MASSACHUSETTS
Department of Elementary and Secondary Education

2023 Next-Generation MCAS and MCAS-Alt Technical Report

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Prepared by Cognia and the Massachusetts Department of Elementary and Secondary Education

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Chapter 1. Overview

1.1 Purposes of the MCAS and This Report

The Massachusetts Comprehensive Assessment System (MCAS) was originally developed in response to provisions in the Massachusetts Education Reform Act of 1993, which established greater and more equitable funding to schools, accountability for student learning, and statewide standards and assessments for students, educators, schools, and districts.

The Act defines the purposes of the MCAS in Chapter 69 of the Massachusetts General Laws as follows:

- Establish "whether students are meeting the academic standards described," in the state curriculum frameworks ensuring that "such instruments shall be criterion referenced." (Ch. 69, Sec 1I)
- Provide "a comprehensive diagnostic assessment of individual students" in the required grades. (Ch. 69, Sec 1I)
- Support the annual publication of assessment results in all public schools, districts, and the state. (Ch. 69, Sec 1I)
- Provide a "competency determination," defined as the requirement that all high school graduates have fulfilled a measure of the "mastery of a common core of skills and knowledge" in mathematics, science and technology, English, and history and social sciences. (Ch. 69, Sec. 1D)
- Set and activate goals for high standards of innovation, quality, and accountability in schools. (Ch. 69, Sec. 1B)

Additional tests and requirements have been added to the MCAS program to meet the requirements of the No Child Left Behind Act (NCLB) of 2001 and the Every Student Succeeds Act (ESSA) of 2015.

The purpose of this *2023 Next-Generation MCAS and MCAS-Alt Technical Report* is to document the technical quality and characteristics of the 2023 next-generation MCAS English language arts (ELA), mathematics, grades 5 and 8 science and technology/engineering (STE), and high school biology and introductory physics tests, as well as of the 2023 MCAS-Alt, in order to present evidence of the reliability and the validity of test score interpretations, and to describe modifications made to the program in 2023.

Technical reports for previous testing years are available on the DESE website. The previous technical reports, as well as other documents referenced in this report, provide additional background information about the MCAS program, its development, and its administration.

This report is primarily intended for experts in psychometrics and educational measurement. It assumes a working knowledge of measurement concepts, such as reliability and validity, as well as statistical concepts of correlation and central tendency. For some sections, the reader is presumed to have basic familiarity with advanced topics in measurement and statistics, such as item response theory (IRT), standard errors of measurement, reliability, and factor analysis.

In addition, this report provides technical evidence for how the MCAS is designed to fulfill the requirements of the Act described above, as well as federal requirements under ESSA for assessments in ELA, mathematics, and STE.

The MCAS is designed to do the following:

- Assess all students who are educated with Massachusetts public funds in designated grades, including students with disabilities and English learner (EL) students. (Historically, Massachusetts has had an annual state participation rate over 98% across all grades, subjects, and assessments [see section 3.3.3]).

- Measure student performance in relation to the state's learning standards as detailed in the Massachusetts curriculum frameworks. As described throughout this document, the MCAS tests are designed to measure the standards in the curriculum frameworks. The process for ensuring alignment to the standards begins with the test and item specifications and test blueprints, continues through the development process with rigorous review by educators and other experts, and culminates with the release of test information (including standards alignment) to students, schools, and districts.
- Produce scaled scores and achievement levels that indicate students' readiness to engage in academic work at the next grade level, and to inform parents and students if they are not on track based on their test results.
- Help families and educators better understand how students are being assessed on the content standards and how instruction can be targeted to achieve better outcomes at the individual or aggregate levels by releasing test items each year—and by providing item descriptions, standards, and other related information for all test questions, whether released or unreleased.

1.2 Organization of This Report

This report provides detailed information regarding test design and development, scoring, and analysis and reporting of 2023 next-generation MCAS and MCAS-Alt results at the student, school, district, and state levels. This detailed information includes, but is not limited to, the following:

- content descriptions of all tests
- an explanation of test administration
- an explanation of equating and scaling of tests
- statistical and psychometric summaries of the tests
  - item analyses
  - reliability evidence
  - validity evidence

In addition, the appendices contain detailed item-level and summary statistics related to each 2023 next-generation MCAS test and its results.

Chapter 1 of this report provides a brief overview of what is documented within the report, including updates made to the MCAS program during 2023. Chapter 2 explains the guiding philosophy, purposes, uses, components, and validity evidence of MCAS. The next two chapters cover test design and development, test administration, scoring, and analysis and reporting of results for the standard MCAS assessments (Chapter 3) and the MCAS Alternate Assessment (Chapter 4). These two chapters include information about the characteristics of test items, how scores were calculated, the reliability of scores, how scores were reported, and validity evidence of results. Numerous appendices are referenced throughout the report.

1.3 Current Year Updates

In 2017, Massachusetts began a transition from the legacy paper-based MCAS tests (administered since 1998) to next-generation MCAS tests administered primarily via computer and aligned with the most recent Massachusetts curriculum frameworks. The 2020 MCAS administration was intended to be a continuation of this transition with the introduction of the next-generation high school biology and introductory physics tests. However, due to the COVID-19 pandemic, no new next-generation tests were administered in 2020 or 2021. Thus, the next-generation high school biology and introductory physics tests were first administered in 2022. The final administration of high school legacy chemistry and technology/engineering occurred in spring 2023, completing the plan to phase out legacy tests.

Table 1-1 shows which MCAS tests were administered at each grade level in spring 2023 and whether the tests were next-generation (NG) or legacy (L) assessments.

Table 1-1. Spring 2023 MCAS Tests Administered, by Grade Level

Content Area	Grade Level							
	3	4	5	6	7	8	9	10
English Language Arts	NG	NG	NG	NG	NG	NG		NG
Mathematics	NG	NG	NG	NG	NG	NG		NG
Science and Technology/Engineering			NG			NG	NG	L/NG*

** Students must take a high school STE test by the end of grade 10. The legacy chemistry and technology/engineering tests were phased out after the 2023 administration. Additional information about the biology and introductory physics tests is available in Chapter 3.*

1.3.1 About the Next-Generation MCAS Assessments

On November 17, 2015, the Massachusetts Board of Elementary and Secondary Education (the Board) voted to endorse the use of next-generation MCAS assessments starting in 2017. The next-generation MCAS assessments include the following elements:

- high-quality test items aligned to the Massachusetts learning standards
- item types that assess both skills and knowledge, such as writing to text in English language arts (ELA) and solving complex problems in mathematics and science and technology/engineering (STE)
- achievement levels that send clear signals to students, parents, and educators about readiness for work at the next level (including results at grade 10 that signal readiness for college and career)
- a full range of student accessibility features and accommodations
- both computer-based and paper-based test administrations, with computer-based testing as the primary method

In 2023, all students in grades 3–8 and 10 took the next-generation assessments in ELA and mathematics; students in grades 5 and 8 took the next-generation assessments in STE. In addition, the next-generation high school biology and introductory physics tests were administered for the second time. Computer-based administration was required for all content areas at grades 3–8, for grade 10 ELA and mathematics, and for high school biology and introductory physics, but paper-based tests were available as a test accommodation at all grades.

1.3.2 Background on the Transition to Next-Generation Assessments

The following are some key milestones for developing and implementing the next-generation MCAS tests:

- **2010**: Massachusetts joins PARCC, a multi-state consortium formed to develop a new set of assessments for ELA and mathematics.
- **2013**: The Board votes to conduct a two-year “test drive” of the PARCC assessments to decide whether Massachusetts should adopt them in place of the existing MCAS assessments in ELA and mathematics.
- **2014**: The PARCC assessments are field-tested in a randomized sample of schools in Massachusetts and in the other consortium states.
- **Spring 2015**: Massachusetts districts (including charter schools and vocational-technical high schools) are given the choice of administering either PARCC or MCAS to their students in grades 3–8. Approximately one-half of the students at those grade levels take the MCAS assessments, and about one-half take the PARCC assessments.
- **November 2015**: Former Commissioner Mitchell Chester recommends to the Board that the state transition to a next-generation MCAS that would be administered for the first time in

spring 2017 and that would utilize both MCAS and PARCC test items. The Board votes to endorse his recommendation.

- **Spring 2017**: Next-generation MCAS tests are administered statewide in ELA and mathematics grades 3–8 for the first time. The tests include a mixture of MCAS and PARCC items.
- **Spring 2018**: The second administration of next-generation MCAS tests in ELA and mathematics grades 3–8. PARCC items are used only for a small number of items on the mathematics tests.
- **Spring 2019**: The third administration of next-generation MCAS tests in ELA and mathematics grades 3–8. The first administration in ELA and mathematics grade 10 and STE grades 5 and 8. The tests include only MCAS items, and PARCC items are no longer included.
- **Spring 2020:** Due to the COVID pandemic, MCAS tests are not administered.
- **Spring 2021**: The fourth administration of next-generation MCAS tests in ELA and mathematics grades 3–8, using one-session tests and some remote administration. The second administration in ELA and mathematics grade 10 using full test forms and in STE grades 5 and 8 using one-session tests.
- **Spring 2022**: The return to full administration of next-generation MCAS tests in ELA and mathematics grades 3–8. The third administration of ELA and mathematics grade 10 and STE grades 5 and 8, plus the first administration of next-generation introductory physics and biology in grades 9 and 10.
- **Spring 2023**: The final administration of legacy chemistry and technology/engineering occurred in grade 10, completing the plan to phase out legacy tests.

1.4 Special Issues

Throughout 2023, the Department (DESE) continued to monitor the progressive recovery from COVID-19 and sought to understand more fully the cumulative impact of the pandemic on instruction. DESE's response to COVID-19 is documented in the 2021 MCAS Next-Generation Technical Report.

1.4.1 Return to Regular Administration

As recovery from the pandemic continued to progress in 2021–2022, DESE endeavored to return to regular administration of the MCAS, including administration of the full ELA, mathematics, and STE tests to all students. In 2022–2023, regular administration continued with no provisions for remote testing.

1.4.2 Change in ELA Essay Scoring

DESE changed the ELA essay scoring for grades 3–8 and removed the dependency between the two trait scores for idea development and conventions. Through spring 2022, students in grades 3–8 could only receive up to 1 point for Conventions if they obtained a 0 score for Idea Development. Beginning in spring 2023, students were able to receive up to 3 points for Conventions regardless of the score for Idea Development. The rule was applied to all 2023 field-test and operational essays in grades 3–8.

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Chapter 2. The State Assessment System: MCAS

2.1 Guiding Philosophy

The MCAS and MCAS Alternate Assessment (MCAS-Alt) programs play a central role in helping all stakeholders in the Commonwealth's education system—students, parents, teachers, administrators, policy leaders, and the public—understand the successes and challenges in preparing students for higher education, work, and engaged citizenship.

Since the first administration of the MCAS tests in 1998, DESE has gathered evidence from many sources suggesting that the assessment reforms introduced in response to the Massachusetts Education Reform Act of 1993 have been an important factor in raising the academic expectations of all students in the Commonwealth and in making the educational system in Massachusetts one of the country's best.

The MCAS testing program has been an important component of education reform in Massachusetts for over 25 years. The program continues to evolve. As described in section 1.3, Massachusetts is finalizing the process of transitioning from the legacy MCAS tests to next-generation MCAS assessments that

- align MCAS items with the revised Massachusetts academic learning standards;
- incorporate innovations in assessment, such as computer-based testing, technology-enhanced item types, and upgraded accessibility and accommodation features;
- provide achievement information that sends clear signals about a student's readiness for academic work at the next level; and
- ensure that MCAS measures the knowledge and skills students need to meet the challenges of the 21st century.

2.2 Alignment to the Massachusetts Curriculum Frameworks

All items included on the MCAS tests are developed to measure the standards contained in the Massachusetts curriculum frameworks. Each test item correlates and is aligned to at least one standard in the curriculum framework for its content area.

The 2023 next-generation MCAS tests were aligned to the 2017 Massachusetts curriculum frameworks for English language arts (ELA) and mathematics and the 2016 Massachusetts curriculum frameworks for science and technology/engineering (STE).

All learning standards defined in the frameworks are addressed by and incorporated into local curriculum and instruction, whether they are assessed on MCAS or not.

2.3 Uses of MCAS Results

MCAS results from the next-generation ELA and mathematics tests in grades 3–8 and 10 and the next-generation STE tests in grades 5 and 8 and high school biology and introductory physics are intended as follows:

1. To be used within the state's framework for district accountability and assistance, in accordance with state priorities and federal requirements.
2. To provide information to support program evaluation at the school and district levels.
3. To provide transparency into student performance through comprehensive reporting on the results of individual students, schools, districts, and the state.
4. To help determine ELA, mathematics, and STE competency (see Appendix A for modified competency determination information) for the awarding of high school diplomas. Students must achieve a passing score on the ELA, mathematics, and STE tests (or successfully file an MCAS appeal) as one condition for high school graduation.

2.4 Validity of MCAS and MCAS-Alt

Validity information for the MCAS and MCAS-Alt assessments is provided throughout this technical report, including information on

- test design and development;
- administration;
- scoring;
- technical evidence of test quality (classical item statistics, differential item functioning, item response theory statistics, reliability, dimensionality, decision accuracy and consistency); and
- reporting.

Tables 2-1 and 2-2 summarize validity information for MCAS and MCAS-Alt provided in specific sections of this report. Note that some of these sections will point the reader to additional validity evidence located in the appendices of the report.

Table 2-1. Summary of Validity Evidence for the Next-Generation MCAS Tests

Type of Validity Evidence	Section	Description of Information Provided
Reliability and classical item analyses; scoring consistency and classification consistency by achievement level	3.4 Appendices G and H	Scoring consistency, interrater agreement, and scoring accuracy
	3.5 Appendices I and J	Classical item analyses
	3.7 Appendix M	Overall reliability and standard error of measurement by test; reliability by student subgroups
	3.7.5	Decision accuracy and consistency (DAC): estimates of accuracy for student classification by achievement level and for each achievement level cut score
Content-related validity evidence	3.2 and 3.9.1 Appendices B, C, and T	Test blueprints: item alignment to test blueprints and standards
Construct-related and structural validity evidence	3.9.2	Response process validity evidence
	3.5 to 3.7 Appendices K and L	Item response theory modeling; dimensionality; scaling; differential item functioning
Consequential validity	3.8 Appendices L, N, and O	MCAS reporting
	3.9.5	Supporting the valid use of MCAS data

MCAS-Alt assessment results are sometimes aggregated with other MCAS results. Therefore, validity information with respect to reliability and content-related validity provided for MCAS also pertains, to

some extent, to the MCAS-Alt. In addition, MCAS-Alt also includes reliability and construct-related characteristics specific to the alternate assessment, as described below in Table 2-2.

Table 2-2. Summary of Validity Evidence for MCAS-Alt

Type of Validity Evidence	Section	Description of Information Provided
Content-related validity evidence	4.2.1 Appendix C	Assessment design (test blueprints aligned to MCAS blueprints but with modifications made for the range and complexity of standards); descriptions of primary evidence and supporting documentation
Cognitive processes	4.5.5 Appendices V and W	Distributions of score frequencies indicate that the tests elicit the expected range of cognitive processes for this population
Precision over the full continuum	4.7.3 Appendix M	Measurement error calculated over respondent subgroups at each performance level indicate that the tests are sufficiently precise over the full performance continuum
Validity based on other variables	4.10.5, 4.1.3, 4.2.1.1, and 4.6	Resource Guides capturing the judgments of educators and experts about the curricular expectations
Reliability and classical item analyses; subgroup statistics and scoring consistency	4.4, 4.7.4, and 4.8 Appendices H, N, R, and S	Procedures to ensure consistent scoring; interrater scoring statistics
	4.5 Appendices I and J	Classical item statistics
	4.7.1, 4.7.2, and 4.7.3 Appendix M	Overall and subgroup reliability statistics
Construct-related and structural validity evidence	4.5.3	Interrelations among scoring dimensions
	4.6	Item bias review and procedures

2.5 Next-Generation MCAS Achievement-Level Descriptors

The achievement-level descriptors (ALDs) used to define expectations on the next-generation MCAS assessments were established to identify students who are prepared for academic work at the next grade level. Massachusetts's *Meeting Expectations* level is also aligned to the level of academic work a student must perform to eventually be prepared for college-level work upon completion of high school.

2.5.1 General Achievement-Level Descriptors

The general ALDs for the next-generation MCAS tests at grades 3–8 and 10 are as follows:

Exceeding Expectations

A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations

A student who performed at this level met grade-level expectations and is academically on track to succeed in the current grade in this subject.

Partially Meeting Expectations

A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations

A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

2.5.2 Grade-Specific Achievement-Level Descriptors

The grade-specific ALDs provided in Appendix B illustrate the knowledge and skills students at each grade are expected to demonstrate on MCAS at each achievement level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because a student's work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Chapter 3. MCAS

3.1 Overview

MCAS tests have been administered to students in Massachusetts since 1998. In 1998, English language arts (ELA), mathematics, and science and technology/engineering (STE) were assessed at grades 4, 8, and 10. In subsequent years, additional grades and content areas were added to the testing program. Following the initial administration of each new test, performance standards were set.

Public school students in the graduating class of 2003 were the first students required to earn a Competency Determination (CD) in ELA and mathematics as a condition for receiving a high school diploma. To fulfill the requirements of the No Child Left Behind (NCLB) Act, tests for several new grades and content areas were added to the MCAS in 2006. As a result, all students in grades 3–8 and 10 are now assessed in both ELA and mathematics, and students in grades 5, 8, and 9/10 are assessed in STE. In 2017, MCAS began the transition to tests administered primarily through a computer-based platform.

The MCAS program is managed by DESE staff with assistance and support from the assessment contractor, Cognia, and its subcontractor, Pearson. The computer-based tests were administered through Pearson's TestNav application. Massachusetts educators play a key role in MCAS through service on a variety of committees related to the development of MCAS test items, the development of MCAS achievement-level descriptors, and the setting of performance standards. The program is supported by a five-member national Technical Advisory Committee (TAC).

More information about the MCAS program is available at www.doe.mass.edu/mcas/.

3.2 Test Design and Development

In 2023, the MCAS operational tests were administered to grades 3–8 and 10 in both ELA and mathematics and grades 5, 8, and 9/10 in STE. The tests were administered primarily on a computer with paper accommodations available. Legacy high school STE tests in chemistry and technology/engineering were administered on paper to a small population of grade 10+ students who had previously failed one of these tests. The 2023 school year was the last year these legacy tests were offered.

3.2.1 Test Specifications

3.2.1.1 Criterion-Referenced Test

In 2023, the items used on MCAS tests were developed specifically for Massachusetts. All items were aligned to content standards in the Massachusetts curriculum frameworks. These content standards are the basis for the reporting categories in each content area and are used to guide the development of test items. Items on the 2023 MCAS tests were coded to the 2017 Massachusetts curriculum frameworks in ELA and mathematics and the 2016 Massachusetts curriculum framework for STE. All items were coded to at least one content standard and some were coded to more than one standard. For STE, items were also coded to a science practice, if applicable. See section 3.2.4.1 for more information about science practices.

3.2.1.2 Item Types

The types of items and their functions, by content area, are described below.

English Language Arts (ELA)

- **Selected-response (SR) items** are worth one or two points and consist of the following:
  - **Multiple-choice items** (computer and paper) make efficient use of limited testing time and allow for coverage of a wide range of knowledge and skills within a content area. Each one-point, multiple-choice item requires students to select the single best answer from four response options. Items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
  - **Two-part, multiple-choice items** (computer and paper) have two parts. In the first part, students select the single best answer from four response options. In the second part, students select, from four response options, the evidence from the stimulus that supports the answer from the first part. (In some limited cases in grade 10, item directions instruct students to select two correct answers in the second part.) The items are machine-scored: correct responses are worth 2 points, partially correct answers are worth 1 point, and incorrect and blank responses receive 0 points. Students who answer the first part incorrectly receive a score of 0; students must answer the first part correctly to receive 1 or 2 points.
  - **Two-point, technology-enhanced (TE) items** (computer only) use computer-based interactions such as inline choice, hot spots, and drag and drop that require the student to choose from a range of options presented. The items are machine-scored: correct responses are worth 2 points, partially correct answers are worth 1 point, and incorrect and blank responses receive 0 points.
- **Constructed-response (CR) items** (computer and paper) are worth 3 points and are used only on grades 3 and 4 tests. Students are expected to generate approximately one paragraph of text in response to a text-based question. Student responses are hand-scored and receive a score of 3, 2, 1, or 0 points.
- **Essays (ES)** (computer and paper) are on all tests in grades 3–8 and 10 and are text-based. Students are required to type or write an essay in response to a prompt, which is based on the passage or passage set they have read. Essays are hand-scored and receive a score of 0–7 possible score points for grades 3–5 and 0–8 possible score points for grades 6–8 and 10.

See section 3.4 for more details on the scoring of CR and ES items.

Mathematics

- **Selected-response (SR) items (computer and paper)** are worth 1 or 2 points and consist of the following:
  - **Multiple-choice items** make efficient use of limited testing time and allow for coverage of a wide range of knowledge and skills within a content area. The items require students to select the single best answer from four response options. Items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
  - **Multiple-select items** require students to select two or more correct answers from a set of answer options. Students are typically instructed to select a certain number of options. There are typically five to six options to choose from. Items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
  - **Technology-enhanced (TE) items** (computer only) use interactions such as inline choice, hot spot, and drag and drop that require the student to choose from a range of options presented. TE Items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
  - **Two-part items** have two parts (Part A and Part B) and are worth two points, each part independently being worth 1 point. They can be multiple-choice, multiple-select, TE, or a combination thereof. Items are machine-scored: students earn 1 point for each correct part and receive 0 points for an incorrect or blank response.

- **Short-answer (SA) items** (computer and paper) are worth 1 or 2 points and consist of the following:
    - **Short-answer items** are used to assess students' skills and abilities to work with brief, well-structured problems that have one solution or a very limited number of solutions (e.g., mathematical computations). The advantage of this type of item is that it requires students to demonstrate knowledge and skills by generating, rather than selecting, an answer. These items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response. For the paper versions of these items, students write their numbers in boxes and then complete a number grid, which is machine-scored.
    - **Technology-enhanced (TE) items** (computer only) use interactions such as fraction models or line plots that require the students to demonstrate knowledge and skills by generating an answer or selecting an answer from a wide range of options. These TE items are machine-scored. For 1-point TE items, students earn 1 point for a correct response and receive 0 points for an incorrect or blank response. Two-point TE items are assessed in grades 4–8 and 10. For two-point TE items, there are two parts, and each part is worth 1 point. The two parts are scored independently from each other. Students earn 2 points for 2 correct parts, 1 point for only 1 correct part, and receive 0 points for no correct parts.
- **Constructed-response (CR) items** (computer and paper) require students to solve problems and generate responses to prompts. Students are required to use higher-order thinking skills, such as analyzing and explaining, to construct responses. Some CR items include a technology-enhanced part, such as creating a graph or completing a model using drag and drop technology. Student responses are hand-scored. CR items are worth either 3 or 4 points.
    - **Three-point constructed-response items** are used only on the grade 3 test. Students are expected to solve problems and generate one to two sentences in response to a prompt. Student responses are hand-scored. Students earn 3, 2, 1, or 0 score points for these items.
    - **Four-point constructed-response items** are used on the grades 4–8 and 10 tests. Students are expected to solve problems and generate one to two sentences in response to a prompt. Student responses are hand-scored. Students earn 4, 3, 2, 1, or 0 score points for these items.

Science and Technology/Engineering (STE)

- **Selected-response (SR) items** (computer and paper) are worth 1 or 2 points and consist of the following:
    - **Multiple-choice items** make efficient use of limited testing time and allow for coverage of a wide range of knowledge and skills within a content area. The items require students to select the single best answer from four response options. Items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
    - **Multiple-select items** require students to select two or more correct answers from a set of answer options. Students are instructed to select a certain number of options. There are typically four to six options to choose from. Items are machine-scored: students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
    - **Technology-enhanced (TE) items** (computer only) use interactions such as inline choice, hot spot, and drag and drop that require the student to choose from a range of options presented. These TE items are machine-scored. For one-point TE items, students earn 1 point for a correct response and receive 0 points for an incorrect or blank response.
    - **Two-part items** have two parts (Part A and Part B) and are worth 2 points, each part being worth 1 point. They can be multiple-choice, multiple-select, TE, or a

combination thereof. Items are machine-scored: students earn 1 point for each correct part and receive 0 points for an incorrect or blank response.

- **Constructed-response (CR) items** (computer and paper) typically require students to process information about a scenario and to use higher-order thinking skills, such as analyzing and explaining, to construct responses to prompts (e.g., identify, describe, explain) about the scenario. The scenario information may include narrative descriptions, models, and data tables or graphs. Some CR items include a technology-enhanced part, such as completing a model using drag and drop technology. Student responses are hand-scored, and each item is worth either 2, 3, or 4 score points. For 2-point CR items, students may earn 2, 1, or 0 score points. For three-point CR items, students may earn 3, 2, 1, or 0 score points. For 4-point CR items, students may earn 4, 3, 2, 1, or 0 score points.

3.2.1.3 Description of Test Designs

The MCAS assessments contain both common and matrix items. The common items are administered to all students and count toward a student's overall score. Matrix items are either field-test items or equating items. Field-test items are tried out to see how they perform and do not count toward a student's score. Equating items are used to link one year's results to those of previous years and do not count toward a student's score. Equating and field-test items are distributed among multiple forms of the test for each grade and content area.

The number of test forms varies by grade and content area and typically ranges between 10 to 20 forms. Each student takes one form of the test and therefore answers a subset of matrix items. Common and matrix items are not distinguishable to test takers. Because all students are given matrix items, an adequate sample size (typically a minimum of 1,500 responses per item) is obtained to produce data that can be used to inform equating decisions and common item selection for future tests.

A computer-based test (CBT) common form and a paper-based test (PBT) common form were developed for grades 3–8 and 10 ELA and mathematics and for grades 5, 8, and 9/10 STE. To create the PBT common form, technology-enhanced items on the CBT form were revised and made into paper-based items, typically multiple-choice items. The PBT items tested the same content as the technology-enhanced items on the CBT.

3.2.2 ELA Test Specifications

3.2.2.1 Standards

The 2023 MCAS grades 3–8 and 10 ELA tests, including all matrix items, were aligned to the following learning standards from the *2017 Massachusetts Curriculum Framework for English Language Arts and Literacy*:

- Anchor Standards for Reading
  - Key Ideas and Details (Standards 1–3)
  - Craft and Structure (Standards 4–6)
  - Integration of Knowledge and Ideas (Standards 7–9)
- Anchor Standards for Language
  - Conventions of Standard English (Standards 1 and 2)
  - Knowledge of Language (Standard 3)
  - Vocabulary Acquisition and Use (Standards 4–6)
- Anchor Standards for Writing
  - Text Types and Purposes (Standards 1–3)
  - Production and Distribution of Writing (Standard 4)

The *2017 Massachusetts Curriculum Framework for English Language Arts and Literacy* can be found at www.doe.mass.edu/frameworks/ela/2017-06.pdf.

3.2.2.2 ELA Item Types

The grades 3–8 and 10 ELA tests used several item types, as shown in Table 3-1.

Table 3-1. ELA Item Types and Score Points

Item Type	Possible Raw Score Points	Grade Levels
Multiple-choice (SR)	0 or 1	3–8, 10
Two-part, multiple-choice (SR)	0, 1, or 2	3–8, 10
Technology-enhanced (SR)	0, 1, or 2	3–8, 10
Constructed-response (CR)	0, 1, 2, or 3	3–4
Essay (ES)	0 to 7	3–5
	0 to 8	6–8, 10

SR = selected-response, CR = constructed-response, ES = essay

3.2.2.3 Passage Types

Passages used in the ELA tests are authentic published passages selected for the MCAS assessment. Test developers, including DESE test developers, review numerous texts to find passages that possess the characteristics required for use in ELA tests. Passages must

- be of interest to and appropriate for students in the grade being addressed;
- have a clear beginning, middle, and end;
- contain appropriate content;
- support the development of a sufficient number of unique assessment items; and
- be free of bias and sensitivity issues.

Passages ranged in length from approximately 600 to 2500 words per passage set. Word counts are on a scale outlined in the passage specifications and are less at lower grades. Passage sets consisted of either a single passage or paired passages. Passages were selected from published works; no passages were specifically written for the MCAS tests.

Passages are categorized into one of two types:

1. **Literary passages** represent a variety of genres: poetry, drama, fiction, biographies, memoirs, folktales, fairy tales, myths, legends, narratives, diaries, journal entries, speeches, and essays. Literary passages are not necessarily fictional passages.
2. **Informational passages** are reference materials, editorials, encyclopedia articles, and general nonfiction. Informational passages are drawn from a variety of sources, including magazines, newspapers, and books.

In grades 3–8, each common form included three passage sets, with some forms containing two literary passage sets and one informational passage set, while other forms contained one literary passage set and two informational passage sets. In grade 10, each common form included four passage sets; two sets were literary and two were informational. Across the forms, sets may be single, paired, or tripled selections.

The MCAS ELA test is designed to include a selection of passage sets with a balanced representation, considering gender, race and ethnicity, and socioeconomic status. Another important consideration is that passages be of interest to the tested age group.

Differences among the passages used at each grade level include the length of the passages (typically increases with increasing grade levels) and the degree of complexity (increasing sophistication in

language and concepts as the grade level increases). Test developers use a variety of readability measures to aid in the selection of passages appropriate at each grade level. In addition, Massachusetts teachers use their grade-level expertise when participating in passage selection as members of the Assessment Development Committees (ADCs).

3.2.2.4 ELA Test Design

All items are coded to ELA framework standards. There are no standalone items on the tests; all vocabulary, grammar, and mechanics questions are associated with a passage set.

Students read a passage set and answer questions that follow. Question types include selected-response items, constructed-response items (grades 3 and 4 only), and essay items. Please see section 3.2.1.2 above for additional details on item types. Approximately 10%–15% of the items were technology-enhanced items.

Test Design by Grade

Grades 3 and 4

The common portion of each test at grades 3 and 4 included three passage sets. Two of the common passage sets included ten to twelve 1- or 2-point selected-response items plus one 7-point text-based essay item or one 3-point constructed-response item. The other common passage set included seven or eight 1- or 2-point selected-response items. Each test contained a total of 44 common points distributed across two testing sessions.

Grade 5

The common portion of each test at grade 5 included three passage sets. Two of the passage sets included eleven 1- or 2-point selected-response items and one 7-point text-based essay item and the other passage set included seven 1- or 2- point selected-response items. The test contained a total of 48 common points distributed across two testing sessions.

Grades 6–8

The common portion of each test at grades 6–8 included three passage sets. Two of the passage sets included eleven 1- or 2-point selected-response items and one 8-point text-based essay item. The other common passage set included seven 1- or 2- point selected-response items. The test contained a total of 50 common points distributed across two testing sessions.

Grade 10

The common portion of each test at grade 10 included four passage sets. Three passage sets in the common portion included seven or eight 1- or 2-point selected-response items and two of those three sets included one 8-point text-based essay item. The fourth common passage set included five 1- or 2-point selected-response items. The test contained a total of 51 common points distributed across two testing sessions.

Matrix

For grades 3–8, the matrix portion included two passage sets. In grades 3 and 4, one matrix passage set included eight to ten 1- or 2-point selected-response items, and either two constructed-response items or one essay. The other matrix passage set included seven 1- or 2-point machine-scored items. In grades 5–8, one matrix passage set included seven to ten 1- or 2-point selected-response items and one essay item and the other matrix passage set included seven 1- or 2-point selected-response items.

The grade 10 matrix portion included two passage sets. One matrix passage set included eight 1- or 2-point selected-response items and one 8-point text-based essay item. The other matrix passage set included four 1- or 2-point selected-response items.

Table 3-2 shows the recommended testing times. MCAS tests are untimed; therefore, the times shown in the table are approximate.

Table 3-2. ELA Recommended Testing Times, Grades 3–8 and 10

Grade	Session 1 Recommended Testing Time (min)	Session 2 Recommended Testing Time (min)	Total Recommended Testing Time (min)
3	120–150	120–150	240–300
4	120–150	120–150	240–300
5	120–150	120–150	240–300
6	120–150	120–150	240–300
7	120–150	120–150	240–300
8	120–150	120–150	240–300
10	150	90-120	240-270

Common and Matrix Item Distribution

The grades 3–8 and 10 ELA tests were administered to a large majority of students on the computer with relatively few students who were unable to use a computer taking the paper form as an accommodation. The paper form was derived from Form 1 of the CBT. Both forms had the same number of common and matrix points. Table 3-3 shows the distribution of common and matrix items in each 2023 ELA test, by grade level.

Table 3-3. Distribution of ELA Common and Matrix Items by Grade and Item Type

Grade and Test			Items per Form							
			Common				Matrix			
Grade	Test	# of Forms	SR (1 pt.)	SR (2 pt.)	CR	ES	SR (1 pt.)	SR (2 pt.)	CR[1]	ES
3	ELA	8	26	4	1	1	14	3	0-2	0-1
4	ELA	8	26	4	1	1	14	3	0-2	0-1
5	ELA	8	24	5	0	2	14	3	0	1
6	ELA	8	24	5	0	2	14	3	0	1
7	ELA	10	24	5	0	2	14	3	0	1
8	ELA	8	24	5	0	2	14	3	0	1
10	ELA	24[2]	21	7	0	2	9	3	0	1

[1] Each grade 3 and grade 4 matrix form contained either two constructed-response items or one essay item.
2 For grade 10, Cognia has included the two retest forms in this number. Retest forms do not include matrix items.

3.2.2.5 ELA Blueprints

Table 3-4 shows the target and actual (in parentheses) percentages of common item points by reporting category. Reporting categories are based on the anchor standards in the 2017 Massachusetts curriculum framework for ELA. An in-depth look at the test blueprints is available in Appendix C.

Table 3-4. Target (and Actual) Distribution of ELA Common Item Points by Reporting Category

Reporting Category	Percent of Points at Each Grade (+/-5%)						
	3	4	5	6	7	8	10
Language	25 (27)	25 (27)	25 (29)	25 (20)	25 (24)	25 (22)	25 (21)
Reading	65 (64)	65 (64)	55 (54)	55 (60)	55 (56)	55 (58)	55 (59)
Writing	10 (9)	10 (9)	20 (17)	20 (20)	20 (20)	20 (20)	20 (20)
Total	100	100	100	100	100	100	100

3.2.2.6 ELA Cognitive Levels

Each item on the ELA tests is assigned a cognitive level according to the cognitive demand of the item. Cognitive levels are not synonymous with item difficulty. The cognitive level provides information about each item based on the complexity of the mental processing a student must use to answer the item correctly. The three cognitive levels used in ELA tests are described below:

- **Level I (Identify/Recall)**—Level I items require that the student recognize basic information presented in the text. Examples of skills at this level include identifying main ideas/facts/details; recalling and locating details; identifying genre or setting; and identifying definitions, parts of speech, or functions of punctuation. Key words include identify, list, match, recognize, describe, and distinguish.
- **Level II (Infer/Analyze)**—Level II items require that the student understand a given text by making inferences and drawing conclusions related to the text. Examples of skills at this level include understanding the whole text (Big Picture)/generalizing; interpreting, making connections, visualizing, and forming questions; explaining a character's role/motives; determining whether an idea is fact or opinion; filtering important information and key concepts; and determining the meaning of a word in context. Key words include infer, analyze, describe, interpret, determine, conclude, explain, summarize, and classify.
- **Level III (Evaluate/Apply)**—Level III items require that the student understand multiple points of view and be able to project their own judgments or perspectives on the text. Examples of skills at this level include understanding another point of view; analyzing/evaluating an author's purpose, style, and message; arguing/defending a point of view with evidence from the text; using reasoning to determine an outcome; applying information from the text; and synthesizing elements of text(s) in order to create a whole. Key words include critique, evaluate, analyze, predict, agree/disagree, argue/defend, apply, synthesize, judge, compare, and contrast.

Each cognitive level is represented in the ELA tests. Table 3-5 shows the range of score points and associated percentages targeted on the operational forms.

Table 3-5. Targeted Percentage of Score Points by Cognitive Skill Level in English Language Arts

Grade	Cognitive Skill Level	Total Points	Percent of Score Points (+/-5%)	Score Points
3–4	I	44	5%	0–5
	II		70%	29–33
	III		25%	10–14
5	I	48	5%	0–5
	II		60%	26–31
	III		35%	14–17
6–8	I	50	5%	0–5
	II		60%	27–32
	III		35%	16–20
10	I	51	5%	0–5
	II		60%	28–33
	III		35%	16–21

3.2.2.7 ELA Reference Materials

The use of authorized bilingual word-to-word dictionaries was allowed during ELA tests only for current and former English learner (EL) students. No other reference materials were allowed during the ELA tests.

3.2.3 Mathematics Test Specifications

3.2.3.1 Mathematics Standards

The 2023 MCAS grades 3–8 and 10 mathematics tests, including all field-test items, were aligned to the learning standards from the *2017 Massachusetts Curriculum Framework for Mathematics*. The 2017 standards are grouped by domains in grades 3–8 and conceptual categories in grade 10, as shown below:

- Domains for grades 3–5
  - Operations and Algebraic Thinking
  - Number and Operations in Base Ten
  - Number and Operations—Fractions
  - Geometry
  - Measurement and Data
- Domains for grades 6 and 7
  - Ratios and Proportional Relationships
  - The Number System
  - Expressions and Equations
  - Geometry
  - Statistics and Probability
- Domains for grade 8
  - The Number System
  - Expressions and Equations
  - Functions
  - Geometry
  - Statistics and Probability
- Conceptual Categories for grade 10
  - Number and Quantity
  - Algebra
  - Functions
  - Geometry

- Statistics and Probability

The *2017 Massachusetts Curriculum Framework for Mathematics* can be found at www.doe.mass.edu/frameworks/math/2017-06.pdf.

3.2.3.2 Mathematics Item Types

The 2023 mathematics tests included several item types, as shown in Table 3-6. Approximately 25–30% of the items were technology-enhanced items.

Table 3-6. Mathematics Item Types and Score Points

Item Type	Possible Raw Score Points	Grade Levels
Multiple-choice (SR)	0 or 1	3–8, 10
Multiple-select (SR)	0 or 1	3–8, 10
Technology-enhanced (TE) (SA or SR)	0 or 1 0, 1, or 2	3 4–8, 10
Two-part (SA or SR)	0, 1, or 2	4–8, 10
Short-answer (SA)	0 or 1	3–8, 10
Constructed-response (CR)	0, 1, 2, or 3 0, 1, 2, 3, or 4	3 4–8, 10

SA = short-answer, SR = selected-response, CR = constructed-response

3.2.3.3 Mathematics Test Design

Test Design by Grade

Grade 3

The common portion of the grade 3 test included thirty-six 1-point selected-response or short-answer items and four 3-point constructed-response items. The matrix portion included three 1-point selected-response or short-answer items and one 3-point constructed-response item. The test contained a total of 48 common points distributed across two testing sessions.

Grades 4–6

The common portion of the grades 4–6 tests included thirty-four 1-point selected-response or short-answer items, two 2-point selected-response items, and four 4-point constructed-response items. The matrix portion included two 1-point selected-response or short-answer items, one 2-point selected-response or short-answer item, and one 4-point constructed-response item. Each test contained a total of 54 common points distributed across two testing sessions.

Grades 7 and 8

The common portion of the grades 7 and 8 tests included thirty-four 1-point selected-response or short-answer items, two 2-point selected-response items, and four 4-point constructed-response items. The matrix portion included two 1-point selected-response or short-answer items, two 2-point selected-response or short-answer items, and two 4-point constructed-response items. Each test contained a total of 54 common points distributed across two testing sessions. Items in session 2 were developed to assess content where the students may need a calculator. These items were either calculator-neutral (calculators are permitted but not required to answer the question) or calculator-active (students are expected to use a calculator to answer the question).

Grade 10

The common portion of the grade 10 test included thirty-two 1-point selected-response or short-answer items, six 2-point selected-response items, and four 4-point constructed-response items. The matrix portion included eight 1-point selected-response or short-answer items, two 2-point selected-response or short-answer items, and two 4-point constructed-response items. Each test contained a total of 60 common points distributed across two testing sessions. Items in session 2 were developed to assess content where the students may need a calculator. These items were either calculator-neutral (calculators are permitted but not required to answer the question) or calculator-active (students are expected to use a calculator to answer the question).

Table 3-7 shows the distribution of common and matrix points on the 2023 mathematics tests, as well as recommended testing times. Since MCAS tests are untimed, the times shown are approximate.

Table 3-7. Mathematics Recommended Testing Times and Common/Matrix Points per Test, Grades 3–8 and 10

Grade	# of Sessions	Session 1 Recommended Testing Time (in minutes)	Session 2 Recommended Testing Time (in minutes)	Total Recommended Testing Time (in minutes)	Common Points	Matrix Points
3	2	90	90	180	48	6
4–6	2	90	90	180	54	8–9
7–8	2	90	90	180	54	12–14
10	2	90–120	90–120	180–240	60	24

Grades 3–8 and 10 mathematics tests were administered to a large majority of students on the computer with relatively few students taking the paper form as an accommodation. The paper form was derived from Form 1 of the CBT. Both forms had the same number of common and matrix points. Table 3-8 shows the distribution of common and matrix item types by grade level.

Table 3-8. Distribution of Mathematics Common and Matrix Items by Grade and Item Type

Grade	# of Forms	Common				Matrix	
		SR/SA/TE		CR		SR/SA/TE	CR
		(1 pt.)	(2 pt.)	(3 pt.)	(4 pt.)	(1 or 2 pt.)	(3 or 4 pt.)
3	28	36	0	4	0	3	1
4	28	34	2	0	4	3	1
5	28	34	2	0	4	3	1
6	28	34	2	0	4	3	1
7	21	34	2	0	4	4	2
8	22	34	2	0	4	4	2
10	20	32	6	0	4	10	2

3.2.3.4 Mathematics Blueprints

Tables 3-9 through 3-12 show the target and actual percentages of common item points by reporting category. Reporting categories are based on the Massachusetts curriculum framework domains.

Table 3-9. Target (and Actual) Distribution of Math Common Item Points by Reporting Category, Grades 3–5

Domain	% of Points at Each Grade (+/-5%)		
	3	4	5
Operations and Algebraic Thinking	30 (31)	20 (20)	15 (15)
Number and Operations in Base Ten	15 (17)	20 (20)	30 (30)
Number and Operations – Fractions	20 (19)	30 (30)	25 (26)
Geometry	10 (8)	10 (9)	10 (9)
Measurement and Data	25 (25)	20 (20)	20 (20)
Total	**100**	**100**	**100**

Table 3-10. Target (and Actual) Distribution of Math Common Item Points by Reporting Category, Grades 6 and 7

Domain	% of Points at Each Grade (+/-5%)	
	6	7
Ratios and Proportional Relationships	20 (20)	20 (20)
The Number System	20 (20)	20 (20)
Expressions and Equations	30 (30)	25 (24)
Geometry	15 (15)	15 (15)
Statistics and Probability	15 (15)	20 (20)
Total	**100**	**100**

Table 3-11. Target (and Actual) Distribution of Math Common Item Points by Reporting Category, Grade 8

Domain	% of Points at Each Grade (+/-5%)
The Number System and Expressions and Equations	40 (37)
Functions	20 (20)
Geometry	30 (30)
Statistics and Probability	10 (13)
Total	**100**

Table 3-12. Target (and Actual) Distribution of Math Common Item Points by Reporting Category, Grade 10

Conceptual Category	% of Points at Each Grade (+/-5%)
Number and Quantity	15 (15)
Algebra & Functions	35 (35)
Geometry	35 (35)
Statistics and Probability	15 (15)
Total	**100**

3.2.3.5 Mathematics Cognitive Levels

Each item on the mathematics test is assigned a cognitive level according to the cognitive demand of the item. Cognitive levels are not synonymous with difficulty. The cognitive level provides information about each item based on the complexity of the mental processing a student must use to answer the item correctly. The three cognitive levels used in the mathematics tests are described below:

- **Level I (Recall and Recognition)**—Level I items require that the student recall mathematical definitions, notations, simple concepts, and procedures, and apply common, routine procedures or algorithms (that may involve multiple steps) to solve a well-defined problem.

- **Level II (Analysis and Interpretation)**—Level II items require that the student engage in mathematical reasoning beyond simple recall, in a more flexible thought process, and in enhanced organization of thinking skills. These items require a student to make a decision about the approach needed, to represent or model a situation, or to use one or more non-routine procedures to solve a well-defined problem.
- **Level III (Judgment and Synthesis)**—Level III items require that the student perform more abstract reasoning, planning, and evidence-gathering. To answer questions of this cognitive level, a student must engage in reasoning about an open-ended situation with multiple decision points, represent or model unfamiliar mathematical situations, and solve more complex, non-routine, or less well-defined problems.

Cognitive Levels I and II are represented by items in all grades and across item types. Cognitive Level III is best represented by constructed-response items; an attempt was made to include Level III items at each grade. Table 3-13 shows the target score points and associated score point percentage by cognitive skill level.

Table 3-13. Targeted Percent of Score Points by Cognitive Skill Level in Mathematics

Grade	Cognitive Skill Level	Total Points	Percent of Score Points	Score Points
3	I	48	25–40%	12–20
	II		55–65%	26–32
	III		6–15%	3–7
4–8	I	54	25–40%	13–22
	II		55–65%	29–35
	III		6–15%	3–8
10	I	60	25–35%	15–21
	II		55–65%	33–39
	III		7–20%	4–12

3.2.3.6 Mathematics Reference Materials

Rulers were provided to students in grades 3–8. Handheld rulers were provided to students taking the paper version of the mathematics test. Students taking the computer-based mathematics test had access to two separate computer-based rulers: a centimeter ruler and a 1/8-inch ruler; students were not permitted to use handheld rulers on the computer-based test.

Reference sheets were provided to students at grades 5–8 and 10. These sheets contain information, such as formulas, that students may need to answer certain items.

The second session of the grades 7, 8, and 10 mathematics tests was a calculator session. All items included in this session were either calculator-neutral (calculators are permitted but not required to answer the question) or calculator-active (students are expected to use a calculator to answer the question). Each student taking the computer-based grade 7 mathematics test had access to a five-function calculator and a scientific calculator during session 2 of the mathematics test. Each student taking the computer-based grade 8 and grade 10 mathematics tests had access to a scientific calculator, a TI-84 graphing calculator, and a Desmos graphing calculator during session 2 of the mathematics test. Students taking the paper-based mathematics tests in grades 7, 8, and 10 had access to comparable handheld calculators.

3.2.4 Science and Technology/Engineering (STE) Test Specifications

3.2.4.1 STE Standards and Practices

The next-generation STE MCAS tests for grades 5, 8, and 9/10 were aligned to the standards in the 2016 Massachusetts Science and Technology/Engineering Curriculum Framework. In addition, Instructional Guidelines were developed to help clarify some standards and can be found at www.doe.mass.edu/stem/ste/.

The grade 5 test was based on the grades 3–5 standards, and the grade 8 test was based on the grades 6–8 standards. The 2016 Pre-K–8 standards are grouped into the following four domains:

- Earth and Space Science
- Life Science
- Physical Science
- Technology/Engineering

The grade 9/10 tests were based on the high school biology standards (biology test) and the high school introductory physics (introductory physics test) standards. The 2016 standards are grouped into four domains for biology:

- Molecules to Organisms
- Heredity
- Evolution
- Ecology

The 2016 standards are grouped into three domains for introductory physics:

- Motion, Forces, and Interactions
- Energy
- Waves

The *2016 Massachusetts Science and Technology/Engineering (STE) Curriculum Framework* can be found at https://www.doe.mass.edu/frameworks/scitech/2016-04.pdf.

In addition, the next-generation STE MCAS tests assessed the science and engineering practices incorporated into the standards. There are eight practices included in the standards:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

3.2.4.2 STE Item Types

The grades 5, 8, and 9/10 STE tests included several item types, as shown in Table 3-14.

Table 3-14. STE Item Types and Score Points

Item Type	Possible Raw Score Points	Grade Level
Multiple-choice (SR)	0 or 1	5, 8, and 9/10
Multiple-select (SR)	0 or 1	5, 8, and 9/10
Technology-enhanced (SR)	0 or 1	5, 8, and 9/10
Two-point (SR)	0, 1, or 2	5, 8, and 9/10
Constructed-response (CR)	0, 1, 2, 3, or 4	5, 8, and 9/10

SR = selected-response, CR = constructed-response

3.2.4.3 STE Test Design

Test Design

The common portion of the grades 5 and 8 tests included thirty-two 1-point selected-response items, three 2-point selected-response items, two 2-point constructed-response items, and four 3-point constructed-response items. The tests included two common modules, which are groups of items based on a scenario/phenomenon. Each module contained three 1-point selected-response items and one 3-point constructed-response item. Module items made up 12 points of the test, while discrete items made up 42 points of the test. The matrix portion included five 1-point selected-response items, one 2-point selected-response or constructed-response item, and one 3-point constructed-response item, for a total of 10 points. Some forms contained matrix modules (equating or field test) while other forms only included discrete items. The test contained a total of 54 common points distributed across two testing sessions. Approximately 25–30% of the items were technology-enhanced items.

The common portion of the grade 9/10 tests included thirty-two 1-point selected-response items, five 2-point selected-response items, two 3-point constructed-response items, and three 4-point constructed-response items. The tests included two common modules, which are groups of items based on a scenario/phenomenon. Each module contained three to five 1-point selected-response items, zero to one 2-point selected-response items, and one 3-point constructed-response item. Each module was made up of a total of 8 points and module items in total made up 16 points of the test; discrete items made up 44 points of the test. The matrix portion included eleven to thirteen 1-point selected-response items, two to three 2-point selected-response items, one 3-point constructed response item, and one 4-point constructed-response item, for a total of 24 points. Each form contained a matrix module (field test) and discrete items. The test contained a total of 60 common points distributed across two testing sessions. Approximately 25% of the items were technology-enhanced items.

Table 3-15 shows the distribution of common and matrix points on the STE tests, as well as recommended testing times. Since MCAS tests are untimed, the times shown are approximate.

Table 3-15. STE Recommended Testing Times and Common/Matrix Points per Test

Grade	# of Sessions	Session 1 Recommended Testing Time (in minutes)	Session 2 Recommended Testing Time (in minutes)	Total Recommended Testing Time (in minutes)	Common Points	Matrix Points
5	2	60–90	60–90	120–180	54	10
8	2	60–90	60–90	120–180	54	10
9/10	2	60-90	60-90	120–180	60	24

The STE tests were administered to a large majority of students on the computer with relatively few students taking the paper form as an accommodation. The paper form was derived from Form 1 of the

CBT. Both forms had the same number of common and matrix points. Table 3-16 shows the distribution of common and matrix item types by grade level.

Table 3-16. Distribution of STE Common and Matrix Items by Grade and Item Type

Grade	# of Forms	Common					Matrix			
		SR1 (1 pt.)	SR2 (2 pt.)	CR2 (2 pt.)	CR3 (3 pt.)	CR4 (4 pt.)	SR1 (1 pt.)	SR2/CR2 (2 pt.)	CR3 (3 pt.)	CR4 (4 pt.)
5	12	32	3	2	4	0	5	1	1	0
8	12	32	3	2	4	0	5	1	1	0
9/10	14/15*	32–34	4-5	0	2	3	11–13	2–3	1	1

**Introductory physics was 14 and biology was 15, not including retest forms.*

3.2.4.4 STE Blueprints

Tables 3-17 through 3-19 show the target and actual percentages of common item points by content reporting category. Content reporting categories are based on the Massachusetts curriculum framework domains.

Table 3-17. Target (and Actual) Distribution of STE Common Item Points by Reporting Category, Grades 5 & 8

Domain	% of Points at Each Grade (+/-5%)	
	5	8
Earth and Space Science	25 (26)	25 (26)
Life Science	25 (26)	25 (26)
Physical Science	25 (26)	25 (24)
Technology/Engineering	25 (22)	25 (24)
Total	**100**	**100**

Table 3-18. Target (and Actual) Distribution of STE Common Item Points by Reporting Category, Grade 9/10 – Biology

Domain	% of Points
Molecules to Organisms	35 (35)
Heredity	25 (25)
Evolution	20 (20)
Ecology	20 (20)
Total	**100**

Table 3-19. Target (and Actual) Distribution of STE Common Item Points by Reporting Category, Grade 9/10 – Introductory Physics

Domain	% of Points at Each Grade (+/-5%)
Motion, Forces, and Interactions	50 (50)
Energy	30 (30)
Waves	20 (20)
Total	**100**

In addition to the content reporting categories, over 50% of the items were coded to an MCAS science and engineering practice category. These items were dually coded, meaning they were coded to both a content reporting category and a practice reporting category. The MCAS practice reporting categories are listed in Table 3-20.

Table 3-20. STE Practices Assessed on MCAS

MCAS Practice Category	Science and Engineering Practices
A. Investigations and Questioning	Asking Questions and Defining Problems Planning and Carrying Out Investigations
B. Mathematics and Data	Analyzing and Interpreting Data Using Mathematics and Computational Thinking
C. Evidence, Reasoning, and Modeling	Developing and Using Models Constructing Explanations and Designing Solutions Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information

Regarding the STE practices, each content standard includes a reference to one STE practice. For example, standard 5-ESS2-1 states:

> *Use a model to describe the cycling of water through a watershed through evaporation, precipitation, absorption, surface runoff, and condensation.*

Although only a single practice category is referenced within each standard, different practices may be assessed with the associated content. In the example above, items assessing standard 5-ESS2-1 may assess not only the "developing and using models" practice; they may also assess any other practice, such as constructing explanations or analyzing and interpreting data.

Each item that assessed a practice was coded to one of the three practice categories listed in Table 3-20.

3.2.4.5 STE Cognitive Levels

Each item on the STE tests is assigned a cognitive level according to the cognitive demand of the item. Cognitive levels are not synonymous with difficulty. The cognitive skill describes each item based on the complexity of the mental processing a student must use to answer the item correctly. Only one cognitive skill is designated for each item. STE uses a modified revised Bloom's taxonomy to code items by cognitive level. Items generally fall into either the understanding or applying/analyzing cognitive skill level. Table 3-21 is an example (grade 5 STE) of the descriptions of the cognitive skills used for the STE test items. Each STE test has its own cognitive skill description, which can be found at https://www.doe.mass.edu/mcas/tdd/cognitive_skills.html.

Table 3-21. Grade 5 STE Cognitive Skill Descriptions

Cognitive Skill	Description
Understanding/ Level 1	**Students show an understanding of scientific and engineering concepts and skills by:** • Ordering events or quantities for a simple phenomenon, such as ordering the age of rock layers. • Completing a simple model, such as labeling some parts of the water cycle or adding an arrow to complete a model showing the path that light takes for an object to be seen. • Identifying a scientific or engineering process, such as erosion or encoding in a given model or based on a description. • Identifying or describing basic characteristics of an organism, substance, object, event, or environment such as the function of a plant's roots or that a desert receives only small amounts of rain. • Interpreting information to determine a straightforward conclusion, such as where volcanoes occur on a map with plate boundaries. • Determining the materials and tools needed for a basic investigation or to build a prototype, such as a ruler for measuring length or a thermometer for measuring temperature. • Describing the purpose of a design feature for a given design solution, such as plastic being used because it is waterproof, or glass being used because it is see-through.
Applying/ Level 2	**Students apply their science and engineering knowledge and skills by:** • Interpreting data from a graph or table to draw a conclusion, such as the amount of fresh water available for use by humans and other organisms. • Interpreting a model to draw a conclusion, such as determining the flow of energy in a food web. • Completing an unfamiliar or complex model, such as adding an arrow representing a force on an object to show the object is changing speed. • Setting up a data table for an investigation, given certain criteria. • Providing evidence that supports a claim about a scientific or engineering phenomenon, such as using masses of substances to support a claim that the amount of matter stays the same during a phase change of chemical reaction. • Explaining a scientific or engineering concept when given an unfamiliar context, such as how water changes and moves through several steps of the water cycle for a certain watershed. • Interpreting a diagram of a design solution to draw a straightforward conclusion, including using a ruler to determine if a design solution meets certain criteria. • Determining what scientific question to ask given certain data and criteria. • Determining which variables should be controlled in an investigation and those that may change, such as amount of water, sunlight, or air in a photosynthesis investigation. • Writing a testable question that can be asked for an investigation. (CR items only)
Analyzing/ Evaluating/ Level 3	**Students analyze or evaluate data and information using their science and engineering knowledge and skills by:** • Analyzing data from multiple sources or from a complex graph or table to draw a conclusion or develop an explanation, such as comparing weather or climate data from two or more locations. • Drawing a conclusion from a complex model or multiple models using scientific or engineering knowledge, such as analyzing two life cycles and drawing conclusions about the two organisms. • Evaluating two models or prototypes and explaining why one is better than the other. (CR items only) • Revising a complex model to make it more accurate, such as determining an error in a food web and describing how to correct the error. • Explaining how a design can be changed to address several criteria and constraints. (CR items only) Note: Some items will reach this level due to students needing to construct an explanation in a constructed response (CR) based on an application of their knowledge.

3.2.4.6 STE Reference Materials

Rulers were provided to students in all grades. Handheld rulers were provided to students taking the paper version of the STE test. Students taking the computer-based STE tests had access to two separate computer-based rulers: a centimeter ruler and a 1/8-inch ruler; students were not permitted to use handheld rulers on the computer-based tests.

Students were provided a computer-based five-function calculator in grade 5 and a computer-based scientific calculator in grade 8 and in grade 9/10. Handheld calculators were given to students taking the paper-based tests.

A reference sheet was provided to students taking the introductory physics test. This sheet contains information, such as formulas, that students may need to answer certain items.

3.2.5 Item and Test Development Process

Table 3-22 provides a detailed view of the item and test development process, in chronological order.

Table 3-22. Overview of Item and Test Development Process

Development Step	Detail of the Process
Select reading passages (for ELA only)	Contractor's test developers find potential passages and these passages are reviewed by the contractor's internal diversity, equity, and inclusion committee to minimize bias and sensitivity issue prior to the passages going to DESE. The passages are then presented to DESE for initial approval. DESE-approved passages go to Assessment Development Committees (ADCs) composed of experienced educators, and then to a Bias and Sensitivity Committee (BSC) for review and recommendations. ELA items are not developed until passages have been reviewed by an ADC and a BSC. DESE makes the final determination as to which passages will be developed and used on a future MCAS test.
Develop items	Contractor's test developers generate items and edit items from subcontractors that are aligned to Massachusetts standards and specifications.
DESE and educator review of items	1. Contractor sends draft items to DESE test developers for review. 2. DESE test developers review and edit items prior to presenting the items to ADCs. 3. ADCs review items and make recommendations. 4. BSC reviews items and makes recommendations. 5. DESE test developers edit & revise items based on recommendations from ADC & BSC.
Expert review of items	Experts from higher education and practitioners review all field-tested items for content accuracy. Each item is reviewed by at least two independent expert reviewers. Comments and suggested edits are provided to DESE staff for review.
Benchmark constructed-response items and essays	DESE and contractor test developers meet to determine appropriate benchmark papers for training of scorers of field-tested constructed-response items and essays. Scoring rubrics and notes are reviewed and edited during benchmarking meetings. During the scoring of field-tested items, the contractor contacts DESE test developers with any unforeseen issues.
Item statistics meeting	ADCs review field-test statistics and recommend items for the common-eligible status, for re-field-testing (with edits, for math and discrete STE items, since ELA is passage-based), or for rejection. BSC also reviews items and recommends items to become common-eligible or to be rejected.
Test construction	Before test construction, DESE provides target performance-level cut scores to contractor's test developers. Contractor proposes sets of common items (items that count toward student scores) and matrix items. Matrix items consist of field-test and equating items, which do not count toward student scores. Each common set of items is delivered with proposed cut scores, including test characteristic curves (TCCs) and test information functions (TIFs). DESE test developers and editorial staff review and edit proposed sets of items. Contractor and DESE test developers and editorial staff meet to review edits and changes to tests. Psychometricians are available to provide statistical information for changes to the common form.
Operational test items	Approved common-eligible items become part of the common item set and are used to determine individual student scores.
Released common items	Approximately 50% of common items in grades 3–8 and 100% of common items in grade 10 are released to the public, and the remaining items are returned to the common-eligible pools to be used on future MCAS tests. An item description (a statement specifying the content of the item) is released for each common item (both released and non-released).

3.2.5.1 Item Development and Review

Initial DESE Item Review

As described in the table above, all passages, items, and scoring guides are reviewed and edited by DESE test developers before presentation to the educator committees for review. Passage selection information can be found in section 3.2.2.3. DESE test developers evaluate new items for the following characteristics:

- **Alignment**: Are the items aligned to the standards?
- **Complexity**: Are the items at the appropriate level of complexity?
- **Content**: Is the content accurate? Does the item elicit a response that shows a depth of understanding of the subject?
- **Contexts**: Are contexts grade-level appropriate? Are they realistic? Are they interesting to students?
- **Grade-level appropriateness**: Are the content, language, and contexts appropriate for the grade level?
- **Distractors**: Have the distractors for selected-response items been chosen based on plausible content errors? What are the distractor rationales?
- **Mechanics**: How well are the items written? Are they grammatically correct? Do they follow the conventions of item writing? Is the wording grade-level appropriate and accessible for all students?
- **Technology**: Are the items scoring correctly? Is the item making the best use of the technology? Is there another type of item that is more appropriate?

After DESE's initial review, DESE and the contractor's test developers work collaboratively to revise the proposed item sets in preparation for ADC review. DESE's initial review, subsequent revision, and following work by committees draws on long standing DESE guidance on standards alignment, appropriateness and quality, as well as newly revised guidance on cognitive complexity. This revised guidance defines three "skill levels" of cognitive complexity, articulates what each level means, and provides example items by grade level.

Assessment Development Committee (ADC) and Bias & Sensitivity Committee (BSC) Reviews

The ADCs and BSCs are each composed of approximately 10–12 Massachusetts educators from across the state (see Appendix D for lists of names). There is an ADC for each content area and grade (e.g., ELA grade 3), and one BSC. ADC and BSC members meet several times a year to review new passages and items and to review data from field-test items. Each ADC meeting is co-facilitated by DESE and Cognia's test developers. BSC meetings are facilitated by Cognia staff with one DESE test developer in attendance. ADC and BSC members review items using Pearson's online platform ABBI. Each participant enters their "vote" and recommendations, and the facilitators record the consensus of the committee. All ADC and BSC recommendations remain with each item. DESE takes the recommendations of the ADCs and the BSCs into consideration and makes the final decision to approve items to become field-test eligible.

ADC Passage Review (ELA Only)

ELA ADCs review passages before any corresponding items are written. Committee members consider all the elements noted in section 3.2.2.3. Committee members are also asked to consider whether a passage is well-known or comes from a book that is widely taught, since such a passage would likely provide an unfair advantage to those students who are familiar with it. Committee members vote to accept or reject each passage, and the facilitators record the consensus of the group.

For each passage recommended for acceptance, committee members provide suggestions for item development. They also provide recommendations for the presentation of the passage, including suggestions for the purpose-setting statement, words to be footnoted/glossed or redacted, and graphics, illustrations, or photographs to be included with the text.

ADC Item Review

Once DESE test developers have reviewed and edited new items and scoring guides, the items are reviewed by the ADCs. Committee members review and suggest edits to items for the following:

- content accuracy
- grade-level appropriate context and wording
- clearly written stem and question
- clear and accurate graphs, tables, and graphics
- correct answer(s) and scoring notes
- plausible but incorrect distractors
- alignment to correct standard(s)
- alignment to the correct practice (science only)
- alignment to correct cognitive skill
- appropriate use of technology-enhanced items

Members vote to accept, accept with edits (members may include suggested edits), or reject each item. If an item needs significant edits, it will be brought back to the ADC for review again. The meeting facilitators record the consensus/majority opinion of the group, including the suggested edits or reasoning for rejection.

BSC Passage and Item Review

After passages and items have been approved by the ADCs, they are also reviewed by a separate BSC. The role of the committee is to identify whether a passage or item contains material that is likely to significantly favor or disadvantage one group of students for reasons that are not educationally relevant. The purpose of the committee's review is to ensure that the ability to answer an item correctly reflects a student's learning, not cultural opportunities, or life experiences. Specifically, a passage or item is flagged by the committee if it is insensitive or disrespectful to a student's ethnic, religious, or cultural background (including disability, socio-economic status, and regional differences). The BSC uses a set of guiding questions, which provide the members with a list of considerations in their review of the passages and items for bias and sensitivity. The BSC votes to accept, accept with edits (including suggested edits), or reject (including their reasoning) each passage or item. The meeting facilitators record the consensus of the group.

External Content Expert Item Review

When items are selected to be included on the field-test portion of the MCAS, they are submitted to expert reviewers for their feedback. The task of the expert reviewer is to consider the accuracy of item content. Each item is reviewed by two independent expert reviewers. All expert reviewers for MCAS hold a doctoral degree (either in the content they are reviewing or in the field of education) and are affiliated with an institution of higher education in either a teaching or research position. Each expert reviewer has been approved by DESE. The External Content Experts recommend either accepting, accepting with edits, or rejecting an item, including their reasoning for edits, or rejecting an item. Expert reviewers' comments remain with each item.

Status and Editing of Items

DESE test developers review the recommendations of the ADC, BSC, and expert reviewers and determine whether to revise or reject an item based on the suggested edits (in ELA, items are submitted for expert review after the field-test administration; reviewers' comments are considered for the next development cycles and items are rejected for use on the operational test if issues are found). The items are also reviewed and edited by DESE and Cognia editors to ensure adherence to style guidelines in *The Chicago Manual of Style*, *American Heritage Dictionary*, MCAS Style Guidelines, and to sound testing principles. According to these principles, all items should

- demonstrate correct grammar, punctuation, usage, and spelling;
- be written in a clear, concise style;
- contain unambiguous descriptions of what is required for a student to attain a maximum score; and
- be written at a reading level that allows students to demonstrate their knowledge of the subject matter being tested.

3.2.5.2 Field-Testing of Items

Items that pass the reviews as described above are approved to be field-tested. Field-tested items appear in the matrix portions of the tests. Each matrix item is typically answered by a minimum of 1,500 students, resulting in enough responses to yield reliable performance data.

Scoring of Field-Tested Items

All field-tested items, except for constructed-response items and essays, are machine-scored. These items include multiple-choice, multiple-select, short-answer, and technology-enhanced items.

All field-tested constructed-response items and essays are hand-scored. To train scorers, DESE works closely with the scoring staff to refine rubrics and scoring notes, and to select benchmark papers that exemplify the score points and variations within each score point. We scored approximately 2,000 responses per field-tested constructed-response item or essay. See section 3.4 for additional information on scorers and scoring.

Data Review of Field-Tested Items

Data Review by DESE

DESE test developers review all item statistics as available prior to committee review by the ADCs and BSCs. An item displaying statistics that indicate it did not perform as expected is closely reviewed and, if found to be flawed, it is rejected from the pool of items. After ADC and BSC reviews of item statistics, DESE test developers make final decisions regarding any recommendations.

Data Review by ADCs

The ADCs meet to review the field-test items with their associated statistics. ADCs review the following item statistics:

- item difficulty (or mean score for polytomous items)
- item discrimination
- Differential Item Functioning (DIF)
- distribution of scores across answer options and score points
- distribution of answer options and score points across quartiles
- distribution of unique student responses (for some items)

The ADCs make one of the following recommendations for each field-tested item:

- accept
- edit and field-test again (this recommendation is made for mathematics and discrete STE items only, since ELA items are passage-based)
- reject

Data Review by BSCs

The BSC also reviews the statistics for the field-tested items. The committee reviews only the items that the ADCs have accepted. The BSC pays special attention to items that show DIF when comparing the following subgroups of test takers:

- female compared with male
- African American/Black compared with white
- Hispanic or Latino/a compared with white
- English learners (EL) and former EL compared with non-EL

3.2.5.3 Item Selection for Operational Test

Cognia's test developers propose a set of previously field-tested or common, non-released items to be used in the common portion of the test. Test developers work closely with psychometricians to ensure that the proposed tests meet the statistical requirements set forth by DESE. In preparation for meeting with the DESE test developers, the contractor's test developers consider the following criteria in selecting items to propose for the common portion of the test:

- **Content coverage/match to test design and blueprints**. The test designs and blueprints stipulate a specific number of items per item type and per reporting category for each content area. A broad coverage of standards and cognitive skills is expected. The previous year's common test should also be considered, and items should not be duplicated.
- **Item difficulty and complexity**. Item statistics drawn from the data analysis of items are used to ensure similar levels of difficulty and complexity from year to year as well as high-quality psychometric characteristics. Items can be reused if they have not been released and were not used the previous year. When an item is reused in the common portion of the test, the latest usage statistics accompany that item.
- **"Clueing" items**. Items are reviewed for any information that might "clue" or help the student answer another item.
- **Item types**. A variety of item types, including approximately 20–30% technology-enhanced items, should populate the common slots.

Field-test items are also selected during form construction. Field-test items are drawn from the field-test eligible pools and should mirror the operational test to the extent needed. If a standard or reporting category is lacking in the common eligible item pool, items should be chosen to fill this need. During assembly of the test forms, the following criteria are considered:

- **Key patterns**. The sequence of keys (correct answers) is reviewed to ensure that the key order appears random.
- **Option balance**. Items are balanced across forms so that each form contains a roughly equivalent number of key options.
- **"Clueing" items**. Items are reviewed for any information that might "clue" or help the student answer another item.
- **Item types**. A variety of item types should populate the matrix slots.

3.2.5.4 Operational Test Draft Review

The proposed operational test is posted for DESE to review. DESE test developers consider the proposed items, make recommendations for changes, and then meet with Cognia's test developers to

construct the final forms of the tests. After form construction meetings, the test forms enter several rounds of review by test developers and editors. Items are checked to ensure that requested changes were made after the test construction meetings, and to ensure that all items are scoring correctly. In addition, items are checked again for any grammatical or "fatal flaw" errors, and these are corrected before the test forms are published.

3.2.5.5 Special Edition Test Forms

MCAS Accessibility Features and Accommodations

MCAS is accessible to students with and without disabilities through the universal design of the testing platform and test items, the provision of special edition test forms, and the availability of a range of accommodations and accessibility features for students taking the standard tests. To be eligible to receive a special edition test form, a student must have a documented disability either in an individualized education program (IEP) or in a 504 plan. English learners may also be eligible for selected special test forms and accommodations. MCAS 2023 operational tests and retests were available in the following special editions for eligible students:

- **Large-print**—Form 1 of the operational test was translated into a large-print edition. The large-print edition contains all common and matrix items found in Form 1.
- **Braille**—This form included only the common items found in the operational test. If an item indicates bias toward students with visual disabilities (e.g., if it includes a complex graphic that a student taking the Braille test could not reasonably be expected to comprehend as rendered), then simplification of the graphic is considered, with appropriate rewording of the item text, as necessary. If a graphic such as a photograph cannot be rendered in Braille, or if the graphic is not needed for the student to respond to the item, the graphic is replaced with descriptive text or a caption or eliminated altogether. Three-dimensional shapes that are rendered in two dimensions in print are rendered on the Braille test as "front view," "top view," and/or "side view," and are accompanied where necessary by a three-dimensional wooden or plastic manipulative wrapped in a Braille-labeled plastic bag. Modifications to original test items for the Braille version of the test are made only when necessary, as determined by the Braille test subcontractor and DESE staff, and only when they do not provide clues or assistance to the student or change what the item is measuring. When successful modification of an item or graphic is not possible, all or part of the item is omitted, and may be replaced with a similar item.
- **Screen reader**—This accommodation was available only for those students who are blind or have a visual disability. Students who used a screen reader were also given a separate hard-copy Braille edition test in order to have the appropriate Braille graphics. All answers are entered onscreen, either by the student using a Braille writing device or by the test administrator.
- **Text-to-speech**—This functionality was embedded in the grades 3–8 and 10 computer-based tests (CBT). Students typically use headphones with this format but may also be tested individually in a separate setting to minimize distractions to other students (from hearing what is being read aloud).
- **American Sign Language (ASL)**—The grade 10 MCAS mathematics computer-based test and the grade 9/10 STE computer-based tests are available to students who are deaf or hard-of-hearing in an American Sign Language edition, which contains only the common items found in the operational test.
- **Spanish-English**—This version of the grade 10 mathematics test and grade 9/10 STE tests are intended for Spanish-speaking EL students who have been in the United States less than 3 years. Spanish-English tests are available in computer- and paper-based formats. Paper-based tests consist of English-Spanish facing pages (side-by-side) and computer-based tests consist of "stacked" Spanish text above English text. Students may respond either in Spanish or English. (Note: For all other MCAS test versions, students must respond in English.)

Appendix E includes all accommodations and special edition test forms and lists accessibility features that were available to all students, such as screen magnification and highlighting. After testing was completed, DESE received a list with the number of students who participated in the 2023 MCAS with each accommodation, based on information compiled in the Personal Needs Profile in PearsonAccess Next.

3.3 Test Administration

3.3.1 Test Administration Schedule

The grades 3–8 and 10 next-generation MCAS tests were administered in 2023 with staggered start dates, as shown in Table 3-23.

Table 3-23. Test Administration Schedule—ELA and Mathematics Grades 3–8 & 10, STE 5 & 8, and High School STE

Content Area	Complete the Student Registration/ Personal Needs Profile Process	Receive Test Administration Materials	Test Administration Windows	Deadline to Complete the Principal's Certification of Proper Test Administration (PCPA); Update Students' Accommodations, and Mark CBT as Complete	Deadline for Return of Materials to Contractor (for PBT Only)
February Biology and Introductory Physics	December 5–December 16	January 25	February 1–2 (Last day for makeup testing: February 7)	February 7	February 8
March Retests (ELA and Mathematics)	January 30–February 7	March 1	ELA: March 8–9 Math: March 14–15 (Last day for makeup testing: March 20)	March 20	March 21
Grades 3–8 ELA	January 23–February 3	March 13	March 27–April 28	Deadline to complete PCPA: May 30 Deadline to update accommodations and mark CBT complete: May 1	May 2
Grades 3–8 Mathematics	January 23–February 3	March 13	April 24–May 26	May 30	May 31
Grades 5 & 8 Science and Tech/Eng.	January 23–February 3	March 13	April 25–May 26	May 30	May 31
Grade 10 ELA	January 30–February 10	March 14	Session 1: March 28 Session 2: March 29 (Last day for makeup testing: April 6)	Deadline to complete PCPA: May 25 Deadline to update accommodations and mark CBT complete: April 6	April 10
Grade 10 Mathematics	January 30–February 10	March 14	Session 1: May 16 Session 2: May 17 (Last day for makeup testing: May 25)	May 25	May 26
HS Science and Tech/Eng.	April 14–May 2	May 23	NG Biology and Introductory Physics: Session 1: June 6 Session 2: June 7 (Last day for makeup testing: June 14) Legacy Chemistry & Tech/Eng.: Session 1: June 6 Session 2: June 7 (Last day for makeup testing: June 14)	June 14	June 15
November 2022 Retest	September 19–30	November 2	ELA: November 9–10 Math: November 15–16 (Last day of makeup testing for all tests: November 21)	November 21	November 22

3.3.2 Security Requirements

Principals were responsible for ensuring that all test administrators complied with the requirements and instructions contained in the *Principal's Administration Manual*. In addition, other administrators, educators, and staff within the school were responsible for complying with the same requirements. Schools and school staff who violated the test security requirements were subject to numerous possible sanctions and penalties, including delays in reporting of test results, the invalidation of test results, the removal of school personnel from future MCAS administrations, employment consequences, and possible licensure consequences for licensed educators.

If test content is breached, quick identification and resolution of the breach are critical to the integrity of a testing program. In addition to reports of breaches in the field, the MCAS program used the Pearson proprietary web monitoring tool to perform web monitoring. The Pearson web monitoring system leverages technology tools and human expertise to identify, prioritize, and monitor sites where sensitive test information may be disclosed. The following strategies were used:

- systematically patrolling the internet, websites, blogs, discussion forums, video archives, social media, document archives, brain dumps, auction sites, and media outlets
- identifying and verifying threats to MCAS test security and notified DESE and Cognia, as required
- working systematically through the steps necessary to have infringing content removed if a threat was verified
- providing summary reporting that included overall and specific threat analysis

DESE receives reports of testing irregularities from schools throughout the various test administrations. For serious irregularities, test results are invalidated, and any cases of educator misconduct are investigated and may be referred to DESE's legal office for a licensure investigation.

DESE performs data analysis on all spring MCAS results and flags schools as outliers if they fall outside certain defined parameters. In cases where the validity of results is called into question, DESE may place student results under review until an investigation can be conducted.

DESE also conducts school monitoring during MCAS testing, going into the field and observing schools' test administrations. Observations are conducted with a checklist and any deviations from the testing protocols are noted for correction.

Full security requirements, including details about responsibilities of principals and test administrators, examples of testing irregularities, guidance for establishing and following a document tracking system, and lists of approved and unapproved resource materials, can be found in the *Spring 2023 Principal's Administration Manual* (PAM), the *Spring 2023 Test Administrator's Manual for Computer-Based Testing* (CBT TAM), and the *Spring 2023 Test Administrator's Manual for Paper-Based Testing* (PBT TAM).

3.3.3 Participation Requirements

In spring 2023, students educated with Massachusetts public funds were required by state and federal laws to participate in MCAS testing. The 1993 Massachusetts Education Reform Act, state law M. G. L. Chapter 69, section 1I, mandates that **all** students in the tested grades who are educated with Massachusetts public funds participate in the MCAS, including the following groups of students:

- students enrolled full-time at all publicly funded K–12 schools including
    - district schools
    - charter schools
    - publicly run innovation schools
    - Commonwealth of Massachusetts Virtual Schools
    - educational collaboratives

- students enrolled in private schools receiving special education that is publicly funded by the Commonwealth, including approved and unapproved private special education schools within and outside Massachusetts
- students enrolled in institutional settings receiving educational services at public expense
- students in military families enrolled in public schools
- students in the custody of either the Department of Children and Families (DCF) or the Department of Youth Services (DYS)
- students with disabilities, including students with temporary disabilities such as a broken arm
- English learner (EL) students
- students who have been expelled but receive educational services from a district
- foreign exchange students who are coded as #11 under "Reason for Enrollment" in the Student Information Management System (SIMS) in grades 3–8 and 10

It was the responsibility of the principal to ensure that all enrolled students participated in testing as mandated by state and federal laws. To certify that **all** students participated in testing as required, principals were required to complete the online Principal's Certification of Proper Test Administration (PCPA) following test administration. For a summary of participation rates, see the 2023 MCAS Participation Report on DESE's School and District Profiles website.

3.3.3.1 Students Not Tested on Standard Tests

A very small number of students educated with Massachusetts public funds were not required to take the standard MCAS tests. These students were strictly limited to the following categories:

- EL students in their first year of enrollment in U.S. schools, who are not required to participate in ELA testing, and who were required to participate in the ACCESS for ELLs test
- students with significant disabilities who were unable to take the standard MCAS tests and instead participated in the MCAS-Alt (see Chapter 4 for more information)
- students with a medically documented absence who were unable to participate in make-up testing, including students participating in post-concussion "graduated reentry" plans who were determined to be not well enough for standard MCAS testing

More details about test administration policies and participation requirements for students without disabilities, for students with disabilities, for EL students, and for students educated in alternate settings can be found in the PAM.

3.3.4 Administration Procedures

In 2023, DESE maintained regular administration of the MCAS to all students. No provision was made for remote testing.

It was the principal's responsibility to coordinate the school's 2023 MCAS test administration. This coordination included the following responsibilities:

- understanding and enforcing test security requirements and test administration protocols
- reviewing plans for maintaining test security with the superintendent
- ensuring that all enrolled students participated in testing at their grade level
- coordinating the school's test administration schedule and ensuring that tests were administered in the correct order and during the prescribed testing windows
- ensuring that test accommodations were properly provided and that transcriptions, if required for any accommodation, were done appropriately. (Accommodation frequencies during 2023 testing can be found in Appendix F [note that the information presented in Appendix F is based on all test takers, and counts are broken out by all students, EL students, and students with IEP/Plan 504]; for a list of test accommodations, see Appendix E.)
- completing and ensuring the accuracy of information provided on the PCPA

- monitoring DESE's website (www.doe.mass.edu/mcas/) throughout the school year for important updates
- reading the Student Assessment Update emails throughout the year for important information
- providing DESE with correct contact information to receive important notices during test administration

More details about test administration procedures, including ordering test materials, scheduling test administration, designating and training qualified test administrators, identifying testing spaces, meeting with students, providing accurate student information, and accounting for and returning test materials, can be found in the PAM.

The MCAS program is supported by the MCAS Service Center, which includes a toll-free telephone line, email, and live chat answered by staff members who provide support to schools and districts. The MCAS Service Center operates weekdays from 7:00 a.m. to 5:00 p.m. (Eastern Time), Monday through Friday.

3.4 Scoring

3.4.1 Preparation

3.4.1.1 Preparation of Student Responses

Scoring of the 2023 MCAS tests was conducted by both Cognia and Pearson.

Scoring responses to short-answer, constructed-response, and essay items began by first preparing the documents for scoring. Student identification information, demographic information, and school contact information was converted to alphanumeric format. Digitized student responses to constructed-response items were sorted into specific content areas, grade levels, and items before being scored.

Scoring consistency across scoring departments on all item types was established as follows:

- Cognia provided annotated anchor, practice, and qualification sets for all existing items to Pearson for review in advance of scoring. Content specialists at Pearson and Cognia consulted with each other to address any questions and ensure clarity of training materials.
- Cognia facilitated in-person benchmarking meetings for field-test items.
- For operational ELA items that needed additional benchmarked responses, content specialists from Cognia, Pearson, and DESE collaborated on the establishment of final scoring decisions.
- Weekly meetings between the Cognia and Pearson scoring departments were held to address any issues and questions before and during scoring.

Table 3-24 shows the breakdown of how scoring work was divided between Cognia and Pearson.

Table 3-24. Breakdown of Scoring Work

Cognia	Pearson
ELA & mathematics grade 10 operational	ELA & mathematics grades 3–8 operational
ELA & mathematics grades 3–8 & 10 field tests	
ELA & mathematics grades 3–8 operational preparation of expanded training materials for hand-off to Pearson	
STE grades 5, 8, and HS operational and field tests	

For computer-based tests, images for field-test constructed response and essay items were loaded into iScore, Cognia's secure scoring platform. For operational constructed-response and essay items, images were uploaded into the ePEN scoring platform.

For paper-based tests, Cognia scanned each MCAS student answer booklet. Images for field-test constructed-response and essay items were loaded into iScore. Images for operational constructed response and essay items were transferred via FTP site to Pearson for uploading into the ePEN scoring platform. A set of quality-control procedures was enacted for scanning paper test forms. These procedures are provided in Appendix G and included

- checks of the answer booklet codes against the grade level, to ensure that the correct answer booklets were scanned in each batch;
- counting checks, to ensure that all booklets were accounted for; and
- spot checks, in which the scanned results were checked against randomly selected answer booklets to ensure that the scanners were working as intended.

3.4.2 Benchmarking Meetings

Samples of student responses of field-test items were read, scored, and discussed by members of Cognia's Scoring Services and Content Development and Publishing (CDP) Departments and by DESE test developers and content leads. Each benchmarking meeting was content- and grade-specific (e.g., grade 6 ELA). All decisions were recorded and considered final upon DESE signoff.

The primary goals of the field-test benchmarking meetings were to

- revise, as necessary, an item's scoring guide and/or scoring rubric;
- revise, as necessary, an item's scoring notes based on student responses—these, along with scoring guides, provide detailed information about how to score an item;
- assign final score points with justifications to a given set of student responses;
- approve anchor and practice sets of responses that are used to train scorers; and
- score additional papers that may be used for qualification sets.

3.4.3 Short-Answer Items

Student responses to selected-response and short-answer items were machine-scored by PearsonAccess Next (PAN) Scoring. Student responses with multiple marks (possible only on paper-based tests) and blank responses were assigned zero points.

Prior to machine-scoring of selected-response items, DESE reviewed all items in the online item bank (ABBI) and approved all selected-response answer keys during test construction. The item scoring specifications (in Question and Test Interoperability [QTI]) were configured using the test maps and keys provided for the tests. Once the scoring system was configured, a quality-assurance group verified that the selected responses entered by the student for an item as shown in the uploaded image corresponded to the response recorded in the database, for both the pre-score and the scored student data files.

Scoring for selected-response items was verified against the specific DESE requirements for the item, the requirement of the test map, which includes the QTI response, and the keys and validations made for an individual student's derived scores per level of the test. This process included a review of all score-value-related fields—such as raw scores, object scores (part one and part two of multi-part items), strand scores, performance levels, pass/fail indicators, attempt rules, and scaled scores—against the tables provided by Pearson psychometrics.

3.4.4 Scoring of Constructed-Response and Essay Items

3.4.4.1 Scoring Plan and Staff

The following scoring plan summarizes the approach to the scoring for all grades and content areas:

- All scoring was conducted by applying a virtual/synchronous scoring model maintaining the same quality control measures that were applied in a center-based, regional scoring environment.
- Prior to the start of scoring, scorers attended connectivity sessions to support their readiness for virtual/synchronous scoring and to answer any technology-related questions.
- Scorers evaluated student work on a fixed daily schedule under constant supervision of leadership.
- Training and all interaction between leadership and scorers occurred live via Zoom (Cognia) or Teams (Pearson) and/or via pre-recorded training module or a recording of live training.
- Breakout rooms were used to facilitate scorer training and individualized coaching.
- DESE had remote access to the scoring systems and Zoom/Teams links were provided to observe training sessions and scoring.
- Scorers worked in a non-public setting and were required to be on camera during training, scoring, and any one-on-one or group coaching sessions.
- A post-scoring survey was sent out to all MCAS scoring associates to elicit feedback on their scoring experience. The results were shared with DESE.

The following staff members were involved with scoring the 2023 MCAS responses:

- Cognia Staff
    - The *Scoring Director for Content and Quality* provided guidance, direction, and leadership to MCAS scoring.
    - The *Scoring Operations Managers* provided guidance and oversight of all operational and logistical matters related to scoring.
    - The *Scoring Project Manager* was responsible for the communication and coordination of MCAS scoring between Cognia and Pearson, and between Cognia and DESE.
    - *Scoring Content Specialists* facilitated all benchmarking meetings to ensure consistency of content area benchmarking and field-test scoring across all grade levels. They also handled all aspects for scoring of grade 10 ELA and mathematics, and grades 5, 8, and HS STE. Scoring content specialists prepared training materials for all operational scoring of ELA and mathematics grades 3–8 prior to scoring by Pearson. They also fielded any questions between Pearson and Cognia to ensure a consistent scoring approach across the scoring groups and years.
    - *Scoring Supervisors* were responsible for the training and qualification of both scorers and Scoring Team Leaders, and for ensuring quality targets for their assigned items.
    - *Scoring Team Leaders* provided support and direction to scorers on quality, accuracy, and timely completion of scoring.
- Pearson Staff
    - The *Scoring Portfolio Manager* was responsible for the coordination, management, and oversight of MCAS scoring for Pearson.
    - The *Scoring Project Manager* oversaw communication and coordination of MCAS scoring between Pearson and Cognia.
    - *Scoring Content Specialists* ensured consistency of content area scoring across all grade levels. Scoring content specialists monitored the quality of scoring and worked closely with a group of scoring directors to ensure the accurate and timely completion of scoring. Scoring content specialists also coordinated communication with their counterparts at Cognia regarding the training materials.

- *Scoring Directors* were responsible for the training and qualification of both scorers and scoring supervisors and ensuring quality targets for their assigned items.
- *Scoring Supervisors* provided support and direction to scorers on quality, accuracy, and timely scoring completion.
- *Automated Scoring Team Members* were responsible for training and monitoring the scoring performance of the Intelligent Essay Assessor (IEA) on the subset of the ELA prompts selected for automated scoring.

3.4.4.2 Scorer Recruitment and Qualifications

MCAS scorers, a diverse group of individuals with a wide range of backgrounds, ages, and experiences, were recruited to meet contract requirements. These requirements included successful completion of at least two years of college, although hiring preference was given to individuals with a four-year college degree. Those scoring high school students' responses must have at least a 4-year degree and must either have a degree related to the content they were working on OR have at least two classes related to the content and have prior experience in the content area.

Teachers, tutors, and administrators (e.g., principals, guidance counselors) currently under contract or employed by or in Massachusetts schools, and people under 18 years of age, were not eligible to score MCAS responses. Potential scorers were required to submit an application and documentation of qualifications, such as résumés and transcripts, which were carefully reviewed. Regardless of their qualifications, potential scorers who did not clearly demonstrate content-area knowledge or have at least two college courses with average or above-average grades in the content area they wished to score were eliminated from the applicant pool. A summary of scorers' backgrounds is provided in Table 3-25.

Table 3-25. Summary of Scorer and Scoring Leadership Backgrounds (Operational Scoring)

Education	Cognia Scorers		Cognia Leadership	
	Number	Percent	Number	Percent
Master's degree/doctorate	236	42%	31	37%
Bachelor's degree	316	57%	53	63%
Associate's degree/more than 48 college credits	8	1%	--	--
Less than 48 college credits	--	--	--	--
TOTAL	560	100%	84	100%
Teaching Experience				
11 years or more	-	--	--	--
6–10 years	--	--	--	--
3–5 years	323	58%	47	56%
1–2 years	--	--	--	--
Less than a year	--	--	--	--
I have no teaching experience	237	42%	37	44%
Scoring Experience				
3+ years of experience	88	16%	72	86%
1–3 years of experience	472	84%	12	14%
No previous experience as scorer/first season	--	--	--	--
Education	**Pearson Scorers**		**Pearson Leadership**	
	Number	**Percent**	**Number**	**Percent**
Master's degree/doctorate	793	30%	54	33%
Bachelor's degree	1,853	70%	110	67%
Associate's degree/more than 48 college credits	--	--	--	--
Less than 48 college credits	--	--	--	--
TOTAL	2,646	100%	164	100%
Teaching Experience				
11 years or more	358	19.3%	21	19%
6–10 years	265	14.3%	9	8%
3–5 years	361	19.5%	18	16%
1–2 years	308	16.6%	15	14%
Less than a year	156	8.4%	12	11%
I have no teaching experience	450	24.3%	41	37%
Scoring Experience				
3+ years of experience	**578**	**29%**	**39**	**35%**
1–3 years of experience	**1,392**	**71%**	**71**	**65%**
No previous experience as scorer/first season	--	--	--	--

3.4.4.3 Scorer Training

Scoring content specialists had overall responsibility for ensuring that responses were scored consistently, fairly, and according to the approved scoring guidelines. Scoring materials were carefully compiled and checked for consistency and accuracy. Student identification information, demographic information, and school contact information were not visible to scorers. The sequence and manner in which the materials were presented to scorers was standardized to ensure that all scorers had the same training environment and scoring experience, regardless of content, grade level, or item scored.

Three training methods were used to train scorers of MCAS hand-scored items:

- live group training via Zoom/Teams
- recording of live group training
- pre-recorded interactive modules

Scorers started the training process by receiving an overview of MCAS; this general orientation included the purpose and goal of the testing program and any unique features of the test and the testing population. Scorer training for a specific item to be scored always started with a thorough review and discussion of the scoring guide, which consisted of the task, the scoring rubric, and any specific scoring notes for that task. All scoring guides were previously approved by DESE during field-test benchmarking meetings and used without any additions or deletions.

As part of training, prospective scorers carefully reviewed three different sets of student responses, some of which had been used to train scorers when the item was a field-test item:

- **Anchor sets** were DESE-approved sets consisting of two or three sample responses at each score point. Each response represented a typical response, rather than an unusual or uncommon one; it was solid and had a true score, meaning that this response had a precise score. Anchor sets were used to exemplify each score point.
- **Practice sets** may have included unusual, discussion-provoking responses, illustrating the range of responses encountered in operational scoring (including exceptionally creative approaches; extremely short or disorganized responses; responses that demonstrate attributes of both higher-score anchor papers and lower-score anchor papers; and responses that show traits of multiple score points). Practice sets were used to refine the scorers' understanding of how to apply the scoring rules across a wide range of responses.
- **Qualifying sets** consisted of 10 responses that were clear, typical examples of each of the possible score points. Qualifying sets were used to determine whether scorers could score consistently according to the DESE-approved scoring standards.

Meeting or surpassing the minimum acceptable standard on an item's qualifying set was an absolute requirement for scoring student responses to that item. An individual scorer must have attained a scoring accuracy rate of 70% exact and 90% exact-plus-adjacent agreement[1] (at least 7 out of the 10 were exact score matches and either zero or one discrepant) on either of two potential qualifying sets. For multi-trait ELA items, each scorer had to meet the 70% / 90% passing threshold for each individual trait.

3.4.4.4 Leadership Training

Scoring content specialists also had overall responsibility for ensuring that scoring leadership (Cognia scoring supervisors and Pearson scoring directors) continued their history of scoring consistently, fairly, and according to the approved scoring guidelines. Once they had completed their item-specific training, scoring leadership was required to meet or surpass a qualification standard of at least 80% exact and

1 "Adjacent agreement" means that a pair of scores (for the same response) are only off by one point. "Exact-plus-adjacent agreement" means that a pair of scores are either the same or off by only one point.

90% exact-plus-adjacent scoring accuracy. For multi-trait ELA items, scoring leadership had to meet the 80% and 90% passing threshold for each individual trait.

3.4.4.5 Hand-Scoring of Constructed Response and Essay Items

Hand-scoring by human scorers was conducted on all field-test items in grades 3–8 and high school and on all operational items in science and mathematics across all grades and for ELA high school. In addition to human scoring, for 10 essay items in ELA in grades 3–8, 10% double-blind scoring (described below in this section) was conducted via automated scoring using Pearson's Intelligent Essay Assessor (IEA). The double-blind scoring on the other 3–8 ELA and mathematics items was done by human scorers at a rate of 10%. All high-school operational scoring received 100% double-blind human scoring. Information on how the IEA works and how it was used on the MCAS essay scoring is provided in section 3.4.4.7 below.

The 2023 MCAS tests included constructed-response items and essays that were scored by hand. Hand-scored items included the following:

- constructed-response items with assigned scores of 0–3 (ELA grades 3 and 4 only)
- constructed-response items with assigned scores of 0–3 (mathematics grade 3) and 0–4 (mathematics grades 4–8 and 10)
- constructed-response items with assigned scores of 0–2 and 0–3 (STE grades 5, 8, and HS)
- essays with assigned scores of 0–7 (ELA grades 3–5) and 0–8 (ELA grades 6–8)

For each of these hand-scored items, a scoring guide was created. For examples of item-specific scoring guides, see the MCAS Student Work/Scoring Guides webpage at www.doe.mass.edu/mcas/student/.

The final non-numeric scores assigned by Cognia and Pearson could be designated as the following:

- Blank: The written response form is completely blank.
- Unreadable: The response cannot be read because of poor penmanship, or spelling cannot be deciphered, or writing is too small, too faint to see, or only partially visible.
- Non-English: Response was written entirely in a language other than English or without enough English or numbers to provide a score.
- Off Topic: Response does not address the topic or task for the item. The response is irrelevant to the item prompt, or the response states that the student is refusing to participate in testing.
- Direct Copy: Direct copy of text from the passage or item prompt.

Scorers at both Cognia and Pearson could also flag a response as a "Crisis" response, which would be sent to scoring leadership for immediate attention.

A response would be flagged as a "Crisis" response if it indicated

- perceived, credible desire to harm self or others;
- perceived, credible, and unresolved instances of mental, physical, or sexual abuse;
- presence of language or thoughts that may require professional intervention;
- sexual knowledge well beyond the student's developmental age;
- ongoing, unresolved misuse of legal/illegal substances (including alcohol);
- knowledge of or participation in real, unresolved criminal activity; or
- direct or indirect request for adult intervention/assistance (e.g., crisis pregnancy, doubt about how to handle a serious problem at home).

3.4.4.6 Single-Scoring, Double-Blind Scoring, and Read-Behind Scoring

Student responses were either single scored (response was scored once by a single scorer) or double-blind scored (response was independently read and scored by two scorers).

Double-Blind Scoring

In double-blind scoring, scorers were not aware that double-blind scoring was taking place. For a double-blind response with adjacent scores (within one point of each other), the higher score was used for high school and the first score was used for grades 3–8 as score-of-record. Any double-blind response with discrepant scores (greater than one point) was sent to the arbitration queue and read by scoring leadership, where the expert score resolved the scoring discrepancy.

Double-blind scoring with the IEA scoring platform was conducted on 10% of the responses for ten ELA essay items across grades 3–8. For the remaining items in grades 3–8, human scorers conducted double-blind scoring at a rate of 10%. For the grade 10 ELA essay items, human scorers conducted double-blind scoring at a 100% rate.

A description of how the IEA functions and how it was used is provided in section 3.4.4.7. Scoring agreement statistics provided in Tables 3-29 and 3-30 are based on comparing human scoring to the 10% double-blind scoring (IEA scoring or human scoring depending on the prompt).

Read-Behind Scoring

In addition to the 10% or 100% double-blind scoring, scoring leadership, at random points throughout the scoring shift, engaged in read-behind (back-read) scoring for each scorer assigned to their team. In this process, scoring leadership views responses recently scored by a particular scorer and assigns a score to that same response. Scoring leadership then compared scores and advised or counseled the scorer as necessary.

Table 3-26 illustrates how the rules were applied for instances when two read-behind scores were not an exact match or when two scorers conducting double-blind scoring assigned scores that did not match. The examples are based on a 0–4-point high school (HS) item.

Table 3-26. Read-Behind and Double-Blind Resolution Examples

Read-Behind Scoring[1]			
Scorer #1	Scorer #2	Scoring Leadership Resolution	Final
4	-	4	4
3	3	4	4
3	-	2	2
Double-Blind Scoring[2]			
Scorer #1	Scorer #2	Scoring Leadership Resolution	Final
4	3	-	4
4	2	3	3
1	3	1	1
1	2	-	2
4	2	1	1
1	1	-	1

[1] In all cases, the scoring leadership score is the final score of record.
[2] At Grades 3–8: If double-blind scores are adjacent (only 1 point different), the first score is the final score. At Grade HS: If double-blind scores are adjacent, the higher score is used as the final score. If double-blind scores are neither exact nor adjacent, the resolution score is used as the final score.

3.4.4.7 Double-Blind Scoring with the Intelligent Essay Assessor (IEA)

The Intelligent Essay Assessor (IEA) is used to score student responses to essay prompts. Like human scorers, IEA evaluates the content and meaning of text, as well as grammar, style, and mechanics. IEA learns to score via a range of machine learning and natural language processing technologies. The engine is trained individually on each prompt and trait using hundreds or thousands of human-scored student responses.

IEA measures the content and quality of responses by determining the features human scorers evaluate when scoring a response. Given a set of human-scored responses to a prompt, IEA computes hundreds

of different metrics that characterize each response in numerical ways. Some examples of these metrics include the following:

- number of grammar errors
- types of grammar errors
- variety of words
- maturity of vocabulary
- variety of sentence types
- coherence of the response
- similarity of the response to other responses and/or source materials

All these different metrics are fed to machine learning algorithms that determine which of them best predict the scores assigned by human scorers.

One of the hallmarks of IEA is its ability to score constructed responses in content areas beyond just ELA using a unique implementation of Latent Semantic Analysis (LSA). LSA analyzes large bodies of relevant text to generate semantic similarity of words and passages. LSA can then "understand" the meaning of text in much the same way as a human scorer.

IEA's background knowledge of English is based on a collection of text of about 12 million words—roughly the amount of text a student will read over the course of their academic career. Because LSA operates over the semantic representation of texts, rather than at the individual word level, it can evaluate similarity even when texts have few or no words in common. For example, LSA finds the following two sentences to have a high semantic similarity:

Surgery is often performed by a team of doctors.

On many occasions, several physicians are involved in an operation.

IEA was used operationally for the third consecutive year as the second double-blind score. IEA was trained before the operational assessment was administered using responses collected during the field test and scored by trained human scorers. For each prompt, IEA was trained using approximately 1,300 responses per prompt and then evaluated using approximately 640 responses. Table 3-27 includes the specific N counts for each prompt. The responses were randomly assigned to each set (training or evaluation). Performance on the evaluation set was measured using a variety of criteria comparing IEA with human scoring using the standard metrics shown in Table 3-28.

Table 3-27. N Counts by Prompt

Grade	Prompt	Training Set Size	Evaluation Set Size
3	EL909882556	1263	631
4	EL007459900	1305	652
5	EL030400392	1283	639
5	EL624182427	1195	598
6	EL007051004	1251	624
6	EL807016586	1312	656
7	EL006653237	1275	637
7	EL713375305	1186	594
8	EL007062902	1278	640
8	EL007253494	1268	636

Table 3-28. Standard Metrics for Evaluating Automated Scoring[2]

Measure	Threshold
Pearson R	≥ 0.70
Quadratic Weighted Kappa (QWK)	≥ 0.70
Kappa	≥ 0.40
Exact Agreement	≥ 65% (or better than human-human agreement)
Per score point agreement	≥ 50% (or better than human-human agreement)
Standardized Mean Difference (SMD)	Within |0.15|

Ten prompts met the required performance criteria and were approved by DESE to be scored by IEA as the double-blind score to monitor quality during the operational assessment. Scoring performance on the operational assessment is described in the next section.

Table 3-29 shows a comparison of IEA to human scoring on the validity papers, by exact score point (validity papers are student responses with known scores interspersed among the other student responses; these papers are used to check scoring accuracy). As shown below, IEA scoring accuracy on these validity papers is similar to or slightly higher than the human scoring accuracy at all score points. IEA accuracy tends to be higher than human accuracy at the highest score point, as seen in the Idea Development agreement statistics for grades 3–8.

Table 3-29. Comparison of Human and IEA Agreement with Validity Papers—ELA

Grade	UIN	Trait	Validity	N	Exact Agreement	Exact Agreement by Score Point					
						0	1	2	3	4	5
3	EL909882556	Idea Development	IEA	136	90%	79%	97%	89%	83%	100%	
			Human		84%	91%	93%	79%	65%	77%	
		Conventions	IEA		87%	100%	91%	74%	88%		
			Human		87%	97%	92%	76%	79%		
4	EL007459900	Idea Development	IEA	79	92%	100%	97%	93%	71%	75%	
			Human		89%	71%	95%	83%	62%	55%	
		Conventions	IEA		98%	50%	100%	100%	91%		
			Human		91%	50%	96%	84%	87%		
5	EL030400392	Idea Development	IEA	104	78%	84%	80%	72%	67%	94%	
			Human		78%	91%	87%	63%	58%	46%	
		Conventions	IEA		83%	91%	50%	85%	91%		
			Human		80%	87%	80%	64%	78%		
	EL624182427	Idea Development	IEA	43	70%	100%	71%	61%	75%	67%	
			Human		76%	80%	84%	72%	72%	37%	
		Conventions	IEA		77%	83%	85%	61%	100%		
			Human		77%	75%	81%	74%	74%		
6	EL007051004	Idea Development	IEA	110	86%	86%	85%	86%	92%	63%	0%
			Human		75%	84%	84%	72%	49%	35%	0%
		Conventions	IEA		91%	100%	90%	90%	88%		
			Human		75%	78%	76%	75%	66%		
	EL807016586	Idea Development	IEA	55	87%	100%	75%	100%	50%	67%	100%
			Human		89%	97%	92%	74%	65%	48%	71%
		Conventions	IEA		95%	100%	82%	80%	100%		
			Human		90%	96%	87%	64%	84%		
7	EL006653237	Idea Development	IEA	130	85%	95%	96%	85%	93%	31%	100%
			Human		85%	93%	91%	88%	77%	51%	49%
		Conventions	IEA		91%	100%	80%	91%	93%		
			Human		88%	97%	85%	86%	85%		
	EL713375305	Idea Development	IEA	76	92%	100%	100%	87%	92%	90%	85%
			Human		85%	99%	91%	79%	81%	70%	72%
		Conventions	IEA		96%	90%	94%	93%	100%		
			Human		90%	90%	89%	79%	96%		
8	EL007062902	Idea Development	IEA	132	96%	100%	90%	96%	95%	96%	100%
			Human		78%	95%	86%	75%	72%	50%	67%
		Conventions	IEA		97%	100%	91%	96%	98%		
			Human		88%	95%	85%	78%	91%		
	EL007253494	Idea Development	IEA	114	87%	100%	100%	76%	89%	71%	0%
			Human		74%	85%	84%	73%	69%	52%	0%
		Conventions	IEA		85%	94%	83%	85%	83%		
			Human		79%	91%	80%	73%	79%		

[2] *Williamson, D. M., Xi, X., & Breyer, F. J. (2012). A framework for evaluation and use of automated scoring. Educational Measurement: Issues and Practices, 31, 2.*

3.4.4.8 Monitoring of Scoring Quality

Once MCAS scorers met or exceeded the minimum standard on a qualifying set and were allowed to begin scoring, they were constantly monitored throughout the entire scoring window to ensure they scored student responses as accurately and consistently as possible. If a scorer fell below the minimum standard on any of the quality-control indicators, some form of intervention occurred, ranging from counseling to retraining to dismissal. Scorers were required to meet or exceed the minimum standard of 70% exact and 90% exact-plus-adjacent agreement on the following quality control methods listed and further defined below:

- daily recalibration set (Cognia)
- embedded responses (Cognia)
- validity responses (Pearson)
- read-behind scoring (RBs)/back-reading
- double-blind scoring (DBs)
- compilation reports (summary of scoring agreement statistics)

Daily recalibration sets (Cognia) were administered at the very beginning of a scoring shift and each set consisted of five responses representing various scores. If scorers had an exact score match on at least four of the five responses, and were at least adjacent on the fifth response, they were allowed to begin scoring operational responses. Scorers who had discrepant scores, or only two or three exact score matches, were retrained and, if approved by leadership, were allowed to return to scoring with extra monitoring. Scorers who had zero or one out of the five exact were typically reassigned to another item or released for the day.

Embedded responses (Cognia) were approved by the scoring content specialist and loaded into iScore for blind distribution to scorers at random points during the scoring of their first 200 operational responses. Embedded responses comprised 5% of responses scored by a scorer during this period. Scorers who fell below the 70% exact and 90% exact-plus-adjacent accuracy standard were provided counseling and additional read-behind monitoring.

Validity responses (Pearson) were used to monitor the scorer's accuracy of scoring. These responses were approved by scoring leadership and distributed to scorers based on a percentage of their total number of responses scored. For the first two days, validity responses routed to scorers comprised 6% of their responses for ELA and 3% for mathematics. Starting with the third day of live scoring, these rates were reduced to 4% for ELA and 2% for mathematics. At the third-day rate, a full shift of scoring was expected to result in 6–19 validity responses per day in ELA and around 8 validity responses per day in mathematics, based on expected read rates.

Alert messages were issued to scorers who did not meet minimum validity metrics after 10 validity responses. If after an additional five validity responses, the scorer had not improved, ePEN automatically blocked that scorer, and launched a 10-response targeted calibration set. The scorer was required to attain at least 70% exact agreement and 90% exact-plus-adjacent agreement on this calibration set to continue scoring the item for which the calibration set was administered. If the scorer passed the targeted calibration, ePEN was unblocked and the scorer regained admission to operational responses. The scorer was required to continue maintaining scoring standards for validity, as validity statistics continued to be checked every 10 validity responses. If validity fell below scoring standards at any of these subsequent intervals, the scorer was released from the project and all scores assigned immediately reset.

Read-behinds involved responses that were first read and scored by a scorer, then read and scored by a member of scoring leadership. Scoring leadership would, at various points during the scoring shift, conduct a review of submitted scorer work. After the scorer scored the response, scoring leadership would give their own score to the response and then compare that score to the scorer's score. Read-behinds were performed at least 10 times for each full-time day shift scorer and at least five times for

each evening shift and partial-day shift scorer. Scorers who fell below the 70% exact and 90% exact-plus-adjacent score agreement standard were counseled, given extra monitoring assignments such as additional read-behinds, and allowed to resume scoring if they demonstrated the ability to meet the scoring standards after the intervention.

Double-blinds involved responses scored independently by two different scorers. Scorers knew in advance that some of the responses they scored were going to be scored by others, but they had no way of knowing what responses would be scored by another scorer, or whether they were the first, second, or only scorer. Double-blind scoring served as an indicator for agreement of scoring between two scorers. Responses given discrepant scores by two independent scorers were read and scored by scoring leadership.

Compilation reports were generated at both Cognia and Pearson. Compilation reports displayed all the statistics for each scorer, including the percentage of exact, adjacent, and discrepant scores on the RBs as well as the percentage of exact, adjacent, and discrepant scores on recalibration sets (Cognia) or validity sets (Pearson). As scoring leadership conducted RBs, the scorers' overall percentages on the compilation report were automatically calculated and updated. If the compilation report at the end of the scoring shift listed any individuals who were still below the 70% exact and 90% exact-plus-adjacent standard, their scores for that day were voided. Responses with voided scores were returned to the scoring queue for other scorers to score.

3.4.4.9 Interrater Consistency

Interrater consistency statistics are evaluated to ensure valid and reliable hand-scoring of items and, as such, provide evidence of scoring stability or consistency. As described above, double-blind scoring was the primary process used to monitor the consistency of the hand-scoring of students' constructed responses. Ten percent of responses to constructed-response items in grades 3–8 were randomly selected and scored independently by two different scorers. As described in the previous section, for ten of those prompts, IEA was the second scorer.

A summary of the interrater consistency results is presented in Table 3-30. Results in the table are organized by content area and grade. The table shows the number of score categories (number of possible scores for an item type), the number of included scores, the exact agreement percentage, the adjacent agreement percentage, and the correlation between the first two sets of scores. The percentages of exact and adjacent scores will approach 100%; sums less than 100 denote that some proportion of third-score resolutions took place. This same information is provided at the item level in Appendix H. Linearly weighted kappa is also included in Table 3-30 as a measure of scorer consistency by accounting for chance agreement. It is defined as (Cohen, 1968):

$$\kappa = \frac{O - E}{1 - E}$$

where

$$O = \sum_{i=1}^{n} \sum_{j=1}^{n} \left[1 - \frac{|i - j|}{n - 1}\right] a_{ij}$$

$$E = \sum_{i=1}^{n} \sum_{j=1}^{n} \left[1 - \frac{|i - j|}{n - 1}\right] p_i q_j$$

with a_{ij} being the proportion of that scorer 1 gives score i and scorer 2 gives score j, p_i being the proportion of that scorer 1 gives score i, and q_j being the proportion of that

scorer 2 gives score j. O and E are observed agreement and chance agreement, respectively.

Table 3-30. Summary of Interrater Consistency Statistics Organized across Items by Content Area and Grade

Content Area	Grade	Items	Number of		Percentage		Correlation	LW Kappa
			Score Categories	Included Scores	Exact	Adjacent		
ELA	3	2	4	12,367	73.83	25.19	0.80	0.71
		1	5	6,156	71.52	26.98	0.78	0.67
	4	2	4	12,694	72.04	27.17	0.72	0.62
		1	5	6,268	71.94	27.46	0.76	0.65
	5	2	4	12,742	66.70	31.89	0.78	0.65
		2	5	12,742	64.82	32.97	0.79	0.64
	6	2	4	13,015	68.97	30.15	0.84	0.72
		2	6	13,015	64.42	33.54	0.85	0.71
	7	2	6	12,905	70.21	27.91	0.91	0.76
		2	4	12,905	72.86	26.52	0.87	0.78
	8	2	6	13,259	64.10	33.03	0.86	0.75
		2	4	13,259	74.34	24.78	0.86	0.72
	10	2	6	136,766	66.35	32.52	0.85	0.75
		2	4	136,766	78.73	20.63	0.84	0.71
Mathematics	3	5	4	25,733	90.51	9.28	0.96	0.92
	4	4	5	26,220	79.89	18.82	0.92	0.84
	5	5	5	26,335	81.71	16.82	0.93	0.86
	6	4	5	26,516	87.84	11.04	0.96	0.91
	7	4	5	26,305	86.61	12.58	0.96	0.91
	8	4	5	26,854	79.09	19.28	0.94	0.84
	10	8	5	281,475	85.52	13.47	0.95	0.89
STE	5	2	3	19,359	70.34	26.93	0.70	0.62
		4	4	32,995	75.04	22.51	0.83	0.69
	8	2	3	20,012	75.97	23.23	0.78	0.67
		5	4	19,562	71.39	26.19	0.83	0.72
Biology	HS	6	5	187,833	76.07	21.10	0.90	0.76
		4	4	63,645	74.35	24.18	0.86	0.80
Introductory Physics	HS	4	4	30,094	69.45	27.22	0.81	0.67
		6	5	45,070	69.15	27.49	0.84	0.72

[1]*Caution should be used when interpreting the sums of exact and adjacent percentages for ELA items. This is because resolutions are done by response in ELA, and it is entirely possible that only one trait (either idea development or conventions) on a writing response has a non-adjacent score. For instance, if the idea development score for a response were non-adjacent, the response would also receive a third score for conventions, even if it initially received an exact or adjacent score for conventions.*

Table 3-30 summarizes the interrater consistency across score categories for the double-blind scored responses. To evaluate the interrater consistency at each score point, Table 3-31 summarizes the proportion of exact agreement by score points at the test level. Item-level results are also included in Appendix H. The proportion of exact agreement at each score point is calculated as the proportion of responses where the double-blind scores are the same as the initial score at each score point. As noted in section 3.4.4.6, the double-blind scores for ten of the grades 3–8 essay responses are generated by IEA, with the remaining item response scores provided by human scorers.

Table 3-31. Summary of Proportion of Exact Agreement by Score Points

Content Area	Grade	Number of Score Categories	Number of Included Scores	Exact	Score Points 0	1	2	3	4	5
ELA	3	4	12,367	73.83	84.70	74.60	64.40	44.80		
		5	6,156	71.52	74.70	78.20	62.70	48.90	39.70	
	4	4	12,694	72.04	63.55	76.90	68.75	51.90		
		5	6,268	71.94	77.00	75.00	68.60	42.80	19.60	
	5	4	12,742	66.70	71.15	68.30	60.65	66.05		
		5	12,742	64.82	71.20	66.60	64.70	55.15	42.90	
	6	4	13,015	68.97	78.50	62.75	62.00	82.20		
		6	13,015	64.42	75.85	61.10	64.20	61.30	49.30	61.65
	7	4	12,905	72.86	83.65	63.15	66.30	81.45		
		6	12,905	70.21	83.90	66.55	69.00	65.70	49.45	47.60
	8	4	13,259	74.34	77.25	68.10	69.95	81.25		
		6	13,259	64.10	74.50	67.00	65.30	57.65	58.50	43.05
	10	4	136,766	78.73	64.65	71.25	65.10	88.40		
		6	136,766	66.35	65.70	75.25	66.55	63.55	63.80	18.00
Mathematics	3	4	25,733	90.51	94.80	86.30	87.30	91.38		
	4	5	26,220	79.89	87.10	76.00	77.68	73.15	83.48	
	5	5	26,335	81.71	89.20	82.65	78.55	76.72	82.28	
	6	5	26,516	87.84	92.58	85.48	80.30	77.53	92.30	
	7	5	26,305	86.61	92.58	81.55	78.38	80.50	90.73	
	8	5	26,854	79.09	93.20	77.30	66.10	67.33	83.18	
	10	5	281,475	85.52	93.10	78.08	76.20	77.60	89.58	
Science	5	3	19,359	70.34	76.25	64.20	72.60			
		4	32,995	75.04	81.18	68.65	61.15	58.93		
	8	3	20,012	75.97	79.75	66.65	76.95			
		4	19,562	71.39	83.00	65.50	64.37	63.30		
Biology	HS	4	63,645	74.35	84.80	69.60	71.10	71.00		
		5	187,833	76.07	92.73	70.63	60.50	57.40	67.13	
Introductory Physics	HS	4	30,094	69.45	79.40	60.30	59.95	64.15		
		5	45,070	69.15	82.10	68.03	60.13	55.07	65.30	

As described in section 3.4.4.8, validity responses were used to monitor the scoring accuracy. Table 3-32 provides a summary of these “validity” statistics. These statistics denote accuracy in scoring; they provide an average of the human and IEA agreement with the validity responses (e.g., agreement with the true scores for each essay). Item-level results are also included in Appendix H.

Table 3-32. Summary of Validity Statistics[1]

Subject	Grade	Number of Score Categories[2]	Number of Validity Responses[3]	Exact Agreement	Agreement by Score Point					
					0	1	2	3	4	5
ELA	3	4 (SR)	3,584	82.5%	93.3%	83.1%	78.5%	31.3%		
		4 (Conv)	3,282	86.6%	97.1%	91.7%	75.5%	78.8%		
		5 (ID)	3,282	84.5%	91.1%	92.6%	79.3%	64.7%	77.0%	
	4	4 (SR)	3,765	83.9%	84.9%	83.9%	81.9%	84.7%		
		4 (Conv)	3,214	90.5%	50.3%	95.6%	83.8%	86.6%		
		5 (ID)	3,214	88.7%	71.2%	95.4%	83.4%	62.2%	55.1%	
	5	4 (Conv)	6,464	78.7%	84.9%	80.7%	71.3%	76.3%		
		5 (ID)	6,464	77.2%	90.1%	84.7%	69.5%	63.3%	42.9%	
	6	4 (Conv)	6,712	82.5%	89.0%	81.7%	74.2%	75.9%		
		6 (ID)	6,712	82.1%	91.6%	88.2%	72.4%	55.3%	41.9%	70.9%
	7	4 (Conv)	6,598	88.7%	93.8%	86.9%	84.0%	91.6%		
		6 (ID)	6,598	85.1%	96.2%	91.1%	85.6%	78.4%	63.4%	69.1%
	8	4 (Conv)	7,023	83.5%	93.6%	82.9%	74.5%	84.9%		
		6 (ID)	7,023	76.1%	90.3%	84.9%	73.7%	70.0%	51.2%	66.5%
Mathematics	3	4	6,901	94.3%	95.6%	93.2%	92.5%	96.6%		
	4	5	7,208	91.4%	91.6%	91.3%	91.1%	87.5%	94.0%	
	5	5	7,100	94.8%	96.1%	94.0%	94.0%	95.5%	94.5%	
	6	5	7,107	94.9%	97.0%	92.8%	95.2%	93.2%	97.1%	
	7	5	7,150	94.1%	98.2%	93.2%	90.8%	91.9%	95.9%	
	8	5	7,327	93.2%	98.4%	92.3%	91.7%	88.6%	93.7%	

[1]Includes all operational and equating items for ELA and mathematics.
[2]SR= Short response; Conv= Conventions; ID=Idea Development
[3] This column displays the number of validity reads (how many times all the responses were scored against validity papers) that occurred, not the number of validity papers used.

3.5 Classical Item Analyses

As noted in Brown (1983), "A test is only as good as the items it contains." A complete evaluation of a test's quality must include an evaluation of each item. Both Standards for Educational and Psychological Testing (AERA et al., 2014) and the Code of Fair Testing Practices in Education (Joint Committee on Testing Practices, 2004) include standards for identifying quality items. Items should predominantly assess the knowledge and skills that are identified as part of the domain being tested and should avoid assessing irrelevant factors. Items should also be unambiguous and free of grammatical errors, potentially insensitive content or language, and other confounding characteristics. In addition, items must not unfairly disadvantage students—in particular, racial, ethnic, or gender groups.

Both qualitative and quantitative analyses have been conducted to ensure that MCAS items meet these standards. Qualitative analyses, such as those conducted by the ADC committees, are described in earlier sections of this chapter; this section focuses on quantitative evaluations. Statistical evaluations are presented in four parts: (1) difficulty indices, (2) item-test correlations, (3) DIF statistics, and (4) dimensionality analyses. The item analyses presented here are based on the statewide administration of the MCAS assessments in spring 2023. Note that the information presented in this section is based only on the operational items, since those are the items on which student scores are calculated. (Item analyses, not included in this report, have also been performed for field-test items; the statistics are used during the item review process and during form assembly for future administrations.)

3.5.1 Classical Difficulty and Discrimination Indices

All selected-response and constructed-response items are evaluated in terms of item difficulty according to standard classical test theory practices. Difficulty is defined as the average proportion of points achieved on an item and is measured by obtaining the average score on an item and dividing it by the

maximum possible score for the item. Selected-response items are scored dichotomously (correct vs. incorrect), so, for these items, the difficulty index is simply the proportion of students who correctly answered the item. Constructed-response items and essay items are scored polytomously, meaning that a student can achieve scores other than just 0 or 1 (e.g., 0, 1, 2, 3, or 4 for a 4-point constructed-response item). By computing the difficulty index as the average proportion of points achieved, the indices for the different item types are placed on a similar scale, ranging from 0.0 to 1.0 regardless of the item type. Although this index is traditionally described as a measure of difficulty, it is properly interpreted as an easiness index, because larger values indicate easier items. An index of 0.0 indicates that all students earned 0% of the item points, and an index of 1.0 indicates that all students received full credit for the item (i.e., all the item points).

Items that are answered correctly by almost all students provide little information about differences in student abilities, but they do indicate knowledge or skills that have been mastered by most students. Similarly, items that are correctly answered by very few students provide little information about differences in student abilities, but they may indicate knowledge or skills that have not yet been mastered by most students. In general, to provide the best measurement, difficulty indices should range from near-chance performance (approximately 0.25 for four-option selected-response items or essentially zero for constructed-response items) to 0.90, with the majority of items generally falling between 0.40 and 0.70. However, on a standards-referenced assessment such as the MCAS, it may be appropriate to include some items with very low or very high item difficulty values to ensure sufficient content coverage.

It is desirable for an item to be one on which higher-ability students perform better than lower-ability students. The correlation between student performance on a single item and total test score is a commonly used measure of this item characteristic. Within classical test theory, the item-test correlation is referred to as the item's discrimination because it indicates the extent to which successful performance on an item discriminates between high and low scores on the test. For 2023 MCAS constructed-response items, the item discrimination index used was the Pearson product-moment correlation; for selected-response items, the corresponding statistic is commonly referred to as a point-biserial correlation. The theoretical range of these statistics is -1.0 to 1.0, with a typical observed range for selected-response items from 0.20 to 0.60.

Discrimination indices can be thought of as measures of how closely an item assesses the same knowledge and skills assessed by the other items contributing to the criterion total score on the assessment. When an item has a high discrimination index, it means that, in general, students selecting the correct response are students with higher total scores, and students selecting incorrect responses are students with lower total scores. Given this definition, an item can discriminate between low-performing examinees and high-performing examinees. Discrimination indices were very useful to consider when selecting items for the new MCAS tests and were provided to the ADC committees along with other item-level statistics, such as difficulty. Very low or negative point-biserial coefficients on field-tested new items can indicate that the items are flawed and should not be considered for the operational tests.

A summary of the item difficulty and item discrimination statistics for each grade and content area combination for the CBT items administered in school is presented in Table 3-33. Note that the statistics are presented for all items as well as separately by item type: selected-response (SR), constructed-response (CR), and essay (ES). The mean difficulty (*p*-value) and discrimination values shown in the table are within generally acceptable and expected ranges and are consistent with results obtained in previous administrations. Note that the information presented in this section and associated appendices are based only on first-time test takers who are not first-year EL students.

Table 3-33. Summary of Item Difficulty and Discrimination Statistics by Content Area and Grade

Content Area	Grade	Item Type	Number of Items	*p*-Value		Discrimination	
				Mean	Standard Deviation	Mean	Standard Deviation
ELA	3	All	32	0.61	0.13	0.52	0.10
		SR	26	0.63	0.11	0.49	0.08
		CR	5	0.58	0.16	0.62	0.07
		ES	1	0.31		0.73	
	4	All	32	0.62	0.13	0.47	0.10
		SR	26	0.64	0.13	0.44	0.08
		CR	5	0.56	0.09	0.56	0.09
		ES	1	0.35		0.69	
	5	All	31	0.65	0.15	0.48	0.13
		SR	24	0.67	0.14	0.43	0.09
		CR	5	0.69	0.10	0.61	0.06
		ES	2	0.39	0.09	0.74	0.01
	6	All	31	0.61	0.12	0.46	0.12
		SR	24	0.63	0.11	0.43	0.07
		CR	5	0.58	0.11	0.52	0.12
		ES	2	0.39	0.01	0.80	0.00
	7	All	31	0.60	0.12	0.47	0.11
		SR	24	0.63	0.11	0.43	0.05
		CR	5	0.55	0.12	0.53	0.07
		ES	2	0.41	0.04	0.79	0.01
	8	All	31	0.65	0.10	0.46	0.13
		SR	24	0.67	0.10	0.43	0.10
		CR	5	0.65	0.08	0.48	0.09
		ES	2	0.48	0.04	0.81	0.02
	10	All	30	0.71	0.10	0.50	0.12
		SR	21	0.74	0.09	0.45	0.08
		CR	7	0.64	0.09	0.55	0.04
		ES	2	0.61	0.02	0.81	0.01
Mathematics	3	All	40	0.58	0.12	0.56	0.11
		SR	16	0.57	0.11	0.49	0.09
		CR	24	0.58	0.13	0.60	0.11
	4	All	40	0.59	0.12	0.55	0.11
		SR	20	0.61	0.13	0.48	0.09
		CR	20	0.57	0.11	0.62	0.08
	5	All	40	0.53	0.12	0.52	0.12
		SR	18	0.52	0.13	0.45	0.09
		CR	22	0.54	0.10	0.58	0.11
	6	All	40	0.52	0.12	0.54	0.14
		SR	16	0.55	0.13	0.44	0.11
		CR	24	0.50	0.11	0.60	0.12
	7	All	40	0.44	0.11	0.55	0.14
		SR	17	0.46	0.10	0.44	0.11
		CR	23	0.43	0.11	0.63	0.11
	8	All	40	0.51	0.12	0.54	0.14
		SR	16	0.56	0.11	0.45	0.09
		CR	24	0.48	0.12	0.59	0.14
	10	All	42	0.53	0.13	0.56	0.13
		SR	22	0.60	0.11	0.51	0.09
		CR	20	0.45	0.11	0.62	0.14
STE	5	All	41	0.58	0.16	0.50	0.08
		SR	20	0.63	0.15	0.46	0.08
		CR	21	0.54	0.16	0.53	0.08
	8	All	41	0.51	0.12	0.50	0.12
		SR	26	0.53	0.13	0.46	0.09
		CR	15	0.47	0.10	0.56	0.14
Biology	HS	All	42	0.56	0.13	0.51	0.12
		SR	27	0.59	0.11	0.47	0.08
		CR	15	0.51	0.15	0.59	0.15
Introductory Physics	HS	All	42	0.58	0.13	0.50	0.14
		SR	21	0.60	0.12	0.44	0.10
		CR	21	0.56	0.13	0.56	0.15

Caution should be exercised when comparing indices across grade levels. Differences may be due not only to differences in the item statistics on the test but may also be affected by differences in student abilities and/or differences in the standards and/or curricula taught in each grade.

Difficulty indices for selected-response items tend to be higher (indicating that students performed better on these items) than the difficulty indices for constructed-response items because selected-response items can be answered correctly by simply identifying rather than providing the correct answer, and by guessing. Similarly, discrimination indices for those constructed-response items with more than two points tend to be larger than those for dichotomous items because of the greater variability of the former (i.e., the partial credit these items allow). The restriction of range (i.e., only two score categories) in dichotomous items tends to make the discrimination indices lower. Note that these patterns are more consistent within item type, and therefore when interpreting classical item statistics, comparisons should be emphasized among items of the same type.

In addition to the item difficulty and discrimination summaries presented above, item-level classical statistics are provided in Appendix I. On these MCAS items, the item difficulty and discrimination indices are within generally acceptable and expected ranges. Very few items were answered correctly at near-chance or near-perfect rates. Similarly, the positive discrimination indices indicate that students who performed well on individual items tended to perform well overall. There are none with difficulty below 0.20 and one item with discrimination below 0.20. Often, items with relatively lower discrimination are kept in the operational forms to ensure content blueprint coverage. Item-level score point distributions are provided for constructed-response items in Appendix J; for each item, the percentage of students who received each score point is presented.

3.5.2 DIF

The *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) explicitly states that subgroup differences in performance be examined when sample sizes permit and that actions be taken to ensure that differences in performance are attributable to construct-relevant, rather than irrelevant, factors. *Standards for Educational and Psychological Testing* (AERA et al., 2014) includes similar guidelines. As part of the effort to identify such problems, psychometricians evaluated the 2023 MCAS items in terms of DIF statistics. One application of the DIF statistics is to use them to evaluate item quality in the ADC and bias committee item review process.

For the 2023 MCAS, the standardization DIF procedure (Dorans & Kulick, 1986) was employed to evaluate subgroup differences. (Subgroup differences denote significant group-level differences in performance for examinees with equivalent achievement levels on the test.) The standardization DIF procedure is designed to identify items for which subgroups of interest perform differently, beyond the impact of differences in overall achievement. The DIF procedure calculates the difference in item performance for two groups of students (at a time) matched for achievement on the total test. Specifically, average item performance is calculated for students at every total score. Then an overall average is calculated, weighting the total score distribution so that it is the same for the two groups. DIF statistics were calculated for all subgroups with at least 75 students. Note that the information presented in this section and the associated appendix is based only on first-time test takers who are not first-year EL students.

DIF for items is evaluated initially at the time of field-testing. When differential performance between two groups occurs on an item (i.e., a DIF index in the “low” or “high” categories, explained below), it may or may not indicate actual item bias. Consequently, all items with either high or low DIF are examined by content experts and educators to try to identify the cause. If subgroup differences in performance can be traced to differential experience (such as geographical living conditions or access to technology), the

inclusion of such items is reconsidered during the item review process. If content experts do not identify a source of bias on the item, the item may be eligible for operational form construction.

Computed DIF indices have a theoretical range from -1.0 to 1.0 for selected-response items, and an adjusted index with the same scale (-1.0 to 1.0) for constructed-response items. Dorans and Holland (1993) suggested that index values between -0.05 and 0.05 denote either a negligible amount of DIF or the absence of DIF. The majority of 2023 MCAS items fell within this range. Dorans and Holland further stated that items with values between -0.10 and -0.05 and between 0.05 and 0.10 (i.e., "low" DIF) should be inspected to ensure that no possible effect is overlooked, and that items with values outside the -0.10 to 0.10 range (i.e., "high" DIF) are more unusual and should be examined very carefully before being used operationally.

For the 2023 MCAS administration, DIF analyses were conducted for all subgroups (as defined in the No Child Left Behind Act) for which the sample size was adequate. Six subgroup comparisons were evaluated for DIF:

- male compared with female
- not EL/FEL compared with EL/FEL[3]
- not Low Income compared with Low Income
- white compared with African American/Black
- white compared with Hispanic or Latino
- without disabilities compared to with disabilities

After the 2023 spring administration, DIF analyses were conducted again as a post-hoc quality check based on the operational data. The tables in Appendix K present the number of items classified as either "low" or "high" DIF, in total and by group favored. Following Dorans and Holland's recommendation, items with DIF indices between -0.10 and -0.05 and between 0.05 and 0.10 were categorized as "low" DIF, and values outside the -0.10 to 0.10 range were categorized as "high" DIF. Very few items exhibited high DIF in the operational data, suggesting that the bias and sensitivity review after the field-testing effectively ruled out items displaying large DIF for the MCAS 2023 spring tests.

3.5.3 Dimensionality Analysis

Because tests are constructed with multiple content area subcategories and their associated knowledge and skills, the potential exists for the invocation of multiple dimensions beyond the common primary dimension. Generally, the subcategories are highly correlated with each other; therefore, a primary dimension typically explains the majority of variance in test scores. The presence of one dominant primary dimension is the primary psychometric assumption to support the use of the unidimensional item response theory (IRT) models that are used for calibrating and scaling the 2023 MCAS assessments.

The purpose of dimensionality analysis is to investigate whether violation of the assumption of test unidimensionality is statistically detectable and, if so, (a) the degree to which unidimensionality is violated and (b) the nature of the multidimensionality. Dimensionality analyses were performed on common items for all MCAS test forms used during the spring 2023 administrations. A total of 18 forms were analyzed; the results for these analyses are reported in sections 3.5.3.1 and 3.5.3.2 below.

The dimensionality analyses were conducted using the nonparametric IRT-based methods DIMTEST (Stout, 1987; Stout, Froelich, & Gao, 2001) and DETECT (Zhang & Stout, 1999). Both methods use as their basic statistical building block the estimated average conditional covariances for item pairs. A conditional covariance is the covariance between two items conditioned on true score (expected value of observed score) for the rest of the test, and the average conditional covariance is obtained by averaging across all possible conditioning scores. When a test is strictly unidimensional, all conditional covariances

[3] *EL=English learner / FEL=former English learner*

are expected to take on values within random noise of zero, indicating statistically independent item responses for examinees with equal expected scores. Nonzero conditional covariances are essentially violations of the principle of local independence, and such local dependence implies multidimensionality. Thus, nonrandom patterns of positive and negative conditional covariances are indicative of multidimensionality.

DIMTEST is a hypothesis-testing procedure for detecting violations of local independence. The data are first randomly divided into a training sample and a cross-validation sample. Then an exploratory analysis of the conditional covariances is conducted on the training sample data to find the cluster of items that displays the greatest evidence of local dependence. The cross-validation sample is then used to test whether the conditional covariances of the selected cluster of items display local dependence, conditioning on total score from the non-clustered items. The DIMTEST statistic follows a standard normal distribution under the null hypothesis of unidimensionality.

DETECT is an effect-size measure of multidimensionality. As with DIMTEST, the data are first randomly divided into a training sample and a cross-validation sample (these samples are drawn independently of those used with DIMTEST). The training sample is used to find a set of mutually exclusive and collectively exhaustive clusters of items that best fit a systematic pattern of positive conditional covariances for pairs of items from the same cluster and negative conditional covariances for pairs composed of items from different clusters. Next, the clusters from the training sample are used with the cross-validation sample data to average the conditional covariances: within-cluster conditional covariances are summed; from this sum, the between-cluster conditional covariances are subtracted. This difference is divided by the total number of item pairs, and this average is multiplied by 100 to yield an index of the average violation of local independence for an item pair. DETECT values less than 0.2 indicate very weak multidimensionality (or near unidimensionality); values of 0.2 to 0.4, weak to moderate multidimensionality; values of 0.4 to 1.0, moderate to strong multidimensionality; and values greater than 1.0, very strong multidimensionality (Roussos & Ozbek, 2006).

DIMTEST and DETECT were applied to the operational items of the MCAS tests administered during spring 2023. The data for each grade were split into a training sample and a cross-validation sample. Because DIMTEST had an upper limit of 24,000 students, the training and cross-validation samples for the tests that had over 24,000 students were limited to 12,000 each, randomly sampled from the total sample. DETECT, on the other hand, had an upper limit of 500,000 students, and so every training sample and cross-validation sample used all the available data. After randomly splitting the data into training and cross-validation samples, DIMTEST was applied to each data set to see if the null hypothesis of unidimensionality would be rejected. DETECT was then applied to each data set for which the DIMTEST null hypothesis was rejected to estimate the effect size of the multidimensionality. Note that the information presented in this section is based only on first-time test takers who are not first-year EL students and who took non-accommodated online forms.

3.5.3.1 DIMTEST Analyses

The results of the DIMTEST analyses indicated that the null hypothesis was rejected at a significance level of 0.05 for every data set. Because strict unidimensionality is an idealization that almost never holds exactly for a given data set, the statistical rejections in the DIMTEST results were not surprising. Indeed, because of the very large sample sizes involved in most of the data sets (over 24,000 in 17 out of 18 tests), DIMTEST would be expected to be sensitive to even quite small violations of unidimensionality.

3.5.3.2 DETECT Analyses

Next, DETECT was used to estimate the effect size for the violations of local independence for the 2017 to 2023 tests. Table 3-34 displays the multidimensionality effect-size estimates from DETECT.

Table 3-34. Multidimensionality Effect Sizes by Grade and Content Area

Content Area	Grade	Multidimensionality Effect Size						
		2017	2018	2019	2021*		2022	2023
					Session 1	Session 2		
ELA	3	0.25	0.17	0.27	0.24	0.27	0.20	0.16
	4	0.30	0.35	0.29	0.34	0.25	0.25	0.20
	5	0.35	0.28	0.34	0.44	0.26	0.23	0.23
	6	0.38	0.26	0.42	0.44	0.37	0.33	0.30
	7	0.34	0.34	0.49	0.51	0.26	0.35	0.41
	8	0.38	0.35	0.47	0.32	0.20	0.31	0.34
	10	0.20	0.24	0.26	0.34	--	0.28	0.32
	Average	**0.33**	**0.29**	**0.36**	**0.38**	**0.27**	**0.28**	**0.28**
Mathematics	3	0.20	0.17	0.20	0.23	0.18	0.21	0.19
	4	0.19	0.22	0.10	0.12	0.20	0.16	0.11
	5	0.19	0.15	0.15	0.26	0.22	0.18	0.10
	6	0.21	0.13	0.21	0.21	0.21	0.14	0.17
	7	0.13	0.14	0.15	0.34	0.14	0.16	0.15
	8	0.11	0.15	0.13	0.19	0.25	0.19	0.16
	10	0.12	0.09	0.09	0.11	--	0.17	0.13
	Average	**0.17**	**0.16**	**0.15**	**0.21**	**0.20**	**0.17**	**0.14**
STE	5	0.08	0.11	0.08	0.22	0.18	0.09	0.13
	8	0.08	0.13	0.08	0.19	0.18	0.13	0.14
Biology**	HS	--	--	--	--	--	0.10	0.10
Introductory Physics**	HS	--	--	--	--	--	0.10	0.10
	Average	**0.08**	**0.12**	**0.08**	**0.21**	**0.18**	**0.10**	**0.12**

** In 2021, two sessions in each test were randomly spiraled among students, and each session was analyzed as a separate form except grade 10 ELA and math. Because each session had a different content blueprint than the entire test, caution should be taken when comparing the 2021 DETECT effect size results to any other year's results.*
*** Because 2022 was the first year of the next-generation tests for high school biology and introductory physics, no dimensionality analysis was conducted for these tests in prior years.*

The DETECT values indicate very weak (DETECT < 0.2) multidimensionality for all the 2023 mathematics and STE test forms, which are consistent with previous years' results. The 2023 high school biology and introductory physics tests also show very weak multidimensionality (DETECT < 0.2). The 2023 ELA tests mostly show very weak (DETECT < 0.2) or weak multidimensionality (0.2 < DETECT < 0.4; with larger DETECT effect size indicating stronger multidimensionality), though the ELA Grade 7 shows moderate multidimensionality (DETECT = 0.41).

The way in which DETECT divided the tests into clusters was investigated to determine whether there were any discernable patterns with respect to the selected-response and constructed-response item types. Inspection of the DETECT clusters indicated that selected-response/constructed-response separation generally occurred much more strongly with ELA than with mathematics, a pattern that has been consistent across all previous years. Specifically, for the ELA test forms with stronger multidimensionality, every form had one set of clusters dominated by selected-response items and another set of clusters dominated by essay items. These results give solid evidence that the essays form a distinct cluster from the selected-response items.

On the mathematics and STE test forms, there was less clear evidence of consistent separation of selected-response and constructed-response items. This lack of evidence is consistent with the weaker multidimensionality exhibited by those subjects historically.

In summary, for the 2023 dimensionality analyses, the violations of local independence, as evidenced by the DETECT effect sizes, were either weak or very weak in mathematics and STE test forms and were weak in ELA test forms. The patterns with respect to the selected-response and constructed-response

items were consistent with those in the previous years, with ELA tending to display more separation than mathematics and STE.

3.6 MCAS IRT Linking and Scaling

This section describes the procedures used to calibrate, equate, and scale the MCAS tests. During these psychometric analyses, several quality-control procedures and checks on the processes were conducted. These procedures included the following:

- evaluations of the calibration processes (e.g., checking the number of cycles required for convergence for reasonableness)
- checking item parameters and their standard errors for reasonableness
- examination of test characteristic curves (TCCs) and test information function curves (TIFs) for reasonableness
- evaluation of model fit
- evaluation of equating items (e.g., delta analyses, b-b analyses, beta analyses)
- examination of a-plots and b-plots for reasonableness
- evaluation of the scaling results (e.g., comparing look-up tables to the previous year's)

Section 3.6.3 summarizes the equating procedure and results to place the 2023 next-generation MCAS tests on the same scale as the previous year. An equating report (Appendix L), which provided complete documentation of the quality-control procedures and results, was reviewed by DESE and approved prior to production of the *Spring 2023 MCAS Tests Parent/Guardian Reports*. Note that the information presented in this section and associated appendices are based only on first-time test takers who are not first-year EL students and who took non-accommodated online forms.

3.6.1 IRT

All MCAS items are calibrated using IRT. IRT uses mathematical models to define a relationship between an unobserved measure of student performance, usually referred to as theta (θ), and the probability [$P(\theta)$] of getting a dichotomous item correct or of getting a particular score on a polytomous item (Hambleton, Swaminathan, & Rogers, 1991; Hambleton & Swaminathan, 1985). In IRT, it is assumed that all items are independent measures of the same construct (i.e., of the same θ). Another way to think of θ is as a mathematical representation of the latent trait of interest. Several common IRT models are used to specify the relationship between θ and $P(\theta)$ (Hambleton & van der Linden, 1997; Hambleton & Swaminathan, 1985). The process of determining the mathematical relationship between θ and $P(\theta)$ is called item calibration. After items are calibrated, they are defined by a set of parameters that specify a nonlinear, monotonically increasing relationship between θ and $P(\theta)$. Once the item parameters are known, an estimate of θ for each student can be calculated. This estimate, $\hat{\theta}$, is considered an estimate of the student's true score or a general representation of student performance. IRT has characteristics that may be preferable to those of raw scores for equating purposes because it specifically models examinee responses at the item level and facilitates equating to an IRT-based item pool (Kolen & Brennan, 2014).

For the 2023 next-generation MCAS tests, the three-parameter logistic (3PL) model was used for traditional four-option selected-response items, and the two-parameter logistic (2PL) model was used for binary-scored selected-response and technology-enhanced items (Hambleton & van der Linden, 1997; Hambleton, Swaminathan, & Rogers, 1991). The graded-response model (GRM) was used for polytomous items (Nering & Ostini, 2010), including polytomously scored multi-part items, constructed-response items, and essays.

The 3PL model for selected-response items can be defined as:

$$P_i(\theta_j) = P(U_i = 1|\theta_j) = c_i + (1 - c_i)\frac{\exp[Da_i(\theta_j - b_i)]}{1+\exp[Da_i(\theta_j - b_i)]},$$

where
U represents the scored response on an item,
I indexes the items,
j indexes students,
α represents item discrimination,
b represents item difficulty,
c is the pseudo guessing parameter,
θ is the student proficiency, and
D is a normalizing constant equal to 1.701.

For the 2PL model, this equation reduces to the following:

$$P_i(\theta_j) = P(U_i = 1|\theta_j) = \frac{\exp[Da_i(\theta_j - b_i)]}{1+\exp[Da_i(\theta_j - b_i)]}.$$

In the GRM for polytomous items, an item is scored in k + 1 graded categories that can be viewed as a set of k dichotomies. At each point of dichotomization (i.e., at each threshold), a two-parameter model can be used to model the probability that a student's response falls at or above a particular ordered category, given θ. This implies that a polytomous item with k + 1 categories can be characterized by k item category threshold curves (ICTCs) of the 2-PL form:

$$P_{ik}^*(\theta_j) = P(U_i \geq k|\theta_j) = \frac{\exp[Da_i(\theta_j - b_i + d_{ik})]}{1+\exp[Da_i(\theta_j - b_i + d_{ik})]},$$

where
U indexes the scored response on an item,
i indexes the items,
j indexes students,
k indexes threshold,
θ is the student ability,
α represents item discrimination,
b represents item difficulty,
d represents threshold, and
D is a normalizing constant equal to 1.701.

After computing k ICTCs in the GRM, k + 1 item category characteristic curves (ICCCs), which indicate the probability of responding to a particular category given θ, are derived by subtracting adjacent ICTCs:

$$P_{ik}(\theta_j) = P(U_i = \mathrm{k}|\theta_j) = P_{ik}^*(\theta_j) - P_{i(k+1)}^*(\theta_j),$$

where
i indexes the items,
j indexes students,
k indexes threshold,
θ is the student ability,
P_{ik} represents the probability that the score on item *i* falls in category k, and
P_{ik}^* represents the probability that the score on item *i* falls at or above the threshold k

($P_{i0}^{*} = 1$ and $P_{i(m+1)}^{*} = 0$).

The GRM is also commonly expressed as:

$$P_{ik}(\theta_j) = \frac{\exp[Da_i(\theta_j - b_i + d_k)]}{1+\exp[Da_i(\theta_j - b_i + d_k)]} - \frac{\exp[Da_i(\theta_j - b_i + d_{k+1})]}{1+\exp[Da_i(\theta_j - b_i + d_{k+1})]}.$$

Finally, the item characteristic curve (ICC) for a polytomous item is computed as a weighted sum of ICCCs, where each ICCC is weighted by a score assigned to a corresponding category. The expected score for a student with a given theta is expressed as:

$$E(U_i|\theta_j) = \sum_k^{m+1} w_{ik} P_{ik}(\theta_j),$$

where w_{ik} is the weighting constant and is equal to the number of score points for score category *k* on item *i*.

Note that for a dichotomously scored item, $E(U_i|\theta_j) = P_i(\theta_j)$. For more information about item calibration and determination, see Lord and Novick (1968), Hambleton and Swaminathan (1985), or Baker and Kim (2004).

3.6.2 IRT Results

IRT calibration was conducted using flexMIRT 3.03 (Cai, 2012). IRT calibration was conducted for the computer-based tests in all grades. Because paper test forms are treated as accommodated forms, item parameters for computer-based items were applied to their paper counterparts. The tables in Appendix L give the IRT item parameters and associated standard errors of all operational scoring items on the 2023 MCAS tests. Appendix L contains graphs of the TCCs and TIFs, which are defined below.

TCCs display the expected (average) raw score associated with each θ_j value typically between -4.0 and 4.0. Mathematically, the TCC is computed by summing the ICCs of all items that contribute to the raw score. Using the notation introduced in section 3.6.1, the expected raw score at a given value of θ_j is as follows:

$$E(X|\theta_j) = \sum_{i=1}^{n} E(U_i|\theta_j),$$

where
i indexes the items (and *n* is the number of items contributing to the raw score),
j indexes students (here, θ_j runs from -4 to 4), and
$E(X|\theta_j)$ is the expected raw score for a student of ability θ_j.

The expected raw score monotonically increases with θ_j, consistent with the notion that students of high ability tend to earn higher raw scores than students of low ability. Most TCCs are “S-shaped”: they are flatter at the ends of the distribution and steeper in the middle.

The TIF displays the amount of statistical information that the test provides at each value of θ_j. Information functions depict test precision across the entire latent trait continuum. There is an inverse relationship between the information of a test and its standard error of measurement (SEM). For long tests, the SEM at a given θ_j is approximately equal to the inverse of the square root of the statistical information at θ_j (Hambleton, Swaminathan, & Rogers, 1991), as follows:

$$SEM(\theta_j) = \frac{1}{\sqrt{I(\theta_j)}}.$$

Compared to the tails, TIFs are often higher near the middle of the θ distribution where most students are located. This is by design. Test items are often selected with middle difficulty levels and high discriminating powers so that test information is maximized for most candidates who are expected to take a test.

The number of cycles required for convergence for each grade and content area during the IRT analysis can be found in Table 3-35. The calibration went smoothly and converged in all subjects/grades.

Table 3-35. Number of Cycles Required for Convergence

Content Area	Grade	Initial Cycles	FCIP Cycles
ELA	3	30	8
	4	27	7
	5	43	8
	6	26	12
	7	21	9
	8	119	12
	10	43	11
Mathematics	3	66	--
	4	71	--
	5	50	--
	6	43	--
	7	80	--
	8	33	--
	10	55	--
STE	5	50	--
	8	47	--
Biology	HS	23	--
Introductory Physics	HS	66	--

3.6.3 Equating

The purpose of equating is to ensure that scores obtained from different forms of a test are comparable to one another. Equating may be used if multiple test forms are administered in the same year; or one year's forms may be equated to those used in the previous year. Equating ensures that students are not given an unfair advantage or disadvantage because the test form they took is easier or harder than that taken by other students. See section 3.2 for more information about how the test development process supports successful equating.

The 2023 administration of the next-generation MCAS used a raw score-to-theta equating procedure in which test forms were equated to the theta scale established on the reference form (i.e., the form used in the most recent standard setting). The groups of students who take equating items on the MCAS tests are never strictly equivalent to the groups who took the tests in the reference years. IRT is particularly useful for equating scenarios that involve nonequivalent groups (Allen & Yen, 1979). Equating for the MCAS uses the anchor test–nonequivalent groups design described by Petersen, Kolen, and Hoover (1989). In this equating design, no assumption is made about the equivalence of the examinee groups taking different test forms (i.e., naturally occurring groups are assumed). Comparability is instead evaluated by using a set of anchor items (also called equating items), assuming they perform in the same way in both groups and can, thus, accurately measure the differences in the two groups.

For mathematics and STE, the item parameter estimates for 2023 test forms were placed on the reference scale by using the Stocking-Lord method (SL; Stocking & Lord, 1983). However, a two-step equating approach was taken for ELA because of the finding in the 2022 dimensionality analyses that the dimensionality structure of the test displayed evidence of having changed from 2019. More detail on the 2022 dimensionality analyses can be found in the *2022 Next-Generation MCAS and MCAS-Alt Technical Report*. The 2023 equating followed the same procedure as established in 2022. The first step involved applying the SL method for all items except the essay items; thus, isolating any dimensionality variability in the essay items from the estimation of the equating relationship across years. Then, the essay items were brought onto the scale established in the first step by applying the fixed common item parameters (FCIP2; Kim, 2006) method. The FCIP2 method is based on the IRT principle of item parameter invariance. According to this principle, the equating items for both tests should have the same item parameters. After the item parameters for the non-essay items were put on the reference scale (the first step), the FCIP2 method was employed to place the essay items onto the operational scale (the second step). This method is performed by fixing the parameters of the "equating" items (in this case, all non-essay items) to their previously obtained on-scale values and then calibrating using flexMIRT to place the remaining items (in this case, the essay items) on scale.

Prior to implementing the SL method, two evaluations of the equating items were conducted to check for parameter drift, as follows.

- Delta method: compares two years' delta values (the percent correct transformed into a scale "with an effective range of 6 [very easy item] to 20 [very difficult item]"[4]) for equating items and flags an item if its standardized distance to the principal axis line is at or above 3 in absolute value.
- *b*-*b* method: compares current year's freely estimated IRT difficulty parameters with the previous year's values for equating items and flags an item if its standardized distance to the principal axis line is at or above 3 in absolute value.

During the implementation of the SL method, a third evaluation of the equating items was conducted to check for parameter drift, as follows.

- IRT curve-based beta method: a measure of the weighted average difference between the item response function (IRF) curves between two years for each equating item (Jiang, Roussos & Yu, 2017; Wang & Roussos, 2018). The current year's IRF is calculated based on transformed item parameters using the SL constants estimated with all equating items. The difference index is denoted as β, its estimate is denoted as $\hat{\beta}$, and the following threshold is used to categorize an item into negligible, moderate, or large drift:
  - $|\hat{\beta}| < 0.05$, negligible drift
  - $0.05 \leq |\hat{\beta}| < 0.1$, moderate drift
  - $|\hat{\beta}| \geq 0.1$, large drift

Items that were flagged as a result of these evaluations are listed in Table 3-36. Detailed results from each drift analysis, along with Delta and *b*-plots are presented in Appendix L.

[4] *Walker, M. E. (2014, May 13). Enhancing the Equating of Item Difficulty Metrics: Estimation of Reference Distribution. ETS Research Report Series. P. 1. Retrieved 1.10.20 from: https://onlinelibrary.wiley.com/doi/full/10.1002/ets2.12006*

Following the statistical evaluation, each of these flagged items went through a content review process to further investigate whether there are construct-irrelevant or relevant factors that may have resulted in the item parameter drift. Anything pertaining to the content being measured is considered a construct-relevant factor, such as any instructional shift in certain content areas. A list of construct-irrelevant factors follows:

- changes to item administration mode
- word/graphic changes to any part of the item
- change to option order
- change in position (e.g., beginning of test vs. end of test)
- whether an item experiences "clueing" in one administration but not in the other
- whether there are test security risks associated with the flagged items
- any other difference that may affect the testing experience

An item was removed from the equating set if a construct-irrelevant reason was identified in the content review. If a construct-relevant reason was identified or the content review does not find any reason, an item was kept as an equating item.

Table 3-36. Year-to-year Equating Items Watch List

Content Area	Grade	Item ID	Statistical Reason	Content Reason	Action
ELA	3	IA00286	beta	None identified	Retained
	4	IA00289	beta	None identified	Retained
	8	IA00063	beta	None identified	Retained
Mathematics	4	IA00961	beta	None identified	Retained
		IA01093	beta	None identified	Retained
	5	IA00936	beta	None identified	Retained
		IA00865	beta	None identified	Retained
	8	IA02495	beta	None identified	Retained
		IA05070	beta	None identified	Retained
STE	5	IA05657	beta	None identified	Retained
		IA05702	beta	None identified	Retained
	8	IA05245	beta	Item used a term from the old standards	Removed from equating
		IA05690	beta	None identified	Retained
Biology	HS	IA10684	beta	None identified	Retained
		IA10989	beta	None identified	Retained
		IA11033	beta	None identified	Retained
		IA11054	beta	None identified	Retained
Introductory Physics	HS	IA10704	beta	None identified	Retained
		IA10936	beta	None identified	Retained

The equating items that successfully survived these evaluation procedures were then employed in the SL method, and the linking relationship obtained from the SL method was used to transform the item parameters for all items in the 2023 next-generation computer-based administration onto the target scale. The transformed item parameters were then used to build the raw score to scaled score look-up tables for the 2023 tests. The SL constants are presented in Table 3-37.

Table 3-37. Stocking and Lord Constants

Content Area	Grade	Slope	Intercept
ELA	3	1.14	-0.21
	4	1.07	-0.26
	5	1.14	-0.21
	6	1.44	-0.36
	7	1.22	-0.30
	8	1.41	-0.21
	10	1.16	-0.17
Mathematics	3	1.08	-0.03
	4	1.03	0.10
	5	1.01	-0.02
	6	1.03	-0.11
	7	1.11	-0.14
	8	1.10	-0.19
	10	0.97	-0.18
STE	5	1.11	-0.17
	8	1.06	-0.17
Biology	10	0.84	0.26
Introductory Physics	10	0.94	0.29

3.6.4 Achievement Standards

Cutpoints for the next-generation MCAS tests were set via standard setting in 2017 for grades 3–8 ELA and mathematics tests, in 2019 for grade 10 ELA and mathematics tests and grades 5 and 8 STE tests, and in 2022 for biology and introductory physics (see the *2022 Next-Generation MCAS and MCAS-Alt Technical Report* for the 2022 standard-setting report, the *2019 Next-Generation MCAS and MCAS-Alt Technical Report* for the 2019 standard-setting report, and the *2017 Next-Generation MCAS and MCAS-Alt Technical Report* for the 2017 standard-setting report). The standard setting establishes the theta cutpoints used for reporting each year. These theta cuts are presented in Table 3-38. Also shown in Table 3-38 are the cut scores on the reporting score scale. The operational θ-metric and reporting score scale cut scores will remain fixed throughout the assessment program unless standards are reset.

Table 3-38. Cut Scores on the Theta Metric and Reporting Scale by Content Area and Grade

Content Area	Grade	Theta			Scale Score				
		Cut 1	Cut 2	Cut 3	Min	Cut 1	Cut 2	Cut 3	Max
ELA	3	-1.581	0.011	1.604	440	470	500	530	560
	4	-1.561	0.031	1.623	440	470	500	530	560
	5	-1.659	0.038	1.734	440	470	500	530	560
	6	-1.591	-0.011	1.570	440	470	500	530	560
	7	-1.560	0.011	1.582	440	470	500	530	560
	8	-1.456	0.051	1.559	440	470	500	530	560
	10	-1.728	-0.299	1.130	440	470	500	530	560
Mathematics	3	-1.377	0.027	1.432	440	470	500	530	560
	4	-1.379	0.054	1.487	440	470	500	530	560
	5	-1.551	0.025	1.601	440	470	500	530	560
	6	-1.518	-0.008	1.502	440	470	500	530	560
	7	-1.414	0.031	1.476	440	470	500	530	560
	8	-1.496	-0.008	1.479	440	470	500	530	560
	10	-1.721	-0.317	1.087	440	470	500	530	560
STE	5	-1.621	-0.112	1.398	440	470	500	530	560
	8	-1.499	-0.020	1.459	440	470	500	530	560
Biology	HS	-0.850	0.210	1.300	440	470	500	530	560
Introductory Physics	HS	-1.010	0.120	1.260	440	470	500	530	560

3.6.5 Reported Scale Scores

Because the θ scale used in IRT calibrations is not understood by most stakeholders, reporting scales were developed for the MCAS tests. The reporting scales are linear transformations of the underlying θ scale. As the three θ cutpoints from the standard setting have equal intervals, one single linear transformation was sufficient to transform the θ scale from each performance level category on one reporting scale.

Student scores on the next-generation MCAS tests are reported in integer values from 440 to 560. Because the same transformation is applied to all achievement-level categories, and the reported scaled scores preserve the interval scale properties (except for the truncated scaled scores at the lower and upper end of the score scale), it is appropriate to calculate means and standard deviations with scaled scores.

By providing information that is more specific about the position of a student's results, scaled scores supplement achievement-level scores. Students' raw scores (i.e., total number of points obtained) on the 2023 next-generation MCAS tests were translated to scaled scores using a data analysis process called *scaling*, which simply converts from one scale to another. In the same way that a given temperature can be expressed on either the Fahrenheit or the Celsius scale, or the same distance can be expressed in either miles or kilometers, student scores on the 2023 next-generation MCAS tests can be expressed in raw or scaled scores.

It is important to note that converting from raw scores to scaled scores does not change students' achievement-level classifications. Given the relative simplicity of raw scores, it is fair to question why scaled scores for the MCAS are reported instead of raw scores. The answer is that scaled scores make the reporting of results consistent. To illustrate, equating typically results in different raw cut scores across different administrations. The raw cut score between *Partially Meeting Expectations* and *Meeting Expectations* could be, for example, 35 in grade 3 mathematics in 2022 but 34 in 2023, yet both of these raw scores would be transformed to scaled scores of 500. It is this uniformity across scaled scores that facilitates the understanding of student performance. The psychometric advantage of scaled scores over raw scores comes from their being linear transformations of θ. Since the θ scale is used for equating, scaled scores are comparable from one year to the next. Raw scores are not.

The scaled scores are obtained by a simple translation of ability estimates ($\hat{\theta}$) using the linear relationship between threshold values on the θ metric and their equivalent values on the scaled score metric. Students' ability estimates are obtained by mapping their raw scores through the TCC. Scaled scores are calculated using the following linear equation, representing the standard deviation of scaled scores on the first administration of the test:

$$SS = m\hat{\theta} + b,$$

where
m is the slope and
b is the intercept.

A separate linear transformation is used for each grade and content area combination. Table 3-39 shows the slope and intercept terms used to calculate the scaled scores for each grade and content area. Note that the values in Table 3-39 will not change unless the standards are reset.

Appendix L contains the raw-score-to-scaled-score look-up table for each test. The tables show the scaled score equivalent of each raw score for the 2023 next-generation MCAS tests. Additionally, Appendix L contains scaled score distribution graphs for each grade and content area for each testing form.

Table 3-39. Scale Score Slopes and Intercepts by Content Area and Grade

Content Area	Grade	Slope	Intercept
ELA	3	18.839	499.785
	4	18.846	499.421
	5	17.686	499.335
	6	18.984	500.202
	7	19.098	499.791
	8	19.900	498.981
	10	20.995	506.274
Mathematics	3	21.357	499.413
	4	20.938	498.869
	5	19.039	499.525
	6	19.870	500.165
	7	20.758	499.353
	8	20.172	500.170
	10	21.373	506.775
STE	5	19.875	502.220
	8	20.287	500.409
Biology	HS	27.907	493.721
Introductory Physics	HS	26.432	496.696

3.7 MCAS Reliability

Although an individual item's performance is an important factor in evaluating an assessment, a complete evaluation must also address the way items that are grouped in a set function together and complement one another. Tests that function well provide a dependable assessment of a student's level of ability. Just like the measurement of physical properties, such as temperature or height, any measurement tool contains some amount of measurement error, which leads to different results if the measurements were taken multiple times. The quality of items, as the tools to measure the latent ability, determines the degree to which a given student's score can be higher or lower than their true ability on a test.

There are several ways to estimate an assessment's reliability. The approach that was implemented to assess the reliability of the 2023 next-generation MCAS tests is the α coefficient of Cronbach (1951). This approach is most easily understood as an extension of a related procedure, split-half reliability. In the split-half approach, a test form is split in half, and students' scores on the two half-tests are correlated. To estimate the correlation between two full-length tests, the Spearman-Brown correction (Spearman, 1910; Brown, 1910) is applied. If the correlation is high, this is evidence that the items complement one another and function well as a group, suggesting that measurement error is minimal. The split-half method requires psychometricians to select items that contribute to each half-test score. This decision may have an impact on the resulting correlation since each different possible split of the test into halves will result in a different correlation. Cronbach's α eliminates the item selection impact by comparing individual item variances to total test variance, and it has been shown to be the average of all possible split-half correlations. Along with the split-half reliability, Cronbach's α is referred to as a coefficient of internal consistency. The term "internal" indicates that the index is measured internally to each test of interest, using data that come only from the test itself (Anastasi & Urbina, 1997). The formula for Cronbach's α is given as follows:

$$\alpha = \frac{n}{n-1}\left[1 - \frac{\sum_{i=1}^{n} \sigma^2_{(Y_i)}}{\sigma^2_x}\right],$$

where
i indexes the item,

n is the total number of items,
$\sigma^2_{(Y_i)}$ represents individual item variance, and
σ^2_x represents the total test variance.

Note that the information presented in this section and associated appendices are based only on first-time test takers who are not first-year EL students and who took non-accommodated online forms.

3.7.1 Reliability and Standard Errors of Measurement

Table 3-40 presents descriptive statistics, Cronbach's α coefficient, and raw score SEMs for each content area and grade. Statistics are based on operational items only. The reliability estimates range from 0.88 to 0.94, which are generally in acceptable ranges.

Table 3-40. Raw Score Descriptive Statistics, Cronbach's Alpha, and SEMs by Content Area and Grade—Computer-based

Content Area	Grade	Number Of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
ELA	3	60,542	44	25.01	9.51	0.91	2.81
	4	61,836	44	25.59	8.43	0.88	2.86
	5	62,316	48	28.76	9.43	0.90	2.96
	6	63,574	50	27.63	9.90	0.90	3.17
	7	63,711	50	27.50	10.71	0.90	3.44
	8	65,553	50	30.67	9.96	0.90	3.22
	10	68,104	51	34.77	10.17	0.91	3.13
Mathematics	3	51,707	48	29.38	11.52	0.93	2.99
	4	52,554	54	33.18	11.79	0.93	3.22
	5	54,159	54	30.52	11.90	0.92	3.36
	6	56,389	54	28.84	13.12	0.93	3.56
	7	57,234	54	25.42	13.58	0.93	3.49
	8	59,572	54	28.94	13.10	0.93	3.47
	10	63,574	60	31.75	14.78	0.94	3.61
STE	5	49,237	54	31.91	10.22	0.90	3.18
	8	54,215	54	29.09	10.92	0.90	3.42
Biology	HS	49,403	60	33.94	13.08	0.92	3.61
Introductory Physics	HS	12,822	60	33.89	12.48	0.92	3.49

Because of the dependency of the alpha coefficients on the test-taking population and the test characteristics, cautions need be taken when making inferences about the quality of one test by comparing its reliability to that of another test from a different grade or content area. To elaborate, reliability coefficients are highly influenced by test-taking population characteristics such as the range of individual differences in the group (i.e., variability within the population), average ability level of the population that took the exams, test designs, test difficulty, test length, ceiling or floor effect, and influence of guessing. Hence, "the reported reliability coefficient is only applicable to samples similar to that on which it was computed" (Anastasi & Urbina, 1997, p. 107).

3.7.2 Subgroup Reliability

The reliability coefficients discussed in the previous section were based on the overall population of students who took the 2023 next-generation MCAS tests. Appendix M presents reliability coefficients for various subgroups of interest. Cronbach's α coefficients were calculated using the formula defined above based only on the members of the subgroup in question in the computations; values are calculated only for subgroups with 10 or more students. The reliability coefficients for subgroups range from 0.78 to 0.95 across the tests, with a median of 0.91 and a standard deviation of 0.02, indicating that reliabilities are generally within a reasonable range.

For several reasons, the subgroup reliability results should be interpreted with caution. Reliability is dependent not only on the measurement properties of a test but also on the statistical distribution of the studied subgroup. For example, Appendix M shows that subgroup sizes may vary considerably, which results in natural variation in reliability coefficients. Alternatively, α, which is a type of correlation coefficient, may be artificially depressed for subgroups with little variability (Draper & Smith, 1998). Third, there is no industry standard to interpret the strength of a reliability coefficient when the population of interest is a single subgroup.

3.7.3 Reporting Subcategory Reliability

Reliabilities were calculated for the reporting subcategories within the 2023 next-generation MCAS content areas, which are described in section 3.2. Cronbach's α coefficients for subcategories were calculated via the same formula defined previously using only the items of a given subcategory in the computations. Results are presented in Appendix M. Lower reliabilities on subcategory scores are associated with lower numbers of items. For example, the grade 3 reporting category Geometry has only 4 items, resulting in a predictably very low reliability statistic of 0.49, the reliability coefficients for the reporting subcategories range from 0.49 to 0.88, with a median of 0.72 and a standard deviation of 0.09. Because they are based on a subset of items rather than the full test, subcategory reliabilities were typically lower than were overall test score reliabilities, approximately to the degree expected based on classical test theory (Haertel, 2006), and interpretations should take this into account. Qualitative differences among grades and content areas once again preclude valid inferences about the reliability of the full test score based on statistical comparisons among subcategories.

3.7.4 Reliability of Achievement-Level Categorization

The accuracy and consistency of classifying students into achievement levels are critical components of a standards-based reporting framework (Livingston & Lewis, 1995). For the 2023 next-generation MCAS tests, students were classified into one of four achievement levels: *Not Meeting Expectations*, *Partially Meeting Expectations*, *Meeting Expectations*, or *Exceeding Expectations*. Appendix N shows achievement-level distributions by content area and grade for the 2023 next-generation MCAS tests. Note that the information presented in Appendix N is based on all test takers reported with an achievement level.

Cognia conducted decision accuracy and consistency (DAC) analyses to determine the statistical accuracy and consistency of the classifications. This section explains the methodologies used to assess the reliability of classification decisions and gives the results of these analyses.

Accuracy refers to the extent to which achievement classifications based on test scores match the classifications that would have been assigned if the scores did not contain any measurement error. Accuracy must be examined because errorless test scores do not exist. Consistency measures the extent to which classifications based on test scores match the classifications based on scores from a second,

parallel form of the same test. Consistency can be evaluated directly from actual responses to test items if two complete and parallel forms of the test are administered to the same group of students. In operational testing programs, however, such a design is usually impractical. Instead, techniques have been developed to estimate both the accuracy and the consistency of classifications based on a single administration of a test. The Livingston and Lewis (1995) technique was used for the 2023 next-generation MCAS tests because it is easily adaptable to all types of testing formats, including mixed formats.

The DAC estimates reported in Tables 3-41 and 3-42 make use of "true scores" in the classical test theory sense. A true score is the score that would be obtained if a test had no measurement error. True scores cannot be observed and so must be estimated. In the Livingston and Lewis (1995) method, estimated true scores are used to categorize students into their "true" classifications.

For the 2023 next-generation MCAS tests, after various technical adjustments (described in Livingston & Lewis, 1995), a four-by-four contingency table of accuracy was created for each content area and grade, where cell [i,j] represented the estimated proportion of students whose true score fell into classification i (where i = 1 to 4) and observed score fell into classification j (where j = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students whose true and observed classifications matched) signified overall accuracy.

To calculate consistency, true scores were used to estimate the joint distribution of classifications on two independent, parallel test forms. Following statistical adjustments (per Livingston & Lewis, 1995), a new four-by-four contingency table was created for each content area and grade and populated by the proportion of students who would be categorized into each combination of classifications according to the two (hypothetical) parallel test forms. Cell [i,j] of this table represented the estimated proportion of students whose observed score on the first form would fall into classification i (where i = 1 to 4) and whose observed score on the second form would fall into classification j (where j = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students categorized by the two forms into the same classification) signified overall consistency.

Cognia also measured consistency on the 2023 next-generation MCAS tests using Cohen's (1960) coefficient κ (kappa), which assesses the proportion of consistent classifications after removing the proportion of consistent classifications that would be expected by chance. It is calculated using the following formula:

$$\kappa = \frac{(\text{Observed agreement}) - (\text{Chance agreement})}{1 - (\text{Chance agreement})} = \frac{\sum_i C_{ii} - \sum_i C_{i.} C_{.i}}{1 - \sum_i C_{i.} C_{.i}},$$

where
$C_{i.}$ is the proportion of students whose observed achievement level would be level i (where i = 1–4) on the first hypothetical parallel form of the test;
$C_{.i}$ is the proportion of students whose observed achievement level would be level i (where i = 1–4) on the second hypothetical parallel form of the test; and
C_{ii} is the proportion of students whose observed achievement level would be level i (where i = 1–4) on both hypothetical parallel forms of the test.

Because κ is corrected for chance, its values are lower than other consistency estimates.

3.7.5 Decision Accuracy and Consistency Results

DAC analyses were conducted both for the overall population and for subpopulations at each performance achievement level. Results of the DAC analyses are provided in Tables 3-41 and 3-42. The tables include overall accuracy indices with consistency indices displayed in parentheses next to the

accuracy values, as well as overall kappa values. Overall ranges for accuracy (0.78–0.86), consistency (0.69–0.80), and kappa (0.56–0.69) indicate that most students were classified accurately and consistently with respect to measurement error and chance.

In addition to overall accuracy and consistency indices, accuracy and consistency values conditional on achievement level are also given. For the calculation of these conditional indices, the denominator is the proportion of students associated with a given achievement level. For example, from Table 3-41, the conditional accuracy value is 0.84 for *Not Meeting Expectations* for the grade 3 ELA computer-based form. This figure indicates that among the students whose true scores placed them in this classification, 84% would be expected to be in this classification when categorized according to their observed scores. Similarly, a consistency value of 0.73 indicates that 73% of students with observed scores in the *Not Meeting Expectations* level would be expected to score in this classification again if a second, parallel test form were taken.

For some testing situations, the greatest concern may be decisions about achievement level thresholds. For example, for tests associated with the Every Student Succeeds Act (ESSA), the primary concern is distinguishing between students who are proficient and those who are not yet proficient. In this case, accuracy at the *Partially Meeting Expectations/Meeting Expectations* threshold is critically important, since it summarizes the percentage of students who are correctly classified either above or below the particular cutpoint. Table 3-42 provides the accuracy and consistency estimates and false positive and false negative decision rates at each cutpoint. A false positive is the proportion of students whose observed scores were above the cut and whose true scores were below the cut. A false negative is the proportion of students whose observed scores were below the cut and whose true scores were above the cut.

The accuracy and consistency indices at the *Partially Meeting Expectations/Meeting Expectations* threshold shown in Table 3-42 range from 0.90–0.93 and 0.86–0.90, respectively. The false positive and false negative decision rates at the *Partially Meeting Expectations/Meeting Expectations* threshold range from 4%–5% and 3%–5%, respectively. These results indicate that nearly all students were correctly classified with respect to being above or below the *Partially Meeting Expectations/Meeting Expectations* cutpoint.

Table 3-41. Summary of Decision Accuracy and Consistency Results by Content Area and Grade—Overall and Conditional on Achievement Level

Content Area	Grade	Overall	Kappa	Conditional On Achievement Level			
				Not Meeting Expectations	*Partially Meeting Expectations*	*Meeting Expectations*	*Exceeding Expectations*
ELA	3	0.82 (0.74)	0.61	0.84 (0.73)	0.81 (0.75)	0.83 (0.77)	0.77 (0.61)
	4	0.81 (0.73)	0.59	0.83 (0.72)	0.82 (0.76)	0.80 (0.73)	0.74 (0.54)
	5	0.82 (0.75)	0.61	0.83 (0.74)	0.81 (0.75)	0.84 (0.78)	0.72 (0.52)
	6	0.78 (0.69)	0.56	0.85 (0.77)	0.77 (0.69)	0.78 (0.70)	0.64 (0.48)
	7	0.81 (0.73)	0.60	0.83 (0.73)	0.81 (0.75)	0.79 (0.72)	0.78 (0.62)
	8	0.78 (0.69)	0.57	0.85 (0.76)	0.78 (0.69)	0.77 (0.69)	0.70 (0.55)
	10	0.80 (0.71)	0.58	0.83 (0.71)	0.77 (0.69)	0.82 (0.75)	0.78 (0.67)
Mathematics	3	0.83 (0.76)	0.65	0.84 (0.74)	0.84 (0.78)	0.83 (0.78)	0.80 (0.67)
	4	0.84 (0.78)	0.66	0.85 (0.74)	0.83 (0.77)	0.85 (0.80)	0.82 (0.70)
	5	0.86 (0.80)	0.67	0.76 (0.66)	0.86 (0.82)	0.87 (0.82)	0.82 (0.68)
	6	0.86 (0.80)	0.69	0.85 (0.75)	0.86 (0.81)	0.86 (0.81)	0.83 (0.72)
	7	0.85 (0.78)	0.68	0.86 (0.78)	0.85 (0.79)	0.84 (0.78)	0.84 (0.73)
	8	0.84 (0.78)	0.67	0.80 (0.72)	0.85 (0.79)	0.85 (0.79)	0.85 (0.73)
	10	0.86 (0.80)	0.69	0.73 (0.58)	0.86 (0.82)	0.88 (0.84)	0.85 (0.76)
STE	5	0.81 (0.73)	0.59	0.81 (0.68)	0.82 (0.76)	0.80 (0.73)	0.79 (0.65)
	8	0.82 (0.75)	0.62	0.84 (0.73)	0.82 (0.76)	0.83 (0.77)	0.76 (0.59)
Biology	HS	0.83 (0.76)	0.65	0.82 (0.74)	0.81 (0.75)	0.85 (0.79)	0.83 (0.72)
Introductory Physics	HS	0.82 (0.75)	0.64	0.68 (0.58)	0.81 (0.75)	0.85 (0.79)	0.88 (0.79)

Table 3-42. Summary of Decision Accuracy and Consistency Results by Content Area and Grade—Conditional on Cutpoint

Content Area	Grade	*Not Meeting Expectations / Partially Meeting Expectations*			*Partially Meeting Expectations / Meeting Expectations*			*Meeting Expectations / Exceeding Expectations*		
		Accuracy (Consistency)	False		Accuracy (Consistency)	False		Accuracy (Consistency)	False	
			Pos	Neg		Pos	Neg		Pos	Neg
ELA	3	0.95 (0.93)	0.02	0.03	0.91 (0.87)	0.05	0.04	0.96 (0.94)	0.02	0.01
	4	0.95 (0.92)	0.02	0.03	0.90 (0.86)	0.05	0.05	0.96 (0.95)	0.03	0.01
	5	0.95 (0.93)	0.02	0.03	0.91 (0.87)	0.05	0.04	0.96 (0.95)	0.03	0.01
	6	0.94 (0.91)	0.03	0.03	0.91 (0.87)	0.05	0.05	0.94 (0.91)	0.03	0.03
	7	0.94 (0.92)	0.03	0.03	0.91 (0.87)	0.05	0.05	0.96 (0.94)	0.03	0.02
	8	0.94 (0.91)	0.03	0.03	0.91 (0.87)	0.04	0.05	0.94 (0.91)	0.03	0.03
	10	0.96 (0.94)	0.02	0.02	0.91 (0.87)	0.05	0.04	0.93 (0.90)	0.04	0.03
Mathematics	3	0.96 (0.94)	0.02	0.02	0.92 (0.88)	0.04	0.04	0.96 (0.94)	0.02	0.02
	4	0.96 (0.95)	0.01	0.02	0.92 (0.89)	0.04	0.04	0.96 (0.94)	0.02	0.02
	5	0.97 (0.95)	0.02	0.02	0.92 (0.88)	0.05	0.04	0.97 (0.96)	0.02	0.01
	6	0.96 (0.95)	0.01	0.02	0.92 (0.89)	0.04	0.04	0.97 (0.96)	0.02	0.01
	7	0.95 (0.93)	0.02	0.03	0.93 (0.90)	0.04	0.04	0.97 (0.95)	0.02	0.01
	8	0.95 (0.92)	0.03	0.03	0.93 (0.90)	0.04	0.03	0.97 (0.96)	0.02	0.01
	10	0.97 (0.95)	0.01	0.02	0.93 (0.90)	0.04	0.03	0.97 (0.95)	0.02	0.02
STE	5	0.95 (0.93)	0.02	0.03	0.90 (0.87)	0.05	0.05	0.95 (0.93)	0.03	0.02
	8	0.95 (0.93)	0.02	0.03	0.91 (0.87)	0.05	0.04	0.96 (0.95)	0.02	0.01
Biology	HS	0.96 (0.94)	0.02	0.02	0.92 (0.89)	0.05	0.03	0.96 (0.94)	0.02	0.02
Introductory Physics	HS	0.95 (0.93)	0.03	0.02	0.92 (0.89)	0.05	0.03	0.95 (0.93)	0.03	0.02

The above indices are derived from Livingston and Lewis's (1995) method of estimating DAC. Livingston and Lewis discuss two versions of the accuracy and consistency tables. A standard version performs calculations for forms parallel to the form taken. An "adjusted" version adjusts the results of one form to match the observed score distribution obtained in the data. The tables use the standard version for two reasons: (1) This "unadjusted" version can be considered a smoothing of the data, thereby decreasing the variability of the results; and (2) for results dealing with the consistency of two parallel forms, the unadjusted tables are symmetrical, indicating that the two parallel forms have the same statistical properties. This second reason is consistent with the notion of forms that are parallel (i.e., it is more intuitive and interpretable for two parallel forms to have the same statistical distribution).

As with other methods of evaluating reliability, DAC statistics that are calculated based on groups with smaller variability can be expected to be lower than those calculated based on groups with larger variability. For this reason, the values presented in Tables 3-41 and 3-42 should be interpreted with caution. In addition, it is important to remember that it might be inappropriate to compare DAC statistics across grades and content areas.

3.8 Reporting of Results

The next-generation MCAS tests are designed to measure student achievement on the Massachusetts content standards. Consistent with this purpose, results on the MCAS were reported in terms of achievement levels, which describe student achievement in relation to these established state standards. There are four achievement levels for ELA and mathematics in grades 3–8 and 10 and grades 5, 8 science and technology/engineering (STE) and high school biology and introductory physics: *Not Meeting*

Expectations, Partially Meeting Expectations, Meeting Expectations, and *Exceeding Expectations.* (This language is different than that used for the high school chemistry and technology/engineering tests.)

Parent/Guardian Reports and student results labels are the only printed reports; one copy of each was mailed to districts for distribution to schools. The schools disseminate the reports to parents/guardians. Parent/Guardian Reports were also made available to schools and districts online in PearsonAccess Next (PAN). See section 3.8.1 for additional details of the Parent/Guardian Report.

DESE also provides numerous reports to districts, schools, and teachers through its Edwin Analytics reporting system. Section 3.9.5 provides more information about the Edwin Analytics system, along with examples of commonly used reports.

3.8.1 Parent/Guardian Report

The Parent/Guardian Report is generated for each student eligible to take the MCAS tests based on Reporting Business Requirements. It is a standalone 4-page (11” x 17” sheet of paper) color report that is folded in half. A sample report is provided in Appendix O.

The report is designed to present parents/guardians with a detailed summary of their student’s MCAS performance and to enable comparisons with other students at the school, district, and state levels. DESE has revised the report’s design several times to make the data displays more user-friendly and to add information. The 2017 revisions were undertaken with input from the MCAS Technical Advisory Committee, and from parent focus groups held in several towns across the state, with participants from various backgrounds.

The front cover of the Parent/Guardian Report provides student identification information, including student name, grade, date of birth, ID (SASID), school name, and district name. Local Student ID was added to the report at all grades. When available, the student’s graduating class is printed on the report for high school students. The cover also presents general information about the test, and website information for parent/guardian resources. The front page also contains text from the Family Guide pertaining to the student’s grade in fall of 2023 for all subjects.

Each content area page of the report contains the achievement level, scaled score, and standard error of the scaled score for the content area. If the student does not receive a scaled score, the reason is displayed where the achievement level would be displayed. Each achievement level has its own distinct color, and that color is used throughout the report to highlight important report elements based on the student's achievement level and score. These report elements include the student’s earned achievement level, scaled score, the visual scale’s achievement-level title and achievement-level cut scores, and the comparison of the student’s scaled score to the average scaled score at the student’s school, district, and the state levels. All achievement level descriptors are presented as part of the scale score graphical display for each content area. A horizontal gray bar was used to represent the standard error for next-generation content areas. A vertical black bar was used to represent the standard error for legacy content areas.

For next-generation tests, the student’s scaled score is compared to the average scaled score at the school, district, and state levels, based on business requirements that document student inclusion rules for aggregations. These scaled score values are color-coded based on the corresponding achievement levels. The mode of testing—paper, or computer—for the subject is indicated on each content area page. Up to 3 years of scores, including the current year, are reported where available for ELA and mathematics. Growth percentiles are reported for ELA and mathematics in all grades except in grade 3.

If the student took the ELA or mathematics test with one of the following nonstandard accommodations, a note was printed on the report in the area where scaled score and achievement level are reported:

- The ELA test was read aloud to the student.
- The ELA essay was scribed for the student.
- The student used a calculator during the non-calculator session of the mathematics test.
- At the bottom of each subject page, grade-specific resources are provided to help parents with the next steps.

Reporting Categories for each content area is reported in a table presenting the points earned by the student for the reporting category, the total points possible for the reporting category, average points earned in the school, district, and state and the average points earned by students at or near the Meeting Expectations cut score. Science practices are also summarized in the table.

The Science practices reported in the item grid illustrate the assignment of specific practices to items associated with that practice (practices are not assigned to all items). A '/' was used to indicate when an item does not have a practice assigned.

For students in grade 10 or higher, a template was created for students who previously passed or previously failed high school STE and did not take the spring 2023 STE tests. The science page for these students was replaced by the back page image that is provided by DESE. Students in grade 10 or higher taking ELA and mathematics and chemistry or technology/engineering were reported on the previously existing template for legacy sciences.

The fourth or back page of the report shows the results for science for students in grades 5, 8, or high school, for students in grades where science is not assessed (3, 4, 6, and 7), or high school students who did not participate in the science assessment, the back page shows the image that was provided by DESE. Report templates are used based on reporting rules provided by DESE.

3.8.2 Student Results Label

A student results label was produced for each student receiving a Parent/Guardian Report. The following information appeared on the label:

- student name
- grade
- birth date
- test date
- student ID (SASID)
- school code
- school name
- district name
- Local Student ID
- student's scaled score and achievement level for each content area (or the reason the student did not receive a score)
- Additionally, for high school, the student's graduating class and the CD status for each content area are printed.

3.8.3 Analysis and Reporting Business Requirements

To ensure that MCAS results are processed and reported accurately, the documents detailing analysis and reporting business requirements and data processing specifications are updated to reflect any changes/additions necessary for reporting each year. The processing, analysis, and reporting business requirements are observed in the analyses of the MCAS test data and in reporting results. These requirements also guide data analysts in identifying which students will be excluded from school-, district-,

and state-level summary computations. A copy of the *Analysis and Reporting Business Requirements* document for the 2023 next-generation MCAS administration is included in Appendix P.

3.8.4 Quality Assurance

Quality-assurance measures are implemented throughout the process of analysis and reporting at Cognia. The data processors and data analysts perform routine quality-control checks of their computer programs. When data are handed off to different units within the data team, the sending unit verifies that the data are accurate before handoff. Additionally, when a unit receives a data set, the first step is to verify the accuracy of the data. Once new report designs were approved by DESE, reports were run using demonstration data to test the application of the analysis and reporting business requirements. The populated reports were then approved by DESE.

Another type of quality-assurance measure used at Cognia is parallel processing. One data analyst is responsible for writing all programs required to populate the student-level and aggregate reporting tables for the administration. Each reporting table is assigned to a second data analyst who uses the analysis and reporting business requirements to independently program the reporting table. The production and quality-assurance tables are compared; when there is 100% agreement, the tables are released for report generation.

The third aspect of quality control involves procedures to check the accuracy of reported data. Using a sample of schools and districts, the quality-assurance group verifies that the reported information is correct. The selection of sample schools and districts for this purpose is very specific because it can affect the success of the quality-control efforts. There are two sets of samples selected that may not be mutually exclusive. The first set includes samples that satisfy all the following criteria:

- one-school district
- two-school district
- multi-school district
- private school
- special school (e.g., a charter school)
- small school that does not have enough students to report aggregations
- school with excluded (not tested) students

The second set of samples includes districts or schools that have unique reporting situations that require the implementation of a decision rule. This set is necessary to ensure that each rule is applied correctly.

The quality-assurance group uses a checklist to implement its procedures. Once the checklist is completed, sample reports are circulated for review by psychometric and program management staff. The appropriate sample reports are then sent to DESE for review and signoff.

3.9 MCAS Validity

One purpose of this report is to describe the technical and reporting aspects of the next-generation MCAS program that support valid score interpretations. According to the *Standards for Educational and Psychological Testing* (AERA et al., 2014), considerations regarding establishment of intended uses and interpretations of test results—and conformance to these uses—are of paramount importance regarding valid score interpretations. These considerations are addressed in this section.

Many sections of this technical report provide evidence of validity, including sections on test design and development, test administration, scoring, scaling and equating, item analysis, reliability, and score reporting. Taken together, these sections provide a comprehensive presentation of validity evidence associated with the MCAS program.

3.9.1 Test Content Validity Evidence

Test content validity demonstrates how well the assessment tasks represent the curriculum and standards for each content area and grade level. Content validity is rooted in the item development process, including how the test blueprints and test items align to the curriculum and standards. All items are developed, edited, administered, reviewed, and scored to represent the expectations from the state curriculum frameworks. This process is described further in sections 3.2, 3.3, and 3.4.

The following are all components of validity evidence based on test content: item alignment with Massachusetts curriculum framework content standards, item bias, sensitivity, and content appropriateness review processes, adherence to the test blueprint, use of multiple item types, use of standardized administration procedures with accommodated options for participation, and appropriate test administration training. As discussed earlier, all MCAS items are aligned by Massachusetts education stakeholders to specific Massachusetts curriculum framework content standards, and they undergo several rounds of review for content fidelity and appropriateness.

A 2017 content alignment study on the next-generation MCAS tests, conducted by Boston College researchers under the leadership of Michael Russell (See the *2019 Next-Generation MCAS and MCAS-Alt Technical Report*, Appendix S for study details), found a high degree of content alignment. For mathematics, over 90% of the domains assessed across the grade level tests showed high levels of alignment. For ELA, alignment was also found to be strong across grade levels and domains. When both the items and essay scoring criteria were considered, over 95% of the alignment considerations were deemed adequate. Only two domains, Grade 7 and Grade 8 Reading Informational Text, were identified as candidates for improved alignment. In addition, analyses of the level of agreement among panel members' ratings showed high levels of agreement for most ratings following the consensus process. While the study found a few select opportunities to improve alignment, the results from the analyses provide evidence of strong alignment across most of the tests examined.

3.9.2 Response Process Validity Evidence

Response process validity evidence can be gathered via cognitive interviews and/or focus groups with examinees. It is particularly important to collect this type of information prior to introducing a new test or test format, or when introducing new item types to examinees. DESE ensures that evidence of response process validity is collected and reported for all new MCAS item types used in the next-generation assessments.

DESE conducted a 2019 study to determine the readiness of grade 10 students and educators in Massachusetts schools to respond to the next-generation MCAS items. Two standalone field tests were administered to students in every high school in the state. Data from these standalone field tests were then analyzed to determine the following:

- the psychometric properties of the test items and the field tests
- the response time students took to successfully respond to the test

Student response time data were used to filter out the results of students who did not spend sufficient time on their answers. The data from the remaining motivated students were used to examine item discrimination and ensure that new scoring rubrics were keyed correctly. Next-generation test forms were then developed from these sampled results.

3.9.3 Internal Structure Validity Evidence

Evidence of test validity based on internal structure is presented in detail in the discussions of item analyses, reliability, and scaling and linking in sections 3.5 through 3.7. Technical characteristics of the internal structure of the assessments are presented in terms of classical item statistics (item difficulty, item-test correlation), DIF analyses, dimensionality analyses, reliability, SEM, and IRT parameters and procedures. In general, item difficulty and discrimination indices were within acceptable and expected ranges. Very few items were answered correctly at near-chance or near-perfect rates. Similarly, the positive discrimination indices indicate that most items were assessing consistent constructs, and students who performed well on individual items tended to perform well overall. See the individual sections for more complete results of the different analyses.

Furthermore, to evaluate whether different reporting categories constitute statistically different dimensions, an item-level confirmatory factor analysis (CFA) was conducted to assess the internal structure of the MCAS ELA and mathematics assessments in grade 10 from the 2018–19 administration. The CFA model for each test was specified such that the number of factors equaled the number of reporting categories and each item loaded onto the factor that corresponded to the reporting category to which the given item contributed. The results showed very high correlations between different factors, suggesting that there is very little unique variance among the given set of reporting categories. In other words, different reporting categories are essentially measuring the same thing. These results are highly consistent with the unidimensionality results from the DIMTEST and DETECT analyses, as well as the previous CFA analyses conducted on MCAS ELA and mathematics assessments in grades 3–8 in 2017–18. Although the CFA analysis suggested unidimensionality among different reporting categories, the high and positive factor loadings do suggest the items provide good measurement for each reporting category. Unidimensionality, meaning items from one reporting category correlate highly to other reporting categories, can be evidence that students have learned different content areas within each subject in an integrated fashion.

3.9.4 Validity Evidence in Relationship to Other Variables

DESE continues collecting evidence to evaluate the extent to which the next-generation MCAS assessments measure “student readiness for the next level” of schooling, such as readiness for the next grade level, or readiness for postsecondary education. In 2019, DESE conducted concurrent validity studies. They first compared student results on the Next Generation MCAS tests to course grades and course-taking in middle school and high school. Specifically, the relationships among MCAS results and student course grades in the respective subjects (in ELA and mathematics) showed that MCAS results were more strongly associated with course grades than other covariates tested, including course level, economic disadvantage, being on an IEP, or being an English learner. In mathematics in grades 8 and 10, MCAS achievement levels were significantly associated with taking advanced mathematics courses. Convergent validity evidence was also reported between MCAS test portions and subjects.

3.9.5 Efforts to Support the Valid Use of Next-Generation MCAS Data

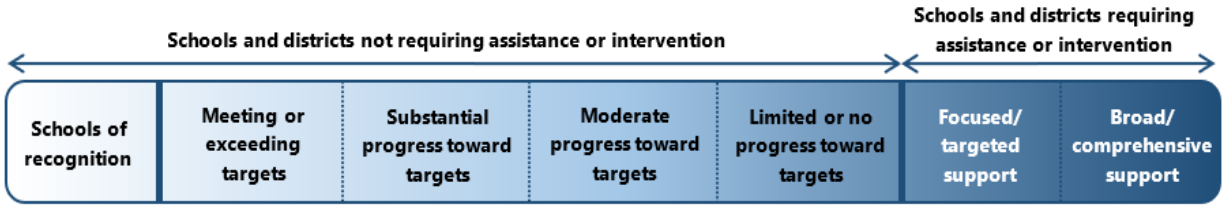
DESE takes many steps to support the intended uses of MCAS data. (The intended uses are listed in section 2.3 of this report.) This section will examine some of the reporting systems and policies designed to address each use.

1. Determining school and district progress toward the goals set by the state and federal accountability systems.

In 2018, DESE updated its accountability plan to conform to state and federal requirements. Measures of student achievement and growth are prominently featured alongside other indicators in the new school and district accountability system. Each school's performance on all measures is compared to its targets and to the performance of other schools in the state. The system includes incentives designed to focus schools on their lowest-performing students from prior years.

In the system, schools are placed into categories that describe their performance relative to state goals. As shown in Figure 3-1, the categories reflect how much assistance or intervention each school requires under the system. School and district accountability report cards are publicly available at www.doe.mass.edu/accountability/report-cards/.

Figure 3-1. School Categories in Massachusetts Accountability System



Students with significant disabilities who are unable to take the MCAS exams even when accommodations are provided can participate in the MCAS-Alt, which requires that students submit an MCAS-Alt Skills Survey as well as a collection of work samples and other documentation that demonstrates their proficiency on the state standards. Technical information on the MCAS-Alt is presented in Chapter 4 of this report.

2. Providing information to support program evaluation at the school and district levels.
3. Providing transparency into student performance through comprehensive reporting on the results of individual students, schools, districts, and the state.

Each year, student-level data from each test administration are shared with parents/guardians and school and district stakeholders in personalized *Parent/Guardian Report*s. The current versions of these reports (see the samples provided in Appendix O) were designed with input from groups of parents. These reports contain scaled scores and achievement levels from the current year and prior years, as well as norm-referenced student growth percentiles, which calculate how a student's current score compares to that of students who scored similarly on the prior one or two tests in that subject. They also contain item-level data broken down by standard. The reports include links that allow parents and guardians to access the released test items on the DESE website.

DESE's secure data warehouse, Edwin Analytics, provides users with more than 150 customizable reports that feature achievement data and student demographics geared toward educators at the classroom, school, and district levels. All reports can be filtered by year, grade, subject, and student demographic group. In addition, Edwin Analytics gives users the capacity to generate their own reports, with user-selected variables and statistics. These reports can help educators review classroom and school patterns, reflect on practice from last year, and plan for incoming classes based on previous performance. DESE monitors trends in report usage in Edwin Analytics. Between June and November (the peak reporting season for MCAS), over one million reports are run in Edwin Analytics, with approximately 400,000 reports generated in August when schools review their preliminary assessment results in preparation for the return to school.

Examples of two of the most popular reports are provided on the following pages. The MCAS School Results by Standards report, shown in Figure 3-2, indicates the mean percentage of possible points earned by students in the school, the district, and the state on MCAS items assessing particular standards/topics. The reporting of total possible points provides educators with a sense of how reliable the statistics are, based on the number of test items/test points. The School/State Diff column allows educators to compare their school or district results to the state results. Filters provide educators with the capacity to compare student results across nine demographic categories, which include gender, race/ethnicity, low-income status, and special education status.

The MCAS Growth Distribution report, shown in Figure 3-3, presents the distribution of students by student growth percentile band across years. For each year, the report also shows the median student growth percentile and the percentage of students scoring *Meeting or Exceeding Expectations*. Teachers, schools, and districts use this report to monitor student growth from year to year. As in the report above, all demographic filters can be applied to examine results within student groups.

Figure 3-2. Example of School Results by Standards Report—Mathematics, Grade 7

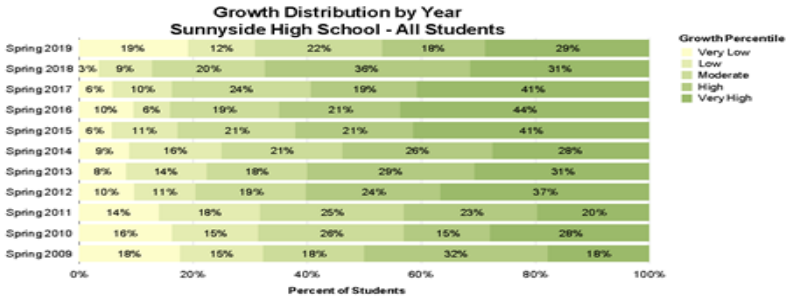
All Students Students (161)

Standards: MA 2017 Standards **Show results with <10 students :** No

	Possible Points	School % Possible Points	District % Possible Points	State % Possible Points	School/ State Diff
Mathematics					
All items	54	48%	48%	47%	1
Question Type					
Constructed Response	16	48%	49%	48%	1
Short Answer	14	41%	42%	39%	2
Selected Response	24	52%	51%	51%	1
Domain / Cluster					
Expressions and Equations	**14**	**47%**	**48%**	**47%**	**-1**
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	10	54%	54%	52%	2
Use properties of operations to generate equivalent expressions.	4	28%	31%	36%	-8
Geometry	**8**	**42%**	**43%**	**44%**	**-2**
Draw	2	39%	44%	47%	-9
Solve real-life and mathematical problems involving angle measure	6	43%	43%	43%	0
Ratios and Proportional Relationships	**11**	**55%**	**54%**	**53%**	**2**
Analyze proportional relationships and use them to solve real-world and mathematical problems.	11	55%	54%	53%	2
Statistics and Probability	**11**	**36%**	**36%**	**37%**	**0**
Draw informal comparative inferences about two populations.	3	29%	30%	32%	-2
Investigate chance processes and develop	6	36%	35%	36%	0
Use random sampling to draw inferences about a population.	2	48%	45%	47%	2
The Number System	**10**	**62%**	**59%**	**54%**	**8**
Apply and extend previous understandings of operations with fractions to add	10	62%	59%	54%	8

Note: MCAS results are suppressed for group counts less than 10 and school results only include students enrolled in the school since October 1.

Figure 3-3. Example of Growth Distribution Report—ELA, Grade 10



Vertical lines at 20%, 40%, 60%, 80% and 100% represent the Statewide distribution for very low, low, moderate, high and very high growth.

Test	# Very Low	# Low	# Moderate	# High	# Very High	Median SGP	Mean SGP	# Students (SGP)	% Proficient or Higher	% Meeting or Exceeding Expectations	# Students (Ach. Level)
Spring 2019	18	11	21	17	27	58.5	55.0	94		65	95
Spring 2018	3	8	17	31	27		66.6	86	99		88
Spring 2017	5	9	21	16	35	70.5		86	100		86
Spring 2016	9	6	18	20	41	71.5		94	99		94
Spring 2015	5	10	18	18	36	73.0		87	99		87
Spring 2014	7	13	17	21	22	65.0		80	95		83
Spring 2013	7	12	15	25	26	67.0		85	100		86
Spring 2012	9	10	18	22	34	70.0		93	98		93
Spring 2011	15	19	27	25	21	53.0		107	85		109
Spring 2010	14	13	22	13	24	51.0		86	74		87
Spring 2009	11	9	11	20	11	60.5		62	88		69
Spring 2008									81		43

Aggregate student growth percentile (SGP) is not calculated if the number of students with SGP is less than 20.

Aggregated assessment data in Edwin Analytics are also available on the DESE public website through the school and district profiles (profiles.doe.mass.edu). In both locations, stakeholders can click on links to view released assessment items, the educational standards they assess, and the rubrics and model student work at each score point. The public is also able to view each school's progress toward the performance goals set by the state and federal accountability system.

The high-level summary provided in this section documents DESE's efforts to promote uses of state data that enhance student, educator, and LEA outcomes while reducing less-beneficial unintended uses of the data. Collectively, this evidence documents DESE's efforts to support the use of MCAS results by parents, educators, and leaders in addition to the use of MCAS results as a component of school accountability.

Chapter 4. MCAS Alternate Assessment (MCAS-Alt)

4.1 MCAS-Alt Overview

4.1.1 Background

This chapter presents evidence in support of the technical quality of the MCAS Alternate Assessment (MCAS-Alt) and documents the procedures used to conduct, score, and report student results on MCAS-Alt student assessments. These procedures have been implemented to ensure, to the extent possible, the validity of score interpretations based on the MCAS-Alt. While flexibility is built into the MCAS-Alt to allow teachers to customize academic goals at an appropriate level of challenge for each student, the procedures described in this report are also intended to constrain unwanted variability wherever possible.

For each phase of the alternate assessment process, this chapter includes a separate section that documents how the assessment evaluates the knowledge and skills of students with the most significant cognitive disabilities in the context of grade-level content standards. Together, these sections provide a basis for the validity of the results.

This chapter is intended primarily for a technical audience and requires highly specialized knowledge and a solid understanding of measurement concepts. However, teachers, parents/guardians, and the public will also be interested in how the assessments both inform and emerge from daily classroom instruction.

4.1.2 Purposes of the Assessment System

The MCAS is the state's program of student academic assessment, implemented in response to the Massachusetts Education Reform Act of 1993. Statewide assessments, along with other components of education reform, are designed to strengthen public education in Massachusetts and to ensure that all students receive challenging instruction based on the standards in the Massachusetts curriculum frameworks. The law requires that the curriculum of all students whose education is publicly funded, including students with disabilities, be aligned with state standards. The MCAS is designed to improve teaching and learning by reporting detailed results to districts, schools, and parents/guardians; to serve as the basis, with other indicators, for school and district accountability; and to certify that students have met the Competency Determination (CD) standard to graduate from high school. Students with the most significant cognitive disabilities who are unable to take the standard MCAS tests, even when accommodations are provided, are designated in their individualized education program (IEP) or 504 plan to take the MCAS-Alt. The MCAS-Alt is intended to document the student's achievement and progress in learning the skills, knowledge, and concepts outlined in the state's curriculum frameworks, and to

- provide a basis for including difficult-to-assess students in statewide assessment and accountability systems;
- determine whether students with the most significant cognitive disabilities are receiving a program of instruction based on the state's academic learning standards;
- determine how much the student has learned in the specific areas of the academic curriculum being assessed; and
- assist teachers in providing challenging academic instruction.

The MCAS-Alt was developed between 1998 and 2000 and has been refined and enhanced each year since its initial implementation in the 2000–2001 school year.

4.1.3 Format

The MCAS-Alt consists of a structured set of "evidence" collected during instructional activities in each subject to be assessed during the school year, plus a standardized MCAS-Alt Skills Survey that measures the degree to which students have already learned the range of skills covered by a particular strand or domain of the frameworks. Teachers are required to use the results of the skills survey to identify particular standards and levels of complexity at which to begin assessing the student. The MCAS-Alt also includes the student's demographic information and weekly schedule, parent/guardian verification and signoff, and a school calendar, all of which are submitted to the state each spring. Preliminary 2023 results were reported to schools in June, with final results provided in September.

The Department's *Resource Guide to the Massachusetts Curriculum Frameworks for Students with Disabilities* (the *Resource Guide*) describes the content to be assessed by the 2023 MCAS-Alt and contains the 2017 English language arts (ELA) standards, the 2017 mathematics standards, and the 2016 science and technology/engineering (STE) standards.

The *Resource Guide* provides strategies for adapting and using the state's learning standards to instruct and assess students taking the MCAS-Alt. The fall 2022 *Resource Guide* is intended to ensure that all students receive instruction in the Massachusetts curriculum frameworks in ELA, mathematics, and STE at levels that are challenging and attainable for each student. For the MCAS-Alt, students are expected to achieve the same standards as their peers without disabilities. However, they may need to learn the necessary knowledge and skills differently, such as through presentation of the knowledge/skills at lower levels of complexity, in smaller segments, and at a slower pace.

4.2 MCAS-Alt Test Design and Development

4.2.1 Test Content and Design

MCAS-Alt assessments are required for all grades and content areas in which standard MCAS tests are administered. In the MCAS-Alt, the range and level of complexity of the standards being assessed have been modified, yet without altering the essential components or meaning of the standards. The MCAS-Alt content areas and strands/domains required for the assessment of students in each grade are listed in Table 4-1.

Table 4-1. MCAS-Alt Requirements in Each Category

Grade	ELA Strands Required	Mathematics Domains Required	STE Strands Required
3	▪ Language ▪ Reading ▪ Writing	▪ Operations and Algebraic Thinking ▪ Measurement and Data	
4	▪ Language ▪ Reading ▪ Writing	▪ Operations and Algebraic Thinking ▪ Numbers and Operations – Fractions	
5	▪ Language ▪ Reading ▪ Writing	▪ Number and Operations in Base Ten ▪ Number and Operations – Fractions	For any three of the four STE disciplines,* select one core idea in each discipline and assess six entry points within each core idea.
6	▪ Language ▪ Reading ▪ Writing	▪ Statistics and Probability ▪ The Number System	
7	▪ Language ▪ Reading ▪ Writing	▪ Ratios and Proportional Relationships ▪ Geometry	
8	▪ Language ▪ Reading ▪ Writing	▪ Expressions and Equations ▪ Geometry	For any three of the four STE disciplines,* select one core idea in each discipline and assess six entry points within each core idea.
10	▪ Language ▪ Reading ▪ Writing	Any three of the five mathematics conceptual categories: ▪ Functions ▪ Geometry ▪ Statistics and Probability ▪ Number and Quantity ▪ Algebra	Select three core ideas in <u>one</u> of the following disciplines: ▪ Biology ▪ Chemistry ▪ Introductory Physics or ▪ Technology/Engineering

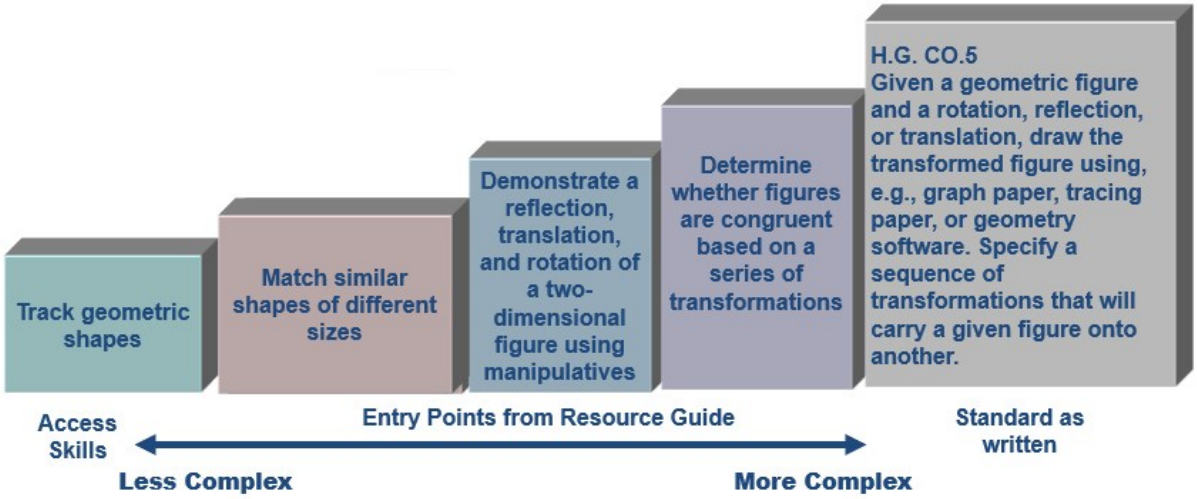
** Earth and Space Science, Life Science, Physical Sciences, Technology/Engineering*

4.2.1.1 Access to the Grade-Level Curriculum

Students with disabilities are expected to achieve the same standards as their peers who do not have disabilities. However, they may need extensive support to learn the necessary knowledge and skills and are likely to require instruction in smaller segments and at a slower pace. The *Resource Guides to the Massachusetts Curriculum Frameworks for Students with Disabilities* identify student-centered academic outcomes, called entry points, based on each grade-level content standard. The *Resource Guides* are intended to assist educators in teaching and assessing appropriately challenging, standards-based academic skills and content aligned with grade-level standards, as required by law. Entry points consist of academic outcomes based on the "essence" of the grade-level content but presented at modified levels of complexity and difficulty. Entry points provide a roadmap for students to make steady progress toward eventually meeting standards at grade-level complexity.

In a small number of cases where students with the most significant cognitive abilities cannot yet address entry points even at the lowest levels of complexity and even with the use of instructional accommodations, those students are instructed and assessed on the acquisition of access skills, which describe the communication and motor skills practiced during age-appropriate activities based on the standards. Entry points and access skills are listed in the *Resource Guides* in ELA, mathematics, and STE for every curriculum framework standard, available online at www.doe.mass.edu/mcas/alt/resources.html.

Figure 4-1. Model of a Method to Access the Grade-Level Curriculum Using Entry Points That Address the Essence of the Standard for Students Who Take the MCAS-Alt (Mathematics Example)



How Resource Guides Were Developed

After each curriculum framework was developed or subsequently revised, DESE convened panels of experts in each of three content areas (ELA, mathematics, and STE) to adapt the general education curriculum standards for students with the most significant cognitive disabilities. Panelists included content specialists, assessment experts, special educators familiar with students with the most significant cognitive disabilities, higher education faculty, parents and advocates, and members of the state's contractor team. Panelists are listed for each content area on the acknowledgements page of each on the Resource Guides here: www.doe.mass.edu/mcas/alt/resources.html.

Each panel reviewed the standards in their respective content area and identified the big ideas, key skills, and content knowledge—the so-called "essence"—contained in each standard. Once panelists agreed upon the essence, they determined "entry points," standards-based outcomes at successively lower levels of complexity than are typically expected of students who are achieving the grade-level standards as originally written. First, the panels determined entry points at the lowest level of complexity at which a student could address the standard without losing its essence. Then, they determined additional entry points at successively higher levels of complexity so teachers could identify and select the entry point at a challenging and attainable level of complexity appropriate for each student. This "continuum of complexity" allows teachers to progress to higher levels of complexity once lower complexity entry points are mastered by the student.

The process of developing the essence and entry points was repeated in each of the three content areas and was replicated each time revisions were made to the curriculum frameworks (1999; 2001; 2006; 2011; 2016; 2017). Subsequently, special educators familiar with students with the most significant cognitive disabilities developed access skills appropriate for students who are unable to address the content and skills at even the lowest level of complexity. Access skills include only motor and communication skills addressed during a standards-based activity in the required strand/domain and are intended for a very small number of students with the most unique, complex, and significant cognitive disabilities. Each Resource Guide lists the standards as written for students in each grade together with entry points and access skills intended for students with the most cognitive disabilities who are designated to participate in the MCAS-Alt.

4.2.1.2 Assessment Design

The MCAS-Alt assessments for ELA–language, ELA–reading, mathematics, and legacy high school STE (chemistry and technology/engineering only) consist of a completed MCAS-Alt Skills Survey, a collection of primary evidence, supporting documentation, and other required information.

MCAS-Alt Skills Survey

The MCAS-Alt Skills Survey (see Appendix Q) is a standardized component of the MCAS-Alt that must be administered by the teacher to each student before selecting an entry point or access skill in the subject required for assessment. The survey determines a student's current level of academic knowledge, skills, and abilities across a broad range of standards. The results of the skills survey are intended to be used as the basis for selecting an entry point or access skill listed in the *Resource Guide* in each subject scheduled for assessment. The survey is also intended to familiarize teachers with the range of entry points in a strand/domain that are available for the assessment.

The survey lists the important skills in each strand/domain/conceptual category/discipline from least to most complex. The skills represented on each survey were identified in collaboration with content experts in order to assess students with the most significant cognitive disabilities on skills that represent the "knowledge of most worth" within each strand ranging from low to high complexity.

To complete the skills survey, teachers may use the sample tasks provided on the survey, design their own simple tasks, use classroom observations, class assignments, progress reports, or locally administered assessments to determine the degree to which the student can perform each skill listed in the survey. A sample strand from the survey is shown in Figure 4-2.

A follow-up skills survey, though not required, is recommended *after* the selected skill has been taught to note the student's progress, especially if the student will attend a different classroom the following year.

Figure 4-2. MCAS-Alt Skills Survey–Reading Sample Strand

Reading (Informational or Literary Text)

	Based on a literary or informational text read by or to the student, student can:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Identify the main character(s) in the text.					
2.	Identify the setting of the text.					
3.	State key details from the text.					
4.	Identify events (or ideas) presented in the text.					
5.	Identify the central (main) idea of the text.					
6.	Explain *why* or *how* something occurred in the text.					
7.	Identify and define unknown words in the text; or match words or phrases from the text to their meaning.					
8.	Differentiate between a fact and the author's opinion.					
9.	Describe the author's point of view.					

Instructions for Completing the Skills Survey

Teachers are instructed to conduct the MCAS-Alt Skills Survey for the most significant entry points listed in the Resource Guide in the required strand/domain for a student in that grade. Next, they check one box (A–E) for each skill in the required strand/domain(s).

Teachers may use any combination of the following methods to conduct a brief assessment of each skill:

a) observations, informal assessments, progress reports, or classroom work

b) 2–4 tasks, based on the examples provided in the survey form or designed by the teacher that are accommodated for each student's instructional level and needs

If using specific tasks or activities to assess the student, the following protocol should be used:

1) Present the first task to the student.

2) If the student does not respond on the first attempt, repeat the task with a verbal reminder or other prompt (if needed), but do not give the answer. (Note: If a prompt is given, the response may be accurate, but is not independent.)

3) If the student responds to the first task, give a second, more complex task. Repeat with a prompt if needed. Make notes on the survey form to remind you of the student's performance of each task.

4) If the student does not respond to the second task, even with a prompt, do not introduce a third task. Simply mark an "X" in the column (A, B, C, D, or E) that most closely describes their performance of the skill.

5) Introduce the next task in the survey. Repeat steps 2 through 4 until all skills in the required strand/domain are assessed.

Once the survey has been completed for each required strand/domain, review the results, and proceed as follows:

- Select a related or higher-level-of-complexity entry point from the Resource Guide based on any skill that has been checked in columns A, B, or C.
- Do not select an entry point for any skills checked in columns D or E.
- If column A ("unable to perform the skill") is checked for all skills in the strand/domain, consider assessing an access skill (i.e., a motor or communication skill).
- If columns D and/or E are checked for most of the skills in the strand/domain, then the IEP team should consider whether the standard MCAS test (paper or online) would be more appropriate for the student in that subject.

Submit a completed MCAS-Alt Skills Survey for each assessed strand just after the Strand Cover Sheet in each student's MCAS-Alt. A strand without a completed Skills Survey will receive a score of *Incomplete*.

MCAS-Alt Skills Survey Pilot

In fall 2018, 55 MCAS-Alt training specialists (i.e., special educators selected to be peer trainers) were asked to conduct a pilot study of the MCAS-Alt Skills Survey with one or more students in at least one of three content areas and provide responses to the following questions.

- How difficult was it to administer the skills survey?
- How much time did it take to administer each strand of the survey?
- Did conducting the skills survey help you gain a better understanding of your students' abilities?

- Was the skills survey helpful in guiding you to select appropriate entry points to assess?
- Was the skills survey rating system useful in determining a student's performance?
- Do you have suggestions for how the DESE should communicate this new requirement to teachers for the 2019–2020 school year? (Note: The survey was introduced in 2019–2020, but the state's academic assessments were cancelled due to the impact of the pandemic in spring 2020. The survey was first implemented and scored in the 2020–2021 school year.)

DESE received 48 written responses to the questions listed above. Most respondents said the skills survey was easy to administer, though the duration of administration varied widely (from 5–30 minutes per strand, depending on the student's abilities—surveying lower functioning students was completed more quickly while higher functioning students took longer).

Several said it seemed redundant of other broad-based skills assessments they routinely conduct at the start of each school year, though many said the MCAS-Alt Skills Survey was more formal, sequential, systematic, and standards-based. Respondents were about equally divided on the question of its effectiveness in helping gain a better understanding of their student(s), though many said it helped them identify the standards on which to focus for instruction and assessment. A few said their students surprised them with new skills they hadn't been aware they had mastered, and many said it was most helpful in cases when surveying students with whom they were less familiar. Many felt the survey helped them expand their understanding of possible entry points to select for assessment and the range of skills they were willing to teach and assess.

While most respondents acknowledged that the survey would require additional time to conduct, a large proportion said it was not overly time-consuming to administer. A few said it had saved them time, since it revealed the areas that needed the greatest instructional focus and gave them ideas for areas to assess. Some suggested the survey would be a good informal pre- and post-assessment conducted at different points throughout the school year, which could assist with progress monitoring and passing along orientation information to a new teacher the following year. Most felt the skills survey process will make sense to teachers when it is introduced, though they might be unhappy about the additional work requirement and suggested it be made optional.

As a result of feedback from the pilot study, the following adjustments were made to the operational MCAS-Alt Skills Survey:

- The skills survey was incorporated into the online MCAS-Alt forms and graphs application so it could be completed online.
- Multiple skills that had been combined were separated into separate skills.
- A training unit was developed to prepare teachers for implementation.
- The designations used in headers for columns A through E to rate each skill were edited to include both percentages of independence AND descriptors of the students' achievement of the skill (see Figure 4-3 below).
- Additional consultation occurred with content specialists to develop examples of assessment activities, ensure fidelity to the standards, and provide coverage of the most significant entry points across all ability levels.
- Instructional examples were added to the listed skills in Science and Technology/Engineering.

Figure 4-3. Descriptors for Each Column Used on the Skills Survey

A	B	C	D	E
Student is **unable** to perform this skill. ---------OR-------- Teacher is unable to assess student on this skill.	Student is just starting to learn this skill and demonstrates the skill only **rarely** without support. Student performs this skill accurately with **0–25% independence**. ---------OR-------- Student performs this skill independently with **0–25% accuracy**.	Student demonstrates this skill **intermittently** and only **occasionally** without support. Student performs this skill accurately with **26–50% independence**. ---------OR-------- Student performs this skill independently with **26–50% accuracy**.	Student demonstrates this skill **more often than not** without support. Student performs this skill accurately with **51–75% independence**. ---------OR-------- Student performs this skill independently with **51–75% accuracy**.	Student demonstrates this skill **almost all the time** without support. Student performs this skill accurately with **76–100% independence**. --------OR--------- Student performs this skill independently with **76–100% accuracy**.

Primary Evidence

For the evidence collection portion of the MCAS-Alt, the ELA, mathematics, and STE assessments require the inclusion of an instructional data chart and two or more pieces of primary evidence in each assessed strand, plus other supporting documentation that shows or describes the student's performance of the targeted skill.

The ELA–language, ELA–reading, and all required mathematics strands must include a data chart (e.g., field data chart, line graph, or bar graph) that indicates the following:

- the student's performance of the targeted skill based on the learning standard being assessed
- tasks performed by the student on at least eight distinct dates, with a brief description of each activity
- percentage of accuracy for each performance
- percentage of independence for each performance
- progress over time, including an indication that the student has attempted a new skill

Two or more pieces of primary evidence must document the student's performance of the same skill or outcome identified on the data chart. Primary evidence may include

- work samples (created by the student or dictated to a scribe using the student's primary mode of communication)
- photographs of one or more classroom activities
- audio or video clips of the student performing the targeted activity

Each piece of primary evidence must clearly show the final product of an instructional activity and be labeled with

- the student's name,
- the date of the activity,
- a brief description of what the student was asked to do and how the task or activity was conducted,
- the percentage of accuracy for the task or activity, and

- the percentage of independence during the task or activity (i.e., the degree to which the student demonstrated knowledge and skills without the use of prompts or cues from the teacher).

The data chart and at least two additional pieces of primary evidence comprise the "core set of evidence" required in each strand, with the exception (noted below) of the ELA–Writing strand and next-generation STE strands.

The MCAS-Alt for ELA–Writing consists of a skills survey, one baseline writing sample (not included in the student's score), plus three final writing samples in any of three writing types generated using the student's primary mode of communication. Final writing samples are included in the final score.

The MCAS-Alt assessments for STE in grades 5 and 8, and high school biology and introductory physics consist of primary evidence in three STE disciplines. Each discipline includes evidence of three entry points within the same core idea. STE evidence consists of the MCAS-Alt Skills Survey plus three work samples that integrate the STE content with three of the eight science practices described in the 2016 Massachusetts Curriculum Framework for STE. The STE assessment for high school consists of a skills survey and three different core ideas in one discipline (either biology or introductory physics). Each core idea consists of three work samples documenting three different science practices, one for each summary sheet.

A detailed description of the instructions given to educators who are conducting the MCAS-Alt is provided in section 4.3, MCAS-Alt Test Administration.

Supporting Documentation

In addition to the required pieces of primary evidence, supporting documentation may be included at the discretion of the teacher to indicate the context in which the activity was conducted. Supporting documentation may include any of the following:

- photographs of the student that show how the student engaged in the context of the instructional activity
- tools, templates, graphic organizers, or models used by the student
- reflection sheet or evidence of other self-evaluation activities that document the student's self-awareness, perceptions, choices, decision-making, and self-assessment of the work he or she created and/or the learning that occurred as a result. For example, a student may respond to questions such as these:
    - What did I do? What did I learn?
    - What did I do well? What am I good at?
    - Did I correct my inaccurate responses?
    - How could I do better? Where do I need help?
    - What should I work on next? What would I like to learn?
- work sample description labels providing important information about the activity or work sample

4.2.1.3 Assessment Dimensions (Scoring Rubric Areas)

Trained and qualified scorers examine each piece of evidence in the strand and apply the criteria described in the *Guidelines for Scoring 2023 MCAS-Alt* (see Appendix R), using the MCAS-Alt Rubric for Scoring Each Strand, to produce a subscore for the strand based on the following:

- **completeness** of assessment materials
- **level of complexity** and alignment with learning standards in the Massachusetts curriculum frameworks in the content area being assessed
- **accuracy** of the student's responses to questions or performance of specific tasks
- **independence** demonstrated by the student in responding to questions or performing tasks

- **self-evaluation** of each task or activity (e.g., reflection, self-correction, goal-setting)
- **generalized performance** demonstrating the skill in different instructional contexts or using different materials or methods of presentation or response

Each strand is scored in each of five rubric dimensions, further described in section 4.4.3.1. Rubric dimensions and possible scores are as follows:

- Level of Complexity (score range of 1–5)
- Demonstration of Skills and Concepts (M, 1–4)
- Independence (M, 1–4)
- Self-Evaluation (M, 1, 2)
- Generalized Performance (1, 2)

(Note: a score of "M" would signify insufficient evidence or information to generate a numerical score in a dimension.)

Scores in Level of Complexity, Demonstration of Skills and Concepts, and Independence are combined to yield a strand subscore; those subscores are combined, as shown in the Analysis and Reporting Business Requirements (Appendix P) to yield an overall score in the content area. Students taking alternate assessments based on alternate academic achievement standards (AA-AAAS) receive scores of either *Progressing*, *Emerging*, or *Awareness.*

4.2.2 Test Development

4.2.2.1 Rationale

AA-AAAS is the component of the state's assessment system that measures the academic performance of students with the most significant cognitive disabilities. Students with disabilities are required by federal and state laws to participate in the statewide MCAS so their performance of skills and knowledge of content described in the state's curriculum frameworks can be assessed and so that they are visible, included, and accountable in reports of results for each school and district.

The Elementary and Secondary Education Act (ESEA) requires states to include an alternate assessment option for students with the most significant cognitive disabilities. This requirement ensures that students with the most significant cognitive disabilities receive academic instruction based on the state's learning standards, have an opportunity to "show what they know" on the state assessment, and are included in reporting and accountability. Alternate assessment results provide accurate and detailed feedback that can be used to identify challenging instructional goals for each student. When schools are held accountable for the performance of students with disabilities, these students are more likely to receive consideration when school resources are allocated.

Through use of curriculum resources provided by DESE, teachers of students with disabilities have become adept at providing standards-based instruction at a level that challenges and engages each student, and they have informally reported unanticipated gains in student achievement.

4.2.2.2 Test Specifications

MCAS-Alt Skills Survey

Each strand must include a completed MCAS-Alt Skills Survey indicating the results of the student's performance in a broad range of skills. The information compiled in the skills survey must be used by the educator to select a targeted skill from the *Resource Guide* in the content area and strand(s) required for assessment. Only those skills (i.e., entry points and access skills) that the student was unable to perform

accurately and independently at least 50 percent of the time on the MCAS-Alt Skills Survey may be selected by the student's teacher for the MCAS-Alt.

Evidence for English Language Arts (Language and Reading only), Mathematics, and Legacy STE (Chemistry and Technology/Engineering) Strands

Each portfolio strand must include a data chart documenting the student's performance of the targeted skill being assessed in the required content area (i.e., the percentage of accuracy and independence of each performance). Data are collected on at least eight different dates to determine the degree to which the skill has been mastered. On each date, the data must indicate the percentage of correct versus inaccurate responses given by the student, and whether the student required cues, prompts, or other assistance to respond (i.e., the overall percentage of independent responses by the student). Each data chart must include a brief description of activities conducted on each date and must describe how the activity addressed the measurable outcome being assessed. Data are collected either during routine classroom instruction or during tasks and activities set up specifically to assess the student. The data chart may include performance data from either a single activity or task; or from a series of responses to specific tasks summarized for each date.

In addition to the data chart, each strand must include at least two individual work samples (including photographs, if the evidence is too large, fragile, or temporary in nature) that documents the percentage of accuracy and independence of the student's responses on a given date, based on the measurable outcome that was also documented on the data chart.

The following information must be provided either on a Work Description or on the evidence itself:

- student's name
- date
- content area, strand/domain, and learning standard being assessed
- entry point being assessed during the activity
- a summary of the percent of student's accuracy and independence during the activity
- description of the activity

Evidence for ELA–Writing

The ELA–Writing strand requires a completed MCAS-Alt Skills Survey and at least three writing samples that demonstrate the student's expressive communication skills, based on any combination of the following text types:

- Opinion (grades 3–5)/Argument (grades 6–8 and 10)
- Informative/Explanatory
- Narrative, including Poetry

In addition to three writing samples, one *baseline* sample must be submitted, which may include either an outline, completed graphic organizer, or draft of a writing assignment. The baseline sample should provide information to guide additional instruction in writing in that text type. Teachers are also required to pre-score the student's three final writing samples using a rubric provided by DESE for that purpose. See Appendix S for the Scoring Rubric for ELA–Writing.

Evidence for Next-Generation Science and Technology/Engineering (STE) Strands (Grades 5 and 8)

The format described below is intended to encourage the teaching of units of science based on a core idea, rather than assessing isolated skills. Teachers are directed to complete these steps:

Step 1: Select three (3) of the following STE disciplines:

- Earth and Space Science
- Life Science
- Physical Science
- Technology/Engineering

Step 2: Conduct the STE Skills Survey available to determine the optimal grade-span at which to select entry points for the student. The STE Skills Survey must be conducted once for the entire STE content area, not for each discipline, and must include all eight science practices.

Step 3: Select a core idea within the chosen discipline that is relevant and that engages and challenges the student.

Step 4: Select three (3) entry points or access skills. Three (3) different science practices must be addressed within the selected entry points or access skills. This step encourages teachers to design inter-related activities that address a theme or unit of study.

Step 5: List the following information on each STE Summary Sheet:

- student's name
- date
- core idea
- entry point addressed during the activity
- numbered science practice for that entry point
- accuracy and independence for each task or response in the activity, and the summary percent
- description of the activity

Step 6: Attach three pieces of primary evidence (i.e., work samples) to its corresponding completed STE Summary Sheet. Photographs and/or videos may be submitted as primary evidence if they are labeled and clearly show the final product of instruction.

Evidence for High School STE Strands

Assessment formats differ depending on the educator's selection of either the next-generation or legacy disciplines described below.

Step 1: Choose one (1) of the following next-generation STE disciplines:

- Biology **OR** Introductory Physics

Step 2: Conduct the MCAS-Alt STE Skills Survey to determine the grade-span at which to select entry points in each science practice for the student. Only one skills survey is required for high school Biology and Introductory Physics.

Step 3: Select three (3) *core ideas* within the chosen discipline from the Next-Generation STE Resource Guide that engage and challenge the student.

For *each* core idea:

Step 4: Select three (3) entry points or access skills. Three (3) different science practices must be addressed within the selected entry points or access skills. If entry points seem too complex at the grade level of the student, select entry points from earlier grade-level clusters in the same core idea. Use the information in the STE skills survey to assist with selection.

Follow Steps 5 and 6 above for each of the three core ideas.

4.3 MCAS-Alt Test Administration

4.3.1 Preparing the MCAS-Alt for Submission

The student's MCAS-Alt must include all elements listed below. Required forms can either be photocopied from those found in the *2023 Educator's Manual for MCAS-Alt* or completed electronically using an online MCAS-Alt Forms and Graphs program available at www.doe.mass.edu/mcas/alt/resources.html.

- **Artistic cover** designed and produced by the student and inserted in the front window of the three-ring binder
- **MCAS-Alt cover sheet** containing important information about the student
- **Student's introduction** to his/her MCAS-Alt produced as independently as possible by the student using his/her primary mode of communication (e.g., written, dictated, or recorded on video or audio) describing "What I want others to know about me as a learner"
- **Verification form** signed by a parent, guardian, or primary care provider signifying that he or she has reviewed the student's completed MCAS-Alt materials or, at minimum, was invited to do so. (In the event no signature was obtained, the school must include a record of attempts to invite a parent, guardian, or primary care provider to view the student's completed MCAS-Alt materials.)
- **Weekly schedule** documenting the student's program of instruction, including participation in the general academic curriculum
- **School calendar** indicating dates in the current academic year on which the school was in session; the calendar is used to verify the dates specified on the data chart and in other evidence.
- **MCAS-Alt Skills Survey** completed for each strand/domain/discipline required for assessment
- **Strand cover sheet** describing the accompanying set of evidence for a particular strand
- **Work sample description** attached to each piece of primary evidence providing required labeling information. (If work sample description labels are not used, this information must be written directly on each piece.)
- **Writing scoring rubric** for ELA–Writing only completed by the teacher for each of three final writing samples
- **STE Summary Sheet** completed by the teacher (as detailed in section 4.2.2.2)

The contents listed above, plus all primary evidence and supporting documentation, constitute the student's MCAS-Alt.

4.3.2 Participation Requirements

4.3.2.1 Identification of Students

All students educated with Massachusetts public funds, including students with disabilities educated inside or outside their home districts, must be engaged in an instructional program guided by the standards in the Massachusetts curriculum frameworks and must participate in statewide assessments that correspond with the grades in which they are reported in DESE's Student Information Management System (SIMS). Students with the most significant cognitive disabilities who are unable to take the standard MCAS tests, even with accommodations, must take the MCAS-Alt, as determined by the student's IEP team or as designated in their 504 plan.

4.3.2.2 Participation Guidelines

A student's IEP team (or 504 plan coordinator, in consultation with other staff) determines how the student will participate in MCAS and other state- and district-wide assessments for each content area scheduled for assessment, either by taking the test routinely or with accommodations, or by taking the alternate assessment if the student is unable to take the standard test, even when accommodations are provided, because of the complexity or severity of their cognitive disabilities. The participation guidelines and the characteristics to consider for students taking the MCAS-Alt are described below and in the participation section of the *Educator's Manual for MCAS-Alt* (available at www.doe.mass.edu/mcas/alt/resources.html). Information on how a student with a disability will participate in state- and district-wide testing must be documented in the student's IEP or 504 plan and revisited on an annual basis. A student may take the general assessment with or without accommodations in one subject and the alternate assessment in another subject.

A decision-making flow chart, entitled the MCAS Decision-Making Tool for MCAS Participation (see Appendix T), was developed in 2003 and updated in 2020 and is intended for use by IEP teams to make annual decisions regarding appropriate student participation in MCAS in each content area. Recent revisions to the tool included the addition of specific criteria determining which students may be considered for accommodations when taking the standard MCAS and which are eligible to participate in the MCAS-Alt. The criteria are located in Appendix U. IEP teams are strongly encouraged to use the tool to guide the team's discussion and decision-making regarding statewide assessments.

The student's team must consider the following questions each year for each content area scheduled for assessment:

- Can the student demonstrate knowledge and skills, either fully or partially, on the **standard MCAS test under routine conditions**?
- Can the student demonstrate knowledge and skills, either fully or partially, on the **standard MCAS test with accommodations**? If so, which accommodations are necessary for the student to participate?
- If no to the above questions and the student has a significant cognitive disability, see the options below to determine whether the student qualifies to take the **alternate assessment** (MCAS-Alt). (**Note:** Alternate assessments are intended only for students with the most significant cognitive disabilities who are unable to take standard MCAS tests, even with accommodations. Students should not be identified for alternate assessments based solely on a particular disability, a placement in a specific classroom or program, previous low achievement on the tests, or EL status.)

The student's team must review the options provided in Figure 4-4. Additional guidance on MCAS-Alt participation is provided in the Commissioner's memo and attachments available at www.doe.mass.edu/mcas/alt/essa/.

Figure 4-4. Participation Guidelines

OPTION 1

Characteristics of Student's Instructional Program and Local Assessment	Recommended Participation in MCAS
If the student is a) generally able to demonstrate knowledge and skills on a computer- or paper-based test, either with or without test accommodations, ***and*** is b) working on learning standards **at, near, or somewhat below grade-level expectations,**	*Then* the student should take the computer- or paper-based **MCAS test**, either with or without accommodations.

OPTION 2

Characteristics of Student's Instructional Program and Local Assessment	Recommended Participation in MCAS
If the student has a significant cognitive disability and is a) **generally unable** to demonstrate knowledge and skills on a paper-and-pencil test, even with accommodations; ***and*** is b) working on learning standards that have been **substantially modified** due to the nature and severity of their disability; ***or*** is c) receiving **intensive, individualized instruction** in order to acquire, generalize, and demonstrate knowledge and skills,	*Then* the student should take the **MCAS Alternate Assessment** (MCAS-Alt) in this subject.

4.3.2.3 2023 MCAS-Alt Participation Rates

In ELA, 5,822 students took the MCAS-Alt (1.2 percent); in mathematics, 5,889 students took the MCAS-Alt (1.2 percent); and in STE, 2,382 students took the MCAS-Alt (1.1 percent).

Additional information about MCAS-Alt participation rates is provided in the 2023 MCAS-Alt State Summary, including the comparative rate of participation in each MCAS assessment format (i.e., routinely tested, tested with accommodations, or alternately assessed), available at: www.doe.mass.edu/mcas/alt/results.html.

4.3.3 Educator Training

During October 2022, a total of 1,308 educators and administrators received training on conducting the 2023 MCAS-Alt. Attendees had the option to participate in one of three sessions: an introduction to MCAS-Alt for educators new to the alternate assessment, an update for those with previous MCAS-Alt experience, or an overview for school and district administrators.

Topics for the introduction session included the following:

- decision-making regarding which students should take the MCAS-Alt
- alternate assessment requirements in each grade and content area
- developing measurable outcomes using the Resource Guide to the Massachusetts Curriculum Frameworks for Students with Disabilities and collecting data on student performance and progress based on measurable outcomes

Topics for the update session included the following:

- a summary of the previous year
- updates and reminders for 2023
- completing quality alternate assessments
- ensuring appropriate designation of students for MCAS-Alt

Topics for the administrators' overview session included the following:

- MCAS-Alt overview
- MCAS-Alt statewide results from previous year
- who should take the MCAS-Alt
- supporting teachers who conduct the MCAS-Alt, principal's role in MCAS-Alt
- the federally mandated cap on the percentage of students who may be assessed through an alternate assessment based on alternate academic achievement standards
- grade-level and Competency Portfolios

In January–March 2023, educators attended virtual training and in-person review sessions during which they were able to discuss their students' alternate assessments that were under development and have their questions answered by MCAS-Alt training specialists (i.e., expert teachers).

4.3.4 Support for Educators

A total of 60 MCAS-Alt training specialists were trained by DESE in the 2022–2023 school year to assist and support teachers conducting the MCAS-Alt in their districts, as well as to assist DESE at Department-sponsored assessment training and review sessions in January–March 2023. In addition, DESE staff provided ongoing technical assistance throughout the year via email and telephone to educators with specific questions about their students' alternate assessments.

The MCAS Service Center provided toll-free telephone support to district and school staff regarding test administration, reporting, training, materials, and other relevant operations and logistics. The Cognia project management team provided extensive training to the MCAS Service Center staff on the logistical, programmatic, and content-specific aspects of the MCAS-Alt, including web-based applications used by the districts and schools to order materials and schedule shipment pickups. Informative scripts were used by the Service Center coordinator to train Service Center staff in relevant areas such as web support, enrollment inquiries, and discrepancy follow-up and resolution procedures.

4.4 MCAS-Alt Scoring

The MCAS-Alt reflects the degree to which a student has learned and applied the knowledge and skills outlined in the Massachusetts curriculum frameworks. The MCAS-Alt measures progress over time, as well as the highest level of achievement attained by the student on the assessed skills, considering the degree to which cues, prompts, and other assistance were required by the student in learning each skill.

Scorers were rigorously trained and qualified based on the criteria outlined in the *Guidelines for Scoring 2023 MCAS-Alt,* available in Appendix R. The *MCAS-Alt Rubric for Scoring Each Strand* has been used as the basis for scoring the MCAS-Alt since 2001 when it was first developed with assistance from teachers and a statewide advisory committee.

4.4.1 Scoring Logistics

MCAS-Alt assessments were scored in Portsmouth, New Hampshire, from April 9 through May 10. DESE and Cognia trained and closely monitored scorers to ensure that scores were accurate.

Each student's MCAS-Alt was reviewed and scored by trained scorers according to the procedures described in section 4.4. Scores were entered into a computer-based scoring system designed by Cognia and DESE, and scores were frequently monitored for accuracy and completeness.

Security was maintained at the scoring site by restricting access to unscored assessments to DESE and Cognia staff, and by locking assessments in a secure location before and after each scoring day.

MCAS-Alt scoring leadership staff included several floor managers (FMs) who monitored the scoring room. Each FM managed a group of tables at the elementary, middle, or secondary level. A Table Leader (TL) was responsible for managing a single table with assigned scorers. Communication and coordination among scorers were maintained through daily meetings between FMs, TLs, and scoring leadership to ensure that critical information and uniform scoring rules were implemented across all grade clusters.

4.4.2 Recruitment, Training, and Qualification of Scoring Personnel

4.4.2.1 Scorer Training Materials

The MCAS-Alt Project Leadership Team (PLT), including DESE and Cognia staff plus four contracted teacher consultants, met daily over the course of scoring in 2023 and periodically throughout the 2022–2023 school year to accomplish the following:

- nominate prospective MCAS-Alt training specialists to serve as scoring specialists for the 2023 scoring institute
- select sample strands to use to train, calibrate, and qualify scorers in 2023
- discuss which recurring issues and concerns to address during the following fall educator training sessions

All sample strands were scored using the *2023 Guidelines for Scoring MCAS-Alt*, noting any scoring concerns or discrepancies that arose during the review. Concerns were resolved by referring to guidelines and requirements in the *2023 Educator's Manual for MCAS-Alt* and by following additional scoring rules agreed upon by the PLT.

Of the alternate assessments reviewed the previous year, several sample strands were set aside as possible exemplars to train, qualify, and calibrate scorers for the current year. These strands consisted of solid examples of each score point on the scoring rubric.

Each of these samples was scored by all four MCAS-Alt Teacher Consultants. Of the scores, only scores in exact agreement in all five scoring dimensions—Level of Complexity, Demonstration of Skills and Concepts, Independence, Self-Evaluation, and Generalized Performance—were considered as possible exemplars.

4.4.2.2 Recruitment

Through multiple hiring agencies, Cognia recruited prospective scorers and TLs for the MCAS-Alt Scoring Center. All TLs and many scorers had previously worked on scoring projects for other states' test or alternate assessment administrations, and all had four-year college degrees.

Additionally, the PLT recruited MCAS-Alt training specialists, many of whom had previously served as scoring specialists, to assist DESE and Cognia. Eight MCAS-Alt training specialists were selected to participate in scoring and were designated as scoring specialists to assist in verifying that scores of "M" (indicating that evidence was missing or insufficient to determine a score) were accurate, and in the training/retraining of TLs.

4.4.2.3 Training

Scorers

Scorers were rigorously trained in all rubric dimensions. Scorers reviewed scoring rules and participated in the "mock scoring" of numerous sample strands selected to illustrate examples of each rubric score point. Scorers were given detailed instructions on how to review data charts and other primary evidence to tally the rubric area scores using the AltScore computer program. Trainers facilitated discussions and review among scorers to clarify the rationale for each score point and describe special scoring scenarios and exceptions to the general scoring rules.

Table Leaders and Floor Managers

In addition to the training received by scorers, TLs and FMs received training in logistical, managerial, and security procedures, as well as maintaining the accuracy, reliability, and consistency of scorers at tables under their supervision.

4.4.2.4 Qualification of Scorers

Before scoring actual student assessments, each potential scorer was required to take a qualifying assessment consisting of eight sample strands that contained a total of 178 score points. The threshold percentage for qualification on the 178 available score points was 85%.

Scorers

Scorers who did not achieve the required percentages were retrained using another qualifying assessment. Those who achieved the required percentages were authorized to begin scoring student assessments. If a scorer did not meet the required accuracy rate on the second qualifying assessment, he or she was released from scoring.

Table Leaders and Floor Managers

TLs and FMs were qualified by DESE using the same methods and criteria used to qualify scorers, except that they were required to achieve a score of 90% correct or higher on the qualifying test.

4.4.3 Scoring Methodology

Originally, a statewide task force comprised of DESE staff (from Special Education and Student Assessment offices), members of the contractor team (then Measured Progress and the University of Kentucky), and the Massachusetts Alternate Assessment Statewide Advisory Committee (a diverse stakeholder group) provided recommendations to DESE on how alternate assessments should be scored, including the criteria on which to base the scores. Some advised DESE to develop scoring criteria based only on student performance, since that is what the standard MCAS assessments measured, rather than assessing how well the student's program provided opportunities to learn and demonstrate knowledge and skills. Others felt that student achievement could not be separated from program effectiveness. In the end, a scoring rubric was developed in which three of five categories are based on student performance; two reflect the effectiveness of the student's program; and one on whether the evidence submitted was sufficient in scope and quantity to allow a score to be determined.

- Completeness: whether the submitted evidence was sufficient to allow a score to be determined
- Level of Complexity: the relative difficulty of academic tasks and knowledge attempted by the student (counts toward the final overall score)
- Demonstration of Skills and Concepts: the accuracy of the student's performance (counts toward the final overall score)
- Independence: cues, prompts, and other assistance provided to the student during tasks and activities being assessed (counts toward the final overall score)
- Self-Evaluation: the extent to which opportunities were provided for the student to evaluate, reflect upon, self-correct, set goals, and select examples of the student's own performance (context of the instruction; not counted toward the final overall score)
- Generalized Performance: the number of contexts and instructional approaches provided to and used by the student to perform tasks and demonstrate knowledge and skills (program quality; not counted toward the final overall score)

4.4.3.1 Scoring English Language Arts (except ELA–Writing), Mathematics, and Legacy Science and Technology/Engineering

Guided by a TL, scorers at each table reviewed and scored assessments from the same grade. Scorers were permitted to ask TLs questions as they reviewed assessments. In the event a TL could not answer a question, the FM provided assistance. In the event the FM was unable to answer a question, DESE staff members were available to provide clarification.

Scorers were randomly assigned an assessment to score by their TL. Scorers were required to ensure that the required strands for each grade were submitted and then to determine if each submitted strand was complete. A strand was considered complete if it included a data chart with at least eight different dates related to the same measurable outcome, and two additional pieces of evidence based on the same outcome.

Once the completeness of the assessment was verified, including the submission of a completed MCAS-Alt Skills Survey, each strand was scored in the following dimensions:

A. Level of Complexity (LOC)
B. Completeness
C. Demonstration of Skills and Concepts (DSC)
D. Independence (Ind)
E. Self-Evaluation (S-E)
F. Generalized Performance (GP)

The 2023 MCAS-Alt score distributions for all scoring dimensions are provided in Appendix J.

Scorers used an automated, customized scoring program called *AltScore* to score MCAS-Alt assessments. Scorers were guided through the scoring process by answering a series of yes/no and fill-in-the-blank questions onscreen, which were used by the program to calculate the correct score and provide scorer comments to the school submitting the assessment. Use of the computer-based scoring application allowed scorers to 1) focus exclusively and sequentially on each assessment product and record the necessary information, rather than keeping track of products they had previously reviewed, and 2) automatically calculate the scores.

A. Level of Complexity

The score for Level of Complexity reflects at what level of difficulty (i.e., complexity) the student addressed curriculum framework learning standards and whether the measurable outcomes were aligned with assessment requirements and with descriptions of the activities documented in the assessment products. Using the *Resource Guide,* scorers determined whether the student's measurable outcomes were aligned with the intended learning standard, and if so, whether the evidence was addressed at grade-level performance expectations, was modified below grade-level expectations ("entry points") or was addressed through skills in the context of an academic instructional activity ("access skills").

Each strand was given a Level of Complexity score based on the scoring rubric for Level of Complexity (Table 4-2) that incorporated the criteria listed above.

Table 4-2. Scoring Rubric for Level of Complexity

Score Point				
1	2	3	4	5
The strand reflects little or no basis in, or is unmatched to, curriculum framework learning standard(s) required for assessment.	Student primarily addresses social, motor, and communication "access skills" during instruction based on curriculum framework learning standards in this strand.	Student addresses curriculum framework learning standards that have been modified below grade-level expectations in this strand.	Student addresses a narrow sample of curriculum framework learning standards (one or two) at grade-level expectations in this strand.	Student addresses a broad range of curriculum framework learning standards (three or more) at grade-level expectations in this strand.

B. Completeness

Scorers confirmed that a "core set of evidence" was submitted and that all evidence was correctly labeled with the following information:

- the student's name
- the date of performance
- a brief description of the activity
- the percentage of accuracy
- the percentage of independence

If evidence was not labeled correctly, or if pieces of evidence did not address the measurable outcome stated on the Strand Cover Sheet or work description, that evidence was not scorable.

Brief descriptions of each activity on the data chart were also considered in determining the completeness of a data chart. Educators had been instructed during educator training workshops and in the *2023 Educator's Manual for MCAS-Alt* that "each data chart must include a brief description beneath each data point that clearly illustrates how the task or activity relates to the measurable outcome being assessed." One- or two-word descriptions were not likely to be considered sufficient to document the relationship between the activity and the measurable outcome and therefore would result in the exclusion of those data points from being scored.

A score of M (i.e., evidence was missing or was insufficient to determine a score) was given in both Demonstration of Skills and Concepts and Independence if

- a completed data chart documenting the student's performance of the same skill on at least eight dates was not submitted; and/or
- at least two pieces of scorable primary evidence were not submitted.

A score of M was also given if any of the following was true:

- A completed MCAS-Alt Skills Survey was not submitted for the strand.
- The data chart listed the percentages of *both* accuracy and independence at or above 80 percent at the beginning of the data collection period, indicating that the student was not learning a challenging new skill in the strand and was instead addressing a skill he or she had already learned.
- The data chart did not document the measurable outcome on at least eight different dates; the measurable outcome was not based on a required learning standard or strand; and/or the evidence did not indicate the student's accuracy and independence on each task or trial.
- Two additional pieces of primary evidence did not address the same measurable outcome as the data chart or were not labeled with all required information.

C. Demonstration of Skills and Concepts

Each strand is given a score for Demonstration of Skills and Concepts based on the degree to which a student gave correct (accurate) responses in demonstrating the targeted skill.

If a "core set of evidence" was submitted in a strand, it was scored for Demonstration of Skills and Concepts by first identifying the "final-1/3 time frame" during which data were collected on the data chart (or the final three data points on the chart, if fewer than 12 points were listed). Then, an average percentage was calculated based on the percentage of accuracy for

- all data points in the final-1/3 time frame listed on the data chart, and
- all other primary evidence in the strand produced during or after the final-1/3 time frame (provided the piece was not already included and counted on the chart).

Based on the average percentage of accuracy in the data points and evidence in the final-1/3 time frame, the overall score in the strand was determined using the rubric shown in Table 4-3.

Table 4-3. Scoring Rubric for Demonstration of Skills and Concepts

Score Point				
M	**1**	**2**	**3**	**4**
The strand contains insufficient information to determine a score.	Student's performance is primarily inaccurate and demonstrates minimal understanding in this strand. (0%–25% accurate)	Student's performance is limited and inconsistent with regard to accuracy and demonstrates limited understanding in this strand. (26%–50% accurate)	Student's performance is mostly accurate and demonstrates some understanding in this strand. (51%–75% accurate)	Student's performance is accurate and is of consistently high quality in this strand. (76%–100% accurate)

D. Independence

The score for Independence reflects the degree to which the student responded without cues or prompts during tasks or activities based on the measurable outcome being assessed. For strands that included a core set of evidence, Independence was scored by identifying the final-1/3 time frame listed on the data chart (or the final three data points, if fewer than 12 points were listed). Then, an average percentage was calculated based on the percentage of independence for

- all data points during the final-1/3 time frame listed on the data chart, and
- all other primary evidence in the strand produced during or after the final-1/3 time frame (provided the piece was not already included on the chart).

Based on the average percentage of Independence of the data points and evidence in the final-1/3 time frame, the overall score in the strand was determined using the rubric shown in Table 4-4.

A score of M was given both in Demonstration of Skills and Concepts and in Independence if any of the following was true:

- At least two pieces of scorable primary evidence and a completed data chart documenting the student's performance of the same skill were not submitted.
- The data chart listed the percentages of both accuracy and independence at or above 80% at the beginning of the data collection period, indicating that the student did not learn a challenging new skill in the strand and was addressing a skill he or she had already learned.
- The data chart did not document a single measurable outcome based on the required learning standard or strand on at least eight different dates, and/or did not indicate the student's accuracy and independence on each task or activity.

- Two additional pieces of primary evidence did not address the same measurable outcome as the data chart or were not labeled with all required information.

Table 4-4. Scoring Rubric for Independence

Score Point				
M	**1**	**2**	**3**	**4**
The strand contains insufficient information to determine a score.	Student requires extensive verbal, visual, and/or physical assistance to demonstrate skills and concepts in this strand. (0%–25% independent)	Student requires frequent verbal, visual, and/or physical assistance to demonstrate skills and concepts in this strand. (26%–50% independent)	Student requires some verbal, visual, and/or physical assistance to demonstrate skills and concepts in this strand. (51%–75% independent)	Student requires minimal verbal, visual, and/or physical assistance to demonstrate skills and concepts in this strand. (76%–100% independent)

E. Self-Evaluation

The score for Self-Evaluation indicates the frequency of activities in the strand that involve self-correction, task-monitoring, goal-setting, reflection, and overall awareness by the student of their own learning. Each strand was given a score of M, 1, or 2 based on the scoring rubric shown in Table 4-5.

Table 4-5. Scoring Rubric for Self-Evaluation, Individual Strand Score

Score Point		
M	**1**	**2**
Evidence of self-correction, task-monitoring, goal-setting, and reflection was **not found** in this strand.	Student infrequently self-corrects, monitors, sets goals, and reflects in this content area—only **one example of self-evaluation** was found in this strand.	Student frequently self-corrects, monitors, sets goals, and reflects in this content area—**multiple examples** of self-evaluation were found in this strand.

F. Generalized Performance

The score for Generalized Performance reflects the number of contexts and instructional approaches used by the student to demonstrate knowledge and skills in the strand. Each strand was given a score of either 1 or 2 based on the rubric shown in Table 4-6.

Table 4-6. Scoring Rubric for Generalized Performance

Score Point	
1	**2**
Student demonstrates knowledge and skills in **one** context or uses **one** approach and/or method of response and participation **in this strand**.	Student demonstrates knowledge and skills in **multiple** contexts or uses **multiple** approaches and/or methods of response and participation **in this strand**.

4.4.3.2 ELA–Writing

Prior to submission, teachers were asked to pre-score each of their student's three final writing samples using the state-provided Writing Scoring Rubric in Appendix S, according to the appropriate text type:

- Opinions/Arguments

- Informative/Explanatory texts
- Narrative (including Poetry)

MCAS-Alt scorers verified the completion of the MCAS-Alt Skill Survey for the strand and that the scores submitted by the teacher were based on the writing sample generated by the student, and not based on any text generated by the teacher. The rubric scores were lowered by scorers in cases where writing rubric scores did not accurately reflect the student's own work.

Writing samples were to be produced as independently as possible by the student. If teachers provided text for the student or applied their own revisions to the student's work, that must have been reflected in the rubric scores, particularly in the area of Independence. Teachers were expected to explain how edits and revisions were made and indicate the student's contribution to the creation of the sample.

Writing samples were required to be produced using the student's primary mode of communication; for example, dictated to a scribe, with the scribe assuming the use of capital letters and basic punctuation. Teachers were permitted to submit a student's constructed response to reading comprehension questions or other topics as the basis for their writing samples, even if those responses were already included in the evidence compiled for another strand.

4.4.3.3 Next-Generation Science and Technology/Engineering

The requirements for STE in grades 5 and 8 included teachers selecting any three (3) of the following STE disciplines:

- Earth and Space Science
- Life Science
- Physical Science
- Technology/Engineering

Teachers were required to create one STE strand within each of the three selected disciplines, each based on a different learning standard and core idea.

High school next-generation STE included a selection of either biology or introductory physics. Teachers were required to create three strands within the one selected discipline, each based on a different learning standard and core idea.

For each strand submitted, the scorer confirmed the following using the *AltScore* program:

1. One MCAS-Alt next-generation STE Skills Survey was submitted for the entire content area.
2. The student's name, valid date, % of accuracy, and % independence were listed on at least three STE Summary Sheets.
3. The activities on the three STE Summary Sheets reflected the same core idea.
4. Three different science practices were represented from the selected entry points or access skills.
5. At least three STE Summary Sheets had primary evidence attached.

After verifying the above, the scorer used the *AltScore* program to rate complexity, accuracy, independence, and self-evaluation for the three STE Summary Sheets.

4.4.3.4 Monitoring Scoring Quality

The FM oversees the general workflow in the scoring room and monitors overall scoring consistency and accuracy, particularly among TLs. The TLs ensure that scorers at their table are consistent and accurate in their scoring. Scoring consistency and accuracy are maintained using two methods: double-blind scoring and resolution (i.e., read-behind) scoring.

4.4.3.5 Double-Blind Scoring

In double-blind scoring, two scorers independently score a response, without knowing either the identity of the other scorer or the score that was assigned. Neither scorer knows how responses will be (or have already been) scored by another randomly selected scorer. For each scored assessment, at least one was double-scored for each scorer each morning and afternoon or, at minimum, every fifth assessment each day (i.e., 20% of the total scored by a scorer).

Scorers were required to maintain a scoring accuracy rate of at least 80% exact agreement with the TL's score. The TL retrained any scorer whose interrater consistency fell below 80% agreement. The TL reviewed discrepant scores (those that differed by two or more points from the TL's score) with the responsible scorers and determined when or if they might resume scoring.

Table 4-10 in section 4.7.4 shows the percentages of interrater agreement for the 2023 MCAS-Alt.

4.4.3.6 Resolution Scoring

Resolution scoring refers to the rescoring of an assessment by a TL and a comparison of the TL's score with the score assigned by the previous scorer. If there was exact score agreement, the first score was retained as the score of record. If the scores differed, the TL's score became the score of record.

Resolution scoring was conducted on all assessments during the first full day of scoring. After that, a rescoring was performed at least once each morning, once each afternoon, and on every fifth subsequent assessment per scorer.

The required rate of agreement between a scorer and the TL's score was 80% exact agreement. A double score was performed on each subsequent assessment for any scorer whose previous scores fell below 80% exact agreement and who resumed scoring after being retrained, until 80% exact agreement with the TL's scores was established.

4.4.3.7 Tracking Scorer Performance

A real-time, cumulative data record was maintained digitally for each scorer. Each scorer's data record showed the number of strands and complete assessments scored, plus their interrater consistency in each rubric dimension.

In addition to maintaining a record of scorers' accuracy and consistency over time, leadership also monitored scorers for output, with slower scorers remediated to increase their production. The overall ratings were used to enhance the efficiency, accuracy, and productivity of scorers.

4.5 MCAS-Alt Classical Item Analyses

As noted in Brown (1983), "A test is only as good as the items it contains." A complete evaluation of a test's quality must therefore include an evaluation of each item. Both *Standards for Educational and Psychological Testing* (AERA et al., 2014) and the *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) include standards for identifying high-quality items. While the specific statistical criteria identified in these publications were developed primarily for general assessments rather than alternate assessments, the principles and some of the techniques apply to the alternate assessment framework as well. Both qualitative and quantitative analyses are conducted to ensure that the MCAS-Alt meets these standards. Qualitative analyses are described in earlier sections of this chapter; this section focuses on quantitative evaluations.

Quantitative analyses presented here are based on the statewide administration of the 2023 MCAS-Alt and include three of the five-dimension scores on each task (Level of Complexity, Demonstration of Skills and Concepts, and Independence). Although the other two-dimension scores (Self-Evaluation and Generalized Performance) are reported, they do not contribute to a student's overall achievement level; therefore, they are not included in quantitative analyses.

For each MCAS-Alt subject and strand, dimensions are scored polytomously across tasks according to scoring rubrics described previously in this chapter. Specifically, a student can achieve a score of 1, 2, 3, 4, or 5 on the Level of Complexity dimension and a score of M, 1, 2, 3, or 4 for both the Demonstration of Skills and Concepts and the Independence dimensions. Dimensions within subjects and strands are treated as traditional test items, since they capture or represent student performance against the content of interest; therefore, dimension scores for each strand are treated as item scores for the purpose of conducting quantitative analyses.

Statistical evaluations of MCAS-Alt include difficulty and discrimination indices, structural relationships (correlations among the dimensions), and bias and fairness. Item-level classical statistics—item difficulty and discrimination values—are provided in Appendix I. Item-level score distributions for each item (i.e., the percentage of students who received each score point) are provided in Appendix J. Note that the Self-Evaluation and Generalized Performance dimension scores are also included in Appendix J.

4.5.1 Difficulty

Based on the definition of dimensions and dimension scores as similar to traditional test items and scores, all items are evaluated in terms of difficulty according to standard classical test theory practices. Difficulty is traditionally described according to an item's *p*-value, which is calculated as the average proportion of points achieved on the item. Dimension scores achieved by each student are divided by the maximum possible score to return the proportion of points achieved on each item; *p*-values are then calculated as the average of these proportions. Computing the difficulty index in this manner places items on a scale that ranges from 0.0 to 1.0. This statistic is properly interpreted as an "easiness index," because larger values indicate easier items. An index of 0.0 indicates that all students received no credit for the item, and an index of 1.0 indicates that all students received full credit for the item.

Items that have either a very high or very low difficulty index are considered potentially problematic, because they are either so difficult that few students get them right or so easy that nearly all students get them right. In either case, such items should be reviewed for appropriateness for inclusion on the assessment. If an assessment consisted entirely of very easy or very hard items, all students would receive nearly the same scores, and the assessment would not be able to differentiate high-ability students from low-ability students.

It is worth mentioning that using norm-referenced criteria such as *p*-values to evaluate test items is somewhat contradictory to the purpose of a criterion-referenced assessment like the MCAS-Alt. Criterion-referenced assessments are primarily intended to provide evidence of individual student progress relative to a standard rather than provide a comparison of one student's score with other students. In addition, the MCAS-Alt makes use of teacher-designed instructional activities, which serve as a proxy for test items to measure performance. For these reasons, the generally accepted criteria regarding classical item statistics should be cautiously applied to the MCAS-Alt.

A summary of item difficulty for each grade and content area is presented in Table 4-7. The mean difficulty values shown in the table indicate that, overall, students performed well on the items on the MCAS-Alt. In assessments designed for the general population, difficulty values tend to be in the 0.40 to 0.70 range for most items. Because the nature of alternate assessments is different from that of general assessments, and because few guidelines exist as to criteria for interpreting these values for alternate assessments, the values presented in Table 4-7 should not be interpreted to mean that the students

performed better on the MCAS-Alt than the students who took general assessments performed on those tests.

4.5.2 Discrimination

Discrimination indices can be thought of as measures of how closely an item assesses the same knowledge and skills assessed by other items contributing to the criterion total score. That is, the discrimination index can be thought of as a measure of construct consistency. The correlation between student performance on a single item and total test score is a commonly used measure of this characteristic of an item. Within classical test theory, this item-test correlation is referred to as the item's discrimination because it indicates the extent to which successful performance on an item discriminates between high and low scores on the test. It is desirable for an item to be one on which higher-ability students perform better than lower-ability students or one that demonstrates strong, positive item-test correlation.

Considering this interpretation, the selection of an appropriate criterion total score is crucial to the interpretation of the discrimination index. For the MCAS-Alt, the sum of the three-dimension scores, excluding the item being evaluated, was used as the criterion score. For example, in grade 3 ELA, total test score corresponds to the sum of scores received on the three dimensions included in quantitative analyses (i.e., Level of Complexity, Demonstration of Skills and Concepts, and Independence) across both Language and Reading strands.

The discrimination index used to evaluate MCAS-Alt items was the Pearson product-moment correlation, which has a theoretical range of -1.00 to 1.00. A summary of the item discrimination statistics for each grade and content area is presented in Table 4-7. Because the nature of the MCAS-Alt is different from that of a general assessment, and because very few guidelines exist as to criteria for interpreting these values for alternate assessments, the statistics presented in Table 4-7 should be interpreted with caution.

Table 4-7. Summary of Item Difficulty and Discrimination Statistics by Content Area and Grade

Content Area	Grade	Number of Items	*p*-Value		Discrimination	
			Mean	Standard Deviation	Mean	Standard Deviation
ELA	3	9	0.76	0.20	0.37	0.09
	4	9	0.77	0.20	0.41	0.08
	5	9	0.77	0.20	0.38	0.08
	6	9	0.77	0.20	0.41	0.07
	7	9	0.77	0.20	0.42	0.06
	8	9	0.77	0.19	0.43	0.10
	10	9	0.78	0.19	0.34	0.10
Mathematics	3	6	0.83	0.19	0.53	0.17
	4	6	0.83	0.18	0.57	0.14
	5	6	0.83	0.19	0.59	0.12
	6	6	0.82	0.19	0.59	0.11
	7	6	0.83	0.19	0.63	0.06
	8	6	0.83	0.19	0.57	0.13
	10	15	0.83	0.18	0.34	0.12
STE	5	12	0.81	0.17	0.44	0.18
	8	12	0.80	0.17	0.44	0.16
Biology	HS	9	0.81	0.17	0.43	0.20
Chemistry	HS	9	0.86	0.19	0.34	0.18
Introductory Physics	HS	9	0.80	0.17	0.41	0.20
Technology/Engineering	HS	9	0.83	0.18	0.54	0.17

4.5.3 Structural Relationships Among Dimensions

By design, the achievement-level classification of the MCAS-Alt is based on three of the five scoring dimensions (Level of Complexity, Demonstration of Skills and Concepts, and Independence). As with any assessment, it is important that these dimensions be carefully examined. This was achieved by exploring the relationships among student dimension scores with Pearson correlation coefficients. A very low correlation (near zero) would indicate that the dimensions are not related; a low negative correlation (approaching -1.00) indicates that they are inversely related (i.e., that a student with a high score on one dimension had a low score on the other); and a high positive correlation (approaching 1.00) indicates that the information provided by one dimension is similar to that provided by the other dimension. The average correlations among the three dimensions by content area and grade level are shown in Table 4-8.

Table 4-8. Average Correlations Among the Three Dimensions by Content Area and Grade

Content Area	Grade	Number of Items Per Dimension	Average Correlation Between*:			Correlation Standard Deviation*		
			Comp/ Ind	Comp/ Sk	Ind/ Sk	Comp/ Ind	Comp/ Sk	Ind/ Sk
ELA	3	3	0.07	0.17	0.11	0.04	0.16	0.05
	4	3	0.17	0.20	0.14	0.05	0.09	0.04
	5	3	0.15	0.15	0.11	0.08	0.15	0.07
	6	3	0.21	0.22	0.15	0.03	0.14	0.07
	7	3	0.21	0.32	0.20	0.04	0.09	0.05
	8	3	0.15	0.25	0.15	0.01	0.15	0.02
	10	3	0.06	0.20	0.15	0.01	0.13	0.09
Mathematics	3	2	0.07	0.05	0.10	0.02	0.04	0.05
	4	2	0.15	0.12	0.07	0.03	0.01	0.00
	5	2	0.20	0.12	0.15	0.04	0.03	0.00
	6	2	0.21	0.15	0.09	0.02	0.04	0.08
	7	2	0.19	0.32	0.16	0.00	0.02	0.06
	8	2	0.19	0.15	0.09	0.04	0.00	0.05
	10	5	0.11	0.12	0.10	0.10	0.10	0.10
STE	5	4	0.07	0.09	-0.06	0.10	0.03	0.02
	8	4	0.11	0.13	-0.01	0.05	0.02	0.05
Biology	HS	3	0.14	0.06	-0.06	0.08	0.11	0.04
Chemistry	HS	3	-0.02	0.26	0.12	0.01	0.12	0.22
Introductory Physics	HS	3	0.01	0.13	-0.03	0.05	0.09	0.07
Technology/ Engineering	HS	3	-0.01	0.05	0.50	0.06	0.13	0.27

** Comp = Level of Complexity; Sk = Demonstration of Skills and Concepts; Ind = Independence*

The average correlations between every two dimensions range from very weak (absolute values between 0.00 and 0.20) to weak (absolute values between 0.20 and 0.40) for most tests. It is important to remember in interpreting the information in Table 4-8 that the correlations are based on small numbers of item scores and small numbers of students and should therefore be interpreted with caution.

4.5.4 Differential Item Functioning

The *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) explicitly states that subgroup differences in performance should be examined when sample sizes permit and that actions should be taken to ensure that differences in performance are because of construct-relevant, rather than irrelevant, factors. *Standards for Educational and Psychological Testing* (AERA et al., 2014) includes similar guidelines.

When appropriate, the standardization differential item functioning (DIF) procedure (Dorans & Kulick, 1986) is employed to evaluate subgroup differences. The standardization DIF procedure is designed to identify items for which subgroups of interest perform differently, beyond the impact of differences in overall achievement. However, because of the small number of students who take the MCAS-Alt, and because those students take different combinations of tasks, it was not possible to conduct DIF analyses. Conducting DIF analyses using groups of fewer than 200 students would result in inflated type I error rates.

4.5.5 Measuring Intended Cognitive Processes

Appendix V (Summary of Alt Score Frequencies) provides the frequency of scores in each strand's rubric area by grade and content area. Note that not all grades and content areas will use all strands and scores in the table. Where not applicable, the table cell is marked as blank. Although scores tend toward the center of the rubric, this is an expected outcome for the population taking the alternate assessment. There is still the expected frequency of scores at the highest or lowest ends of the rubric when a substantial population has taken the test, indicating that the tests elicit evidence across the full expected range of rubric areas and measure the full range of intended cognitive processes.

4.6 MCAS-Alt Bias/Fairness

Fairness is validated through the assessment development processes, and in the development of the standards themselves, which were thoroughly vetted for bias and sensitivity. The *Resource Guides to the Massachusetts Curriculum Frameworks for Students with Disabilities* provide instructional and assessment strategies for teaching students with disabilities the same learning standards (by grade level) as general education students. The *Resource Guides* are intended to promote access to the general curriculum, as required by law, and to assist educators in planning instruction and assessment for students with the most significant cognitive disabilities. *Resource Guides* were developed by diverse panels of education experts in each content area, including DESE staff, testing contractor staff, higher education faculty, MCAS Assessment Development Committee members, curriculum framework writers, and regular and special educators. Each section was written, reviewed, and validated by these panels to ensure that each modified standard (entry point) embodied the essence of the grade-level learning standard on which it was based and that entry points at varying levels of complexity were aligned with grade-level content standards.

Specific guidelines direct educators to conduct the MCAS-Alt based on academic outcomes in the content area and strand being assessed, while maintaining the flexibility necessary to meet the needs of diverse learners. The requirements for constructing alternate assessments necessitate teaching challenging skills based on grade-level content standards to all students. Thus, all students taking the MCAS-Alt are taught academic skills based on the standards at an appropriate level of complexity.

Issues of fairness are also addressed in the scoring procedures. Rigorous scoring procedures hold scorers to high standards of accuracy and consistency, using monitoring methods that include frequent double-scoring, monitoring, and recalibrating to verify and validate assessment scores. These procedures, along with DESE's review of each year's MCAS-Alt results, indicate that the MCAS-Alt is being successfully used for the purposes for which it was intended. Section 4.4 describes in greater detail the scoring rubrics used, selection and training of scorers, and scoring quality-control procedures. These processes ensure that bias due to differences in how individual scorers award scores is minimized.

4.7 MCAS-Alt Characterizing Errors Associated with Test Scores

As with the classical item statistics presented in section 4.5, three of the five-dimension scores on each task (Level of Complexity, Demonstration of Skills and Concepts, and Independence) were used as the item scores for purposes of calculating reliability estimates. Note that, due to the way in which student scores are awarded—that is, using an overall achievement level rather than a total raw score—it was not possible to run decision accuracy and consistency (DAC) analyses.

4.7.1 MCAS-Alt Overall Reliability

In section 4.5, individual item characteristics of the 2023 MCAS-Alt were presented. Although individual item performance is an important focus for evaluation, a complete evaluation of an assessment must also address the way in which items function together and complement one another. Any assessment includes some amount of measurement error; that is, no measurement is perfect. This is true of all academic assessments—some students will receive scores that underestimate their true ability, and others will receive scores that overestimate their true ability. When tests have a high amount of measurement error, student scores are very unstable. Students with high ability may get low scores and vice versa. Consequently, one cannot reliably measure a student's true level of ability with such a test. Assessments that have less measurement error (i.e., errors are small on average, and therefore students' scores on such tests will consistently represent their ability) are described as reliable.

There are several methods of estimating an assessment's reliability. One approach is to split the test in half and then correlate students' scores on the two half-tests; this in effect treats each half-test as a complete test. This is known as a "split-half estimate of reliability." If the two half-test scores correlate highly, items on the two half-tests must be measuring very similar knowledge or skills. This is evidence that the items complement one another and function well as a group. This also suggests that measurement error will be minimal.

The split-half method requires psychometricians to select items that contribute to each half-test score. This decision may have an impact on the resulting correlation since each different possible split of the test into halves will result in a different correlation. Another problem with the split-half method of calculating reliability is that it underestimates reliability, because test length is cut in half. All else being equal, a shorter test is less reliable than a longer test. Cronbach (1951) provided a statistic, alpha (α), that eliminates the problem of the split-half method by comparing individual item variances to total test variance. Cronbach's α was used to assess the reliability of the 2023 MCAS-Alt. The formula is as follows:

$$\alpha = \frac{n}{n-1}\left[1 - \frac{\sum_{i=1}^{n}\sigma^2_{(Y_i)}}{\sigma^2_x}\right],$$

where
i indexes the item,
n is the number of items,
$\sigma^2_{(Y_i)}$ represents individual item variance, and
σ^2_x represents the total test variance.

Table 4-9 presents Cronbach's α coefficient and raw score standard errors of measurement (SEMs) for each content area and grade.

Table 4-9. Cronbach's Alpha and SEMs by Content Area and Grade

Content Area	Grade	Number of Students	Raw Score			Alpha	SEM
			Maximum Score	Mean	Standard Deviation		
ELA	3	856	39	28.01	3.65	0.62	2.24
	4	917	39	28.24	3.83	0.67	2.21
	5	802	39	28.62	3.37	0.61	2.12
	6	757	39	28.33	3.65	0.68	2.07
	7	719	39	28.25	3.74	0.70	2.04
	8	722	39	28.66	3.48	0.67	2.00
	10	694	39	28.16	4.02	0.61	2.51
Mathematics	3	747	26	21.08	1.49	0.55	1.00
	4	809	26	21.02	1.56	0.58	1.01
	5	733	26	21.15	1.46	0.65	0.86
	6	702	26	20.97	1.61	0.63	0.99
	7	654	26	21.05	1.64	0.65	0.97
	8	636	26	21.03	1.58	0.59	1.01
	10	676	39	30.41	3.64	0.82	1.56
STE	5	758	39	30.31	3.17	0.72	1.68
	8	695	39	30.18	3.09	0.78	1.46
Biology	HS	417	39	30.61	3.22	0.67	1.84
Chemistry	HS	114	39	32.01	2.43	0.71	1.31
Introductory Physics*	HS	74	39	30.26	3.00	0.67	1.72
Technology/ Engineering*	HS	72	39	31.23	3.15	0.82	1.32

**Due to the small sample size of the tested population, the calculations do not produce meaningful values.*

An alpha coefficient toward the high end (greater than 0.50) is taken to mean that the items are likely measuring very similar knowledge or skills; that is, they complement one another and suggest that the test is a reliable assessment. However, the interpretation of reliability estimate coefficient should consider the characteristics of the testing sample (such as the variability within the sample) and the test (such as the test length). For MCAS-Alt, considering the special population and the short test length, the range of the α coefficient in the 2023 assessments is reasonable.

4.7.2 Subgroup Reliability

The reliability coefficients discussed in the previous section were based on the overall population of students who participated in the 2023 MCAS-Alt. Appendix M presents reliabilities for various subgroups of interest taking MCAS-Alt. Subgroup Cronbach's α coefficients were calculated using the formula defined on the previous page, based only on the members of the subgroup in question in the computations; values are calculated only for subgroups with 10 or more students.

For several reasons, the results documented in this section should be interpreted with caution. First, inherent differences between grades and content areas preclude making valid inferences about the quality of a test based on statistical comparisons with other tests. Second, reliability coefficients are dependent not only on the measurement properties of a test but also on the statistical distribution of the studied subgroup. For example, it can be readily seen in Appendix M that subgroup sample sizes may vary considerably, which results in natural variation in reliability coefficients. Moreover α, which is a type of correlation coefficient, may be artificially depressed for subgroups with little variability (Draper & Smith, 1998). Third, there is no industry standard to interpret the strength of a reliability coefficient, and this is particularly true when the population of interest is a single subgroup.

4.7.3 Achievement-Level SEM

The SEM and reliability statistics discussed in section 4.7.1 were based on various groups of interest taking MCAS-Alt. Tables M-18 through M-24 in Appendix M present SEM for populations of students analyzed by achievement level. These results show a range of SEM from 0.48–4.83, which is reasonable and relatively stable over each grade and achievement-level category, demonstrating that the precision of the MCAS-Alt is consistent across the full achievement continuum.

As above, and for the same reasons, the results documented in this section should be interpreted with caution. Limiting the analyses to individual performance levels will reduce the variability for each subgroup when compared to the whole, which would likely indicate greater measurement error estimates in comparison to the true measurement error within the group, if it were known.

4.7.4 Interrater Consistency

Section 4.4 of this chapter describes the processes that were implemented to monitor the quality of the hand-scoring of student responses. One of these processes was double-blind scoring of at least 20 percent of student responses in all strands. Results of the double-blind scoring, used during the scoring process to identify scorers who required retraining or other intervention, are presented here as evidence of the reliability of the MCAS-Alt. A third score was required for any score category in which there was not an exact agreement between scorer 1 and scorer 2. A third score was also required as a confirmation score when either scorer 1 and/or scorer 2 provided a score of M for Demonstration of Skills and Concepts and Independence or a score of 1 for Level of Complexity.

A summary of the interrater consistency results is presented in Table 4-10. Results in the table are aggregated across the tasks by content area, grade, and number of score categories (five for Level of Complexity and four for Demonstration of Skills and Concepts and Independence). The table shows the number of items, number of score categories, number of included scores, exact agreement percentage, adjacent agreement percentage, the correlation between the first two sets of scores, and the percentage of responses that required a third score. This information is also provided at the item level in Tables H-18 through H-21 of Appendix H.

Table 4-10. Summary of Interrater Consistency Statistics Aggregated Across Items by Content Area and Grade

Content Area	Grade	Items	Number of Score Categories	Included Scores	Percentage		Correlation	% Third Scores
					Exact	Adjacent		
ELA	3	6	4	1,138	97.89	2.02	0.99	3.78
		3	5	651	98.62	1.38	0.90	3.23
	4	6	4	990	97.58	2.22	0.98	4.04
		3	5	567	99.12	0.88	0.91	2.29
	5	6	4	1,216	98.93	0.99	0.99	1.89
		3	5	669	98.95	1.05	0.89	1.94
	6	6	4	1,056	98.86	0.95	0.99	1.99
		3	5	591	98.82	1.18	0.92	2.20
	7	6	4	2,352	97.28	2.21	0.97	4.25
		3	5	1,397	98.21	1.72	0.84	3.94
	8	6	4	998	98.30	1.60	0.99	2.71
		3	5	546	98.72	1.28	0.91	2.01
	10	6	4	1,818	97.63	2.31	0.98	3.74
		3	5	1,110	98.56	1.44	0.84	2.97

continued

Content Area	Grade	Items	Number of Score Categories	Included Scores	Percentage		Correlation	% Third Scores
					Exact	Adjacent		
Mathematics	3	4	4	722	99.58	0.42	0.99	0.55
		2	5	440	98.86	1.14	0.90	1.14
	4	4	4	632	98.89	1.11	0.98	1.74
		2	5	373	98.39	1.61	0.84	1.61
	5	4	4	772	98.58	1.17	0.96	2.46
		2	5	439	99.32	0.68	0.93	0.68
	6	4	4	724	98.90	1.10	0.98	1.93
		2	5	397	98.99	1.01	0.94	1.01
	7	4	4	1,602	97.63	1.94	0.92	3.12
		2	5	949	98.84	1.16	0.89	1.37
	8	4	4	636	98.90	1.10	0.98	2.20
		2	5	362	98.62	1.38	0.91	1.38
	10	10	4	1,788	98.38	1.57	0.97	2.29
		5	5	1,103	99.27	0.73	0.92	0.82
STE	5	8	4	1,212	98.84	1.16	0.99	2.06
		4	5	667	98.80	1.20	0.90	1.35
	8	8	4	928	99.25	0.75	0.99	1.29
		4	5	533	98.87	1.13	0.93	1.31
Biology	HS	6	4	1,146	98.34	1.57	0.98	2.44
		3	5	697	99.00	1.00	0.91	1.00
Chemistry	HS	6	4	266	99.62	0.38	0.98	0.38
		3	5	157	100.00	0.00	--	0.00
Introductory Physics	HS	6	4	168	98.81	1.19	0.98	2.38
		3	5	87	100.00	0.00	1.00	0.00
Technology/ Engineering	HS	6	4	178	100.00	0.00	1.00	0.00
		3	5	102	99.02	0.98	0.70	0.98

4.8 MCAS-Alt Comparability Across Years

The issue of comparability across years is addressed in the progression of learning outlined in the *Resource Guide to the Massachusetts Curriculum Frameworks for Students with Disabilities*, which provides instructional and assessment strategies for teaching students with disabilities according to the same learning standards applied to students in general education.

Comparability is also addressed in the scoring procedures. Consistent scoring rubrics are used each year along with rigorous quality-control procedures that hold scorers to high standards of accuracy and consistency, as described in section 4.4. Scorers are trained using the same procedures, models, examples, and methods each year.

Finally, comparability across years is encouraged through the classification of students into achievement-level categories, using a look-up table that remains consistent each year. While MCAS has transitioned to next-generation achievement levels in grades 3–8 and 10, the description of each alternate academic achievement level (shown in Table 4-11) remains relatively consistent, because alternate academic achievement standards (i.e., levels) signify those students taking alternate assessments who perform well below the expectations of students taking the standard MCAS assessments. Therefore, this ensures that the meaning of students' alternate assessment scores is comparable from one year to the next. Names and descriptors for next-generation alternate and grade-level academic achievement standards are shown in Appendix W. Table 4-11 shows the achievement-level look-up table (i.e., the achievement level corresponding to each possible combination of dimension scores), which is used each year to combine and tally the overall content area achievement level from the individual strand scores. In addition, achievement-level distributions for each of the last four years are provided in Appendix N.

Table 4-11. MCAS-Alt Strand Achievement-Level Look-Up Table

Level of Complexity	Demonstration of Skills	Independence	Achievement Level
2	1	1	1
2	1	2	1
2	1	3	1
2	1	4	1
2	2	1	1
2	2	2	1
2	2	3	1
2	2	4	1
2	3	1	1
2	3	2	1
2	3	3	2
2	3	4	2
2	4	1	1
2	4	2	1
2	4	3	2
2	4	4	2
3	1	1	1
3	1	2	1
3	1	3	1
3	1	4	1
3	2	1	1
3	2	2	1
3	2	3	2
3	2	4	2
3	3	1	1
3	3	2	2
3	3	3	3
3	3	4	3
3	4	1	1
3	4	2	2
3	4	3	3
3	4	4	3
4	1	1	1

Level of Complexity	Demonstration of Skills	Independence	Achievement Level
4	1	2	1
4	1	3	1
4	1	4	1
4	2	1	1
4	2	2	1
4	2	3	2
4	2	4	2
4	3	1	1
4	3	2	2
4	3	3	3
4	3	4	3
4	4	1	1
4	4	2	2
4	4	3	3
4	4	4	3
5	1	1	1
5	1	2	1
5	1	3	2
5	1	4	2
5	2	1	1
5	2	2	2
5	2	3	3
5	2	4	3
5	3	1	1
5	3	2	2
5	3	3	3
5	3	4	4
5	4	1	1
5	4	2	2
5	4	3	3
5	4	4	4

4.9 MCAS-Alt Reporting of Results

4.9.1 Primary Reports

Cognia created two primary reports for the MCAS-Alt: the *MCAS-Alt Feedback Form* and the *Parent/Guardian Report*.

4.9.2 Feedback Forms

One *Feedback Form* is produced for each student who submitted the MCAS-Alt and serves as a preliminary score report intended for the educator at the school that submitted the assessment. Content area achievement level(s), strand dimension scores, and comments relating to those scores are printed on the form.

4.9.3 Parent/Guardian Report

The *Parent/Guardian Report* provides the final scores (overall content area achievement level and rubric dimension scores in each strand) for each student who submitted the MCAS-Alt. It provides background information on the MCAS-Alt, participation requirements, the purposes of the assessment, an explanation of the scores, and contact information for further information. The student's achievement level displayed

for each content area is shown relative to all possible achievement levels. The student's dimension scores are displayed in relation to all possible dimension scores for the assessed strands.

Two printed copies of the report are provided: one for the parent/guardian and one to be kept in the student's school record. A sample report is provided in Appendix X.

The *Parent/Guardian Report* was redesigned in 2012 with input from parents in two focus groups to include information that had previously been published in a separate interpretive guide that is no longer produced. The report was redesigned again in 2017 to parallel the layout and format of the next-generation MCAS *Parent/Guardian Report* based on next-generation MCAS tests.

4.9.4 Reporting Business Requirements

To ensure that reported results for the MCAS-Alt are accurate relative to the collected evidence, a document delineating analysis and reporting business requirements is prepared before each reporting cycle. The reporting business requirements are observed in the analyses of the MCAS-Alt data and in the reporting of results. They are included in Appendix P.

4.9.5 Quality Assurance

Quality-assurance measures are implemented throughout the entire process of analysis and reporting at Cognia. The data processors and data analysts working with MCAS-Alt data perform quality-control checks of their respective computer programs. Moreover, when data are handed off to different units within the Reporting Services Department, the sending unit verifies that the data are accurate before handoff. Additionally, when a unit receives a data set, the first step performed is verification of the accuracy of the data.

Quality assurance is also practiced through parallel processing. One production data analyst is responsible for writing all programs required to populate the individual student and aggregate reporting tables for the administration. Each reporting table is also assigned to another quality-assurance data analyst, who uses the analysis and reporting business requirements to independently program the reporting table. The production and quality-assurance tables are compared; if there is 100% agreement, the tables are released for report generation.

A third aspect of quality control involves the procedures implemented by the quality-assurance group to check the accuracy of reported data. Using a sample of students, the quality-assurance group verifies that the reported information is correct. The selection of specific sampled students for this purpose may affect the success of the quality-control efforts.

The quality-assurance group uses a checklist to implement its procedures. Once the checklist is completed, sample reports are circulated for psychometric checks and review by program management. The appropriate sample reports are then sent to DESE for review and signoff.

4.10 MCAS-Alt Validity

One purpose of the *2023 Next-Generation MCAS and MCAS-Alt Technical Report* is to describe the technical aspects of the MCAS-Alt that contribute validity evidence in support of MCAS-Alt score interpretations. According to the *Standards for Educational and Psychological Testing* (AERA et al., 2014), considerations regarding establishment of intended uses and interpretations of test results and conformance to these uses are of paramount importance in relation to valid score interpretations. These considerations are addressed in this section.

Recall that the score interpretations for the MCAS-Alt include using the results to make inferences about student achievement on the ELA, mathematics, and STE content standards; to inform program and instructional improvement; and as a component of school accountability. Thus, as described below, each section of the report (development, administration, scoring, item analyses, reliability, performance levels, and reporting) contributes to the development of validity evidence and taken together, the sections form a comprehensive validity argument in support of MCAS-Alt score interpretations.

4.10.1 Test Content Validity Evidence

Test content validity is determined by identifying how well the assessment tasks represent the curriculum and standards for each content area and grade level. The primary evidence described in section 4.2.1 describes how the range and level of complexity of the standards being assessed have been modified to fit the needs of the MCAS-Alt testing population yet retain the essential components or meaning of the standards. The MCAS-Alt content areas and strands/domains required for the assessment of students in each grade are listed in Table 4-1, providing evidence the assessment is well-aligned to the same content standards applied to all Massachusetts students.

4.10.2 Internal Structure Validity Evidence

Evidence based on internal structure is presented in detail in the discussions of item analyses and reliability in sections 4.5 and 4.7. Technical characteristics of the internal structure of the assessment are presented in terms of classical item statistics (item difficulty and item-test correlation), correlations among the dimensions (Level of Complexity; Demonstration of Skills and Concepts; and Independence), fairness/bias, and reliability, including alpha coefficients and interrater consistency.

4.10.3 Validity Based on Cognitive Processes

Evidence based on cognitive processes is presented in section 4.5.5 and in Appendix V. An examination of score frequencies by content area by grade by subject shows that student scores are most common in the expected ranges for the population and that the tests measure the full range of intended cognitive processes.

4.10.4 Adequate Precision Across the Full Performance Continuum

Evidence indicating precision across the full performance continuum is presented in section 4.7.3 and in Appendix M. Standard errors of measurement calculated over students at each achievement level indicate that the tests provide an adequately precise estimate of student achievement across the full performance continuum.

4.10.5 Validity Based on Relations to Other Variables

The *Resource Guides to the Massachusetts Curriculum Framework for Students with Disabilities* (described in sections 4.1.3, 4.2.1.1, and 4.6) are used by Massachusetts educators to identify standards-based instructional goals for students. The guides also serve as the basis for the selection of the specific knowledge and skills on which the student will be assessed on the MCAS-Alt. These *Resource Guides* are developed through extensive collaboration with educators and experts. In essence, the *Resource Guides* capture the judgments of educators and experts about the curricular expectations and, as such, constitute a form of external criteria. By basing each student's assessment on the guides, the educator

implementing the MCAS-Alt brings their skills survey results and evidence collection into alignment with these judgments.

4.10.6 Response Process Validity Evidence

Response process validity evidence pertains to information regarding the cognitive processes used by examinees as they respond to items on an assessment. The MCAS-Alt directs educators to identify measurable outcomes for students based on the state's curriculum frameworks and to collect data and work samples that document the extent to which the student engaged in the intended cognitive process(es) to meet the intended goal. The scoring process is intended to confirm the student's participation in instructional activities that were focused on meeting the measurable outcome, and to provide detailed feedback on whether the instructional activities were sufficient in duration and intensity for the student to meet the intended goal.

4.10.7 Efforts to Support the Valid Reporting and Use of MCAS-Alt Data

The assessment results of students who participate in the MCAS-Alt are included in all public reporting of MCAS results and in the state's accountability system. Annual state summaries of the participation and achievement of students on the MCAS-Alt are available at www.doe.mass.edu/mcas/alt/results.html.

To ensure that all students were provided access to the Massachusetts curriculum frameworks, federal and state laws and DESE policy require that all students in grades 3–8 and 10 are assessed each year on their academic achievement and that all students are included in the reports provided to parents, guardians, teachers, and the public. The alternate assessment ensures that students with the most significant cognitive disabilities have an opportunity to "show what they know" and receive instruction at a level that is challenging and attainable based on the state's academic learning standards.

Aside from legal requirements, another important reason to include students with significant disabilities in standards-based instruction is to explore their capacity to learn standards-based knowledge and skills. While learning "daily living skills" is critical for those students to function as independently as possible, academic skills are important for all students in terms of post-secondary, career, and community success, and are the primary focus of teaching and learning in the state's public schools. Standards in the Massachusetts curriculum frameworks are defined as "valued outcomes for all students." Evidence indicates that students with significant disabilities learn more than anticipated when given opportunities to engage in challenging instruction with the necessary support.

As a result of taking the MCAS-Alt, students with significant disabilities have become more "visible" in their schools and have a greater chance of being considered when decisions are made to allocate staff and resources to improve their academic achievement.

Appendix X shows the report provided to parents and guardians for students assessed on the MCAS-Alt. The achievement-level descriptors provided on the first page of that report, as well as in Appendix W, describe the students' performance at each alternate academic achievement standard.

4.10.8 Summary

The *Standards for Educational and Psychological Testing* (2014) define validity as "the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (p. 11). Elaborating on that definition, the *Standards* assert that "it is the interpretations of test scores for proposed uses that are evaluated, not the test itself" (p. 11) and that "validation logically begins with an

explicit statement of the proposed interpretation of test scores, along with a rationale for the relevance of the interpretation to the proposed use" (p. 11). This definition applies specifically to intended interpretations and uses of test scores, rather than to the broader program of curriculum and instruction in which a testing program is embedded or to the surrounding education and school improvement policies and aspirations for student learning.

Further, the *Standards* state that "a sound validity argument integrates various strands of evidence into a coherent account of the degree to which existing evidence and theory support the intended interpretations of test scores for specific uses" (p. 21).

The evidence for validity and reliability presented in this chapter supports the use of the MCAS-Alt assessment to make inferences about the knowledge, skills, abilities, and achievement of students with significant disabilities based on the skills and content described in the Massachusetts curriculum frameworks for ELA, mathematics, and STE. As such, this evidence supports the use of MCAS-Alt results for the purposes of programmatic and instructional improvement and as a component of school accountability.

MCAS-Alt assessment results are sometimes aggregated with other MCAS results. Therefore, validity information with respect to reliability and content-related validity provided for MCAS also pertains, to some extent, to the MCAS-Alt. In addition, MCAS-Alt also includes reliability and dimensionality characteristics and other evidence specific to the alternate assessment, as described in Table 4-12.

Table 4-12. Summary of Validity Evidence for MCAS-Alt

Type of Validity Evidence	Section	Description of Information Provided
Content-related validity evidence	4.2.1 Appendix C	Assessment design (test blueprints aligned to MCAS blueprints but with modifications made for the range and complexity of standards); descriptions of primary evidence and supporting documentation
Cognitive processes	4.5.5 Appendices V and W	Distributions of score frequencies indicate that the tests elicit the expected range of cognitive processes for this population
Precision Over the Full Continuum	4.7.3 Appendix M	Measurement error calculated over respondent subgroups at each performance level indicate that the tests are sufficiently precise over the full performance continuum
Validity Based on Other Variables	4.10.5, 4.1.3, 4.2.1.1, and 4.6	Resource Guides capturing the judgments of educators and experts about the curricular expectations
Reliability and classical item analyses; and subgroup statistics and scoring consistency	4.4, 4.7.4, and 4.8 Appendices H, N, R, and S	Procedures to ensure consistent scoring; interrater scoring statistics
	4.5 Appendices I and J	Classical item statistics
	4.7.1, 4.7.2, and 4.7.3 Appendix M	Overall and subgroup reliability statistics
Construct-related and structural validity evidence	4.5.3	Interrelations among scoring dimensions
	4.6	Item bias review and procedures

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Appendices

APPENDIX A
MODIFIED COMPETENCY DETERMINATION—FAQS

Modified Competency Determination – Frequently Asked Questions

The purpose of this document is to provide clarification on the process that the Massachusetts Department of Elementary and Secondary Education (DESE) will use to determine whether certain high school students meet modified competency determination requirements.

Background

In response to the suspension of in-person instruction and the cancellation of the spring 2020 MCAS assessments due to the COVID-19 emergency, the Board of Elementary and Secondary Education (BESE) voted to temporarily modify the competency determination (CD) requirement for certain high school students.[1] Under this change, certain students may earn their CD through successful completion of a relevant Department-identified high school course, according to the criteria below:

- **For students in grade 12 in the 2019-2020 school year** (at the time of the April 2020 BESE vote), as well as other actively enrolled students who were on track to graduate in the 2019-2020 school year, the CD will be awarded in each subject as follows:
    - *For English language arts and mathematics* – upon district certification that the student earned credit for a course aligned to the curriculum frameworks in the relevant subject matter and has demonstrated competency in that subject.
    - *For science and technology/engineering* – upon district certification that the student earned credit for a course aligned to the curriculum frameworks in the relevant subject matter and has demonstrated competency in one of the four tested disciplines (biology, chemistry, introductory physics, and technology/engineering) during their high school career.
- **For students in the classes of 2021 and 2022,** the CD will be awarded in each subject as follows:
    - *For English language arts and mathematics* – upon district certification that the student earned full credit for a relevant course aligned to the appropriate curriculum framework in that subject matter and has demonstrated competency in that subject.
    - *For science and technology/engineering* – upon demonstration that the student earned credit for a course in the relevant subject matter and demonstrated competency in one of the four tested disciplines (biology, chemistry, introductory physics, technology/engineering) during their high school career.
- **For students in the class of 2023**, the CD in science and technology/engineering shall be awarded upon demonstration that the student earned credit for a course in the relevant subject matter and demonstrated competency in one of the four tested disciplines (biology, chemistry, introductory physics, technology/engineering) during their high school career.

Frequently Asked Questions

Accessing the Competency Determination Tool

Is the modified CD process required?
Yes. All districts that graduated students in 2020-2023 have students who are eligible for the modified CD due to the cancellation of the 2020 MCAS assessments, and therefore must use this tool to submit information to DESE for review. Districts will not be able to issue diplomas to students who have not earned their CD via MCAS testing or this modified process.

[1] The BESE voted to modify CD requirements on four occasions: April 2020 (in ELA, mathematics, and science for students in grade 12 and those who were on track to graduate in 2020); May 2020 (in science only for students in the classes of 2021-2023); January 2021 (in ELA and mathematics for students in the class of 2021); and April 2021 (in ELA and mathematics for students in the class of 2022).

How do I report CD information to DESE?
The Department created the 'Competency Determination' application in the Security Portal, which districts must use to submit the required information.

Can I provide the required information to DESE in a different way (e.g., via email, in a dropbox, over the phone, etc.)?
No. Data must be submitted through the Security Portal's 'Competency Determination' tool, which includes a final certification by the district's Superintendent.

How do I access the 'Competency Determination' tool?
To access the 'Competency Determination' application in the Security Portal, each district must assign the *Competency Determination* security role to the individual(s) who will be responsible for submitting and certifying data. This role must be assigned in Directory Administration, by the district's Directory Administrator.

Who should be given access to the tool?
The *Competency Determination* security role should be assigned as follows:

- **For each school**, the role should be assigned to the individual(s) who will be responsible for reviewing and verifying course and credit information for each eligible student. Individuals assigned the *Competency Determination* security role for a school will only be able to see student-level information for students enrolled in that school. An individual may be assigned the role for more than one school, if appropriate.
- **For each district**, the role should be assigned to the Superintendent and any other individual(s) who require access to student-level data for eligible students in all district schools, including students educated in out-of-district settings. To formally submit the data to DESE, at least one person (the Superintendent) should be assigned the *Competency Determination* security role for the district. Only individuals with the district-level role will be able to submit the final certification for the entire district.

How does the *Competency Determination* security role work?
The role allows individuals to access the 'Competency Determination' application in the Security Portal. It can be assigned at the school level, the district level, or both. Depending on the level of access, users have different permissions:

- **When assigned at the school level**, users will only see data for the school(s) to which they have been granted access. School-level users can enter and confirm information for individual students but are not able to submit the final district-level certification to DESE. There is no overall school-level certification. An individual may be assigned the role for more than one school, and multiple individuals may be assigned the role for a single school.
- **When assigned at the district level**, users will see data for all district schools that have eligible students, as well as for any eligible out-of-district students. District-level users can enter information for any student or school. Only district-level users can submit the single, final certification for the district as a whole, and only if data has been entered completely for all schools. There is no overall school-level certification.

Student Eligibility

Which students are included in the tool?
The modified CD collection tool has been designed to collect data for two groups of students: those eligible for the modified CD in ELA, mathematics, and science (i.e., the classes of 2020-2022), and those eligible for the modified CD in science only (i.e., the class of 2023). The Department identifies eligible students using Student Information Management System (SIMS) and Student Course Schedule (SCS) data which has been submitted to DESE by districts. For the October 2023 modified CD collection period,

DESE is collecting course information for eligible students in the classes of 2020, 2021, 2022, and 2023, based on October 2024 SIMS. See the Modified CD Eligibility table at the end of this document for details.

Is the modified CD an option for students with Individualized Education Programs (IEPs)?
Yes. Certain students with IEPs are eligible for the modified CD if they meet the eligibility criteria outlined in this document. Districts may graduate students with IEPs if those students: (1) have received a Free and Appropriate Public Education (FAPE), (2) have completed all local graduation requirements, and (3) have earned their CD. See *Administrative Advisory SPED 2018-2: Secondary Transition Services and Graduation with a High School Diploma* for further information on graduation requirements for students with IEPs. See the question below for specific information on students with IEPs enrolled beyond grade 12.

Excellent two-way communication with students and parents is particularly important when the student is about to exit from school. Districts should always communicate with families and confirm in writing via the IEP or the IEP Notice of Proposed School District Action (N1) that families are aware of the upcoming graduation or aging out date. Districts should contact parents to let them know that they have applied for the modified CD and to offer a Team meeting to discuss further. As described later in this document, IEP page 8 of the MA IEP forms ("Additional Information" and "Response" sections) or an N1 reflecting the student's graduation date and the parent's agreement must be submitted through the 'Competency Determination' tool during an open collection window. Districts are also reminded of their obligation to provide the student and/or parent(s) with a Summary of Student Performance (SOP) as required by 34 CFR 300.305(e)(3). Schools and districts must be prepared to provide the SOP to DESE upon request.

Are out-of-district students included?
Yes. All eligible students who are educated in out-of-district settings are included in the tool, under a single "Out of District" section that can be accessed by individuals with the district-level security role. Districts are responsible for submitting information for their out-of-district students and should communicate with their students' outplacement settings to determine whether each eligible student has fulfilled the modified CD coursework requirements, in addition to following the guidelines stated in the previous question.

Are SP students (students with IEPs enrolled beyond grade 12) included?
Students reported as SP in SIMS who were originally members of the graduating classes of 2020-2023 may be eligible for the modified CD if they have an anticipated graduation date prior to October 1, 2024, as noted in their most recent signed IEP. A student reported as SP whose anticipated graduation date on their current, signed IEP is on or after October 1, 2024, is eligible for the modified CD only if the IEP Team reconvenes and agrees to change the graduation date to a new date prior to October 1, 2024.

Excellent two-way communication with students and parents is particularly important when the student is about to exit from school. Districts should always communicate with families and confirm in writing via the IEP or N1 that families are aware of the upcoming graduation or aging out date. Districts should contact parents to let them know that they have applied for the modified CD and to offer a Team meeting to discuss further. As described later in this document, IEP page 8 of the MA IEP forms ("Additional Information" and "Response" sections) or an N1 reflecting the new date and the parent's agreement must be submitted through the Competency Determination tool during an open collection window. Districts are also reminded of their obligation to provide the student and/or parent(s) with a Summary of Student Performance (SOP) as required by 34 CFR 300.305(e)(3). Schools and districts must be prepared to provide the SOP to DESE upon request.

What about students who transferred in after End-of-Year 2023 SIMS?
Eligible students who transferred into a Massachusetts public school after End-of-Year 2023 SIMS will be included in a future modified CD collection if they were previously enrolled in a Massachusetts public high school as a member of an eligible class (2020-2023).

What about students who earned their certificate of attainment during the 2022-2023 school year, and were reported as such in End-of-Year 2023 SIMS?
These students are included in the current modified CD collection if they have not yet earned CD.

What about students who finished high school without a diploma prior to the 2019-2020 school year, are no longer enrolled, but were planning on taking the MCAS tests this year?
In accordance with the BESE vote, these students are not eligible for the modified CD.

Can I add or delete students to/from the tool?
No. The Department has prepopulated the student lists based on eligibility, which was determined using data that districts submitted to DESE in previous SIMS collection periods.

We believe a student should be on our list of eligible students, but they are not included in the 'Competency Determination' tool in the Security Portal. How can our district fix this?
Please review all student eligibility information provided in this document. If you still believe that a student was omitted from your eligibility list, contact DESE's Office of Data Analysis and Reporting at data@doe.mass.edu.

Entering Data

What student-level information is included in the tool?
Where possible, DESE has prepopulated the tool using student-level information that has previously been submitted and certified by the district through the SIMS and SCS data collections. Prepopulated data include the name, date of birth, SASID, and class/graduation year for each student who has not yet earned the CD in one or more subjects; for each subject (ELA, mathematics, and science), an indication of whether the student has already earned the CD; and, for the subject(s) in which the student has not yet earned a CD, relevant course and credit information that DESE has on file (if any).

What information am I required to provide?
For the subject(s) in which a student has not yet earned a CD, the district must review and certify the prepopulated course and credit information, or make changes as needed. In some instances, the tool may display incorrect course and/or credit information for a student, based on inaccurate data that was previously submitted to DESE by the district. In these cases, the district should correct the information as needed. Alternatively, DESE may not have any course information for a student. In those cases, no course information is prepopulated, and the district must select the appropriate course from the dropdown menu and indicate whether full credit was earned. If a student did not complete or earn credit in any of the eligible courses (and therefore would not earn the CD in that subject), the district should choose "No Course Taken" from the dropdown menu.

Additionally, districts with special education students enrolled beyond grade 12 (reported as 'SP' in SIMS) must indicate whether each SP student in the tool has an anticipated graduation date before October 1, 2024. For each eligible SP student who will graduate before October 1, the district must provide all required course and credit information, and must also upload one of the following two documents into the 'Competency Determination' tool:

- Page 8 of the MA IEP forms ("Additional Information" and "Response" sections) of the student's most recently signed IEP. This signed page of the IEP should include information about the student's anticipated graduation date and indicate student and/or parent agreement **with a student and/or parent signature**. Please submit the signature page *as one document attached to Page 8* if the signature is not at the bottom of Page 8.
- IEP Notice of Proposed School District Action (N1). The N1 form may be submitted in lieu of Page 8 of the student's IEP if it contains up-to-date information about the student's anticipated graduation date and indicates student and/or parent agreement.

Which courses meet the modified CD requirements?
The Department has identified specific courses in ELA, mathematics, and science that fulfill the modified CD requirements. The list of courses was made available to districts in May 2020 and is also available in the 'Competency Determination' application in the Security Portal. Districts should report course information in the tool based on NCES course codes, not local course codes or names.

If a student did not earn full credit in a prepopulated grade 12 course, can we use eligible course information from an earlier grade?
Yes. The subject-specific dropdowns include eligible courses from grades 9 through 12.

What if there are students in the tool that have not yet met CD coursework requirements?
You must submit information for all students included in the tool. If a student has not yet met CD coursework requirements, that should be indicated in the tool by selecting "No Course Taken" from the course dropdown menu, selecting "No" under *Full Credit Earned*, and checking the confirmation checkbox.

I entered data for my high school. Why can't I certify and submit it to DESE?
To certify and submit the data to DESE, data must be confirmed and saved for each student in the school list(s) and for each student in the out-of-district list. The out-of-district list will only appear in the tool for users who have been assigned the *Competency Determination* security role for the district. Additionally, only users who have been assigned the role for the district are allowed to certify and submit the data to DESE.

Can I change data after it has been certified by the district?
Data may be saved (but not certified) at any time. However, once the final certification has been submitted by the district, data cannot be changed.

Modified Competency Determination Requirements and MCAS Appeals

Does this process replace the MCAS appeals process?
No. While many students are expected to be certified by their district through the modified CD process, MCAS appeals continue to be available for students who meet eligibility requirements who may not be eligible for certification by the district for the grade 12 CD modification. For example, appeals may be appropriate for students who were not enrolled in a course authorized by DESE to receive a CD; or students with disabilities in special programs and those in programs beyond grade 12.

If I already filed an MCAS appeal, should I disregard that application?
No. Both the appeals and modified CD processes may yield a CD. If an appeal was submitted and the student is also included in the modified CD process, DESE will accept whichever is the higher result. Please see above.

Timeline for Awarding the Competency Determination

What is the timeframe for submitting this information to DESE?
The Round 17 (February) modified CD collection window opens on January 29, 2024, and closes on February 9, 2024.

Will DESE implement a process to review compliance with the guidelines established for the modified competency determination?
Yes. The Department has established a process for reviewing documentation provided by districts for compliance with the guidelines of the modified CD. This process includes an examination of various factors such as the percentage of students a school or district submits for consideration. Additionally, relevant documentation for students with disabilities may be requested and reviewed.

When will DESE notify districts about final competency determination decisions?
For eligible students reported during the February 2024 modified CD collection window, DESE will begin reviewing the information submitted by districts after the application closes and intends to make final CD decisions within 7 days.

Does submitting this information to DESE mean that a student will automatically be awarded the CD?
No. Providing this data to DESE does not constitute the awarding of the CD. The Department will notify districts about the award of the CD, and at that time the students will be eligible to receive a Massachusetts high school diploma if the school district determines they meet local graduation requirements and, in the case of students with IEPs, have been provided FAPE.

If DESE awards the CD to a student, does that mean the student automatically earns their diploma?
No. Diplomas are issued by the district, not by DESE. If DESE awards the CD to a student through this modified process, the student must still meet all other local graduation requirements and have been provided FAPE by the district before the district issues a diploma.

If DESE cannot issue CD determinations prior to my school's graduation, does this mean that these students cannot participate in the ceremonies?
This is a local decision. These students may be eligible to participate in graduation ceremonies (for example, as certificate of attainment earners) if the district determines that they have met local graduation requirements; however, they may not receive a diploma unless DESE awards the CD.

Should students who meet state and local graduation requirements after DESE has issued final CD decisions be reported as graduates in the next SIMS collection?
Yes. Students can be reported as graduates in the next SIMS collection if the district receives confirmation from DESE that the CD has been awarded in all three subjects and the student meets local graduation requirements.

Contact Information and Resources

Topic	Email	Resources
Modified CD	data@doe.mass.edu	• List of accepted courses: https://www.doe.mass.edu/mcas/accepted-courses.xlsx • Modified CD tool demonstration video: https://www.youtube.com/watch?v=6sbfC8Fbuac
MCAS testing	mcas@doe.mass.edu	https://www.doe.mass.edu/mcas/
MCAS performance appeals	mcasappeals@doe.mass.edu	https://www.doe.mass.edu/mcasappeals/
Graduation requirements	mcas@doe.mass.edu	https://www.doe.mass.edu/mcas/graduation.html
Edwin Analytics Report w/ CD Status	mcas@doe.mass.edu	PE613 Assessment History Summary

Modified Competency Determination (CD) Eligibility

Students in the Classes of 2020-2022

Students who were enrolled in grade 12 during the 2019-2020 school year, students who were on track to graduate in 2020, and students in the classes of 2021 and 2022 are eligible for the modified CD in ELA, mathematics, and science. See the MCAS Graduation Requirements website for more information.

Round (Collection period opens)	Class/ graduation year(s)	Subject(s)	Notes
Rounds 1-16	2020, 2021, & 2022	ELA, mathematics, science	Students were included if: • They were enrolled in grade 12 or SP at the time of the modified CD data collection, or • They were enrolled in SIMS at the time of collection and were originally members of graduation classes 2020 through 2022
Round 17 (February 2024)	2020, 2021, & 2022	ELA, mathematics, science	Students are included if: • They were included in the Round 16 collection (October 2023) as a member of the 2020, 2021, or 2022 graduation class and are still enrolled in October 2023 SIMS, but have not yet met coursework requirements in one or more subjects

Students in the Class of 2023

Students in the class of 2023 are eligible for the modified CD in science only. See the MCAS Graduation Requirements website for more information.

Round (Collection period opens)	Class/ graduation year(s)	Subject	Notes
Rounds 12-16	2023	Science	Students were included if: • They were enrolled in grade 12 or SP at the time of the modified CD data collection, or • They were enrolled in SIMS at the time of collection and were originally members of the 2023 graduation class
Round 17 (February 2024)	2023	Science	Students are included if: • They are enrolled in grade 12 or SP in October 2023 SIMS and are not members of an earlier graduation class, but have not yet met coursework requirements in science; or • They are members of the 2023 graduation class and are still enrolled in October 2023 SIMS but have not yet met coursework requirements in science.

APPENDIX B
GRADE-SPECIFIC ACHIEVEMENT-LEVEL DESCRIPTORS

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts

General: All grades (grades 3–8 and 10)

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA **All Grades**	**Partially Meeting Expectations** ***On MCAS, a student at this level:***	**Meeting Expectations** ***On MCAS, a student at this level:***	**Exceeding Expectations** ***On MCAS, a student at this level:***
Reading	Demonstrates **partial** understanding of what a text implies and states explicitly; cites **limited** textual support for conclusions; **incompletely** summarizes key details and ideas; provides a **partial** analysis of a character, an event, or an idea in grade-appropriate texts Demonstrates **partial** understanding of words and phrases used in a text; provides **limited** understanding of how structural elements, point of view, or purpose affects the content and style in text(s) Makes **basic** comparisons between texts; shows **partial** understanding of content in diverse media; **partially** evaluates and analyzes claims and evidence in text(s)	Demonstrates **sufficient** understanding of what a text implies and states explicitly; cites **solid** textual support for conclusions; **appropriately** summarizes key details and ideas; provides a **mostly complete** analysis of a character, an event, or an idea in grade-appropriate texts Demonstrates **general** understanding of words and phrases used in a text; provides **general understanding** of how structural elements, point of view, or purpose affects the content and style in text(s) Makes **appropriate** comparisons between texts; shows **solid** understanding of content in diverse media; **appropriately** evaluates and analyzes claims and evidence in text(s)	Demonstrates **comprehensive** understanding of what a text implies and states explicitly; cites **in-depth** textual support for conclusions; **skillfully** summarizes key details and ideas; provides a **sophisticated** analysis of a character, an event, or an idea in grade-appropriate texts Demonstrates **in-depth** understanding of words and phrases used in a text; provides **sophisticated** understanding of how structural elements, point of view, or purpose affects the content and style in text(s) Makes **insightful** comparisons between texts; shows **sophisticated** understanding of content in diverse media; **insightfully** evaluates and analyzes claims and evidence in text(s)
Writing	Produces **basic** writing with **limited** selection and explanation of evidence and details related to grade-appropriate texts, topics, or subject areas Produces writing with **little** development of a central idea or sequenced events, **limited** organization, and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of evidence and details related to grade-appropriate texts, topics, or subject areas Produces writing with **appropriate** development of a central idea or sequenced events, **moderate** organization, and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **clear** writing with **skillful** selection and explanation of evidence and details related to grade-appropriate texts, topics, or subject areas Produces writing with **full** development of a central idea or sequenced events, **effective** organization, and **clear** expression of ideas Exhibits **full** awareness of task, purpose, and audience

ELA All Grades	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Language	Demonstrates **limited** reading vocabulary of general academic and domain-specific words and phrases in grade-appropriate texts Demonstrates **limited** understanding of unfamiliar words in text and shows **partial** understanding of word parts and word relationships in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of general academic and domain-specific words and phrases in grade-appropriate texts Demonstrates **solid** understanding of unfamiliar words in text and shows **sufficient** understanding of word parts and word relationships in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of general academic and domain-specific words and phrases in grade-appropriate texts Demonstrates **comprehensive** understanding of unfamiliar words in text and shows **full** understanding of word parts and word relationships in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts

Grade 3

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 3	**Partially Meeting Expectations** *On MCAS, a student at this level:*	**Meeting Expectations** *On MCAS, a student at this level:*	**Exceeding Expectations** *On MCAS, a student at this level:*
Reading	Demonstrates **partial** understanding of what a text states explicitly; cites **limited** textual support; demonstrates **incomplete** understanding of key details and how they support the main idea; provides a **partial** description of a character, an event, or an idea in grade 3 texts Demonstrates **partial** understanding of words and phrases (e.g., figurative language); demonstrates a **limited** understanding of structural elements and different points of view Makes **basic** comparisons between texts; shows **partial** understanding of information presented in illustrations; **partially** compares and contrasts important points in text(s)	Demonstrates **sufficient** understanding of what a text states explicitly; cites **solid** textual support; demonstrates **appropriate** understanding of key details and how they support the main idea; provides a **mostly complete** description of a character, an event, or an idea in grade 3 texts Demonstrates **general** understanding of words and phrases (e.g., figurative language); demonstrates a **general** understanding of structural elements and different points of view Makes **appropriate** comparisons between texts; shows **solid** understanding of information presented in illustrations; **appropriately** compares and contrasts important points in text(s)	Demonstrates **comprehensive** understanding of what a text states explicitly; cites **in-depth** textual support; demonstrates **in-depth** understanding of key details and how they support the main idea; provides a **comprehensive** description of a character, an event, or an idea in grade 3 texts Demonstrates **in-depth** understanding of words and phrases (e.g., figurative language); demonstrates a **clear** understanding of structural elements and different points of view Makes **effective** comparisons between texts; shows **clear** understanding of information presented in illustrations; **effectively** compares and contrasts important points in text(s)

ELA Grade 3	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Writing	Produces **basic** writing with **limited** selection and explanation of facts and details related to grade 3 texts, topics, or subject areas Produces writing with **little** development of a central idea or sequenced events, **limited** organization, and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of facts and details related to grade 3 texts, topics, or subject areas Produces writing with **appropriate** development of a central idea or sequenced events, **moderate** organization, and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **clear** writing with **effective** selection and explanation of facts and details related to grade 3 texts, topics, or subject areas Produces writing with **full** development of a central idea or sequenced events, **effective** organization, and **clear** expression of ideas Exhibits **full** awareness of task, purpose, and audience
Language	Demonstrates **limited** reading vocabulary of grade 3 academic and domain-specific words and phrases Demonstrates **limited** understanding of unfamiliar words in text; shows **partial** understanding of word parts and word relationships in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of grade 3 academic and domain-specific words and phrases Demonstrates **solid** understanding of unfamiliar words in text; shows **sufficient** understanding of word parts and word relationships in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of grade 3 academic and domain-specific words and phrases Demonstrates **comprehensive** understanding of unfamiliar words in text; shows **full** understanding of word parts and word relationships in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts

Grade 4

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 4	**Partially Meeting Expectations** *On MCAS, a student at this level:*	**Meeting Expectations** *On MCAS, a student at this level:*	**Exceeding Expectations** *On MCAS, a student at this level:*
Reading	Demonstrates **partial** understanding of what a text implies and states explicitly; cites **limited** textual support; **incompletely summarizes** key details and main ideas; provides a **partial** description of a character, an event, or an idea in grade 4 texts Demonstrates **partial** understanding of words and phrases (e.g., figurative language); provides a **limited** understanding of structural elements and different points of view Makes **basic** comparisons between texts; shows **partial** understanding of information presented in media; **partially** explains important points and themes in text(s)	Demonstrates **sufficient** understanding of what a text implies and states explicitly; cites **solid** textual support; **appropriately** summarizes key details and main ideas; provides a **mostly complete** description of a character, an event, or an idea in grade 4 texts Demonstrates **general** understanding of words and phrases (e.g., figurative language); provides a **general** understanding of structural elements and different points of view Makes **appropriate** comparisons between texts; shows **solid** understanding of information present in media; **appropriately** explains important points and themes in text(s)	Demonstrates **comprehensive** understanding of what a text implies and states explicitly; cites **in-depth** textual support; **skillfully** summarizes key details and main ideas; provides a **comprehensive** description of a character, an event, or an idea in grade 4 texts Demonstrates **in-depth** understanding of words and phrases (e.g., figurative language); provides a **clear** understanding of structural elements and different points of view Makes **effective** comparisons between texts; shows **clear** understanding of information present in media; **effectively** explains important points and themes in text(s)

ELA Grade 4	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Writing	Produces **basic** writing with **limited** selection and explanation of facts and details related to grade 4 texts, topics, or subject areas Produces writing with **little** development of a central idea or sequenced events, **limited** organization, and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of facts and details related to grade 4 texts, topics, or subject areas Produces writing with **appropriate** development of a central idea or sequenced events, **moderate** organization, and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **clear** writing with **effective** selection and explanation of facts and details related to grade 4 texts, topics, or subject areas Produces writing with **full** development of a central idea or sequenced events, **effective** organization, and **clear** expression of ideas Exhibits **full** awareness of task, purpose, and audience
Language	Demonstrates **limited** reading vocabulary of grade 4 academic and domain-specific words and phrases Demonstrates **limited** understanding of unfamiliar words in text; shows **partial** understanding of word parts, word relationships, and nuances in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of grade 4 academic and domain-specific words and phrases Demonstrates **solid** understanding of unfamiliar words in text; shows **sufficient** understanding of word parts, word relationships, and nuances in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of grade 4 academic and domain-specific words and phrases Demonstrates **comprehensive** understanding of unfamiliar words in text; shows **full** understanding of word parts, word relationships, and nuances in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement Level Descriptors
English Language Arts

Grade 5

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 5	**Partially Meeting Expectations** *On MCAS, a student at this level:*	**Meeting Expectations** *On MCAS, a student at this level:*	**Exceeding Expectations** *On MCAS, a student at this level:*
Reading	Demonstrates **partial** understanding of what a text implies and states explicitly; provides **limited** textual support through the use of quotations or paraphrasing; **incompletely** summarizes key details and main ideas; provides a **partial** analysis of a character, an event, or an idea in grade 5 texts Demonstrates **partial** understanding of words and phrases (e.g., figurative language); provides a **limited** explanation of how structural elements or points of view influence text(s) Makes **basic** comparisons between texts; shows **partial** understanding of information present in multiple sources or media; **partially** analyzes important points and themes in text(s)	Demonstrates **sufficient** understanding of what a text implies and states explicitly; provides **solid** textual support through the use of quotations or paraphrasing; **appropriately** summarizes key details and main ideas; provides a **mostly complete** analysis of a character, an event, or an idea in grade 5 texts Demonstrates **general** understanding of words and phrases (e.g., figurative language); provides a **general** explanation of how structural elements or points of view influence text(s) Makes **appropriate** comparisons between texts; shows **solid** understanding of information present in multiple sources or media; **appropriately** analyzes important points and themes in text(s)	Demonstrates **comprehensive** understanding of what a text implies and states explicitly; provides **in-depth** textual support through the use of quotations or paraphrasing; **skillfully** summarizes key details and main ideas; provides a **comprehensive** analysis of a character, an event, or an idea in grade 5 texts Demonstrates **in-depth** understanding of words and phrases (e.g., figurative language); provides a **clear** explanation of how structural elements or points of view influence text(s) Makes **effective** comparisons between texts; shows **clear** understanding of information present in multiple sources or media; **effectively** analyzes important points and themes in text(s)

ELA Grade 5	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Writing	Produces **basic** writing with **limited** selection and explanation of facts and details related to grade 5 texts, topics, or subject areas Produces writing with **little** development of a central idea or sequenced events, **limited** organization, and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of facts and details related to grade 5 texts, topics, or subject areas Produces writing with **appropriate** development of a central idea or sequenced events, **moderate** organization, and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **clear** writing with **effective** selection and explanation of facts and details related to grade 5 texts, topics, or subject areas Produces writing with **full** development of a central idea or sequenced events, **effective** organization, and **clear** expression of ideas Exhibits **full** awareness of task, purpose, and audience
Language	Demonstrates **limited** reading vocabulary of grade 5 academic and domain-specific words and phrases Demonstrates **limited** understanding of unfamiliar words in text; shows **partial** understanding of word parts, word relationships, and nuances in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of grade 5 academic and domain-specific words and phrases Demonstrates **solid** understanding of unfamiliar words in text; shows **sufficient** understanding of word parts, word relationships, and nuances in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of grade 5 academic and domain-specific words and phrases Demonstrates **comprehensive** understanding of unfamiliar words in text; shows **full** understanding of word parts, word relationships, and nuances in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts
Grade 6

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 6	**Partially Meeting Expectations** *On MCAS, a student at this level:*	**Meeting Expectations** *On MCAS, a student at this level:*	**Exceeding Expectations** *On MCAS, a student at this level:*
Reading	Demonstrates **partial** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **partially** support conclusions; **incompletely** summarizes text; provides a **partial** analysis of a character, an event, or an idea in grade 6 texts Demonstrates **partial** understanding of meanings (e.g., figurative, connotative, technical) and effects (e.g., on mood) of words and phrases; demonstrates **limited** understanding of how structural elements and point of view contribute to the development of ideas Makes **basic** comparisons between texts; **partially** integrates information in different media or formats; **partially** analyzes important claims, arguments, or themes in text(s)	Demonstrates **sufficient** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **generally** support conclusions; **appropriately** summarizes text; provides a **mostly complete** analysis of a character, an event, or an idea in grade 6 texts Demonstrates **general** understanding of meanings (e.g., figurative, connotative, technical) and effects (e.g., on mood) of words and phrases; demonstrates **general** understanding of how structural elements and point of view contribute to the development of ideas Makes **appropriate** comparisons between texts; **solidly** integrates information in different media or formats; **appropriately** analyzes important claims, arguments, or themes in text(s)	Demonstrates **comprehensive** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **insightfully** support conclusions; **skillfully** summarizes text; provides a **sophisticated** analysis of a character, an event, or an idea in grade 6 texts Demonstrates **in-depth** understanding of meanings (e.g., figurative, connotative, technical) and effects (e.g., on mood) of words and phrases; demonstrates **sophisticated** understanding of how structural elements and point of view contribute to the development of ideas Makes **insightful** comparisons between texts; **skillfully** integrates information in different media or formats; **insightfully** analyzes important claims, arguments, or themes in text(s)
Writing	Produces **basic** writing with **limited** selection and explanation of evidence and details related to grade 6 texts, topics, or subject areas Produces writing with **little** development of a central idea, a claim, or sequenced events; **limited** organization; and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of evidence and details related to grade 6 texts, topics, or subject areas Produces writing with **appropriate** development of a central idea, a claim, or sequenced events; **moderate** organization; and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **sophisticated** writing with **skillful** selection and explanation of evidence and details related to grade 6 texts, topics, or subject areas Produces writing with **full** development of a central idea, a claim, or sequenced events**; skillful** organization; and **rich** expression of ideas Exhibits **full** awareness of task, purpose, and audience

ELA Grade 6	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Language	Demonstrates **limited** reading vocabulary of grade 6 academic and domain-specific words and phrases Demonstrates **limited** understanding of unfamiliar words in text and shows **partial** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of grade 6 academic and domain-specific words and phrases Demonstrates **solid** understanding of unfamiliar words in text and shows **sufficient** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of grade 6 academic and domain-specific words and phrases Demonstrates **comprehensive** understanding of unfamiliar words in text and shows **full** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts
Grade 7

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 7	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Reading	Demonstrates **partial** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **partially** support conclusions; incompletely summarizes text; provides a **partial** analysis of the interactions of characters, events, or ideas in grade 7 texts Demonstrates **partial** understanding of meanings (e.g., figurative, connotative, technical) and effects (e.g., on mood) of words and phrases; demonstrates **limited** understanding of how structural elements and point of view contribute to the development of ideas Makes **basic** comparisons between texts; **partially** integrates information in different media or formats; **partially** analyzes important claims, arguments, or themes in text(s)	Demonstrates **sufficient** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **generally** support conclusions; **appropriately** summarizes text; provides a **mostly complete** analysis of the interactions of characters, events, or ideas in grade 7 texts Demonstrates **general** understanding of **meanings** (e.g., figurative, connotative, technical) and effects (e.g., on mood) of words and phrases; demonstrates **general** understanding of how structural elements and point of view contribute to the development of ideas Makes **appropriate** comparisons between texts; **solidly** integrates information in different media or formats; **appropriately** analyzes important claims, arguments, or themes in text(s)	Demonstrates **comprehensive** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **insightfully** support conclusions; **skillfully** summarizes text; provides a **sophisticated** analysis of the interactions of characters, events, or ideas in grade 7 texts Demonstrates **in-depth** understanding of **meanings** (e.g., figurative, connotative, technical) and effects (e.g., on mood) of words and phrases; demonstrates **sophisticated** understanding of how structural elements and point of view contribute to the development of ideas Makes **insightful** comparisons between texts; **skillfully** integrates information in different media or formats; **insightfully** analyzes important claims, arguments, or themes in text(s)
Writing	Produces **basic** writing with **limited** selection and explanation of evidence and details related to grade 7 texts, topics, or subject areas Produces writing with **little** development of a central idea, a claim, or sequenced events; **limited** organization; and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of evidence and details related to grade 7 texts, topics, or subject areas Produces writing with **appropriate** development of a central idea, a claim, or sequenced events; **moderate** organization; and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **sophisticated** writing with **skillful** selection and explanation of evidence and details related to grade 7 texts, topics, or subject areas Produces writing with **full** development of a central idea, a claim, or sequenced events; **skillful** organization; and **rich** expression of ideas Exhibits **full** awareness of task, purpose, and audience

ELA Grade 7	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Language	Demonstrates **limited** reading vocabulary of grade 7 academic and domain-specific words and phrases Demonstrates **limited** understanding of unfamiliar words in text and shows **partial** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of grade 7 academic and domain-specific words and phrases Demonstrates **solid** understanding of unfamiliar words in text and shows **sufficient** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of grade 7 academic and domain-specific words and phrases Demonstrates **comprehensive** understanding of unfamiliar words in text and shows **full** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts
Grade 8

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 8	**Partially Meeting Expectations** ***On MCAS, a student at this level:***	**Meeting Expectations** ***On MCAS, a student at this level:***	**Exceeding Expectations** ***On MCAS, a student at this level:***
Reading	Demonstrates **partial** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **partially** support conclusions; **incompletely** summarizes text; provides a **partial** analysis of connections among characters, events, or ideas in grade 8 texts Demonstrates **partial** understanding of meanings (e.g., figurative, ironic, allusive) and effects (e.g., on mood) of words and phrases; demonstrates **limited** understanding of how structural elements and point of view contribute to the development of ideas Provides a **basic** analysis between texts; **partially** integrates information from different media or formats; **partially** analyzes important claims, arguments, or themes in multiple texts	Demonstrates **sufficient** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **generally** support conclusions; **appropriately** summarizes text; provides a **mostly complete** analysis of connections among characters, events, or ideas in grade 8 texts Demonstrates **general** understanding of meanings (e.g., figurative, ironic, allusive) and effects (e.g., on mood) of words and phrases; demonstrates **general** understanding of how structural elements and point of view contribute to the development of ideas Provides an **appropriate** analysis between texts; **solidly** integrates information from different media or formats; **appropriately** analyzes important claims, arguments, or themes in multiple texts	Demonstrates **comprehensive** understanding of what a text implies and states explicitly; uses quotations and paraphrases to **insightfully** support conclusions; **skillfully** summarizes text; provides a **sophisticated** analysis of connections among characters, events, or ideas in grade 8 texts Demonstrates **in-depth** understanding of meanings (e.g., figurative, ironic, allusive) and effects (e.g., on mood) of words and phrases; demonstrates **sophisticated** understanding of how structural elements and point of view contribute to the development of ideas Provides an **insightful** analysis between texts; skillfully integrates information from different media or formats; **insightfully** analyzes important claims, arguments, or themes in multiple texts
Writing	Produces **basic** writing with **limited** selection and explanation of evidence and details related to grade 8 texts, topics, or subject areas Produces writing with **little** development of a central idea, a claim, or sequenced events; **limited** organization; and **basic** expression of ideas Exhibits **partial** awareness of task, purpose, and audience	Produces **solid** writing with **appropriate** selection and explanation of evidence and details related to grade 8 texts, topics, or subject areas Produces writing with **appropriate** development of a central idea, a claim, or sequenced events; **moderate** organization; and **adequate** expression of ideas Exhibits **sufficient** awareness of task, purpose, and audience	Produces **sophisticated** writing with **skillful** selection and explanation of evidence and details related to grade 8 texts, topics, or subject areas Produces writing with **full** development of a central idea, a claim, or sequenced events; **skillful** organization; and **rich** expression of ideas Exhibits **full** awareness of task, purpose, and audience

ELA Grade 8	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Language	Demonstrates **limited** reading vocabulary of grade 8 academic and domain-specific words and phrases Demonstrates **limited** understanding of unfamiliar words in text and shows **partial** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of grade 8 academic and domain-specific words and phrases Demonstrates **solid** understanding of unfamiliar words in text and shows **sufficient** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of grade 8 academic and domain-specific words and phrases Demonstrates **comprehensive** understanding of unfamiliar words in text and shows **full** understanding of word parts, figurative language, word relationships, and nuances in word meanings Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

MCAS Next-Generation Achievement-Level Descriptors
English Language Arts
Grade 10

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students' work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

ELA Grade 10	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Reading	**Partially** analyzes what a text implies and states explicitly; uses **little** evidence to support the analysis; **incompletely** identifies and analyzes the development of a central idea or theme of a text; provides a **limited** analysis of how characters, events or ideas are developed and interact across sufficiently complex texts **Partially** determines meanings (e.g., figurative, connotative, technical) of words and phrases and analyzes how they impact meaning and tone; demonstrates **limited** understanding of how structural elements and point of view contribute to the overall development of ideas or purpose Provides a **basic** analysis between texts; **partially** integrates information from different sources; **partially** analyzes and evaluates important claims, arguments, or themes in multiple texts	**Adequately** analyzes what a text implies and states explicitly; uses **sufficient** evidence to support the analysis; **appropriately** identifies and analyzes the development of a central idea or theme of a text; provides a **mostly complete** analysis of how characters, events or ideas are developed and interact across sufficiently complex texts **Appropriately** determines meanings (e.g., figurative, connotative, technical) of words and phrases and analyzes how they impact meaning and tone; demonstrates **general** understanding of how structural elements and point of view contribute to the overall development of ideas or purpose Provides an **appropriate** analysis between texts; **solidly** integrates information from different sources; **appropriately** analyzes and evaluates important claims, arguments, or themes in multiple texts	**Insightfully** analyzes what a text implies and states explicitly; uses **strong** and **thorough** evidence to support the analysis; **skillfully** identifies and analyzes the development of a central idea or theme of a text; provides a **sophisticated** analysis of how characters, events or ideas are developed and interact across sufficiently complex texts **Skillfully** determines meanings (e.g., figurative, connotative, technical) of words and phrases and analyzes how they impact meaning and tone; demonstrates **sophisticated** understanding of how structural elements and point of view contribute to the overall development of ideas or purpose Provides an **insightful** analysis between texts; **skillfully** integrates information from different sources; **insightfully** analyzes and evaluates important claims, arguments, or themes in multiple texts
Writing	Produces **basic** writing with **limited** selection and explanation of evidence and details related to sufficiently complex texts, topics, or subject areas Produces writing with **little** development of a **basic** central idea, thesis, or sequenced events; **limited** organization; and **basic** expression of ideas	Produces **solid** writing with **appropriate** selection and explanation of evidence and details related to sufficiently complex texts, topics, or subject areas Produces writing with **adequate** development of a **solid** central idea, thesis, or sequenced events; **moderate** organization; and **appropriate** expression of ideas	Produces **clear** and **sophisticated** writing with **skillful** selection and explanation of evidence and details related to sufficiently complex texts, topics, or subject areas

ELA Grade 10	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
	Exhibits **partial** awareness of task, purpose, and audience	Exhibits **sufficient** awareness of task, purpose, and audience	Produces writing with **full** development of an **insightful** central idea, thesis, or sequenced events; **skillful** organization; and **rich** expression of ideas Exhibits **full** awareness of task, purpose, and audience
Language	Demonstrates **limited** reading vocabulary of sufficiently complex academic and domain-specific words and phrases **Partially** determines the meaning of unfamiliar words in text using a variety of strategies; shows **partial** understanding of various grammatical rules and literary devices in a text Demonstrates **little** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **solid** reading vocabulary of sufficiently complex academic and domain-specific words and phrases **Sufficiently** determines the meaning of unfamiliar words in text using a variety of strategies; shows **sufficient** understanding of various grammatical rules and literary devices in a text Demonstrates **mostly consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics	Demonstrates **comprehensive** reading vocabulary of sufficiently complex academic and domain-specific words and phrases **Skillfully** determines the meaning of unfamiliar words in text using a variety of strategies; shows **full** understanding of various grammatical rules and literary devices in a text Demonstrates **consistent** control of the standard English conventions of sentence structure, grammar, usage, and mechanics

MCAS Next-Generation Achievement-Level Descriptors
Mathematics

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

MCAS Achievement-Level Descriptors

Mathematics: Grades 3 through 8 and 10

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics All Grades	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Conceptual Understanding and Procedural Knowledge	• Demonstrates partial understanding of the grade appropriate numeration system • Performs some calculations and estimations • Identifies examples of basic math facts or mathematical concepts • Mostly reads and sometimes constructs graphs, tables, and charts	• Applies understanding of the base-ten system and fractions to interpret numbers and solve problems • Performs most calculations and estimations • Describes mathematical concepts and generates examples and counterexamples of concepts • Represents data and mathematical relationships using equations, verbal descriptions, tables, and graphs	• Performs complex calculations and estimations • Selects the best representations for a given set of data • Explains relationships between models such as equations, verbal descriptions, tables, and graphs • Applies math facts and connects mathematical concepts from various areas of mathematics, and uses the concepts to develop generalizations • Recognizes and makes use of structure, discerning patterns by seeing complicated things as single objects
Problem Solving	• Applies learned procedures to solve routine problems • Uses concrete objects or pictures to help conceptualize and solve problems	• Applies learned procedures and mathematical concepts to solve a variety of problems, including multi-step problems • Solves problems using multiple methods • Demonstrates the relationships between operations used to solve problems and the context of the problems	• Generates strategies and procedures to solve non-routine problems • Solves problems using multiple methods, evaluating reasonableness of intermediate steps leading to the standard algorithms • Draws connections between strategies • Analyzes givens, constraints, and relationships in problems, using multiple methods and appropriate tools
Mathematical Reasoning	• Applies some reasoning methods to solve routine problems	• Uses a variety of reasoning methods to solve routine and non-routine problems • Uses symbols to solve routine mathematical problems	• Reasons abstractly and quantitatively, using multiple reasoning methods to solve complex problems and provides justification for the reasoning • Decontextualizes situations and represents them symbolically
Mathematical Communication	• Identifies and uses basic terms	• Uses logical forms of representation (e.g., text, graphs, symbols) to illustrate steps to a solution	• Uses logical forms of representation (e.g., text, graphs, symbols) to justify solutions and solution strategies • Constructs viable arguments and critiques the reasoning of others, attending to precision

MCAS Next-Generation Achievement-Level Descriptors
Mathematics

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

MCAS Achievement-Level Descriptors

Mathematics: Grade 3

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 3	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Operation and Algebraic Thinking	• Determines products and quotients of whole numbers • Solves one-step word problems by multiplying and dividing within 100 with limited accuracy • Determines the unknown whole number in a multiplication or division equation • Recognizes simple arithmetic patterns	• Interprets products and quotients of whole numbers • Solves word problems by multiplying and dividing within 100 accurately • Solves two-step word problems with unknowns in equations involving all four operations • Applies the properties of multiplication • Recognizes arithmetic patterns • Recognizes products of two single-digit numbers • Uses equal groups and arrays to solve word problems involving multiplication and division within 100 • Consistently uses estimation strategies to assess the reasonableness of answers	• Creates and solves equations with unknown factors to solve word problems • Explains arithmetic patterns using the properties of operations • Uses area models to solve word problems involving multiplication and division within 100 • Recognizes products of two single-digit numbers and the related division facts
Number and Operations in Base Ten	• Uses place value to round two-digit numbers to the nearest 10 • Solves problems by adding and subtracting within 1000 using various strategies with limited accuracy	• Uses place value to round three-digit numbers to the nearest 10 • Fluently adds and subtracts within 1000 using various strategies • Solves problems involving multiplication of a one-digit whole number by multiples of 10 in the range 10–90	• Uses algorithms to add and subtract within 1000 and multiply one-digit whole numbers by multiples of 10 in the range 10–90, and explain why they work • Recognizes the relationship between addition and subtraction

Mathematics Grade 3	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Number and Operations – Fractions	• Visually identifies fractional parts of a whole • Recognizes equivalent fractions • Compares two fractions with like numerators or like denominators	• Identifies fractional parts of a whole • Identifies and represents fractions on number lines or other visual fraction models that are already created • Generates equivalent fractions • Represents whole numbers as fractions • Compares fractions with like numerators and denominators by reasoning about their size using visual fraction models that are already created, and symbols <, > and =	• Explains fraction equivalence • Recognizes and explains fractional equivalence of whole numbers • Creates visual fraction models to justify the size comparison made about two fractions that refer to the same whole.
Measurement and Data	• Tells, writes and measures time to the nearest minute • Identifies appropriate tools and units of measurement to solve problems • Uses line plots to solve problems • Uses scaled picture graphs and bar graphs to solve problems • Finds area by using non-standard units • Solves mathematical problems involving perimeters of polygons, including finding the perimeter given the side length	• Solves word problems involving addition and subtraction of time intervals in minutes • Selects and uses appropriate tools and units of measure to solve problems • Draws simple scaled picture graphs and bar graphs and uses them to solve one-step problems • Generates measurement data using rulers marked with halves and fourths of an inch • Creates line plots with whole numbers, halves and fourths to record and show data to solve problems • Finds area by using standard units • Relates multiplication and addition to area • Determines area by decomposing shapes into non-overlapping rectangles and adding the areas of the non-overlapping parts • Solves mathematical problems involving perimeters of polygons, including finding an unknown side length and identifies rectangles with the same perimeter and different area	• Uses estimation to solve word problems involving measurement • Draws scaled picture graphs and scaled bar graphs and uses them to solve two-step problems • Differentiates perimeter from area • Interprets scaled picture and bar graphs, and line plots • Solves mathematical and real-world problems involving perimeters of polygons, including finding an unknown side length and is able to reproduce rectangles with the same perimeter and different area
Geometry	• Identifies two-dimensional shapes based on their sides and angles • Partitions shapes into parts	• Describes two-dimensional shapes based their sides and angles • Partitions shapes into parts with equal areas and expresses the area as a unit fraction of the whole	• Compares and classifies two-dimensional shapes based on their sides and angles

MCAS Achievement-Level Descriptors

Mathematics: Grade 4

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 4	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Operation and Algebraic Thinking	• Interprets a multiplication equation as a comparison • Solves multiplication and division word problems • Solves two-step word problems using the four operations with whole numbers, including problems where remainders must be interpreted • Identifies multiplication facts through 12 x 12 • Identifies factor pairs in the 1-100 range • Identifies a pattern that follows a rule	• Recognizes verbal statements of multiplicative comparisons as multiplication equations. • Represents multiplication and division word problems using drawings and equations • Uses the four operations to solve multi-step word problems and represents the problems by equations • Identifies related multiplication and division facts through 12 x 12 • Finds factor pairs in the 1-100 range and recognizes that a whole number is a multiple of each of its factors • Distinguishes between prime and composite numbers in the range 1-100 • Identifies a pattern that follows a rule and generates a pattern, given a rule	• Explains the difference between multiplicative and additive comparison • Uses equations to represent problems, and justifies solutions with estimation • Identifies multiples and their corresponding factors and distinguishes between prime and composite numbers. • Generates patterns not explicit to the rule • Uses estimation to assess the reasonableness of answers

Mathematics Grade 4	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Number and Operations in Base Ten	• Reads and writes whole numbers using base-ten number names and expanded form • Uses place value understanding to round whole numbers to the thousands place • Solves problems involving multiplication of four-digit numbers by a one-digit numbers • Solves problems involving quotients and remainders with up to three-digit dividends and one-digit divisors based on place value and properties of operations	• Uses place value to recognize that in a multi-digit number, a digit in any place represents 10 times as much as it represents in the place to its right • Compares two multi-digit numbers based on place value position using <, > and = • Uses place value understanding to round whole numbers to the ten thousands place • Adds and subtracts whole numbers using the standard algorithm • Solves problems involving multiplication of two-digit numbers by two-digit numbers • Solves problems involving quotients and remainders with up to four-digit dividends and one-digit divisors, using p the relationship between multiplication and division understanding	• Uses place value understanding to round whole numbers up to one million • Uses understanding of structure to explain the standard algorithm for addition and subtraction. • Solves problems involving multiplication of four-digit numbers by one-digit, and justifies solutions by using equations, rectangular arrays or area models. • Justifies solutions using equations, rectangular arrays, and/or area models
Number and Operations – Fractions	• Recognizes equivalency in fractions • Compares fractions with different numerators and different denominators by using common denominators or common numerators • Decomposes fractions into a sum of fractions and uses visual fraction models to solve problems • Multiplies a fraction by a whole number	• Explains why fractions are equivalent using visual fraction models • Consistently compares two fractions when the two fractions refer to the same whole • Consistently compares two decimals when the two decimals refer to the same whole • Compares fractions with different numerators and different denominators by comparing to a benchmark fraction • Adds and subtracts fractions with like denominators • Decomposes fractions into a sum of fractions and uses equations to solve problems • Adds and subtracts mixed numbers with like denominators by replacing with equivalent fraction and by using properties of operations or the relationship of addition and subtraction • Uses visual fraction models and equations to solve word problems involving multiplication of a fraction by a whole number • Uses decimal notation to represent fractions with denominators of 10 and 100 • Compares decimals to hundredths by reasoning about their size	• Generates equivalent fractions including fractions greater than 1 • Decomposes fractions into a sum of fractions and justifies solutions to problems with visual fraction models and equations • Justifies the conversion of a fraction with denominator of 10 to an equivalent fraction with a denominator of 100 and expresses it as a decimal

Mathematics Grade 4	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Measurement and Data	• Solves measurement problems involving whole numbers using all four operations • Solves measurement problems involving perimeter and area • Interprets data presented in line plots (dot plots) and uses addition and subtraction of fractions to solve problems involving line plots • Identifies concepts of angles and angle measurement	• Solves problems involving converting measurements from larger units to smaller units • Creates line plots (dot plots) in fractions of a unit (1/2, ¼, 1/8), to display given data, and uses addition and subtraction of fractions solve problems involving line plots • Uses a protractor to measure, sketch or interpret an angle • Finds unknown angles in diagrams • Justifies solutions to perimeter and area problems	• Reasons about relative sizes of measurement units within one system of units • Sketches an angle without a protractor
Geometry	• Identifies right triangles, points, lines, line segments, rays, angles, perpendicular and parallel lines, lines of symmetry	• Identifies right triangles and draws points, lines, line segments, rays, angles, perpendicular and parallel lines, in two dimensional shapes • Classifies two-dimensional shapes based on their attributes, including the presence and absence of parallel or perpendicular lines or angles of a specified size. • Recognizes lines of symmetry in two-dimensional figures and identifies line-symmetric figures	• Draws two-dimensional shapes based on attributes.

MCAS Achievement-Level Descriptors

Mathematics: Grade 5

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 5	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Operation and Algebraic Thinking	• Recognizes when parentheses, brackets, or braces are appropriately used in numerical expressions • Given two rules, generates numerical patterns	• Uses parentheses, brackets, or braces to write, interpret and evaluate numerical expressions • Interprets numerical expressions without evaluating • Given two rules, identifies the relationship between corresponding terms	• Given two rules, forms and graphs ordered pairs and interprets the relationship between corresponding terms
Number and Operations in Base Ten	• Recognizes that in a multi-digit number, including a decimal, a digit in any place represents 10 times as much as it represents in the pace to its right or 1/10 of what it represents in the place to its left • Reads decimals to thousandths using base 10 numerals, number names, and expanded form • Identifies which comparison symbols to use when comparing decimals to hundredths • Uses various strategies to solve problems involving all operation with whole numbers including quotients with division limited to four-digit dividends and 2-digit divisors • Solves problems involving addition and subtraction with decimals to tenths • Identifies the quotient of whole numbers	• Uses whole number exponents to denote powers of 10 • Uses place value to round decimals to any place • Fluently multiplies multi-digit whole numbers • Writes decimals to thousandths using base ten numerals, number names, expanded form and comparison symbols • Compares decimals using base ten numerals, number names and comparison symbols <, > and = • Uses various strategies to solve problems involving all operation with whole numbers including quotients with division limited to four-digit dividends and 2-digit divisors and explains using rectangular arrays and/or area models • Applies understandings of models for decimals, place value, and properties of operations to add, subtract, multiply and divide decimals to hundredths • Solves mathematical and real-world problems involving multiplication of whole numbers and decimals to hundredths using the standard algorithm. • Uses models to find the quotients of whole numbers. • Solves problems involving all operations on decimals to hundredths.	• Uses place value understanding of multi-digit numbers including decimals to explain patterns in the number of zeros and the placement of the decimal point, when multiplying a number by powers of 10. • Compares decimals using expanded form • Makes reasonable estimates of decimal results • Explains understandings of models for decimals, decimal notation, and properties of operations to add, subtract, multiply and divide decimals to hundredths • Uses the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers to understand and explain why the procedures for multiplying and dividing finite decimals make sense.

Mathematics Grade 5	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Number and Operations – Fractions	• Adds and subtracts fractions with like denominators (including mixed numbers) • Uses visual fraction models to multiply fractions or whole numbers by fractions • Finds areas or rectangles with fractional side lengths by tiling with unit squares • Recognizes multiplication as scaling by comparing the factors with computation	• Adds and subtracts fractions with unlike denominators (including mixed numbers) • Uses visual fraction models to solve real-world problems by multiplying fractions or whole numbers by fractions, and fractions by mixed numbers • Shows that the area of rectangles with fractional side lengths, found by tiling with unit squares, is the same as multiplying the side lengths • Recognizes multiplication as scaling by comparing the factors without computation • Interprets division of a unit fraction by a non-zero whole number and division of a whole number • Solves real-world and mathematical problems involving division of a unit fraction by a non-zero whole number and a whole number by a unit fraction	• Applies understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators in the context of solving word p problems. • Uses understanding of fraction equivalence to make sense of sums and differences of fractions and makes reasonable estimates of them. • Uses the relationship between multiplication and division of fractions to solve and explain mathematical and real-world problems including finding the area of rectangles with fractional side lengths, finding quotients of division of non-zero whole number by unit fractions
Measurement and Data	• Converts among different-sized measurement units within a given measurement system • Interprets and represents data presented in line plots (dot plots) to solve problems • Recognizes volume as an attribute of solid figures and calculates volume of right rectangular prisms by packing it with unit cubes, counting unit cubes, and with standard and non-standard units	• Applies conversion among different-sized measurement units within a given measurement system to solve multi-step real-world problems • Uses a line plot (dot plot) to represent data and uses operations on fractions to solve problems involving the line plots • Recognizes volume as additive and calculates volume by finding the total number of same-size units of volume required to fill a space without gaps or overlaps. • Decomposes three-dimensional shapes and finds volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes	• Uses appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume with application of the volume formula • Decomposes three-dimensional shapes and finds volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes and relate to the volume formula • Solves real world application problems requiring the application of V =lwh and V=Bh
Geometry	• Represents mathematical and real-world problems by locating points in the first quadrant • Identifies two-dimensional figures based on properties	• Represents mathematical and real-world problems by locating and graphing in the first quadrant • Classifies two-dimensional figures in a hierarchy based on properties	• Solves mathematical and real-world problems by graphing in the first quadrant and interpreting the coordinate values of points based on the context of the situation • Applies knowledge of number and length to the order and distance relationships of a coordinate plane

MCAS Achievement-Level Descriptors

Mathematics: Grade 6

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 6	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
The Number System	• Interprets quotients of fractions to solve problems • Identifies greatest common factors or least common multiples • Uses positive and negative numbers to describe quantities having opposite directions or values • Solves mathematical problems by using all operations on multi-digit decimals • Graphs ordered pairs in all four quadrants to solve problems • Interprets statements of order for rational numbers	• Computes quotients of fractions to solve problems • Uses prime factorization to find the greatest common factors, least common multiples to solve problems • Represents quantities in real-world context on a number line, explaining the meaning of zero • Uses the understanding of structure to explain the standard algorithm to divide multi-digit numbers • Uses the standard algorithm to fluently operate on multi-digit decimals • Finds the absolute value of a rational number by recognizing its distance from zero on the number line • Uses the standard algorithm to divide multi-digit numbers • Computes all operations on multi-digit decimals • Solve problems by graphing in all four quadrants and finds distances between points with same first coordinate or same second coordinate • Interprets and writes statements of order for rational numbers	• Applies interpretation of quotients of fractions to solving word problems • Uses visual fraction models to solve word problems involving computing quotients of fractions • Applies number theory concepts to the solution of problems. • Solves problems involving order and absolute value of rational numbers

Mathematics Grade 6	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Ratios and Proportional Relationships	• Identifies part to part and part to whole relationships • Uses rate language in the context of a ratio relationship • Sometimes solves unit rate problems	• Solves problems requiring part to part ratios to be converted to part to whole ratios • Consistently solves unit rate problems • Uses rate reasoning to solve problems • Finds the percent of a quantity • Uses ratio reasoning to convert measurement units within measurement systems • Interprets and manipulates models with ratios such as tape diagrams, tables, and double number lines to compare ratios	• Determines what percent of a quantity is a given amount • Explains when to use part to part ratios, and when to use part to whole ratios to solve problems • Uses ratio reasoning to convert measurement units between measurement systems • Creates models with ratios such as tape diagrams, tables, and double number lines to compare ratios • Relates mass of an object to its volume to solve problems
Expressions and Equations	• Evaluates given expressions and equations involving whole-number exponents to solve problems • Identifies parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient)	• Interprets, evaluates, and writes expressions and equations involving whole-number exponents • Views one or more parts of an expression as a single entity • Generate and identify equivalent expressions • Relates tables and graphs to equations • Writes and solves equations of the form $x + p = q$ and $px = q$ • Solves and graphs inequalities that represent a constraint or condition in a mathematical or real-world problem. • Analyzes the relationships between dependent and independent variables in real-world problems.	• Writes and graphs inequalities that represent a constraint or condition in a mathematical or real-world problem • Creates equations of the form $x + p = q$ and $px = q$ from a given situation • Uses equations to describe relationships between quantities

Mathematics Grade 6	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Geometry	• Solves mathematical problems involving areas of triangles, including right triangles and quadrilaterals • Solves mathematical problems involving volume of right rectangular prisms with whole number edge lengths • Represents three-dimensional figures using nets • Given coordinates of a polygon, draws the polygon on a coordinate plane	• Solves real-world problems involving areas of triangles, including right triangles and quadrilaterals by decomposing shapes, rearranging or removing pieces, and relating shapes to rectangles • Finds volume of right rectangular prisms with fractional edge lengths • Uses nets of three-dimensional figures to find the surface area • Given coordinates of a polygon on a coordinate plane, finds lengths of the sides of the polygon	• Reasons about geometric shapes and their measurements • Develops, and justifies formulas to solve mathematical and real-world problems that involve areas of triangles, including right triangles, and quadrilaterals • Applies the formula for volume of right rectangular prisms with fractional edge lengths • Applies knowledge of nets to solve mathematical and real-world problems involving surface area • Given coordinates of a polygon (without a coordinate plane), finds lengths of the sides of the polygon and applies these techniques to solve real-world problems
Statistics and Probability	• Recognizes a statistical question • Visually recognizes measures of center and variability • Interprets dot plots and histograms	• Solve problems involving finding the measures of center and variability • Constructs dot plots, histograms, box plots and circle graphs given real-world situations	• Recognizes that a data distribution may not have a definite center, and different ways to measure center can yield different values, and uses this understanding to interpret a situation • Describes and summarizes numerical data sets, identifying clusters, peaks, gaps, and symmetry in a real-world problem

MCAS Achievement-Level Descriptors

Mathematics: Grade 7

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 7	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
The Number System	• Represents addition and subtraction on a horizontal and vertical number line • Operates with rational numbers	• Recognizes situations in which opposite quantities combine to make zero • Operates with rational numbers in mathematical and real-world problems • Translates between rational numbers and decimals	• Translates from repeating decimal form of a rational number to fraction form • Interprets quotient and remainder of rational numbers • Applies properties of operations as strategies to add, subtract, multiply and divide
Ratios and Proportional Relationships	• Recognizes a proportional relationship • Uses ratios and proportionality to solve simple mathematical problems, including percent problems	• Represents a proportional relationship by equations • Sometimes uses ratios and proportionality to solve multi-step mathematical and real-world problems, including percent problems • Interprets the meaning of any point on a graph of a proportional relationship	• Consistently uses ratios and proportionality to solve multi-step mathematical and real-world problems, including percent problems
Expressions and Equations	• Uses properties of operations to add and subtract linear expressions • Solves simple mathematical problems using numerical and algebraic expressions and equations • Identifies simple arithmetic and geometric sequences from tables, graphs, words, and expressions. • Extends patterns in simple arithmetic and geometric sequences from tables, graphs, words, and expressions.	• Uses properties of operations to expand linear expressions • Uses properties of operations to factor linear expressions • Given a real-world problem, rewrites expressions in different forms to show understanding of the problem • Interprets the solution of an inequality in a real-world problem • Solves multi-step mathematical and real-world problems using numerical and algebraic expressions and equations • Fluently converts between different forms • Create equations and inequalities to solve problems • Graphs the solutions of an inequality	• Uses properties of operations to factor linear expressions and interprets the result in the context of a problem • Justifies solutions to multi-step problems • Analyzes patterns and determines expressions for simple arithmetic and geometric sequences using tables, graphs, words, and expressions

Mathematics Grade 7	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Geometry	• Draws triangles with given conditions • Applies the formulas to find the circumference of circles • Applies the formulas to find the area of two-dimensional figures, including circles • Recognizes attributes of angles (supplementary, complementary, vertical, adjacent)	• Constructs triangles with given conditions and describes some of their attributes • Describes the shape of the two-dimensional face of the figure that results from slicing three-dimensional figures. • Solves problems involving the relationship between area and circumference of circles • Solves problems involving the surface area and volume of three-dimensional shapes • Solves mathematical problems involving scale drawings • Solves multi-step problems using attributes of angles (supplementary, complementary, vertical, adjacent)	• Finds unknown supplementary, complementary, vertical, and adjacent angles by solving equations
Statistics and Probability	• Makes inferences about a population by examining the sample population • Visually compares two populations based on measures of center and variability • Differentiates between representative and non-representative samples • Identifies probability as a number between 0 and 1 • Finds probabilities of simple events	• Uses random sampling to draw inferences about a population • Recognizes the probabilities of 0 through 1 as likely, unlikely, or neither. • Develops probability models and uses it to find probabilities of events • Finds probabilities for compound events using organized lists, tables, and tree diagrams	• Evaluates probability models • Designs and uses a simulation to generate frequencies for compound events • Computes the differences of the centers as a multiple of the measure of variability for two populations

MCAS Achievement-Level Descriptors

Mathematics: Grade 8

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 8	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
The Number System	• Distinguishes between rational and irrational numbers	• Recognizes that rational and irrational numbers have decimal expansions • Uses rational approximations of irrational numbers to compare the size of irrational numbers • Finds approximate location of irrational numbers on the number line • Finds rational approximations of irrational numbers	• Estimates the values of expressions with irrational numbers • Converts a decimal expansion which repeats eventually to a rational number
Expressions and Equations	• Identifies the properties of integer exponents • Know that √2 is irrational • Uses and evaluates square root s of small squares • Graphs proportional relationships, and identifies the unit rate as the slope • Solves one-variable linear equations with one or many solutions • Recognizes that the point of intersection of two linear equations is the solution	• Applies the properties of integer exponents to generate equivalent expressions • Performs operations with decimals and scientific notation • Uses and evaluates cube roots of small cubes • Uses numbers in the form of a single digit times an integer power of 10 to estimate the magnitude and relationships of quantities • Uses scientific notation and chooses appropriate units of measurement for varying magnitudes • Uses linear equations and systems of linear equations to represent and solve problems. • Compares proportional relationships represented in different ways • Recognizes the difference between proportional and non-proportional in linear relationships • Solves one-variable linear equations with rational coefficients • Solves systems of two linear equations algebraically or graphically in real-world and mathematical problems	• Uses numbers in the form of a single digit times an integer power of 10 to estimate the magnitude and interpret relationships of quantities in word problems • Uses linear equations and systems of linear equations to represent, analyze, and solve problems. • Use similar triangles to explain why the slope is the same between any two distinct points on a non-vertical line in the coordinate plane • Derives the equation y=mx for a line through the origin and the equation y=mx + b for a line intercepting the vertical axis b • Estimates solutions to systems of two equations from a graph • Uses understanding of a proportional relationship and structure to interpret the meaning of b, the vertical axis intercept

Mathematics Grade 8	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Functions	• Identifies a relationship as a function • Interprets the equation of a linear function	• Determines the rate of change and initial value of a function from a table or graph • Compares the properties of functions represented in different ways • Writes a function to model a linear relationship • Determines the rate of change of a function from a table, graph, or description • Describes or sketches functional relationships represented graphically	• Identifies functions as linear and non-linear from graphs or equations • Interprets the rate of change of a function from a table, graph, equation, or description
Geometry	• Identifies the properties of rotations, reflections and translations • Uses the relationship among the sides of a right triangle to solve problems • Translates and reflects two dimensional figures • Uses Pythagorean theorem to find the hypotenuse	• Describes the congruence relationship between two congruent figures • Describes the effect of transformations on two-dimensional figures using coordinates • Describes the similarity relationship between two similar figures • Rotates two-dimensional figures around the origin • Finds angle sum and exterior angle of triangles, angles created when parallel lines are cut by a transversal, and angle-angle criterion for similarity of triangles • Applies the Pythagorean theorem to find distances between points on the coordinate plane • Applies the Pythagorean theorem to determine the unknown side lengths in right triangles in mathematical and real-world problems • Solves mathematical and real-world problems involving volume of cones, cylinders, and spheres	• Use informal arguments to establish facts about the angle sum and exterior angle of triangles, angles created when parallel lines are cut by a transversal, and angle-angle criterion for similarity of triangles • Justifies Pythagorean theorem and its converse • Given the volume of a cone, finds unknown dimensions of the cone • Given the volume of a cylinder, finds unknown dimensions of the cylinder • Given the volume of a sphere, finds unknown dimensions of the sphere
Statistics and Probability	• Describes the patterns associated with bivariate data • Identifies and constructs a line of best fit	• Constructs and interprets scatter plots • Constructs and interprets two-way tables • Uses the equation of a linear model to solve problems	• Interprets the slope and intercept of linear models • Analyzes scatter plots • Analyzes relative frequencies in two-way tables

MCAS Next-Generation Achievement-Level Descriptors
Mathematics

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

MCAS Achievement-Level Descriptors

Mathematics: Grade 10

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations, and Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Mathematics Grade 10	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Number and Quantity	• Rewrites expressions involving integer exponents using the properties of exponents • Uses units as a way to understand problems and chooses units consistently in formulas • Chooses the scale and the origin in graphs and data displays • Identifies significant figures in recorded measures and computed values based on the context given and the precision of the tools used to measure • Identifies appropriate quantities for the purpose of descriptive modeling	• Rewrites expressions involving radical and rational exponents using the properties of exponents • Performs operations on rational and irrational numbers • Determines whether the solution of operations on two numbers would be rational or irrational • Interprets units consistently in formulas and uses units to solve multi-step problems. • Interprets the scale and the origin in graphs and data displays • Defines appropriate quantities for the purpose of descriptive modeling • Chooses a level of accuracy appropriate to limitations on measurement when reporting quantities • Describes the effects of approximate error in measurement and rounding on measurements and on computed values from measurements	• Explains how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of radical exponents • Explains why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational
Algebra	• Usually interprets parts and structures of linear expressions • Chooses an equivalent form of an expression to reveal properties of the quantity represented by the expression • Identifies, combines, and expands like terms when performing operations on polynomial expressions • Creates linear equations and inequalities in one variable and uses them to solve problems • Creates equations in two variables to represent relations between quantities	• Consistently interprets parts of an expression based on real-world context • Usually interprets the structure of quadratic and exponential expressions with integer exponents • Factors polynomial expressions • Creates quadratic and exponential equations in one variable and uses them to solve problems • Creates equations with more than two variables • Represents constraints by linear equations/ inequalities and by systems of linear equations/inequalities • Constructs viable arguments to justify or refute a solution method for linear equations/inequalities	• Interprets complicated expressions by viewing one or more of their parts as a single entity • Chooses and produces an equivalent form of an expression to explain properties of the quantity represented by the expression • Completes the square in a quadratic expression to reveal the maximum or minimum value of the function it defines • Recognizes that the system of polynomials is similar to the system of integers in that they are both closed under certain operations • Interprets solutions of linear equations or inequalities as viable or non-viable options in a modeling context

Mathematics Grade 10	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
	• Graphs the equations on coordinate axes with labels and scales • Rearranges formulas to highlight a quantity of interest using the same reasoning as in solving equations • Solves and explains each step in solving linear equations and inequalities in one variable • Solves system of linear equations exactly and approximately • Knows that the graph of an equation in two variables is the set of all its solutions • Graphs the solutions of linear inequality in two variables	• Usually solves linear equation/inequalities in one variable involving absolute value • Solves a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically • Finds and is able to explain the solutions of linear equations $y = f(x)$ and $y = g(x)$ approximately, using technology to graph the functions and make tables of values • Graphs the solution set of a system of linear inequalities in two variables	• Uses the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions • Derives the quadratic formula • Recognizes when solutions of a quadratic equation results in non-real solutions and write them as a ± bi for real numbers a and b • Proves that, given a system of equations in two variables, replacing one equation by the sum of that equation and a multiple of the other to produces a system with the same solutions
Functions	• Knows the structure of a function and uses function notation to evaluate and interpret functions • Distinguishes between an arithmetic and a geometric sequence • Interprets key features of graphs and tables for a function that models a relationship • Calculates and interprets the average rate of change of a function presented symbolically or as a table • Graphs linear functions to show intercepts • Compares properties of functions each represented algebraically, graphically, numerically in tables, or by verbal descriptions • Distinguishes between situations that model linear functions and exponential functions • Constructs linear functions given a graph, a description of a relationship, or input-output pairs • Draws comparisons between exponential and linear graphs	• Interprets symmetries of graphs and tables in terms of the quantities • Relates the domain of a function to its graph • Estimates the rate of change from a graph. • Graphs functions and uses the properties of functions to create equivalent functions • Interprets zeros, maximum/minimum values, and symmetry of the graph • Writes quadratic and exponential functions to describe relationship between quantities • Determines an explicit expression or steps for calculation from a context • Writes arithmetic and geometric sequences both recursively and with an explicit formula • Identifies the effect on a graph of a function by replacing $f(x)$ with $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k • Finds the inverse of a linear function • Constructs exponential functions given a graph, a description of a relationship, or input-output pairs • Draws comparisons between exponential and quadratic graphs • Interprets the parameters in a linear function	• Recognizes that sequences are functions that are sometimes defined recursively • Interprets relative maximums and minimums and end behavior of graphs and tables in terms of the quantities • Uses graphs to show relative maximums and minimums; symmetries; and end behavior • Graphs piecewise-defined functions, including step functions • Creates equivalent functions to explain different properties of the function • Uses process of completing the square in a quadratic function to show zeros, maximum/minimum values, and symmetry of the graph • Determines a recursive process, or steps for calculation from a context • Uses recursive and explicit formulas to model situations, and translates between the two forms • Utilizes technology to experiment with cases and illustrates an explanation of the effects on the graph of linear, quadratic, exponential, or absolute value functions • Interprets the parameters in an exponential function

Mathematics Grade 10	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:

Geometry	• Knows precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc
	• Represents rigid transformations in the plane
	• Compares transformations that preserve distance and angle to those that do not and identifies a sequence of transformations that will carry a given figure onto another
	• Finds angle sum and exterior angle of triangles, angles created when parallel lines are cut by a transversal, and angle-angle criterion for similarity of triangles
	• Uses congruence and similarity criteria for triangles to solve problems
	• Uses Pythagorean Theorem to solve right triangles
	• Uses coordinates to compute perimeters of polygons and areas of triangles and rectangles
	• Uses volume formulas for cylinders, cones, and spheres to solve problems
		• Uses geometric descriptions of rigid motions to solve problems
		• Applies properties of polygons to the solutions of problems
		• Verifies experimentally the properties of dilations given by a center and a scale factor
		• Uses congruence and similarity criteria for triangles to prove relationships in geometric figures
		• Knows that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles
		• Uses Pythagorean Theorem to solve right triangles in applied problems
		• Identifies relationships among inscribed angles, radii, and chords
		• Uses the fact that the length of the arc intercepted by an angle is proportional to the radius to solve problems
		• Uses the slope criteria for parallel and perpendicular lines to solve geometric problems
		• Finds the point on a directed line segment between two given points that partitions the segment in a given ratio
		• Uses volume formulas for pyramids to solve problems
			• Develops definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments
			• Explains how the criteria for triangle congruence follow from the definition of congruence in terms of rigid motions
			• Makes formal geometric constructions
			• Proves theorems about:
			  ○ triangles
			  ○ parallelograms
			  ○ circles
			  ○ polygons
			• Proves the Pythagorean Theorem using triangle similarity
			• Explains the relationship between the sine and cosine of complementary angles
			• Uses trigonometric ratios to solve right triangles in applied problems
			• Uses relationships among inscribed angles, radii, and chords to solve problems
			• Derives the formula for the area of a sector.
			• Derives the equation of a circle to find the center and the radius
			• Derives the equation of a parabola given a focus and directrix
			• Uses coordinates to prove simple geometric theorems algebraically, including the distance formula and its relationship to the Pythagorean Theorem
			• Proves the slope criteria for parallel and perpendicular lines
			• Uses dissection arguments, Cavalieri's principle, and informal limit arguments to give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone

Mathematics Grade 10	Partially Meeting Expectations On MCAS, a student at this level:	Meeting Expectations On MCAS, a student at this level:	Exceeding Expectations On MCAS, a student at this level:
Statistics and Probability	• Represents data with plots on the real number line • Usually uses statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets • Usually interprets differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers) • Interprets relative frequencies in the context of the data • Represents data on two quantitative variables on a scatter plot and describes how the data are related • Fits a linear function for a scatter plot that suggests a linear association and interprets the slope and the intercept of the model • Informally assesses the fit of a function by plotting and analyzing residuals • Describes events as subsets of a sample space using characteristics of the outcomes, or as unions, intersections, or complements of other events • Constructs and interprets two-way frequency tables of data when two categories are associated with each object being classified	• Consistently uses statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets • Consistently interprets differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers) • Recognizes possible associations and trends in the data contained in a two-way frequency table • Fits a linear function to the data and uses the fitted function to solve problems in the context of the data • Computes and interprets the correlation coefficient of a linear fit • Distinguish between dependent and independent events • Uses a two-way table to approximate conditional probabilities • Recognizes the concepts of conditional probability and independence in everyday language and everyday situations • Applies the addition rule to calculate probabilities	• Applies the addition rule and interprets the answer in terms of the model • Distinguishes between correlation and causation • Knows that the conditional probability of A given B is P(A and B)/P(B) and uses it to solve problems • Explains the concepts of conditional probability and independence in everyday language and everyday situations

MCAS Next-Generation Achievement-Level Descriptors
Science and Technology/Engineering

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

Grade 5 MCAS Next-Generation Achievement-Level Descriptors

Science and Technology/Engineering

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

STE Grade 5	**Partially Meeting Expectations** *On MCAS, a student at this level:*	**Meeting Expectations** *On MCAS, a student at this level:*	**Exceeding Expectations** *On MCAS, a student at this level:*
Understanding and Application of Disciplinary Core Ideas	Demonstrates a partial understanding of some scientific concepts and processes by identifying and sometimes describing or providing evidence for these concepts and processes. Uses some basic scientific terms in common scientific examples.	Demonstrates a solid understanding of many scientific concepts and processes by mostly describing, explaining, and providing evidence for these concepts and processes. Mostly applies appropriate scientific terms in a variety of applications, including common science examples and some novel situations.	Demonstrates a comprehensive, in-depth understanding of many scientific concepts and processes by consistently describing, explaining, and providing evidence for these concepts and processes. Consistently applies scientific terms in appropriate contexts in both common science examples and many novel situations.
Understanding and Application of Scientific and Engineering Practices	Identifies a testable, scientific question for an investigation. Completes a simple, commonly used model. Uses simple graphs or data to draw general conclusions about a familiar scientific investigation or phenomena. Identifies evidence to support a claim. Describes a benefit or drawback of simple design features given a familiar device or prototype.	Develops some testable, scientific questions for an investigation. Completes or uses a model and describes some strengths and weaknesses of the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a familiar scientific investigation or phenomena. Provides some evidence to support a claim and constructs basic explanations for scientific phenomena or results from an investigation. Analyzes design features of a familiar device or prototype and describes a benefit or drawback of the design.	Consistently develops testable, scientific questions for an investigation. Creates a model, consistently describes the strengths and weaknesses of the model, and provides information for how to improve the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a novel or complex scientific investigation or phenomena. Provides several pieces of evidence to support a claim and constructs thorough explanations for scientific phenomena or results from an investigation. Analyzes design features of a novel device or prototype and constructs an explanation for how the design features meet criteria for success or are limited by constraints.

Grade 5 MCAS Next-Generation Achievement-Level Descriptors

Science and Technology/Engineering

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Earth and Space Science	**Partially Meeting Expectations** *On MCAS, a student at this level:*	**Meeting Expectations** *On MCAS, a student at this level:*	**Exceeding Expectations** *On MCAS, a student at this level:*
ESS1. Earth's Place in the Universe	Identifies the Sun, the Moon, and Earth in a model. Recognizes that the Sun is a star. Recognizes that people at different locations on Earth may experience day and night at the same time. Given a pattern of moon phases, selects the Moon phase that completes the pattern. Recognizes that shadows change over the course of a day because of the apparent movement of the Sun. Supports a claim with evidence that an environment has changed over time, such as a forested area that was once covered by water. Classifies whether geologic structures were formed by erosion or deposition.	Completes a model of the Sun, the Moon, and Earth and mostly describes the movements of each. Recognizes that the Sun is the only star in our solar system. Constructs an explanation for why people on Earth experience day and night. Describes how the Moon reflects the Sun's light and makes a pattern over approximately one month. Uses a model to show the pattern of the Moon over a week or a month. Completes a model showing the relationship between a shadow's length and the position of the Sun in the sky. Generally, describes the processes of erosion or deposition. Identifies the relative age of rock layers based on the position of the rock layers.	Develops a model of the Sun, the Moon, and Earth and consistently describes the movements of each. Explains why the Sun appears brighter than other stars. Constructs an explanation with evidence for why people at one location on Earth are experiencing day while people at another location on Earth are experiencing night. Explains how the Moon's reflection of the Sun's light and the orbit of the Moon are responsible for the phases of the Moon. Constructs an explanation for why the length and direction of a shadow changes during a day. Constructs an explanation with evidence of how erosion and deposition can change geologic structures or an area over time.

Earth and Space Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
ESS2. Earth's Systems	Uses weather data tables or simple graphs to describe one of the following: precipitation, wind speed, or temperature for an area. Differentiates between two different types of climates. Completes a simple model of the water cycle. Identifies on a map where a volcano or earthquake is likely to occur. Recognizes evidence of weathering or erosion in a diagram or simple description. Interprets simple graphs to draw general conclusions about the relative amounts of fresh and saltwater on Earth.	Analyzes simple weather data patterns to describe expected weather for an area. Analyzes climate data for several different regions and describes differences in weather patterns. Recognizes that different regions can have different climate types. Completes a model of the water cycle and describes what is happening in most of the water cycle stages. Analyzes a map to locate where mountain ranges, ocean trenches, volcanoes, and earthquakes are likely to occur. Describes the processes of weathering and erosion and applies them to common examples, such as landslides, canyons, valleys, etc. Analyzes a map to identify water sources as fresh or saltwater, including fresh water stored in glaciers and polar ice caps.	Analyzes and interprets graphs and tables to draw conclusions about various weather patterns. Explains the difference between weather and climate and uses climate data to draw conclusions about the expected weather patterns of different climate types (e.g., desert, tropical, tundra). Develops a model of the water cycle, including absorption and surface runoff, and describes how heat energy is needed for water to cycle. Explains why mountain ranges, ocean trenches, volcanoes, and earthquakes occur at plate boundaries. Explains how landscapes change due to weathering and erosion and provides examples of each process. Describes different sources of fresh water and saltwater and explains why it is important to understand the relative amounts of these types of water on Earth.
ESS3. Earth and Human Activity	Categorizes some common examples of renewable and nonrenewable energy resources. Identifies one way to reduce human impact on the environment for a given situation. Identifies one design solution to reduce the impact of a weather event, such as a hurricane, or other natural event, such as an earthquake, on humans. Identifies a testable question about a filter to determine how well the filter will work.	Explains why some sources of energy are considered renewable and others are not. Consistently categorizes energy sources as either renewable or nonrenewable. Describes different ways to reduce human impact on the environment for a given situation. Identifies multiple design solutions to reduce the impact of a weather event or other natural event on humans. Develops a testable question about how to improve the design of a filtering system and provides information about how to answer the question.	Explains how humans have impacted the environment in different ways and constructs explanations for how to reduce those impacts on the environment. Identifies multiple design solutions to reduce the impact of a weather event or other natural event on humans and explains how each design solution could reduce the impact. Develops testable questions about how to make several improvements to the design of a filtering system and provides evidence for how the improvements will better filter the water.

Grade 5 MCAS Next-Generation Achievement-Level Descriptors

Science and Technology/Engineering

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Life Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS1. From Molecules to Organisms: Structures and Processes	Completes a model of an organism's life cycle and describes the importance of one stage of the life cycle. Supports a claim with evidence about how the function of an animal or plant structure helps it to survive. Recognizes that photosynthesis is important for the survival of a plant.	Compares the life cycles of two organisms and describes similarities between the two life cycles, including the importance of some of the stages. Supports claims with evidence about how different functions of animal or plant structures help the animal or plant to survive. Completes a model showing some of the inputs (sunlight, air, water) or outputs (sugars) of photosynthesis.	Constructs an explanation for why each stage of the life cycle is important, using examples of both plants and animals. Supports claims with evidence about how several structures of animals and plants allow for the survival, growth, and reproduction of different organisms. Develops a model showing the inputs and outputs of photosynthesis and explains the importance of photosynthesis for the survival and growth of a plant.
LS2. Ecosystems: Interactions, Energy, and Dynamics	Analyzes a simple food web or other model and identifies the ecological role of some of the organisms. Recognizes that the energy organisms depend on originates from the Sun. Describes one way animals and plants use energy. Identifies the function of a composter and one design element of a composter. Identifies a type of organism (bacteria or fungi) that breaks down dead organisms.	Analyzes a food web or other model, identifies the ecological roles of several of the organisms, and describes some of the roles of the organisms. Analyzes a model and describes the flow of energy through a simple food web. Analyzes several composter designs and describes some advantages and disadvantages of each design. Describes the importance of decomposers in recycling matter back to the soil.	Analyzes food webs and other models and consistently describes the ecological roles of the organisms. Completes a model to show energy transfer through a food web and describes how energy is transferred from one organism to another. Analyzes several composter designs, describes several advantages and disadvantages of each, and explains which composter is best to use. Explains what would happen to an ecosystem without decomposers and explains how decomposers recycle matter back into both the soil and air.

Life Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS3. Heredity: Inheritance and Variation of Traits	Provides observable evidence that traits are inherited from a parent. Recognizes that some basic characteristics are inherited, while others are a result of the environment.	Analyzes data and draws some conclusions about familiar traits that are inherited and characteristics that are a result of the environment.	Analyzes novel data and draws conclusions about traits that are inherited and characteristics that are a result of the environment.
LS4. Biological Evolution: Unity and Diversity	Identifies the type of environment where an organism once lived based on fossilized remains. Supports a claim with one piece of evidence for how some individuals within a population may have a survival advantage over other individuals in the population. Uses evidence, such as an organism's structure, to describe how an organism is well adapted to its environment. Recognizes what may happen to an organism if its environment changes and it is unable to move away.	Classifies fossils based on their physical characteristics, including the type of environment where the fossilized organism once lived. Supports a claim with several pieces of evidence for how some individuals within a population may have a survival advantage over other individuals in the population. Identifies an example of how an organism is well adapted to its environment. Describes what will happen to a population if individuals within that population are unable to reproduce.	Constructs an explanation for why the fossil record is incomplete due to many organisms not being fossilized. Given data about the characteristics of a novel organism, draws conclusions and explains how the organism is well adapted to its environment. Explains, with evidence, if an organism is likely to survive environmental changes. Explains why reproduction is critical to the survival of a species.

Grade 5 MCAS Next-Generation Achievement-Level Descriptors

Science and Technology/Engineering

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Physical Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
PS1. Matter and Its Interactions	Analyzes a simple particle model of matter and identifies the phase of the substance. Completes a graph to show the masses of substances after a phase change or after a chemical reaction. Analyzes a simple set of data to determine the best material to use in a common situation, based on the material's characteristic properties. Determines if a chemical reaction occurred or if a mixture was formed during an investigation and provides one piece of evidence to support the claim.	Analyzes a particle model of a substance before and after a phase change to determine phases of the substance and the phase change that occurred. Constructs an explanation about how mass is conserved during a phase change or a chemical reaction. Analyzes a set of data about materials, identifies the best material to use in a given situation, and provides evidence for the reasoning. Develops a question to determine if a chemical reaction occurred or if a mixture was formed during an investigation and provides possible answers to the question with pieces of evidence to support the answers.	Analyzes particle models of substances before and after phase changes to determine the phase change that occurred and describes whether heat was added or removed. Describes an investigation that could be used to show that mass is conserved during a phase change or chemical reaction. Analyzes multiple sets of data to determine the best materials to use in a variety of different situations, based on the material's characteristic properties. Supports the conclusions with evidence from the data. Describes an investigation that could be used to determine if a chemical reaction will occur or if a mixture will be formed when two substances are combined and includes information about evidence that would be needed to make the determination.
PS2. Motion and Stability: Forces and Interactions	Interprets a diagram to determine if balanced forces are acting on an object. Labels a model showing the direction of the gravitational force on an object on Earth. Identifies if two magnets will be attracted to each other or repelled from each other based on the magnets' orientations. Recognizes that either an attractive or a repulsive force exists between two magnets.	Determines if the motion of an object will change, based on a diagram showing the forces acting on the object. Describes how friction affects the motion of an object. Completes a model showing the direction of the gravitational force on multiple objects that are on or near the surface of Earth. Completes a model of the poles on several magnets based on whether the magnets attract each other or repel each other.	Completes a diagram of the forces acting on an object based on whether the object is at rest, moving at a constant speed, or changing speed and explains the reasoning. Describes how different surface textures affect friction. Constructs an explanation about the gravitational force exerted by Earth on objects always being toward the center of Earth. Describes an investigation that could be used to determine the poles of magnets and explains what evidence could be used to make this determination.

Physical Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
PS3. Energy	Interprets a graph that shows the relationship between speed and kinetic energy. Identifies one type of energy that is produced when a collision occurs. Describes one way that energy can be moved from one place to another. Interprets a familiar situation to describe one way that stored energy is converted to another type of energy.	Describes the relationship between the speed of an object and the kinetic energy of that object. Describes the energy conversions that take place when two objects collide. Interprets a given scenario and describe one way that energy is transferred in the scenario. Describes two energy conversions in a given situation including kinetic energy being converted to electrical energy and/or stored energy being converted into another type of energy.	Completes a graph showing the kinetic energy of object as the speed of the object changes and explains why the graph should be completed in that way. Constructs an explanation about the energy conversions that take place when two objects collide and supports the explanation with evidence. Analyzes a novel scenario and describes multiple ways that energy is transferred from place to place and how energy is converted in multiple ways.
PS4. Waves and Their Applications in Technologies for Information Transfer	Recognizes that waves can cause an object to move. Uses a simple model of a wave to show that the wave has a regular pattern. Recognizes that light must be reflected off an object and enter the eye for the object to be seen. Given a communication system, identifies one component (encoder, decoder, receiver, sender) of the system.	Generally, describes that waves carry energy and can cause objects to move. Completes a model showing that a wave has a regular pattern of motion. Develops a model to show how light reflects off an object and enters the eye so the object can be seen. Describes at least two components of a given communication system.	Constructs an explanation about how an object can be moved by the energy of a wave. Explains how objects are seen by the eye, using evidence from a given scenario. Consistently describes the components of a communication system for a given scenario.

Grade 5 MCAS Next-Generation Achievement-Level Descriptors

Science and Technology/Engineering

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

Technology/ Engineering	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
ETS1. Engineering Design **and** **ETS3. Technological Systems**	Identifies a criterion for success and a constraint when given a simple design problem. Identifies one solution to a simple engineering design problem. Analyzes different representations of a simple design solution and chooses the most appropriate one for a given situation. Identifies the importance of a prototype. Identifies the difference between an innovation and an invention.	Describes several criteria for success and constraints when given a design problem. Generates a solution to an engineering design problem and generally explains how the solution could be successful based on evidence. Analyzes different representations of a design solution, chooses the most appropriate representation for the given situation, and explains the reasoning. Identifies several design features of a prototype and explains how these features are important to the design of the prototype. Analyzes a design feature of a prototype and explains the importance of a prototype. Describes one innovation to an existing technology. Provides an example of an invention, including common examples and some novel examples.	Explains how certain criteria for success and constraints will impact the solution to a design problem. Generates two or more solutions to an engineering design problem and explains in detail how the solutions could be successful and identifies possible failure points for each solution. Describes an appropriate representation for a design solution and explains the reasoning. Describes several design features of prototypes and explains the benefits and possible limitations of each. Explains why prototypes are constructed and explains the importance of redesigning a prototype. Explains why a novel technology is an innovation or an invention, given a description of the technology.

MCAS Next-Generation Achievement-Level Descriptors
Science and Technology/Engineering

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

Grade 8 MCAS Next-Generation Achievement-Level Descriptors
Science and Technology/Engineering

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

STE **Grade 8**	**Partially Meeting Expectations** ***On MCAS, a student at this level:***	**Meeting Expectations** ***On MCAS, a student at this level:***	**Exceeding Expectations** ***On MCAS, a student at this level:***
Understanding and Application of Disciplinary Core Ideas	Demonstrates a partial understanding of some scientific concepts and processes by identifying and sometimes describing or providing evidence for these concepts and processes. Uses some basic scientific terms in common scientific examples.	Demonstrates a solid understanding of many scientific concepts and processes by mostly describing, explaining, and providing evidence for these concepts and processes. Mostly applies appropriate scientific terms in a variety of applications, including common science examples and some novel situations.	Demonstrates a comprehensive, in-depth understanding of many scientific concepts and processes by consistently describing, explaining, and providing evidence for these concepts and processes. Consistently applies scientific terms in appropriate contexts in both common science examples and many novel situations.
Understanding and Application of Scientific and Engineering Practices	Identifies a testable, scientific question for an investigation. Completes a simple, commonly used model. Uses simple graphs or data to draw general conclusions about a familiar scientific investigation or phenomena. Identifies evidence to support a claim. Describes a benefit or drawback of simple design features given a familiar device or prototype.	Develops some testable, scientific questions for an investigation. Completes or uses a model and describes some strengths and weaknesses of the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a familiar scientific investigation or phenomena. Provides some evidence to support a claim and constructs basic explanations for scientific phenomena or results from an investigation. Analyzes design features of a familiar device or prototype and describes a benefit or drawback of the design.	Consistently develops testable, scientific questions for an investigation. Creates a model, consistently describes the strengths and weaknesses of the model, and provides information for how to improve the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a novel or complex scientific investigation or phenomena. Provides several pieces of evidence to support a claim and constructs thorough explanations for scientific phenomena or results from an investigation. Analyzes design features of a novel device or prototype and constructs an explanation for how the design features meet criteria for success or are limited by constraints.

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Science and Technology/Engineering

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Earth and Space Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
ESS1. Earth's Place in the Universe	Completes a model of the Earth-Sun-Moon system to show either a solar or a lunar eclipse. Identifies the basic pattern of the moon phases. Recognizes that the tilt of Earth's axis causes the seasons. Recognizes that gravity affects high and low tides, Earth's orbit, and the Moon's orbit. Recognizes that the Milky Way galaxy contains many solar systems, and that Earth is one planet within our solar system. Identifies the bottom layer of rock as the oldest and the top layer of rock as the youngest. Identifies some of the processes that play a role in the formation of rock.	Develops a model showing the positions of the Sun, the Moon, and Earth during a solar or a lunar eclipse. Completes a model of the moon phases. Compares the intensity of sunlight at different locations on Earth during different seasons of the year. Analyzes models to determine where high and low tides occur based on the position of the Moon. Describes the role that gravity plays in orbital motions. Orders the planets, our solar system, the Milky Way galaxy, and the universe by their relative sizes. Analyzes a model showing several layers of rock and draws conclusions about the relative ages of the fossils found in the rock layers. Uses rock layers and fossil evidence to describe how the geology of a particular area has changed over time, such as from a sea floor to a forest.	Constructs an explanation for why people see solar and lunar eclipses on Earth. Constructs an explanation for why people on Earth observe the phases of the Moon. Analyzes a graph to describe how changes in the duration and intensity of sunlight during a year determines the seasons. Supports conclusions with evidence from the graph. Completes models showing where high and low tides occur and explains why there are high and low tides in these locations. Compares and draws conclusions about the force of gravity on planets, moons, asteroids, comets, etc. in our solar system. Analyzes a model showing several layers of rock containing a fault to draw a conclusion about the relative age of the fault. Constructs an explanation for how rock layers and geologic structures, such as canyons, volcanoes, mountains, and beaches, are formed through weathering, erosion, heat, pressure, and/or deposition.

Earth and Space Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
ESS2. Earth's Systems	Uses a model to show that geologic structures, such as volcanoes and mountain ranges, are formed where plates are pushed together. Recognizes that surface structures continue to change over time due to geologic processes, such as weathering, erosion, glaciation, and the movement of Earth's plates. Completes a model showing the primary steps of the water cycle. Analyzes weather data and draws simple conclusions about the precipitation and temperature of an area. Recognizes that temperatures near the ocean are more stable than temperatures of inland locations.	Uses a model to describe the role of convection currents in the movement of Earth's plates and identifies where convection currents occur. Describes how geologic processes form and shape geologic structures, such as mid-ocean ridges, mountains, and volcanoes, and cause geologic events, including earthquakes, landslides, and volcanic eruptions. Analyzes maps and other evidence to draw conclusions about the movement of Earth's plates. Describes the role of solar energy and gravity in the water cycle. Describes the weather conditions that typically occur when cool and warm air masses collide.	Constructs an explanation for how the movement of Earth's plates causes various geologic events, such as earthquakes, volcanic eruptions, and tsunamis. Uses data to explain the relative time scales different geologic structures form over. Supports a claim about the movement of Earth's plates using several pieces of evidence, such as the shapes of continents and the locations of specific fossils and types of rock. Describes evidence that glaciers were once present in an area. Constructs an explanation for how each stage of the water cycle is dependent upon energy from the Sun and/or the Earth's gravity. Describes how air masses move and how the movement of air masses affects the weather in an area.
ESS3. Earth and Human Activity	Analyzes a basic map to draw general conclusions about the distribution of minerals or fossil fuels on Earth. Identifies one way that humans can mitigate the impact of increases in human population on natural resources and the environment. Analyzes a simple graph or data table to draw conclusions about how climate change is affecting an area.	Provides a partial explanation for why some resources, such as fossil fuels, water, and mineral/ores, are unevenly distributed on Earth. Describes various ways that humans can mitigate the overuse of Earth's resources, such as using renewable energy sources, recycling, using public transportation, etc. Constructs an explanation that human activities, such as fossil fuel combustion, agriculture, and deforestation, have played a role in rising global temperatures.	Explains why natural resources are unevenly distributed on Earth. Analyzes data, including graphs and maps, to draw conclusions about how humans use natural resources and identifies some ways human can mitigate the overuse of these resources. Constructs an explanation using evidence that human activities, such as fossil fuel combustion, agriculture, and deforestation, have played a role in rising global temperatures over the past century. Describes several ways humans can mitigate the effects of climate change.

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Science and Technology/Engineering

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Life Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS1. From Molecules to Organisms: Structures and Processes	Recognizes that animal, plant, and bacterial cells have some shared characteristics and some different characteristics. Recognizes some parts of a cell and the function of some cell parts. Describes two body systems and how they work together. Identifies some behaviors and structures of plants and animals that enables them to survive and successfully reproduce. Identifies a characteristic that is inherited and a characteristic that is mostly a result of the environment. Recognizes that all organisms need an energy source and nutrients to survive.	Uses the characteristics of cells to categorize an organism as an animal, plant, or bacteria. Given a diagram of a cell, identifies the cell parts and describes most functions of the cell parts. Generally, describes how different body systems work together. Provides evidence for how some organisms are able survive and reproduce more than other organisms. Analyzes information about an organism to determine which characteristics are inherited and which characteristics are mostly a result of the environment. Describes how carbohydrates, proteins, and fats are broken down to support cell growth and to release energy (cellular respiration).	Compares animal, plant, and bacterial cells and identifies both similarities and differences between them. Consistently describes the functions of cell parts. Describes how the interactions between body systems can be affected by a condition or disease based on the functions of the body systems. Explains how various structures and behaviors can provide survival and reproductive advantages to plants and animals. Uses evidence to explain why some characteristics are inherited and other characteristics are a result of both inheritance and the environment. Using a model, explains how food molecules are broken down and rearranged to provide nutrients for cell growth and energy for cellular processes.

Life Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS2. Ecosystems: Interactions, Energy, and Dynamics	Interprets graphs to determine whether the size of a population increased, decreased, or stayed the same. Identifies one ecological relationship (competitive, predator-prey, parasitic, or mutually beneficial) when given a description of the interaction of two organisms. Recognizes that the biodiversity of a population is positively correlated with its size. Identifies how an ecosystem and how an organism living in the ecosystem can be helped by a human action.	Analyzes population data, including graphs, to describe changes in the size a particular population over time. Identifies several ecological relationships when given the interactions of organisms in an environment (including analyzing a food web). Completes models to show the cycling of matter through photosynthesis, cellular respiration, and decomposition. Uses a model of an ecosystem to describe how a disruption to the ecosystem can have an effect on an organism in the ecosystem. Describes multiple ways how the biodiversity of a population can be increased. Describes several ways an ecosystem and the organisms living in the ecosystem can be helped by human actions.	Constructs an explanation for the reasons why populations grow versus decline over time. Analyzes a complex food web and describes the ecological roles of the organisms. Consistently describes the roles of producers, primary, secondary, tertiary consumers, and decomposers in a model. Develops a model to show the cycling of matter and energy through an ecosystem, including the role of photosynthesis, cellular respiration, and decomposition. Uses a model of an ecosystem to construct an explanation with evidence for how a natural or manmade disruption to the environment can affect multiple populations in the ecosystem. Evaluates competing designs for protecting an ecosystem and its inhabitants from threats such as climate change, habitat loss, pollution, or overharvesting of resources.
LS3. Heredity: Inheritance and Variation of Traits	Uses a model to show that chromosomes are made up of genetic information. Identifies one benefit of sexual reproduction or one benefit of asexual reproduction. Recognizes that offspring from sexual reproduction inherit genes and characteristics from two parents. Analyzes a simple Punnett square to determine the expected percentage of offspring with a certain trait.	Completes a model to show that chromosomes hold genes and genes hold the instructions for proteins. Describes mutations as changes to genes. Identifies examples of mutations that are harmful, beneficial, or neutral to changes in traits of an organism. Describes some of the benefits and drawbacks of sexual versus asexual reproduction. Completes a Punnett square to determine the expected percentage of offspring that will inherit certain genotypes (allele pairs) and phenotypes (traits).	Develops a model to show that chromosomes are made up of genes and that genes contain the instructions for proteins, which determine the inherited characteristics of an organism. Describes how a mutation may be harmful, neutral, or beneficial to an organism depending on its interactions with the environment. Constructs an explanation for why some organisms benefit from asexual reproduction while other organisms benefit from sexual reproduction. Develops a model to show that sexual reproduction results in sets of chromosomes (found in the nucleus) from each parent, and therefore an allele for each gene is inherited from each parent.

Life Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS4. Biological Evolution: Unity and Diversity	Analyzes fossil evidence to draw conclusions about different organisms living at different times. Compares a structure in a living organism to a structure from a fossilized organism and draws a conclusion about their similarity. Recognizes that individuals with certain inherited characteristics have a higher probability of surviving than individuals without those characteristics. Identifies one difference between natural selection and artificial selection.	Analyzes fossil evidence to describe how the environment in an area has changed over geologic time. Explains how living and fossilized organisms can have similar body structures with similar or different functions. Identifies examples of natural selection and generally explains why they are examples of natural selection. Compares examples of natural selection and artificial selection.	Constructs an explanation using fossil evidence for how similar structures can be used to infer whether two types of organism share a recent common ancestor. Constructs an explanation for how a trait can become more common in a population over time due to natural selection. Describes advantages and disadvantages of both natural and artificial selection.

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Physical Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
PS1. Matter and Its Interactions	Identifies that all living and non-living things are made-up of atoms. Identifies that mixtures can be separated by physical means. Using data, identifies one piece of evidence that a chemical reaction or a physical change occurred. Interprets a particle model to determine the three states of matter shown in the model. Recognizes that a new substance is formed when a chemical reaction occurs. Given data, determines if energy is being absorbed or released in a chemical reaction. Calculates the density of an object given its mass and volume.	Completes a model showing how atoms form compounds and molecules. Describes how mixtures are made up of pure substances that can be separated by physical means. Using data, identifies multiple pieces of evidence that a chemical reaction or a physical change occurred. Partially describes how particle motion, spatial arrangement, or temperature of a substance change when thermal energy is added to or removed from the substance. Completes a bar graph to show the conservation of mass in a chemical reaction or a physical change. Given a chemical reaction, identifies if it is exothermic and endothermic based on whether or not thermal energy is released or absorbed. Describes, compares, and calculates the densities of different materials.	Analyzes a chemical formula to determine the number of each type of atom that makes up a given molecule. Analyzes data to determine which substances are pure substances. Explains the difference between a chemical reaction and a physical change and provides multiple pieces of evidence to support the explanation. Consistently describes how particle motion, spatial arrangement, and temperature of a substance change when thermal energy is added to or removed from the substance. Relates temperature to a measure of average kinetic energy and recognizes that temperature/kinetic energy does not change as a substance is changing state. Supports a claim that matter is not created or destroyed during a chemical reaction or a physical change, using evidence from an investigation. Describes the difference between an endothermic and exothermic reaction. Supports the description with evidence from a chemical reaction. Determines whether an object would float or sink in water due its density and supports the answer with evidence.

Physical Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
PS2. Motion and Stability: Forces and Interactions	Given a model, recognizes that an object that applies a force to another object will also experience a force acting on it. Recognizes that the speed of an object will change if the mass of the object changes and the forces acting on the object are constant. Recognizes that the speed of an object will change if the forces acting on the object are not balanced. Recognizes that two positive charges or two negative charges will repel each other, and a negative charge and a positive charge will attract each other. Completes a model, to show that gravitational forces are always attractive. Using a model, describes how an object can exert forces on another object, even when the objects are not in contact with each other.	Analyzes models to draw conclusions about the forces acting on objects during a collision. Completes a graph to show how the change in speed of an object, with a constant net force acting on it, depends on the mass of the object. Completes a model to show whether the speed of an object will increase, decrease, or remain constant based on the forces acting on an object. Completes a model to show how the distance between two electric charges or the magnitudes of the charges affects the strength of the forces between the charges. Describes how the mass of objects affects the gravitational forces on the objects. Completes a model of the electric, magnetic, or gravitational field around an object.	Develops models to show the forces acting on objects before, during, and after a collision. Develops a model to show how the change in speed of an object depends on the mass of the object and the net force acting on the object. Uses data to construct an explanation about how the distance between two electric charges or the magnitudes of the charges affects the strength of the force between the charges. Develops a model showing the relative magnitudes of gravitational forces acting between two objects. Completes a model of the electric, magnetic, or gravitational field between two objects.
PS3. Energy	Interprets a graph to show how the kinetic energy of an object relates to the speed of the object, or vice versa. Interprets data to describe what will happen to an object's kinetic energy as its potential energy decreases. Identifies the flow of thermal energy from hot to cold. Identifies an example of conduction, radiation, or convection. Describes how it takes more time to heat an object that has more mass than an object (of the same material) with less mass. Using a graph, determines how an increase in average kinetic energy of an object results in an increase in temperature.	Completes a graph to show how the kinetic energy of an object relates to the speed of the object, or vice versa. Analyzes information, including graphics and data, and generally describes how the kinetic and potential energies of an object compare at different heights, when energy is conserved. Analyzes the conversions of different types of potential energy into kinetic energy and vice versa to draw conclusions about energy conservation. Generally, describes how thermal energy is transferred through conduction, radiation, and convection and generally describes ways this heat flow can be increased or decreased in a given situation.	Uses a graph to show how the kinetic energy of an object relates to the speed of the object, or vice versa, and explains the reasoning. Analyzes information, including graphics and data, and consistently describes how the kinetic and potential energies of an object compare at different heights, and is able to explain that energy is conserved. Explains how different types of potential energies are converted to kinetic energy and vice versa. Explains how thermal energy is transferred through conduction, radiation, and convection and fully describes ways the rate of this heat flow can be increased or decreased in a given situation. Constructs an explanation to show the relationships among the amount of energy transferred between

Physical Science	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
		Analyzes data and draws conclusions to describe how certain materials will better conduct thermal energy compared to others. Describes how average kinetic energy is related to temperature.	objects, how well materials of the objects retain or radiate heat, the masses of the objects, and the changes in the average kinetic energies of the object's materials.
PS4. Waves and Their Applications in Technologies for Information Transfer	Completes a model of a wave to show its frequency, amplitude, or wavelength. Given a model, sometimes identifies where waves are reflected, absorbed, or transmitted through a material. Identifies when a signal is either encoded or transmitted.	Compares two waves' frequencies, amplitudes, and wavelengths, and sometimes describes how these characteristics will affect the waves. Completes a model showing reflection, absorption, and transmission of a wave, including how waves are refracted. Describes the processes of encoding and transmitting.	Compares two or more waves' frequencies, amplitudes, and wavelengths, and consistently describes how these characteristics will affect the pattern of a wave. Develops a model to explain how waves are reflected, absorbed, or transmitted in a given situation, including how waves are refracted.

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Technology/ Engineering	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
ETS1. Engineering Design	Identifies criteria and constraints of a design problem. Identifies one solution to a simple problem. Uses a simple design matrix to determine the best solution. Sometimes solves simple scale problems, given the actual measurement or the scaled measurement. Analyzes a design feature of a prototype and identifies the importance of a prototype.	Describes some criteria and constraints of a design problem. Describes a solution to a problem and explains how it could be successful based on evidence. Uses a design matrix to draw conclusions about possible solutions. Solves scale problems, given the actual measurement or the scaled measurement. Generally, describes appropriate design features of a prototype and describes the importance of a prototype.	Describes several criteria and constraints of a design problem. Describes several solutions to a problem and explains their limitations and benefits based on evidence. Uses a design matrix to draw conclusions about possible solutions and explains the reasoning. Explains when a scale drawing should be used and determines an appropriate scale for a given situation. Consistently describes appropriate design features of prototypes for a given situation.
ETS2. Materials, Tools, and Manufacturing	Recognizes basic properties of common materials (such as wood, metal, and plastic). Given data, chooses a material for a design problem given its characteristics. Given a set of tools, chooses the best tool for a given task. Identifies and describes some of the manufacturing processes (forming, separating, conditioning, assembling, finishing, quality control, and safety). Identifies an advantage or a disadvantage of using a computer or a human for a given task.	Describes properties (such as flexibility, ductility, hardness, thermal conductivity, electrical conductivity, and melting point) of common materials and generally uses the materials for appropriate design solutions. Describes the best tools to use for a given situation. Generally, describes a few steps of the manufacturing process in a given situation. Provides an advantage and a disadvantage of using a computer or a human for a given task.	Evaluates different materials and determines the best materials to use for a given design problem. Explains the reasoning, giving both drawbacks and benefits of the materials. Consistently describes several steps of the manufacturing process in a given situation. Provides multiple advantages and/or disadvantages of using a computer or a human for a given task.

Technology/ Engineering	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
ETS3. Technological Systems	Identifies and describes the functions of some components of a communication system (source, encoder, transmitter, receiver, decoder, and storage). Given a diagram, identifies and describes some of the functions of some components of a vehicle (structural, propulsion, guidance, suspension, and control subsystems). Given a diagram, identifies and describes some of the parts of a structural system (foundation, decking, wall, and roofing). Given a diagram, identifies a force (tension, torsion, compression, and shear) acting on a structure. Given a transportation, structural, or communication system, identifies some of the components of an engineering system: inputs, processes, outputs, and feedback.	Completes a model and describes the functions of several components of a communication system. Completes a model and describes most of the functions of some components of a vehicle. Identifies and describes most of the parts of a given structural system. Identifies and describes two forces acting on a shown structure. Identifies live and dead loads for a given scenario. Given a transportation, structural, or communication system, identifies and describes several components of an engineering system.	Develops a model and describes the functions of the components of a communication system. Develops a model and describes most of the functions of the components of a transportation system. Consistently identifies and describes the parts of a given structural system. Consistently identifies and describes forces acting on a shown structure. Describes live and dead loads for a given scenario. Given a transportation, structural, or communication system, consistently identifies and describes components of an engineering system.

High School Biology MCAS Next-Generation Achievement-Level Descriptors

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

High School Biology
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HS Biology	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Understanding and Application of Disciplinary Core Ideas	Demonstrates a partial understanding of some scientific concepts and processes by identifying and sometimes describing or providing evidence for these concepts and processes. Uses some basic scientific terms in common scientific examples.	Demonstrates a solid understanding of many scientific concepts and processes by mostly describing, explaining, and providing evidence for these concepts and processes. Mostly applies appropriate scientific terms in a variety of applications, including common science examples and some novel situations.	Demonstrates a comprehensive, in-depth understanding of many scientific concepts and processes by consistently describing, explaining, and providing evidence for these concepts and processes. Consistently applies scientific terms in appropriate contexts in both common science examples and many novel situations.
Understanding and Application of Scientific and Engineering Practices	Identifies a testable, scientific question for an investigation. Completes a simple, commonly used model. Uses simple graphs or data to draw general conclusions about a familiar scientific investigation or phenomena. Identifies evidence to support a claim. Describes a benefit or drawback of simple design features given a familiar device or prototype.	Develops some testable, scientific questions for an investigation. Completes or uses a model and describes some strengths and weaknesses of the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a familiar scientific investigation or phenomena. Provides some evidence to support a claim and constructs basic explanations for scientific phenomena or results from an investigation. Analyzes design features of a familiar device or prototype and describes a benefit or drawback of the design.	Consistently develops testable, scientific questions for an investigation. Creates a model, consistently describes the strengths and weaknesses of the model, and provides information for how to improve the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a novel or complex scientific investigation or phenomena. Provides several pieces of evidence to support a claim and constructs thorough explanations for scientific phenomena or results from an investigation. Analyzes design features of a novel device or prototype and constructs an explanation for how the design features meet criteria for success or are limited by constraints.

HS Biology	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS1. From Molecules to Organisms: Structures and Processes	Identifies some of the most common elements that make up organic macromolecules. Describes a basic function of a type of organic macromolecule (carbohydrate, lipid, nucleic acid, or protein). Identifies the source of energy and the major reactants and products of photosynthesis by their names or chemical formulas. Describes ATP as a source of usable energy and that it is produced in mitochondria. Describes some major events of the cell cycle (including interphase, mitosis, cytokinesis) and their purposes. Identifies complementary base pairs for a DNA sequence and for an mRNA sequence. Identifies that a gene codes for a protein and describes one function of a protein. Completes a basic model to generally describe how a body system works. Describes one way the body maintains homeostasis.	Analyzes models to classify most organic macromolecules and identifies all common elements for a given example. Analyzes models of monomers to determine some types of organic macromolecules and describes some basic functions of these macromolecules. Constructs or completes models of photosynthesis using the names or chemical formulas of reactants and products and describes the importance of photosynthesis. Constructs or completes models of cellular respiration using the names or chemical formulas of reactants and products and describes the importance of cellular respiration. Completes a model to describe how major events of the cell cycle, including DNA replication, allow a cell to grow and survive. Describes the structure of DNA and how its structure affects its function. Describes how genes code for proteins through transcription and translation and describes several functions of proteins. Recognizes that all cells within the same organism have the same genes. Describes several functions of proteins. Describes the functions of structures and organs of body systems. Interprets models to draw a conclusion about the way the human body maintains homeostasis.	Analyzes models of monomers to consistently identify their organic macromolecules and describes the functions of these molecules. Constructs an explanation about the important uses of the products of photosynthesis for both plants and animals. Analyzes data to determine the relative amount of ATP that is generated by organisms under different conditions. Explains how ATP is used in a variety of ways by both animal and plant cells. Constructs an explanation about how the sequence of events of the cell cycle allows organisms to grow and survive. Describes specific functions of several proteins, including enzymes, hormones, and structural proteins. Calculates the percentage of one type of nitrogenous base for a DNA molecule using complementary base pairs. Analyzes and creates models of DNA, RNA, and amino acid chains to describe the products of replication, transcription, or translation. Analyzes data to determine when a gene is expressed and to determine whether replication, transcription, or translation occurs. Constructs an explanation about why different types of cells express different genes, which results in different cell functions. Analyzes data to draw conclusions about how body systems work together to support life functions. Constructs explanations about how body systems work to restore homeostasis when conditions change.

HS Biology	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
LS2. Ecosystems: Interactions, Energy, and Dynamics	Describes birth and immigration as factors that increase population size, and death and emigration as factors that decrease population size. Identifies some basic ecological relationships (such as predation, competition, mutualism), when given an example. Interprets a basic food web to identify simple ecological relationships. Analyzes a food web to identify the trophic level of a species. Recognizes that less energy is available at higher tropic levels in an energy pyramid. Identifies some carbon cycle processes and recognizes that carbon is released or stored in the environment depending on the process. Recognizes that the biodiversity of an ecosystem is affected by the number of species in the ecosystem. Describes one-way invasive species can impact other species in an ecosystem. Identifies human impacts (climate change, pollution, habitat destruction) on an ecosystem and describes some ways to address them.	Describes how various biotic and abiotic factors affect a population's birth rate, death rate, immigration rate, or emigration rate. Describes several ecological relationships and determines evidence that supports claims about ecological relationships. Analyzes a food web to describe changes to populations resulting from an increase or decrease of another population. Uses an energy pyramid to calculate the amount of energy that is expected to be stored in different trophic levels. Completes a carbon cycle model showing how carbon is moved through both biotic and abiotic parts of an ecosystem. Describes how the biodiversity of an ecosystem is affected by the number of individuals within a species (genetic diversity is lower in smaller populations). Describes some characteristics of invasive species and how these characteristics can affect other species in an ecosystem. Analyzes data to determine the human impact on an ecosystem and describes several ways to reduce the impact of human activity on the ecosystem.	Analyzes multiple factors (such as species interactions, human activities, and natural phenomena) to solve problems relating to population size and carrying capacity of an ecosystem. Analyzes complex food webs and constructs explanations about various interactions in the food web as the sizes of populations change. Constructs an explanation for why only about 10% of the energy stored in one trophic level will be available to the next higher trophic level and how having less energy available reduces the number of organisms that can be supported at higher trophic levels. Constructs an explanation for how several carbon cycle processes interact within an ecosystem and how changes in the environment can disrupt the cycle. Explains how biodiversity of an ecosystem can be impacted by both the number of species in that ecosystem as well as the number of individuals within a species. Constructs thorough explanations for how and why invasive species can affect an ecosystem. Evaluates several solutions for either reducing the impact of human activity on an ecosystem or restoring an ecosystem and explains the benefits and drawbacks of these solutions.
LS3. Heredity	Identifies the general purpose of meiosis, that gametes come from two parents, and that egg and sperm combine to produce offspring.	Analyzes and completes a basic model of meiosis.	Constructs an explanation of why meiosis is important for maintaining the number of chromosomes from one generation to the next.

HS Biology	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
	Recognizes that inherited traits are encoded in an organism's DNA and RNA. Completes a simple model to show how a mutation in a DNA sequence can change an mRNA codon. Identifies that only mutations in a gamete can be passed from parent to offspring and that mutations can be a source of genetic diversity. Identifies simple inheritance patterns for a given trait. Identifies genotypes for a certain trait, completes a Punnett square for a given cross, and calculates the expected percentage of offspring for a given genotype or phenotype. Identifies the genotype of an individual in a basic pedigree when the inheritance pattern is given.	Describes the product of fertilization as a zygote (a diploid cell) containing genetic information from both parents. Describes how mutations in DNA can lead to the production of different amino acids and therefore different proteins. Interprets a model of crossing over and concludes that genetic variability increases as a result of crossing over. Interprets information to consistently determine inheritance patterns. Constructs and completes Punnett squares and calculates the expected percentages of genotypes and phenotypes of crosses for a given scenario. Analyzes a pedigree to determine the inheritance pattern of a trait. Describes how polygenic traits are influenced by the expression of multiple genes. Describes how environmental factors can influence the expression of some inherited traits.	Explains how crossing over, independent assortment, and random pairing of gametes contribute to the genetic diversity of offspring. Constructs an explanation for how a mutation in a DNA code may or may not result in a phenotypic (trait) change. Analyzes Punnett squares to determine the expected genotype and phenotype percentages for sex-linked traits. Analyzes a complex pedigree to determine genotypes and phenotypes of individuals and to make predictions about future offspring of parents in the pedigree. Uses data to explain the likelihood that a certain trait will be more influenced by genetics or by the environment.
LS4. Evolution	Identifies some types of evidence (genomes, amino acids, fossils, homologous structures) that support the process of evolution. Recognizes that individuals with certain traits survive and produce more offspring than individuals without those traits.	Explains how evolution can be supported by evidence that demonstrates common ancestry. Completes a cladogram to show the evolutionary relationships among several species. Describes how an advantageous heritable trait allows individuals in a population to survive and reproduce more than individuals without that trait.	Constructs an explanation based on a model, such as a cladogram, to support a claim about the evolutionary relatedness of species and explains why comparing genomes provides the best evidence that two species are closely related. Constructs a thorough explanation about evolution, including conditions (heritable variation, differential fitness) that need to be met for evolution to occur and how there will be changes in the frequency of alleles (or traits) within a population over time.

HS Biology	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
	Describes that, in general, two organisms from the same species are able to mate and produce offspring. Recognizes that isolated populations generally have a smaller gene pool than larger populations. Recognizes that viruses are unable to reproduce outside of a host cell and that bacteria reproduce through asexual reproduction.	Describes how to determine whether two organisms are closely related and/or from the same species. Describes the role of genetic drift or gene flow in the speciation or extinction of a population. Describes how bacteria and viruses adapt quickly to changing environments due to their high mutation rate and the ability to quickly reproduce.	Analyzes a situation to determine evidence of selection pressures that could influence the evolution of a population. Constructs explanations based on data for how genetic drift, gene flow, mutations, and natural selection can play a role in the speciation or extinction of a population. Analyzes the results of an investigation to determine conditions that will support the growth of bacteria or viruses.

High School Introductory Physics MCAS Next-Generation Achievement-Level Descriptors

Next-Generation Achievement-Level Descriptors

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on-track to succeed in the current grade in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

High School Introductory Physics
MCAS Next-Generation Achievement-Level Descriptors

Student results on the MCAS tests are reported according to four achievement levels: *Exceeding Expectations, Meeting Expectations, Partially Meeting Expectations,* and *Not Meeting Expectations.* The descriptors below illustrate the knowledge and skills students demonstrate on MCAS at each level. Knowledge and skills are cumulative at each level. No descriptors are provided for the *Not Meeting Expectations* achievement level because students work at this level, by definition, does not meet the criteria of the *Partially Meeting Expectations* level.

HS Physics	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
Understanding and Application of Disciplinary Core Ideas	Demonstrates a partial understanding of some scientific concepts and processes by identifying and sometimes describing or providing evidence for these concepts and processes. Uses some basic scientific terms in common scientific examples.	Demonstrates a solid understanding of many scientific concepts and processes by mostly describing, explaining, and providing evidence for these concepts and processes. Mostly applies appropriate scientific terms in a variety of applications, including common science examples and some novel situations.	Demonstrates a comprehensive, in-depth understanding of many scientific concepts and processes by consistently describing, explaining, and providing evidence for these concepts and processes. Consistently applies scientific terms in appropriate contexts in both common science examples and many novel situations.
Understanding and Application of Scientific and Engineering Practices	Identifies a testable, scientific question for an investigation. Completes a simple, commonly used model. Uses simple graphs or data to draw general conclusions about a familiar scientific investigation or phenomena. Identifies evidence to support a claim. Describes a benefit or drawback of simple design features given a familiar device or prototype.	Develops some testable, scientific questions for an investigation. Completes or uses a model and describes some strengths and weaknesses of the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a familiar scientific investigation or phenomena. Provides some evidence to support a claim and constructs basic explanations for scientific phenomena or results from an investigation. Analyzes design features of a familiar device or prototype and describes a benefit or drawback of the design.	Consistently develops testable, scientific questions for an investigation. Creates a model, consistently describes the strengths and weaknesses of the model, and provides information for how to improve the model. Analyzes multiple sources of data, including graphs and tables, to draw conclusions about a novel or complex scientific investigation or phenomena. Provides several pieces of evidence to support a claim and constructs thorough explanations for scientific phenomena or results from an investigation. Analyzes design features of a novel device or prototype and constructs an explanation for how the design features meet criteria for success or are limited by constraints.

HS Physics	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
PS1. Matter and Its Interactions	Interprets a model to determine that energy is released during the processes of fission, fusion, and radioactive decay.	Analyzes a model to determine whether fission, fusion, or a radioactive decay (alpha, beta, or gamma) process occurred.	Analyzes incomplete models of fission, fusion, and radioactive decay and describes the results of each in terms of energy and products.
PS2. Motion and Stability: Forces and Interactions	Solves simple problems involving average speed, velocity, and acceleration. Interprets a motion graph to determine how the graphed variable changes over time. Interprets a scenario to determine the relative magnitude of a force. Determines a net force using Newton's 2nd law or by interpreting a free-body force diagram with two colinear forces. Solves simple momentum and change in momentum (impulse) problems. Interprets a model to determine whether two charges will attract or repel. Describes how the magnitude of charges or the distance between charges affects electrostatic forces. Describes how the masses of objects or the distance between objects affect gravitational forces. Solves simple problems using Ohm's Law when given two of the three variables (current, voltage, or resistance). Identifies a schematic symbol for a simple circuit element and generally explains its role.	Solves problems involving acceleration, velocity, and change in position for a given time. Analyzes motion graphs and their slopes to solve for and compare speeds, velocities, accelerations, and net forces. Analyzes free-body force diagrams to determine which diagram represents a given system. Solves for an unknown force by interpreting a model with two or more colinear forces when also given the net force. Solves for the total momentum or change in momentum of a system. Interprets a model to determine the direction an object will move after a collision. Compares the magnitude and the direction of the forces that two objects exert on each other when they collide. Compares models of pairs of masses or charges to order the magnitude of the gravitational or electrostatic forces. Completes a model to represent electrostatic forces between charges. Interprets a model to support a claim that an electric current produces a magnetic field or a claim that a changing magnetic field produces an electric current.	Solves a motion problem by analyzing a model and then applying information from the model to solve for velocity or acceleration. Explains how changing a system would affect an object's velocity or acceleration. Solves force problems by analyzing motion graphs and then models the forces involved using free-body force diagrams. Analyzes a motion graph and then applies information from the graph to solve a momentum problem. Describes that the total momentum of a system stays the same during a collision and solves for velocity or mass by applying conservation of momentum. Explains how forces involved in a collision can be minimized. Applies proportional reasoning to solve for how changing the distance between a pair of masses or a pair of charges affects the forces between the pair. Applies proportional reasoning when multiple variables are changed to determine the forces between a pair of masses or charges.

HS Physics	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
		Describes how a change to a circuit affects current, voltage, or resistance. Interprets a series circuit diagram with several circuit elements and solves for current, resistance, or voltage. Interprets simple series or parallel circuit diagrams and explains which circuit elements will have the same current through them and which elements will have the same voltage drop across them.	Describes the effect of a gravitational or electrostatic force between two objects by solving for the force using either Newton's law of gravitation or Coulomb's law. Explains that the interplay of electric and magnetic forces is the basis for electric motors and generators. Analyzes series and parallel circuit diagrams with multiple circuit elements to compare and solve for current, voltage, and resistance.
PS3. Energy	Solves for gravitational potential energy when given the height and mass of an object. Describes an example of energy being converted from one form to another. Interprets a model to determine a location where gravitational potential energy or kinetic energy is either the greatest or the least. Solves simple problems for work when given the force and distance. Solves efficiency problems when given energy in and energy out. Interprets a simple graph to determine when thermal equilibrium is reached. Recognizes that heat flows from a substance with a higher temperature to a substance with a lower temperature. Recognizes the relationship between average molecular motion and temperature.	Analyzes a model of a system and then uses information from the model to calculate kinetic energy or gravitational potential energy. Describes that energy cannot be created or destroyed, but energy may enter or leave a system. Compares an object's kinetic energy at two positions or an object's potential energy at two positions when mechanical energy is conserved. Analyzes data to solve mechanical energy problems. Interprets a model of a device and explains how to increase the efficiency of the device. Explains how the temperatures in two substances change as the substances reach thermal equilibrium. Describes how changing the mass of a substance affects the energy required to cause a temperature change. Analyzes electric field diagrams and determines the direction and relative strength of the electric field around two charges.	Constructs an explanation for how kinetic energy and potential energy change over time in a given model. Explains how the mechanical energy of a system can change, due to work being done on the system by a force, while maintaining the law of conservation of energy. Solves complex work problems, including first solving for initial and final mechanical energy. Analyzes a graph to compare the energy efficiency of multiple devices. Explains how the average molecular motion of molecules in two substances changes as the substances reach thermal equilibrium, and how energy is conserved in a system as thermal equilibrium is reached. Analyzes a model and solves problems for the amount of heat transferred in a system, the specific heat of a substance, or the initial or final temperature of a substance.

HS Physics	Partially Meeting Expectations *On MCAS, a student at this level:*	Meeting Expectations *On MCAS, a student at this level:*	Exceeding Expectations *On MCAS, a student at this level:*
	Describes the relative amount of force between two magnets as they are moved closer together or farther apart.	Explains how the energy stored in a field between two magnets or two charges changes when they are moved different distances apart.	Interprets a model to describe the motion of a freely moving charged particle and the energy stored in the field between two charged particles.
PS4. Waves and Their Applications in Technologies for Information Transfer	Solves simple wave problems for velocity/speed, wavelength, or frequency when given two of these three variables. Identifies the wavelength of a wave on a model. Solves simple wave problems involving period and frequency when given one of the variables. Identifies differences between mechanical waves and electromagnetic waves. Recognizes the relationships between frequency and pitch of a sound wave as well as between frequency and energy of a light wave. Identifies evidence of light behaving like a wave or light behaving like a particle. Interprets simple models of the photoelectric effect. Interprets simple models of common wave behaviors, including resonance, diffraction, refraction, and interference.	Analyzes data to determine additional information needed to solve wave problems. Describes how the particles in a medium move when a longitudinal or transverse wave travels through the medium. Describes several properties of mechanical waves and electromagnetic waves. Compares multiple electromagnetic waves in terms of frequency, energy, and wavelength. Analyzes a model and explains the causes of resonance and refraction. Analyzes a model of a technology or device and describes how wave behaviors or the photoelectric effect are used in the technology or device.	Analyzes models of waves and uses information from the models to solve problems. Interprets a graph with relative speeds of mechanical waves to determine the states of matter of various media. Constructs an explanation with evidence about how light can behave like a wave and how it can behave like a particle. Explains the relationship between photon energy and the electrons ejected by the photoelectric effect. Analyzes a model of constructive and destructive interference and determines the amplitude of a wave pulse that results from the interference. Analyzes how a technology or device uses waves and describes how changing the properties of the waves would influence the device.

APPENDIX C

TEST DESIGN AND BLUEPRINT SPECIFICATIONS

The following tables present the test design and blueprints for English language arts; they include numbers of items and total number of points for each item type. The percentage of points in each reporting category is also presented.

Distribution of ELA Common Items by Session and Item Type—Grade 3

Session	Number					Points				
	SR1	SR2	CR	ES	Total	SR1	SR2	CR	ES	Total
1	11	1	0	1	13	13		0	7	20
2	15	3	1	0	19	21		3	0	24
Total	26	4	1	1	32	34		3	7	44

Item Types: 1 SR1 = MC; 2 SR2 = 2-pt MC or TE, EBSR; 3 CR (hand scored); 7 ES (hand scored)

Reporting Categories	G3	
Language	25%	+/-5%
Reading	65%	+/-5%
Writing	10%	+/-5%
Totals	100%	

Distribution of ELA Common Items by Session and Item Type—Grade 4

Session	Number					Points				
	SR1	SR2	CR	ES	Total	SR1	SR2	CR	ES	Total
1	9	2	0	1	12	13		0	7	20
2	17	2	1	0	20	21		3	0	24
Total	26	4	1	1	32	34		3	7	44

Item Types: 1 SR1 = MC; 2 SR2 = 2-pt MC or TE, EBSR; 3 CR (hand scored); 7 ES (hand scored)

Reporting Categories	G4	
Language	25%	+/-5%
Reading	65%	+/-5%
Writing	10%	+/-5%
Totals	100%	

Distribution of ELA Common Items by Session and Item Type—Grade 5

Session	Number					Points				
	SR1	SR2	CR	ES	Total	SR1	SR2	CR	ES	Total
1	9	2	0	1	12	13		0	7	20
2	15	3	0	1	19	21		0	7	28
Total	24	5	0	2	31	34		0	14	48

Item Types: 1 SR1 = MC; 2 SR2 = 2-pt MC or TE, EBSR; 3 CR (hand scored); 7 ES (hand scored)

Reporting Categories	G5	
Language	25%	+/-5%
Reading	55%	+/-5%
Writing	20%	+/-5%
Totals	100%	

Distribution of ELA Common Items by Session and Item Type—Grades 6–8

Session	Number					Points				
	SR1	SR2	CR	ES	Total	SR1	SR2	CR	ES	Total
1	9	2	0	1	12	13		0	8	21
2	15	3	0	1	19	21		0	8	29
Total	24	5	0	2	31	34		0	16	50

Item Types: 1 SR1 = MC; 2 SR2 = 2-pt MC or TE, EBSR; 3 CR (hand scored); 7 ES (hand scored)

Reporting Categories	G6-8	
Language	25%	+/-5%
Reading	55%	+/-5%
Writing	20%	+/-5%
Totals	**100%**	

Distribution of ELA Common Items by Session and Item Type—Grade 10

Session	Number					Points				
	SR1	SR2	CR	ES	Total	SR1	SR2	CR	ES	Total
1	9	3	0	1	13	15		0	8	23
2	12	4	0	1	17	20		0	8	28
Total	21	7	0	2	30	35		0	16	51

Item Types: 1 SR1 = MC; 2 SR2 = 2-pt MC or TE, EBSR; 3 CR (hand scored); 7 ES (hand scored)

Reporting Categories	G10	
Language	25%	+/-5%
Reading	55%	+/-5%
Writing	20%	+/-5%
Totals	100%	

The following tables present the test design and blueprints for mathematics; they include numbers of items and total number of points for each item type. The percentage of points in each reporting category is also presented.

Distribution of Mathematics Common Items by Session and Item Type—Grade 3

	Number				Points			
Session	**MS1**	**HS3**	**Matrix***	**Total**	**MS1**	**HS3**	**Matrix***	**Total**
1	18	2	2	22	18	6	2	26
2	18	2	2	22	18	6	4	28
Total	36	4	4	44	36	12	6	54

* *Equating and/or Field Test) per form*

	Max Points	**Scored**	
Item Types:	1	MS1	SA/SR
	3	HS3	CR

Reporting Category		**G3**	
		Percents	**Points**
OA	Operations & Algebraic Thinking	30%	14–15
NBT	Number & Operations in Base Ten	15%	7–8
NF	Number & Operations-Fractions	20%	9–10
G	Geometry	10%	4–5
MD	Measurement & Data	25%	12

Distribution of Mathematics Common Items by Session and Item Type—Grades 4–5

	Number					Points				
Session	**MS1**	**MS2**	**HS4**	**Matrix***	**Total**	**MS1**	**MS2**	**HS4**	**Matrix***	**Total**
1	17	1	2	2	22	17	2	8	2–3	29–30
2	17	1	2	2	22	17	2	8	5–6	32–33
Total	34	2	4	4	44	34	4	16	7–8	61–62

* *Equating and/or Field Test) per form*

	Max Points	**Scored**	
Item Types:	1	MS1	SA/SR
	2	MS2	SA/SR
	4	HS4	CR

Reporting Category		G4		G5	
		Percents	Points	Percents	Points
OA	Operations & Algebraic Thinking	20%	10–11	15%	8
NBT	Number & Operations in Base Ten	20%	10–11	30%	16
NF	Number & Operations-Fractions	30%	16	25%	13–14
G	Geometry	10%	5–6	10%	5–6
MD	Measurement & Data	20%	10–11	20%	10–11

Distribution of Mathematics Common Items by Session and Item Type—Grade 6

Session	Number					Points				
	MS1	MS2	HS4	Matrix*	Total	MS1	MS2	HS4	Matrix*	Total
1	17	1	2	2	22	17	2	8	2–3	29–30
2	17	1	2	2	22	17	2	8	5–6	32–33
Total	34	2	4	4	44	34	4	16	7–8	61–62

* *Equating and/or Field Test) per form*

	Max Points	Scored	
Item Types:	1	MS1	SA/SR
	2	MS2	SA/SR
	4	HS4	CR

Reporting Category		G6	
		Percents	Points
RP	Ratios & Proportional Relationships	20%	10–11
NS	The Number System	20%	10–11
EE	Expressions & Equations	30%	16
G	Geometry	15%	8
SP	Statistics & Probability	15%	8

Distribution of Mathematics Common Items by Session and Item Type—Grade 7

Session	Number					Points				
	MS1	MS2	HS4	Matrix*	Total	MS1	MS2	HS4	Matrix*	Total
1	17	1	2	3	23	17	2	8	6–7	33–34
2	17	1	2	3	23	17	2	8	6–7	33–34
Total	34	2	4	6	46	34	4	16	12–14	66–68

* *Equating and/or Field Test) per form*

	Max Points	Scored	
Item Types:	1	MS1	SA/SR
	2	MS2	SA/SR
	4	HS4	CR

Reporting Category		G7	
		Percents	Points
RP	Ratios & Proportional Relationships	20%	10–11
NS	The Number System	20%	10–11
EE	Expressions & Equations	25%	13–14
G	Geometry	15%	8
SP	Statistics & Probability	20%	10–11

Distribution of Mathematics Common Items by Session and Item Type—Grade 8

Session	Number					Points				
	MS1	MS2	HS4	Matrix*	Total	MS1	MS2	HS4	Matrix*	Total
1	17	1	2	3	23	17	2	8	6–7	33–34
2	17	1	2	3	23	17	2	8	6–7	33–34
Total	34	2	4	6	46	34	4	16	12–14	66–68

* *Equating and/or Field Test) per form*

	Max Points	Scored	
Item Types:	1	MS1	SA/SR
	2	MS2	SA/SR
	4	HS4	OR

Reporting Category		G8	
		Percents	Points
NSEE	The Number System and Expressions & Equations	40%	21–22
F	Functions	20%	10–11
G	Geometry	30%	16
SP	Statistics & Probability	10%	5–6

Distribution of Mathematics Common Items by Session and Item Type—Grade 10

Session	Number					Points				
	MS1	MS2	HS4-OR	Matrix*	Total	MS1	MS2	HS4-OR	Matrix*	Total
1	16	3	2	6	27	16	6	8	10	40
2	16	3	2	6	27	16	6	8	10	40
Total	32	6	4	12	54	32	12	16	20	80

* *Equating and/or Field Test) per form*

	Max Points	Scored	
Item Types:	1	MS1	SA/SR
	2	MS2	SA/SR
	4	HS4	CR

Reporting Categories		G10	
		Percents	Points
NQ	Number & Quantity	15%	9
AF	Algebra & Functions	35%	21
G	Geometry	35%	21
SP	Statistics & Probability	15%	9

The following tables present the test design and blueprints for science, technology, and engineering; they include numbers of items and total number of points for each item type. The percentage of points in each reporting category is also presented. Additionally, the science practices are identified. Finally for introductory physics, the target percentage of points from items that are considered quantitative is provided.

Distribution of STE Common Items by Session and Item Type[1]—Grades 5 & 8 (Discrete)

Session	Number						Points					
	MS1	MS2	HS2	HS3	Matrix[2]	Total	MS1	MS2	HS2	HS3	Matrix*	Total
1	12	2	1	1	4	20	12	4	2	3	6	27
2	14	1	1	1	3	20	14	2	2	3	4	25
Total	26	3	2	2	7	40	26	6	4	6	10	52

1 *Item types: machine scored 1 or 2 points (MS1 or MS2); human scored 3 or 4 points (HS3 or HS4). A module is a stimulus with three MS1, one MS2 (or 2 additional MS1) and one HS3, totaling 6 points.*
2 *Equating and/or Field Test) per form; may also be modules*

Distribution of STE Common Items by Session and Item Type[1]—Grades 5 & 8 (Module/Stimulus)

Session	Number			Points		
	MS1	HS3	Total	MS1	HS3	Total
1	3	1	4	3	3	6
2	3	1	4	3	3	6
Total	6	2	8	6	6	12

1 *Item types: machine scored 1 or 2 points (MS1 or MS2); human scored 3 or 4 points (HS3 or HS4). A module is a stimulus with three MS1, one MS2 (or 2 additional MS1) and one HS3, totaling 6 points.*

		Grade 5		Grade 8	
Code	**Reporting Category**	**% (+-5%)**	**Points**	**%**	**Points**
ES	Earth and Space Science	25	12–14	25	12–14
LS	Life Science	25	12–14	25	12–14
PS	Physical Science	25	12–14	25	12–14
TE	Technology/Engineering	25	12–14	25	12–14

Code	Practice Category
A	Investigations and Questioning
B	Mathematics and Data
C	Evidence, Reasoning, and Modeling

Distribution of Biology Common Items by Session and Item Type[1]—Grade HS (Discrete)

Session	Number					Points				
	MS1	MS2	HS4	Matrix[2]	Total	MS1	MS2	HS4	Matrix*	Total
1	13	1	2	8	24	13	2	8	12	35
2	13	2	1	8	24	13	4	4	12	33
Total	26	3	3	16	48	26	6	12	24	68

1 *Item types: machine scored 1 or 2 points (MS1 or MS2); human scored 3 or 4 points (HS3 or HS4). A module is a stimulus with three MS1, one MS2 (or 2 additional MS1) and one HS3, totaling 6 points.*
2 *Equating and/or Field Test) per form; may also be modules*

Distribution of Biology Common Items by Session and Item Type[1]—Grade HS (Module/Stimulus)

Session	Number				Points			
	MS1	MS2	HS3	Total	MS1	MS2	HS3	Total
1	3	1	1	5	3	2	3	8
2	3	1	1	5	3	2	3	8
Total	6	2	2	10	6	4	6	16

1 *Item types: machine scored 1 or 2 points (MS1 or MS2); human scored 3 or 4 points (HS3 or HS4). A module is a stimulus with three MS1, one MS2 (or 2 additional MS1) and one HS3, totaling 6 points.*

Code	Reporting Category	%	Points
MO	Molecules to Organisms	35	21
HE	Heredity	25	15
EV	Evolution	20	12
EC	Ecology	20	12

Code	Practice Category
A	Investigations and Questioning
B	Mathematics and Data
C	Evidence, Reasoning, and Modeling

Distribution of Introductory Physics Common Items by Session and Item Type[1]—Grade HS (Discrete)

Session	Number					Points				
	MS1	MS2	HS4	Matrix[2]	Total	MS1	MS2	HS4	Matrix*	Total
1	13	1	2	8	24	13	2	8	12	35
2	13	2	1	8	24	13	4	4	12	33
Total	26	3	3	16	48	26	6	12	24	68

1 *Item types: machine scored 1 or 2 points (MS1 or MS2); human scored 3 or 4 points (HS3 or HS4). A module is a stimulus with three MS1, one MS2 (or 2 additional MS1) and one HS3, totaling 6 points.*
2 *Equating and/or Field Test) per form; may also be modules*

Distribution of Introductory Physics Common Items by Session and Item Type[1]—Grade HS (Module/Stimulus)

Session	Number				Points			
	MS1	MS2	HS3	Total	MS1	MS2	HS3	Total
1	3	1	1	5	3	2	3	8
2	3	1	1	5	3	2	3	8
Total	6	2	2	10	6	4	6	16

1 *Item types: machine scored 1 or 2 points (MS1 or MS2); human scored 3 or 4 points (HS3 or HS4). A module is a stimulus with three MS1, one MS2 (or 2 additional MS1) and one HS3, totaling 6 points.*

Code	Reporting Category	%	Points
MF	Motion, Forces, and Interactions	50	30
EN	Energy	30	18
WA	Waves	20	12

Code	Practice Category
A	Investigations and Questioning
B	Mathematics and Data
C	Evidence, Reasoning, and Modeling

Quantitative
35–50% of the test (by points) should be quantitative (21–30 points).

APPENDIX D
NEXT-GENERATION MCAS
COMMITTEE MEMBERSHIP

English Language Arts

2023–24 Assessment Development Committee Members

Grade	Name		School Name	School District/Affiliation
	Last	First		
3/4	Benedetto	MaryBeth	Madeline English School	Everett
3	Huber	Dana	Abraham Lincoln Elementary School	Lowell
3	Maucione	Lisa	DeMello Elementary School	Dartmouth
3	McCarty	Chaitra	Hyannis West Elementary	Barnstable
3	Merrill	Corey	John F. Kennedy School	Somerville
3	Peritz-Smith	Ivy	Swift River Elementary School	Belchertown
3	Rahilly	Lisa	White Street School	Springfield
3	Swintak	Brenda	Attleboro	Attleboro
3	Verdolino	Nancy	Memorial Elementary	Hopedale
3	Walsh	Meghan	John A. Crisafulli School	Westford
4	Ball	Amy	Alden Elementary	Duxbury
4	Bilodeau	Michelle	Gerena Community School	Springfield
4	Gallant	Mary	Morse Elementary School	Cambridge
4	Hyde	Kimberly	Mary O. Pottenger School	Springfield
4	Murphy	Karen	Lincoln-Thomson Elementary School	Lynn
4	Newell	Melissa	Lowell Public Schools	Lowell
4	Olson	Cindy	Parkview School	Easton
4/5	Primiano	Karen	Mary Rowlandson Elementary School	Nashoba Regional
4	Smith	Alyson	Woodville	Wakefield
4	White	Lisa	Plymouth Public Schools	Plymouth
5	Byrd	Brandon	Barnstable United Elementary School	Barnstable
5	Devine	Lisa	Hill School	Revere
5	Hogan	Erin	Westford Public Schools	Westford
5	James	Julie	Wamsutta Middle School	Attleboro
5	Kelty	Megan	Public Schools of Northborough and Southborough	Northborough and Southborough
5	Koonz	Kathleen	Swift River Elementary School	New Salem-Wendell
5	Krasowski	Sarah	Lincoln-Thomson Elementary	Lynn
5	Messer	Marsha	White Brook Middle School	Easthampton
5	Murray	Elizabeth	Nash Primary School and Hamilton Primary School	Weymouth
5	Pollard	Cheryl	Kathryn P. Stoklosa Middle School	Lowell
5	Rumbelow	Alison	Mary Rowlandson Elementary School	Nashoba Regional
5	Wright	Molly	Marblehead Charter School	Marblehead Charter School
6	Barney	Sara	Robert J. Coelho Middle School	Attleboro
6	Campbell	Brian	Wellesley Middle School	Wellesley
6	DiSarcina	Jennifer	Eliot K-8 Innovation School	Boston Public

continued

Grade	Name		School Name	School District/Affiliation
	Last	First		
6	Franty	Olivio (Lee)	Richard J. Murphy K-8 School	Boston
6	Jacob-Dolan	Peter	John Glenn Middle School	Bedford
6	Lavoie	Elizabeth	Richardson Middle School	Dracut
6	Martinsen	Robyn	Douglas Middle School	Douglas
6/7	McPartland	Jennifer	East Bridgewater Public Schools	East Bridgewater
6	Moroso	Taylor	W.L. Chenery Middle School	Belmont
6	Pettengill	Alecia	Williams Middle School	Longmeadow
6	Sayles	Julia	Prospect Hill Academy Charter School	Prospect Hill Academy Charter School
6	Vowels	Heather	Lynnfield Middle School	Lynnfield
7	Angell	Elizabeth	Richard J. Murphy K-8	Boston
7	Bettano	Judith	Higgins Middle School	Peabody
7	Cangemi	Pamela	Williams Middle School	Longmeadow
7	Costa	Lauren	Joseph H. Martin Middle School	Taunton
7	DeLisle	Kimberly	Point Webster Middle School	Quincy
7	DeMoura	Lincoln	Coelho Middle School	Attleboro
7	Doiley	Pamela	BCLA/ McCormack	Boston
7	Gervais	Jacklyn	Plymouth Community Intermediate School	Plymouth
7	Jordan	Colleen	Silver Lake Regional Middle School	Silver Lake Regional
7	Quinn	Anita	Agawam Junior High School	Agawam
7	Stanton	Jessica	Littleton Middle School	Littleton
7	Weigle	Katharine	Winter Hill Community Innovation School	Somerville
8	Blanchard	Deborah	Athol-Royalston Middle School	Athol-Royalston Regional
8	Byers	Kathleen	Somerset Middle	Somerset
8	Costello	Terry	Community Day Charter Public School	Community Day Charter Public School
8	Dickey	Brian	Springfield Public Schools	Springfield
8	Griswold	Andrea	Mohawk Trail Regional School	Mohawk Trail Regional School District
8	Karns	Brigitte	Marblehead Veterans Middle School	Marblehead
8	Looby	Emily	Oxford High School	Oxford
8	Palladino	Kathryn	Greater Lowell Technical High School	Lowell
8	Plosky	Carolyn	Winchester High School	Winchester
8	Testa-Adams	Kathleen	Coelho Middle School	Attleboro
8	Weldon	Diane	Georgetown Middle High School	Georgetown
8	Whitaker	Mary	Lunenburg Middle High School	Lunenburg
10	Cangemi	Charles	Ludlow High School	Ludlow
10	Cunningham	Eamon	Milford High School	Milford
10	DeFelice	Mary	International High School	Lawrence
10	Egan	Aleisha	Ashland High School	Ashland
10	Fialho	Luis	Springfield Central High School	Springfield
10	Galligan	Mark	Pembroke Public Schools	Pembroke

continued

Grade	Name		School Name	School District/Affiliation
	Last	First		
10	Hayes Frohock	Kristin	Dracut High School	Dracut
10	Hebert	Cheryl	Greater New Bedford Regional Vocational Technical High School	New Bedford
10	Hill	Andrew	Upper Cape Cod Regional Technical School	Upper Cape Cod Regional Technical School
10	Mulcahy	Kerry	Doherty High School	Worcester
10	Porter (Starnes)	Dr. Paula	Roger L. Putnam High School	Springfield
10	Trinh	Courtney	Southeastern Regional Vocational Technical High School	Southeastern Regional School District

Mathematics

2023–24 Assessment Development Committee Members

Grade	Name		School Name	School District/Affiliation
	Last	First		
3	Bille	Jessica	Lincoln-Thomson Elementary School	Lynn
3	Edwards	Kathleen	William A. Berkowitz Elementary School	Chelsea
3	Hopson	Sarah	Agawam Public School	Agawam
3	Johnson	Winnie	Codman Academy Public Charter School	Boston
3	Larocque	Kathleen	McAuliffe School	Lowell
3	Larssen	Monica	Brightwood Elementary School	Springfield
3	LeBlanc	Katelyn	Leicester Elementary School	Leicester
3	Manning	Adam	Woodland Elementary School	Milford
3	Norvin	Daphne	Eliot K-8 Innovation School	Boston
3	O'Brien	Taylor	Station Avenue Elementary School	South Yarmouth
3	Powers	Jennifer	Plymouth Public Schools	Plymouth
3	Vanderpoel	Deborah	Mosier School	Hadley
4	Allen	Heather	Scituate Public Schools	Scituate
4	Cleaves	Wendy	Quabbin Regional School District	Barre
4	Gilmartin	Deborah	Thomson School	North Andover
4	Johnson	Samantha	Renaissance Community Innovation School	New Bedford
4	Joseph	Tracy	Martin Luther King, Jr. K-8 School	Boston
4	LaPointe	Cynthia	Staff Sergeant James J. Hill Elementary School	Revere
4	Marchesiani	Jennifer	Plymouth Public School	Plymouth
4	Massa	Michelle	Salemwood School	Peabody
4	Milton	Jill	K-8 Mathematics Coach	Marshfield
4	O'Gorman	Mary	Westford Public Schools	Westford

continued

Grade	Name		School Name	School District/Affiliation
	Last	First		
4	Size	Christine	Westwood Public Schools	Westwood
5	Campbell	Joanne	Captain Samuel Brown School	Peabody
5	Carlson	Kara	Nantucket Intermediate School	Nantucket
5	DeSimone	Stacey	Tobin Montessori School	Cambridge
5	Gogoi	Elizabeth	Boston Renaissance Charter Public School	Boston
5	Hanafin	Megan	Locke and Marshall Middle Schools	Billerica
5	Jackson	Shane	Woodland Elementary School	Milford
5	Johnston	Christine	Roberta G. Doering School	Agawam
5	LaFleur	Tami	Attleboro Public Schools	Attleboro
5	O'Neil-Hopkins	Bridget	Hoosac Valley Middle School	Cheshire
5	Raposa	Laura	Russell Street Elementary School	Littleton
5	Varney	Alison	Grace F. Cole School	Norwell
6	Andrews	Jessica	Wareham Middle School	Wareham
6	Buchanan	Susan	JFK Middle School	Northhampton
6	Cross	Karen	Richard J. Murphy School	Boston
6	Duffy	Mark	Pembroke Public Schools	Pembroke
6	Dunn	Suzanne	Hopedale Memorial Elementary School	Hopedale
6	Edmonds	Margaret	Memorial Middle School	Fitchburg
6	Jurgiel	Jamie	Overlook Middle School	Ashburnham
6	Lorusso	Melissa	Somerset Middle School	Somerset
6	Murray	Lisa	Plymouth Community Intermediate School	Plymouth
6	Romaniak	Kaitlyn	Roberta G. Doering School	Agawam
6	Torkomian	Michele	Coelho Middle School	Attleboro
7	Anusauskas	Cathy	Hopkinton Middle School	Hopkinton
7	Benotti	Julie	Plymouth South Middle School	Plymouth
7	Brown	Anne	Dartmouth Middle School	Dartmouth
7	Gwiazda	Jeff	Lowell Public Schools	Lowell
7	Holden	Seth	Grafton Middle School	Grafton
7	Lito	Irgena	Worcester East Middle School	Worcester
7	Mazzone	Monique	Auburn Middle School	Auburn
7	Olmstead	Chantele	Hawthorne Brook Middle School	Townsend
7	O'Rourke	Megan	Medway Middle School	Medway
7	Schlegel	Joanna	William Diamond Middle School	Lexington
7	Tarallo	Susan	Leominster Public Schools	Leominster
8	Agruso	Cynthia	Agawam Junior High	Agawam
8	Banks	Lorie	Sullivan School	Holyoke
8	Bowman	Adrienne	William H. Ohrenberger School	Boston
8	Carpenter	Michele	Auburn Middle School	Auburn
8	Fedora	Robin	Hampden-Wilbraham Public Schools	Hampden-Wilbraham

continued

Grade	Name		School Name	School District/Affiliation
	Last	First		
8	Ferko	Ana	Up Academy Boston	Up Academy Boston
8	Gardner-Thomas	Carolyn	Harvard University	Harvard University
8	Johnston	Mark	Lynn Classical High School	Lynn
8	McGuire	Shannon	Greater New Bedford Regional Vocational Technical High School	New Bedford
8	Perez	Kate	Westfield Public Schools	Westfield
8	Santiago-Lizardi	Filiberto	James P. Timilty Middle School	Boston
8	Wooley	Stephanie	John T. Nichols Middle School	Middleboro
10	Belley	Colleen	Greater Lawrence Technical School	Lawrence
10	Collins	Andrea	Greater Lowell Technical High School	Lowell
10	Hebert	Kim	Agawam High School	Agawam
10	Johnson	Deatrice	Springfield Public Schools	Springfield
10	Lacombe	Lisa	Bristol-Plymouth Regional Technical School	Taunton
10	Macomb	Elizabeth	Dennis-Yarmouth Regional High School	South Yarmouth
10	Marini	Audra	Worcester Technical High School	Worcester
10	Miles	Victoria	Greenfield Virtual Commonwealth School	Virtual School
10	Pillai	Jay	Natick High School	Natick
10	Pires	Aderito	Ludlow High School and Westfield State University	Ludlow
10	Pollard	Stephanie	Mount Wachusett Community College	Mount Wachusett Community College
10	Reynolds	Colleen	Mystic Valley Charter School	Mystic Valley Charter School
10	Szymaszek	Kathryn	Whittier Regional Vocational Technical High School	Haverhill
10	Yun	Yujuan	Boston Adult Technical Academy	Boston

Science and Technology/Engineering (STE)

2023–24 Assessment Development Committee Members

Grade	Name		School Name	School District/Affiliation
	Last	First		
5	Callahan	Judy	Egremont School	Pittsfield
5	Collins	Carolyn	Wellesley Public Schools	Wellesley
5	Goncalves	Jodi	Springfield Public Schools	Springfield
5	Larose	Evelyn	Winship Elementary Schools	Boston
5	Lynch	Janet	Boston Public Schools	Boston
5	MacNeil	Janet	Cambridge Public Schools	Cambridge
5	Maynard-Gonzalez	Rochelle	Rebecca Johnson Elementary School	Springfield

continued

Grade	Name		School Name	School District/Affiliation
	Last	First		
5	Riordan	Alison	Plymouth Public Schools	Plymouth
5	Rodriguez	Angela	Albert F. Argenziano School	Somerville
5	Styckiewicz	Taylor	Bellamy Middle School	Chicopee
5	Turmel	Kathryn	Comprehensive Grammar School	Methuen
8	Bonnar	Roslyn	McCarthy Middle School	Chelmsford
8	Borges	Amy	Hopkinton Middle School	Hopkinton
8	Bromley	Nikki	Bridgewater Middle School	Bridgewater Raynham Regional
8	Cummiskey	William	Community Day Charter School, Lawrence	Community Day Charter School, Lawrence
8	Facques	Karen	Hawthorne Brook Middle School	North Middlesex Regional
8	Franz	Mary	Holten Richmond Middle School	Danvers
8	Hickey	Charles	Weymouth Middle School, Adams Campus	Weymouth
8	Jean-Baptiste	Vanessa	Tech Boston Academy	Boston
8	Kaur	Rupinderpal	Everett Public Schools	Everett
8	Phillips-Ramos	Tammy	Wamsutta Middle School	Attleboro
8	Slatkavitz	Aimee	Bridge Boston Charter School	Bridge Boston Charter School
Biology	Adamiak	Michael	Keefe Technical High School	South Middlesex Reg. Voc. Tech.
Biology	Davidson	Tom	West Springfield High School	West Springfield
Biology	Dube	Jennifer	Greater Lawrence Technical School	Greater Lawrence Regional Technical School
Biology	Genovese	Elizabeth	Chelsea High School	Chelsea
Biology	Hernando Cupido	Miguel Angel	Chelsea High School	Chelsea
Biology	Hogan	Janet	Mansfield High School	Mansfield
Biology	Madsen	Heather	Greater New Bedford Regional Vocational Technical High School	Greater New Bedford Regional Vocational Technical High School
Biology	Menice	Constance	Westford Academy	Westford
Biology	Mitchell	Mary	Lynn English High School	Lynn
Biology	Pouliot	Amber	Claremont Academy	Worcester Public Schools
Biology	O'Donnell	Pamela	Upper Cape Cod Regional Technical School	Upper Cape Cod Regional Technical School
Biology	St. Amand	Ronald	Springfield Public Schools	Springfield
Biology	Perry	Jim	N/A	N/A
Intro Physics	DiBiasio	Kenneth	Tantasqua Regional High School	Tantasqua
Intro Physics	Foster	Gita	Weston High School	Weston
Intro Physics	Lui	Kevin	Boston Adult Technical Academy	Boston
Intro Physics	McKay	Keith	Hull High School	Hull

continued

Grade	Name		School Name	School District/Affiliation
	Last	First		
Intro Physics	Morey	Shannon	Abbott Lawrence Academy at Lawrence High	Lawrence
Intro Physics	Newton	Kristin	Cambridge Rindge and Latin School	Cambridge
Intro Physics	Pourmand	Mahshid	Wellesley High School	Wellesley
Intro Physics	Sebring	Tamala	Pittsfield High School	Pittsfield
Intro Physics	Sears	Russell	Cohasset Middle High School	Cohasset
Intro Physics	Shapiro	David	Natick High School	Natick
Intro Physics	Tong	Jason	Brookline High School	Brookline
Intro Physics	Tsan	Florence	Brighton High School	Boston
Intro Physics	Valentine	Adriel	Community Charter School of Cambridge	Cambridge

Bias Committee Members

2023–24

Committee	Name		School Name	School District/Affiliation
	Last	First		
BSC	Alvarez	Jaime	Collaborative for Educational Services	Northampton
	Callahan	Judy	Egremont School	Pittsfield
	Charbonneau	Nichole	Old Rochester Regional Junior High School	Old Rochester Regional
	Galewski	Jake	Kingston Elementary School	Silver Lake Regional
	Goldner	Daniel	Acton-Boxborough Regional High School	Acton-Boxborough Regional
	Gould	Michelle	High School of Commerce	Springfield Public Schools
	Guttenberg	Nicole	Boston Public Schools	Boston
	Johnson	Rachel	Assabet Valley Regional Technical High School	Assabet Valley Regional Technical
	Lataille	Michelle	Happy Hollow Elementary School	Wayland
	Mahmud	Amatul	N/A	Cambridge, Retired
	Marino	Monica	Whittier Tech	Whittier Regional Vocational Technical
	Martin	Dr. Paula S.	Quinsigamond Community College	Quinsigamond Community College, Worcester
	Miller	Tammi	Hurley Middle School	Seekonk
	Minot-Seabrook	Jill	Fletcher Maynard Academy	Cambridge
	Nguyen	Thao	Atlantic Middle School	Quincy
	O'Kane	Meredith	Furnace Brook Middle School	Marshfield
	Parker	Andrea	N/A	Federation for Children with Special Needs, Boston
	Strus	Jinnee	Gardner Middle School	Gardner
	Wolfson	Karen	Sudbury Public Schools	Sudbury
	Woods	Brenna	Thomas Ditson Elementary	Billerica

APPENDIX E

ACCESSIBILITY FEATURES AND TEST ACCOMMODATIONS MANUAL

Accessibility and Accommodations Manual for the 2022–2023 MCAS Tests and Retests

Including Participation Requirements for Students with Disabilities and English Learners

August 2022

This document was prepared by the
Massachusetts Department of Elementary and Secondary Education
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Commissioner

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Purpose of This Manual

The purpose of this manual is to provide comprehensive information about the accommodations and accessibility policies that apply to MCAS testing, as well as information about testing English Learners. This manual goes beyond the information provided in the MCAS *Principal's Administration Manual* (PAM).

Intended Audience and Recommended Use

Classroom teachers, special educators, 504 coordinators, IEP team chairs, and school administrators should familiarize themselves with the MCAS accessibility and accommodations policies in this manual in order to understand the use of supports for student participation in MCAS.

This manual provides guidance and information about the following topics:

- MCAS participation requirements for students with disabilities, students who are English learners (ELs), and ELs with disabilities
- which students with disabilities should be considered for an alternate assessment (MCAS-Alt)
- the availability, selection, and use of
    - *universal accessibility features*, which provide tools and supports for *all* students
    - *designated accessibility features* intended for *all* students, but which must be authorized by the principal
    - *test accommodations* for students with disabilities and students who are ELs.

Schools may request guidance from the Department throughout the year as they plan for the use of test accommodations and other supports for the students who need them. Please contact Student Assessment Services at mcas@doe.mass.edu or 781-338-3625 with any questions.

TABLE OF CONTENTS

I. Overview of MCAS Accessibility and Accommodations

A. Introduction

State and federal law requires that all students educated with Massachusetts public funds (including students with disabilities and EL students) participate in MCAS assessments scheduled for their grade levels.

The assessment options indicated on the following pages are based upon (a) accommodations research; (b) generally accepted practices and procedures currently in use for statewide assessments; (c) previous versions of MCAS accommodations policies; and (d) the recommendations of Massachusetts stakeholders who were members of the MCAS Accessibility and Accommodations Work Group.

The application of universal design principles to the MCAS assessments, in conjunction with the accessibility and accommodations policies described in this manual, are intended to alleviate stigmas associated with accessibility differences and reduce barriers to participation in the MCAS assessments for *all* students, not just students with disabilities and English learners. Many accessibility features are embedded into the computer-based testing platform (TestNav) and others can be readily applied to paper-based testing for students who are unable to take tests on a computer. Increased flexibility for local administrators has been incorporated in test administration procedures in response to input and requests from local educators for greater autonomy in determining the testing conditions within their schools.

To assist schools in providing and tracking the use of accessibility features and accommodations during testing, the Department recommends that test coordinators develop a table or spreadsheet prior to test administration that lists **where**, **when**, and **with whom** students will be testing, and which accessibility features and accommodations each student will need, to ensure that students receive all accessibility features and/or accommodations to which they are entitled.

B. Important Announcements and Reminders

- MCAS Retests: The Department will offer only Next Generation ELA and Mathematics retests in November and March. Retests will be computer-based with all available accommodations. Paper-based equivalent accommodations will be available for students with disabilities who are unable to participate in computer-based tests.
- February Science and Technology/Engineering (STE) test administration: A Next Generation Introductory Physics test will be offered in February 2023, with paper-based and computer-based accommodations, in addition to a Next Generation Biology test.
- High school Chemistry and Technology/Engineering tests (being administered for the last time in June 2023) will be administered only as legacy **paper-based**

tests.

- The Kurzweil accommodated version of MCAS tests will *only* be available for June 2023 legacy Chemistry and Technology/Engineering tests.
- Students who use the **speech-to-text** and/or **word prediction** accommodations may use these accommodations with an embedded web extension program if either is listed in their IEP or 504 plan. The use of Web extensions is described in greater detail in the Department' *Guidelines for Using Assistive Technology as an MCAS Test Accommodation*.
- Appendix A describes the ***Procedures for Scribing and Transcribing Student Responses***.
- Computer- and paper-based MCAS practice tests are available, including accommodated editions. Students using accommodated forms, including text-to-speech and the web extensions, should become familiar with these features and the basic functionality of the computer-based testing platform (TestNav) prior to testing. The Department encourages each student to take online practice tests and also view the student tutorial prior to actual test administration.
- Annual decisions about test participation for each student with a disability (including ELs with disabilities) must be made by the IEP team and listed in the student's IEP, or be included in a 504 plan, for each content area test.
    - The team should decide which, if any, **accommodations** the student needs to participate in MCAS testing, according to the policies outlined in this manual
    - The team should decide whether the student with a disability requires a **paper-based rather than a computer-based test**, and, if so, in which subjects
    - Accommodation decisions are made by the student's language-based team—an informal team of adults familiar with the EL student—and documented in writing using the sample (or similar) form provided in Appendix B.
    - If **accessibility features** are needed by a student with a disability, listing these features in the student's plan will be beneficial to guarantee that they will be provided on the test.
- The following must be provided to *all* students on MCAS tests, including students with disabilities and ELs:
    - untimed test sessions until the end of the school day, as needed
    - blank scratch paper (including blank, lined, or graph paper)
    - assistance as needed from a test administrator in using the computer-based testing platform (see the *Test Administrator's Manual for Computer-Based Testing* for more information)

C. Accessibility Features and Accommodations

Accessibility features and accommodations for MCAS tests are listed in the following categories:

- **Universal Accessibility Features** (UF): Tools and supports that are available to *all* students, either on the computer-based tests or their paper-based equivalents
- **Designated Accessibility Features** (DF): Flexible test administration procedures that may be used with *any* student at the discretion of the principal (or designee).
- **Accommodations** (A): Specific supports available only to students with disabilities and English learners.
- **Special Access Accommodations** (SAs): May be provided to students who meet certain guidelines and criteria.

English Learner Accommodations (EL): Several accommodations are available to ELs who do not have disabilities. Accessibility and accommodations policies will also be described in the *MCAS Principal's Administration Manual* (PAM).

D. ACCESS Test for English Leaners who Require Accommodations

The Department uses the ACCESS for ELLs assessment from the WIDA consortium to measure the English language proficiency of ELs in Massachusetts. WIDA provides guidelines for how to best support students with disabilities taking WIDA assessments through the Accessibility and Accommodations Supplement. WIDA developed the supplement to help educators understand and use the test administration considerations, universal tools, and accommodations for individual ELs in order to produce valid assessment results. The supplement covers accommodations for WIDA's multiple assessments.

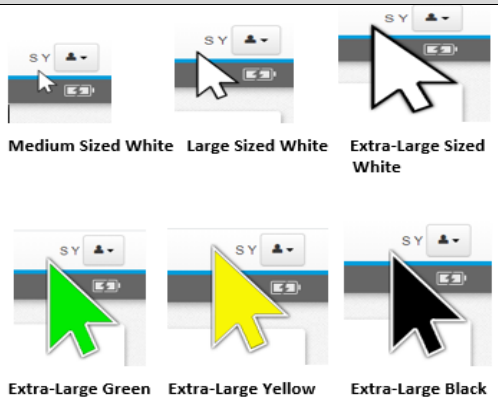
II. Accessibility Features for All Students

A. Universal Accessibility Features (UFs)

Universal Accessibility Features are tools and supports available to *all* students on the MCAS tests, that are either built into the MCAS computer-based test platform or provided by a test administrator on the computer- or paper-based test. Although most universal accessibility features will be available on the day of the test to *any* student who wishes to use them, some *must* be **requested prior to testing** using the student registration system located in PearsonAccess^{next} (PAN). The *(SR/PNP)* designation in Table 1 below refers to an accessibility feature or accommodation that must be requested prior to the start of testing.

Table 1. *Universal Accessibility Features* Available to All Students

Feature #	Computer-Based Testing	Paper-Based Testing
UF1	**Highlighter tool** Four highlighter colors are offered: blue, pink, green, and orange	**Highlighter** Colored highlighters and/or colored pencils may be used. See *Principal's Administration Manual* for details.
UF2 *(SR/PNP)*	**Color Contrast** The student can select a color combination for text and background. 	**Colored overlays or tinted lens(es)**
UF3	**Magnifier or Zoom tool** Magnifier tool enlarges part of the screen; Zoom tool enlarges or reduces the entire screen when the student presses Ctrl + or Ctrl -	**Magnification tool/device** or low-vision aid
UF4 *(SR/PNP)*	**Enlarged Cursor/Mouse Pointer Tool** The student can select an enlarged and colored cursor.	**Enlarged pencil/modified writing instrument**

Feature #	Computer-Based Testing	Paper-Based Testing
	 **Note:** Pointers are not shown in actual size. Pointer size will differ according to the size of the student's computer screen.	
UF5	**Line reader tool** Masks text so only part of the text can be viewed at one time	**Tracking device**, such as a straight edge or similar tool
UF6 *(SR/PNP)*	**Answer masking** Student selects which answer choices will be shown on the screen.	**Mask text or answer(s)** using a blank card or cutout
UF7	**Answer eliminator** Marks an "X" through each answer option the student believes is incorrect.	**Use a pencil to eliminate answer choices** in test booklet (not answer bubbles)
UF8	**Item flag/bookmark**	**Use a blank place marker** to mark a question for later review (Note: sticky notes are *not* allowed)
UF9	**Audio aid** (e.g., amplification device) (**Note**: smartphones may not be used)	**Audio aid** (e.g., amplification device) (Note: smartphones may not be used)
UF10	**Notepad** for notes or calculations	**Scratch paper** is required for all students
UF11	**Test administrator reads aloud selected words** (or **signs selected words**, in the case of a student who is Deaf or Hard-of-Hearing) on the *Mathematics and/or Science and Technology/Engineering (STE) tests only*, as requested by the student. The student may point to a **word or phrase** and request the word to be read aloud or signed. Test administrator quietly reads aloud or signs the selected word(s) or phrase to the student. Students using this feature may be tested alongside other students in groups of any size.	
UF12	**Test administrator redirects student's attention to the test** without coaching or assisting the student to answer any questions (e.g., test administrator reminds student to stay focused; it is not permissible to say, "Add more to your response" or "Make sure to answer all questions.")	
UF13	**Test administrator reads aloud, repeats, or clarifies *general test administration directions* from the Test Administration Manual scripts** to student, as needed.	

B. Designated Accessibility Features (DFs)

Although most students will be tested in their regular classrooms according to the guidelines and schedule intended for all students, principals have the flexibility to test *any* student, including those without identified disabilities and non-EL students, using the designated accessibility features described in Table 2, as long as all requirements for testing conditions, test security, and staffing are met.

It is advisable, although not required, to include designated accessibility features in the Individualized Education Plan (IEP) or 504 plan of a student with a disability who requires them.

Table 2. *Designated Accessibility Features* available to any student, at the principal's discretion.

#	Designated Accessibility Feature
DF1	**Small group test administration** (May include up to a total of 10 students.)
DF2	**Individual (one-to-one) test administration** (Student must be tested in a separate setting.)
DF3	**Frequent brief supervised breaks**
DF4	**Separate or alternate test location**
DF5	**Seating in a specified area** of the testing room, including the use of a study carrel
DF6	**Adaptive or specialized furniture** (e.g., seating, desk, or lighting)
DF7	**Noise buffer,** such as noise-canceling earmuffs/headphones or white noise (**Note:** music or other recordings may *not* be played, unless granted as a *unique accommodation* by the Department.)
DF8	**Familiar test administrator**
DF9	**Student reads test aloud to self**: Student must be tested in a separate setting, unless a low-volume device (e.g., a Whisperphone™) is used.
DF10	**Specific time of day**
DF11	**Stop Testing policy**: The student should be given the opportunity to attempt each test session. If the student does not appear to be responding to test questions after a period of 15–20 minutes, the test administrator may ask if the student is finished. If so, the test administrator may collect the student's test materials and the student can either sit quietly or be excused from the test setting.

III. MCAS Participation Requirements for Students with Disabilities

A. Background

The information in this manual is intended to guide decision-making by Individualized Education Program (IEP) teams and 504 plan coordinators as to *how* a student with a

disability will participate in MCAS. Students with disabilities are required to participate in all MCAS assessments scheduled for students in their grade. Students with significant cognitive disabilities who are unable to take the standard tests, even with accommodations, must take the MCAS Alternate Assessment (MCAS-Alt).

B. Definition of a Student with a Disability

For the purpose of MCAS participation, a student with a disability is defined as a student with an approved Individualized Education Program (IEP) provided under the Individuals with Disabilities Education Improvement Act of 2004 and the Massachusetts General Laws, Chapter 71B; or a plan provided under Section 504 of the Rehabilitation Act of 1973 (i.e., a 504 plan).

C. Participation Requirements for Students with Disabilities

State and federal education laws mandate that *all* students with disabilities who are educated with Massachusetts public funds participate in annual statewide assessments This includes

- students enrolled in public schools
- students enrolled in charter schools
- students enrolled in innovation schools, including virtual schools
- students enrolled in educational collaboratives
- students enrolled in approved and unapproved private special education schools and programs within and outside Massachusetts
- students receiving educational services in institutional settings
- students in the custody of the Department of Children and Families (DCF)
- students in the custody of the Department of Youth Services (DYS)

Students with disabilities must participate in grade-level tests that correspond with the grade in which they are reported in the Department's Student Information Management System (SIMS).

Only a student's IEP team can make decisions about which test accommodations are appropriate for the student and whether the student should take the standard or alternate assessment. Assessment decisions for students with disabilities are made on an annual basis in each content area for each student and must be listed in the IEP. If the student has a 504 plan rather than an IEP, then the 504 plan must also include this information. The principal is responsible for ensuring that each student is assessed using the test format and accommodations listed in the student's IEP or 504 plan.

English Learners (ELs) with Disabilities

EL students, both with and without disabilities, must participate in all MCAS assessments required for students in their grade, regardless of the number of years they have been enrolled in U.S. schools, with one exception: **EL students who first enrolled in a U.S. school after March 1, 2022**, are *not required* to take the spring 2023 MCAS ELA tests, although schools have the *option* to assess first-year EL students in ELA.

EL students with disabilities are entitled to receive test accommodations and to participate in the MCAS Alternate Assessment (MCAS-Alt), as determined by their IEP team or 504 plan. See additional information on the participation of EL students in MCAS beginning on page 26.

In addition to MCAS tests, EL students with disabilities are required to participate annually in the ACCESS for ELLs test, which is developed by WIDA. An English language assessment mandated by federal law for all ELs. Educators use ACCESS results to make decisions about students' proficiency with English in academic contexts and to facilitate their language development. The Accessibility and Accommodations Supplement provides educators a list of administration considerations, universal tools, and accommodations for individual English learners (ELs) with disabilities.

Students Diagnosed with Concussions

The Department has issued guidelines and MCAS testing policies for students who are returning to school after being diagnosed with a concussion. Please refer to this information before making decisions about MCAS testing for a student who has had a concussion.

D. Decision-Making Guidelines for MCAS Participation

This section provides guidelines for IEP team members and staff who develop 504 plans to determine how each student with a disability will participate in MCAS.

The student's IEP team or 504 plan coordinator should address the questions below and consider options 1, 2, and 3 in the chart on pages 11–12:

- Can the student demonstrate knowledge and skills, either fully or partially, on the **standard MCAS test under routine conditions**?
- Can the student demonstrate knowledge and skills, either fully or partially, on the **standard MCAS test with accommodations**? If so, which accommodations are necessary for the student to participate?
- If the answer to the above questions is no, see the options below to determine whether the student should be assessed with the **alternate assessment** (MCAS-Alt) or should submit a **grade-level** or **competency portfolio**.

  Note: Alternate assessments are intended only for students with significant cognitive disabilities who are unable to participate in standard MCAS tests, even with accommodations.

The student's IEP team or 504 plan coordinator must make a separate decision for each subject scheduled for assessment. A student may take the standard test in one subject and the alternate assessment in another. These decisions may be revised each time the team convenes.

Characteristics of Student's Instructional Program and Local Assessment	Recommended Participation in MCAS
OPTION 1	
If the student is a) generally able to demonstrate knowledge and skills on a computer- or paper-based test, either with or without test accommodations, ***and*** is b) working on learning standards **at or near grade-level expectations,** ***or*** is c) working on learning standards that have been modified and are **somewhat below grade-level expectations** due to the nature of the student's disability,	***Then*** the student should take the computer- or paper-based **MCAS test**, either with or without accommodations.

Characteristics of Student's Instructional Program and Local Assessment	Recommended Participation in MCAS
OPTION 2	
If the student is a) an individual with a **significant cognitive disability**, ***and*** is b) **generally unable** to demonstrate knowledge and skills on a computer- or paper-based test, even with accommodations, ***and*** is c) working on learning standards that have been **substantially modified** due to a *significant cognitive disability*, ***and*** is d) receiving **intensive, individualized instruction** in order to acquire, generalize, and demonstrate knowledge and skills,	***Then*** the student should take the **MCAS Alternate Assessment (MCAS-Alt)** in this subject**.**

E. Further Guidance on Designating Students for the MCAS-Alt (Option 2)

IEP teams should **not** designate a student for an alternate assessment solely because the student

- has not received instruction in the general curriculum
- has a particular disability (e.g., all students with intellectual disabilities should not automatically be designated for the MCAS-Alt)

- is placed in a program or classroom where it is expected that students will take the MCAS-Alt
- has taken an alternate assessment in the past (since this is an annual decision)
- has previously failed the MCAS test
- requires assistive technology or an augmentative communication system that has not been provided
- attends a school in which the IEP team may have been influenced to designate the student
  for an alternate assessment in order to receive disproportionate credit toward the school's accountability rating

Please refer to the Commissioner's memorandum regarding MCAS-Alt eligibility criteria.

Characteristics of Student's Instructional Program and Local Assessment	Recommended Participation in MCAS
OPTION 3	
If the student is a) working on learning standards **at or near grade-level expectations** ***and*** is b) **sometimes able** to take a computer- or paper-based test, either with or without test accommodations, ***but*** c) has a **complex and significant disability*** that does not allow the student to fully demonstrate knowledge and skills on a computer- or paper-based test of this duration, * See Section F for examples of complex and significant disabilities for which the student may require an alternate assessment.	***Then*** the student should take the computer- or paper-based **MCAS test**, if possible, with necessary accommodations. ***However*** the team may recommend that the student submit a grade-level or competency portfolio when the severity and complexity of the disability prevent the student from demonstrating knowledge and skills on the computer- or paper-based MCAS test, even with the use of accommodations.

F. Students with Complex and Significant Disabilities Who May Require a Grade-Level or Competency Portfolio (Option 3)

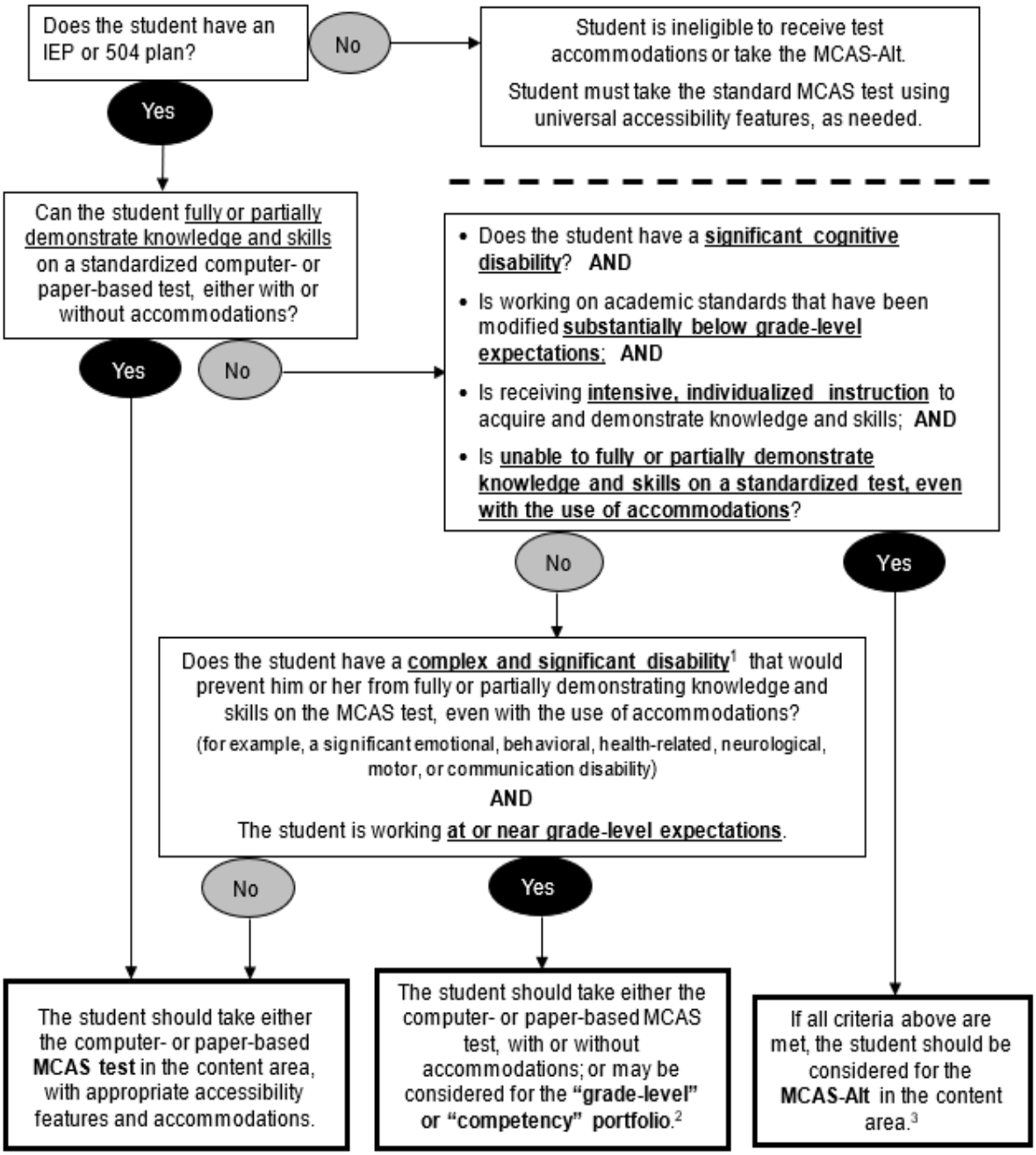
When the nature and complexity of a student's disability present significant barriers or challenges to standardized computer- or paper-based testing, even with the use of accommodations, and the student is working at or close to grade-level expectations, the student's IEP team or 504 plan coordinator may determine that the student should participate either in the grade-level (grades 3–8) or competency (high school) portfolio in one or more subjects. More information on grade-level and competency portfolios is available in the MCAS Grade-Level and Competency Manual.

The following examples are provided to expand a team's understanding of which students may be appropriate for a grade-level or competency portfolio in unique circumstances:

- a student with a significant emotional, behavioral, or other disability, who is unable to maintain sufficient concentration to participate in standard MCAS testing, even with accommodations
- a student with a significant health-related disability, neurological disorder, or other complex disability, who cannot meet the demands of a prolonged test administration
- a student with a significant motor, communication, or other disability, who requires more time than is reasonable or available for testing, even with the allowance of extended time (i.e., the student is unable to complete a test session in a single school day)

G. Decision-Making Tool for MCAS Participation by Students with Disabilities

The decision chart shown below may be used by IEP teams and 504 plan coordinators to make annual decisions regarding appropriate student participation in MCAS. Make separate decisions in *each content area* being assessed: ELA, Mathematics, and Science and Technology/Engineering.



[1] See page 10 of this manual for additional details on complex and significant disabilities.

[2] See the *MCAS Grade-Level and Competency Portfolio Manual* for details on submission of grade-level and competency portfolios.

[3] Students who take the MCAS-Alt in high school will not earn a Competency Determination in the assessed subject and therefore will not be eligible to earn a high school diploma.

IV. MCAS Accommodations for Students with Disabilities

A. Background and Purpose

The information in this section is intended to guide decision-making regarding the selection, use, and evaluation of accommodations for MCAS testing. As required by 34 CFR 300.160, the state is providing districts with these guidelines for the provision of appropriate accommodations on the MCAS tests, and stipulating that IEP teams and 504 plan coordinators carefully identify and select only those accommodations for each assessment that are needed by the student and do not invalidate the score. IEP teams should be trained annually on these guidelines. Please read the following information carefully.

B. Accommodations for Students with Disabilities

1. Purpose of Test Accommodations

A test accommodation is a change in the way a test is administered or the way in which a student responds to test questions. Test accommodations are intended to accomplish the following:

- offset the effects of the student's disability and remove barriers to participation in the assessment
- provide the necessary conditions for a student to demonstrate knowledge and skills effectively on statewide assessments
- provide the opportunity to report test results for students who require accommodations
- provide test results that are comparable to those of students who did not receive accommodations
- yield results that do not affect the validity or reliability of the interpretation of scores for their intended purposes

Based on the information and guidance found on the following pages, the IEP or 504 plan for each student with a disability must be reviewed and revised as needed, either during routinely scheduled meetings prior to testing or through the IEP amendment process. The principal is responsible for ensuring that all students are provided with the test accommodations listed in their IEPs or 504 plans during testing. It is also advisable (though not required) to list any *designated accessibility features* (see Table 2) in the plans of students to ensure these will be provided.

Use of test accommodations should never replace appropriate and rigorous instruction based on grade-level standards in the subject being tested.

2. Eligibility for Test Accommodations

ELIGIBLE: students with disabilities served by an IEP or 504 plan

The right of a student with a disability to receive allowable accommodations on MCAS tests is protected by both federal and state laws. The student's IEP or 504 plan must specify which MCAS accommodation(s) a student will receive, and the IEP must be approved by the parent/guardian (or student over 18) before an accommodation may be used by the student. Similarly, a student's 504 plan must already be in place or under development. In cases where a 504 plan is under development, the school personnel responsible for writing the plan must have already met and agreed upon the necessary MCAS accommodation(s) before the accommodation may be provided.

NOT ELIGIBLE: students <u>without</u> identified disabilities and students who are <u>not</u> served by an IEP or 504 plan.

A student who does not have a documented disability and is not served by either an IEP or 504 plan is not eligible to receive accommodations on MCAS tests, regardless of whether the student already receives support or accommodations during classroom instruction.

3. General Requirements for Use of Test Accommodations

The use of accommodations is based on the individual needs of a student with a disability and may only be provided when all of the following conditions have been met:

a) The student **has a disability** that is documented in an IEP or 504 plan and **requires the use of one or more accommodations** to participate in MCAS testing.

AND

b) The accommodation is listed in this manual (or prior written approval has been obtained from the Department for a unique accommodation); the **accommodation is listed** in the student's IEP under "State- and District-Wide Assessment;" and the **IEP has been signed** by the student's parent(s)/guardian(s) prior to the date of test administration; or is listed as an MCAS accommodation in a 504 plan developed for the student.

AND

c) The student **uses the accommodation routinely** (with rare exceptions) during classroom instruction and assessment in the subject, both before and after the MCAS test is administered, and the student is **comfortable and familiar** with its use. Use of an accommodation during routine instruction does not *necessarily* qualify a student to receive the same accommodation during MCAS testing; for example, the student must meet additional criteria to receive a ***special access* accommodation** on an MCAS test.

AND

d) If a ***special access* accommodation** will be provided, the student meets all of the criteria to receive the accommodation, as shown in Table 5.

IEP teams must reconvene at least annually and determine which accommodations will be needed for state- and district-wide assessments.

Accommodations may **not**

- alter, explain, simplify, paraphrase, or eliminate any test question, reading passage, writing prompt, or multiple-choice answer option
- provide verbal or nonverbal clues or suggestions that hint at or give away the correct response to the student
- contradict test administration requirements or result in a violation of test security – for example:
  - Test questions may not be modified, reordered, or reformatted in any way for any student.
  - Paper-based tests may not be photocopied, photographed, scanned, altered, or duplicated.
  - Screen shots of computer-based tests may not be taken or reproduced.
  - English-language dictionaries are **not** permitted for any student on Next Generation MCAS tests.

If the above conditions have been met and the accommodation is listed in the IEP or 504 plan, the accommodation(s) **must be provided** to the student during MCAS testing. If an accommodation is provided that does not meet the conditions stated above or that is not listed in a student's plan, the student's test score may be **invalidated**.

In the event a test accommodation is provided that was *not* listed in the student's IEP or 504 plan, or if a student was *not* provided a test accommodation listed in the plan, the school should immediately contact the Department at 781-338-3625 or by email at mcas@doe.mass.edu.

4. Updating IEPs and 504 Plans

IEPs and 504 plans should be updated as needed for all students with disabilities prior to the spring 2023 MCAS administration, as well as for other high school MCAS administrations throughout the year to reflect the most current needs of each student. Proper notation of accommodations in students' IEPs and 504 plans will ensure that students receive all the necessary supports to which they are entitled.

Nearly all students are expected to take MCAS tests using the computer-based testing platform (TestNav) and be given an opportunity to view the tutorial and take online practice tests prior to test administration.

5. If a Student Refuses an Accommodation

If a student refuses to use an accommodation listed in their plan during testing, the school should document in writing that the student refused the accommodation and keep the documentation on file at the school. The student should be told that the accommodation will remain available during testing if they need it. The student should *not* be asked to sign an agreement acknowledging that they have refused an accommodation, nor should they be asked to waive their right to receive an

accommodation that is listed in their IEP or 504 plan. A sample form (optional) for documenting a student's refusal of an accommodation is available in Appendix C.

If a student refuses an accommodation, and the IEP team agrees that the listed accommodation is no longer needed by the student, the accommodation should be removed from the plan at the next scheduled meeting (or listed in the plan "as requested by the student"). Written approval must be obtained from the parent/guardian (or student over 18 years of age) for new or amended IEPs before a change in accommodations can go into effect.

Similarly, 504 plans must reflect only those accommodations that are required by the student as determined by educators familiar with the student. Consent by the parent/guardian is *not* required for a new or amended 504 plan, although the parent/guardian must be notified of any changes.

6. Unique Accommodations Requests

If a student with a disability or an English learner requires an accommodation that is not listed in Tables 1–6, the school may request approval from the Department for the use of a unique accommodation.

Unique accommodations may **not**:

- fundamentally change the test or the construct being measured by the test, OR
- assist the student to obtain the answers to test questions, OR
- violate test security requirements.

The school may request approval (via email) for use of a unique accommodation by submitting the request to mcas@doe.mass.edu at least two weeks prior to testing. If approved by the Department, the IEP or 504 plan of the student must be amended.

7. Process for Selecting and Evaluating MCAS Accessibility Features and Accommodations for Students with Disabilities

Accommodations are intended to offset the effects of a disability to allow a student to participate effectively in MCAS testing. When selecting testing accommodations, educators should consider the following:

- **Determine the learning challenges** the student is experiencing.
  - Look at the student's classroom performance, not just the nature or type of disability.
- **Brainstorm the use of various accommodations and universal and designated accessibility features** with IEP team members and other adults familiar with the student.
  - What supports were used successfully with students who have similar learning profiles?

- **Try out the accessibility features and accommodation(s)** in different instructional and assessment settings and make adjustments as needed.
    - Be sure the student is comfortable using the accessibility feature or accommodation and becomes familiar with its use.
- **Evaluate whether the accessibility feature or accommodation addresses the student's need.**
    - If not, revise the plan to provide accommodation(s) and supports accordingly.
- **If the accessibility feature or accommodation addresses the challenge**,
    - determine whether the accessibility feature or accommodation is allowed for MCAS testing in the subject (see Tables 1–5 elsewhere in this manual); and
    - develop or amend the IEP or 504 plan accordingly, listing each accommodation (required) or accessibility feature (optional) for the specific MCAS test(s).

8. Description of MCAS Accommodations

Tables 3–5 list the MCAS accommodations available to students with disabilities on the computer-based test, and where applicable, the comparable accommodation on the paper-based test. **Note:** the paper-based accommodations described below also apply to the legacy MCAS Chemistry and Technology/Engineering tests. MCAS accommodations are grouped into the following categories:

- **Test Presentation:** allowable changes to the format in which the test is presented to the student (Table 3)
- **Response:** allowable changes to the procedures, supports, or devices used to facilitate a student's response to test questions (Table 4)
- **Special Access:** accommodations intended for a small number of students to offset the effects of a disability that would otherwise severely limit or prevent their participation in the assessment, and that may somewhat impact the interpretation of the test results (Table 5)
- **EL accommodations:** available to all ELs with and without disabilities on MCAS tests (Table 6)

Note: Accommodations listed with the *(SR/PNP)* designation in the tables below must be identified in the Student Registration/Personal Needs Profile for each student in PearsonAccess^{next}.

Table 3. *Test Presentation Accommodations* for Students with Disabilities

Test Presentation Accommodations		
#	Computer-Based Test	Paper-Based Test
A1 *(SR/PNP)*	**Paper-based edition** of the MCAS test may be administered as an accommodation to a student who is unable to use a computer or take the computer-based test due to a disability.	N/A

<table>
<tr><th colspan="3">Test Presentation Accommodations</th></tr>
<tr><th>#</th><th>Computer-Based Test</th><th>Paper-Based Test</th></tr>
<tr><td></td><td>(Note: This must be listed as an accommodation in the student's IEP or 504 plan)</td><td></td></tr>
<tr><td>A2
(SR/PNP)</td><td>N/A

(See UF3 and UF4 on page 4 for information on screen magnification and alternate cursor/mouse.)</td><td>Large print (approximately 18-point font size on 11x17-inch paper)
All responses in the large-print booklet must be transcribed verbatim from the large-print booklet to the student's combined test & answer booklet (or standard answer booklet for certain tests) and returned according to instructions in the PAM, so that the student will receive credit.
Large-print special instructions will accompany the large-print test.
Students may either use the large-print booklet to respond to test questions, in which case the answers will need to be transcribed, either by the student (at the time of testing) or a test administrator (anytime during the testing window); OR the student may write answers directly in the test & answer booklet. IEPs and 504 plans should indicate how students taking the large-print test will record their answers.</td></tr>
<tr><td rowspan="2">A3.1
(SR/PNP)

A3.2
(SR/PNP)</td><td>A3.1 – Screen reader: ONLY for a student who is blind or visually impaired and uses the assistive technology program JAWS or NVDA
A separate hard-copy Braille edition test with the appropriate Braille graphics will be sent when screen reader is designated.
All responses must be entered onscreen, either by the student or test administrator.</td><td>A3.2 – Braille edition (hard copy)
All answers must be either scribed or transcribed verbatim into the student's test & answer booklet and returned according to instructions in the PAM so the student will receive.
Braille special instructions will accompany the Braille test.</td></tr>
<tr><td colspan="2">Previewing Braille test content by test administrators: Under secure conditions supervised by the principal, Braille test administrators may review Braille test materials up to four days prior to testing once they are received by the school for the purpose of preparing to orient the student. Test materials may not be removed from the school. Braille test administrators who review the test prior to testing will be asked to sign nondisclosure acknowledgment forms.</td></tr>
<tr><td>A4.1
(SR/PNP)
and
A4.2
(SR/PNP)</td><td>A4.1 – Text-to-speech (TTS) text read aloud on the computer-based MCAS Mathematics and Science and Technology/ Engineering tests</td><td>A4.2 – Kurzweil 3000 electronic text reader
Kurzweil 3000 test editions are only available for the following tests:
High school legacy STE tests</td></tr>
</table>

Test Presentation Accommodations		
#	**Computer-Based Test**	**Paper-Based Test**
	• TTS may be used either with or without headphones. • **For students who require that text be read aloud, IEP teams should consider whether TTS is preferable to a human reader (or vice versa) and list this in each student's IEP or 504 plan (e.g., "text-to-speech is preferable, but human reader is acceptable").** • Students should view the tutorial and take an **online TTS practice test** prior to testing. If the student is unable to use the TTS feature, but has this accommodation listed in his or her plan, a human reader may be substituted. • TTS for ELA is a special access accommodation (SA 1.1). See Table 5 for guidelines and criteria to receive this accommodation.	**(Chemistry and Technology/Engineering)** • Kurzweil 3000 tests are in read-only format. Responses must be recorded in the student's test & answer booklet. • Kurzweil 3000 special instructions will be sent to the school with the test.

Test Presentation Accommodations		
#	**Computer-Based Test**	**Paper-Based Test**
A5 *(SR/PNP)*	**Human read-aloud** for the Mathematics and Science and Technology/Engineering computer- or paper-based tests • **For students who require that text be read aloud, IEP teams should consider whether TTS is preferable to a human reader (or vice versa) and list this in each student's IEP or 504 plan (e.g., "text-to-speech is preferable, but human reader is acceptable").** • A human reader may either read aloud 1) the **computer-based test** signed in to a nearby computer or sitting next to the student; or 2) the **paper-based test**. • The test must be administered in a **separate setting**, either **individually** or to a **small group of 2–5 students**, all of whom are being provided the human read-aloud accommodation. • The entire test must be read word-for-word, exactly as it appears. The test administrator may not provide assistance to the student regarding the meanings of words, intent of any test item, or responses to test items. The test administrator should read with emphasis only when indicated by bold or italicized text. (Note: Reading aloud **selected words** on the Mathematics and/or Science and Technology/Engineering (STE) tests, as requested by the student, is UF11.) • Test administrators who review the test, including human readers, will be asked to sign nondisclosure acknowledgment forms. • **Note: Reading aloud the ELA tests** is a *special access* accommodation (SA1). See Table 5 for guidelines and criteria to receive this accommodation.	

<table>
<tr><th colspan="3">Test Presentation Accommodations</th></tr>
<tr><th>#</th><th>Computer-Based Test</th><th>Paper-Based Test</th></tr>
<tr><td>A6.1
(SR/PNP)</td><td colspan="2">Human signer for the Mathematics, Science and Technology/Engineering tests, and ELA test questions (but NOT passages)
The test must be signed exactly as it appears. The signer may not provide assistance to the student regarding the meaning of words, intent of any test item, or how to respond to any test questions. The signer may finger-spell key words in addition to providing the sign for a term. The signer may sign emphasis only when indicated by bold or italicized text.
The test must be administered in a separate setting, either individually or to a small group of 2–5 students, all of whom are receiving the human signer accommodation.
Note: If preferred, selected words, phrases, or sections of the Mathematics and/or Science and Technology/Engineering test(s) may be signed to the student, as requested, rather than signing the entire test.
Signing the ELA reading passages is a special access accommodation (SA2). See Table 5 for guidelines and criteria to receive this accommodation.
Previewing test content by human signers: Under secure conditions supervised by the principal, interpreters may review test materials up to four days prior to testing once they become available, either online or shipped to the school, for the purpose of preparing to sign the test. Test materials may not be removed from the school nor accessed online outside of the school. Test administrators and interpreters who review the test prior to testing will be asked to sign nondisclosure acknowledgment forms.</td></tr>
<tr><td>A6.2
(SR/PNP)</td><td>ASL video editions of the computer-based spring 2023 MCAS grade 10 Mathematics and high school Introductory Physics and Biology tests
An embedded ASL video is built into these computer-based tests.
Students may turn on, turn off, pause, and control the signing speed of the ASL video. The size of the ASL video may be adjusted (using the control + or - keys) and it may be moved around on the computer screen.
Students should view the tutorial and take online ASL practice tests prior to testing to become familiar with the features of the ASL video player. For students who are unable to use the ASL video, but have this accommodation listed in their plans, a human signer may be substituted.</td><td>N/A (See A6.1 for Human Signer)</td></tr>
<tr><td>A7</td><td colspan="2">Human signer for <u>test directions only</u> for a student who is Deaf or Hard-of-Hearing</td></tr>
<tr><td>A8</td><td colspan="2">Track test items by assisting the student to move from one test question to the next</td></tr>
</table>

Table 4. *Response Accommodations* for Students with Disabilities

<table>
<tr><th colspan="3">Response Accommodations</th></tr>
<tr><th>#</th><th>Computer-Based Test</th><th>Paper-Based Test</th></tr>
<tr><td>A9
(SR/PNP)</td><td colspan="2">
Use of approved graphic organizers, checklists, or supplemental reference sheets for ELA, Mathematics, and/or Science and Technology/Engineering tests

Only the approved ELA organizers and supplemental mathematics reference sheets made available by the Department may be used as accommodations on ELA and Mathematics tests; graphic organizers without text (e.g., paper with only lines, arrows and dots) may also be used without Department approval by students who have this accommodation listed in their IEP or 504 plans.

Notes:

Approved graphic organizers and supplemental reference sheets are available on the Department's website. These have been developed for use on MCAS tests based on the most current versions of the curriculum framework standards measured by the tests, the MCAS test design, expectations for how student essays and text-based responses will be scored, and educator input.
For Science and Technology/Engineering tests in grades 5, 8, and high school, a student may use a sample reference sheet, if available, or submit a customized reference sheet for Department approval (see Appendix E)
Individualized STE reference sheets for the following tests may be submitted to the Department for approval according to the schedule below.

<table>
<tr><th>Test Administration Date</th><th>MCAS Test</th><th>Reference Sheet Submission Deadline</th></tr>
<tr><td>February 2023</td><td>February Biology and Introductory Physics</td><td>January 6, 2023</td></tr>
<tr><td>April 2023</td><td>Grades 5 and 8 STE</td><td>March 3, 2023</td></tr>
<tr><td>June 2023</td><td>High School STE</td><td>April 28, 2023</td></tr>
</table>
For the tests/retests listed in the table above:

Students may continue to use individualized STE reference sheets and checklists provided they have been submitted and approved by the Department prior to testing.
Individualized reference sheets approved prior to the 2020–2021 school year must be resubmitted for approval for use on the 2022–2023 STE tests.
All individualized organizers, checklists, and reference sheets submitted for approval must be accompanied by a completed cover sheet (see Appendix E).

</td></tr>
</table>

<table>
<tr><th colspan="3">Response Accommodations</th></tr>
<tr><td>A10.1
(SR/PNP)</td><td colspan="2">Scribe responses (A10.1) for the Mathematics and/or Science and Technology/Engineering tests and retests using:
human scribe who will record the student's responses verbatim (i.e., as dictated by the student) at the time of testing, either onscreen (computer-based test) or in the student's test & answer booklet (paper-based test). The student must be tested in a separate setting. Test administrators (and/or sign interpreters) who review the test will be asked to sign nondisclosure acknowledgment forms. (See Appendix A for specific guidance on providing the scribe accommodation.)
For students unable to use their hand to respond to test questions due to a recent injury or recovery from surgery, the scribe accommodation may be provided, if:
this is listed in a 504 plan or an approved IEP (Department approval is not required); OR
if a 504 plan is under development, and the staff responsible for writing the plan have already met and agreed upon the need for the scribe accommodation before providing it to the student.</td></tr>
<tr><td>A10.2
(SR/PNP)</td><td colspan="2">Speech-to-text (A10.2); a voice recognition program or device that converts speech into text (other than a smartphone) used to generate responses.
Students using the speech-to-text accommodation for the following computer-based tests — grades 5 and 8 STE tests or high school Biology — will be able to use an embedded speech-to-text web extension that functions within TestNav. The Web Extension AT SR/PNP designation must be selected in PeasonAccess^{Next} for this embedded tool.
The web extension for speech-to-text does not function on Mathematics or Introductory Physics computer-based tests due to its incompatibility with the Equation Editor answer box used for open responses. Refer to the Guidelines for Using Assistive Technology as an MCAS Test Accommodation for a step-by-step guide to accessing and using this feature.
Students may need to use their own AT speech-to-text devices (for mathematics tests) that are not embedded in TestNav; if students use their own AT devices, all assessment content must be deleted from these devices after the test for security purposes.
Speech-to-text technology requires that the student go back through all generated text to correct errors in transcription, including use of writing conventions; thus, prior experience with this accommodation is essential.
Students who use speech-to-text will need headphones/whisperphones unless tested individually in a separate setting.</td></tr>
<tr><td>A11</td><td>Responses recorded by student on special paper.
Responses must be transcribed into the student's computer-based tests. anytime during the testing window.
If the student transcribes their own responses, then transcription must</td><td>Responses recorded by student on special paper, rather than in the test & answer booklet.
Responses must be transcribed into the student's test & answer booklet by a test administrator anytime during the testing window.
If the student transcribes his or her own responses, then transcription must occur during the</td></tr>
</table>

Response Accommodations		
	occur *during the test session* and be completed on the day in which the test session began. See Appendix A for guidelines on transcribing student responses	*test session* and be completed on the day in which the test session began. See Appendix A for guidelines on transcribing student responses
A12 *(SR/PNP)*	N/A	**Typed responses** • Responses must be printed out, one per page, and inserted in the student's test & answer booklet with all required information on each page (see the Principal's Administration Manual). • Transcription of typed responses into the test & answer booklet is NOT required. • After printing out, responses must be deleted from the word processor or device.
A13	**Student records responses on a recording device** (other than a smartphone) for the purpose of playing back and transcribing recorded segment(s). Student may use text-to-speech software or an audio recording device. Responses must be deleted from any external devices once they have been transcribed into the student's test & answer booklet.	
A14	**Responses signed onto video (for a student who is Deaf or Hard-of Hearing)**, then transcribed by the student onscreen or into the answer booklet during playback. The video must be deleted after transcription.	
A15	**Monitor placement of responses** in the appropriate area onscreen or in the test & answer booklet by the test administrator	
A16	**Refreshable Braille Display/Braille note-taker** (specific external device used in conjunction with screen reader for student who is blind or has a vision impairment). A hard-copy edition of the Braille test must also be ordered.	**Braille note-taker** (specific external device used in conjunction with hard-copy Braille test) Note: Braille notes should be returned with the school's nonscorable shipment.
A17	**Braille writer** (specific external device used in conjunction with screen reader and hard-copy Braille test)	**Braille writer** (specific external device used in conjunction with the hard-copy Braille test). A printout of each response may be generated and inserted in the student's test & answer booklet, with all required information on each page (also see the Principal's Administration Manual).

A note regarding the transcription of student responses: The process of transcribing student responses onscreen or into test & answer booklets by a test administrator (e.g., from the large-print answer booklet) may occur at any time during the testing window, and must be monitored and supervised by the principal, test coordinator, or another test administrator. Details on transcribing responses are provided in Appendix A.

9. *Special Access Accommodations* for Students with Disabilities

Special access accommodations are intended for use by a *very small number of students*

with the most significant cognitive disabilities who would not otherwise be able to access the test because a disability severely limits or prevents them from performing the skill in question. **Teams must exercise caution when considering whether a student requires a special access accommodation, since these accommodations may alter part of what the test is designed to measure.** Teams must carefully review the guidelines and criteria described for each special access accommodation listed in Table 5.

Test results for students who took the test using special access accommodations should be interpreted with caution. Parents and schools should not infer that the student has expertise in the skill being accommodated. A notation will accompany the results of students who use a *special access* accommodation.

The Department will review each district's rate of use of special access accommodations. To ensure that IEP teams and 504 plan coordinators carefully review and apply appropriate criteria for use of special access accommodations, districts must do the following:

- train members of IEP teams and 504 plan coordinators on the guidelines for the selection and use of accommodations, including *special access* accommodations, listed in Table 5; and
- revise the IEPs and 504 plans of students with disabilities as needed.

Although test accommodations should generally be consistent with accommodations used for instruction, **the use of a *special access* accommodation during instruction does not automatically qualify a student to receive the same accommodation on an MCAS test**, unless the student meets the guidelines and criteria described on the following pages.

IEP and 504 teams are encouraged to make consistent, appropriate, and defensible decisions regarding the use of *special access* accommodations for each student based on locally administered diagnostic assessments, and to amend the IEPs and 504 plans of students who have been previously designated for special access accommodations, but who do not meet the criteria listed in Table 5.

Table 5. *Special Access Accommodations* for Students with Disabilities

Special Access Accommodations	
#	**Computer- and Paper-Based Tests**
SA1.1 *(SR/PNP)* and SA1.2 *(SR/PNP)*	**Text-to-speech** (SA1.1) **or Human read-aloud** (SA1.2) **for ELA tests**, including oral presentation of test questions, response options, and passages. • text-to-speech may be used either with or without headphones; • a human reader may either read aloud 1) the **computer-based test** logged in to a nearby computer or sitting next to the student; or 2) the **paper-based test**. This accommodation is intended for a very small number of students with disabilities that **severely limit or prevent them from reading**, as documented in locally administered diagnostic evaluations. The student must meet all of the following criteria: • be **virtually unable to read**, even after varied and repeated attempts to teach the student to do so (i.e., the student is at the beginning stages of learning to read, and not simply reading below grade level), as determined by locally administered diagnostic evaluations (reading below the second grade-level); and • receive **ongoing intervention** to learn the skill of reading; and • use this accommodation routinely (except during instruction in learning to read). The human read aloud (SA1.2) may also be provided to a student who is blind or has a visual impairment and uses a screen reader and/or has not yet learned (or is unable to use) Braille on the tests and retests listed above. If the student will use a screen reader, a separate hard copy Braille test edition will be sent to the school to allow the student to access the appropriate Braille graphics (see accommodation A3.1). The student • may be tested in a typical-sized group if using text-to-speech *with* headphones; • must be tested individually in a separate setting if text-to-speech will be used *without* headphones; and • may be tested in a group of up to five students if a human reader will be used.
SA2 *(SR/PNP)*	**Human signer for ELA tests or retests**, including reading passages, questions, and answer options, for a student who is Deaf or Hard-of-Hearing This accommodation is intended for students who are Deaf or Hard-of-Hearing, and who are **severely limited or prevented from reading**, as documented in locally administered diagnostic evaluations. The student must meet all the following criteria: • be **virtually unable to read** (i.e., decode text), even after varied and repeated attempts to teach the student to do so (i.e., the student is at the very beginning stages of learning to read, and not simply reading below grade level), due to a documented disability and/or history of early and prolonged lack of exposure to and use of language; and • uses this accommodation routinely, except during reading instruction; and • receives ongoing intervention to learn the skill. The student must be tested in a group of no more than five students, unless approval is obtained from the Department to increase the group size in rare circumstances.
SA3.1 *(SR/PNP)*	**Scribe responses for the MCAS ELA tests and retests:** **A human scribe (**SA3.1) who will record the student's responses verbatim (i.e., as dictated by the student) *at the time of testing*, either onscreen (computer-based test) or in the student's test & answer booklet (paper-based test). • The student must be tested in a separate setting.

Special Access Accommodations	
#	**Computer- and Paper-Based Tests**
	• Test administrators (and/or sign interpreters) who review the test will be asked to sign non-disclosure agreements (**See Appendix A for specific guidance on providing the scribe accommodation.**). This accommodation is intended for students who have documented significant motor or processing difficulties, or who have had a recent injury (such as a broken hand or arm) that makes it difficult to produce responses and need to dictate their responses to a human, who then records the students' responses verbatim. For many of these students, dictating to a scribe is the only way to demonstrate their composition skills. It is important that these students be able to develop planning notes via the scribe, and to view what they produce while composing via dictation to the scribe.

SA3.2
(SR/PNP)
	Speech-to-text (SA3.2) for MCAS ELA tests and retests:
	
	Students using this special access accommodation use a speech recognition program that converts voice to written text.
	• For the CBT ELA test, students will be able to use an embedded speech-to-text web extension that functions within TestNav. This embedded assistive technology will allow students to dictate their responses directly into the computer-based test without using a separate adjacent (external) device. Refer to *Guidelines for Using Assistive Technology as an MCAS Test Accommodation* for a step-by-step guide on accessing and using this feature**.**
	  ○ The Web Extension AT SR/PNP designation must be selected in PeasonAccess^{Next} for this embedded tool.
	  ○ If students use their own AT devices, all assessment content must be deleted from these devices after the test for security purposes.
	• Speech-to-text technology requires that the student go back through all generated text to correct errors in transcription, including use of writing conventions; thus, prior experience with this accommodation is essential.
	
	This accommodation is intended for students who have documented significant motor or processing difficulties, or who have had a recent injury (such as a broken hand or arm) that makes it difficult to produce responses and need to dictate their responses into a voice/speech-to-text device. For many of these students, dictating is the only way to demonstrate their composition skills. It is important that these students be able to develop planning notes, and to view what they produce while composing via dictation.

Special Access Accommodations	
#	**Computer- and Paper-Based Tests**
SA4 *(SR/PNP)*	**Calculation device or other mathematics tool** (including addition/subtraction or multiplication/division tables; or manipulatives) on the *non-calculator session* of the Mathematics test or retest • Students taking the CBT test will be able to use an embedded calculator. This accommodation is intended for a small number of students with documented disabilities that **severely limit or prevent them from performing basic calculations** without a calculation device or other mathematics tool, as documented in locally administered diagnostic evaluations, even after varied and repeated attempts to teach the student to do so. The student must meet all of the following criteria: • be **virtually unable to calculate** (i.e., unable to perform single-digit addition, subtraction, multiplication, or division without a calculation device or other mathematics tool); and • uses the calculation device or tool during routine instruction in mathematics; and • receives ongoing intervention to learn the skill. The student's IEP or 504 plan must specify which calculation device or tool will be used (e.g., calculator or multiplication table). Manipulatives and other mathematics tools (excluding calculators and arithmetic tables) must be approved by the Department prior to their use on MCAS tests. Please contact Student Assessment Services at 781-338-3625 or mcas@doe.mass.edu to request approval.
SA5 *(SR/PNP)*	**Spell-checker for the ELA test and retest**, including an external spell-checking device for the paper-based test; or in conjunction with the typed response accommodation for the paper-based test • Students taking the CBT test will be able to use an embedded spell-checker tool. This accommodation is intended for a small number of students with disabilities that **severely limit or prevent them from spelling correctly**, even after varied and repeated attempts to teach the student to do so. The student must meet all of the following criteria: • be **unable to spell simple words** (i.e., at the beginning stages of learning how to spell), as documented by locally administered diagnostic evaluations; and • produces understandable written work only when provided this accommodation, which the student uses during routine instruction; and • receives ongoing intervention to learn the skill. The student may *not* use grammar check or access the internet during the test.

Special Access Accommodations	
#	**Computer- and Paper-Based Tests**
SA6 *(SR/PNP)*	**Word prediction for the ELA test and retests**: Word prediction provides a student with a choice of frequently used words after the student types the first few letters of a word. Students using the word prediction *special access* accommodation for the ELA test will be able to use an embedded word prediction web extension that functions within TestNav. This embedded assistive technology will allow students to use word prediction assistive technology within TestNav without using a separate, adjacent (external) device. Refer to the *Guidelines for Using Assistive Technology as an MCAS Test Accommodation* for a step-by-step guide on accessing and using this feature**.** For paper-based tests, a word prediction application must be used at a separate external computer station, and a test administrator or the student must transcribe the selected word(s) into the student's answer booklet. (See Appendix A for information and guidelines on transcribing student responses.) This accommodation is intended for a small number of students who: 1. have a disability that **severely limits or prevents them from recalling and processing language** in order to generate written responses; AND 2. can access written expression only through the use of word prediction software, application, or device during routine instruction in order to generate written responses. Test administrators who review the test will be asked to sign nondisclosure acknowledgment forms. During testing, internet access must be turned off/restricted; and functions that *automatically* select words for the student must be turned off.

V. MCAS Participation Requirements for Students Who Are English Learners (ELs)

EL students must participate in all MCAS tests scheduled for their grades, regardless of the language program and/or services they are receiving or the amount of time they have been in the United States, with one exception: spring 2023 ELA testing is *optional* for EL students who enrolled in U.S. schools **after March 1, 2022** and who were not reported in the March 2022 SIMS report.

Schools may choose to administer the MCAS ELA tests to first-year ELs and *must* administer the ACCESS for ELLs test to first-year and all other EL students, even those who have opted out of English language programs and services. **First-year EL students *must* also participate in MCAS Mathematics and Science and Technology/Engineering tests**, although results will be reported for diagnostic purposes only and students' results will not be included in school and district summary results or in state accountability reporting. For first-year ELs who participate in ELA testing, results will be provided at the school level and will be used for Competency Determination purposes for grade 10 students.

EL Participation Requirements for Spring 2023 MCAS Tests

	Content Area Test		
	ELA	Mathematics	Science and Tech/Eng
First-Year EL Students[1]	*Optional*[2]	Required	Required
All Other Students	Required	Required	Required

[1] Results for first-year EL students are **not** included in MCAS school and district summary results.
[2] Optional, provided that the student has participated in ACCESS for ELLs testing.

Questions regarding the **identification screening, placement, and reclassification of EL students** should be directed to the Office of English Language Acquisition and Academic Achievement at 781-338-3584 or via email at el@doe.mass.edu. For additional details, refer to the Guidance on Identification, Assessment, Placement, and Reclassification of English Learners.

Foreign Exchange Students

Foreign exchange students who are coded in SIMS as #11 under "Reason for Enrollment" in grades 3–8 and 10, regardless of whether they are determined to be English learners, are required to participate in the MCAS tests specified for the grade in which they are reported. These students are also required to participate in ACCESS for ELLs testing if they are reported in SIMS as English learners.

VI. MCAS Accessibility and Accommodations for EL Students

In addition to the accessibility features listed elsewhere in this manual, several accommodations are also available to ELs, as described in Table 6. Table 7 describes the relative suitability of each accommodation for students who are at beginning, intermediate, and advanced levels of English proficiency.

A. Individuals Involved in Selecting Accessibility Features and Accommodations for EL Students

Decisions about which universal and designated accessibility features, and which accommodations, are appropriate for an EL student should be made by a group of educators familiar with the student. The decisions of the decision-making team must be documented using either the sample form for **Documentation of MCAS Accommodations for an EL Student** provided in Appendix B, or using a similar, locally designed form.

Individuals involved in the decision-making process may include any of the following:

- the student
- the student's English as a Second Language (ESL) educator
- school administrator (principal/assistant principal)
- general educator (content area teacher)
- special educator (if appropriate)
- parent or guardian

Decision-making teams are encouraged to determine appropriate accessibility features and accommodations for EL students as early as possible in the school year to ensure that the student is familiar with their use. The student should not be introduced to an accessibility feature or accommodation on the day of the assessment. Accessibility features and accommodations are intended to remove barriers and allow EL students to demonstrate their knowledge and skills more effectively.

B. Guidelines for Selecting and Evaluating Accessibility Features and Accommodations for EL Students

Because a student's level of English language proficiency is transitional, and the student's linguistic needs will differ from one year to the next, universal and designated accessibility features and accommodations should be examined and revised annually as the EL student makes progress toward attaining English proficiency.

1. Decision-Making Procedures

The following procedures may be used to make appropriate decisions regarding the selection of accessibility features and accommodations for EL students:

- After examining the range of supports allowed on MCAS tests that may help the EL student access the curriculum and take assessments more effectively, the student's classroom teacher should consider the following:
    - *Has a particular accessibility feature and/or accommodation been used successfully in the past to assist students in similar situations and at similar English proficiency levels?*
- After trying out the selected supports during routine instruction to determine whether they meet the student's needs, the teacher should consider the following questions:
    - *Does the feature and/or accommodation help the student overcome the barriers posed by developing English language proficiency?*
    - *Is the student comfortable using the feature or accommodation?*
- The teacher should observe the student using the accessibility feature or accommodation in the classroom (or if possible, across different classrooms and school settings) and inform members of the decision-making team which accessibility features or accommodations seem appropriate and effective.
- Based on the accessibility feature(s) and/or accommodations listed in this manual that were used successfully in the classroom, the teacher can select the appropriate features and/or accommodations for use on the MCAS tests.
- The teacher should document the final decisions on the use of specific accessibility features or accommodations, either on the sample form provided in Appendix B or using a similar locally developed form, and maintain this information in the student's file.

2. Involving Students in Selecting and Using Accommodations

The more an EL student is involved in the accommodation selection process, the more likely the accommodations are to be accepted and used by the student. As students' English proficiency increases, and especially as students reach adolescence and the desire to be more independent increases, students can help determine when the support is no longer useful. Students are likely to increase their self-advocacy abilities over time and ensure that they receive the selected supports during testing. Teachers and other adults should play a role in assisting students to advocate on their own behalf regarding their need for and use of accessibility features and accommodations.

It is important to introduce the use of selected features and accommodations as early as possible in the school year to familiarize students with their use and determine their effectiveness. Accommodations should not be introduced for the first time on a statewide assessment.

C. Accommodations for Students Who Are English Learners (ELs)

In addition to universal features and designated features available to all students, the accommodations listed in Table 6 are available to all ELs, with and without disabilities, on MCAS tests.

Note that *some* EL accommodations must be **designated** in the Student Registration/Personal Needs Profile (SR/PNP) in PearsonAccess^{next}. The names of accommodations and the process for their selection in the SR/PNP are identical to accommodations for students with disabilities, although the EL accommodations have unique codes (e.g., EL1.).

Table 6. Accommodations for Students Who Are Els

#	Accommodations for EL Students
EL1 *(SR/PNP)*	**Paper-based editions** of MCAS tests may be administered to a first-year EL student (i.e., a student in their first calendar year of enrollment in a U.S. school) with a low level of English proficiency, or an EL who has little or no familiarity with technology. (Note: Administering the ELA test to a first-year EL student is *optional*)
EL2	**Approved Bilingual Word-to-Word Dictionary and Glossary** (English/Native language) (Note: this accommodation is also available to former ELs)
EL3.1 *(SR/PNP)* and EL3.2 *(SR/PNP)* and EL3.3 *(SR/PNP)*	**Text-to-speech (TTS)** (EL3.1) for computer-based Mathematics, grades 5 and 8 Science and Technology/Engineering, and/or high school Biology or Introductory Physics (STE); or **Human read-aloud** (EL 3.2) for computer-based or paper-based Mathematics; Science and Technology/Engineering tests; or **Kurzweil 3000** (EL3.3) for legacy paper-based high school Science and Technology/Engineering tests (Chemistry and Technology/Engineering) • If administering the paper-based test with a human reader, the test must be read word-for-word in English, exactly as written. The test administrator may not provide assistance to the student regarding the translation or meaning of words. The test administrator should read with emphasis only when indicated by bold or italicized text. • If a human reader is used, the test must be administered in a separate setting either **individually** or to a **group of 2–5 students** all of whom are receiving the human reader accommodation. • A student using the TTS-enabled English-only edition of the computer-based test with **headphones** may be tested in a typical-size group. If *not* using headphones, then student must be tested in a separate setting. **Note:** Reading aloud **selected words** on the Mathematics and/or Science and Technology/ Engineering tests is UF11. (See Table 1.)
EL4.1 *(SR/PNP)* and EL4.2 *(SR/PNP)*	**Scribe or speech-to-text** for Mathematics test responses, and/or STE test responses, consisting either of: • **human scribe** (EL4.1), who records student's responses verbatim *at the time of testing*. See Appendix A for specific guidance on providing the scribe accommodation; or • a **speech-to-text** (EL4.2) program that converts voice to written text, used under the direct supervision of a test administrator to generate responses to test questions.

#	Accommodations for EL Students
	Students using the speech-to-text accommodation for the grade 5 and 8 STE tests, and high school Biology, will be able to use an embedded speech-to-text "web extension" that functions within TestNav. This assistive technology is compatible with TestNav and will allow students to dictate their responses directly into the computer-based test without using a separate adjacent (external) device. The embedded web extension **is not available to ELs on the ELA tests; nor does the speech-to-text web extension function on the Mathematics and Introductory Physics computer-based tests** due to incompatibility with the Equation Editor answer box used for open responses on those tests. Refer to the *Guidelines for Using Assistive Technology as an MCAS Test Accommodation* for a step-by-step guide to accessing and using this feature**.**
EL5	**Test administrator reads aloud/repeats/clarifies general administration directions in English** (from the Test Administration Manual scripts)
EL6	**Test administrator reads aloud/repeats/clarifies general administration directions** (from the Test Administration Manual scripts) **in student's native language**, if a native language speaker is available
EL7 *(SR/PNP)*	**Spanish/English** version of the Grade 10 Mathematics test or retest and **High School Biology** and **Introductory Physics** tests • Spanish/English tests are available in computer- and paper-based formats. Paper-based tests consist of Spanish and English on facing pages (side-by-side); computer-based tests consist of stacked text, Spanish text above English text. • Intended for Spanish-speaking EL students who have been in the U.S. less than 3 years. • Students may respond either in Spanish or English. (Note that for all other MCAS test versions, students may respond only in English.)

Table 7 provides guidance regarding the suitability of EL accommodations based on the English language proficiency (ELP) level of the student.

Table 7. Guidance on Selecting Accommodations for English Learners

KEY for Table 7:

- ● **Highly recommended** for use by English learners at this ELP level
- ⊙ **Recommended** for use by English learners at this ELP level
- ○ **May not be appropriate** for students at this ELP level

#	Accommodation	Most Likely to Benefit English Language Learners at the Following English		
		Beginning	Intermediate	Advanced
EL1	**Paper-based editions** of the Next Generation tests may be administered to a first-year EL student (i.e., in the first calendar year of enrollment in a U.S. school) with a low level of English proficiency and/or no familiarity with technology.	●	⊙	○
EL2	Approved **bilingual word-to-word dictionary** and glossary (English/Native Language)	●	⊙	○

#	Accommodation	Most Likely to Benefit English Language Learners at the Following English		
		Beginning	Intermediate	Advanced
EL3.1 EL3.2 or, EL3.3	**Text-to-speech** (EL3.1) for the computer-based Mathematics or Science Technology/Engineering (STE) tests (in English *only);* OR **Human read-aloud** (EL3.2) for Mathematic or STE tests or (EL3.3) Kurzweil for legacy paper-based high school Science and Technology/Engineering tests (Chemistry and Technology/Engineering)			
EL4.1 and EL4.2	**Human scribe** (EL4.1) or **speech-to-text** (EL4.2) for Mathematics and/or Science and Technology/ Engineering test responses			
EL5	Test administrator reads aloud/repeats/clarifies general administration **directions in English**			
EL6	Test administrator reads aloud/repeats/clarifies general administration **directions in student's native language**			
EL7	**Spanish-English** version of the Grade 10 Math test/retest, High School Biology or Introductory Physics			

Appendix A
Procedures for Scribing and Transcribing Student Responses

A human scribe (A10.1, EL4.1, SA3.1) or speech-to-text (A10.2, EL4.2, SA3.2) are accommodations that allow students to either provide their responses orally to a test administrator who will write or keyboard the responses directly onscreen (or into the student's test booklet) or into a speech recognition device that converts spoken words into text. Students who receive this accommodation may respond to test questions either through:

- verbal dictation to a human scribe
- a speech-to-text device or other augmentative/assistive communication device (e.g., picture/word board)
- signing (e.g., American Sign Language, signed English, Cued Speech),
- gesturing or pointing
- eye-gazing

Guidelines for Administering the Human Scribe Accommodation (A10.1, EL4.1, SA3.1)

- A scribe may administer this accommodation only to **one student at a time** during a test session. The student must be tested in a separate setting.
- If scribing responses into a paper-based booklet, the scribe must produce legible text. For computer-based tests, the scribe will type directly into the student's computer-based test.
- The scribe must transcribe the student's responses verbatim and may not prompt, correct, or question the student regarding the content of the responses.
- The scribe may request that the student restate (or sign) words, phrases, or sentences, as needed. The scribe may not edit or alter the student's dictated response in any way.
- A student using a scribe must be given the same opportunities as other students to plan and draft a written response. The scribe may write an outline, plan, or draft as directed by the student, and must record the draft response or outline exactly as dictated.

Additional guidance for scribing ELA tests and retests (SA3.1):

- The scribe will write verbatim student responses on paper or on screen in an area where the student's answers will not be accessible to others.
- The scribe will correctly spell all words as dictated.
- The scribe will not capitalize words or punctuate text; rather, scribes should request clarification from the student about the use of capitalization, punctuation, and must allow the student to review and edit what the scribe has written.
- The scribe will orally confirm spelling of homonyms and commonly confused

homophones, e.g., than and then; to, two, and too; there, their, and they're.

- The student will proofread to add punctuation, capitalization, formatting, and other edits.
- The scribe will make student requested changes, even if incorrect.
- The student will confirm the correctness of the response.
- After the student has finished dictating his or her response(s), the scribe must:
    - ask the student to review the draft and make any necessary edits, including capitalization, punctuation, and paragraph breaks.
    - either allow the student to make edits independently or direct the scribe to make the edits.
    - not assist the student in making decisions during the editing process.

Guidelines for <u>Transcribing</u> Student Responses

Circumstances may occur during test administration that may require a test administrator to **transcribe** a student's responses into a test & answer booklet or onscreen. Transcribing responses by a test administrator may occur at any time until the end of the testing window under secure conditions supervised by the principal (or designee). These situations may include:

- answers recorded in the wrong section of (or in an incorrect) test & answer booklet or computer-based test.
- a student took the test using a special test format requiring that answers be transcribed; e.g., Braille, large-print. (Braille responses must be transcribed by persons fluent in Braille.)
- a student uses speech-to-text software, or augmentative communication, or an assistive technology device (**that is not compatible with TestNav**) and prints responses for transcription by a test administrator.
- A student recorded answers on blank paper, instead of in the required test & answer booklet or computer-based test, as an accommodation.
- The test & answer booklet or document becomes unusable; e.g., torn, wrinkled, or contaminated.

In cases where a student's responses must be transcribed *after* test administration is completed, the following steps must be followed:

- at least two persons must be present during any transcription of a student's responses. At least one of the individuals must be an authorized test administrator; the other a principal or designee.
- the student's response must be transcribed verbatim into the combined test & answer booklet (or separate answer booklet for legacy tests) or computer-based test.
- the student's original printed responses must either be securely shredded or returned with the school's nonscorable materials.

APPENDIX B

Sample Form

Documentation of MCAS Accommodations for an EL Student

Use this form or a locally developed form to document the selection of **MCAS accessibility features and accommodations** for each EL student. Available accessibility features and accommodations are listed in the *Accessibility and Accommodations Manual for the 2022–2023 MCAS Tests and Retests*. This form or the locally developed form should be completed within 60 days of the start of school year or student's date of enrollment and must be **updated annually**. If the EL is a student with a disability, accommodations decisions for EL students with disabilities must also be documented in the student's IEP or 504 plan.

Student Name:	School Year:
Grade:	SASID:
School:	District:

Name of staff and others who determined the test accommodations and features for the student:

Educators(s):

Parent(s) or other team members:

If the **parent** and/or **student** were not part of the decision-making process, then they should be notified of the features and accommodations the student will receive on the tests.

Directions: Indicate below the **accessibility features and accommodations** that will be provided to the student on MCAS tests.

Accessibility Feature or Accommodation Needed by the EL Student for Testing	Notes/Comments
(Continue on additional pages as needed.)	

APPENDIX C

Sample Form (Optional)

Student Accommodation Refusal

If a student refuses an accommodation listed in their IEP or 504 plan, the school should document in writing that the student refused the accommodation, and the accommodation must be offered and remain available to the student during testing.

This form can be completed and placed in the student's file, and a copy sent to the parent. IEP teams, 504 plan coordinators, and educators making MCAS accommodations decisions for ELs should consider this information when making future accommodations decisions for the student. Use of this form is encouraged, but not required.

Student Name: _____ **Date**: _____

Grade: _____ **SASID**: _____

School: _____

District: _____

MCAS Test: _____

Test Administrator: _____

Accommodation(s) refused by student _____

_____

Reason for refusal: _____

_____

_____

Comments:

_____

_____

Keep this form on file at the school.
Do *not* submit this form with your school's test materials.

APPENDIX D

Submitting Customized Materials for Approval
for MCAS Science and Technology/Engineering Tests

Instructions: This cover sheet must accompany all requests for approval to use customized materials for accommodation A9. Customized material may *only* be used on MCAS STE tests in grades 5, 8, and high school. Please complete and submit this form to the Department's Student Assessment Services Office by email to mcas@doe.mass.edu.

Materials submitted after the deadline(s) shown below may not be reviewed before the testing window begins.

Responses will be sent approximately ten school days after a request is received. Please contact the Student Assessment Services Unit at 781-338-3625 with any questions. Retain documentation on file for three years.

Contact Information

Name:	Date:
School Name:	District Name:
Telephone Number:	Fax Number:
Email:	Resubmittal (Check one): ☐ Yes ☐ No

Accommodation A9 Customized Materials Submitted

Place a check mark next to each material being submitted for approval.

☐ Legacy STE or Other Checklist ☐ STE Reference Sheet

MCAS TEST ADMINISTRATION

Place a check mark next to each test administration for which the material will be used. (Submission deadline in parentheses)

☐ February Biology and Introductory Physics (1/6/2023)

☐ High School STE (4/28/2023) ☐ Grades 5 and 8 STE (3/3/2023)

Principal or Designee Statement

The principal or designee of the school must sign below to acknowledge the following:
I have reviewed the Department's policy for administering customized materials for accommodation A9 .

Name: Signature (or Electronic Signature): Date:

Approval/Denial of Request – For Department Use Only

Database number: Date Received Date of Response ☐ Email ☐ Fax

☐ Approved ☐ Approved with Changes ☐ Denied Date Reviewed

APPENDIX F

ACCOMMODATION FREQUENCIES

Table F-1. Numbers of Students with IEPs/504 Plans Tested with and without Accommodations by Content Area and Grade*

Content Area	Grade	Total Number of Students Tested	Total Number of Students with IEPs/504 Plans Tested with Accommodations	Total Number of Students with IEPs/504 Plans Tested without Accommodations
ELA	3	63,254	8,644	7,231
	4	64,641	10,907	6,100
	5	64,772	12,011	5,585
	6	65,738	12,329	5,527
	7	65,800	12,353	5,512
	8	67,559	12,493	5,761
	10	69,807	11,629	6,410
	Total	**461,571**	**80,366**	**42,126**
Mathematics	3	64,614	9,986	5,960
	4	65,890	11,890	5,127
	5	66,027	12,629	4,981
	6	66,929	12,765	5,078
	7	66,931	12,699	5,164
	8	68,582	12,736	5,480
	10	70,644	11,671	6,203
	Total	**469,617**	**84,376**	**37,993**
STE	5	65,901	12,351	5,219
	8	68,326	12,383	5,709
	Total	**134,227**	**24,734**	**10,928**
Biology	HS	56,500	8,907	5,215
Introductory Physics	HS	14,326	2,277	1,216

**Includes English Learners with IEP/504 Plans.*

Table F-2. Numbers of English Learners (ELs) without Disabilities Tested with and without EL Accommodations by Content Area and Grade

Content Area	Grade	Total Number of Students Tested	Total Number of ELs Tested with EL Accommodations	Total Number of ELs Tested without EL Accommodations
ELA	3	63,254	91	7,499
	4	64,641	183	6,231
	5	64,772	127	3,861
	6	65,738	84	3,170
	7	65,800	108	3,459
	8	67,559	102	3,261
	10	69,807	155	4,090
	Total	461,571	**850**	**31,571**
Mathematics	3	64,614	5,841	3,005
	4	65,890	5,301	2,336
	5	66,027	3,755	1,436
	6	66,929	2,919	1,500
	7	66,931	2,896	1,855
	8	68,582	2,720	1,744
	10	70,644	2,567	2,832
	Total	469,617	**25,999**	**14,708**
STE	5	65,901	3,737	1,437
	8	68,326	2,775	1,701
	Total	134,227	**6,512**	**3,138**
Biology	HS	56,500	2,961	2,429
Introductory Physics	HS	14,326	546	506

Table F-3. Numbers of Students with IEPs/504 Plans Tested with Accommodations by Accommodation Type and Grade—ELA

Accommodation Description	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Paper-Based Test Edition	186	218	192	178	156	148	262
Large-Print Test Edition	10	14	14	10	21	17	16
Screen Reader Edition	2	2	6	3	4	5	5
Compatible Assistive Technology	8	6	20	16	19	16	8
Braille Test Edition	2	0	0	1	7	3	1
Human Read-Aloud as a Special Access Accommodation	1,131	1,164	925	611	498	430	481
Human Signer as a Special Access Accommodation	15	10	14	18	8	12	21
Text-to-Speech as a Special Access Accommodation	1,438	1,499	1,451	1,477	1,471	1,374	1,456
Human Scribe as a Special Access Accommodation	1,026	1,033	864	602	460	366	308
Speech-to-Text as a Special Access Accommodation	497	699	735	634	479	406	247
Typed Responses	5	11	12	26	27	22	38
Spell Checker as a Special Access Accommodation	318	438	606	723	817	831	947
Word Prediction as a Special Access Accommodation	155	247	281	384	374	349	329
Graphic Organizer / Supplemental Reference Sheet	8,118	10,369	11,622	12,015	12,070	12,233	11,345
Web Extension	455	678	691	627	476	380	179
Total*	**13,366**	**16,388**	**17,433**	**17,325**	**16,887**	**16,592**	**15,643**

** The totals may differ from those in Table F-1 because individual students may have more than one accommodation.*

Table F-4. Numbers of Students with IEPs/504 Plans Tested with Accommodations by Accommodation Type and Grade—Mathematics

Accommodation Description	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Paper-Based Test Edition	178	212	195	172	163	162	276
Large-Print Test Edition	10	10	11	10	17	13	19
Screen Reader Edition	1	5	4	2	2	6	6
Compatible Assistive Technology	2	11	7	4	7	8	7
Braille Test Edition	2	0	1	1	5	2	0
Human Read-Aloud	2,042	2,195	1,783	1,187	861	796	833
Human Signer	22	13	22	22	18	33	8
Text-to-Speech	5,169	5,947	6,117	6,059	5,583	5,137	3,254
ASL Video Edition	0	0	0	0	0	0	19
Human Scribe	1,032	1,193	1,064	814	589	499	316
Speech-to-Text	391	478	579	558	453	409	240
Typed Responses	1	4	4	12	15	11	4
Calculation Device as a Special Access Accommodation	505	805	1,097	1,433	1,793	1,994	2,639
Spanish-English Edition	0	0	0	0	0	0	51
Graphic Organizer / Supplemental Reference Sheet	8,164	10,386	11,522	11,955	12,022	12,097	11,142
Total*	**17,519**	**21,259**	**22,406**	**22,229**	**21,528**	**21,167**	**18,814**

** The totals may differ from those in Table F-1 because individual students may have more than one accommodation.*

Table F-5. Numbers of Students with IEPs/504 Plans Tested with Accommodations by Accommodation Type and Grade—STE

Accommodation Description	Grade 5	Grade 8
Paper-Based Test Edition	173	146
Large-Print Test Edition	11	0
Screen Reader Edition	3	6
Compatible Assistive Technology	4	10
Braille Test Edition	1	2
Human Read-Aloud	1,731	773
Human Signer	21	30
Text-to-Speech	6,010	4,921
Human Scribe	1,009	451
Speech-to-Text	712	487
Typed Responses	5	8
Calculation Device	6	26
Spell Checker	2	11
Graphic Organizer / Supplemental Reference Sheet	11,101	11,804
Web Extension	430	215
Total*	**21,219**	**18,890**

** The totals may differ from those in Table F-1 because individual students may have more than one accommodation.*

Table F-6. Numbers of Students with IEPs/504 Plans Tested with Accommodations by Accommodation Type and Grade—Biology

Accommodation Description	Grade 9	Grade 10
Paper-Based Test Edition	116	48
Large-Print Test Edition	4	1
Screen Reader Edition	1	1
Compatible Assistive Technology	0	0
Braille Test Edition	0	0
Human Read-Aloud	410	161
Human Signer	5	3
Text-to-Speech	2,187	748
ASL Video Edition	14	1
Human Scribe	180	77
Speech-to-Text	194	71
Typed Responses	1	0
Word Prediction	33	13
Spanish-English Edition	30	12
Graphic Organizer / Supplemental Reference Sheet	6,212	2,313
Web Extension	89	24
Total*	**9,476**	**3,473**

** The totals may differ from those in Table F-1 because individual students may have more than one accommodation.*

Table F-7. Numbers of Students with IEPs/504 Plans Tested with Accommodations by Accommodation Type and Grade—Introductory Physics

Accommodation Description	Grade 9	Grade 10
Paper-Based Test Edition	30	7
Large-Print Test Edition	2	1
Screen Reader Edition	0	0
Compatible Assistive Technology	1	0
Braille Test Edition	1	0
Human Read-Aloud	94	11
Human Signer	2	1
Text-to-Speech	664	33
ASL Video Edition	0	5
Human Scribe	54	4
Speech-to-Text	53	3
Typed Responses	0	0
Word Prediction	6	0
Spanish-English Edition	4	2
Graphic Organizer / Supplemental Reference Sheet	2,033	107
Web Extension	0	0
Total*	**2,942**	**173**

** The totals may differ from those in Table F-1 because individual students may have more than one accommodation.*

Table F-8. Numbers of English Learners without Disabilities Tested with EL Accommodations by Accommodation Type and Grade—ELA[1]

Accommodation Description	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Paper-Based Test Edition[2]	1	2	3	0	3	2	49
Human Read-Aloud as a Special Access Accommodation	8	6	3	2	2	1	4
Text-to-Speech	43	101	70	44	39	63	101
Human Scribe as a Special Access Accommodation	5	7	3	3	1	4	0
Speech-to-Text as a Special Access Accommodation	2	3	5	5	10	3	20
Total	**59**	**119**	**84**	**54**	**55**	**73**	**174**

1 DESE does not collect data on three EL accommodations available for the ELA tests (Approved Bilingual Word-to-Word Dictionaries, Test Administrator Clarifies General Directions in English, and Test Administrator Clarifies General Directions in Native Language).

2 The Paper-Based Test Edition accommodation is only available to first-year English learners.

Table F-9. Numbers of English Learners without Disabilities Tested with EL Accommodations by Accommodation Type and Grade—Mathematics

Accommodation Description	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Paper-Based Test Edition[1]	11	5	3	18	21	15	131
Human Read-Aloud	420	370	197	38	44	30	32
Text-to-Speech	5,403	4,909	3,531	2,855	2,823	2,666	796
Human Scribe	123	94	82	18	7	13	10
Speech-to-Text	71	56	58	51	70	49	23
Spanish-English Edition[2]	0	0	0	0	0	0	1,710
Total	**6,028**	**5,434**	**3,871**	**2,980**	**2,965**	**2,773**	**2,702**

1 The Paper-Based Test Edition accommodation is only available to first-year English learners.
2 The Spanish-English Edition is only available for grade 10.

Table F-10. Numbers of English Learners without Disabilities Tested with EL Accommodations by Accommodation Type and Grade—STE

Accommodation Description	Grade 5	Grade 8
Paper-Based Test Edition[1]	3	0
Human Read-Aloud	174	23
Text-to-Speech	3,535	2,732
Human Scribe	53	9
Speech-to-Text	117	56
Total	**3,882**	**2,820**

1 The Paper-Based Test Edition accommodation is only available to first-year English learners.

Table F-11. Numbers of English Learners without Disabilities Tested with EL Accommodations by Accommodation Type and Grade—Biology

Accommodation Description	Grade 9	Grade 10
Paper-Based Test Edition[1]	23	65
Human Read-Aloud	22	4
Text-to-Speech	718	353
Human Scribe	6	3
Speech-to-Text	14	21
Spanish-English Edition	1,119	730
Total	**1,902**	**1,176**

1 The Paper-Based Test Edition accommodation is only available to first-year English learners.

Table F-12. Numbers of English Learners without Disabilities Tested with EL Accommodations by Accommodation Type and Grade—Introductory Physics

Accommodation Description	Grade 9	Grade 10
Paper-Based Test Edition[1]	22	25
Human Read-Aloud	10	6
Text-to-Speech	200	36
Human Scribe	3	6
Speech-to-Text	5	0
Spanish-English Edition	174	119
Total	**414**	**192**

1 The Paper-Based Test Edition accommodation is only available to first-year English learners.

APPENDIX G
NEXT-GENERATION SCORING SPECIFICATIONS

MCAS Next-Gen & Legacy

2022–2023

Scoring Specifications

Part A:

Client-Specific Scoring Specifications

Part B:

General Scoring Guidelines & Best Practices

Part A:
Client-Specific Scoring Specifications

Contract Name:	**MCAS Gr 3-8 and HS**	**Year:**	**2022-2023**
Contract Code:	**1637**		
Contact Information:	**Program Managers:** Chris Clough, Dezarae Blossomgame **Scoring Services at Cognia:** • ELA: Sandy Sinclair, Melissa Polansky, Sean Burke, Vince McGroary • Math: Janice Knox, Andrea Kuegel • Science: Rozanna Gaines **Scoring Services at Pearson:** • ELA: Stephen Hoffelt • Math: Tracey Benvin **Project Management:** • Cognia: Sarah Melmed (in transition) & Karin Evans (transitional support) • Pearson: Paula Schwartz		
Administrations:	**Fall '22 ELA & Math Gr 10 Retests; Feb '23 Science HS Retest Biology & Physics; March '23 ELA & Math Gr 10 Retests; Spring '23 ELA & Math Gr 3-8 and Gr 10, and Science Gr 5, 8, and HS Physics & Biology; Spring '23 Science HS Legacy Chemistry & Technology/Engineering**		
Scoring Plan:	This scoring plan summarizes the approach to the scoring of all MCAS Next Gen test administrations for all contents and grades. It also includes the two remaining MCAS Legacy test admins for HS Science (Chemistry and Technology/Engineering): • All scoring will be conducted applying a virtual/synchronous scoring model. • Prior to the start of the scoring project, scorers will attend connectivity sessions to support their readiness and to answer any technology-related questions. • Scorers will evaluate student work on a fixed daily schedule under constant supervision of leadership. • Scorers will work in a non-public setting and will be required to be on camera during training and scoring. Scorers may blur their backgrounds. • Training and all interaction between leadership and scorers will occur live via Zoom (Cognia) or Teams (Pearson) and/or via pre-recorded training module or a recording of live training. • Breakout rooms may be used to facilitate scorer training and individualized coaching. • DESE will have remote access to the scoring system and Zoom/Teams links will be provided in advance to observe training sessions and scoring with technical assistance, if needed. • A post-scoring survey will be sent out to all MCAS scoring associates to elicit feedback on their scoring experience. The results will be shared with DESE. • As a result of DESE's decision to remove the 0/1 rule for essays in grades 3-8, the following actions will be taken: o The asterisk referring to the 0/1 rule will be removed from all rubrics for gr. 3-8. o Cognia will supplement Practice and Qualification Sets, when possible, to show essays that score a 0 in Idea Dev. but warrant a range of Convention scores. o Supplemental responses will be provided for all op. & equating items in gr. 3-8. o The supplemental responses will be reviewed and approved during the conference calls scheduled to finalize the 2023 scoring materials. o Pearson will have the scoring director for gr. 7 attend the scheduled conference call on 3-2-23. o When possible, the scoring directors for other grades will also attend the scheduled ELA conference calls.		
Testing Platform:	☒ **TestNav**		
Scoring Platform:	☒ **iScore:** OP & FT Gr 10 ELA and Math, FT Gr 3-8 ELA and Math, Gr 5, 8 and HS Science ☒ **ePEN:** OP Gr 3-8 ELA and Math		
Admin Type:	☒ **Operational**	☒ **Field Test:** ☐ **Standalone** ☒ **Embedded** ☐ **N/A**	**Note:** Embedded: Math, ELA, and Science
Required Client Meetings:	**Benchmarking**	**Notes:** Benchmarking meetings will be held at mutually agreeable dates and times in Spring 2023 to determine the scoring rules for all FT items.	

Content		Table 1 - Estimated Student Count per Grade, Content, and Test Administration						
		3	4	5	6	7	8	HS
Math	Nov. Retest							Total 12,287 PBT 201 CBT 12,086
	March Retest							Total 5,130 PBT 239 CBT 4,891
	Spring OP	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 69,587 PBT 574 CBT 69,013
ELA	Nov. Retest							Total 7,637 PBT 119 CBT 7,518
	March Retest							Total 3,278 PBT 160 CBT 3,118
	Spring OP	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 70,000 CBT only	Total 69,241 PBT 458 CBT 68,783
Science	Feb. Retest							Biology: 10,704 PBT 200 CBT 10,504 Physics: 6,000 PBT 86 CBT 5,914
	Spring OP			Total 70,000 CBT only			Total 70,000 CBT only	Biology: 63,693 PBT 686 CBT 63,007 Physics: 15,102 PBT 86 CBT 15,016
	Spring OP Legacy							Chem.: 1,058 Tech/Eng.: 500 PBT only
Estimated Spanish Test Takers:								
Math	March Retest							Total 779 PBT 46 CBT 733
	Spring OP							Total 1,303 PBT 68 CBT 1,235
Science	Feb. Retest							Biology: 364 PBT 36 CBT 328 Physics: 183 PBT 10 CBT 173
	Spring OP							Biology: 2,166 PBT 39 CBT 2,127 Physics: 460 PBT 19 CBT 441

Table 2 - Scope of Work by Number and Item Type per Grade and Administration

The 2022-2023 MCAS consists of both operational and matrix test items.
Cognia is responsible for all aspects of scoring with Pearson serving as sub-contractor for the operational scoring of Gr 3-8 ELA and Math. Pearson recruits scoring associates for their assigned scoring activities.

		Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade HS
ELA	Nov. Retest							2 OP ES 5-3
	March Retest							2 OP ES 5-3
	Spring OP	1 OP ES 4-3 1 OP CR3 2 EQ CR3 1 EQ ES 4-3 3 FT ES 4-3 6 FT CR3	1 OP ES 4-3 1 OP CR3 2 EQ CR3 1 EQ ES 4-3 3 FT ES 4-3 6 FT CR3	2 OP ES 4-3 2 EQ ES 4-3 6 FT ES 4-3	2 OP ES 5-3 2 EQ ES 5-3 6 FT ES 5-3	2 OP ES 5-3 2 EQ ES 5-3 8 FT ES 5-3	2 OP ES 5-3 2 EQ ES 5-3 6 FT ES 5-3	2 OP ES 5-3 1 EQ ES 5-3 20 FT ES 5-3
Math	Nov. Retest							4 OP OE4
	March Retest							4 OP OE4
	Spring OP	4 OP OE3 2 EQ OE3 7 FT OE3	4 OP OE4 2 EQ OE4 8 FT OE4	4 OP OE4 2 EQ OE4 8 FT OE4	4 OP OE4 2 EQ OE4 7 FT OE4	4 OP OE4 2 EQ OE4 7 FT OE4	4 OP OE4 2 EQ OE4 7 FT OE4	4 OP OE4 2 EQ OE4 24 FT OE4
Science	Feb. Retest							Biology: 5 OP CR4 Physics: 5 OP CR4
	Spring OP			2 OP CR2 4 OP CR3 1 EQ CR2 2 EQ CR3 4 FT CR2 10 FT CR3			2 OP CR2 4 OP CR3 1 EQ CR2 2 EQ CR3 4 FT CR2 10 FT CR3	Biology: 2 OP CR3 3 OP CR4 12 FT CR3 12 FT CR4 Physics: 2OP CR3 3 OP CR4 12 FT CR3 12 FT CR4
	Spring OP Legacy							Chemistry: 5 OP CR4 Tech/Eng: 5 OP CR4
		OP = Operational FT = Field Test CR# = #-point Constructed Resp.		ES = 2-trait Essay - GR 3-5: 0-4 & 0-3 points, Gr 6-HS: 0-5 & 0-3 points OE3 = 0-3 point open ended response item OE4 = 0-4-point open ended response item EQ = Equating items				

Table 3 - Quality Control Tools				
Qualifying Sets	☒ **OP**	**QTY:** 2 sets	**Notes:** Scorers are required to take Qualification Set 2 if the threshold is not met on Qualification Set 1.	
	☒ **FT**	**QTY:** 1 set	**Notes:**	
Qualification Threshold (%)	**Leadership:** **Exact:** 80% **Exact + Adjacent:** 90%, 1 Discrepant allowed		**Scorers:** **Exact:** 70% **Exact + Adjacent:** 90%, 1 Discrepant allowed	
	Clarification notes: For multi-trait ELA items, the passing thresholds must be met on each individual trait.			
Read-Behind Rate	**Minimum daily requirement per Scorer:** All Grades and Content Areas: 10 responses minimum for a full day. This number will be proportionate for shifts that do not last an entire day.			
Double-Blind Rate	**Minimum (%):** Operational scoring Grades 3-8 ELA & Math: 10% Operational scoring Sci 5 & 8: 10% Operational HS: 100% Field Test 3-8 ELA: 20% Field Test 3-8 Math: 10% Field Test 5 & 8 Sci: 10% Field Test HS ELA, Math, and Science: 10%			
Recalibration Sets	☒ **Standalone** ☐ **Embedded** ☐ **N/A**	**Number of recalibration sets:**	1 set daily	
		Number of responses per set:	5 responses	
	When Administered?	Beginning on the second day of operational scoring for each item and each day until scoring of each item is complete.		
	Notes:	Please refer to comparison chart of scoring terminology and practices as applied by Cognia and by Pearson.		
Embedded Responses	**When Administered?**	Grades 5, 8, HS Science & Grade 10 ELA, Math: 10 responses deployed during the first 100 responses scored by a scorer		
Validity Responses	**Required?** ☒ **Yes** ☐ **N/A**	**Preset percentage:** Operational Grades 3-8 ELA: 6% days 1 & 2, 4% day 3 Operational Grades 3-8 Math: 3% days 1 & 2, 2% day 3		
	Items requiring validity	Operational Grades 3-8 ELA & Math		
	Notes:	Please refer to comparison chart of scoring terminology and practices as applied by Cognia and by Pearson.		
Voiding	**Threshold:**	Grade HS ELA, Math, Sci and Grades 5 & 8 Sci: <70% based on daily Comp. Report Grades 3-8 ELA and Math: <70% based on cumulative validity performance		
	Frequency:	Daily		
	Threshold for scorer removal:	At the discretion of Scoring Leadership		
Equating Items	☒ **Yes** Operational Grades 3-8 and HS			
	Note: To ensure scorer consistency, seeded papers will be inserted for all equating items that are polytomous.			

Table 4 - Staffing Requirements:		
Staffing Level:	**Minimum Education Requirements:**	**Specific Degree Requirements:**
Scorer	Grades 3-8: • 48 college credits AND • passed at least 2 college classes related to the content area being scored High School: • 4-year college degree AND • A degree related to the content area being scored OR • 2 classes related to the content area being scored and demonstrated scoring experience in the content area	• Must be at least 18 years of age. • Cannot be under contract to Massachusetts schools, including as teachers, administrations, and para-professionals.
Scoring Team Leader	Grades 3-8: • 4-year college degree AND • Passed at least 2 college classes related to the content area being scored. High School: • 4-year college degree AND • At least 4 classes related to the content area being scored. OR • 2 classes related to the content area being scored and demonstrated scoring experience in the content area.	• Must be at least 18 years of age. • Cannot be under contract to Massachusetts schools, including as teachers, administrations, and para-professionals.
Scoring Supervisor	Grades 3-8: • 4-year college degree AND • Passed at least 2 college classes related to the content area being scored. High School: • 4-year college degree AND • At least 4 classes related to the content area being scored. OR • Fewer than 4 classes in the content area with approval from the DESE.	• Must be at least 18 years of age. • Cannot be under contract to Massachusetts schools, including as teachers, administrations, and para-professionals.

Table 5 - Scoring Platform Additional Set-up		
AI Scoring	☐ **Yes (1st score)** ☒ **Yes (2nd score)**	**Note:** Use IEA as the 10% read-behind score on those essays in grades 3-8 whose performance is approved by DESE.
Arbitration Rules	☐ **Adjacent** ☒ **Discrepant**	**Note:** Whenever there is a discrepancy between two scores assigned to the same student response (i.e., the two scores are more than one point apart), the response is automatically routed to scoring leadership who evaluates the response and provides an arbitration score.
Practice Set within iScore / ePen	☐ **Yes** ☒ **N/A**	**Note:** Scoring of MCAS practice sets are an integral part of scorer training and will include a discussion of each practice response, revealing the actual score and explaining the scoring rationale.

Score-of-Record Rules

Score Source	Resolution
Arbitration score and read-behind score both provided	Latest read-behind score is the score-of-record
Arbitration score (no read-behind performed)	Arbitration score is the score-of-record
Two read-behind scores that are exact or adjacent (and therefore no resolution is performed)	Grades 3-8: If Read-behind score is provided by 2 STLs, the later read-behind score (RB2) is the score-of-record Grade HS: If Read-behind score is provided by 2 STLs, the higher read-behind score is the score-of-record
Two read-behind scores that are discrepant (and resolution is performed)	If Read-behind score is provided by 2 STLs and they are discrepant (more than one score point apart), then resolution is required. The resolution score (Edit Score) is the score-of-record.
One read-behind score	Read-Behind score is the score-of-record
Two Scores (provided by two scorers in double-blind process)	Grades 3-8: If the first score and second score are adjacent (differ by one score point), the first score is the score-of-record (Cognia setting) Grade HS: If the first score and the second score are adjacent (differ by one score point), the higher score is the score-of-record (MCAS setting)

Condition Codes			
☒ Crisis (41)			
☒ Blank (B-21)	☒ Unreadable (U-51)	☒ Wrong Location (W-52)	☒ Non-English (F-53)
☒ Off Topic (O-54)	☐ Illegible (I-55)	☐ Quarantine (Q-56)	☐ Insufficient Amount to Score (A-57)
☐ Refusal to Score (R-58)	☒ Repeats the Prompt (P-59)	☐ Typed Sheet/NSR (T-60)	☐Escalate (61)
☐ No Score (N-62)	☐	☐	☐
NOTE: Science LEGACY uses the No Score code instead of the Off Topic code.			
Defining information of condition codes can be found in Part B, Section 5.2			

Table 6 – Examples of iScore Reports

Read-Behind Summary

Choose Response Code: RDCC025 Choose Time Frame: 08/27/2018

Submit Export To Excel

Contract: --------
Grade: --------
Content: ---------

Name	ID#	Scored	Read Behind							
			Total RB	% RB	Exact	% Exact	Adj	% Adj	Disc	% Disc
	17112	227	19	8.4	14	73.7	5	26.3	0	0
	19537	163	16	9.8	14	87.5	2	12.5	0	0
	18034	266	15	5.6	12	80	3	20	0	0
	21212	163	15	9.2	12	80	3	20	0	0
	20855	365	19	5.2	18	94.7	1	5.3	0	0
	21239	443	18	4.1	15	83.3	3	16.7	0	0
	21343	426	18	4.2	15	83.3	3	16.7	0	0
	19556	213	16	7.5	15	93.8	1	6.3	0	0
	19832	341	18	5.3	16	88.9	1	5.6	1	5.6
	18104	305	15	4.9	13	86.7	2	13.3	0	0
	19545	385	20	5.2	16	80	3	15	1	5
	19419	255	17	6.7	16	94.1	1	5.9	0	0
	15836	379	19	5	18	94.7	1	5.3	0	0
	Total	3931	225	5.7	194	86.2	29	12.9	2	0.9

Double-Blind Summary

Reader Double Behind Summary **Contract: ----------** **Grade: --------** **Content: --**

Choose Response Code: RDCC025 Choose Time Frame: 08/27/2018

Submit Export To Excel

			Double Blind							
				%		%		%		%
Name	ID#	Scored	Total DB	DB	Exact	Exact	Adj	Adj	Disc	Disc
	17112	227	22	9.7	17	77.3	5	22.7	0	0
	19537	163	15	9.2	15	100	0	0	0	0
	18034	266	25	9.4	19	76	6	24	0	0
	21212	163	15	9.2	11	73.3	4	26.7	0	0
	20855	365	29	7.9	23	79.3	6	20.7	0	0
	21239	443	35	7.9	29	82.9	6	17.1	0	0
	21343	426	49	11.5	43	87.8	5	10.2	1	2
	19556	213	24	11.3	24	100	0	0	0	0
	19832	341	31	9.1	23	74.2	8	25.8	0	0
	18104	305	32	10.5	28	87.5	3	9.4	1	3.1
	19545	385	37	9.6	33	89.2	4	10.8	0	0
	19419	255	17	6.7	12	70.6	5	29.4	0	0
	15836	379	30	7.9	26	86.7	4	13.3	0	0
ZZ Total	999999	3931	361	5.3	303	83.9	56	15.5	2	0.6

Scorer/Item Qualification Summary

Reader/Item Qualification Summary **Contract: ----------**
Grade: -------- **Content: ----------**

Choose Qualification Type Qual1 ☑ Display Reader Names

Submit Export To E

Name	ID#	RDCC025	RDCC026	RDCC027	RDCC028	RDCC029	RDCC030	RDCC031	Total Completed CRRs	# Pass	# Fail	% Pass
	Total Passed	15	4	17	18	4	4	12	74			
	Total Failed	2	0	1	0	0	0	1	4			
	Total Number	17	4	18	18	4	4	13	78			
	59806	P/9	P/10	P/10	P/10	P/10	P/8	P/8	7	7	0	100
	18498			P/7	P/10				2	2	0	100
	21056							P/8	1	1	0	100
	20904			F/3	P/9				2	1	1	50
	17112	P/9							1	1	0	100
	17030							P/8	1	1	0	100
	15567			P/10	P/9				2	2	0	100
	21185							P/7	1	1	0	100
	15555			P/9	P/10				2	2	0	100
	17411	P/9	P/10				P/10		3	3	0	100
	19537	P/10							1	1	0	100
	16827							F/6	1	0	1	0
	17130							P/10	1	1	0	100
	17099			P/8	P/9	P/10			3	3	0	100
	22028							P/8	1	1	0	100
	21401			P/10	P/10				2	2	0	100
	20031			P/7	P/10				2	2	0	100
	18034	P/9							1	1	0	100
	20867			P/9	P/10				2	2	0	100

Compilation Report

Compilation Report Contract: 1225 ReadBK2 Grade: 06 Content: Reading

Choose Response Code: RDCC045 Choose Date: 9/26/2017 Location: All

Message:

Submit Export To Excel

Void	Reader Name	MPID	Scored	Recal	Exact Recal	Read Behind	Compilation	Exact	%Exact	Adj	%Adj	Disc	%Disc	%Exact + %Adj
Review		67571	0	5	1.0	0	5	1.0	20.0	4.0	80.0	0.0	0.0	100.0
Review		65166	147	5	4.0	10	15	10.0	67.0	5.0	33.0	0.0	0.0	100.0
Retrain		60890	113	5	3.0	12	17	12.0	71.0	5.0	29.0	0.0	0.0	100.0
Retrain		66826	120	5	3.0	12	17	12.0	71.0	5.0	29.0	0.0	0.0	100.0
Retrain		65793	188	5	3.0	11	16	13.0	81.0	3.0	19.0	0.0	0.0	100.0
		65532	111	5	4.0	12	17	14.0	82.0	3.0	18.0	0.0	0.0	100.0
		60751	244	5	5.0	12	17	14.0	82.0	2.0	12.0	1.0	6.0	94.0
		80231	149	5	5.0	12	17	14.0	82.0	2.0	12.0	1.0	6.0	94.0
		80264	145	5	5.0	13	18	15.0	83.0	3.0	17.0	0.0	0.0	100.0
		64851	139	5	5.0	13	18	15.0	83.0	3.0	17.0	0.0	0.0	100.0
		66712	125	5	5.0	13	18	15.0	83.0	3.0	17.0	0.0	0.0	100.0
		66311	297	5	5.0	15	20	17.0	85.0	3.0	15.0	0.0	0.0	100.0
		60737	114	5	4.0	10	15	13.0	87.0	2.0	13.0	0.0	0.0	100.0
		66051	181	5	5.0	12	17	15.0	88.0	2.0	12.0	0.0	0.0	100.0
		80082	151	5	5.0	11	16	14.0	88.0	2.0	13.0	0.0	0.0	101.0

Pearson AI Scoring Process

For training the Intelligent Essay Assessor (IEA) engine with a set of human-scored responses, typically 2/3 of the responses are used to train the engine and the remaining 1/3 are held out to evaluate performance. The MCAS models will be trained using 2023 field test prompts, responses, and human-scored data. Within that data, approximately 2,000 responses per prompt received a first human score and 20% received a blind 2nd score. IEA will be trained on ~1,300 responses per trait, randomly selected to represent the operational distribution. Once the engine is trained, the models will be evaluated based on the remaining ~650 responses per trait.

The data will be evaluated based on the industry-standard criteria for automated scoring shown in the table below.

Measure	Threshold
Pearson R QWK	>= 0.70
Kappa	>= 0.40
Exact Agreement	>= 65% (or greater than Human-Human)
By Score Point Agreement	>=50% (or greater than Human-Human)
SMD	Within |0.15|

Training results will be presented to DESE for approval. Based on the engine training, IEA may recommend re-evaluating during the June human scoring window as more operational responses are available to supplement the IEA engine.

Pearson Human Resource Recruitment Overview

Pearson will recruit diverse professional individuals with experience and educational backgrounds that meet all contractual requirements. The Pearson School Assessments Human Resource business partners will ensure hiring of qualified and diverse individuals to fill scoring positions so that the workplace is equally represented with various experiences and skills.

All employees must undergo degree verification and criminal background checks. Pearson prioritizes previous hires to receive offers.

All employees will complete onboarding tasks including the latest Pearson Code of Conduct, Employee Handbook, and the technical requirements of their project. Candidates will be asked to sign and complete a confidentiality form. Employees must sign and agree to the terms as a requirement of employment.

Pearson will ensure completion of all onboarding tasks for each employee prior to their project start date. Notifications will be sent from Human Resources to remind individuals of any open tasks. Hiring records that display a candidate's status in the project will be provided to stakeholders on a regular basis.

Personal Information Guidelines are managed through a controlled document. Data is stored within the Human Resource system and requires secure access.

After converting this document to PDF, please insert here:

- Cognia-Pearson Scoring Terminology (page 13 & 14)
- MCAS Scoring Survey (page 15)
- Pearson Confidentiality and Acknowledgement (Page 16 & 17)

Part B:
Cognia General Scoring Guidelines & Best Practices

Contents

Preface

This document represents Cognisa's comprehensive best practices and standard operating procedures for evaluating and scoring student work. Procedures will be implemented depending on the specific requirements of each client. All client-related details and applicable contractual requirements are specified in Part A of this document: Client-Specific Scoring Guidelines.

Scoring Services Staffing

The following table summarizes key positions held by members of Scoring Services and describes their general responsibilities.

Position	Description
Director, Scoring Content & Quality	Oversees the all content-related deliverables of the Scoring Content Specialists and their respective Scoring Content Group Manager.
Director, Scoring Operations & Logistics	Oversees and coordinates the operations and logistics of all scoring activities, creates budgets, and establishes scoring schedules.
Project Managers – Scoring	Manage scoring-related activities, deliverables, and scheduling of tasks.
iScore Operations Manager	Maintains Cognia's scoring platform (iScore), manages other scoring systems as needed, and coordinates data deliverables between Scoring Services and Reporting team.
Scoring Operations Managers	Oversee scoring logistics, recruitment of contingent workforce, facility requirements and security.
Scoring Content Group Managers	Manage Scoring Content Specialists within content areas of ELA/Social Studies and Science/Math, oversee workflow processes, and ensure quality and production of scoring.
Scoring Content Specialists	Supervise the scoring of their respective content areas within their assigned contracts. Responsibilities include finalizing the selection of all scoring training materials and facilitating benchmarking and rangefinding meetings. They also train and supervise scoring leadership and monitor the training and scoring of items for their assigned projects. Scoring Content Specialists have the overall responsibility of ensuring accurate and consistent scoring according to the approved client guidelines for their content area and contracts.
Scoring Supervisors	Scoring Supervisors work under the guidance of a Scoring Content Specialist. They are responsible for training assessment items and ensuring consistency across assigned grades, content, and assessment administrations. They also respond to questions during scorer training and throughout scoring and monitor the quality and production of ongoing scoring.
Scoring Team Leader (STL)	Scoring Team Leaders work under the supervision of Scoring Supervisors and lead a small group of scorers. STLs are responsible for quality control by performing read-behinds and providing coaching as needed.
Scorers	Scorers review, evaluate, and assign scores to student work based on client-specific scoring standards.

Pre-Scoring Logistics

Employee Recruitment

Cognia HR and its staffing partners are responsible for the recruitment of all scoring personnel. Cognia seeks to employ scoring staff with a wide range of educational backgrounds and professional experience. Cognia will recruit individuals who meet or exceed the contract-specific requirements to fill scorer and scoring leadership positions. All scoring associates are vetted for appropriate educational requirements through collection and review of their post-secondary transcripts. Candidates with backgrounds in education are also noted during this process. Depending on client preferences, Cognia will seek to customize the recruitment effort by including some or excluding all scoring associates from the client state. Potential associates must submit documentation, including transcripts and resumes, to

verify employment eligibility. Prior to hiring, all associates are advised of the scoring systems' minimum technical requirements.

If hired, all scoring associates will be required to sign and abide by a non-disclosure/confidentiality agreement which emphasizes the confidential and proprietary nature of all work and materials associated with all scoring activities. (see Attachment)

After hiring and before the onset of each scoring event, information on demographics and educational background will be collected again as additional employment verification measure. Further contractual specifics related to scoring associates' educational backgrounds are detailed in Part A of this document: Client-Specific Scoring Guidelines.

The Benchmarking Process

Operational Benchmarking

This activity occurs after operational administration of an assessment and prior to scoring it. It typically involves identifying additional suitable student responses (either from the pool of FT responses or from the pool of available OP responses to an item) in order to supplement existing scoring materials or to populate additional training or quality control materials.

Field Test Benchmarking

The activity of benchmarking occurs after administration of a Field Test and prior to scoring a Field Test. To prepare for benchmarking, scoring leadership review the assessment item and any associated stimuli, the scoring rubric, and scoring notes (when available). All students completed the assessment, their responses are loaded into the scoring system. Scoring leadership will log into the scoring system and start viewing student responses. After becoming familiar with both the assessment item and the student responses, scoring leadership will start assigning preliminary scores to appropriate responses and submit them to a separate folder in the scoring system. Within that folder, benchmarking staff can designate responses to specific sets of responses depending on the most appropriate use, e.g., anchor set, practice set, qualification set(s), or an extra set which stores responses for potential substitutions or for the assembly of supplemental training materials. Once the sets are created and reviewed, the benchmarking process for each field test item is completed and the item is ready for either benchmarking meetings or rangefinding meetings.

Benchmarking vs. Rangefinding Meetings

A difference between benchmarking and rangefinding meetings are the participating key stakeholders and the associated meeting facilitation. Key stakeholders in benchmarking meetings are representatives from Scoring Services, Content Development, and State Education Agency (SEA) content staff. In addition, rangefinding meetings also include participation by educators.

In a benchmarking meeting, it is the SEA content staff who define the scoring parameters for an item and they sign off on core training materials. The meeting itself is an open-forum discussion during which all meeting participants discuss how responses fare against the scoring rubric. While the goal is that all meeting participants agree on the scores after thorough discussions, it is the SEA content staff who have the final say and give final approval of the scores for all reviewed student responses.

In a rangefinding meeting, educators are the ones who provide the interpretive framework of the scoring standards. While the entire group (Scoring Services, Content Development, SEA, educators) reviews a

body of student work, it is the educators who are tasked with reaching consensus on the score(s) they assign to each reviewed response. In doing so, educators interpret the scoring rubric and thereby define the range of each score point level of the scoring rubric by consensus-scoring student work associated with an item.

The details as provided in Part A: Client-Specific Scoring Guidelines will outline the applicable meeting forum.

Scorer Training

Process and Materials

Scorer training will begin with an introduction to scoring and an overview of the assessment program. This could include the purpose and goal of the assessment program, any specific characteristics of the test and/or the testing population. There will also be a general discussion about the security, confidentiality, and proprietary nature of the assessment, all scoring materials, and Cognia's scoring procedures.
Training materials will be available to scorers during scoring and may include:

- Student prompt and associated stimuli
- Scoring rubric
- Item sample response and training notes (when provided by content development team)
- Anchor Set
  - Clear examples that include mid-range student responses at each score point (when available)
  - Presented in score point order
- Practice Set
  - May include student work that demonstrates the cut-points between adjacent score points and/or atypical responses
  - May include examples of all score points (when available)
  - Presented in random order
  - Scorer accuracy can be captured and reported
  - Scoring Supervisor will review each practice set response (if required)

Training Sequence

A Scoring Content Specialist or Scoring Supervisor will lead the training for each item. Training may occur through a recorded, interactive training module, or through an online training system. Regardless of the method of training, the approach will follow this sequence:

1. Review of the student prompt, associated stimuli, the scoring rubric, associated sample responses, and training notes
2. Review of the anchor set
3. Analysis and discussion of each anchor response, its assigned score and associated, detailed scoring rationale
4. Scoring of responses in the practice set(s) to be scored independently to replicate the actual scoring process
5. Discussion of each practice response, revealing the actual score assigned to the student response and explaining the scoring rationale
6. Methodical review of all scoring criteria while paying particular attention to the fine lines that determine the cut-points between adjacent score points

7. Question and answer segment addressing any remaining scorer questions
8. Administration of a client-specific number of qualification sets, each consisting of 10 pre-scored responses, scored independently, and deployed randomly to each scorer
9. Review of qualification results after each set before scorers are admitted to subsequent qualification set(s)
10. Start scoring live student responses

The Qualification Process

Qualification sets are used to ensure that scorers have successfully internalized the scoring standards before they begin scoring each item. General qualification guidelines for operational items are:

- Each qualification set will contain 10 responses.
- The number of qualification sets administered are client-specific. Typically, operational items contain two qualifying sets to provide a second opportunity after re-training.
- Qualification sets are administered through Cognia's proprietary iScore system or another compatible scoring system. Responses are distributed to the scorers unscored and in random order.
- In order to qualify, scorers are required to meet the passing threshold as determined by the client and as specified in Part A: Client-Specific Scoring Guidelines
- Scorers who do not pass qualification will not be allowed to score the item. They will either be trained on a different item or dismissed from the scoring project.
- Responses included in the qualification set must be approved for use by the Scoring Content Specialist or Assistant Scoring Content Specialist. Depending on client-specifications, responses may also have to be approved by the client and/or be part of materials approved in a range-finding or benchmarking meeting.

Note:
Scoring Team Leaders receive the same training and undergo the same qualification process as scorers. However, STLs may be trained on some or all items in advance during a separate leadership training. This provides an additional opportunity to absorb the training materials and it prepares them to fulfill their role during scorer qualification.

Consensus Scoring Approach

When the total number of student responses received is small, Cognia may recommend applying the consensus scoring approach. In this approach, a select group of highly experienced scorers will train and qualify on each item and then proceed by scoring the small number of student responses together in pairs, working side-by-side, and discussing each response to reach a consensus score. Using this approach, scorers are constantly calibrating with each other to provide accurate and consistent scoring for the small number of student responses. When the consensus scoring approach is used, quality control tools designed for high n-counts of student responses are not applicable.

Scoring System

Overview

The scoring of student responses will be conducted through Cognia's iScore or another compatible scoring system which displays images that are received through data transfer from the online computer-based testing platform or through scanned images of paper-based tests. In instances of rendering

issues with any paper-based test books, scoring will occur by referring to the actual test book and the scores will be manually entered into the scoring system.

The scoring system does not display any student or school identifiable information. Security is maintained during scoring through a highly secure server-to-server interface. It ensures that images are only accessible to those who will be scoring each item or to scoring management. All responses are tracked through a unique booklet code that is matched to the student records during data processing.

Each scoring day scorers are asked to review the anchor materials and the rubric of an ongoing item. There will also be a broader group refresher upon resumption of scoring following a recess (e.g., a weekend or disruption of delivery). Each scoring day typically concludes with a debrief meeting with the Scoring Content Specialist, the Scoring Supervisors, and, if desired, client staff members to recap the day and address any issues that may need resolution.

During the course of scoring, scorers may encounter student responses that indicate the possibility of cheating or some type of testing irregularity. Scorers will score this type of student response based on its own merits and then refer it to the Scoring Content Specialist and Project Manager for further processing and client notification. Any potential score change request by the client can be made prior to final reporting.

Condition Codes

Scoring Services makes every attempt to score each student response. However, when a response does not conform to the score point parameters as defined in the scoring rubric, condition codes can be employed. Responses that are flagged will receive a numeric score but will undergo supervisory review. Responses that are rejected will not receive a numeric score but will receive a second read.

Flags:

- **Crisis:** Response indicates that a student may present a danger to themselves or others, the student or another child is in danger, there are indications of sexual or physical abuse, or other specific criteria as specified by the client. (Please refer to section 7 for the handling process)

Rejects:

- **Blank:** No deliberate marks in the answer space
- **Unreadable:** A rendering issue or obstructed student response
- **Wrong Location**: A clearly legitimate response to another item on the assessment
- **Insufficient Amount to Score**: The response contains an insufficient amount of student work to score
- **Illegible**: Tiny or poor handwriting (for PBT), spelling that cannot be deciphered, or other conditions that render the student work indecipherable
- **Refusal**: The response clearly indicates a refusal on the part of the student to address the prompt or participate in the assessment
- **Repeats the Prompt**: The response copies the prompt or portions of it and offers no attempt to respond to the task/prompt
- **No Score**: Any other circumstance (as defined by the client) that prevents the assignment of a numeric score
- **Non-English**: The response is written in a language other than English (or in a Spanish assessment in a language other than Spanish) or is a mix of English (Spanish) and another language but lacks sufficient English (Spanish) to provide a score.

Responses that are identified as Unreadable or Wrong Location undergo a separate resolution process. They will be routed to the Scoring Content Specialist or Scoring Supervisor. Responses will be reviewed, and the appropriate score assigned. Furthermore:

- **Unreadable** responses (PBT only) will be reviewed by consulting the student's original test booklet or by requesting a re-scan of the student work. If the response can be read through either method, the appropriate score will be assigned. Completely unreadable responses will not receive a numeric score.
- **Wrong Location** responses (PBT only) will be reviewed by a Scoring Supervisor or Scoring Content Specialist. Their broader access to the scoring system allows them to review all student work and assign the appropriate score for each response. Wrong locations can only be scored when the student was evidently attempting to respond to another item on the assessment.

Quality Control

Note: not all quality control measures listed in this section are applicable to every client contract.

While all scorers must first train and qualify to gain access to scoring student work, they must also maintain acceptable levels of accuracy to continue scoring. The scoring system provides the opportunity to employ multiple quality control tools in order to monitor accuracy and consistency throughout scoring.

Depending on client specifications, STLs may also score responses each day. In doing so, they are also subject to all quality control tools and statistics. While in a scoring capacity, the Scoring Supervisor or Scoring Content Specialist will conduct read-behinds on STLs. STLs may also encounter validity papers during their course of scoring.

Read-Behind Scoring

Read-behind scoring allows the STLs and Scoring Supervisors to monitor the performance of each scorer. It provides an immediate real-time snapshot of a scorer's accuracy and the opportunity to provide individualized coaching or re-training as needed.

Read-behinds are generated in the scoring system at the request of the STL. Scorers are not aware which responses are designated for read-behinds. Cognia's scoring platform allows for blind scoring of read-behinds. The STL conducts each read-behind without prior knowledge of the assigned score. After the STLs submit their score, they can reveal the score assigned by the scorer and provide counseling as needed.

The number of read-behinds conducted per scorer will vary and STLs will focus their attention on scorers as needed. Conducting read-behinds is an ongoing process throughout the day. STLs will conduct more read-behinds on scorers who are at the lower threshold of accuracy and require counseling. Cognia will adhere to contract requirements as outlined in Part A.

To further ensure the accuracy of the STLs, scoring leadership has the ability to review their read-behind work. The Scoring Supervisor has access to all responses that were reviewed and may compare scores to verify the accuracy and consistency of scoring.

Double-Blind Scoring

While read-behinds measure scorer accuracy in relationship to leadership, double-blind scoring provides statistics on scorer-to-scorer agreement, or inter-rater reliability. Double-blind scoring is the practice that refers to a method whereby the same response is routed to two scorers. The response is independently and anonymously reviewed by each scorer. In double-blind scoring, scorers do not know which response will be (or already has been) scored by another randomly selected scorer.

Validity Responses

The deployment of validity responses can provide an additional opportunity to compare and monitor the quality of scoring. The process is set up to meet the following criteria:

- Validity responses are identified from a pool of responses and pre-scored according to the scoring standards as expressed in the anchor set and the scoring rubric
- Pre-scored validity responses are loaded into the live scoring queue
- Validity responses look identical to live student responses such that scorers can't tell the difference between the two
- Validity responses can be launched at any time during the scoring project
- The insertion rate of validity responses is fully customizable in the scoring platform. Please refer to the Client-Specific Scoring Guidelines in Part A of this document. Scoring leadership may select validity responses either from recently scored responses, unscored responses, rangefinding meeting materials, or they may use previously administered validity responses for the item. In order to qualify as a validity response, it must be approved for use by the Scoring Content Specialist or other designated leadership staff. Depending on contract specifics, validity papers may also either be part of the approved rangefinding set or be approved by the client.

Recalibration Sets

Another option in Cognia's suite of quality control measures is the administration of recalibration sets. Beginning on the second day of scoring an item, scorers will take a recalibration set prior to starting scoring to ensure they remain calibrated to the scoring standards. Recalibration sets consist of pre-scored responses. Recalibration sets will include a variety of score points, but they will not always include an example of each score point.

Recalibration sets reinforce the scoring decisions of the training materials and prevents scorer drift throughout the project. Scorers who demonstrate continued understanding of the scoring standard will be allowed to start scoring for the day. Scorers who struggle with the recalibration responses will review them with scoring leadership, comparing the responses to the Anchor Set responses and the scoring rubric. Once the review is complete, scoring leadership will determine whether the scorer may begin scoring the item for that day.

Scoring leadership may select recalibration responses from recently scored responses, unscored responses, rangefinding meeting materials, or they may use previously administered recalibration responses for the item. In order to qualify as a recalibration response, it must be approved for use by the Scoring Content Specialist or other designated leadership staff. Depending on contract specifics, recalibration papers may also either be part of the approved rangefinding set or be approved by the client.

Voiding Scorer Work

When scorers meet or exceed accuracy standards, they will continue to have access to student responses and may continue to score. If scorers fall below the established accuracy threshold, they will be retrained and Scoring leadership will determine whether a scorer is allowed to resume scoring.

The scoring system allows Cognia to void a scorer's work. If a scorer fails to maintain accuracy standards, his or her work for the impacted time frame will be invalidated, and the affected student responses will be routed to other qualified scorers for re-scoring.

Crisis and Alert Responses

Scorers are trained to identify crisis or alert responses. These include responses which indicate that a student may present a danger to themselves or others, the student or another child is in danger, there are indications of sexual or physical abuse, and/or other criteria as specified by the client.

As soon as a crisis or alert response is identified, the Scoring Content Specialist will notify the Scoring Project Manager who may reach out to the Program Manager. Student demographic information and copies of the student response are posted to designated client staff members.

Scorer Monitoring Reports

To monitor the accuracy, consistency, and pace of scoring, the scoring system generates a variety of reports to allow scoring leadership to monitor all aspects of a complex assessment program. These reports show both the overall performance of the scoring project as well as immediate and real-time scorer level data and provide the opportunity to monitor an individual, the group, and the overall project.

STLs and Scoring Supervisors have access to a select number of reports which aids them in monitoring and ensuring quality scoring. Scoring Content Specialists and scoring management have access to all quality and production reports in the scoring system. Clients will also have access to a variety of quality and production reports in the scoring system, including interpretive guides, when applicable.

The following is a summary of the most commonly used reports in iScore, Cognia's proprietary scoring system:

- The **Read-Behind Summary Report** shows the total number of read-behind responses conducted per scorer and shows the number and percentage of responses that were in exact, adjacent, and discrepant agreement between the scorer and the STL. The report also provides an overall statistical summary of all scorers working on the item. The report has both a daily and a cumulative option.
- The **Double-Blind Summary Report** shows the total number of double-blind responses read by a scorer and will note the number and percentages of exact, adjacent, and discrepant scores. The report also provides an overall statistical summary of all scorers working on the item. The report has both a daily and cumulative option.
- The **Daily Embedded Summary Report** shows the total number of validity responses read by a scorer and will note the number and percentages of exact, adjacent, and discrepant scores.
- The **Qualification Statistics Report** lists each scorer by name and ID#, identifies which qualification sets each scorer has taken and the respective pass or fail status for each set.

- The **Summary Report** shows each item and the total number of student responses to be scored for each item. During ongoing scoring, it also shows the number of responses that have already been scored for each item and the number of double-blind scores provided.
- The **Score Point Distribution Report** shows the total number of student responses per assigned score point. The report offers both a daily and a cumulative option.
- The **Compilation Report** shows, for each scorer, the total number of responses scored, the number of read-behind responses and the number of scored recalibration responses (both individually and combined), and the percentage of exact, adjacent, and discrepant scores assigned in comparison to read-behinds and recalibration responses.

Distributed Scoring

Cognia has implemented a distributed scoring model that provides our clients with accurate, reliable, and timely results. Our distributed scoring model adheres to the same requirements as Cognia's center-based scoring model. The following security features are implemented to support the secure nature of distributed scoring:

- Two-Factor Authentication login protocol which prevents unauthorized users from gaining access to the scoring system and materials.
- The scoring system and materials are housed within a secure scoring kiosk which disables any print and download functions.

The communication process between scoring leadership and scorers is managed via a communication tool (e.g., Zoom, MS Teams, Skype) to support regular face-to-face check-ins. All scoring associates are required to utilize a webcam to maintain direct communication and facilitate positive identification.

Cognia Facilities

Cognia currently maintains facilities in Portsmouth, NH; and Alpharetta, GA. Cognia reserves the right to decide on the appropriateness of their utilization depending on any potentially existing health risks to its employees and/or the suitability for use of these facilities.

These facilities are locked, and admission is limited to authorized staff. Access is monitored by a security system that only admits staff with an electronic access card. This card also serves as Cognia identification card which must be worn at all times while in the building.

Addendum: Non-Mutual Non-Disclosure Agreement

This Confidentiality and Non-Disclosure ("Agreement") is made on **«Effective_Date»**, by and between Cognia™, Inc., with a physical address of 9115 Westside Parkway, Alpharetta, Georgia 30009, a 501(c)(3) non-profit organization incorporated under the laws of the State of Georgia, United States of America, and **«Name»**, with a principal address of **«Address1», «City», «State» «PostalCode»**, and taken together, known as ("the Parties").

WHEREAS, "Name" intends to offer services such as but not limited to; scoring and/or distributed scoring for Cognia through a temporary agency service arrangement with such services performed either in facilities arranged by Cognia or location(s) identified by temporary agency agreement with "Name" (the "Transaction"); and

WHEREAS, the Parties may disclose certain confidential and proprietary information to each other for the purpose of evaluating the Transaction, and the Parties mutually agree to enter into a confidential relationship with respect to the disclosure by one or each (the "Disclosing Party") to the other (the "Recipient") of such proprietary and confidential information; and

NOW, THEREFORE, the Parties, intending to be legally bound, agree as follows:

Definition of Confidential Information. For purposes of this Agreement, "Confidential Information" means (1) any and all information, data, design, memoranda, models, prototypes, equipment and/or other material, of a confidential, non-public or proprietary nature, including, without limitation, information relating to or regarding the products or services developed or being developed by the Disclosing Party, information regarding intellectual property (including ideas that may be subject to patent, trade mark, service mark or trade secret protection) and other rights, techniques, research, development, samples, marketing, sales, know-how, operations, distribution, strategy, services, applications, promotions, advertising, costs, prices, business plans, financial statements, software, source code, and firmware and process information and such information relating to the Disclosing Party's existing and prospective invention, business partners, and customers, (2) documents and information that are marked or designated with a word or symbol indicating that the document or information should be considered confidential, such as "Confidential", "Proprietary", or "Privileged", (3) documents and information that the Disclosing Party informs the Recipient, either in writing or orally, are confidential, and (4) information that is a trade secret or the confidential or proprietary information of a third party, which is obtained from the Disclosing Party, irrespective of whether it is in tangible or intangible form, irrespective of whether it was communicated orally, in writing or on any other record bearing media and irrespective of whether it was marked or designated as confidential in connection with the disclosure.

Notwithstanding the foregoing, the term "Confidential Information" does not include information which: was in the public domain prior to the Recipient's receipt of same from the Disclosing Party, or which subsequently becomes part of the public domain by publication or otherwise, other than by the wrongful act of the Recipient**;** information which the Recipient can show by reasonable proof was in its possession prior to the Recipient's receipt of same from the Disclosing Party and which was not acquired directly or indirectly from the Disclosing Party; information which is independently developed by the Recipient without reference to or reliance upon the Confidential Information of the disclosing party and without breach of this Agreement; or that the Parties agree in writing is not proprietary or confidential.

Confidentiality. Recipient agrees to treat as confidential all Confidential Information provided to it by Disclosing Party or Disclosing Party's representatives, whether disclosed before or after the date of this Agreement. In no event, including the breach of this Agreement or any other agreement between the Parties, shall either Party allow the disclosure of any Confidential Information disclosed to it by the Disclosing Party except as permitted under the terms of this Agreement or with the prior written consent of the Disclosing Party. The Parties shall take commercially reasonable steps to prevent the unauthorized disclosure, use, dissemination, or publication of the Confidential Information and shall protect such Confidential Information to the same extent that it protects its own confidential and

proprietary information, but in no event using less than a reasonable standard of care. This Agreement shall be binding on all directors, officers, stockholders, members, managers, employees, agents, representatives, successors and assigns of the Recipient (collectively, "Agents"), and Recipient shall take commercially reasonable steps to assure that its Agents to whom Confidential Information is disclosed maintain the confidential nature of the Confidential Information. Recipient shall immediately notify the Disclosing Party upon discovery of any loss or unauthorized disclosure of the Confidential Information of the Disclosing Party.

Use. Recipient agrees that the Confidential Information shall be used solely for purposes of the Transaction and in connection with any transaction entered into by the Parties. Recipient shall not disclose any Confidential Information to any other party. Recipient further agrees that it is prohibited from using the Confidential Information for its competitive advantage, or to further its own business, professional or economic position. Neither the execution of this Agreement nor the transmission of any Confidential Information by the Disclosing Party to the Recipient shall constitute a conveyance or transfer to the Recipient of any right, title, interest or license in the Confidential Information.

Term. This Agreement shall be in effect for a period of three (3) years from the latter-dated signature below. The obligations contained herein shall survive until the earlier of (a) an exception to what is Confidential Information set forth in Section 1 is met, or (b) one (1) year after the expiration of this Agreement; provided, however, each Party's trade secrets shall be subject to those obligations herein and survive until they are no longer a trade secret.

Remedies. Because of the unique nature of the Confidential Information, Recipient agrees that breach of this Agreement will result in the irreparable harm to the Disclosing Party. Therefore, in addition to any and all other remedies available at law or in equity, the Disclosing Party shall be entitled to injunctive or equivalent relief enjoining the breach of this Agreement, without the necessity of posting bond or other surety. In the event of a breach of this Agreement by the Recipient, the Recipient agrees to pay reasonable fees incurred by the Disclosing Party to protect its rights under this Agreement including, without limitation, attorneys' fees and other costs to bring any lawsuit, action, or proceeding necessary to protect the Disclosing Party's rights. These remedies in addition to any rights by temporary agency related to employment law or dismissal for cause.

Governing Law; Venue. This Agreement shall be governed, interpreted, and/or construed in accordance with the laws of the State of Georgia without giving effect to choice of laws principles that require the application of the law, regulation or rule of a different state. Recipient and Disclosing Party hereby agree that any legal proceeding involving a dispute between Disclosing Party and Recipient concerning any aspect of this Agreement shall be brought solely in a State court located within the State of Georgia or the United States District Court for Georgia.

Return or Destruction of Confidential Information. After the performance of the services relating to the Transaction, Recipient agrees to destroy all Confidential Information and all documents containing Confidential Information Securely or Return to Cognia all Confidential Information held in the parties' position immediately (including any copies, notes, or abstracts, in any media).

Amendment and Assignment. This Agreement may be amended only upon mutual written agreement by the Disclosing Party and the Recipient. This Agreement and the rights and obligations contained herein are not assignable. Nothing in this Agreement obligates the parties to enter into the Transaction.

Severability**.** In case any provisions (or portions thereof) contained in this Agreement shall, for any reason, be held invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect the other provisions of this Agreement, and this Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein. If, moreover, any one or more of the provisions contained in this Agreement shall for any reason be held to be excessively broad as to duration, geographical scope, activity or subject, it shall be construed by limiting and reducing it, so as to be enforceable to the extent compatible with the applicable law as it shall then appear.

Notices. All notices or reports or secure return of materials permitted or required under this Agreement will be in writing and will be delivered by electronic mail or by certified or registered mail, return receipt requested, and will be deemed given upon personal delivery, five (5) days after deposit in the mail, or upon acknowledgment of receipt of electronic transmission. Notices will be sent to the addresses set forth at the end of this Agreement or such other address as either Party may specify in writing.

Entire Agreement. This Agreement is the final, complete and exclusive agreement of the Parties with respect to the subject matters hereof and supersedes and merges all prior discussions between the Parties with respect to such matters.

Counterparts; Signatures. This Agreement may be executed by one party as identified in the first paragraph, which shall be deemed an original for all purposes and all of which will constitute a single instrument. Facsimile signatures shall be deemed original and binding signatures.

Survival. All duties and obligations with regard to the protection of Confidential Information shall survive any termination of the discussions relating to the Transaction.

Parties hereby accept the terms and obligations set forth in this Agreement.

IN WITNESS WHEREOF, the parties, intending to be legally bound, hereto have executed this Agreement made effective as of the day and year set forth above.

By:	«Name»
Signature:	
Print Name:	Click or tap here to enter text.
Title:	Click or tap here to enter text.
Date:	Click or tap here to enter text.

[Non-Mutual Confidentiality and Non-Disclosure Agreement – Signature Page]

Email Legal@cognia.org

ADDRESS FOR RETURN OF MATERIALS:

Cognia

9115 Westside Parkway

Alpharetta, GA 30009

APPENDIX H
INTERRATER CONSISTENCY

Table H-1. Item-Level Interrater Consistency Statistics by Grade—ELA*

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	LW Kappa
3	EL028832702	4	6,211	73.05	26.16	0.79	0.69
	EL909882556#SCORE_TRAIT_Conv	4	6,156	74.63	24.20	0.81	0.72
	EL909882556#SCORE_TRAIT_Ideadev	5	6,156	71.52	26.98	0.78	0.67
4	EL007459900#SCORE_TRAIT_Conv	4	6,268	75.46	24.20	0.73	0.63
	EL007459900#SCORE_TRAIT_Ideadev	5	6,268	71.94	27.46	0.76	0.65
	EL024539092	4	6,426	68.71	30.07	0.71	0.60
5	EL030400392#SCORE_TRAIT_Conv	4	6,396	67.37	31.44	0.77	0.64
	EL030400392#SCORE_TRAIT_Ideadev	5	6,396	65.62	32.44	0.75	0.62
	EL624182427#SCORE_TRAIT_Conv	4	6,346	66.03	32.34	0.77	0.65
	EL624182427#SCORE_TRAIT_Ideadev	5	6,346	64.02	33.50	0.80	0.65
6	EL007051004#SCORE_TRAIT_Conv	4	6,500	69.85	29.80	0.85	0.73
	EL007051004#SCORE_TRAIT_Ideadev	6	6,500	64.11	34.63	0.84	0.70
	EL807016586#SCORE_TRAIT_Conv	4	6,515	68.09	30.50	0.84	0.71
	EL807016586#SCORE_TRAIT_Ideadev	6	6,515	64.73	32.45	0.86	0.72
7	EL006653237#SCORE_TRAIT_Conv	4	6,470	72.75	26.74	0.87	0.76
	EL006653237#SCORE_TRAIT_Ideadev	6	6,470	68.87	30.08	0.87	0.75
	EL713375305#SCORE_TRAIT_Conv	4	6,435	72.98	26.31	0.88	0.77
	EL713375305#SCORE_TRAIT_Ideadev	6	6,435	71.55	25.73	0.93	0.82
8	EL007062902#SCORE_TRAIT_Conv	4	6,704	76.70	22.30	0.86	0.77
	EL007062902#SCORE_TRAIT_Ideadev	6	6,704	64.05	32.91	0.87	0.73
	EL007253494#SCORE_TRAIT_Conv	4	6,555	71.93	27.32	0.85	0.74
	EL007253494#SCORE_TRAIT_Ideadev	6	6,555	64.15	33.17	0.85	0.71
10	EL108631124#SCORE_TRAIT_Conv	4	68,061	80.47	19.10	0.85	0.76
	EL108631124#SCORE_TRAIT_Ideadev	6	68,061	65.46	33.13	0.86	0.72
	EL910055845#SCORE_TRAIT_Conv	4	68,705	77.01	22.14	0.83	0.73
	EL910055845#SCORE_TRAIT_Ideadev	6	68,705	67.23	31.92	0.83	0.70

**Caution should be used when interpreting the sums of exact and adjacent percentages for ELA items. This is because resolutions are done by item in ELA, and it is entirely possible that only one trait (either idea development or conventions) on a writing item has a non-adjacent score. For instance, if the idea development score for an item were non-adjacent, the item would also receive a third score for conventions, even if it initially received an exact or adjacent score for conventions.*

Table H-2. Item-Level Interrater Consistency Statistics by Grade—Mathematics

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	LW Kappa
3	MA253711A	4	6,433	89.49	10.24	0.94	0.90
	MA286750A	4	6,439	91.38	8.50	0.96	0.93
	MA293460A	4	6,414	86.92	12.64	0.95	0.90
	MA310899A	4	6,429	94.21	5.79	0.97	0.94
4	MA293812	5	6,555	85.55	13.73	0.94	0.88
	MA303335	5	6,562	75.60	22.74	0.90	0.81
	MA307317	5	6,526	85.43	13.22	0.94	0.88
	MA801035466	5	6,577	73.04	25.54	0.89	0.79
5	MA002343629	5	6,574	80.61	17.90	0.92	0.85
	MA005852277	5	6,594	90.14	9.33	0.96	0.92
	MA802371654	5	6,575	86.10	13.32	0.95	0.90
	MA903746975	5	6,574	69.94	26.79	0.87	0.76
6	MA290253	5	6,628	85.64	13.26	0.95	0.89
	MA298252	5	6,619	90.89	7.39	0.97	0.93
	MA800301627	5	6,610	83.65	15.49	0.95	0.89
	MA900378821	5	6,659	91.17	8.03	0.96	0.92
7	MA002119133	5	6,603	81.49	17.31	0.95	0.88
	MA261648	5	6,576	83.84	14.87	0.96	0.90
	MA717248260	5	6,583	91.14	8.52	0.96	0.93
	MA802907874	5	6,543	89.99	9.60	0.97	0.93
8	MA010701848	5	6,755	71.64	25.17	0.87	0.75
	MA301714	5	6,648	81.50	17.27	0.95	0.87
	MA311433	5	6,683	79.86	19.02	0.92	0.84
	MA800738445	5	6,768	83.42	15.65	0.95	0.89
10	MA002069968	5	68,599	85.60	13.27	0.96	0.91
	MA294334	5	68,757	86.13	13.03	0.96	0.91
	MA308930	5	67,947	81.88	16.42	0.93	0.86
	MA713808267	5	69,185	87.36	12.18	0.92	0.87

Table H-3. Item-Level Interrater Consistency Statistics—STE

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	LW Kappa
5	SC62523872	3	6,165	73.50	25.04	0.70	0.63
	SC736182092	4	6,809	58.76	35.95	0.67	0.55
	SC801065906	4	6,715	81.86	16.86	0.81	0.76
	SC801629720	4	13,330	84.17	14.28	0.90	0.83
	SC809483803	3	13,194	68.86	27.82	0.69	0.61
	SC814972728	4	6,141	65.80	31.66	0.74	0.62
8	SC000777619	3	13,686	78.66	20.77	0.79	0.72
	SC304510	4	6,275	69.66	27.67	0.82	0.71
	SC631658368	3	6,326	70.15	28.55	0.72	0.63
	SC903855126	4	7,015	69.39	27.67	0.77	0.67
	SC934045224	4	6,219	75.32	23.07	0.87	0.78

Table H-4. Item-Level Interrater Consistency Statistics—Biology

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	LW Kappa
HS	SC299759	5	60,513	72.84	23.37	0.88	0.78
	SC316255	5	59,400	78.7	19	0.93	0.85
	SC903667169	4	60,354	73.87	24.63	0.85	0.76
	SC911246035	5	59,726	74.43	22.91	0.88	0.77

Table H-5. Item-Level Interrater Consistency Statistics—Introductory Physics

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	LW Kappa
HS	SC287206	5	14,686	67.81	28.03	0.83	0.71
	SC301782	5	14,631	66.42	29.25	0.79	0.67
	SC316441	5	14,651	72.29	26.01	0.89	0.78
	SC803432596	4	14,729	73.23	24.49	0.83	0.74
	SC904352276	4	14,622	64.93	30.65	0.72	0.61

Table H-6. Item-level Validity Statistics—ELA Grade 3

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
EL028832702	Overall	4	N	3381	1390	862	892	237	0
EL028832702	Overall	4	Percent	82.26	93.22	82.03	78.61	32.49	NA
EL308855	Overall	4	N	110	37	59	11	3	0
EL308855	Overall	4	Percent	86.37	97.41	86.37	72.82	0	NA
EL308857	Overall	4	N	93	24	46	14	9	0
EL308857	Overall	4	Percent	86.01	91.67	100	78.57	11	NA
EL909882556	Conventions	4	N	3282	832	1027	833	590	0
EL909882556	Conventions	4	Percent	86.67	97.13	91.74	75.53	78.8	NA
EL909882556	Idea Development	5	N	3282	635	1244	800	443	160
EL909882556	Idea Development	5	Percent	84.52	91.09	92.59	79.27	64.68	76.96

Table H-7. Item-level Validity Statistics—ELA Grade 4

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
EL007459900	Conventions	4	N	3214	56	1934	1007	217	0
EL007459900	Conventions	4	Percent	90.51	50.3	95.61	83.79	86.59	NA
EL007459900	Idea Development	5	N	3214	59	1931	1007	119	98
EL007459900	Idea Development	5	Percent	88.73	70.93	95.4	83.4	62.07	55.28
EL024539092	Overall	4	N	3578	101	2027	456	994	0
EL024539092	Overall	4	Percent	83.73	83.34	83.6	81.64	84.98	NA
EL307728	Overall	3	N	95	40	47	8	0	0
EL307728	Overall	3	Percent	86.39	82.62	89.4	87.5	NA	NA
EL307729	Overall	4	N	92	44	38	6	4	0
EL307729	Overall	4	Percent	88.04	90.95	92.05	100	0	NA

Table H-8. Item-level Validity Statistics—ELA Grade 5

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
EL030400392	Conventions	4	N	3198	1395	745	447	611	0
EL030400392	Conventions	4	Percent	80.33	86.92	80.09	64.04	77.5	NA
EL030400392	Idea Development	5	N	3198	1204	851	517	442	184
EL030400392	Idea Development	5	Percent	78.2	91.04	86.96	62.74	57.99	45.7
EL624182427	Conventions	4	N	3266	291	1362	1247	366	0
EL624182427	Conventions	4	Percent	77	75.26	80.96	73.92	74.14	NA
EL624182427	Idea Development	5	N	3266	109	1414	1376	285	82
EL624182427	Idea Development	5	Percent	76.34	79.61	83.45	72.18	71.35	36.71

Table H-9. Item-level Validity Statistics—ELA Grade 6

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4	Agreement by Score Point 5
EL007051004	Conventions	4	N	3443	1075	739	1226	403	0	0
EL007051004	Conventions	4	Percent	75.3	78.04	76.06	75.47	66.06	NA	NA
EL007051004	Idea Development	5	N	3443	1210	643	1188	297	105	0
EL007051004	Idea Development	5	Percent	75.22	83.67	83.54	72.22	48.82	35.39	NA
EL807016586	Conventions	4	N	3269	1799	834	157	479	0	0
EL807016586	Conventions	4	Percent	90.18	95.65	86.7	64.36	84.16	NA	NA
EL807016586	Idea Development	6	N	3269	1747	886	97	211	122	206
EL807016586	Idea Development	6	Percent	89.33	97.15	91.57	74.19	64.3	47.64	70.85

Table H-10. Item-level Validity Statistics—ELA Grade 7

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4	Agreement by Score Point 5
EL006653237	Conventions	4	N	3360	603	771	1276	710	0	0
EL006653237	Conventions	4	Percent	87.66	97.36	84.95	86.01	85.36	NA	NA
EL006653237	Idea Development	6	N	3360	603	718	1296	499	179	65
EL006653237	Idea Development	6	Percent	85.36	93.37	91.36	88.32	76.38	50.93	49.17
EL713375305	Conventions	4	N	3238	626	959	520	1133	0	0
EL713375305	Conventions	4	Percent	89.79	90.31	88.57	78.97	95.5	NA	NA
EL713375305	Idea Development	6	N	3238	676	909	520	384	357	392
EL713375305	Idea Development	6	Percent	84.78	98.69	90.83	78.59	80.84	69.89	72.38

Table H-11. Item-level Validity Statistics—ELA Grade 8

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4	Agreement by Score Point 5
EL007062902	Conventions	4	N	3286	772	777	564	1173	0	0
EL007062902	Conventions	4	Percent	88.38	95.31	85.02	78.21	90.92	NA	NA
EL007062902	Idea Development	6	N	3286	789	760	564	477	329	367
EL007062902	Idea Development	6	Percent	78.47	95.4	85.84	74.52	72.11	50.15	66.51
EL007253494	Conventions	4	N	3737	578	626	1280	1253	0	0
EL007253494	Conventions	4	Percent	79.13	91.28	80.3	72.82	79.38	NA	NA
EL007253494	Idea Development	5	N	3737	691	513	1280	934	319	0
EL007253494	Idea Development	5	Percent	73.99	84.68	83.79	73.39	68.94	52.31	NA

Table H-12. Item-level Validity Statistics—Mathematics Grade 3

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3
MA253711A	Overall	4	N	1668	300	359	694	315
MA253711A	Overall	4	Percent	92.93	95.43	94.42	91.15	92.76
MA286750A	Overall	4	N	1696	231	407	590	468
MA286750A	Overall	4	Percent	96.42	95.21	92.75	97.8	98.47
MA293460A	Overall	4	N	1699	403	211	465	620
MA293460A	Overall	4	Percent	93.2	94.03	85.77	87.6	99.4
MA310899A	Overall	4	N	1698	351	267	737	343
MA310899A	Overall	4	Percent	94.34	96.9	98.55	92.63	92.13
MA623654449	Overall	4	N	59	34	11	5	9
MA623654449	Overall	4	Percent	98.34	100	91.09	100	100
MA623656013	Overall	4	N	56	10	9	11	26
MA623656013	Overall	4	Percent	98.29	100	89.33	100	100

Table H-13. Item-level Validity Statistics—Mathematics Grade 4

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
MA250543	Overall	5	N	66	33	8	9	3	13
MA250543	Overall	5	Percent	90.92	96.97	100	78	33	92.31
MA293812	Overall	5	N	1762	398	388	672	97	207
MA293812	Overall	5	Percent	94.41	94.52	91.68	96.79	82.55	97.14
MA303335	Overall	5	N	1707	397	211	432	205	462
MA303335	Overall	5	Percent	91.58	99.76	81.96	86.08	85.97	96.59
MA307317	Overall	5	N	1746	384	254	352	292	464
MA307317	Overall	5	Percent	91.54	78.92	91.51	92.88	94.86	98.9
MA311581	Overall	5	N	61	21	11	6	14	9
MA311581	Overall	5	Percent	96.66	95.14	100	83	100	100
MA801035466	Overall	5	N	1842	388	855	288	127	184
MA801035466	Overall	5	Percent	88.17	92.1	93.19	83.49	77.3	71.38

Table H-14. Item-level Validity Statistics—Mathematics Grade 5

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
MA002343629	Overall	5	N	1720	405	435	313	302	265
MA002343629	Overall	5	Percent	96.15	97.2	94.35	98.69	95.63	95.11
MA005852277	Overall	5	N	1735	504	202	421	488	120
MA005852277	Overall	5	Percent	97.14	97.13	97.95	96.38	97.98	95.04
MA311366	Overall	5	N	65	13	13	21	6	12
MA311366	Overall	5	Percent	95.34	92.31	100	90.33	100	100
MA704359678	Overall	5	N	60	11	24	10	0	15
MA704359678	Overall	5	Percent	100	100	100	100	NA	100
MA802371654	Overall	5	N	1743	338	369	326	339	371
MA802371654	Overall	5	Percent	94.86	98.83	91.01	93.48	95.5	95.69
MA903746975	Overall	5	N	1753	378	365	402	234	374
MA903746975	Overall	5	Percent	90.89	90.79	93.44	88.08	89.65	92.3

Table H-15. Item-level Validity Statistics—Mathematics Grade 6

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
MA290253	Overall	5	N	1731	252	462	532	49	436
MA290253	Overall	5	Percent	96.66	96.05	96.55	95.32	95.73	98.88
MA298139	Overall	5	N	56	22	5	17	12	0
MA298139	Overall	5	Percent	98.21	95.45	100	100	100	NA
MA298252	Overall	5	N	1744	326	492	121	241	564
MA298252	Overall	5	Percent	96.88	98.14	95.96	96.73	91.73	99.18
MA307339	Overall	5	N	65	7	9	28	5	16
MA307339	Overall	5	Percent	100	100	100	100	100	100
MA800301627	Overall	5	N	1746	74	600	279	252	541
MA800301627	Overall	5	Percent	90.21	94.72	86.09	93.33	88.42	93.39
MA900378821	Overall	5	N	1741	0	405	450	467	419
MA900378821	Overall	5	Percent	95.79	NA	94.42	95.42	95.94	97.35

Table H-16. Item-level Validity Statistics—Mathematics Grade 7

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
MA002119133	Overall	5	N	1774	436	185	362	387	404
MA002119133	Overall	5	Percent	92.68	96.4	89.09	87.49	91.74	95.84
MA261648	Overall	5	N	1730	402	344	296	332	356
MA261648	Overall	5	Percent	91.59	98.77	88.79	80.02	90.06	97.24
MA316886	Overall	5	N	76	21	11	22	6	16
MA316886	Overall	5	Percent	97.34	95.24	100	100	83	100
MA703943185	Overall	5	N	74	33	10	9	12	10
MA703943185	Overall	5	Percent	98.66	100	100	89	100	100
MA717248260	Overall	5	N	1746	296	366	320	407	357
MA717248260	Overall	5	Percent	94.35	98.57	97.69	94.39	89.9	92.45
MA802907874	Overall	5	N	1734	336	363	378	325	332
MA802907874	Overall	5	Percent	97.49	99.4	94.49	98.94	96.44	98.19

Table H-17. Item-level Validity Statistics—Mathematics Grade 8

UIN	Trait	Ncat	Stat	Overall Exact Agreement	Agreement by Score Point 0	Agreement by Score Point 1	Agreement by Score Point 2	Agreement by Score Point 3	Agreement by Score Point 4
MA010701848	Overall	5	N	1797	282	454	438	328	295
MA010701848	Overall	5	Percent	95.31	100	93.24	93.78	92.58	99.34
MA297652	Overall	5	N	71	14	7	15	20	15
MA297652	Overall	5	Percent	100	100	100	100	100	100
MA301714	Overall	5	N	1785	530	350	104	165	636
MA301714	Overall	5	Percent	94.3	98.66	92.97	92.58	76.49	96.3
MA311433	Overall	5	N	1776	371	404	333	370	298
MA311433	Overall	5	Percent	89.56	99.51	94.22	85.22	85.39	80.9
MA314812	Overall	5	N	73	18	8	6	21	20
MA314812	Overall	5	Percent	91.86	100	88	100	85.71	90.1
MA800738445	Overall	5	N	1810	338	369	384	371	348
MA800738445	Overall	5	Percent	93.26	95.16	88.37	94.29	93.35	95.38

Table H-18. Item-Level Interrater Consistency Statistics—Alt/ELA

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	% Third Score*
3	comp1	5	217	100.00	0.00	1.00	0.00
	comp2	5	217	98.62	1.38	0.91	2.76
	comp3	5	217	97.24	2.76	0.84	6.91
	ind1	4	191	99.48	0.52	0.99	1.57
	ind2	4	172	97.67	2.33	0.97	2.33
	ind3	4	206	99.51	0.49	1.00	5.83
	sk1	4	191	98.95	1.05	0.96	2.09
	sk2	4	172	99.42	0.58	0.99	1.74
	sk3	4	206	92.72	6.80	0.92	8.25
4	comp1	5	189	98.94	1.06	0.86	1.06
	comp2	5	189	100.00	0.00	1.00	0.00
	comp3	5	189	98.41	1.59	0.89	5.82
	ind1	4	174	98.28	1.72	0.97	2.30
	ind2	4	150	96.67	3.33	0.95	5.33
	ind3	4	171	98.83	1.17	0.99	3.51
	sk1	4	174	98.85	1.15	0.96	2.87
	sk2	4	150	97.33	2.67	0.94	4.67
	sk3	4	171	95.32	3.51	0.94	5.85
5	comp1	5	223	99.10	0.90	0.87	0.90
	comp2	5	223	98.65	1.35	0.84	1.35
	comp3	5	223	99.10	0.90	0.93	3.59
	ind1	4	211	100.00	0.00	1.00	0.95
	ind2	4	186	98.92	1.08	0.99	1.61
	ind3	4	211	99.53	0.47	1.00	2.84
	sk1	4	211	98.58	1.42	0.94	1.42
	sk2	4	186	99.46	0.54	0.98	1.61
	sk3	4	211	97.16	2.37	0.97	2.84
6	comp1	5	196	98.98	1.02	0.91	1.02
	comp2	5	198	100.00	0.00	1.00	0.00
	comp3	5	197	97.46	2.54	0.87	5.58
	ind1	4	184	99.46	0.54	0.99	1.09
	ind2	4	157	100.00	0.00	1.00	0.64
	ind3	4	187	100.00	0.00	1.00	3.21
	sk1	4	184	98.37	1.63	0.95	2.17
	sk2	4	157	99.36	0.64	0.97	0.64
	sk3	4	187	96.26	2.67	0.95	3.74
7	comp1	5	465	99.35	0.65	0.90	0.86
	comp2	5	468	98.93	1.07	0.91	1.71
	comp3	5	464	96.34	3.45	0.79	9.27
	ind1	4	408	96.32	3.43	0.94	4.41

continued

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	% Third Score*
	ind2	4	347	97.41	2.31	0.93	3.46
	ind3	4	421	98.34	0.95	0.97	4.99
7	sk1	4	408	98.28	1.23	0.88	3.68
	sk2	4	347	97.69	2.02	0.89	2.88
	sk3	4	421	95.72	3.33	0.95	5.70
	comp1	5	183	98.36	1.64	0.87	1.64
	comp2	5	182	99.45	0.55	0.96	0.55
	comp3	5	181	98.34	1.66	0.91	3.87
	ind1	4	170	98.82	0.59	0.94	1.76
8	ind2	4	156	98.72	1.28	0.98	1.92
	ind3	4	173	98.27	1.73	0.98	4.05
	sk1	4	170	98.24	1.76	0.95	2.35
	sk2	4	156	98.72	1.28	0.96	1.92
	sk3	4	173	97.11	2.89	0.98	4.05
	comp1	5	368	99.73	0.27	0.96	0.27
	comp2	5	371	99.46	0.54	0.92	0.54
	comp3	5	371	96.50	3.50	0.73	8.09
	ind1	4	304	97.70	2.30	0.97	3.62
HS	ind2	4	278	97.12	2.88	0.95	3.60
	ind3	4	327	98.78	1.22	0.99	3.67
	sk1	4	304	97.70	2.30	0.94	2.96
	sk2	4	278	97.84	2.16	0.93	2.88
	sk3	4	327	96.64	3.06	0.97	5.50

**The percentages of exact agreement, adjacent agreement and third score do not necessarily sum to 1 due to the scoring rules. The most prevalent case is when a strand contains a score of "M" (indicating a required component is missing/incomplete) within a rubric area. Any instance of an "M" by scorer 1 or 2 must be confirmed by an expert scorer (scorer 3). Even if scorer 1 and 2 both agree on an "M", the third scorer would still provide a confirmation or overturning score. The third scorer will also review strands at random to provide oversight on a particular scorer or even portfolios that are of interest.*

Table H-19. Item-Level Interrater Consistency Statistics—Alt/Mathematics

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	% Third Score*
3	comp1	5	220	99.09	0.91	0.93	0.91
	comp5	5	220	98.64	1.36	0.88	1.36
	ind1	4	186	100.00	0.00	1.00	0.00
	ind5	4	175	100.00	0.00	1.00	0.57
	sk1	4	186	99.46	0.54	0.98	0.54
	sk5	4	175	98.86	1.14	0.96	1.14
4	comp1	5	186	98.92	1.08	0.89	1.08
	comp3	5	187	97.86	2.14	0.79	2.14
	ind1	4	155	98.71	1.29	0.98	1.29
	ind3	4	161	99.38	0.62	0.99	1.86
	sk1	4	155	99.35	0.65	0.99	1.29
	sk3	4	161	98.14	1.86	0.93	2.48
5	comp2	5	220	99.55	0.45	0.96	0.45
	comp3	5	219	99.09	0.91	0.92	0.91
	ind2	4	189	99.47	0.00	0.98	1.59
	ind3	4	197	97.46	2.03	0.94	3.05
	sk2	4	189	98.94	1.06	0.97	1.59
	sk3	4	197	98.48	1.52	0.93	3.55
6	comp2	5	199	98.49	1.51	0.92	1.51
	comp5	5	198	99.49	0.51	0.97	0.51
	ind2	4	183	98.36	1.64	0.98	1.64
	ind5	4	179	97.21	2.79	0.97	3.35
	sk2	4	183	100.00	0.00	1.00	0.00
	sk5	4	179	100.00	0.00	1.00	2.79
7	comp1	5	473	98.73	1.27	0.91	1.27
	comp4	5	476	98.95	1.05	0.86	1.47
	ind1	4	401	97.51	2.24	0.96	3.24
	ind4	4	400	97.75	2.00	0.96	2.50
	sk1	4	401	96.76	2.49	0.77	4.24
	sk4	4	400	98.50	1.00	0.90	2.50
8	comp2	5	181	98.34	1.66	0.92	1.66
	comp4	5	181	98.90	1.10	0.91	1.10
	ind2	4	160	99.38	0.63	0.99	1.88
	ind4	4	158	98.10	1.90	0.97	2.53
	sk2	4	160	98.13	1.88	0.94	2.50
	sk4	4	158	100.00	0.00	1.00	1.90

continued

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	% Third Score*
HS	comp1	5	115	100.00	0.00	1.00	0.00
	comp2	5	301	99.34	0.66	0.91	0.66
	comp3	5	229	99.13	0.87	0.93	0.87
	comp4	5	272	99.26	0.74	0.94	0.74
	comp5	5	186	98.92	1.08	0.83	1.61
	ind1	4	101	97.03	2.97	0.97	2.97
	ind2	4	232	97.84	2.16	0.96	3.02
	ind3	4	187	98.40	1.07	0.95	1.60
	ind4	4	223	97.76	2.24	0.97	2.69
	ind5	4	151	96.69	3.31	0.95	3.31
	sk1	4	101	99.01	0.99	0.98	3.96
	sk2	4	232	98.71	1.29	0.94	1.72
	sk3	4	187	98.93	1.07	0.98	1.07
	sk4	4	223	99.55	0.45	0.99	1.35
	sk5	4	151	99.34	0.66	0.97	2.65

**The percentages of exact agreement, adjacent agreement and third score do not necessarily sum to 1 due to the scoring rules. The most prevalent case is when a strand contains a score of "M" (indicating a required component is missing/incomplete) within a rubric area. Any instance of an "M" by scorer 1 or 2 must be confirmed by an expert scorer (scorer 3). Even if scorer 1 and 2 both agree on an "M", the third scorer would still provide a confirmation or overturning score. The third scorer will also review strands at random to provide oversight on a particular scorer or even portfolios that are of interest.*

Table H-20. Item-Level Interrater Consistency Statistics—Alt/STE

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	% Third Score*
5	comp1	5	219	99.09	0.91	0.93	1.37
	comp2	5	218	98.17	1.83	0.83	1.83
	comp3	5	218	99.08	0.92	0.92	0.92
	comp4	5	12	100.00	0.00	1.00	0.00
	ind1	4	201	97.01	2.99	0.98	3.48
	ind2	4	203	98.52	1.48	0.99	1.97
	ind3	4	191	98.95	1.05	0.99	1.05
	ind4	4	11	100.00	0.00	1.00	0.00
	sk1	4	201	99.50	0.50	0.98	2.49
	sk2	4	203	100.00	0.00	1.00	1.97
	sk3	4	191	98.95	1.05	0.95	1.57
	sk4	4	11	100.00	0.00		0.00
8	comp1	5	167	98.80	1.20	0.93	1.20
	comp2	5	165	99.39	0.61	0.95	1.21
	comp3	5	170	98.82	1.18	0.92	1.18
	comp4	5	31	96.77	3.23	0.92	3.23
	ind1	4	148	97.97	2.03	0.99	2.03
	ind2	4	139	99.28	0.72	1.00	0.72
	ind3	4	148	99.32	0.68	1.00	1.35
	ind4	4	29	96.55	3.45	0.97	3.45
	sk1	4	148	100.00	0.00	1.00	1.35
	sk2	4	139	100.00	0.00	1.00	0.00
	sk3	4	148	99.32	0.68	0.98	1.35
	sk4	4	29	100.00	0.00	1.00	3.45

**The percentages of exact agreement, adjacent agreement and third score do not necessarily sum to 1 due to the scoring rules. The most prevalent case is when a strand contains a score of "M" (indicating a required component is missing/incomplete) within a rubric area. Any instance of an "M" by scorer 1 or 2 must be confirmed by an expert scorer (scorer 3). Even if scorer 1 and 2 both agree on an "M", the third scorer would still provide a confirmation or overturning score. The third scorer will also review strands at random to provide oversight on a particular scorer or even portfolios that are of interest.*

Table H-21. Item-Level Interrater Consistency Statistics—Alt/HS Admin

Grade	Item	Number of Score Categories	Number of Responses Scored Twice	Percent Exact	Percent Adjacent	Correlation	% Third Score
Biology	comp1	5	240	99.58	0.42	0.96	0.42
	comp2	5	231	100.00	0.00	1.00	0.00
	comp3	5	226	97.35	2.65	0.80	2.65
	ind1	4	195	95.90	4.10	0.97	4.62
	ind2	4	190	97.37	2.63	0.98	2.63
	ind3	4	188	98.94	0.53	0.98	1.06
	sk1	4	195	99.49	0.51	0.99	1.54
	sk2	4	190	99.47	0.53	0.98	3.16
	sk3	4	188	98.94	1.06	0.97	1.60
Chemistry	comp1	5	53	100.00	0.00	--	0.00
	comp2	5	52	100.00	0.00	--	0.00
	comp3	5	52	100.00	0.00	--	0.00
	ind1	4	46	100.00	0.00	--	0.00
	ind2	4	44	100.00	0.00	--	0.00
	ind3	4	43	100.00	0.00	1.00	0.00
	sk1	4	46	100.00	0.00	1.00	0.00
	sk2	4	44	100.00	0.00	1.00	0.00
Introductory Physics	comp1	5	29	100.00	0.00	1.00	0.00
	comp2	5	29	100.00	0.00	1.00	0.00
	comp3	5	29	100.00	0.00	1.00	0.00
	ind1	4	27	96.30	3.70	0.97	3.70
	ind2	4	28	96.43	3.57	0.96	3.57
	ind3	4	29	100.00	0.00	1.00	0.00
	sk1	4	27	100.00	0.00	1.00	3.70
	sk2	4	28	100.00	0.00	1.00	3.57
	sk3	4	29	100.00	0.00	1.00	0.00
Technology / Engineering	comp1	5	34	100.00	0.00	--	0.00
	comp2	5	34	97.06	2.94	0.70	2.94
	comp3	5	34	100.00	0.00	--	0.00
	ind1	4	31	100.00	0.00	1.00	0.00
	ind2	4	29	100.00	0.00	1.00	0.00
	ind3	4	29	100.00	0.00	1.00	0.00
	sk1	4	31	100.00	0.00	1.00	0.00
	sk2	4	29	100.00	0.00	1.00	0.00
	sk3	4	29	100.00	0.00	1.00	0.00

APPENDIX I
ITEM-LEVEL CLASSICAL STATISTICS

Table I-1. Item-Level Classical Test Theory Statistics—ELA Grade 3

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL015503476	SR	63,035	0.60	0.53	0
EL015607246	SR	63,035	0.55	0.48	0
EL015611981	SR	63,035	0.44	0.35	0
EL015628878	SR	63,035	0.56	0.52	0
EL015629502	SR	63,035	0.75	0.48	0
EL015630515	SR	63,035	0.42	0.27	0
EL028131763	SR	63,035	0.69	0.54	0
EL028160220	SR	63,035	0.55	0.43	0
EL028217140	SR	63,035	0.60	0.47	0
EL028217627	SR	63,035	0.67	0.48	0
EL028709466	SR	63,035	0.51	0.38	0
EL028717847	SR	63,035	0.60	0.49	0
EL028823014	SR	63,035	0.61	0.47	0
EL028907379	SR	63,035	0.65	0.52	0
EL028914863	SR	63,035	0.53	0.39	0
EL909469479	SR	63,035	0.74	0.60	0
EL909470939	SR	63,035	0.51	0.43	0
EL909472828	SR	63,035	0.68	0.51	0
EL909473433	SR	63,035	0.60	0.53	0
EL909478450	SR	63,035	0.83	0.53	0
EL909479176	SR	63,035	0.82	0.47	0
EL909480023	SR	63,035	0.61	0.47	0
EL909865165	SR	63,035	0.74	0.55	0
EL909869416	SR	63,035	0.74	0.58	0
EL912636232	SR	63,035	0.73	0.58	0
EL919652746	SR	63,035	0.60	0.62	0
EL019650296	CR	63,035	0.73	0.51	5
EL028215856	CR	63,035	0.51	0.62	0
EL028753268	CR	63,035	0.64	0.66	1
EL028832702	CR	63,035	0.34	0.64	1
EL911945550	CR	63,035	0.70	0.68	0
EL909882556	ES	63,035	0.31	0.73	1

Table I-2. Item-Level Classical Test Theory Statistics—ELA Grade 4

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL006458075	SR	64,378	0.89	0.44	0
EL006549511	SR	64,378	0.62	0.53	0
EL007440160	SR	64,378	0.78	0.43	0
EL007444742	SR	64,378	0.77	0.53	0
EL007446608	SR	64,378	0.73	0.45	0
EL007452066	SR	64,378	0.85	0.50	0
EL009344832	SR	64,378	0.59	0.42	0
EL013314332	SR	64,378	0.52	0.39	0
EL014208236	SR	64,378	0.72	0.53	0
EL024031609	SR	64,378	0.51	0.31	0
EL024132276	SR	64,378	0.74	0.55	0
EL024134327	SR	64,378	0.62	0.58	0
EL024148759	SR	64,378	0.83	0.43	0
EL024437543	SR	64,378	0.50	0.38	0
EL024440140	SR	64,378	0.68	0.40	0
EL024442344	SR	64,378	0.42	0.36	0
EL024455037	SR	64,378	0.66	0.33	0
EL024527106	SR	64,378	0.58	0.33	0
EL024532504	SR	64,378	0.38	0.28	0

continued

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL029280667	SR	64,378	0.57	0.46	0
EL029415206	SR	64,378	0.63	0.46	0
EL029417376	SR	64,378	0.66	0.51	0
EL029429384	SR	64,378	0.48	0.36	0
EL030430678	SR	64,378	0.59	0.48	0
EL030741768	SR	64,378	0.60	0.50	0
EL033943069	SR	64,378	0.70	0.50	0
EL007464016	CR	64,378	0.71	0.42	0
EL009343264	CR	64,378	0.59	0.65	0
EL024480931	CR	64,378	0.53	0.57	0
EL024539092	CR	64,378	0.50	0.62	0
EL029323184	CR	64,378	0.47	0.55	0
EL007459900	ES	64,378	0.35	0.69	1

Table I-3. Item-Level Classical Test Theory Statistics—ELA Grade 5

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL029961019	SR	64,576	0.74	0.46	0
EL029974201	SR	64,576	0.69	0.57	0
EL029980757	SR	64,576	0.58	0.44	0
EL030062229	SR	64,576	0.76	0.51	0
EL030080040	SR	64,576	0.74	0.49	0
EL030171711	SR	64,576	0.69	0.49	0
EL030337822	SR	64,576	0.38	0.27	0
EL030483081	SR	64,576	0.81	0.51	0
EL030659380	SR	64,576	0.40	0.35	0
EL033541180	SR	64,576	0.86	0.46	0
EL033604260	SR	64,576	0.80	0.54	0
EL033665287	SR	64,576	0.57	0.35	0
EL033679189	SR	64,576	0.61	0.50	0
EL033800505	SR	64,576	0.51	0.30	0
EL033843854	SR	64,576	0.47	0.35	0
EL624175088	SR	64,576	0.79	0.52	0
EL624176741	SR	64,576	0.49	0.36	0
EL624177026	SR	64,576	0.77	0.27	0
EL624178677	SR	64,576	0.67	0.36	0
EL624179162	SR	64,576	0.82	0.51	0
EL624179855	SR	64,576	0.71	0.44	0
EL624180347	SR	64,576	0.74	0.40	0
EL624180539	SR	64,576	0.78	0.46	0
EL627148548	SR	64,576	0.69	0.53	0
EL029964018	CR	64,576	0.60	0.54	0
EL030463527	CR	64,576	0.64	0.64	0
EL033646585	CR	64,576	0.66	0.69	0
EL624176168	CR	64,576	0.85	0.62	0
EL624177447	CR	64,576	0.68	0.56	0
EL030400392	ES	64,576	0.32	0.74	1
EL624182427	ES	64,576	0.45	0.75	0

Table I-4. Item-Level Classical Test Theory Statistics—ELA Grade 6

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL006639933	SR	65,538	0.53	0.44	0
EL006738734	SR	65,538	0.48	0.42	0
EL006742548	SR	65,538	0.34	0.34	0
EL007074213	SR	65,538	0.80	0.45	0
EL007074445	SR	65,538	0.67	0.47	0
EL007075911	SR	65,538	0.74	0.56	0
EL007076177	SR	65,538	0.72	0.39	0
EL007077078	SR	65,538	0.77	0.52	0
EL007077860	SR	65,538	0.59	0.43	0
EL007078526	SR	65,538	0.70	0.48	0
EL008281454	SR	65,538	0.54	0.28	0
EL008445593	SR	65,538	0.68	0.52	0
EL009514238	SR	65,538	0.62	0.48	0
EL009564267	SR	65,538	0.51	0.39	0
EL009978066	SR	65,538	0.65	0.51	0
EL806979864	SR	65,538	0.72	0.51	0
EL807001596	SR	65,538	0.64	0.40	0
EL807002174	SR	65,538	0.70	0.38	0
EL807009150	SR	65,538	0.72	0.38	0
EL807010236	SR	65,538	0.45	0.39	0
EL807011414	SR	65,538	0.59	0.39	0
EL807011890	SR	65,538	0.66	0.42	0
EL807061702	SR	65,538	0.67	0.26	0
EL808245411	SR	65,538	0.70	0.42	0
EL008181021	CR	65,538	0.68	0.59	0
EL008355	CR	65,538	0.68	0.67	0
EL009438210	CR	65,538	0.48	0.43	0
EL807062301	CR	65,538	0.46	0.53	0
EL808246461	CR	65,538	0.60	0.36	0
EL007051004	ES	65,538	0.38	0.80	1
EL807016586	ES	65,538	0.40	0.80	1

Table I-5. Item-Level Classical Test Theory Statistics—ELA Grade 7

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL006357067	SR	65,593	0.71	0.48	0
EL006439224	SR	65,593	0.52	0.33	0
EL006446884	SR	65,593	0.50	0.43	0
EL006454205	SR	65,593	0.77	0.50	0
EL006537445	SR	65,593	0.53	0.37	0
EL006544709	SR	65,593	0.40	0.37	0
EL006545529	SR	65,593	0.57	0.40	0
EL006546235	SR	65,593	0.65	0.41	0
EL006560393	SR	65,593	0.56	0.40	0
EL006640130	SR	65,593	0.56	0.48	0
EL006977006	SR	65,593	0.64	0.45	0
EL011362473	SR	65,593	0.83	0.41	0
EL011363661	SR	65,593	0.71	0.45	0
EL016833358	SR	65,593	0.59	0.47	0
EL113429887	SR	65,593	0.73	0.50	0
EL713378067	SR	65,593	0.73	0.37	0
EL713476504	SR	65,593	0.48	0.36	0
EL713479099	SR	65,593	0.61	0.48	0
EL713479631	SR	65,593	0.76	0.47	0
EL713480064	SR	65,593	0.60	0.42	0
EL713480958	SR	65,593	0.70	0.44	0

continued

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL713481518	SR	65,593	0.63	0.50	0
EL723632935	SR	65,593	0.58	0.40	0
EL730170770	SR	65,593	0.78	0.52	0
EL006978834	CR	65,593	0.52	0.50	0
EL011353608	CR	65,593	0.41	0.47	0
EL017655451	CR	65,593	0.71	0.62	0
EL713370326	CR	65,593	0.64	0.47	0
EL713475622	CR	65,593	0.49	0.59	0
EL006653237	ES	65,593	0.43	0.78	1
EL713375305	ES	65,593	0.38	0.80	1

Table I-6. Item-Level Classical Test Theory Statistics—ELA Grade 8

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL006655733	SR	67,370	0.54	0.51	0
EL007061131	SR	67,370	0.76	0.37	0
EL007061194	SR	67,370	0.70	0.46	0
EL007061650	SR	67,370	0.73	0.25	0
EL007062053	SR	67,370	0.62	0.44	0
EL007253045	SR	67,370	0.74	0.57	0
EL007256618	SR	67,370	0.71	0.46	0
EL007257202	SR	67,370	0.69	0.24	0
EL007257390	SR	67,370	0.64	0.43	0
EL007335795	SR	67,370	0.67	0.43	0
EL007335808	SR	67,370	0.57	0.48	0
EL007350397	SR	67,370	0.56	0.43	0
EL007353056	SR	67,370	0.51	0.43	0
EL008544460	SR	67,370	0.62	0.46	0
EL009149967	SR	67,370	0.78	0.42	0
EL009246409	SR	67,370	0.76	0.49	0
EL009308236	SR	67,370	0.81	0.58	0
EL009308819	SR	67,370	0.55	0.36	0
EL009343097	SR	67,370	0.85	0.35	0
EL009737508	SR	67,370	0.59	0.43	0
EL016259168	SR	67,370	0.78	0.54	0
EL016259978	SR	67,370	0.61	0.35	0
EL016352526	SR	67,370	0.58	0.23	0
EL022460231	SR	67,370	0.72	0.55	0
EL006653570	CR	67,370	0.62	0.39	0
EL007062608	CR	67,370	0.75	0.43	0
EL007243506	CR	67,370	0.57	0.62	0
EL008553781	CR	67,370	0.71	0.48	0
EL009257746	CR	67,370	0.60	0.49	0
EL007062902	ES	67,370	0.51	0.80	1
EL007253494	ES	67,370	0.45	0.83	1

Table I-7. Item-Level Classical Test Theory Statistics—ELA Grade 10

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
EL108655218	SR	70,046	0.75	0.38	0
EL108735624	SR	70,046	0.67	0.39	0
EL108748372	SR	70,046	0.85	0.57	0
EL108755819	SR	70,046	0.76	0.49	0
EL108759765	SR	70,046	0.64	0.42	0
EL108762851	SR	70,046	0.74	0.52	0
EL110674270	SR	70,046	0.82	0.57	0
EL111645342	SR	70,046	0.88	0.48	0
EL111647089	SR	70,046	0.81	0.46	0
EL111666619	SR	70,046	0.73	0.48	0
EL111730630	SR	70,046	0.83	0.43	0
EL117657201	SR	70,046	0.82	0.51	0
EL910037105	SR	70,046	0.75	0.39	0
EL910038096	SR	70,046	0.82	0.43	0
EL910182760	SR	70,046	0.60	0.23	0
EL910186190	SR	70,046	0.79	0.44	0
EL910752412	SR	70,046	0.81	0.53	0
EL910856535	SR	70,046	0.65	0.44	0
EL910859790	SR	70,046	0.57	0.54	0
EL915848124	SR	70,046	0.67	0.40	0
EL915856523	SR	70,046	0.66	0.34	0
EL108640648	CR	70,046	0.70	0.55	1
EL108650704	CR	70,046	0.60	0.56	0
EL111540952	CR	70,046	0.76	0.63	1
EL111562949	CR	70,046	0.64	0.52	0
EL910161517	CR	70,046	0.71	0.54	0
EL910748365	CR	70,046	0.51	0.52	0
EL910841373	CR	70,046	0.53	0.51	0
EL108631124	ES	70,046	0.63	0.82	1
EL910055845	ES	70,046	0.60	0.81	1

Table I-8. Item-Level Classical Test Theory Statistics—Mathematics Grade 3

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA001049099	SR	64,537	0.47	0.34	0
MA001056175	SR	64,537	0.45	0.55	0
MA001137862	SR	64,537	0.65	0.55	0
MA001633319	SR	64,537	0.57	0.50	0
MA202994	SR	64,537	0.73	0.52	0
MA207001	SR	64,537	0.69	0.56	0
MA212474	SR	64,537	0.72	0.60	0
MA227232	SR	64,537	0.63	0.58	0
MA227485	SR	64,537	0.39	0.45	0
MA253641	SR	64,537	0.72	0.56	0
MA260962	SR	64,537	0.59	0.46	0
MA297500	SR	64,537	0.52	0.45	0
MA306285	SR	64,537	0.56	0.51	0
MA310870	SR	64,537	0.56	0.40	0
MA310880	SR	64,537	0.41	0.30	0
MA900372676	SR	64,537	0.51	0.49	0
MA000749172	CR	64,537	0.60	0.64	0
MA001038775	CR	64,537	0.74	0.48	0
MA001047582	CR	64,537	0.73	0.58	0
MA001335228	CR	64,537	0.49	0.64	1
MA001338241	CR	64,537	0.71	0.53	0
MA001344527	CR	64,537	0.73	0.28	0

continued

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA001439533	CR	64,537	0.69	0.54	0
MA253711A	CR	64,537	0.42	0.78	0
MA286750A	CR	64,537	0.49	0.77	0
MA293460A	CR	64,537	0.49	0.77	1
MA309747	CR	64,537	0.52	0.69	0
MA310884	CR	64,537	0.57	0.64	0
MA310889	CR	64,537	0.69	0.58	0
MA310899A	CR	64,537	0.46	0.75	1
MA703056978	CR	64,537	0.53	0.61	1
MA703078093	CR	64,537	0.79	0.59	0
MA713536927	CR	64,537	0.67	0.54	0
MA734752477	CR	64,537	0.70	0.54	0
MA735663821	CR	64,537	0.42	0.58	0
MA735736004A	CR	64,537	0.53	0.59	0
MA735756531	CR	64,537	0.36	0.60	0
MA735954511	CR	64,537	0.46	0.63	0
MA900425126	CR	64,537	0.44	0.54	1
MA935136577	CR	64,537	0.64	0.55	0

Table I-9. Item-Level Classical Test Theory Statistics—Mathematics Grade 4

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA001750121	SR	65,833	0.59	0.52	0
MA002034926	SR	65,833	0.72	0.49	0
MA002135528	SR	65,833	0.51	0.40	0
MA002139080	SR	65,833	0.50	0.30	0
MA002140372	SR	65,833	0.72	0.46	0
MA003747173	SR	65,833	0.52	0.37	0
MA247691	SR	65,833	0.84	0.47	0
MA247705	SR	65,833	0.52	0.48	0
MA279759	SR	65,833	0.67	0.55	0
MA297614	SR	65,833	0.66	0.41	0
MA301798	SR	65,833	0.64	0.49	0
MA303324	SR	65,833	0.51	0.63	0
MA306990	SR	65,833	0.41	0.35	0
MA307060	SR	65,833	0.58	0.41	0
MA307067	SR	65,833	0.70	0.63	0
MA307075	SR	65,833	0.87	0.48	0
MA311543	SR	65,833	0.67	0.51	0
MA803747806	SR	65,833	0.63	0.57	0
MA903571693	SR	65,833	0.47	0.63	0
MA903776098	SR	65,833	0.40	0.44	0
MA000732007	CR	65,833	0.51	0.55	0
MA001851276	CR	65,833	0.63	0.59	0
MA002128911	CR	65,833	0.63	0.58	0
MA002145158	CR	65,833	0.74	0.45	0
MA002334462	CR	65,833	0.59	0.62	1
MA003540652	CR	65,833	0.76	0.59	0
MA003744055	CR	65,833	0.62	0.73	1
MA293812	CR	65,833	0.39	0.73	0
MA303335	CR	65,833	0.48	0.74	0
MA307317	CR	65,833	0.47	0.75	0
MA311567	CR	65,833	0.57	0.62	0
MA311568	CR	65,833	0.64	0.55	0
MA704653374	CR	65,833	0.64	0.58	0
MA713677363	CR	65,833	0.70	0.59	0
MA736377105	CR	65,833	0.53	0.64	1
MA800727128	CR	65,833	0.44	0.57	0

continued

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA801035466	CR	65,833	0.46	0.75	0
MA803956738	CR	65,833	0.63	0.62	0
MA900756471	CR	65,833	0.56	0.64	0
MA900846441	CR	65,833	0.36	0.57	0

Table I-10. Item-Level Classical Test Theory Statistics—Mathematics Grade 5

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA000846578	SR	66,009	0.58	0.48	0
MA000859040	SR	66,009	0.70	0.38	0
MA000927731	SR	66,009	0.43	0.59	0
MA000937699	SR	66,009	0.38	0.36	0
MA000953421	SR	66,009	0.66	0.56	0
MA000957282	SR	66,009	0.60	0.57	0
MA297992	SR	66,009	0.59	0.46	0
MA301157	SR	66,009	0.65	0.36	0
MA301169	SR	66,009	0.33	0.46	0
MA301602	SR	66,009	0.74	0.52	0
MA301830	SR	66,009	0.54	0.38	0
MA306408	SR	66,009	0.36	0.37	0
MA306458	SR	66,009	0.40	0.53	0
MA800650803	SR	66,009	0.36	0.43	0
MA800651876	SR	66,009	0.47	0.62	0
MA804073907	SR	66,009	0.38	0.41	0
MA900727061	SR	66,009	0.58	0.39	0
MA900982012	SR	66,009	0.59	0.30	0
MA000846693	CR	66,009	0.42	0.60	0
MA000938134	CR	66,009	0.65	0.49	0
MA000955730	CR	66,009	0.53	0.56	0
MA000965213	CR	66,009	0.43	0.56	0
MA001042212	CR	66,009	0.48	0.48	0
MA001066377	CR	66,009	0.64	0.62	0
MA001142456	CR	66,009	0.57	0.46	0
MA002343629	CR	66,009	0.44	0.76	0
MA002837526	CR	66,009	0.65	0.55	0
MA005852277	CR	66,009	0.47	0.66	0
MA006336846	CR	66,009	0.60	0.44	0
MA298032	CR	66,009	0.34	0.57	0
MA704359624	CR	66,009	0.72	0.33	0
MA800975677	CR	66,009	0.51	0.61	0
MA801235389	CR	66,009	0.61	0.53	0
MA801646735	CR	66,009	0.70	0.60	1
MA802371654	CR	66,009	0.51	0.79	0
MA804073329	CR	66,009	0.39	0.58	0
MA903746975	CR	66,009	0.58	0.77	0
MA904453014	CR	66,009	0.60	0.54	0
MA908434516	CR	66,009	0.44	0.56	0
MA935150419	CR	66,009	0.50	0.60	0

Table I-11. Item-Level Classical Test Theory Statistics—Mathematics Grade 6

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA001264865	SR	66,888	0.49	0.54	0
MA001529070	SR	66,888	0.56	0.48	0
MA001585164	SR	66,888	0.64	0.46	0
MA002536621	SR	66,888	0.45	0.22	0
MA002538062	SR	66,888	0.79	0.45	0
MA005664640	SR	66,888	0.43	0.50	0
MA282127	SR	66,888	0.42	0.50	0
MA296382	SR	66,888	0.49	0.35	0
MA307338	SR	66,888	0.64	0.53	0
MA307340	SR	66,888	0.41	0.43	0
MA307363	SR	66,888	0.80	0.35	0
MA736509125	SR	66,888	0.65	0.49	0
MA805101277	SR	66,888	0.40	0.23	0
MA805104566	SR	66,888	0.45	0.50	0
MA805111429	SR	66,888	0.58	0.37	0
MA900283487	SR	66,888	0.58	0.60	0
MA001549477	CR	66,888	0.66	0.51	0
MA001554177	CR	66,888	0.53	0.49	0
MA001577731	CR	66,888	0.57	0.58	1
MA001604473	CR	66,888	0.35	0.63	0
MA003477341	CR	66,888	0.45	0.61	0
MA003861140	CR	66,888	0.50	0.52	0
MA223217	CR	66,888	0.50	0.58	0
MA290253	CR	66,888	0.37	0.82	1
MA298252	CR	66,888	0.32	0.80	1
MA299673	CR	66,888	0.60	0.60	0
MA307362	CR	66,888	0.69	0.60	0
MA624248796	CR	66,888	0.54	0.50	0
MA703149512	CR	66,888	0.63	0.50	0
MA736063629	CR	66,888	0.40	0.57	1
MA736368137	CR	66,888	0.60	0.61	0
MA736452404	CR	66,888	0.38	0.49	0
MA800203270	CR	66,888	0.33	0.76	0
MA800301627	CR	66,888	0.46	0.84	1
MA800385560	CR	66,888	0.57	0.62	0
MA805109765	CR	66,888	0.46	0.42	1
MA805280170	CR	66,888	0.63	0.54	0
MA900378821	CR	66,888	0.44	0.76	0
MA900578720	CR	66,888	0.45	0.66	0
MA902758854	CR	66,888	0.65	0.40	0

Table I-12. Item-Level Classical Test Theory Statistics—Mathematics Grade 7

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA000971342	SR	66,891	0.54	0.57	0
MA005170212	SR	66,891	0.61	0.40	0
MA005207399	SR	66,891	0.55	0.52	0
MA219417	SR	66,891	0.40	0.57	0
MA259175	SR	66,891	0.59	0.29	0
MA272764	SR	66,891	0.57	0.30	0
MA282221	SR	66,891	0.37	0.40	0
MA298072	SR	66,891	0.38	0.55	0
MA304467	SR	66,891	0.59	0.57	0
MA306626	SR	66,891	0.51	0.27	0
MA306627	SR	66,891	0.40	0.55	0
MA311074	SR	66,891	0.37	0.35	0
MA900336138	SR	66,891	0.34	0.55	0
MA900557823	SR	66,891	0.55	0.45	0
MA903983773	SR	66,891	0.35	0.40	0
MA904000450	SR	66,891	0.39	0.33	0
MA904169987	SR	66,891	0.39	0.43	0
MA001678587	CR	66,891	0.42	0.56	0
MA001702061	CR	66,891	0.75	0.54	0
MA001759197	CR	66,891	0.63	0.42	0
MA002046543	CR	66,891	0.36	0.61	1
MA002119133	CR	66,891	0.47	0.84	1
MA005077116	CR	66,891	0.42	0.53	0
MA261648	CR	66,891	0.37	0.83	1
MA302328	CR	66,891	0.43	0.63	0
MA311092	CR	66,891	0.31	0.72	1
MA624562376	CR	66,891	0.44	0.53	0
MA713848056	CR	66,891	0.36	0.61	0
MA713848251	CR	66,891	0.39	0.50	0
MA713848348	CR	66,891	0.41	0.62	1
MA713849125	CR	66,891	0.52	0.62	0
MA713849162	CR	66,891	0.37	0.58	0
MA717248260	CR	66,891	0.37	0.79	1
MA802907874	CR	66,891	0.31	0.82	2
MA804676692	CR	66,891	0.28	0.70	0
MA900567252	CR	66,891	0.35	0.60	1
MA900739359	CR	66,891	0.48	0.64	0
MA900743031	CR	66,891	0.37	0.60	2
MA900749529	CR	66,891	0.47	0.58	0
MA900765087	CR	66,891	0.61	0.69	0

Table I-13. Item-Level Classical Test Theory Statistics—Mathematics Grade 8

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA001736920	SR	68,553	0.59	0.46	0
MA001865159	SR	68,553	0.46	0.57	0
MA002180558	SR	68,553	0.59	0.55	0
MA002181298	SR	68,553	0.59	0.53	0
MA003932801	SR	68,553	0.63	0.55	0
MA252991	SR	68,553	0.72	0.26	0
MA287538	SR	68,553	0.70	0.44	0
MA297517	SR	68,553	0.49	0.31	0
MA298198	SR	68,553	0.40	0.41	0
MA303244	SR	68,553	0.37	0.34	0
MA307585	SR	68,553	0.73	0.48	0
MA307586	SR	68,553	0.50	0.48	0
MA804535837	SR	68,553	0.53	0.37	0
MA901143033	SR	68,553	0.54	0.47	0
MA908446890	SR	68,553	0.70	0.48	0
MA908450808	SR	68,553	0.45	0.57	0
MA001737758	CR	68,553	0.51	0.58	1
MA001737991	CR	68,553	0.48	0.34	0
MA002177981	CR	68,553	0.58	0.57	0
MA002243883	CR	68,553	0.65	0.62	0
MA003128642	CR	68,553	0.47	0.50	0
MA003936639	CR	68,553	0.57	0.64	0
MA010701848	CR	68,553	0.69	0.70	1
MA297651	CR	68,553	0.47	0.60	0
MA301714	CR	68,553	0.32	0.83	3
MA307492	CR	68,553	0.64	0.61	0
MA311433	CR	68,553	0.36	0.81	2
MA715919661	CR	68,553	0.67	0.30	0
MA715919716	CR	68,553	0.64	0.59	0
MA715919758	CR	68,553	0.55	0.41	0
MA715919788	CR	68,553	0.38	0.64	0
MA715919853	CR	68,553	0.44	0.68	0
MA800472975	CR	68,553	0.38	0.61	0
MA800659905	CR	68,553	0.30	0.44	0
MA800738445	CR	68,553	0.44	0.83	1
MA804043870	CR	68,553	0.35	0.64	1
MA901253257	CR	68,553	0.43	0.43	0
MA902278325	CR	68,553	0.48	0.62	0
MA902308680	CR	68,553	0.43	0.68	0
MA905179612	CR	68,553	0.27	0.58	1

Table I-14. Item-Level Classical Test Theory Statistics—Mathematics Grade 10

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
MA002776824	SR	69,627	0.60	0.56	0
MA273263	SR	69,627	0.63	0.61	0
MA281703	SR	69,627	0.59	0.33	0
MA287711	SR	69,627	0.78	0.52	0
MA299944	SR	69,627	0.51	0.49	0
MA301385	SR	69,627	0.49	0.62	0
MA301994	SR	69,627	0.76	0.44	0
MA302009	SR	69,627	0.49	0.34	0
MA303236	SR	69,627	0.52	0.64	0
MA303279	SR	69,627	0.59	0.64	0
MA311971	SR	69,627	0.57	0.52	0
MA312323	SR	69,627	0.49	0.40	0
MA313775	SR	69,627	0.84	0.47	0
MA313793	SR	69,627	0.53	0.50	0
MA314947	SR	69,627	0.72	0.56	0
MA314988	SR	69,627	0.64	0.46	0
MA315396	SR	69,627	0.44	0.52	0
MA315401	SR	69,627	0.68	0.53	0
MA315436	SR	69,627	0.65	0.44	0
MA315737	SR	69,627	0.65	0.55	0
MA717049810	SR	69,627	0.51	0.64	0
MA805406621	SR	69,627	0.51	0.42	0
MA000774815	CR	69,627	0.47	0.70	1
MA001272700	CR	69,627	0.46	0.55	0
MA001275174	CR	69,627	0.45	0.66	0
MA001368680	CR	69,627	0.55	0.53	0
MA001478687	CR	69,627	0.36	0.40	0
MA002057230	CR	69,627	0.75	0.59	0
MA002069968	CR	69,627	0.56	0.83	2
MA002634895	CR	69,627	0.47	0.42	0
MA002880198	CR	69,627	0.33	0.63	0
MA003332783	CR	69,627	0.28	0.34	0
MA003336082	CR	69,627	0.54	0.64	0
MA294334	CR	69,627	0.38	0.85	2
MA308930	CR	69,627	0.32	0.82	3
MA315759	CR	69,627	0.62	0.63	0
MA316870	CR	69,627	0.41	0.55	0
MA713647003	CR	69,627	0.38	0.53	0
MA713808267	CR	69,627	0.44	0.75	1
MA717336908	CR	69,627	0.52	0.74	0
MA805276190	CR	69,627	0.39	0.61	0
MA901757179	CR	69,627	0.41	0.68	0

Table I-15. Item-Level Classical Test Theory Statistics—STE Grade 5

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
SC001657113	SR	65,663	0.85	0.43	0
SC002002025	SR	65,663	0.47	0.35	0
SC291284	SR	65,663	0.79	0.49	0
SC294524	SR	65,663	0.53	0.48	0
SC304600	SR	65,663	0.55	0.46	0
SC309964	SR	59,566	0.60	0.58	0
SC315956	SR	65,663	0.58	0.56	0
SC315987	SR	65,663	0.44	0.45	0
SC627204024	SR	59,566	0.41	0.41	0
SC629148346	SR	59,566	0.86	0.48	0
SC629551835	SR	65,663	0.51	0.43	0
SC630756314	SR	65,663	0.65	0.60	0
SC736232773	SR	65,663	0.77	0.48	0
SC801062661	SR	65,663	0.76	0.52	0
SC801064879	SR	65,663	0.46	0.33	0
SC802352255	SR	65,663	0.64	0.45	0
SC804037841	SR	59,566	0.57	0.43	0
SC809002676	SR	65,663	0.85	0.45	0
SC814668478	SR	65,663	0.77	0.52	0
SC904845052	SR	65,663	0.52	0.32	0
SC000640531	CR	65,663	0.50	0.51	0
SC000876847	CR	65,663	0.69	0.50	0
SC006940380	CR	65,663	0.49	0.50	0
SC315784	CR	65,663	0.72	0.45	0
SC62523872	CR	59,566	0.36	0.58	1
SC632638762	CR	65,663	0.70	0.65	0
SC711452664	CR	65,663	0.61	0.63	0
SC736074020	CR	59,566	0.79	0.47	0
SC736182092	CR	59,566	0.45	0.57	0
SC801063145	CR	65,663	0.58	0.47	0
SC801065906	CR	65,663	0.34	0.51	0
SC801629720	CR	65,663	0.26	0.63	0
SC802343884	CR	65,663	0.75	0.54	0
SC803868033	CR	65,663	0.63	0.48	0
SC803937429	CR	65,663	0.60	0.51	0
SC804065269	CR	65,663	0.46	0.47	0
SC808520381	CR	65,663	0.28	0.34	0
SC809480016	CR	65,663	0.70	0.51	0
SC809483803	CR	65,663	0.51	0.59	0
SC814972728	CR	59,566	0.38	0.66	1
SC903833986	CR	65,663	0.55	0.51	0

Table I-16. Item-Level Classical Test Theory Statistics—STE Grade 8

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
SC000757503	SR	70,646	0.60	0.48	0
SC288298	SR	64,370	0.69	0.48	0
SC288343	SR	64,370	0.43	0.40	0
SC289633	SR	70,646	0.56	0.56	0
SC289731	SR	64,370	0.66	0.55	0
SC291714	SR	70,646	0.37	0.33	0
SC291776	SR	70,646	0.64	0.43	0
SC291825	SR	70,646	0.35	0.33	0
SC299423	SR	70,646	0.52	0.45	0
SC310230	SR	64,370	0.46	0.45	0
SC313155	SR	70,646	0.54	0.39	0
SC313164	SR	70,646	0.46	0.51	0
SC316009	SR	70,646	0.78	0.55	0
SC316056	SR	70,646	0.34	0.32	0
SC735347597	SR	64,370	0.55	0.48	0
SC802143530	SR	70,646	0.37	0.30	0
SC802144364	SR	70,646	0.43	0.49	0
SC803872056	SR	70,646	0.41	0.42	0
SC903843634	SR	70,646	0.70	0.56	0
SC903854067	SR	70,646	0.62	0.63	0
SC905284974	SR	70,646	0.41	0.37	0
SC905334273	SR	70,646	0.61	0.56	0
SC909357115	SR	70,646	0.42	0.42	0
SC933775118	SR	70,646	0.49	0.54	0
SC933938027	SR	70,646	0.62	0.52	0
SC933941764	SR	70,646	0.70	0.51	0
SC000777619	CR	70,646	0.63	0.69	1
SC304510	CR	64,370	0.38	0.70	1
SC631443367	CR	70,646	0.46	0.31	0
SC631658368	CR	64,370	0.43	0.65	1
SC735656788	CR	70,646	0.42	0.28	0
SC802269586	CR	70,646	0.34	0.64	0
SC803667588	CR	70,646	0.34	0.53	0
SC804130460	CR	70,646	0.65	0.65	1
SC804373650	CR	70,646	0.60	0.57	0
SC809260838	CR	70,646	0.46	0.46	0
SC832348897	CR	70,646	0.56	0.44	0
SC903853174	CR	70,646	0.43	0.46	1
SC903855126	CR	70,646	0.38	0.69	1
SC932754119	CR	70,646	0.49	0.61	0
SC934045224	CR	64,370	0.54	0.65	1

Table I-17. Item-Level Classical Test Theory Statistics—HS Biology

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
SC294820	SR	55,983	0.61	0.55	0
SC295278	SR	55,983	0.57	0.55	0
SC296662	SR	55,983	0.49	0.65	0
SC299071	SR	55,983	0.45	0.35	0
SC299739	SR	55,983	0.52	0.60	0
SC301337	SR	55,983	0.69	0.49	0
SC304863	SR	55,983	0.36	0.44	0
SC304901	SR	55,983	0.54	0.51	0
SC304905	SR	55,983	0.52	0.43	0
SC306327	SR	55,983	0.62	0.43	0
SC310087	SR	55,983	0.68	0.45	0
SC313347	SR	55,983	0.58	0.33	0
SC316159	SR	55,983	0.46	0.37	0
SC317087	SR	55,983	0.50	0.47	0
SC632554377	SR	55,983	0.68	0.55	0
SC706031065	SR	55,983	0.77	0.38	0
SC707646320	SR	55,983	0.58	0.49	0
SC802140161	SR	55,983	0.59	0.51	0
SC802460401	SR	55,983	0.66	0.43	0
SC803772254	SR	55,983	0.62	0.55	0
SC831345559	SR	55,983	0.63	0.46	0
SC903434684	SR	55,983	0.78	0.41	0
SC903665008	SR	55,983	0.71	0.47	0
SC903668548	SR	55,983	0.69	0.52	0
SC910651771	SR	55,983	0.38	0.34	0
SC912737872	SR	55,983	0.57	0.54	0
SC924640143	SR	55,983	0.73	0.38	0
SC299759	CR	55,983	0.40	0.80	1
SC316255	CR	55,983	0.43	0.84	3
SC802367082	CR	55,983	0.36	0.57	0
SC815749586	CR	55,983	0.55	0.49	1
SC903432965	CR	55,983	0.54	0.51	0
SC903436569	CR	55,983	0.73	0.42	0
SC903436994	CR	55,983	0.48	0.73	1
SC903667169	CR	55,983	0.53	0.77	1
SC903667486	CR	55,983	0.44	0.33	0
SC910985231	CR	55,983	0.39	0.52	0
SC911246035	CR	55,983	0.28	0.75	2
SC912238529	CR	55,983	0.57	0.53	0
SC913054446	CR	55,983	0.42	0.55	0
SC915044062	CR	55,983	0.87	0.47	0
SC920841277	CR	55,983	0.65	0.50	0

Table I-18. Item-Level Classical Test Theory Statistics—HS Introductory Physics

Item Number	Item Type	N	Difficulty	Discrimination	Percent Omitted (%)
SC230808	SR	14,274	0.73	0.57	0
SC280839	SR	14,274	0.60	0.44	0
SC287048	SR	14,274	0.66	0.49	0
SC293975	SR	14,274	0.66	0.44	0
SC304783	SR	14,274	0.63	0.48	0
SC305503	SR	14,274	0.61	0.59	0
SC313738	SR	14,274	0.51	0.31	0
SC315642	SR	14,274	0.60	0.53	0
SC316347	SR	14,274	0.70	0.54	0
SC630642496	SR	14,274	0.87	0.42	0
SC736226112	SR	14,274	0.64	0.25	0
SC803254164	SR	14,274	0.45	0.45	0
SC803255498	SR	14,274	0.50	0.33	0
SC803313338	SR	14,274	0.36	0.34	0
SC805343036	SR	14,274	0.62	0.52	0
SC813625710	SR	14,274	0.52	0.33	0
SC904262622	SR	14,274	0.42	0.41	0
SC904339575	SR	14,274	0.42	0.27	0
SC904349855	SR	14,274	0.70	0.55	0
SC915751239	SR	14,274	0.66	0.59	0
SC916955396	SR	14,274	0.70	0.43	0
SC005926735	CR	14,274	0.53	0.57	1
SC007257568	CR	14,274	0.83	0.44	0
SC287206	CR	14,274	0.41	0.77	2
SC301782	CR	14,274	0.35	0.72	2
SC316441	CR	14,274	0.34	0.81	2
SC800542273	CR	14,274	0.67	0.51	0
SC801132834	CR	14,274	0.69	0.60	0
SC801152950	CR	14,274	0.66	0.49	0
SC801643310	CR	14,274	0.57	0.53	1
SC803424446	CR	14,274	0.37	0.55	0
SC803432596	CR	14,274	0.60	0.73	1
SC803633622	CR	14,274	0.66	0.44	0
SC805732725	CR	14,274	0.54	0.16	0
SC813853029	CR	14,274	0.59	0.52	0
SC814931121	CR	14,274	0.60	0.57	0
SC904340389	CR	14,274	0.56	0.65	0
SC904352276	CR	14,274	0.34	0.67	2
SC906755093	CR	14,274	0.62	0.54	0
SC907464800	CR	14,274	0.64	0.62	0
SC909552364	CR	14,274	0.69	0.55	0
SC909633335	CR	14,274	0.46	0.34	0

Table I-19. Item-Level Classical Test Theory Statistics—Alt/ELA

Grade	Item Number	Item Type	N	Difficulty	Discrimination
3	comp1	OR	853	0.59	0.25
	comp2	OR	853	0.59	0.27
	comp3	OR	853	0.58	0.32
	ind1	OR	826	0.94	0.44
	ind2	OR	767	0.93	0.51
	ind3	OR	829	0.84	0.42
	sk1	OR	826	0.97	0.31
	sk2	OR	767	0.95	0.36
	sk3	OR	829	0.46	0.49
4	comp1	OR	913	0.59	0.30
	comp2	OR	913	0.59	0.34
	comp3	OR	913	0.59	0.40
	ind1	OR	886	0.95	0.47
	ind2	OR	820	0.93	0.56
	ind3	OR	886	0.85	0.40
	sk1	OR	886	0.97	0.33
	sk2	OR	820	0.95	0.42
	sk3	OR	886	0.50	0.48
5	comp1	OR	800	0.59	0.31
	comp2	OR	800	0.59	0.32
	comp3	OR	800	0.58	0.36
	ind1	OR	782	0.95	0.43
	ind2	OR	733	0.93	0.51
	ind3	OR	781	0.87	0.39
	sk1	OR	782	0.97	0.29
	sk2	OR	733	0.96	0.32
	sk3	OR	781	0.49	0.48
6	comp1	OR	755	0.59	0.30
	comp2	OR	755	0.59	0.31
	comp3	OR	755	0.58	0.43
	ind1	OR	735	0.94	0.43
	ind2	OR	679	0.94	0.51
	ind3	OR	729	0.85	0.43
	sk1	OR	735	0.97	0.35
	sk2	OR	679	0.96	0.40
	sk3	OR	729	0.50	0.49
7	comp1	OR	716	0.59	0.37
	comp2	OR	716	0.59	0.36
	comp3	OR	716	0.58	0.43
	ind1	OR	691	0.93	0.46
	ind2	OR	646	0.93	0.52
	ind3	OR	695	0.87	0.43
	sk1	OR	691	0.96	0.36
	sk2	OR	646	0.97	0.37
	sk3	OR	695	0.50	0.51
8	comp1	OR	720	0.59	0.30
	comp2	OR	720	0.59	0.34
	comp3	OR	720	0.58	0.41

continued

Grade	Item Number	Item Type	N	Difficulty	Discrimination
8	ind1	OR	705	0.95	0.46
	ind2	OR	666	0.92	0.58
	ind3	OR	699	0.87	0.47
	sk1	OR	705	0.96	0.31
	sk2	OR	666	0.96	0.50
	sk3	OR	699	0.52	0.49
HS	comp1	OR	682	0.59	0.21
	comp2	OR	682	0.59	0.23
	comp3	OR	682	0.59	0.25
	ind1	OR	638	0.94	0.42
	ind2	OR	611	0.94	0.39
	ind3	OR	650	0.87	0.32
	sk1	OR	638	0.96	0.29
	sk2	OR	611	0.96	0.44
	sk3	OR	650	0.57	0.47

Table I-20. Item-Level Classical Test Theory Statistics—Alt/Mathematics

Grade	Item Number	Item Type	N	Difficulty	Discrimination
3	comp1	OR	738	0.59	0.36
	comp5	OR	738	0.59	0.37
	ind1	OR	738	0.92	0.77
	ind5	OR	738	0.94	0.69
	sk1	OR	738	0.97	0.43
	sk5	OR	738	0.97	0.57
4	comp1	OR	804	0.59	0.48
	comp3	OR	804	0.59	0.44
	ind1	OR	804	0.92	0.76
	ind3	OR	804	0.93	0.72
	sk1	OR	804	0.96	0.48
	sk3	OR	804	0.97	0.52
5	comp2	OR	731	0.59	0.47
	comp3	OR	731	0.59	0.50
	ind2	OR	731	0.93	0.77
	ind3	OR	731	0.94	0.72
	sk2	OR	731	0.97	0.53
	sk3	OR	731	0.97	0.55
6	comp2	OR	700	0.58	0.52
	comp5	OR	700	0.58	0.57
	ind2	OR	700	0.93	0.75
	ind5	OR	700	0.92	0.72
	sk2	OR	700	0.96	0.51
	sk5	OR	700	0.97	0.49
7	comp1	OR	650	0.58	0.59
	comp4	OR	650	0.59	0.59
	ind1	OR	650	0.92	0.74
	ind4	OR	650	0.95	0.67
	sk1	OR	650	0.97	0.60
	sk4	OR	650	0.97	0.58
8	comp2	OR	634	0.58	0.53
	comp4	OR	634	0.59	0.48
	ind2	OR	634	0.92	0.76

continued

Grade	Item Number	Item Type	N	Difficulty	Discrimination
8	ind4	OR	634	0.94	0.71
	sk2	OR	634	0.97	0.44
	sk4	OR	634	0.96	0.52
HS	comp1	OR	188	0.60	0.08
	comp2	OR	536	0.59	0.19
	comp3	OR	433	0.59	0.23
	comp4	OR	505	0.59	0.25
	comp5	OR	327	0.59	0.27
	ind1	OR	180	0.93	0.52
	ind2	OR	493	0.96	0.44
	ind3	OR	419	0.93	0.38
	ind4	OR	479	0.94	0.39
	ind5	OR	305	0.93	0.52
	sk1	OR	180	0.96	0.46
	sk2	OR	493	0.97	0.38
	sk3	OR	419	0.96	0.26
	sk4	OR	479	0.96	0.35
	sk5	OR	305	0.97	0.37

Table I-21. Item-Level Classical Test Theory Statistics—Alt/STE

Grade	Item Number	Item Type	N	Difficulty	Discrimination
5	comp1	OR	745	0.59	0.37
	comp2	OR	742	0.59	0.33
	comp3	OR	730	0.59	0.38
	comp4	OR	48	0.55	0.42
	ind1	OR	731	0.86	0.69
	ind2	OR	726	0.87	0.70
	ind3	OR	713	0.86	0.65
	ind4	OR	46	0.84	0.52
	sk1	OR	731	0.97	0.26
	sk2	OR	726	0.97	0.23
	sk3	OR	713	0.97	0.25
	sk4	OR	46	1.00	
8	comp1	OR	651	0.58	0.32
	comp2	OR	671	0.59	0.33
	comp3	OR	638	0.59	0.28
	comp4	OR	122	0.57	0.48
	ind1	OR	638	0.86	0.67
	ind2	OR	657	0.85	0.66
	ind3	OR	624	0.86	0.62
	ind4	OR	117	0.88	0.61
	sk1	OR	638	0.96	0.24
	sk2	OR	657	0.97	0.37
	sk3	OR	624	0.97	0.29
	sk4	OR	117	0.96	0.45

Table I-22. Item-Level Classical Test Theory Statistics—Alt/Biology

Grade	Item Number	Item Type	N	Difficulty	Discrimination
HS	comp1	OR	411	0.59	0.30
	comp2	OR	411	0.59	0.31
	comp3	OR	411	0.59	0.38
	ind1	OR	406	0.87	0.67
	ind2	OR	402	0.87	0.70
	ind3	OR	402	0.87	0.68
	sk1	OR	406	0.97	0.26
	sk2	OR	402	0.97	0.31
	sk3	OR	402	0.97	0.23

Table I-23. Item-Level Classical Test Theory Statistics—Alt/Chemistry

Grade	Item Number	Item Type	N	Difficulty	Discrimination
HS	comp1	OR	112	0.60	0.45
	comp2	OR	112	0.60	0.45
	comp3	OR	112	0.60	0.45
	ind1	OR	109	1.00	0.12
	ind2	OR	110	1.00	0.10
	ind3	OR	109	0.99	0.12
	sk1	OR	109	0.98	0.42
	sk2	OR	110	0.98	0.61
	sk3	OR	109	0.97	0.36

Discrimination statistics cannot be reported for some Alt/Chemistry items because the sample size of students was too small in 2021.

Table I-24. Item-Level Classical Test Theory Statistics—Alt/Introductory Physics

Grade	Item Number	Item Type	N	Difficulty	Discrimination
HS	comp1	OR	74	0.58	0.26
	comp2	OR	74	0.59	0.26
	comp3	OR	74	0.59	0.26
	ind1	OR	73	0.82	0.68
	ind2	OR	72	0.86	0.67
	ind3	OR	73	0.88	0.69
	sk1	OR	73	0.98	0.29
	sk2	OR	72	0.96	0.33
	sk3	OR	73	0.97	0.29

Difficulty and discrimination statistics cannot be reported for Alt/Introductory Physics because the sample size of students was too small in 2021.

Table I-25. Item-Level Classical Test Theory Statistics—Alt/TEC

Grade	Item Number	Item Type	N	Difficulty	Discrimination
HS	comp1	OR	70	0.59	0.31
	comp2	OR	70	0.59	0.35
	comp3	OR	70	0.59	0.35
	ind1	OR	68	0.94	0.71
	ind2	OR	69	0.95	0.67
	ind3	OR	69	0.93	0.74
	sk1	OR	68	0.98	0.50
	sk2	OR	69	0.96	0.54
	sk3	OR	69	0.94	0.68

APPENDIX J
ITEM-LEVEL SCORE DISTRIBUTIONS

Table J-1. Item-Level Score Distributions for SR, CR, and ES Items—ELA

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
3	EL019650296	63,035	2	8	28	59			
	EL028215856	63,035	2	37	25	39			
	EL028753268	63,035	2	16	37	46			
	EL028832702	63,035	3	31	38	27	3		
	EL909882556#SCORE_TRAIT_Conv	63,035	3	29	40	24	6		
	EL909882556#SCORE_TRAIT_Ideadev	63,035	4	26	43	24	5	1	
	EL911945550	63,035	2	19	21	59			
4	EL007459900#SCORE_TRAIT_Conv	64,378	3	10	57	28	5		
	EL007459900#SCORE_TRAIT_Ideadev	64,378	4	17	51	27	4	1	
	EL007464016	64,378	2	27	5	68			
	EL009343264	64,378	2	29	22	48			
	EL024480931	64,378	2	38	18	44			
	EL024539092	64,378	3	10	37	44	9		
	EL029323184	64,378	2	31	43	26			
5	EL029964018	64,576	2	33	15	53			
	EL030400392#SCORE_TRAIT_Conv	64,576	3	27	41	23	8		
	EL030400392#SCORE_TRAIT_Ideadev	64,576	4	24	45	23	7	1	
	EL030463527	64,576	2	27	18	55			
	EL033646585	64,576	2	20	28	52			
	EL624176168	64,576	2	11	8	81			
	EL624177447	64,576	2	16	30	53			
	EL624182427#SCORE_TRAIT_Conv	64,576	3	13	36	36	15		
	EL624182427#SCORE_TRAIT_Ideadev	64,576	4	12	34	35	16	2	
6	EL007051004#SCORE_TRAIT_Conv	65,538	3	17	28	34	20		
	EL007051004#SCORE_TRAIT_Ideadev	65,538	5	23	29	30	14	3	0
	EL008181021	65,538	2	11	42	47			
	EL008355	65,538	2	17	30	53			
	EL009438210	65,538	2	31	42	27			
	EL807016586#SCORE_TRAIT_Conv	65,538	3	17	33	30	19		
	EL807016586#SCORE_TRAIT_Ideadev	65,538	5	15	31	29	16	6	2
	EL807062301	65,538	2	50	7	42			
	EL808246461	65,538	2	11	57	32			
7	EL006653237#SCORE_TRAIT_Conv	65,593	3	18	25	31	24		
	EL006653237#SCORE_TRAIT_Ideadev	65,593	5	12	30	31	19	6	1
	EL006978834	65,593	2	40	17	43			
	EL011353608	65,593	2	40	38	22			
	EL017655451	65,593	2	23	13	65			
	EL713370326	65,593	2	17	36	46			
	EL713375305#SCORE_TRAIT_Conv	65,593	3	18	32	21	29		
	EL713375305#SCORE_TRAIT_Ideadev	65,593	5	49	9	12	14	10	5
	EL713475622	65,593	2	39	24	38			
8	EL006653570	67,370	2	14	49	37			
	EL007062608	67,370	2	22	6	71			
	EL007062902#SCORE_TRAIT_Conv	67,370	3	9	22	31	37		
	EL007062902#SCORE_TRAIT_Ideadev	67,370	5	10	22	29	25	10	4

continued

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
8	EL007243506	67,370	2	37	12	51			
	EL007253494#SCORE_TRAIT_Conv	67,370	3	14	23	32	30		
	EL007253494#SCORE_TRAIT_Ideadev	67,370	5	16	22	30	21	9	2
	EL008553781	67,370	2	9	40	51			
	EL009257746	67,370	2	17	46	37			
10	EL108631124#SCORE_TRAIT_Conv	70,046	3	5	13	22	59		
	EL108631124#SCORE_TRAIT_Ideadev	70,046	5	5	13	22	26	30	4
	EL108640648	70,046	2	5	47	47			
	EL108650704	70,046	2	36	8	57			
	EL111540952	70,046	2	8	30	61			
	EL111562949	70,046	2	30	11	58			
	EL910055845#SCORE_TRAIT_Conv	70,046	3	6	14	24	55		
	EL910055845#SCORE_TRAIT_Ideadev	70,046	5	4	14	25	36	19	1
	EL910161517	70,046	2	17	25	58			
	EL910748365	70,046	2	26	45	28			
	EL910841373	70,046	2	41	12	47			

Table J-2. Item-Level Score Distributions for SR, SA, and CR Items—Mathematics

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
3	MA253711A	64,537	3	29	28	30	12		
	MA286750A	64,537	3	25	24	30	21		
	MA293460A	64,537	3	30	20	21	29		
	MA310899A	64,537	3	22	28	38	11		
4	MA293812	65,833	4	23	20	40	8	8	
	MA303335	65,833	4	13	28	25	21	12	
	MA307317	65,833	4	20	12	35	24	9	
	MA704653374	65,833	2	18	36	46			
	MA713677363	65,833	2	14	31	55			
	MA801035466	65,833	4	15	28	26	20	10	
5	MA000965213	66,009	2	34	46	20			
	MA002343629	66,009	4	18	24	25	23	8	
	MA005852277	66,009	4	18	17	33	23	8	
	MA802371654	66,009	4	12	21	30	20	16	
	MA903746975	66,009	4	7	25	21	23	24	
	MA908434516	66,009	2	33	45	21			
6	MA290253	66,888	4	28	27	22	10	13	
	MA298252	66,888	4	47	17	10	8	17	
	MA800203270	66,888	2	55	25	21			
	MA800301627	66,888	4	24	20	20	14	21	
	MA900378821	66,888	4	7	48	18	15	12	
	MA900578720	66,888	2	35	40	25			
7	MA002119133	66,891	4	25	18	21	16	20	
	MA261648	66,891	4	41	16	8	18	16	
	MA624562376	66,891	2	32	47	20			
	MA717248260	66,891	4	20	38	18	16	6	
	MA802907874	66,891	4	37	24	21	8	9	
	MA900765087	66,891	2	14	49	36			
8	MA002243883	68,553	2	18	33	49			
	MA010701848	68,553	4	5	12	17	26	38	
	MA301714	68,553	4	44	18	12	12	13	
	MA311433	68,553	4	22	36	20	13	7	
	MA800738445	68,553	4	27	18	19	19	16	
	MA902278325	68,553	2	34	37	29			
10	MA001368680	69,627	2	24	42	34			
	MA001478687	69,627	2	43	42	15			
	MA002057230	69,627	2	13	23	64			
	MA002069968	69,627	4	19	17	13	15	34	
	MA002880198	69,627	2	51	33	17			
	MA294334	69,627	4	37	16	14	15	15	
	MA308930	69,627	4	40	15	19	18	6	
	MA316870	69,627	2	37	44	19			
	MA713808267	69,627	4	7	34	38	15	5	
	MA717336908	69,627	2	31	32	36			

Table J-3. Item-Level Score Distributions for SR and CR Items—STE

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
5	SC62523872	59,566	2	42	41	16			
	SC632638762	65,663	2	19	21	60			
	SC711452664	65,663	2	18	42	41			
	SC736182092	59,566	3	22	33	34	11		
	SC801065906	65,663	3	24	53	19	4		
	SC801629720	65,663	3	57	21	9	13		
	SC804065269	65,663	2	26	56	19			
	SC809483803	65,663	2	32	32	35			
	SC814972728	59,566	3	29	31	34	5		
8	SC000777619	70,646	2	16	33	46			
	SC304510	64,370	3	30	30	21	14		
	SC631658368	64,370	2	34	38	24			
	SC802269586	70,646	3	39	27	17	13		
	SC803667588	70,646	2	45	35	16			
	SC809260838	70,646	2	30	42	25			
	SC903855126	70,646	3	30	23	37	5		
	SC932754119	70,646	2	30	35	31			
	SC934045224	64,370	3	17	24	25	29		

Table J-4. Item-Level Score Distributions for SR and CR Items—Biology

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
HS	SC299759	55,983	4	26	23	20	23	8	
	SC316255	55,983	4	28	13	24	16	16	
	SC903432965	55,983	2	23	45	32			
	SC903436994	55,983	3	23	33	20	24		
	SC903667169	55,983	3	17	26	35	21		
	SC910985231	55,983	2	39	45	16			
	SC911246035	55,983	4	39	26	15	10	7	
	SC912238529	55,983	2	23	41	36			
	SC915044062	55,983	2	4	18	78			
	SC920841277	55,983	2	13	42	44			

Table J-5. Item-Level Score Distributions for SR and CR Items—Introductory Physics

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
HS	SC287206	14,274	4	19	23	35	13	8	
	SC301782	14,274	4	20	39	23	12	5	
	SC316441	14,274	4	27	35	16	13	7	
	SC801132834	14,274	2	14	33	52			
	SC803424446	14,274	2	42	40	17			
	SC803432596	14,274	3	11	23	38	27		
	SC813853029	14,274	2	20	43	37			
	SC904340389	14,274	2	25	38	37			
	SC904352276	14,274	3	36	31	22	9		
	SC909552364	14,274	2	17	28	55			

Table J-6. Item-Level Score Distributions—Alt/ELA

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
3	comp1	853	5	0	0	4.22	95.78	0	0
	comp2	853	5	0	0	6.45	93.55	0	0
	comp3	853	5	0	0	11.37	88.63	0	0
	gp1	853	2	0	29.31	70.69			
	gp2	853	2	0	46.07	53.93			
	gp3	853	2	0	0.12	99.88			
	ind1	853	4	3.17	1.17	3.52	11.25	80.89	
	ind2	853	4	10.08	1.06	3.75	14.89	70.22	
	ind3	853	4	2.81	3.75	12.43	26.49	54.51	
	se1	853	2	0.23	0.35	99.41			
	se2	853	2	0.23	0.12	99.65			
	se3	853	2	0.7	0.47	98.83			
	sk1	853	4	3.17	0	1.06	10.08	85.7	
	sk2	853	4	10.08	0.47	1.29	12.31	75.85	
	sk3	853	4	2.81	39.62	35.52	20.05	1.99	
4	comp1	913	5	0	0	3.72	96.28	0	0
	comp2	913	5	0	0	4.38	95.62	0	0
	comp3	913	5	0	0	6.68	93.32	0	0
	gp1	913	2	0	28.15	71.85			
	gp2	913	2	0	43.26	56.74			
	gp3	913	2	0	0	100			
	ind1	913	4	2.96	1.42	2.41	12.05	81.16	
	ind2	913	4	10.19	1.97	2.3	12.92	72.62	
	ind3	913	4	2.96	2.08	12.16	27.38	55.42	
	se1	913	2	0	0.33	99.67			
	se2	913	2	0.33	0.22	99.45			
	se3	913	2	0.33	0.33	99.34			
	sk1	913	4	2.96	0.33	1.64	9.31	85.76	
	sk2	913	4	10.19	0.11	2.19	13.03	74.48	
	sk3	913	4	2.96	32.09	35.38	27.93	1.64	
5	comp1	800	5	0	0	4.38	95.63	0	0
	comp2	800	5	0	0	4.13	95.88	0	0
	comp3	800	5	0	0	8.13	91.88	0	0
	gp1	800	2	0	29.38	70.63			
	gp2	800	2	0	47.13	52.88			

continued

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
5	gp3	800	2	0	0	100			
	ind1	800	4	2.25	0.63	2.25	12.88	82	
	ind2	800	4	8.38	1.38	2.5	16	71.75	
	ind3	800	4	2.38	1.75	9.25	27.88	58.75	
	se1	800	2	0.75	0.63	98.63			
	se2	800	2	0.63	0.38	99			
	se3	800	2	0.63	0.38	99			
	sk1	800	4	2.25	0.13	1	8.63	88	
	sk2	800	4	8.38	0.13	1.38	10.25	79.88	
	sk3	800	4	2.38	35.5	31.25	28.75	2.13	
6	comp1	755	5	0	0	4.24	95.76	0	0
	comp2	755	5	0	0	5.3	94.7	0	0
	comp3	755	5	0	0	9.4	90.6	0	0
	gp1	755	2	0	36.56	63.44			
	gp2	755	2	0	46.23	53.77			
	gp3	755	2	0	0	100			
	ind1	755	4	2.65	0.53	3.05	14.83	78.94	
	ind2	755	4	10.07	0.4	3.44	14.7	71.39	
	ind3	755	4	3.44	2.52	10.33	28.61	55.1	
	se1	755	2	0.79	1.59	97.62			
	se2	755	2	0.53	0.66	98.81			
	se3	755	2	0.93	1.06	98.01			
	sk1	755	4	2.65	0	1.32	9.01	87.02	
	sk2	755	4	10.07	0.13	1.85	9.4	78.54	
	sk3	755	4	3.44	32.19	32.32	30.07	1.99	
7	comp1	716	5	0	0	4.75	95.25	0	0
	comp2	716	5	0	0	5.73	94.27	0	0
	comp3	716	5	0	0	10.47	89.53	0	0
	gp1	716	2	0	31.28	68.72			
	gp2	716	2	0	43.58	56.42			
	gp3	716	2	0	0	100			
	ind1	716	4	3.49	0.98	4.19	16.76	74.58	
	ind2	716	4	9.78	0.84	3.63	16.76	68.99	
	ind3	716	4	2.93	1.54	10.61	25.14	59.78	
	se1	716	2	0.56	1.12	98.32			
	se2	716	2	0.42	0.56	99.02			
	se3	716	2	0.7	0.42	98.88			
	sk1	716	4	3.49	0	1.82	10.06	84.64	
	sk2	716	4	9.78	0.14	1.68	8.66	79.75	
	sk3	716	4	2.93	33.8	30.17	31.28	1.82	
8	comp1	720	5	0	0	4.58	95.42	0	0
	comp2	720	5	0	0	4.72	95.28	0	0
	comp3	720	5	0	0	8.89	91.11	0	0
	gp1	720	2	0	31.81	68.19			
	gp2	720	2	0	46.11	53.89			
	gp3	720	2	0	0	100			
	ind1	720	4	2.08	0.56	3.06	13.75	80.56	
	ind2	720	4	7.5	1.94	4.44	13.06	73.06	
	ind3	720	4	2.92	2.36	8.47	25.56	60.69	
	se1	720	2	0.97	0.83	98.19			
	se2	720	2	0.28	0.42	99.31			
	se3	720	2	0.14	0.83	99.03			
	sk1	720	4	2.08	0.28	1.53	10.14	85.97	
	sk2	720	4	7.5	0	1.81	12.92	77.78	
	sk3	720	4	2.92	29.44	32.5	32.64	2.5	
HS	comp1	682	5	0	0	4.11	95.89	0	0
	comp2	682	5	0	0	3.81	96.19	0	0

continued

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
	comp3	682	5	0	0	6.01	93.99	0	0
	gp1	682	2	0	27.86	72.14			
	gp2	682	2	0	40.18	59.82			
	gp3	682	2	0	0	100			
	ind1	682	4	6.45	1.32	2.49	13.05	76.69	
	ind2	682	4	10.41	0.73	3.23	13.93	71.7	
HS	ind3	682	4	4.69	1.91	7.92	27.42	58.06	
	se1	682	2	0.88	0.59	98.53			
	se2	682	2	0.88	0.59	98.53			
	se3	682	2	1.03	0.44	98.53			
	sk1	682	4	6.45	0.29	1.76	10.7	80.79	
	sk2	682	4	10.41	0.59	2.35	9.53	77.13	
	sk3	682	4	4.69	23.31	28.59	38.71	4.69	

Table J-7. Item-Level Score Distributions—Alt/Mathematics

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
	comp1	738	5	0	0	5.96	94.04	0	0
	comp5	738	5	0	0	4.88	95.12	0	0
	gp1	738	2	0	32.93	67.07			
	gp5	738	2	0	32.38	67.62			
	ind1	738	4	0	2.71	3.52	16.67	77.1	
	ind5	738	4	0	1.08	4.07	14.23	80.62	
	se1	738	2	0.54	0	99.46			
	se5	738	2	0.41	0	99.59			
	sk1	738	4	0	0.14	0.68	10.3	88.89	
	sk5	738	4	0	0.41	1.63	8.94	89.02	
	comp1	804	5	0	0	4.73	95.27	0	0
	comp3	804	5	0	0	6.22	93.78	0	0
3	gp1	804	2	0	32.46	67.54			
	gp3	804	2	0	27.61	72.39			
	ind1	804	4	0	2.36	4.35	15.17	78.11	
	ind3	804	4	0	1.62	3.98	14.8	79.6	
	se1	804	2	0	0.12	99.88			
	se3	804	2	0.12	0.25	99.63			
	sk1	804	4	0	0.12	2.11	9.83	87.94	
	comp1	738	5	0	0	5.96	94.04	0	0
	comp5	738	5	0	0	4.88	95.12	0	0
	gp1	738	2	0	32.93	67.07			
	gp5	738	2	0	32.38	67.62			
	ind1	738	4	0	2.71	3.52	16.67	77.1	
	ind5	738	4	0	1.08	4.07	14.23	80.62	
	se1	738	2	0.54	0	99.46			
	se5	738	2	0.41	0	99.59			
	sk1	738	4	0	0.14	0.68	10.3	88.89	
	sk5	738	4	0	0.41	1.63	8.94	89.02	
4	comp1	804	5	0	0	4.73	95.27	0	0
	comp3	804	5	0	0	6.22	93.78	0	0
	gp1	804	2	0	32.46	67.54			
	gp3	804	2	0	27.61	72.39			
	ind1	804	4	0	2.36	4.35	15.17	78.11	

continued

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
4	sk3	804	4	0	0	1.37	10.7	87.94	
5	comp2	731	5	0	0	6.02	93.98	0	0
	comp3	731	5	0	0	5.2	94.8	0	0
	gp2	731	2	0	32.15	67.85			
	gp3	731	2	0	30.23	69.77			
	ind2	731	4	0	1.09	3.83	15.18	79.89	
	ind3	731	4	0	0.82	3.01	15.6	80.57	
	se2	731	2	0.68	0.27	99.04			
	se3	731	2	0.68	0.27	99.04			
	sk2	731	4	0	0.41	1.09	7.25	91.24	
	sk3	731	4	0	0.14	0.96	10.4	88.51	
6	comp2	700	5	0	0	9	91	0	0
	comp5	700	5	0	0	8	92	0	0
	gp2	700	2	0	35.43	64.57			
	gp5	700	2	0	39.86	60.14			
	ind2	700	4	0	1	4.29	17	77.71	
	ind5	700	4	0	2	4.14	16.86	77	
	se2	700	2	0.71	0.43	98.86			
	se5	700	2	0.71	0.71	98.57			
	sk2	700	4	0	0	2.29	9.71	88	
	sk5	700	4	0	0.43	1	8.71	89.86	
7	comp1	650	5	0	0	8.77	91.23	0	0
	comp4	650	5	0	0	5.54	94.46	0	0
	gp1	650	2	0	31.69	68.31			
	gp4	650	2	0	30.46	69.54			
	ind1	650	4	0	1.85	4	17.08	77.08	
	ind4	650	4	0	0.46	3.69	12.31	83.54	
	se1	650	2	0.31	0.62	99.08			
	se4	650	2	0.31	0.77	98.92			
	sk1	650	4	0	0	1.69	9.69	88.62	
	sk4	650	4	0	0	2	9.38	88.62	
8	comp2	634	5	0	0	8.04	91.96	0	0
	comp4	634	5	0	0	4.89	95.11	0	0
	gp2	634	2	0	38.64	61.36			
	gp4	634	2	0	30.13	69.87			
	ind2	634	4	0	2.68	5.99	13.56	77.76	
	ind4	634	4	0	0.95	4.26	11.2	83.6	
	se2	634	2	0.63	0.63	98.74			
	se4	634	2	0.47	0.63	98.9			
	sk2	634	4	0	0.16	0.95	10.25	88.64	
	sk4	634	4	0	0.16	1.74	11.04	87.07	
HS	comp1	188	5	0	0	1.06	98.94	0	0
	comp2	536	5	0	0	4.29	95.71	0	0
	comp3	433	5	0	0	6.47	93.53	0	0
	comp4	505	5	0	0	6.14	93.86	0	0
	comp5	327	5	0	0	4.59	95.41	0	0
	gp1	188	2	0	37.77	62.23			
	gp2	536	2	0	28.36	71.64			
	gp3	433	2	0	28.87	71.13			
	gp4	505	2	0	30.3	69.7			
	gp5	327	2	0	36.7	63.3			
	ind1	188	4	4.26	0.53	7.45	11.17	76.6	

continued

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
HS	ind2	536	4	8.02	0.37	2.8	9.51	79.29	
	ind3	433	4	3.23	1.62	3.7	12.93	78.52	
	ind4	505	4	5.15	1.19	2.57	13.47	77.62	
	ind5	327	4	6.73	1.22	4.28	12.84	74.92	
	se1	188	2	0.53	1.06	98.4			
	se2	536	2	0.56	0.19	99.25			
	se3	433	2	0.69	0	99.31			
	se4	505	2	0.79	0	99.21			
	se5	327	2	0.61	0.61	98.78			
	sk1	188	4	4.26	0	3.72	8.51	83.51	
	sk2	536	4	8.02	0	1.87	8.96	81.16	
	sk3	433	4	3.23	0.46	3	9.01	84.3	
	sk4	505	4	5.15	0.59	1.19	9.5	83.56	
	sk5	327	4	6.73	0	1.22	9.17	82.87	

Table J-8. Item-Level Score Distributions—Alt/STE

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
5	comp1	745	5	0	0	7.25	92.75	0	0
	comp2	742	5	0	0	6.74	93.26	0	0
	comp3	730	5	0	0	6.58	93.42	0	0
	comp4	48	5	0	0	22.92	77.08	0	0
	gp1	745	2	0	0	100			
	gp2	742	2	0	0	100			
	gp3	730	2	0	0	100			
	gp4	48	2	0	0	100			
	ind1	745	4	1.88	3.36	10.6	21.88	62.28	
	ind2	742	4	2.16	3.77	8.36	23.58	62.13	
	ind3	730	4	2.33	3.7	8.9	23.97	61.1	
	ind4	48	4	4.17	2.08	18.75	16.67	58.33	
	se1	745	2	0.94	0.27	98.79			
	se2	742	2	0.81	0.27	98.92			
	se3	730	2	1.1	0	98.9			
	se4	48	2	6.25	0	93.75			
	sk1	745	4	1.88	0.13	1.88	9.13	86.98	
	sk2	742	4	2.16	0.13	1.35	8.09	88.27	
	sk3	730	4	2.33	0	1.92	9.59	86.16	
	sk4	48	4	4.17	0	0	0	95.83	
8	comp1	651	5	0	0	7.53	92.47	0	0
	comp2	671	5	0	0	6.41	93.59	0	0
	comp3	638	5	0	0	5.33	94.67	0	0
	comp4	122	5	0	0	16.39	83.61	0	0
	gp1	651	2	0	0	100			
	gp2	671	2	0	0	100			
	gp3	638	2	0	0	100			
	gp4	122	2	0	0	100			
	ind1	651	4	2	2.61	9.52	27.8	58.06	

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
	ind2	671	4	2.09	5.07	8.94	26.97	56.93	
	ind3	638	4	2.19	3.92	10.19	24.14	59.56	
	ind4	122	4	4.1	0	10.66	24.59	60.66	
	se1	651	2	0.77	0.77	98.46			
	se2	671	2	1.04	0.3	98.66			
8	se3	638	2	0.63	1.1	98.28			
	se4	122	2	0	0.82	99.18			
	sk1	651	4	2	0.15	1.69	10.29	85.87	
	sk2	671	4	2.09	0.3	1.19	9.09	87.33	
	sk3	638	4	2.19	0.16	2.19	7.05	88.4	
	sk4	122	4	4.1	0.82	0.82	12.3	81.97	

Table J-9. Item-Level Score Distributions—Alt/Biology

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
	comp1	411	5	0	0	4.62	95.38	0	0
	comp2	411	5	0	0	5.11	94.89	0	0
	comp3	411	5	0	0	6.81	93.19	0	0
	gp1	411	2	0	0	100			
	gp2	411	2	0	0	100			
	gp3	411	2	0	0	100			
	ind1	411	4	1.22	3.89	8.03	23.36	63.5	
HS	ind2	411	4	2.19	3.65	8.27	22.63	63.26	
	ind3	411	4	2.19	4.62	8.52	20.19	64.48	
	se1	411	2	0.49	0.24	99.27			
	se2	411	2	0.97	0.49	98.54			
	se3	411	2	0.73	0.24	99.03			
	sk1	411	4	1.22	0	2.68	8.03	88.08	
	sk2	411	4	2.19	0	1.46	9.98	86.37	
	sk3	411	4	2.19	0.24	0.73	8.03	88.81	

Table J-10. Item-Level Score Distributions—Alt/Chemistry

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
	comp1	112	5	0	0	1.79	98.21	0	0
	comp2	112	5	0	0	1.79	98.21	0	0
	comp3	112	5	0	0	1.79	98.21	0	0
	gp1	112	2	0	9.82	90.18			
	gp2	112	2	0	9.82	90.18			
	gp3	112	2	0	11.61	88.39			
	ind1	112	4	2.68	0	0	1.79	95.54	
HS	ind2	112	4	1.79	0	0	1.79	96.43	
	ind3	112	4	2.68	0	0.89	3.57	92.86	
	se1	112	2	0	1.79	98.21			
	se2	112	2	0	0	100			
	se3	112	2	0	0	100			
	sk1	112	4	2.68	0	1.79	3.57	91.96	
	sk2	112	4	1.79	0	0.89	8.04	89.29	
	sk3	112	4	2.68	0.89	0	8.04	88.39	

Table J-11. Item-Level Score Distributions—Alt/Introductory Physics

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
	comp1	74	5	0	0	8.11	91.89	0	0
	comp2	74	5	0	0	6.76	93.24	0	0
	comp3	74	5	0	0	6.76	93.24	0	0
	gp1	74	2	0	0	100			
	gp2	74	2	0	0	100			
	gp3	74	2	0	0	100			
	ind1	74	4	1.35	5.41	12.16	31.08	50	
HS	ind2	74	4	2.7	2.7	9.46	25.68	59.46	
	ind3	74	4	1.35	4.05	8.11	18.92	67.57	
	se1	74	2	0	0	100			
	se2	74	2	0	0	100			
	se3	74	2	0	0	100			
	sk1	74	4	1.35	0	1.35	6.76	90.54	
	sk2	74	4	2.7	0	4.05	6.76	86.49	
	sk3	74	4	1.35	0	4.05	5.41	89.19	

Table J-12. Item-Level Score Distributions—Alt/ Technology/Engineering

Grade	Item Number	N	Total Possible Points	Percent of Students at Score Point					
				0	1	2	3	4	5
HS	comp1	70	5	0	0	5.71	94.29	0	0
	comp2	70	5	0	0	4.29	95.71	0	0
	comp3	70	5	0	0	4.29	95.71	0	0
	gp1	70	2	0	17.14	82.86			
	gp2	70	2	0	20	80			
	gp3	70	2	0	15.71	84.29			
	ind1	70	4	2.86	2.86	1.43	12.86	80	
	ind2	70	4	1.43	0	2.86	12.86	82.86	
	ind3	70	4	1.43	0	8.57	10	80	
	se1	70	2	1.43	0	98.57			
	se2	70	2	1.43	0	98.57			
	se3	70	2	1.43	0	98.57			
	sk1	70	4	2.86	0	0	8.57	88.57	
	sk2	70	4	1.43	0	2.86	10	85.71	
	sk3	70	4	1.43	1.43	2.86	12.86	81.43	

APPENDIX K
DIFFERENTIAL ITEM FUNCTIONING RESULTS

Table K-1. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—ELA

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
3	Male	Female	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	Not Low Income	Low Income	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	26	2	1	1	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	White	African American/Black	SR	26	1	0	1	1	1	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
		Hispanic/Latino	SR	26	2	1	1	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
4	Male	Female	SR	26	3	3	0	0	0	0
			CR	5	1	1	0	0	0	0
			ES	1	0	0	0	0	0	0
	Not Low Income	Low Income	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
	White	African American/Black	SR	26	1	1	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0
		Hispanic/Latino	SR	26	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	1	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
5	Male	Female	SR	24	3	3	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not Low Income	Low Income	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	24	3	3	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	White	African American/Black	SR	24	2	1	1	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
		Hispanic/Latino	SR	24	1	1	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
6	Male	Female	SR	24	1	1	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not Low Income	Low Income	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	24	1	1	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	White	African American/Black	SR	24	2	1	1	0	0	0
			CR	5	1	1	0	0	0	0
			ES	2	0	0	0	0	0	0
		Hispanic/Latino	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
7	Male	Female	SR	24	4	3	1	0	0	0
			CR	5	1	1	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not Low Income	Low Income	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	24	2	2	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	White	African American/Black	SR	24	1	0	1	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
		Hispanic/Latino	SR	24	1	1	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
8	Male	Female	SR	24	6	5	1	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not Low Income	Low Income	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	24	0	0	0	1	1	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	24	0	0	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	White	African American/Black	SR	24	1	1	0	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
		Hispanic/Latino	SR	24	2	1	1	0	0	0
			CR	5	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
10	Male	Female	SR	21	1	1	0	0	0	0
			CR	7	1	1	0	1	1	0
			ES	2	0	0	0	0	0	0
	Not Low Income	Low Income	SR	21	1	1	0	0	0	0
			CR	7	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	21	3	3	0	0	0	0
			CR	7	1	1	0	0	0	0
			ES	2	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	21	0	0	0	0	0	0
			CR	7	0	0	0	0	0	0
			ES	2	0	0	0	0	0	0
	White	African American/Black	SR	21	4	3	1	0	0	0
			CR	7	1	1	0	0	0	0
			ES	2	0	0	0	0	0	0
		Hispanic/Latino	SR	21	2	1	1	0	0	0
			CR	7	1	1	0	0	0	0
			ES	2	0	0	0	0	0	0

Table K-2. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—Mathematics

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
3	Male	Female	SR	16	0	0	0	0	0	0
			CR	24	2	1	1	0	0	0
	Not Low Income	Low Income	SR	16	2	1	1	0	0	0
			CR	24	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	White	African American/Black	SR	16	3	1	2	0	0	0
			CR	24	2	2	0	0	0	0
		Hispanic/Latino	SR	16	3	1	2	0	0	0
			CR	24	2	1	1	0	0	0
4	Male	Female	SR	20	1	1	0	0	0	0
			CR	20	2	2	0	0	0	0
	Not Low Income	Low Income	SR	20	0	0	0	0	0	0
			CR	20	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	20	0	0	0	0	0	0
			CR	20	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	20	2	1	1	0	0	0
			CR	20	0	0	0	0	0	0
	White	African American/Black	SR	20	2	0	2	0	0	0
			CR	20	1	1	0	0	0	0
		Hispanic/Latino	SR	20	0	0	0	0	0	0
			CR	20	0	0	0	0	0	0
5	Male	Female	SR	18	1	1	0	0	0	0
			CR	22	4	3	1	0	0	0
	Not Low Income	Low Income	SR	18	0	0	0	0	0	0
			CR	22	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	18	0	0	0	0	0	0
			CR	22	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	18	0	0	0	0	0	0
			CR	22	0	0	0	0	0	0
	White	African American/Black	SR	18	0	0	0	0	0	0
			CR	22	1	1	0	0	0	0
		Hispanic/Latino	SR	18	0	0	0	0	0	0
			CR	22	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring Reference	Favoring Focal	Total	Favoring Reference	Favoring Focal
6	Male	Female	SR	16	2	2	0	0	0	0
			CR	24	2	0	2	0	0	0
	Not Low Income	Low Income	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	16	0	0	0	0	0	0
			CR	24	1	0	1	0	0	0
	Students without Disabilities	Students with Disabilities	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	White	African American/Black	SR	16	1	0	1	0	0	0
			CR	24	2	1	1	0	0	0
		Hispanic/Latino	SR	16	0	0	0	0	0	0
			CR	24	1	0	1	0	0	0
7	Male	Female	SR	17	2	0	2	0	0	0
			CR	23	4	4	0	0	0	0
	Not Low Income	Low Income	SR	17	0	0	0	0	0	0
			CR	23	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	17	1	0	1	0	0	0
			CR	23	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	17	0	0	0	0	0	0
			CR	23	0	0	0	0	0	0
	White	African American/Black	SR	17	2	0	2	0	0	0
			CR	23	1	0	1	0	0	0
		Hispanic/Latino	SR	17	1	0	1	0	0	0
			CR	23	0	0	0	0	0	0
8	Male	Female	SR	16	2	2	0	0	0	0
			CR	24	2	1	1	1	1	0
	Not Low Income	Low Income	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	16	0	0	0	0	0	0
			CR	24	0	0	0	0	0	0
	White	African American/Black	SR	16	0	0	0	0	0	0
			CR	24	2	2	0	0	0	0
		Hispanic/Latino	SR	16	0	0	0	0	0	0
			CR	24	1	1	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring Reference	Favoring Focal	Total	Favoring Reference	Favoring Focal
10	Male	Female	SR	22	0	0	0	0	0	0
			CR	20	1	1	0	0	0	0
	Not Low Income	Low Income	SR	22	0	0	0	0	0	0
			CR	20	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	22	1	0	1	0	0	0
			CR	20	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	22	0	0	0	0	0	0
			CR	20	0	0	0	0	0	0
	White	African American/Black	SR	22	1	0	1	0	0	0
			CR	20	1	1	0	0	0	0
		Hispanic/Latino	SR	22	0	0	0	0	0	0
			CR	20	0	0	0	0	0	0

Table K-3. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—STE

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring Reference	Favoring Focal	Total	Favoring Reference	Favoring Focal
5	Male	Female	SR	20	1	1	0	0	0	0
			CR	21	3	2	1	0	0	0
	Not Low Income	Low Income	SR	20	0	0	0	0	0	0
			CR	21	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	20	0	0	0	0	0	0
			CR	21	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	20	1	0	1	0	0	0
			CR	21	0	0	0	0	0	0
	White	African American/Black	SR	20	0	0	0	0	0	0
			CR	21	1	1	0	0	0	0
		Hispanic/Latino	SR	20	0	0	0	0	0	0
			CR	21	1	1	0	0	0	0
8	Male	Female	SR	26	3	3	0	0	0	0
			CR	15	3	2	1	0	0	0
	Not EL/FEL	EL/FEL	SR	26	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0
	Not Low Income	Low Income	SR	26	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	26	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0
	White	African American/Black	SR	26	0	0	0	0	0	0
			CR	15	1	1	0	0	0	0
		Hispanic/Latino	SR	26	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0

Table K-4. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—Biology

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
HS	Male	Female	SR	27	1	1	0	1	1	0
			CR	15	3	3	0	0	0	0
	Not Low Income	Low Income	SR	27	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	27	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	27	0	0	0	0	0	0
			CR	15	1	0	1	0	0	0
	White	African American/Black	SR	27	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0
		Hispanic/Latino	SR	27	0	0	0	0	0	0
			CR	15	0	0	0	0	0	0

Table K-5. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—Introductory Physics

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
HS	Male	Female	SR	21	2	1	1	2	2	0
			CR	21	2	0	2	0	0	0
	Not Low Income	Low Income	SR	21	0	0	0	0	0	0
			CR	21	0	0	0	0	0	0
	Not EL/FEL	EL/FEL	SR	21	0	0	0	0	0	0
			CR	21	0	0	0	0	0	0
	Students without Disabilities	Students with Disabilities	SR	21	0	0	0	0	0	0
			CR	21	0	0	0	0	0	0
	White	Hispanic/Latino	SR	21	1	0	1	0	0	0
			CR	21	1	1	0	0	0	0

Appendix L

2022–2023 Equating Report

Massachusetts Comprehensive Assessment System

2022–2023: EQUATING REPORT

cognia™

2022–2023 Massachusetts Comprehensive Assessment System

Equating Report

The purpose of this document is to summarize the psychometric calibration and equating results obtained from Cognia for Next-Gen MCAS. Presented in this report are various program summary statistics and specific results related to the study.

The results of this report are organized as follows:

1. Aggregate Results
    1. Percentage of Students by Achievement Levels Categories
    2. Raw Scores Associated with Cutpoints
    3. Calibration Report
    4. Equating Item Summary Statistics
2. Grade Subject Results
    1. A/A, B/B, Delta, Test Characteristic Curve, Test Information Function, and Cumulative Scale Score Distribution Plots
    2. Lookup Tables
    3. Cumulative Scale Score Distribution Tables
    4. Rescore Analysis Results
    5. Tabled Delta Analysis Results
    6. Tabled B/B Analysis Results
    7. Tabled Beta Analysis Results
    8. Final Item Parameters
    9. Decision Accuracy and Consistency (DAC)
    10. Fit Plots of Watchlist Items

The final results of this equating will be included as part of the 2022 - 2023 Next-Gen MCAS Technical Manual. If requested, Cognia will distribute and/or present this report at the next MCAS TAC.

Section 1.1

Percentage of Students by Achievement Levels Categories

Table 1.1.1
Percentage of Students by Achievement Levels Categories
Biology

Grade	Year	Count	NM	PM	ME	EE	ME+EE	Delta	Ave. SS
10	2023	49403	12	36	41	12	52	4.3	500.8
	2022	50827	12	40	37	11	48		498.9

Table 1.1.2
Percentage of Students by Achievement Levels Categories
English Language Arts

Grade	Year	Count	NM	PM	ME	EE	ME+EE	Delta	Ave. SS
3	2023	60542	14	40	39	7	46	0.3	496.0
	2022	61648	13	41	39	7	46	-6.9	497.1
	2021	50011	8	39	43	10	53	-5.7	500.1
	2019	63602	6	36	48	11	58	5.8	504.8
	2018	43046	6	41	43	10	53	1.0	501.8
	2017	26459	7	41	43	8	52		500.1
4	2023	61836	14	44	36	6	42	1.7	494.7
	2022	62100	14	46	36	4	40	-11.2	493.8
	2021	50867	11	38	45	6	51	-2.7	498.9
	2019	65450	7	39	44	10	54	-0.5	502.6
	2018	69078	7	38	44	10	55	3.5	502.2
	2017	63918	8	41	43	8	51		500.1
5	2023	62316	13	41	41	5	46	3.8	496.0
	2022	63620	11	47	37	5	42	-7.1	495.6
	2021	51362	10	41	41	8	49	-5.0	497.9
	2019	67933	6	39	47	8	54	-1.5	501.9
	2018	69390	6	38	49	7	56	4.4	502.3
	2017	28547	7	42	46	5	51		499.9
6	2023	63574	21	35	36	8	44	1.3	494.0
	2022	63887	20	37	35	8	43	-7.2	494.0
	2021	51319	19	31	37	13	50	-5.7	498.4
	2019	67612	11	33	42	13	56	3.4	502.5
	2018	53988	10	38	42	11	52	-0.7	501.3
	2017	29369	8	39	47	6	53		500.3
7	2023	63711	17	41	34	8	42	-0.3	494.2
	2022	65584	17	40	37	6	42	-3.2	493.7
	2021	51120	17	37	39	7	46	-4.8	495.6
	2019	67462	11	39	42	9	50	3.6	499.8
	2018	66410	13	40	39	8	47	-6.5	497.4
	2017	30209	8	38	48	6	53		500.2
8	2023	65553	20	35	35	10	45	2.2	495.4
	2022	67919	16	40	36	7	43	-0.3	494.8
	2021	50822	15	41	37	7	44	-10.0	496.2
	2019	67350	11	35	42	12	54	1.1	500.6
	2018	69486	13	34	42	10	52	1.1	499.6
	2017	65314	9	40	43	8	51		499.5
10	2023	68104	10	30	44	16	60	0.2	504.2
	2022	65193	7	34	51	9	60	-6.4	502.9
	2021	67110	8	26	46	20	66	2.3	508.1
	2019	67067	6	31	50	14	64		507.3

Table 1.1.3

Percentage of Students by Achievement Levels Categories

Mathematics

Grade	Year	Count	NM	PM	ME	EE	ME+EE	Delta	Ave. SS
3	2023	51707	12	39	39	10	49	1.2	499.1
	2022	53433	13	39	40	8	48	9.8	497.5
	2021	45242	20	42	32	6	38	-18.0	491.2
	2019	56176	7	37	45	11	56	7.2	503.0
	2018	43501	11	40	40	9	49	-3.2	499.1
	2017	26659	11	37	44	8	52		499.2
4	2023	52554	10	37	43	10	54	4.0	501.1
	2022	53577	10	40	43	7	50	10.9	498.8
	2021	45553	17	44	34	4	39	-17.8	491.7
	2019	57629	6	37	47	10	57	7.7	503.0
	2018	69779	11	40	42	7	49	-1.9	498.0
	2017	64473	10	39	44	6	51		498.7
5	2023	54159	7	45	42	6	48	5.7	499.3
	2022	55635	10	48	38	5	42	3.1	496.5
	2021	46011	13	47	35	5	39	-15.5	493.5
	2019	60444	5	40	48	6	55	8.0	501.7
	2018	70083	9	45	42	5	47	-2.7	497.7
	2017	29285	8	42	42	8	49		499.4
6	2023	56389	11	42	40	8	47	-0.3	498.1
	2022	56939	9	43	42	6	48	8.9	498.2
	2021	46699	16	45	34	5	39	-18.9	493.4
	2019	61719	6	37	46	12	58	9.6	504.0
	2018	54582	9	43	42	6	48	-4.2	498.4
	2017	29704	9	39	46	6	52		499.7
7	2023	57234	16	41	35	9	44	1.7	496.1
	2022	59311	13	45	34	8	42	2.7	495.5
	2021	46839	13	48	32	7	39	-13.4	494.9
	2019	62495	9	39	41	12	53	5.3	501.0
	2018	66925	12	40	40	8	47	-0.9	497.7
	2017	30144	9	43	40	8	48		498.9
8	2023	59572	14	43	34	9	43	2.3	496.4
	2022	62311	12	48	32	8	40	4.4	495.8
	2021	47150	16	48	32	4	36	-15.1	492.0
	2019	62817	8	41	40	11	51	0.4	501.5
	2018	70044	11	39	42	8	51	1.1	498.9
	2017	66077	9	42	40	9	49		500.3
10	2023	63574	5	41	43	11	54	0.3	502.7
	2022	61296	7	39	41	12	54	-1.4	503.0
	2021	57770	9	36	43	12	55	-7.4	502.2
	2019	64481	6	32	48	14	63		506.9

Table 1.1.4

Percentage of Students by Achievement Levels Categories

Introductory Physics

Grade	Year	Count	NM	PM	ME	EE	ME+EE	Delta	Ave. SS
10	2023	12822	9	36	38	17	55	3.5	504.4
	2022	12837	8	40	39	13	52		502.0

Table 1.1.5

Percentage of Students by Achievement Levels Categories

Science

Grade	Year	Count	NM	PM	ME	EE	ME+EE	Delta	Ave. SS
5	2023	54162	11	40	39	10	49	0.3	499.1
	2022	56846	12	39	40	8	48	-0.1	498.5
	2021	45455	12	39	41	8	49	-6.8	498.2
	2019	60476	7	38	45	10	55		502.5
8	2023	59527	13	41	39	7	46	0.2	496.7
	2022	62926	13	41	39	6	46	0.6	496.3
	2021	46950	11	44	36	9	45	-5.3	497.6
	2019	62933	8	41	41	9	50		500.5

Section 1.2

Raw Scores Associated with Cutpoints

Table 1.2.1

Raw Scores Associated with Cutpoints

Subject	Grade	Cut Point	2022 Actual	2023 Actual	2023 Pred
Biology	10	NM–PM	17	17	17
		PM–ME	34	34	35
		ME–EE	50	51	51
English Language Arts	3	NM–PM	14	13	11
		PM–ME	28	28	26
		ME–EE	37	38	37
English Language Arts	4	NM–PM	15	16	14
		PM–ME	29	29	29
		ME–EE	39	38	39
English Language Arts	5	NM–PM	16	17	14
		PM–ME	33	32	31
		ME–EE	43	42	42
English Language Arts	6	NM–PM	19	19	17
		PM–ME	32	31	30
		ME–EE	42	41	41
English Language Arts	7	NM–PM	18	16	15
		PM–ME	32	31	31
		ME–EE	44	43	44
English Language Arts	8	NM–PM	22	22	19
		PM–ME	36	34	33
		ME–EE	45	43	44
English Language Arts	10	NM–PM	19	20	17
		PM–ME	37	35	35
		ME–EE	47	45	46
Mathematics	3	NM–PM	14	14	13
		PM–ME	30	32	31
		ME–EE	43	44	43
Mathematics	4	NM–PM	14	16	16
		PM–ME	33	34	35
		ME–EE	49	48	49
Mathematics	5	NM–PM	13	13	13
		PM–ME	33	32	32
		ME–EE	50	49	49
Mathematics	6	NM–PM	11	12	11
		PM–ME	28	30	29
		ME–EE	48	49	48
Mathematics	7	NM–PM	10	11	10
		PM–ME	25	27	26
		ME–EE	46	47	47
Mathematics	8	NM–PM	12	14	13
		PM–ME	32	32	32
		ME–EE	49	49	49
Mathematics	10	NM–PM	11	10	13
		PM–ME	30	30	32
		ME–EE	52	52	51
Introductory Physics	10	NM–PM	17	17	17
		PM–ME	35	32	34
		ME–EE	51	48	50
Science	5	NM–PM	19	18	18
		PM–ME	34	34	34
		ME–EE	45	45	45
Science	8	NM–PM	16	16	15
		PM–ME	31	31	31
		ME–EE	45	46	46

Section 1.3

Calibration Report

Calibration Report—Executive Summary

FlexMIRT 3.03 was used for the IRT calibration at Cognia. All command files were set up in a way following general settings. The calibration convergence criterion was set to 0.001.

A 3PLM was used for standard four-option selected-response (SR) items, a 2PLM was used for dichotomously-scored short response items, multi-select items, and technology-enhanced items, and a Graded Response Model (GRM) was specified for the polytomously-scored multi-part items and open response items. The logistic version of the IRT models was used. The prior distribution for the guessing parameter was set to be beta(5,17), and logNormal(0, 0.25) was used as the prior for the item discrimination parameter. No prior was supplied for the item difficulty parameter.

The calibration went smoothly and was converged in all subjects/grades. In particular, the largest change in parameter values (from one iteration to the next) was decreasing and tended to flatten out towards the end of the calibration process. The IRT model fit was evaluated for each of the items. The resulting parameters demonstrated good model fit for most of the items.

In ELA, a two-stage process was used to bring the item parameters onto the operational scale. First all items except the essays were freely calibrated. Next the items were placed onto scale using the Stocking and Lord procedure. These first two steps are referred to as Stage 1. Next, the essays were brought onto scale with a Fixed Common Item Parameter calibration using FlexMIRT while holding the parameters from Stage 1 fixed. This two-stage process is used to assure that the essay parameter estimation process does not unduly influence the dimensional structure of the initial parameter estimation in Stage 1, providing for greater scale stability.

The first table in this section shows the number of cycles to achieve convergence in Stage 1 of the ELA procedure:

Table 1.3.1.a
Number of Cycles to Convergence for ELA Calibration with no Essays

Subject	Grade	Initial Cycles
English Language Arts	Grade 3	30
English Language Arts	Grade 4	27
English Language Arts	Grade 5	43
English Language Arts	Grade 6	26
English Language Arts	Grade 7	21
English Language Arts	Grade 8	119
English Language Arts	Grade 10	43

The Stocking and Lord procedure was used to transform non-essay parameter estimates onto the operational scale. These transformation constants were found using the STUIRT program which can be found at the CASMA website: http://www.education.uiowa.edu/casma/. The Stocking & Lord transformation constants that were calculated in the second step of Stage 1 are listed in the following table:

Table 1.3.1.b

Stocking and Lord Constants for ELA Equating with no Essays

Subject	Grade	Slope	Intercept	Num Eq Items	Num Eq Items Rem
English Language Arts	3	1.14	-0.21	18	0
English Language Arts	4	1.07	-0.26	18	0
English Language Arts	5	1.14	-0.21	16	0
English Language Arts	6	1.44	-0.36	16	0
English Language Arts	7	1.22	-0.30	16	0
English Language Arts	8	1.41	-0.21	16	0
English Language Arts	10	1.16	-0.17	16	0

The third table shows the number of cycles to achieve convergence in the equating (FCIP) calibration runs for Stage 2:

Table 1.3.1.c

Number of Cycles to Convergence for ELA FCIP Calibration with Essays Included

Subject	Grade	Initial Cycles	Equating Cycles
English Language Arts	Grade 3	28	8
English Language Arts	Grade 4	22	7
English Language Arts	Grade 5	44	8
English Language Arts	Grade 6	17	12
English Language Arts	Grade 7	20	9
English Language Arts	Grade 8	42	12
English Language Arts	Grade 10	48	11

The Math and Science tests were equated using a single stage procedure of freely calibrating all items and placing them on the operational scale using the Stocking and Lord procedure. The next table in this section lists the number of cycles to achieve convergence, followed by a table of the Stocking and Lord transformation constants.

Table 1.3.1.d

Number of Cycles to Convergence for Math and Science

Subject	Grade	Initial Cycles
Biology	Grade 10	23
Mathematics	Grade 3	66
Mathematics	Grade 4	71
Mathematics	Grade 5	50
Mathematics	Grade 6	43
Mathematics	Grade 7	80
Mathematics	Grade 8	33
Mathematics	Grade 10	55
Introductory Physics	Grade 10	66
Science	Grade 5	50
Science	Grade 8	47

Table 1.3.1.e

Stocking and Lord Constants for Math and Science

Subject	Grade	Slope	Intercept	Num Eq Items	Num Eq Items Rem
Biology	10	0.84	0.26	22	0
Mathematics	3	1.08	-0.03	20	0
Mathematics	4	1.03	0.10	20	0
Mathematics	5	1.01	-0.02	20	0
Mathematics	6	1.03	-0.11	20	0
Mathematics	7	1.11	-0.14	20	0
Mathematics	8	1.10	-0.19	20	0
Mathematics	10	0.97	-0.18	21	0
Introductory Physics	10	0.94	0.29	22	0
Science	5	1.11	-0.17	20	0
Science	8	1.06	-0.17	20	1

Four methods of evaluating the suitability of the equating items were used: delta analysis, b/b analysis, beta analysis, and rescore analysis. As a result of all four analyses, flagged items were reviewed by content personnel and no items were removed from the equating analysis. Results from these analyses are included in Section II of this report.

Items flagged by the delta, b/b, beta, or rescore analyses, or any item that required intervention during the calibration process, were compiled and placed in our item watch list, which includes the final actions taken on these items. The final watch list is presented in the following table:

Table 1.3.2

Final Items Watch List

Subject	Grade	ItemID	Reason	Action
Biology	10	IA10684 (SC723337422)	beta analysis	retained for equating
Biology	10	IA10989 (SC910635381)	beta analysis	retained for equating
Biology	10	IA11033 (SC914353987)	beta analysis	retained for equating
Biology	10	IA11054 (SC921067241)	beta analysis	retained for equating
English Language Arts	3	IA00286 (EL308842)	beta analysis	retained for equating
English Language Arts	4	IA00289 (EL309792)	beta analysis	retained for equating
English Language Arts	8	IA00063 (EL290814)	beta analysis	retained for equating
Mathematics	4	IA00961 (MA307081)	beta analysis	retained for equating
Mathematics	4	IA01093 (MA623879088)	beta analysis	retained for equating
Mathematics	5	IA00936 (MA306420)	beta analysis	retained for equating
Mathematics	8	IA00865 (MA297656)	beta analysis	retained for equating
Mathematics	8	IA02495 (MA309741)	beta analysis	retained for equating
Mathematics	8	IA05070 (MA804042487)	beta analysis	retained for equating
Introductory Physics	10	IA10704 (SC800964236)	beta analysis	retained for equating
Introductory Physics	10	IA10936 (SC906662706)	beta analysis	retained for equating
Science	5	IA05657 (SC803732869)	beta analysis	retained for equating
Science	5	IA05702 (SC806382697)	beta analysis	retained for equating
Science	8	IA05245 (SC290144)	beta analysis	removed from equating
Science	8	IA05690 (SC804367702)	beta analysis	retained for equating

Section 1.4

Equating Item Summary Statistics

Table 1.4.1

Equating Item Summary Statistics

(2023 a and b values are unscaled parameters before equating for all tests)

			P-Value		Point Biserial		a		b	
Subject	Grade	Year	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Biology	10	2023	0.59	0.16	0.47	0.12	0.94	0.27	-0.21	0.80
		Previous	0.57	0.14	0.47	0.12	1.07	0.29	0.05	0.65
English Language Arts	03	2023	0.58	0.13	0.50	0.09	1.09	0.34	-0.02	0.52
		Previous	0.58	0.13	0.49	0.09	1.00	0.36	-0.19	0.56
English Language Arts	04	2023	0.64	0.16	0.43	0.09	0.86	0.19	-0.29	0.81
		Previous	0.63	0.16	0.41	0.09	0.80	0.20	-0.63	0.85
English Language Arts	05	2023	0.69	0.14	0.40	0.07	0.86	0.27	-0.50	0.66
		Previous	0.68	0.14	0.40	0.08	0.76	0.26	-0.79	0.75
English Language Arts	06	2023	0.68	0.11	0.41	0.09	0.86	0.22	-0.42	0.67
		Previous	0.68	0.11	0.41	0.08	0.60	0.15	-0.97	0.99
English Language Arts	07	2023	0.71	0.11	0.42	0.08	0.86	0.21	-0.68	0.65
		Previous	0.70	0.11	0.43	0.08	0.70	0.19	-1.17	0.79
English Language Arts	08	2023	0.64	0.13	0.41	0.08	0.89	0.28	-0.29	0.62
		Previous	0.64	0.12	0.40	0.08	0.62	0.20	-0.58	0.79
English Language Arts	10	2023	0.71	0.10	0.45	0.06	0.90	0.24	-0.76	0.63
		Previous	0.71	0.10	0.43	0.06	0.79	0.20	-1.02	0.68
Mathematics	03	2023	0.65	0.16	0.48	0.11	1.02	0.21	-0.44	0.84
		Previous	0.63	0.16	0.49	0.10	0.91	0.20	-0.50	0.87
Mathematics	04	2023	0.62	0.16	0.51	0.11	1.02	0.27	-0.32	0.61
		Previous	0.59	0.17	0.50	0.11	0.99	0.29	-0.22	0.71
Mathematics	05	2023	0.61	0.19	0.48	0.12	1.01	0.27	-0.32	0.84
		Previous	0.58	0.18	0.48	0.11	0.98	0.29	-0.33	0.81
Mathematics	06	2023	0.56	0.16	0.47	0.14	1.04	0.34	-0.04	0.87
		Previous	0.56	0.16	0.46	0.14	1.03	0.33	-0.11	0.90
Mathematics	07	2023	0.56	0.19	0.53	0.13	1.20	0.32	-0.13	0.72
		Previous	0.56	0.19	0.52	0.13	1.10	0.29	-0.27	0.79
Mathematics	08	2023	0.56	0.14	0.51	0.12	1.21	0.37	0.00	0.59
		Previous	0.56	0.14	0.49	0.12	1.16	0.39	-0.16	0.64

Table 1.4.1 (continued)

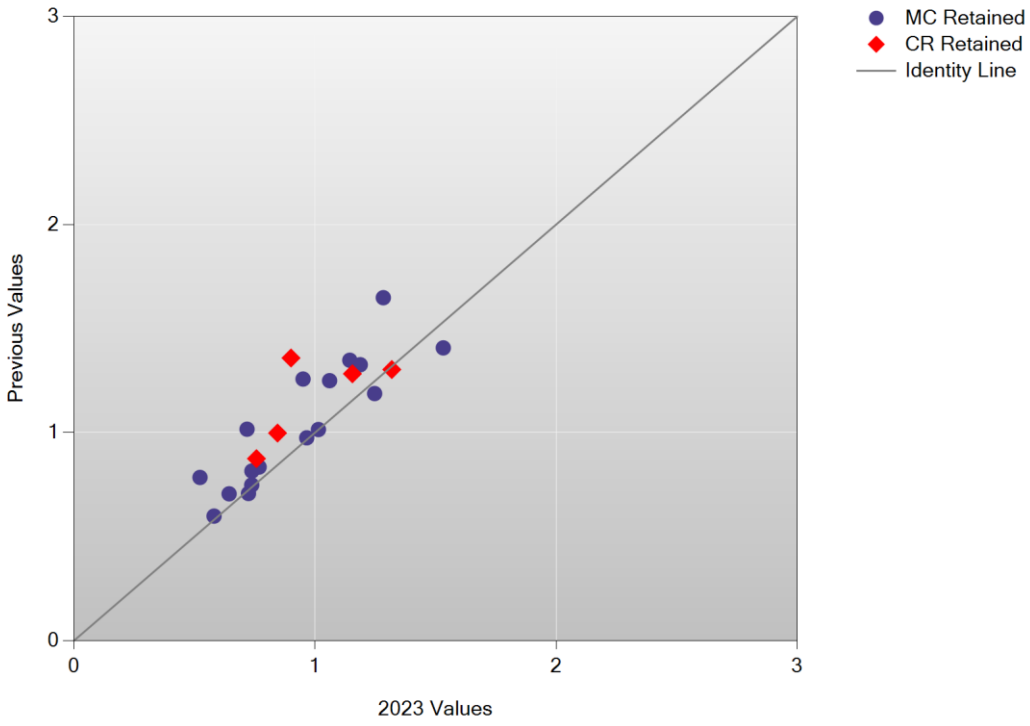
Equating Item Summary Statistics

			P-Value		Point Biserial		a		b	
Subject	Grade	Year	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Mathematics	10	2023	0.45	0.16	0.45	0.16	1.11	0.45	0.51	0.84
		Previous	0.45	0.16	0.47	0.16	1.11	0.45	0.29	0.80
Introductory Physics	10	2023	0.60	0.14	0.49	0.12	1.01	0.36	-0.29	0.66
		Previous	0.58	0.14	0.49	0.11	1.07	0.38	-0.03	0.61
Science	05	2023	0.64	0.19	0.43	0.10	0.83	0.25	-0.46	0.96
		Previous	0.63	0.19	0.43	0.09	0.72	0.18	-0.67	1.09
Science	08	2023	0.55	0.17	0.42	0.14	0.84	0.34	-0.10	0.97
		Previous	0.56	0.18	0.43	0.13	0.84	0.36	-0.29	1.04

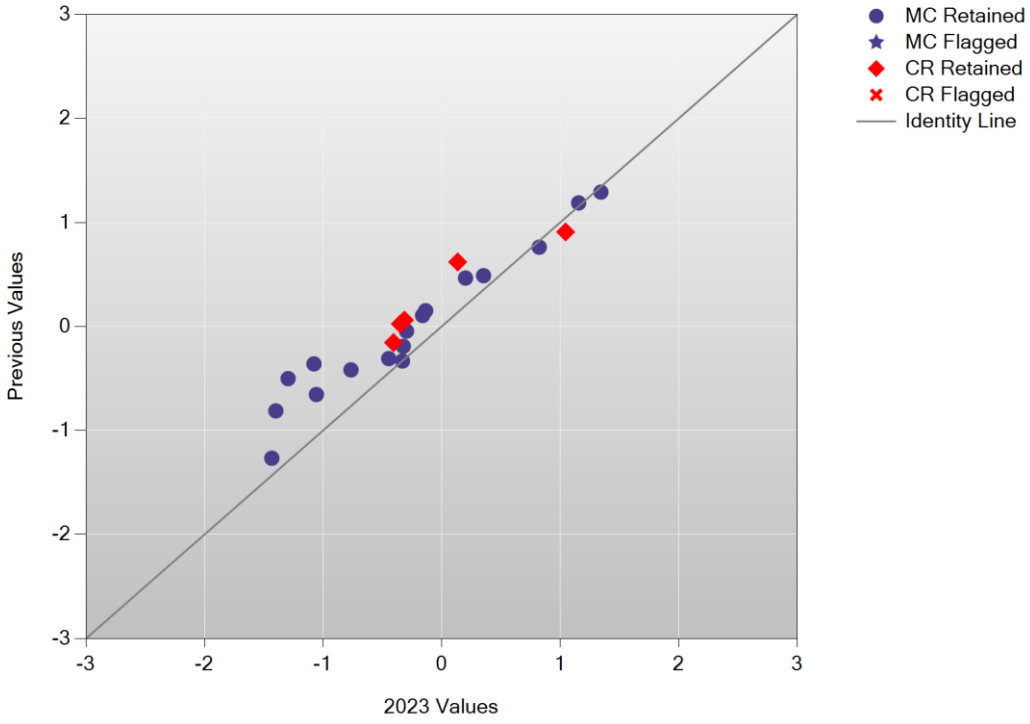
Section 2.1

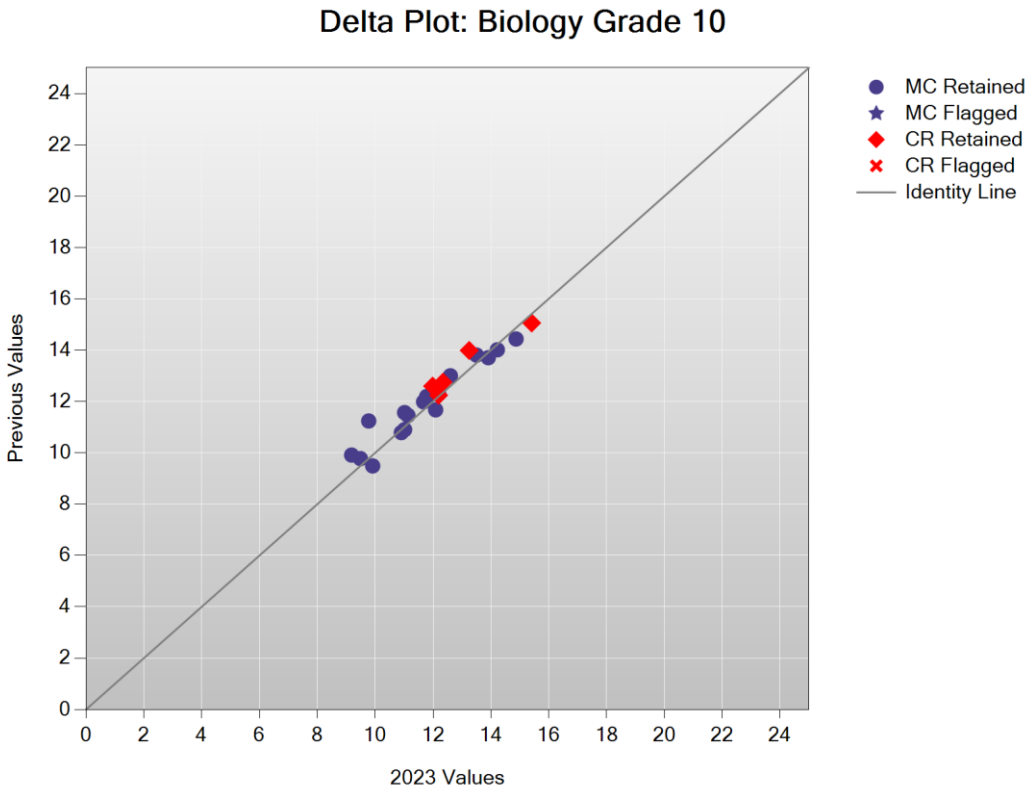
A/A, B/B, Delta, Test Characteristic Curve, Test Information Function, and Cumulative Scale Score Distribution Plots

A/A Plot: Biology Grade 10



B/B Plot: Biology Grade 10




Delta Plot: Biology Grade 10
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
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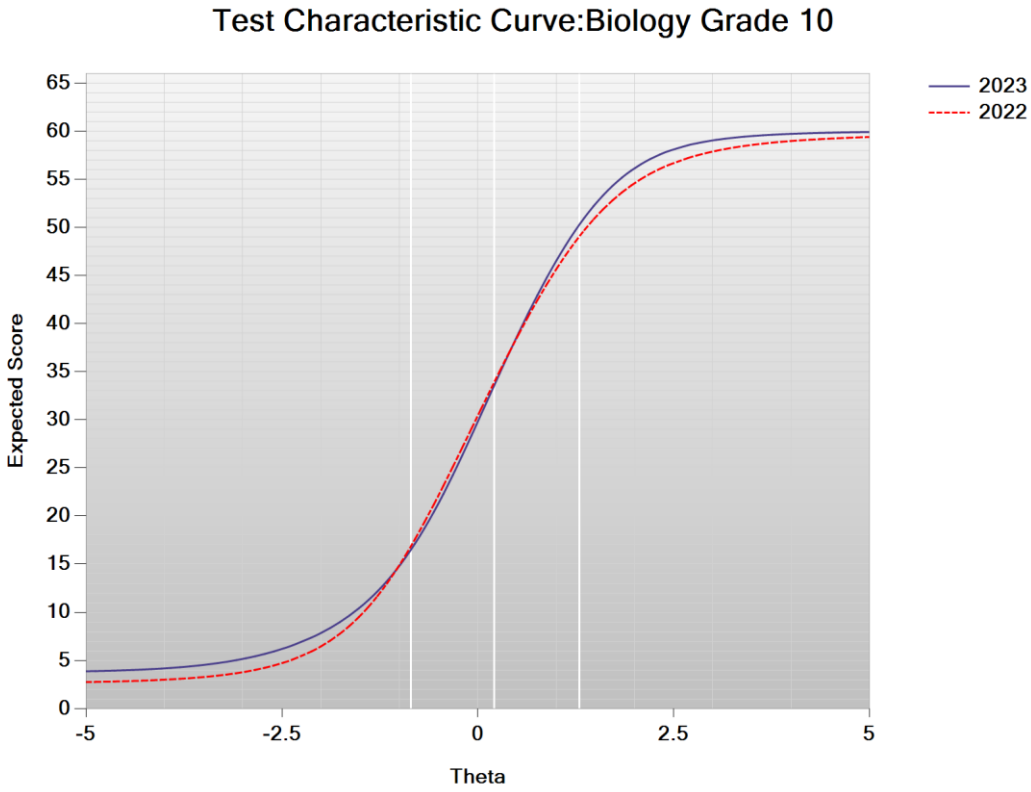
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve:Biology Grade 10
2023
2022
Expected Score
Theta
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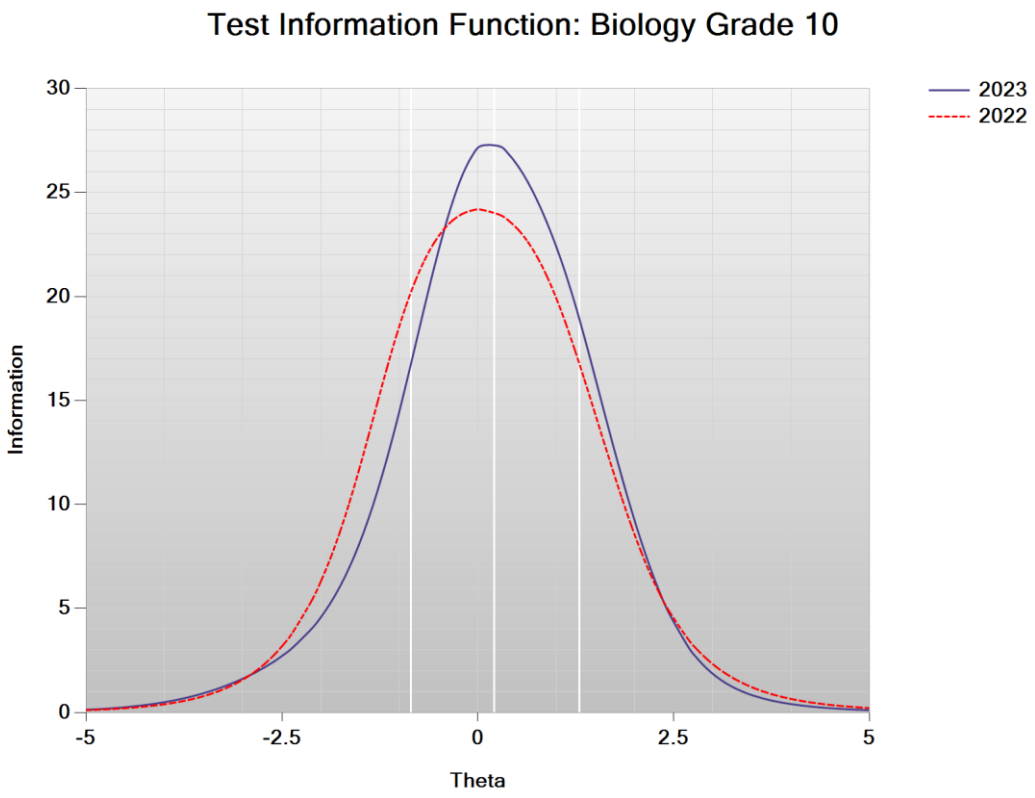
5
10
15
20
25
30
35
40
45
50
55
60
65
-5
-2.5
0
2.5
5


Test Information Function: Biology Grade 10
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2022
Information
Theta
30
25
20
15
10
5
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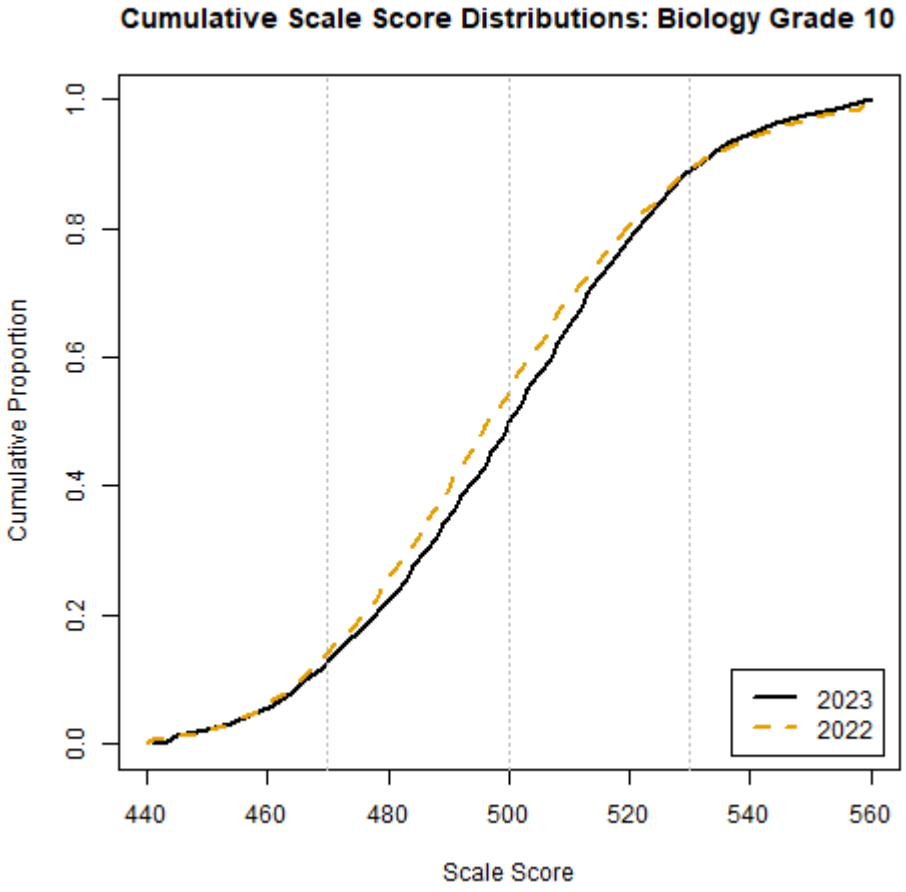
-5
-2.5
0
2.5
5


Cumulative Scale Score Distributions: Biology Grade 10
Cumulative Proportion
Scale Score
2023
2022
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0.2
0.4
0.6
0.8
1.0
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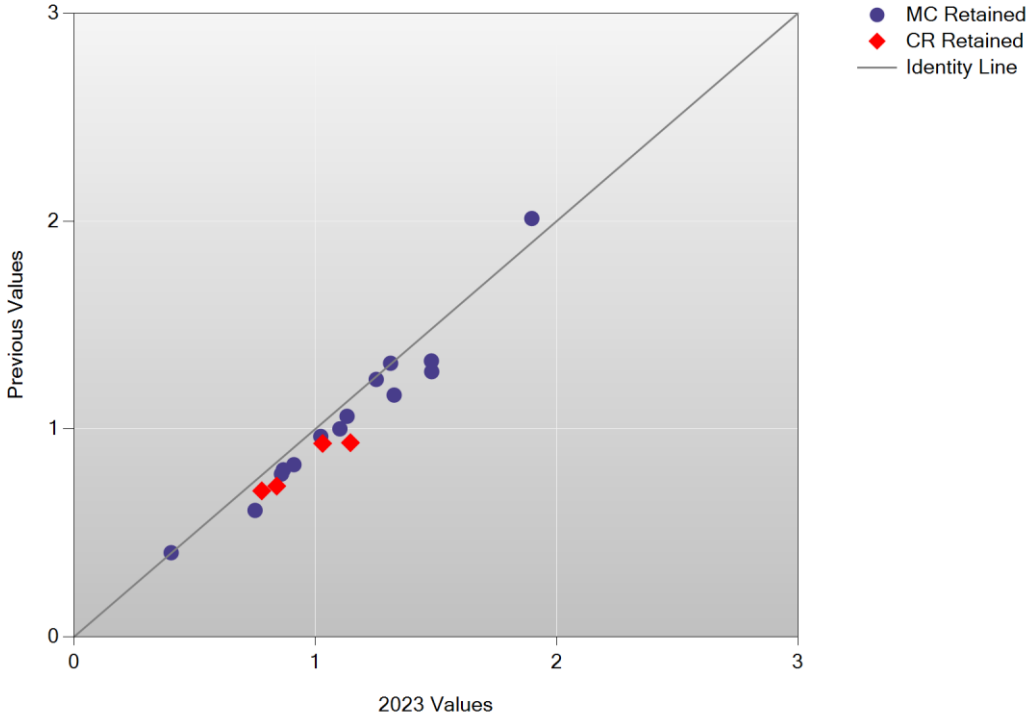
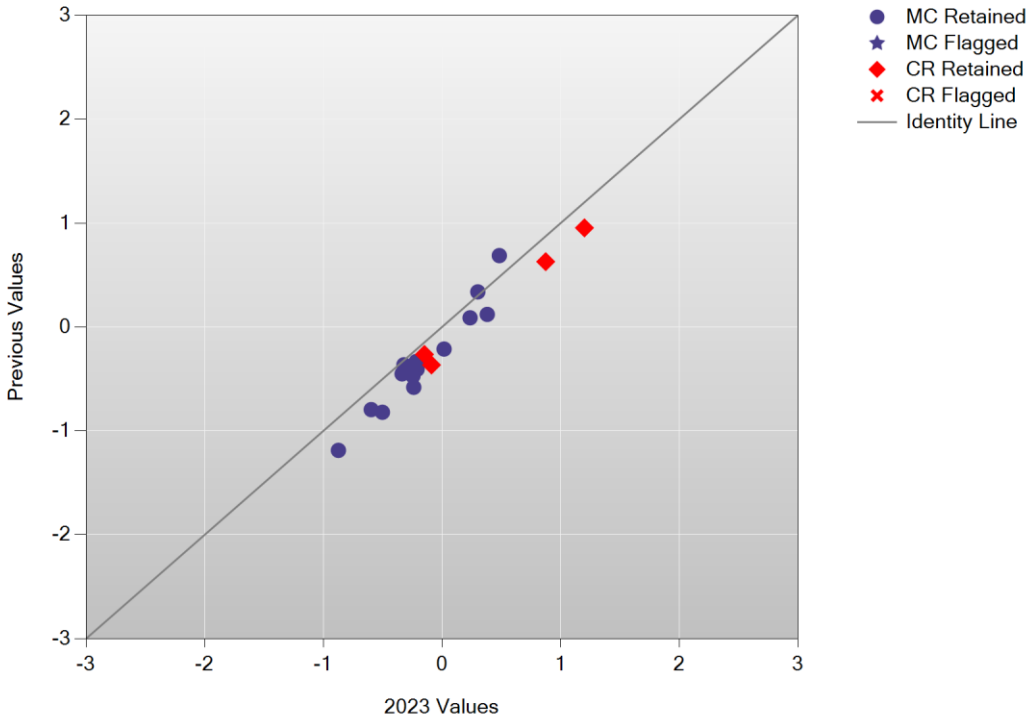
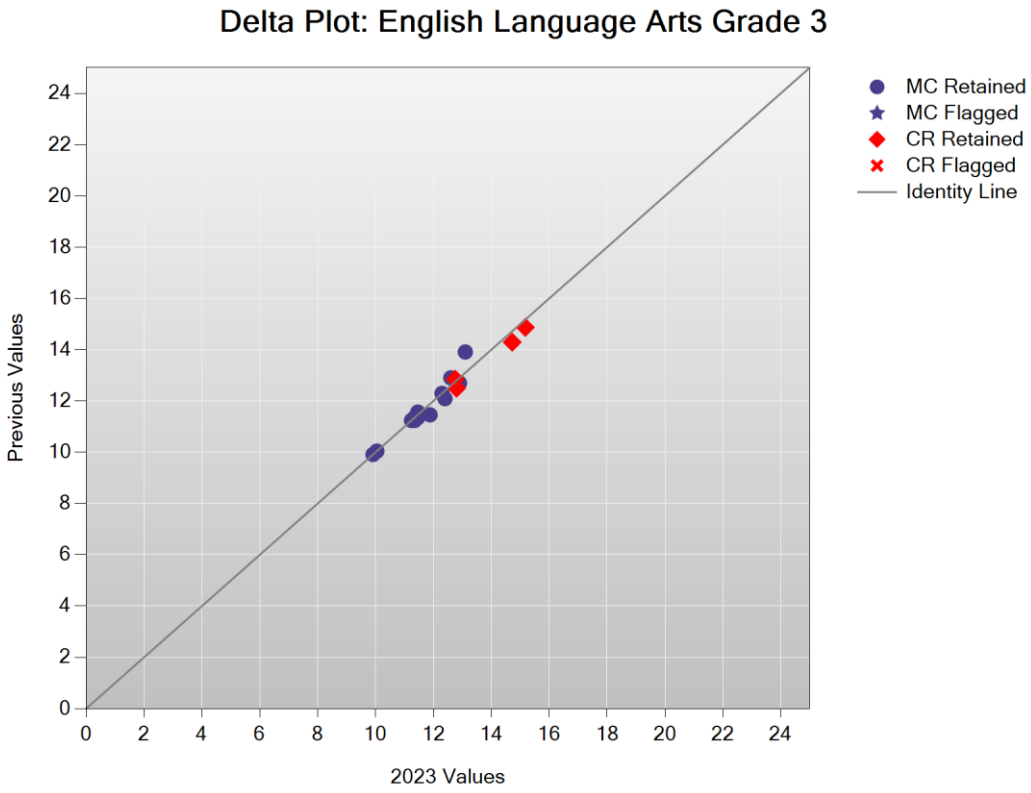
460
480
500
520
540
560

A/A Plot: English Language Arts Grade 3



B/B Plot: English Language Arts Grade 3




Delta Plot: English Language Arts Grade 3
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
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2023 Values
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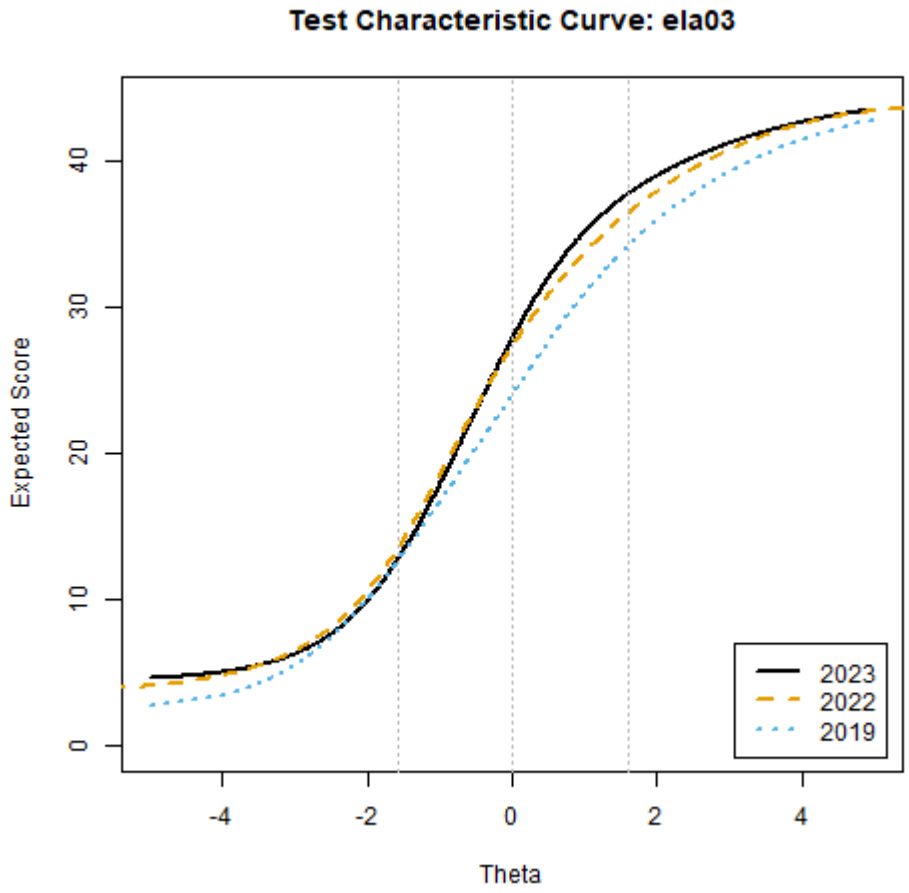
14
16
18
20
22
24


Test Characteristic Curve: ela03
Expected Score
Theta
2023
2022
2019
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20
30
40
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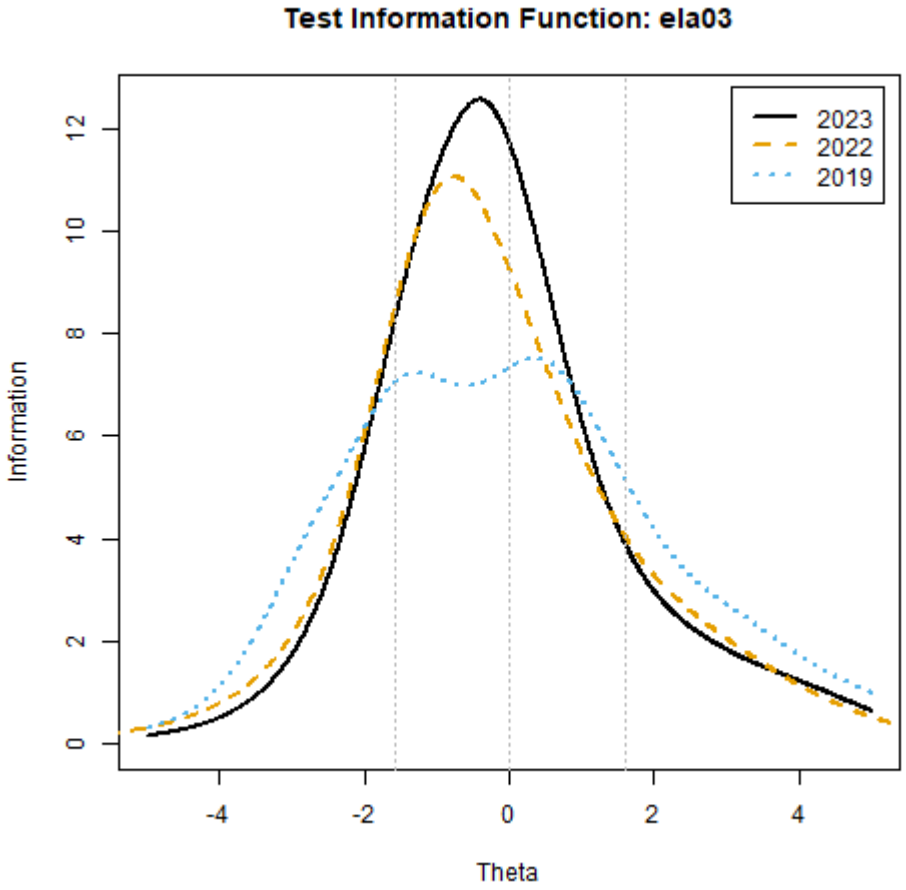
0
2
4


Test Information Function: ela03
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2022
2019
Information
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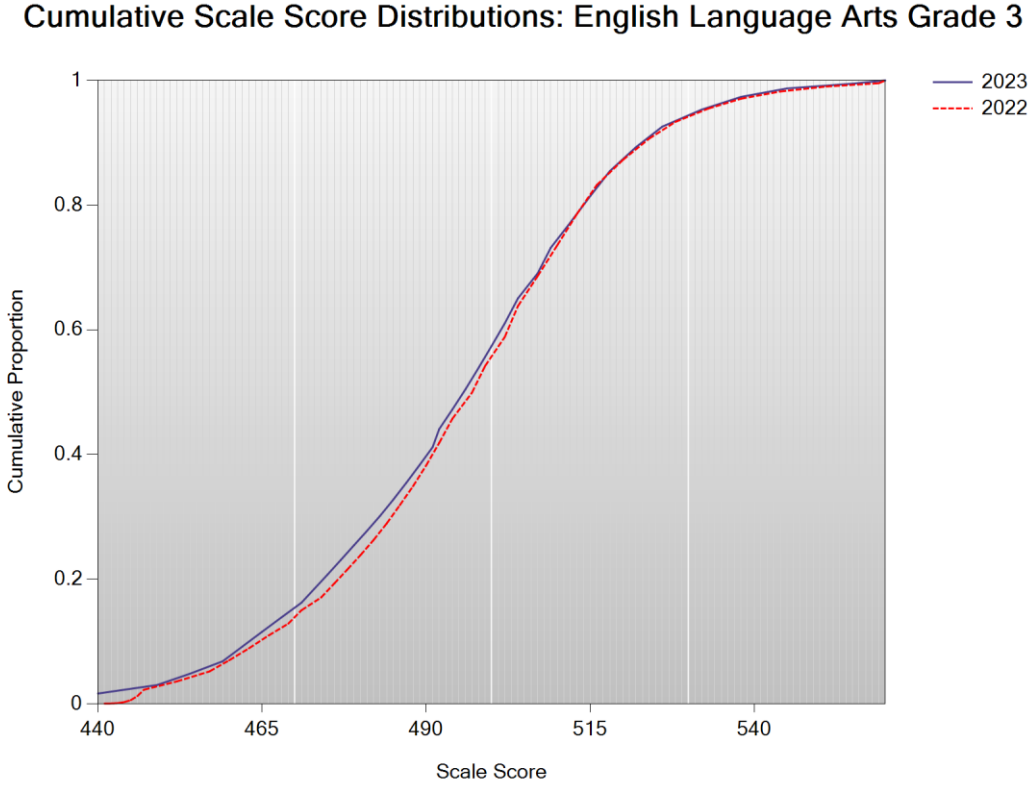
4
6
8
10
12
-4
-2
0
2
4
Theta


Cumulative Scale Score Distributions: English Language Arts Grade 3
2023
2022
Cumulative Proportion
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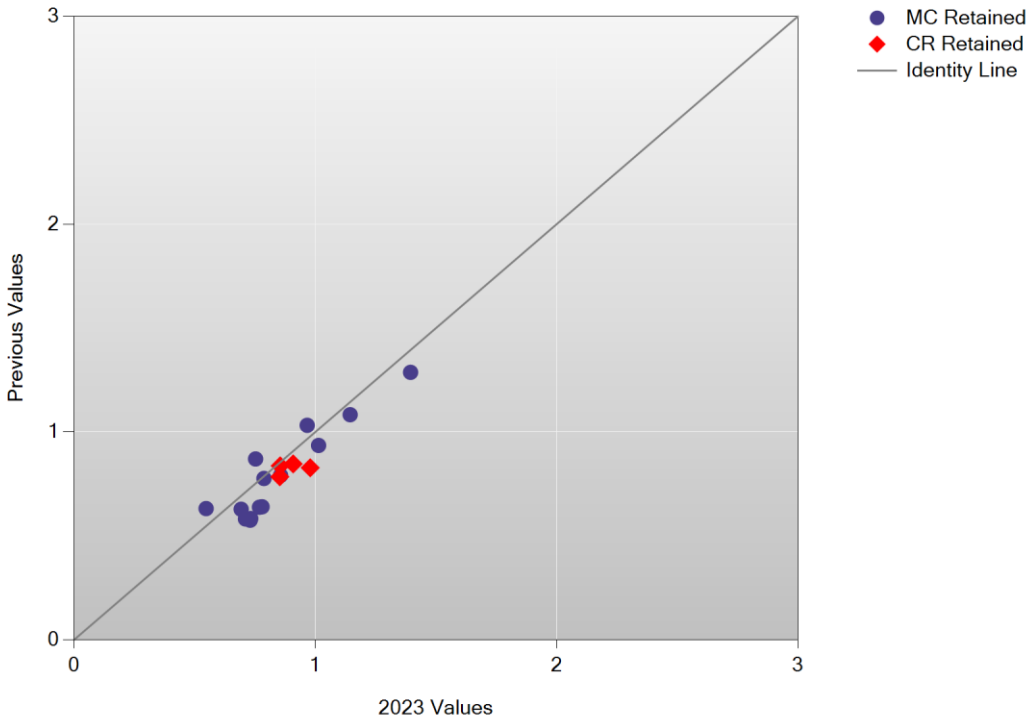
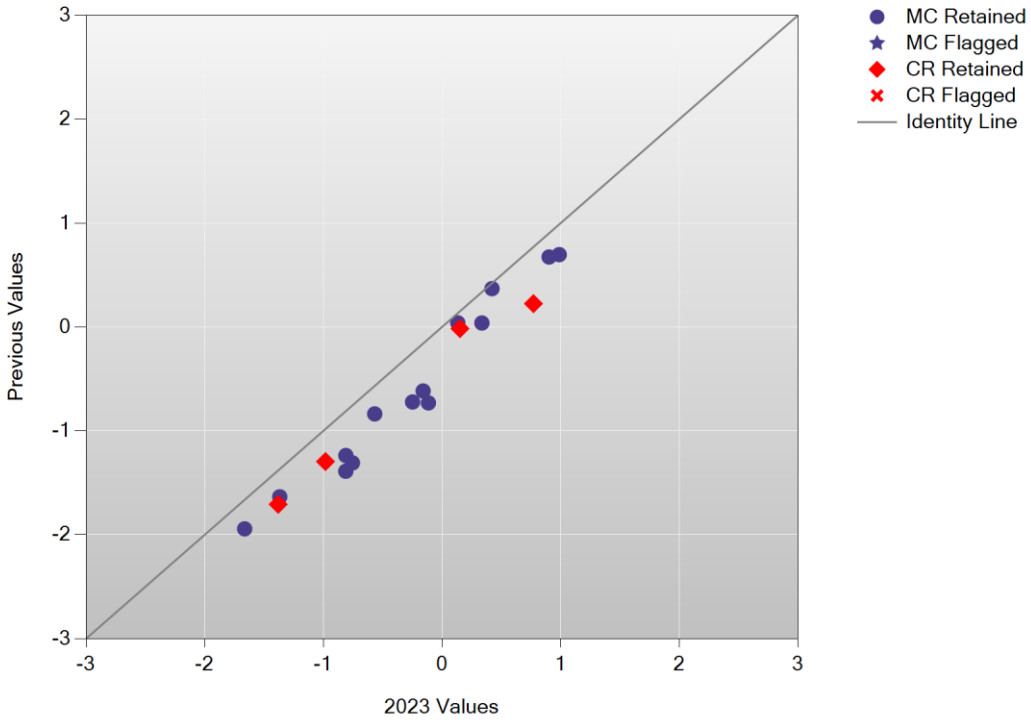
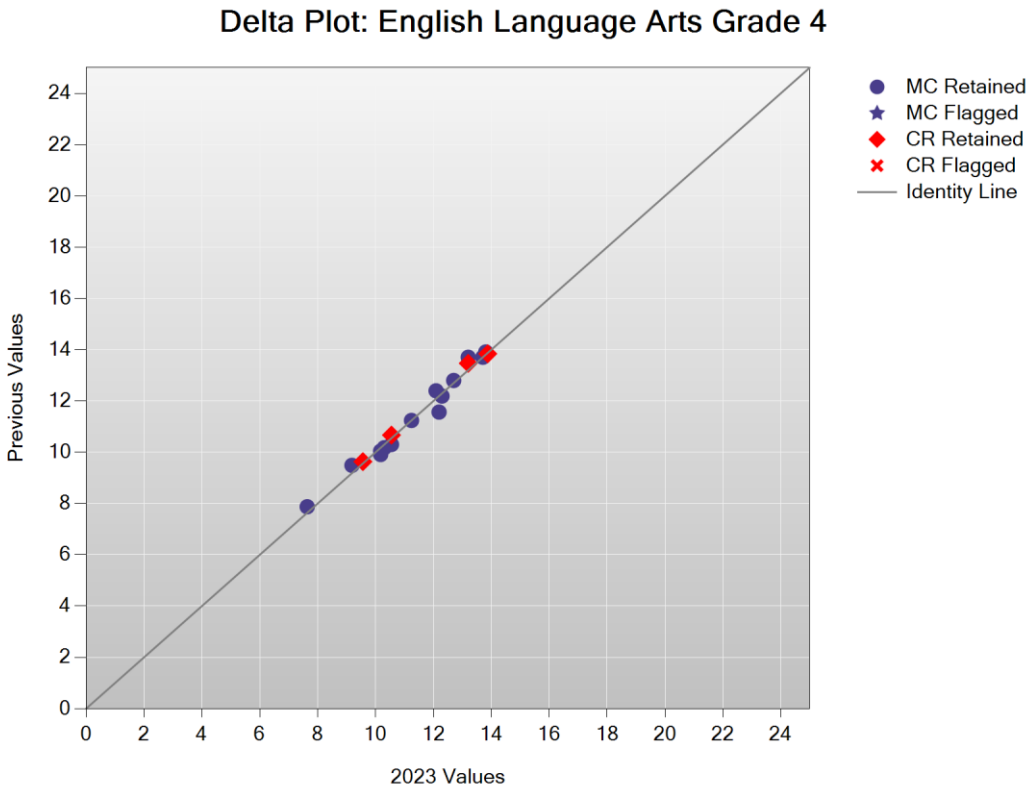
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

A/A Plot: English Language Arts Grade 4



B/B Plot: English Language Arts Grade 4




Delta Plot: English Language Arts Grade 4
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
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2
4
6
8
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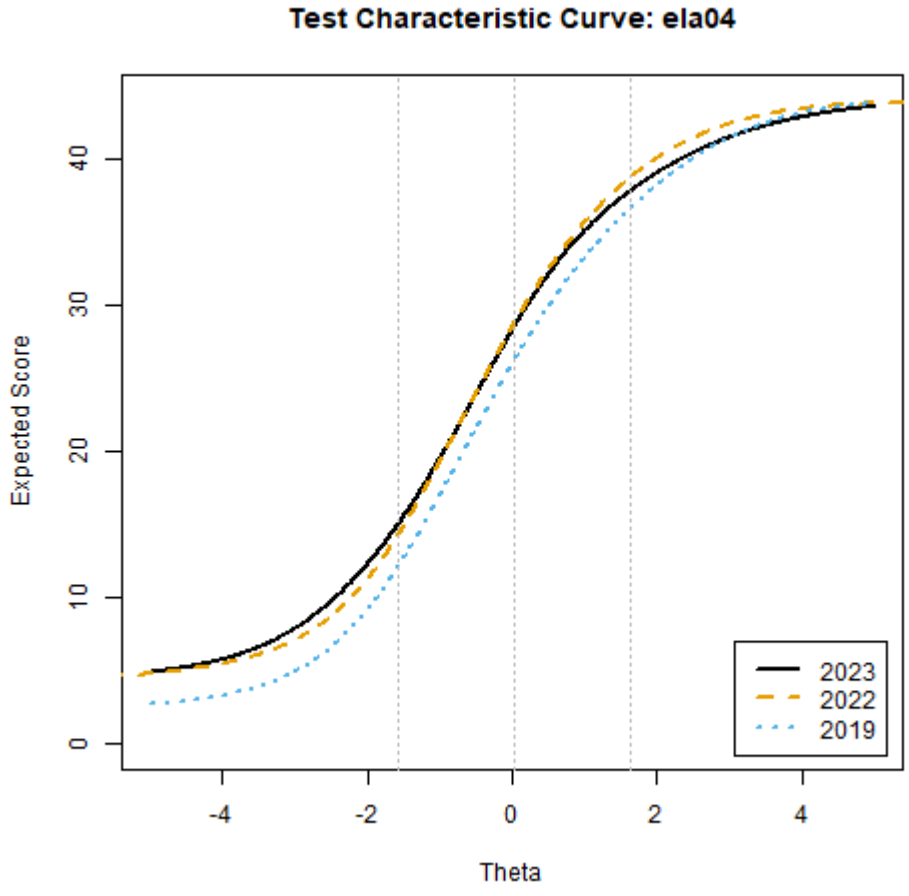
14
16
18
20
22
24


Test Characteristic Curve: ela04
Expected Score
Theta
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2022
2019
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10
20
30
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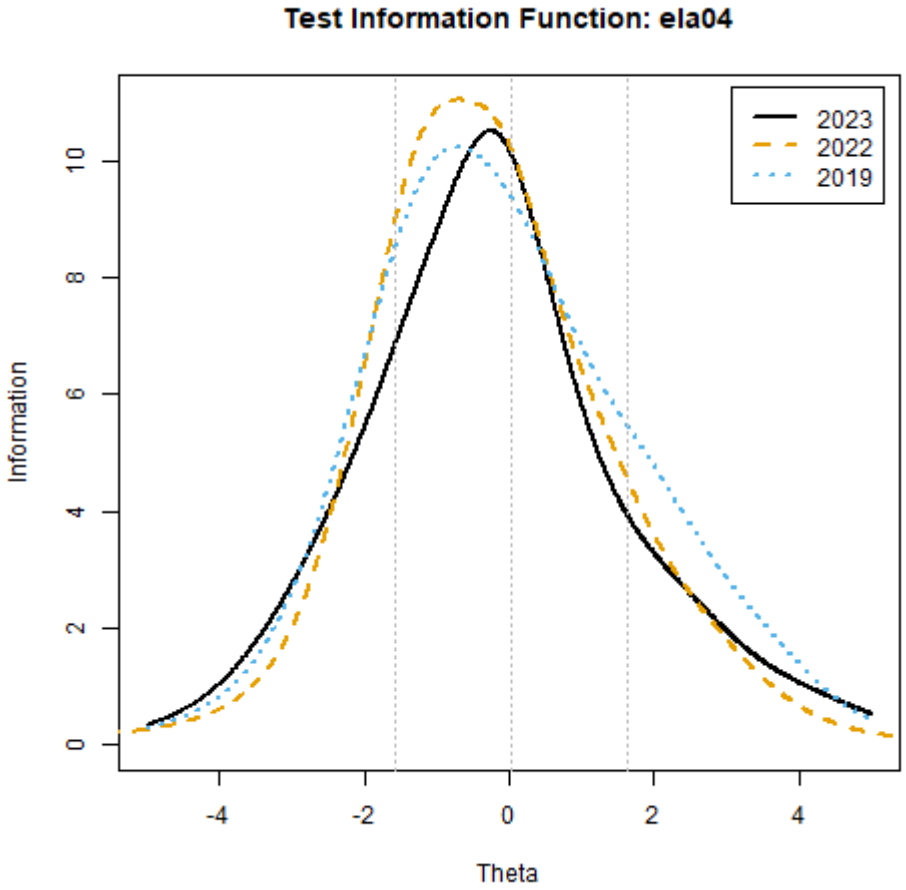
-2
0
2
4


Test Information Function: ela04
2023
2022
2019
Information
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2
4
6
8
10
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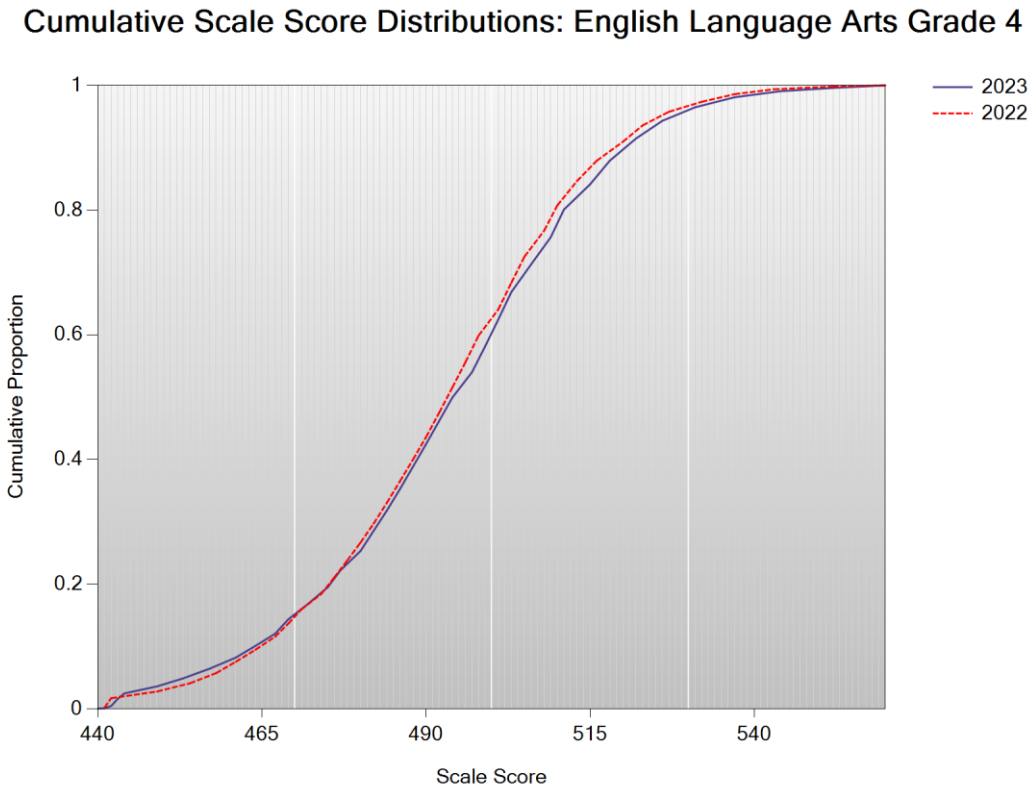
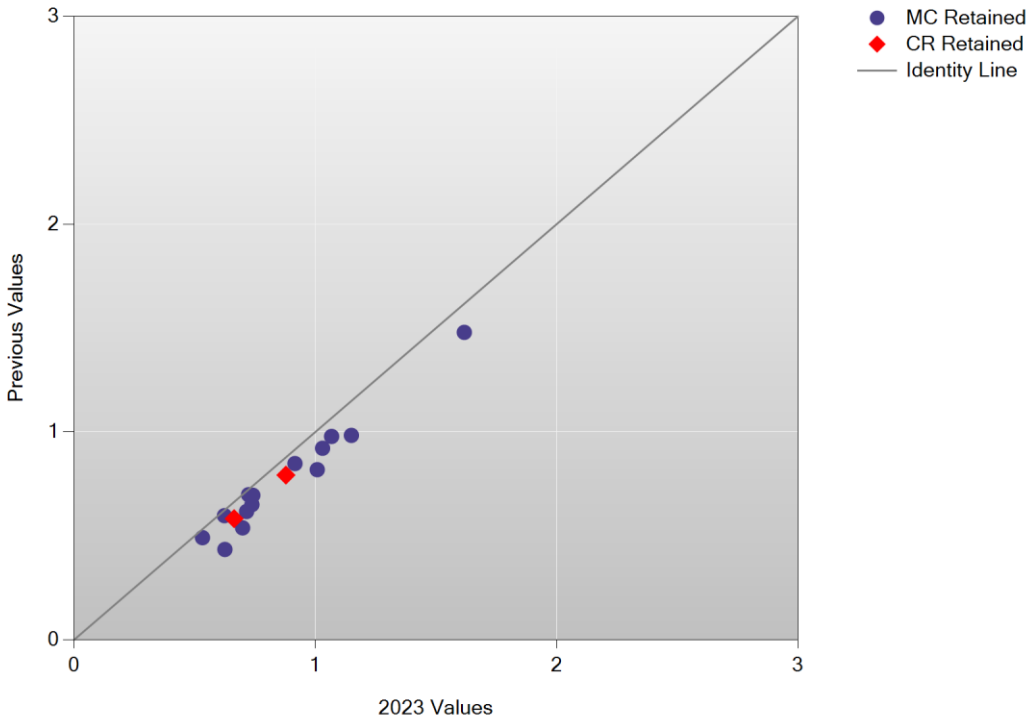
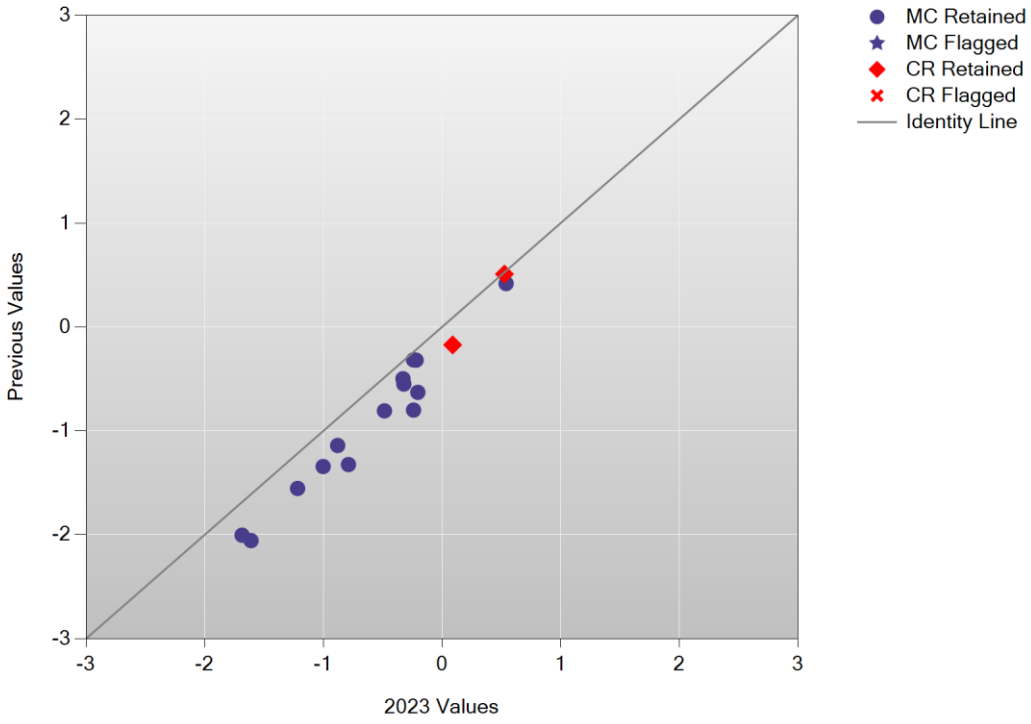
-2
0
2
4
Theta

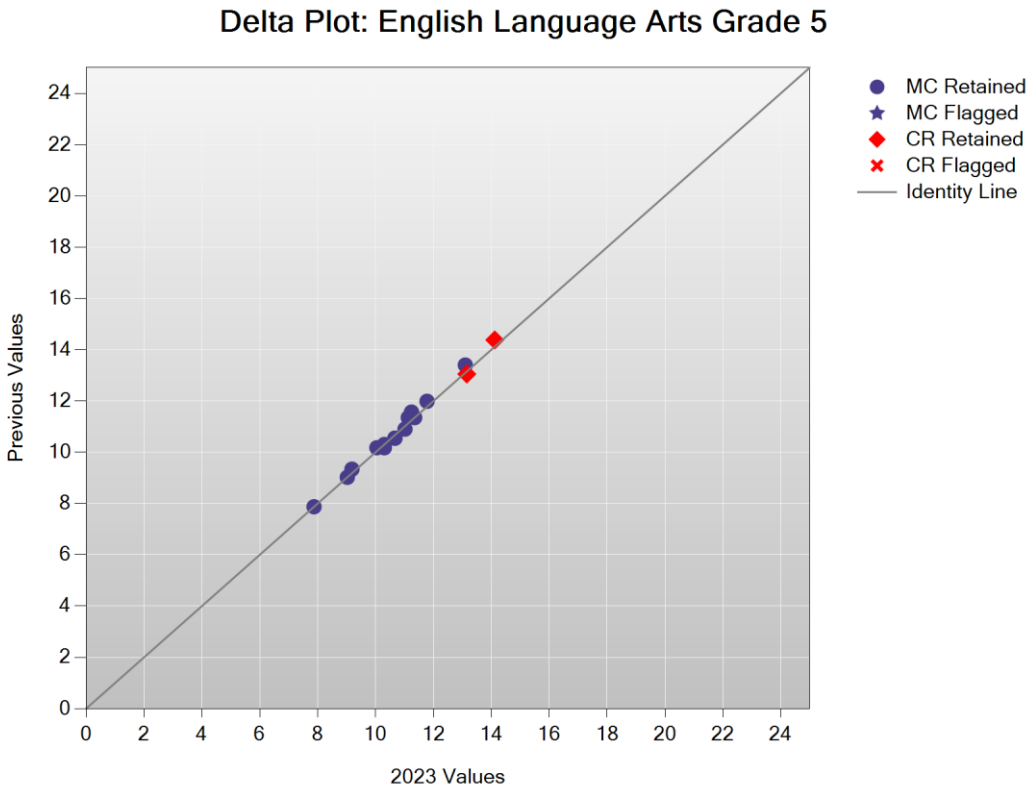

Cumulative Scale Score Distributions: English Language Arts Grade 4
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

A/A Plot: English Language Arts Grade 5



B/B Plot: English Language Arts Grade 5




Delta Plot: English Language Arts Grade 5
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
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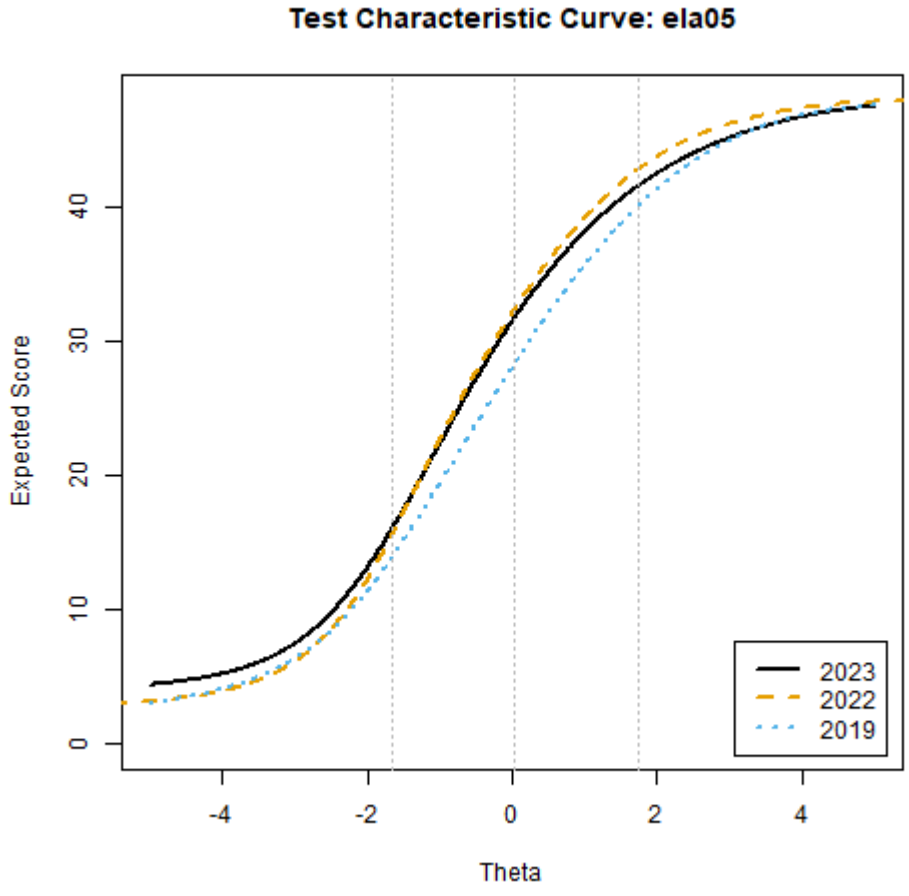
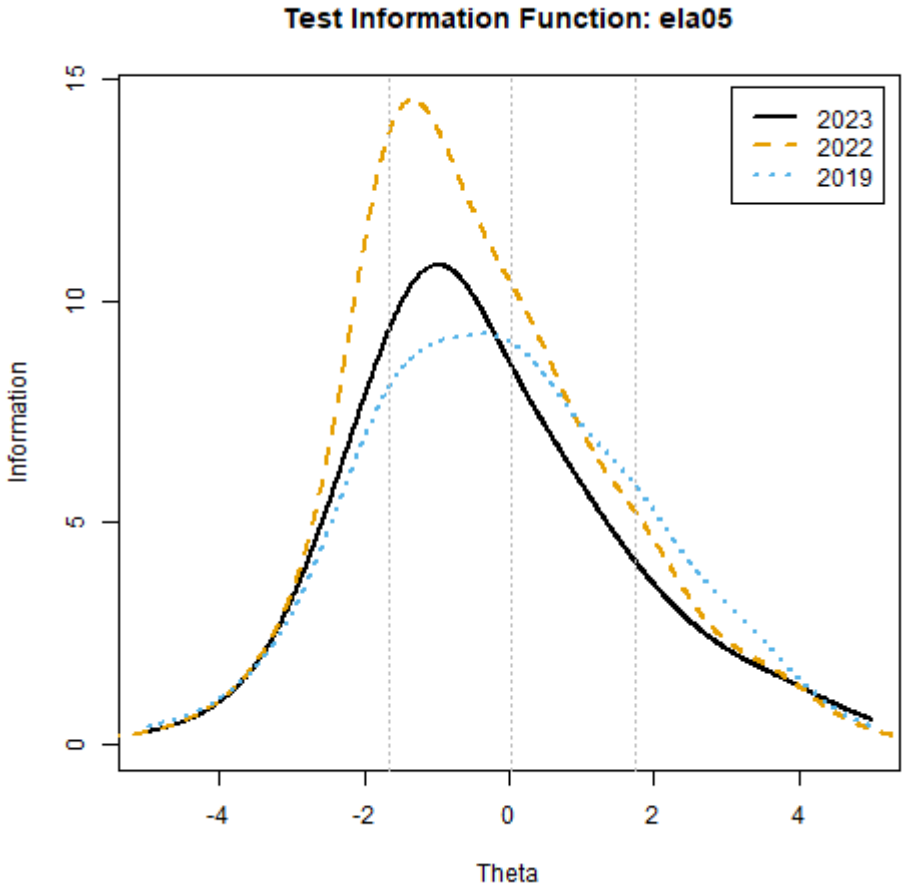
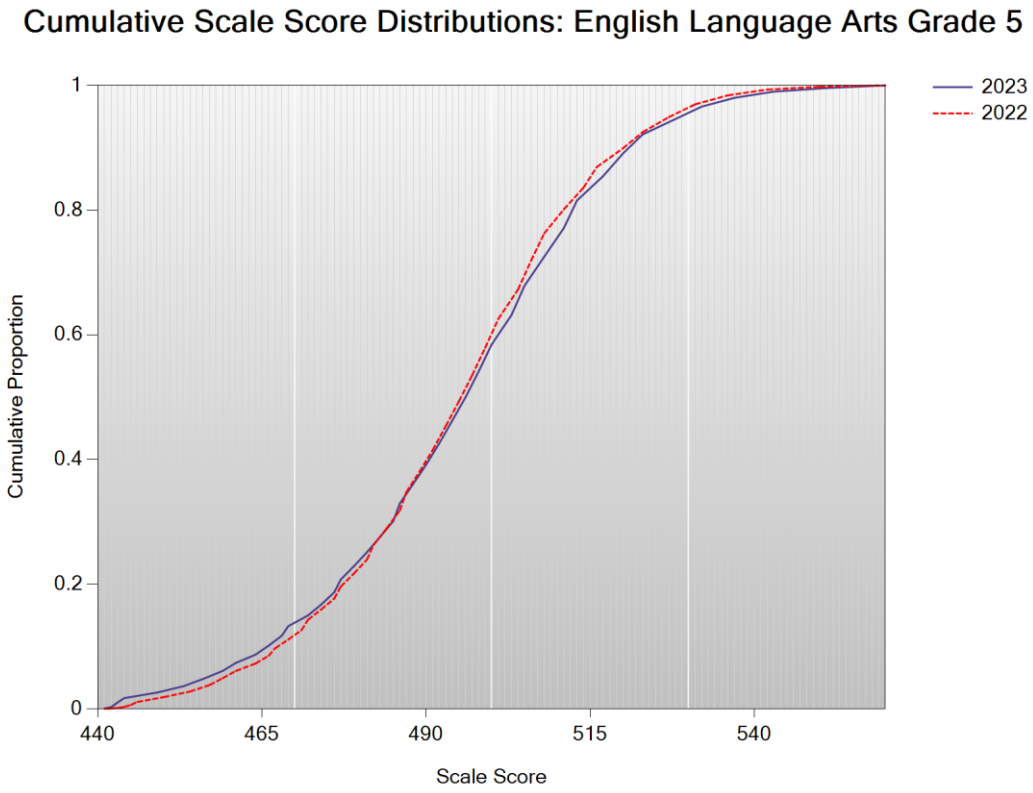
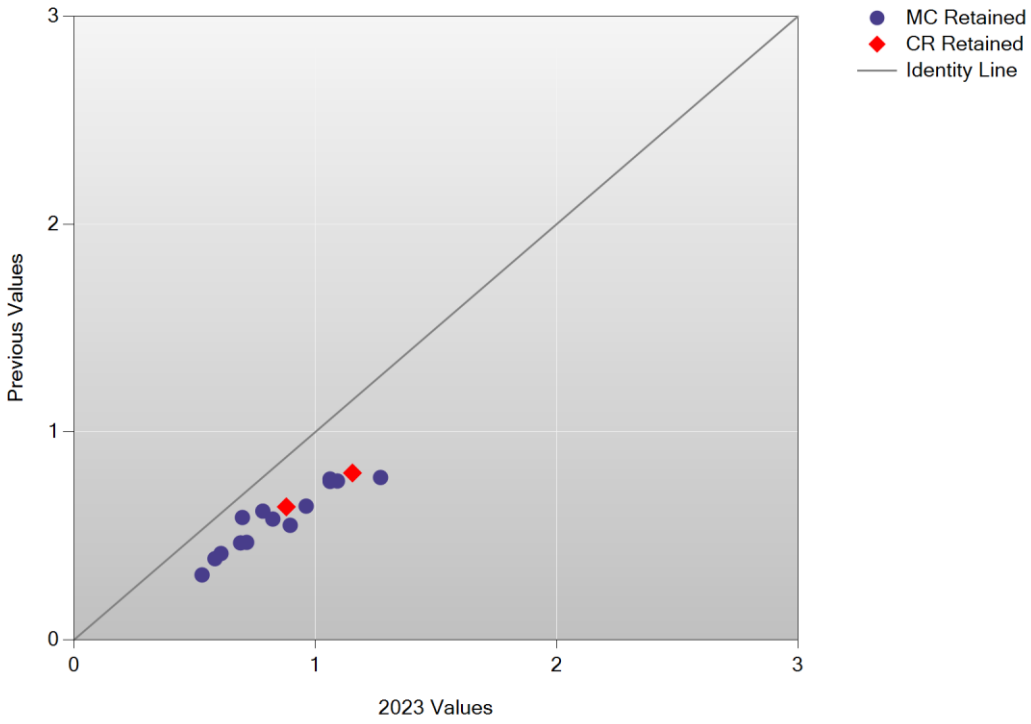
14
16
18
20
22
24


Test Characteristic Curve: ela05
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
-4
-2
0
2
4

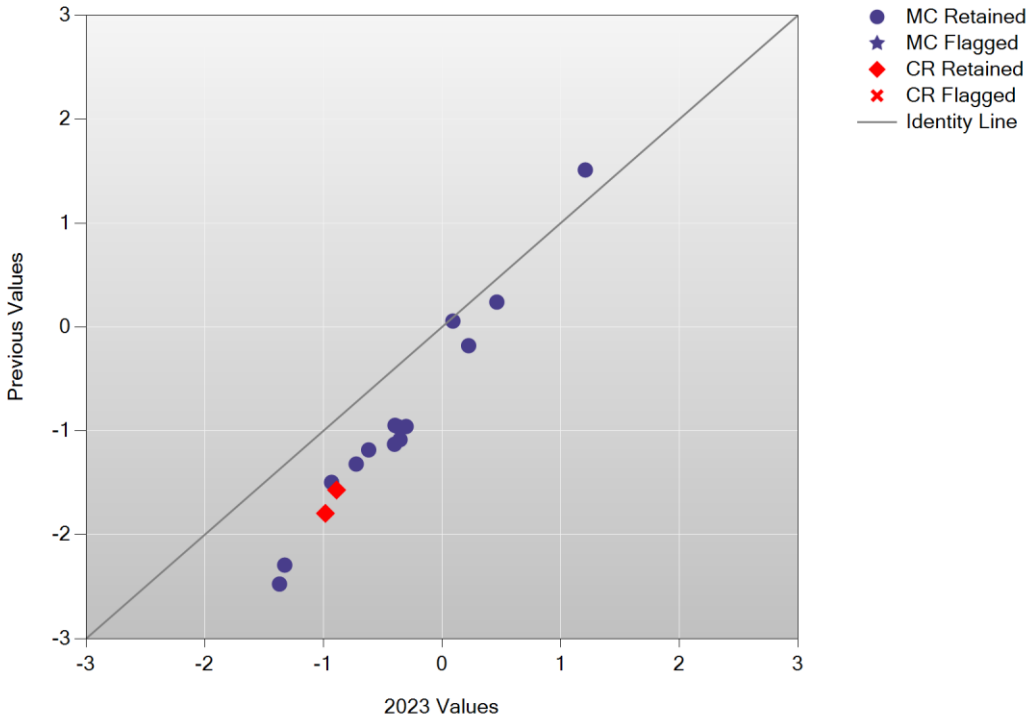

Test Information Function: ela05
Information
Theta
2023
2022
2019
0
5
10
15
-4
-2
0
2
4

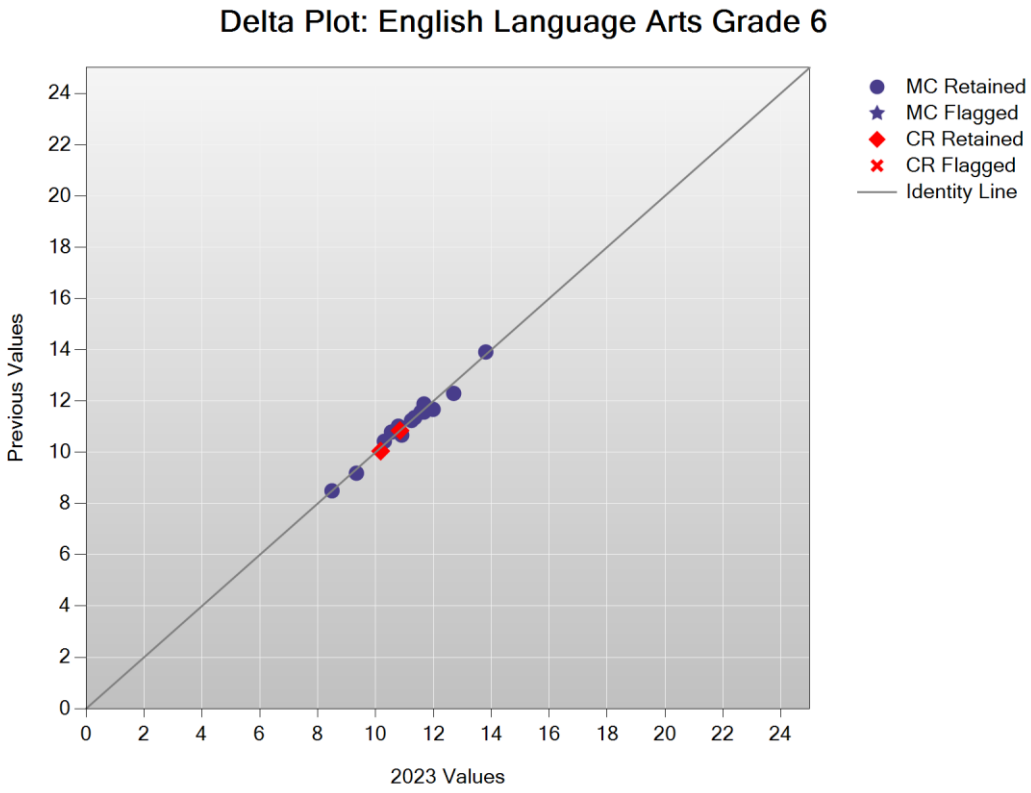

Cumulative Scale Score Distributions: English Language Arts Grade 5
Cumulative Proportion
Scale Score
2023
2022
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540

A/A Plot: English Language Arts Grade 6



B/B Plot: English Language Arts Grade 6




Delta Plot: English Language Arts Grade 6
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
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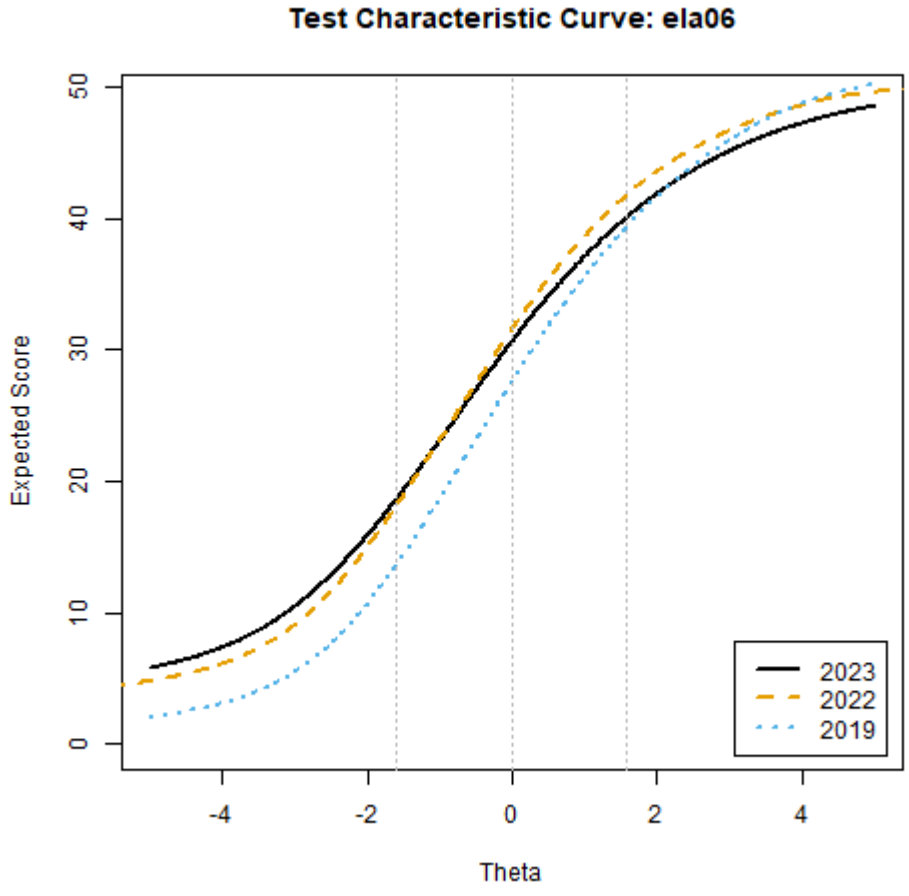
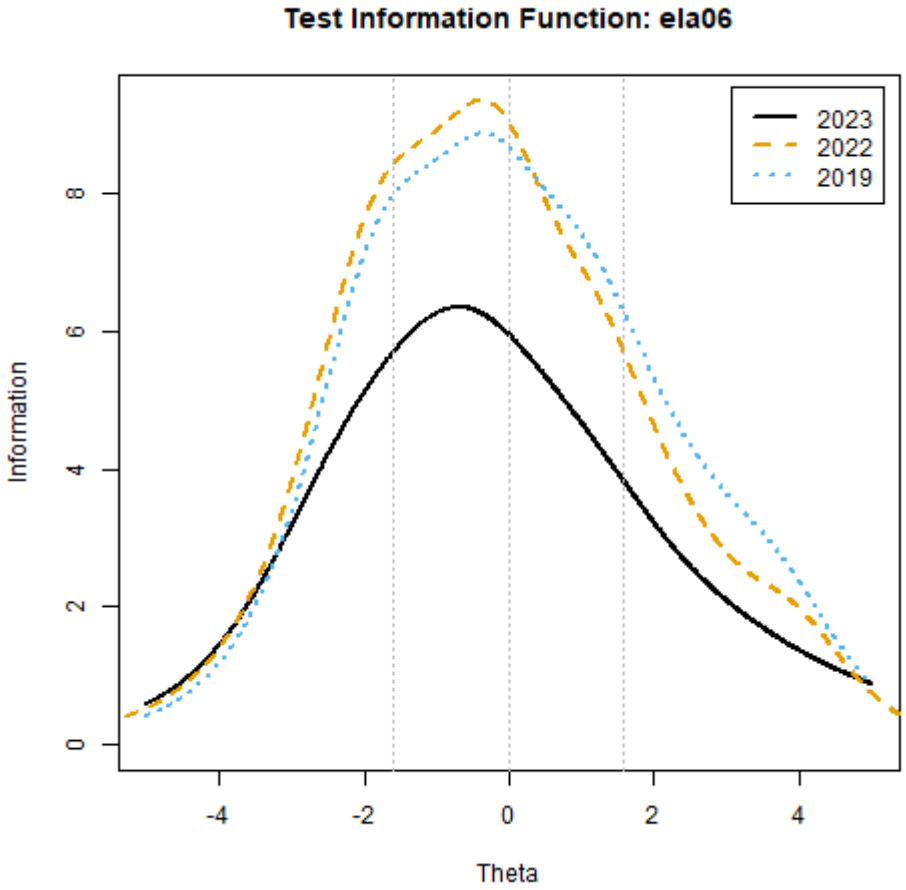
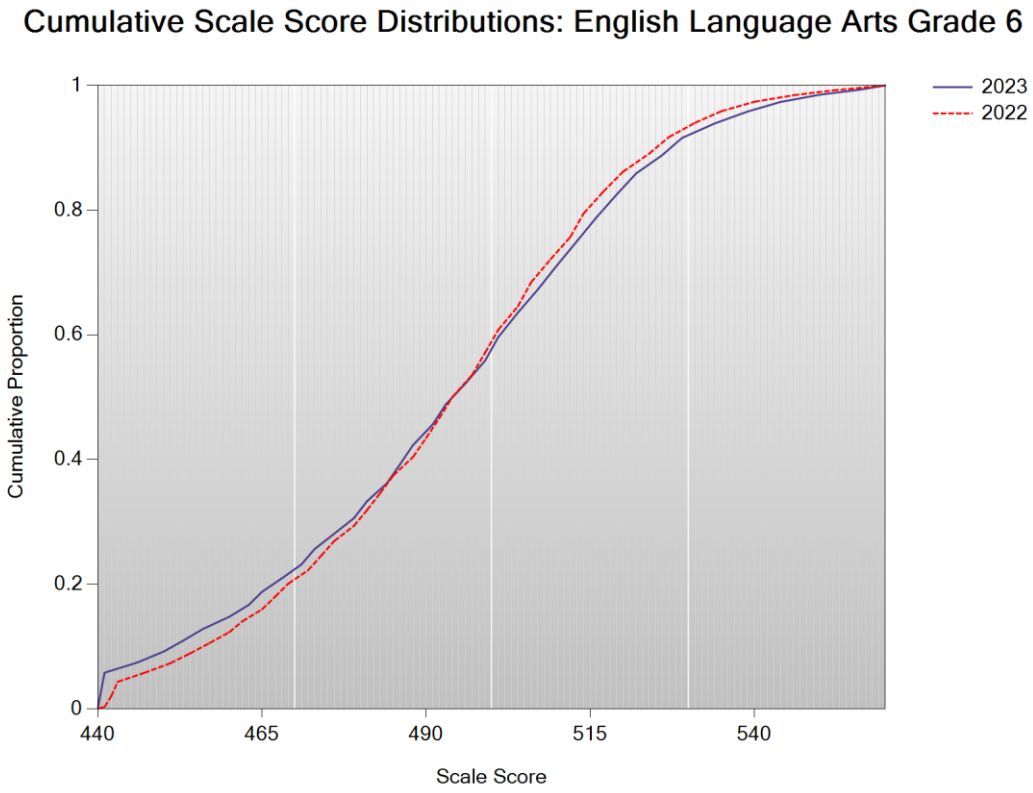
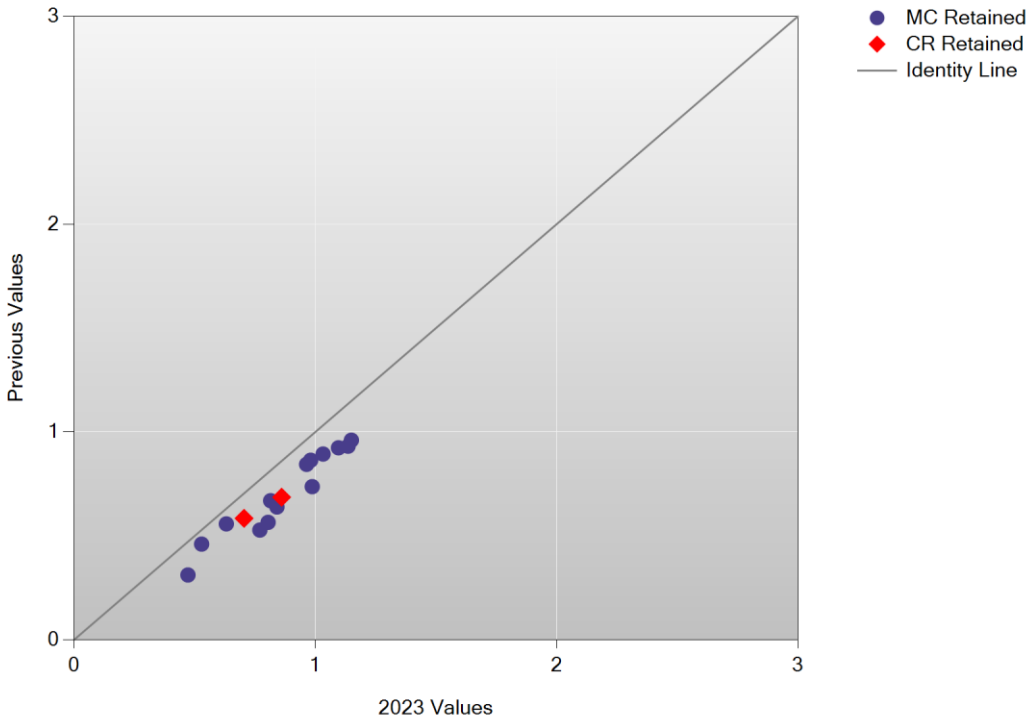
12
14
16
18
20
22
24


Test Characteristic Curve: ela06
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

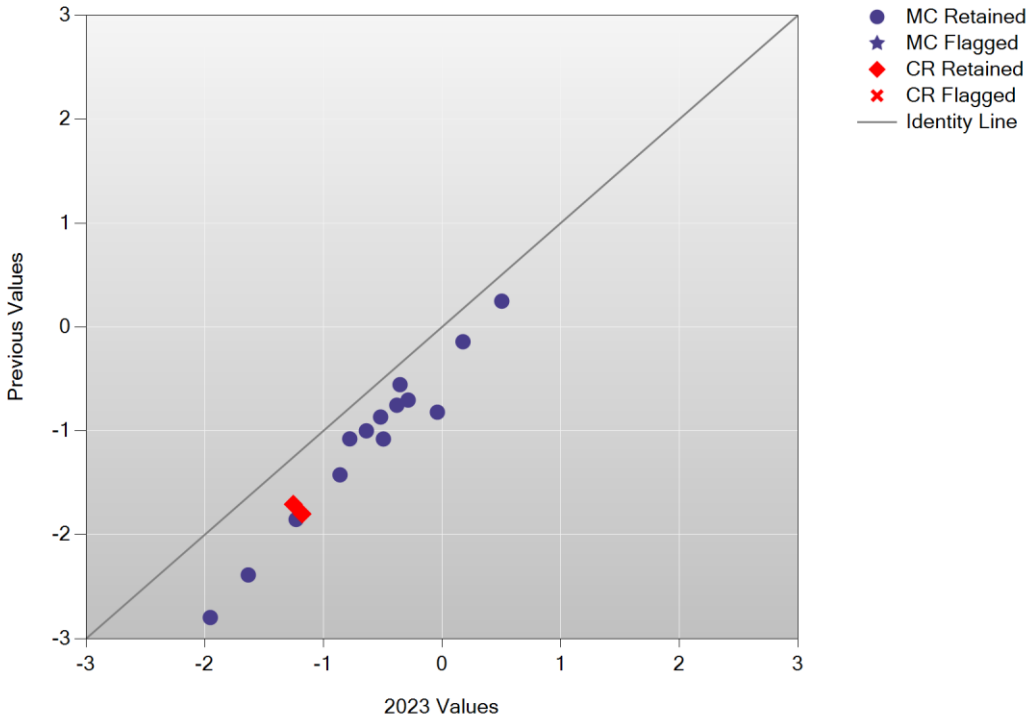

Test Information Function: ela06
2023
2022
2019
Information
0
2
4
6
8
-4
-2
0
2
4
Theta

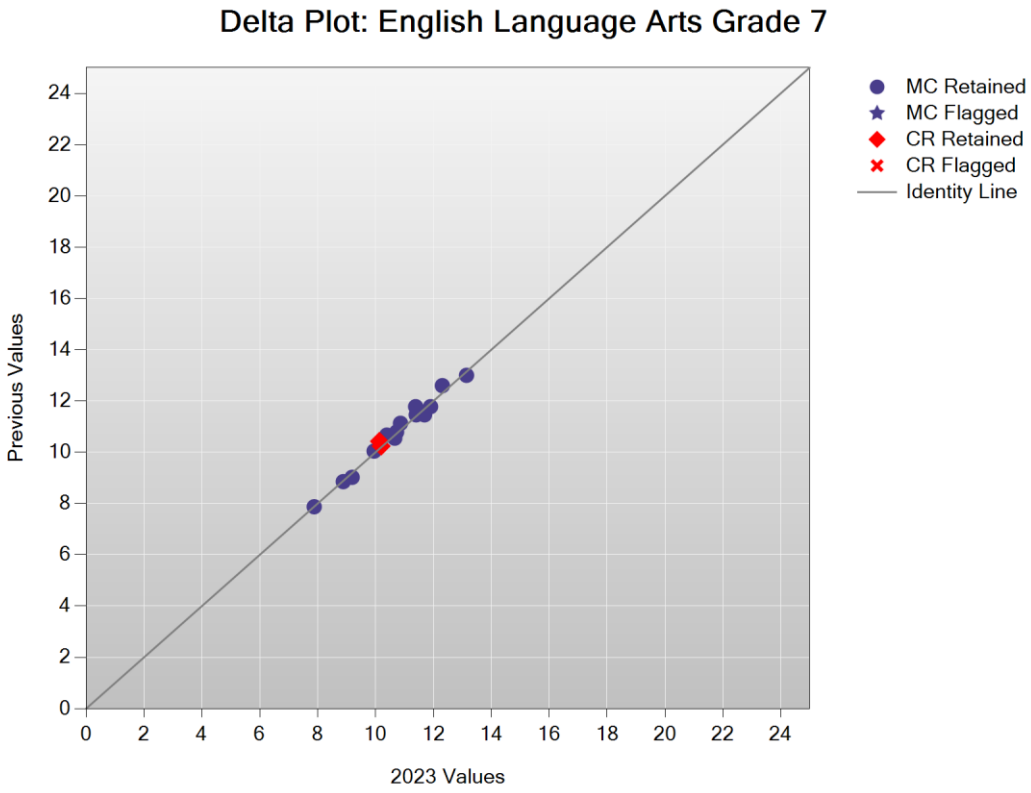

Cumulative Scale Score Distributions: English Language Arts Grade 6
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

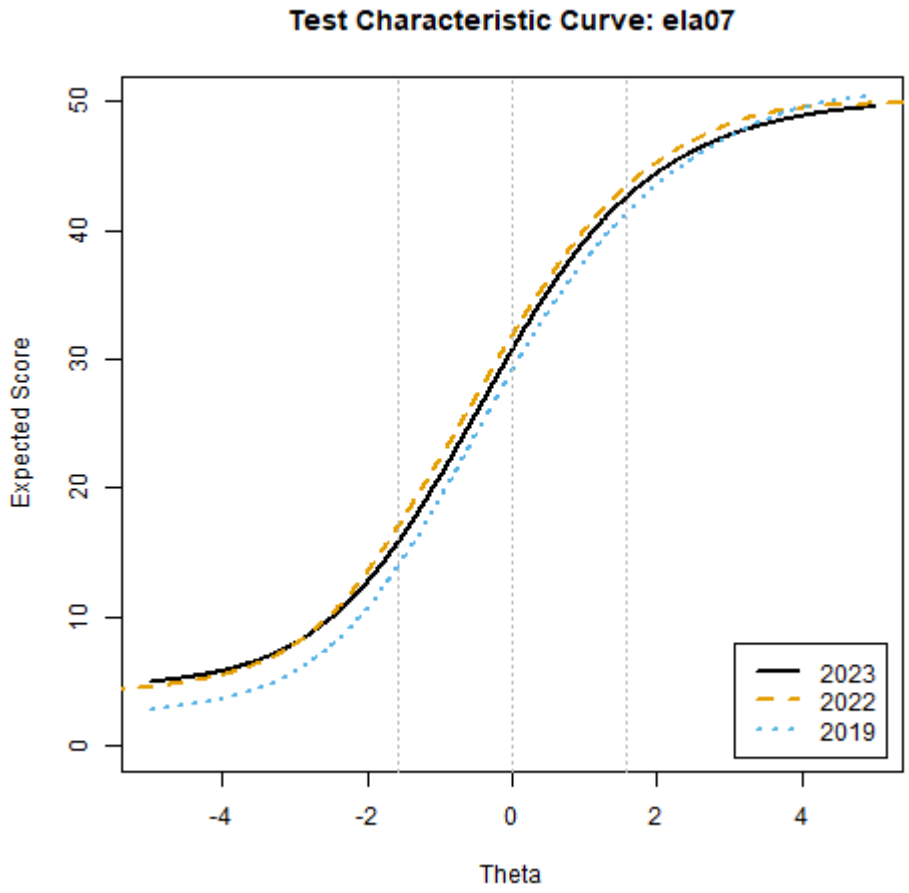
A/A Plot: English Language Arts Grade 7

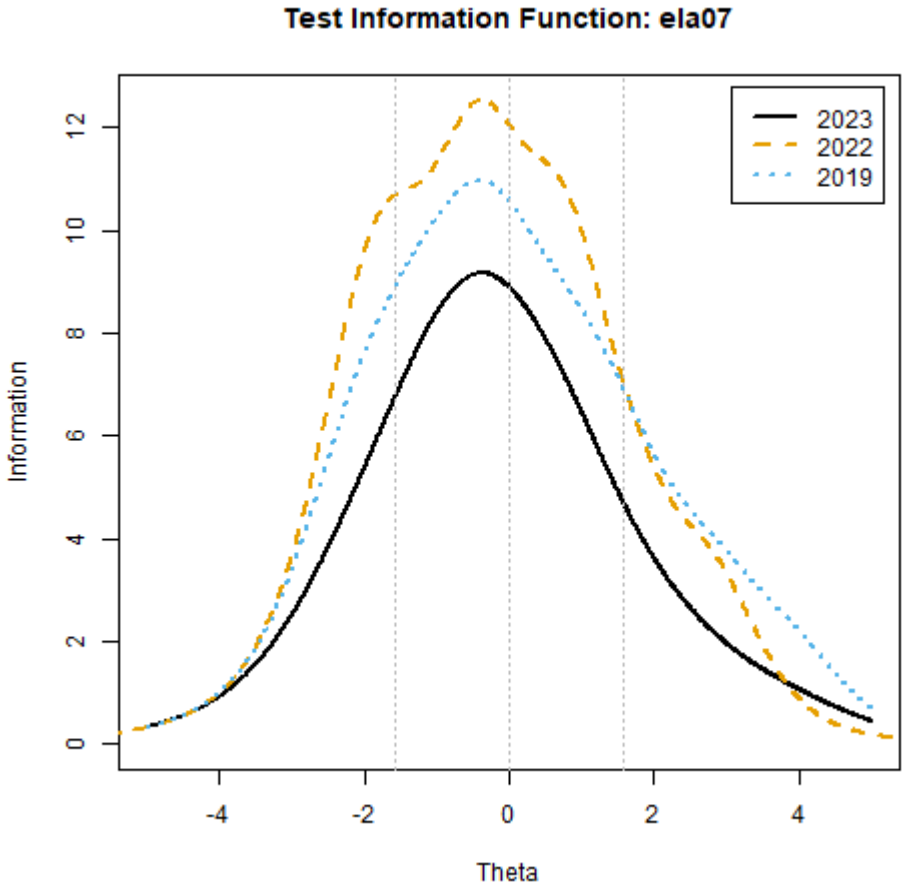


B/B Plot: English Language Arts Grade 7

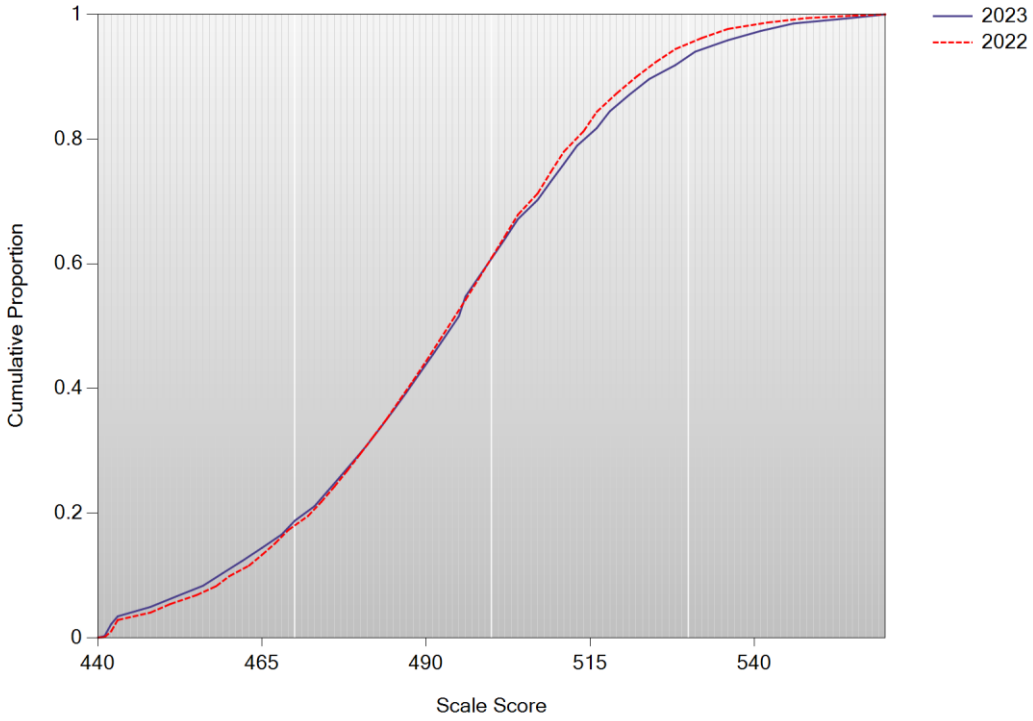



Delta Plot: English Language Arts Grade 7
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24

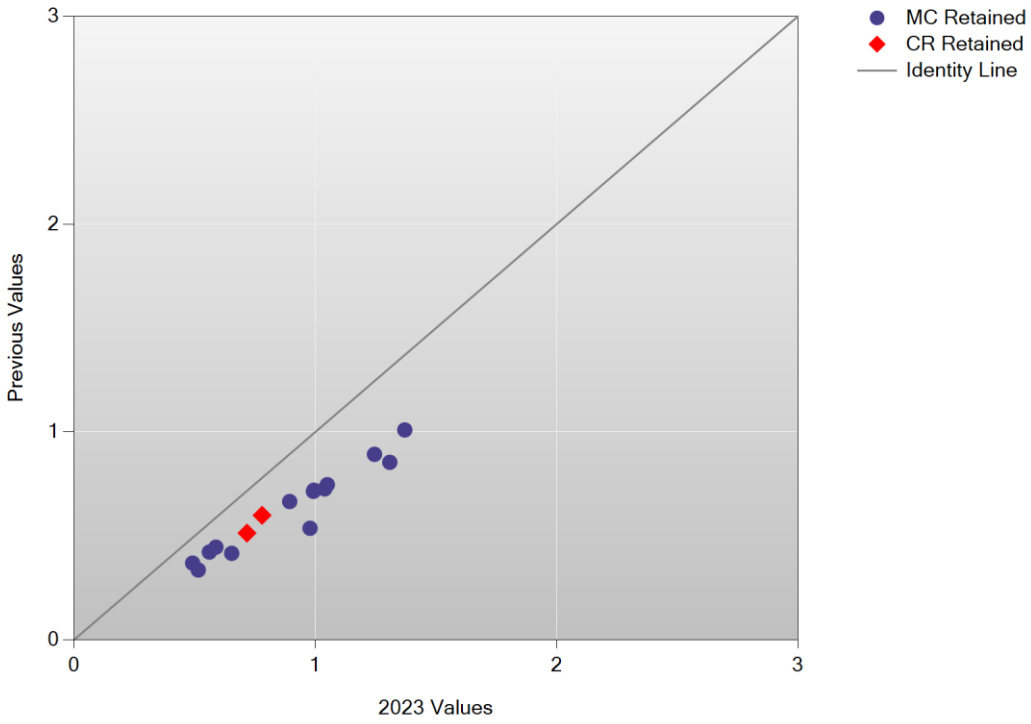

Test Characteristic Curve: ela07
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4



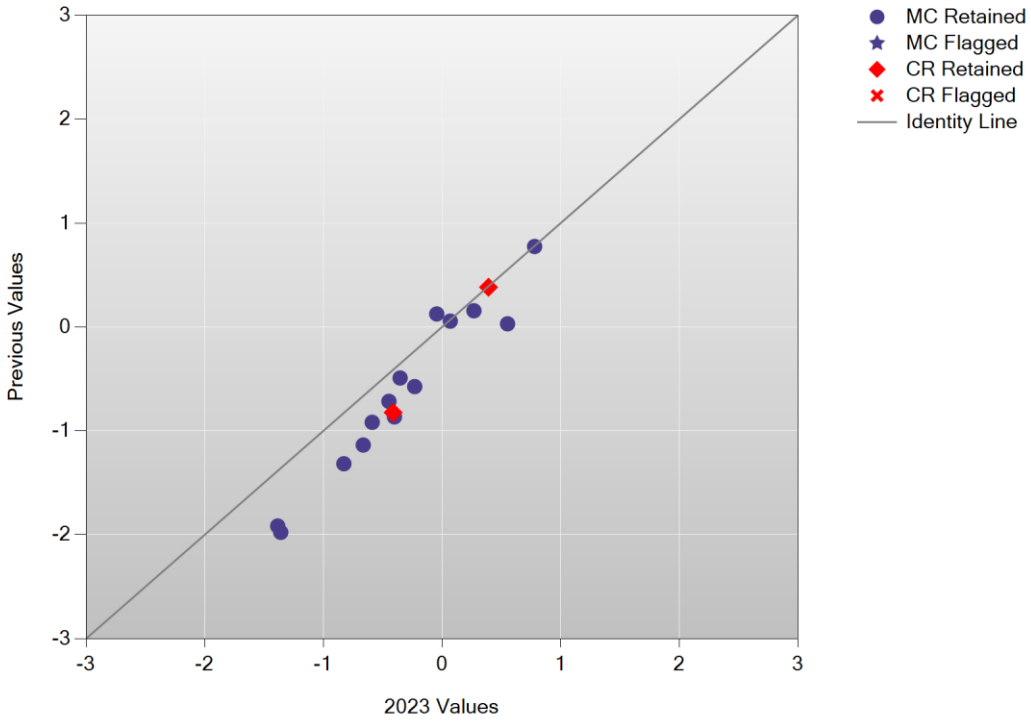
Cumulative Scale Score Distributions: English Language Arts Grade 7

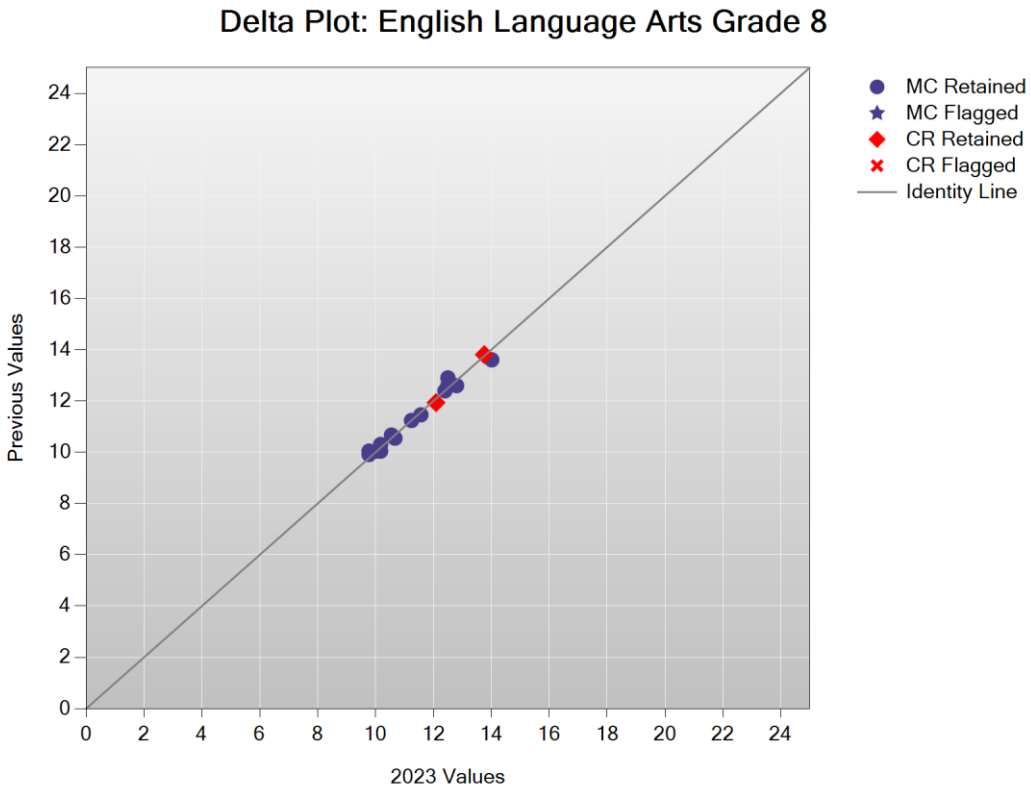


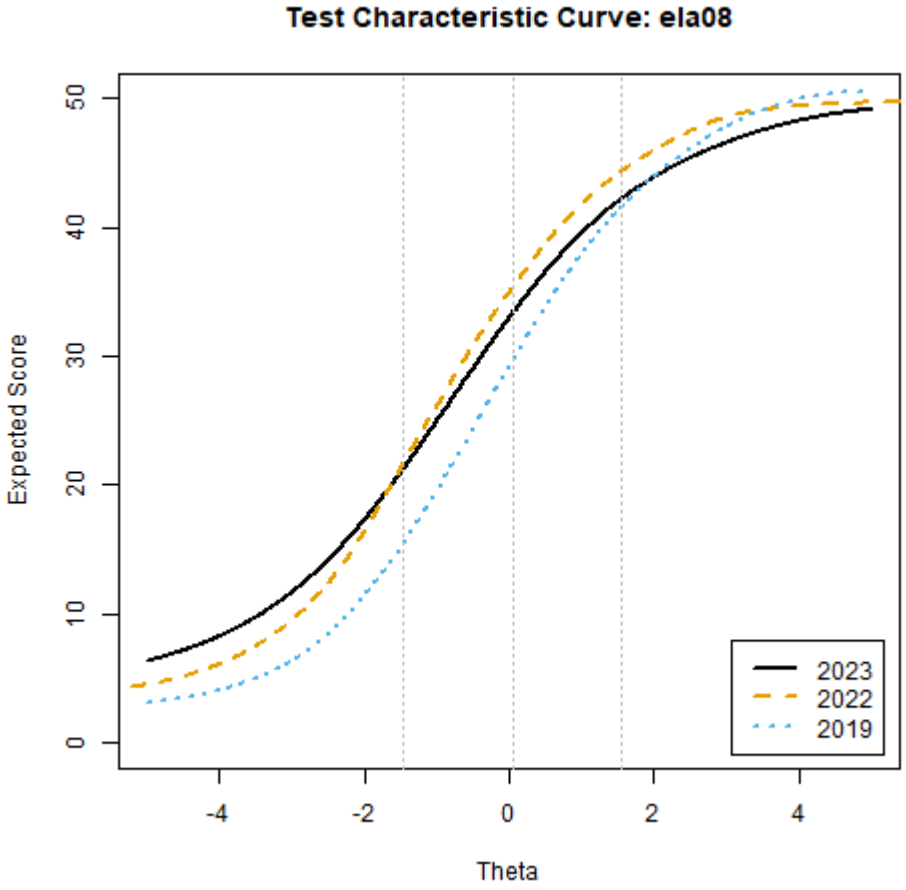
A/A Plot: English Language Arts Grade 8

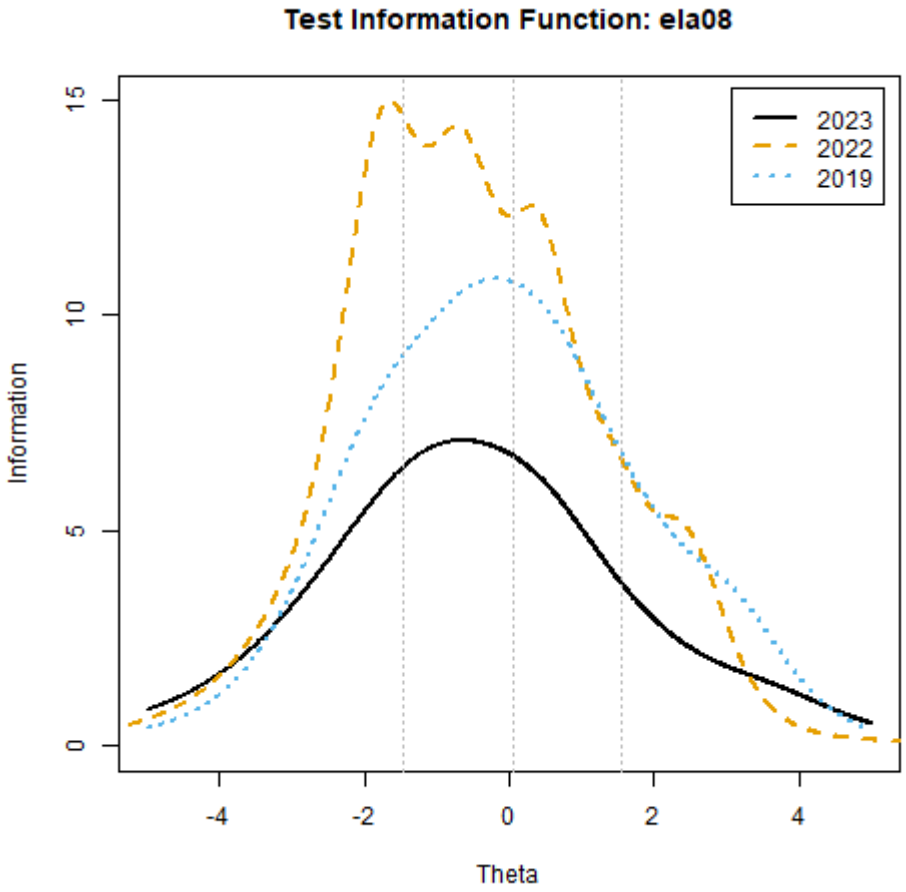


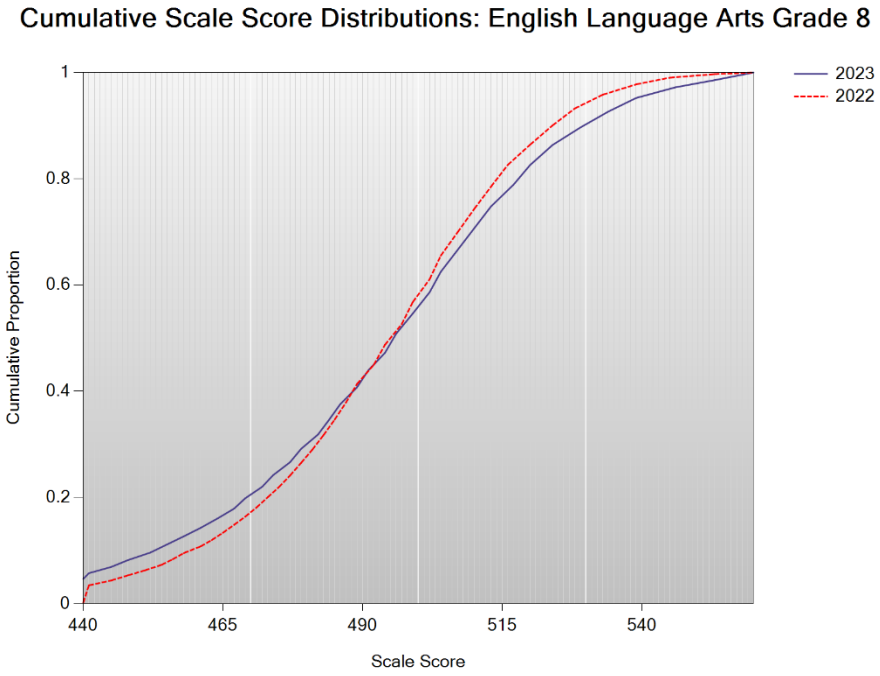
B/B Plot: English Language Arts Grade 8



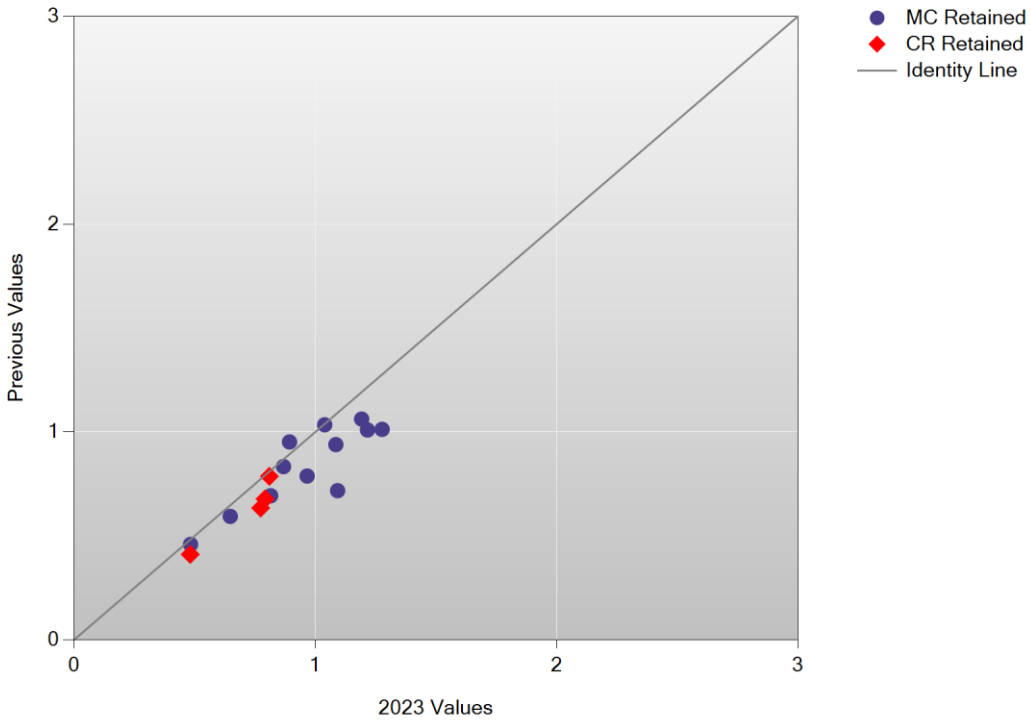

Delta Plot: English Language Arts Grade 8
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: ela08
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

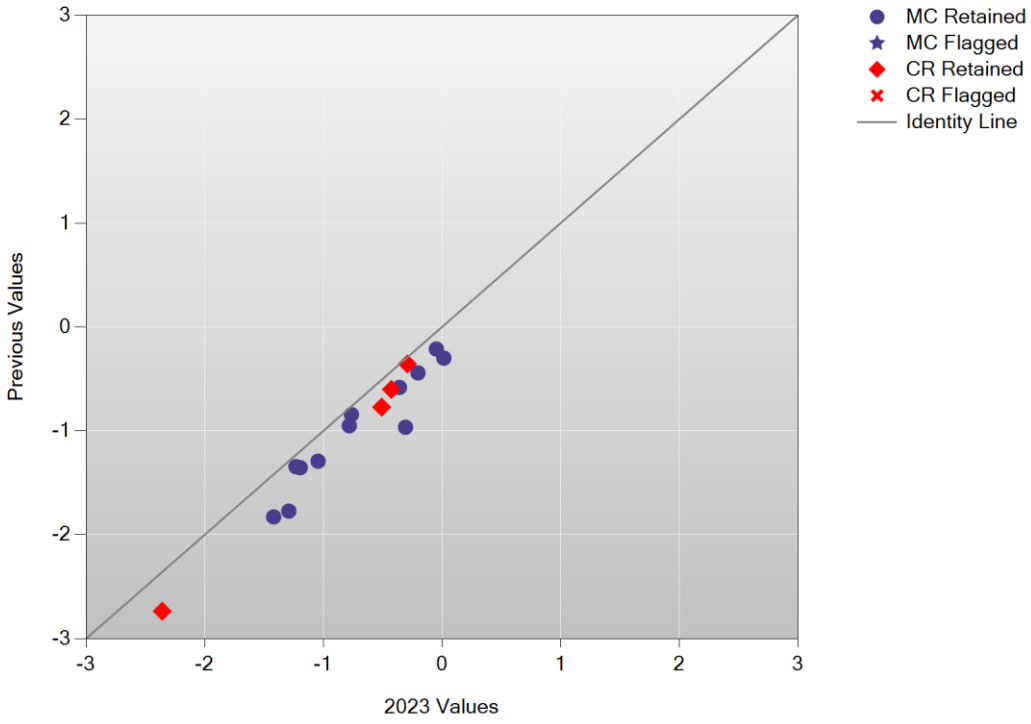

Test Information Function: ela08
Information
Theta
2023
2022
2019
0
5
10
15
-4
-2
0
2
4

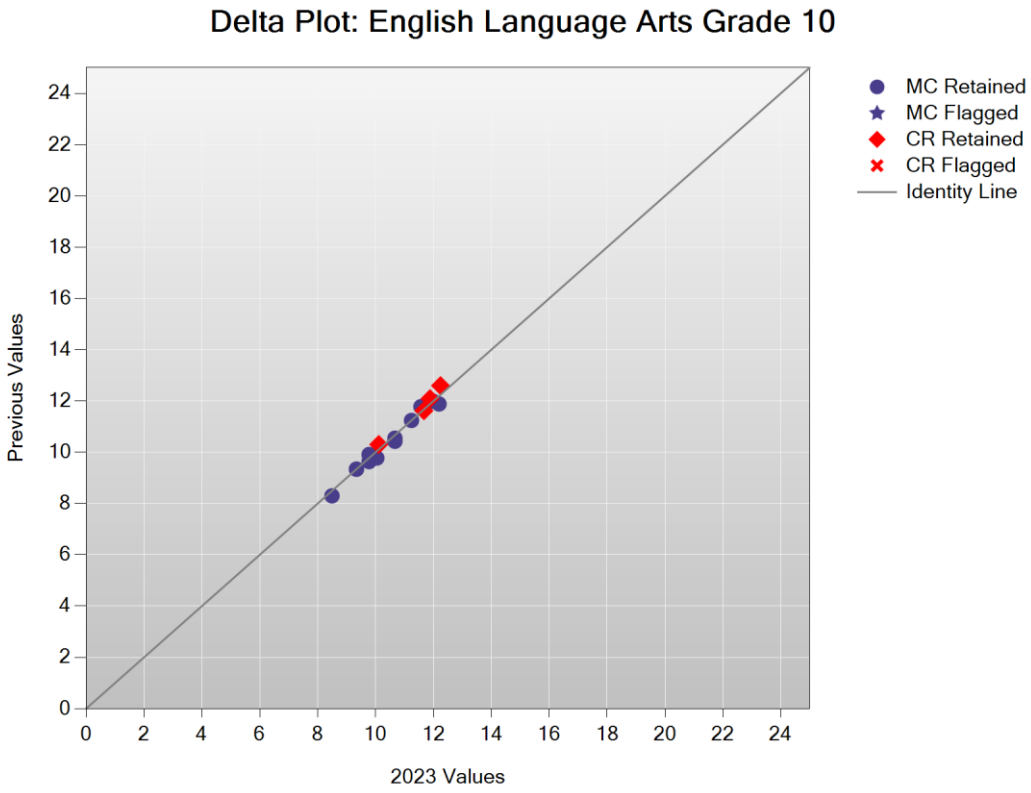

Cumulative Scale Score Distributions: English Language Arts Grade 8
Cumulative Proportion
Scale Score
2023
2022
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540

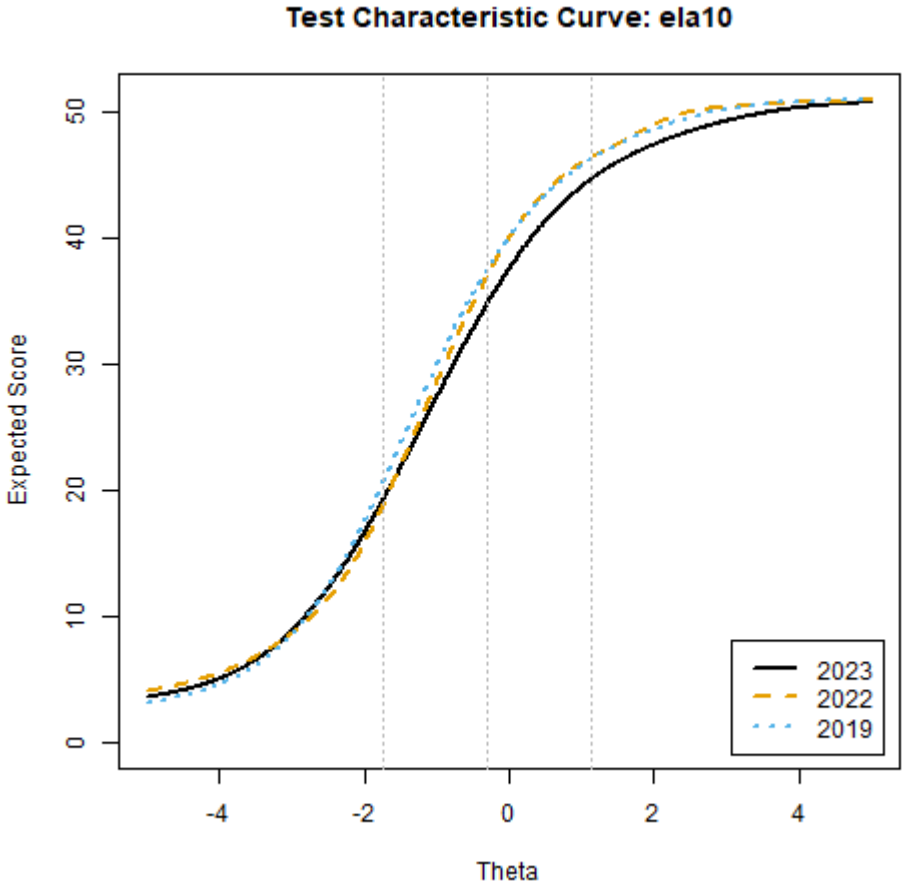
A/A Plot: English Language Arts Grade 10

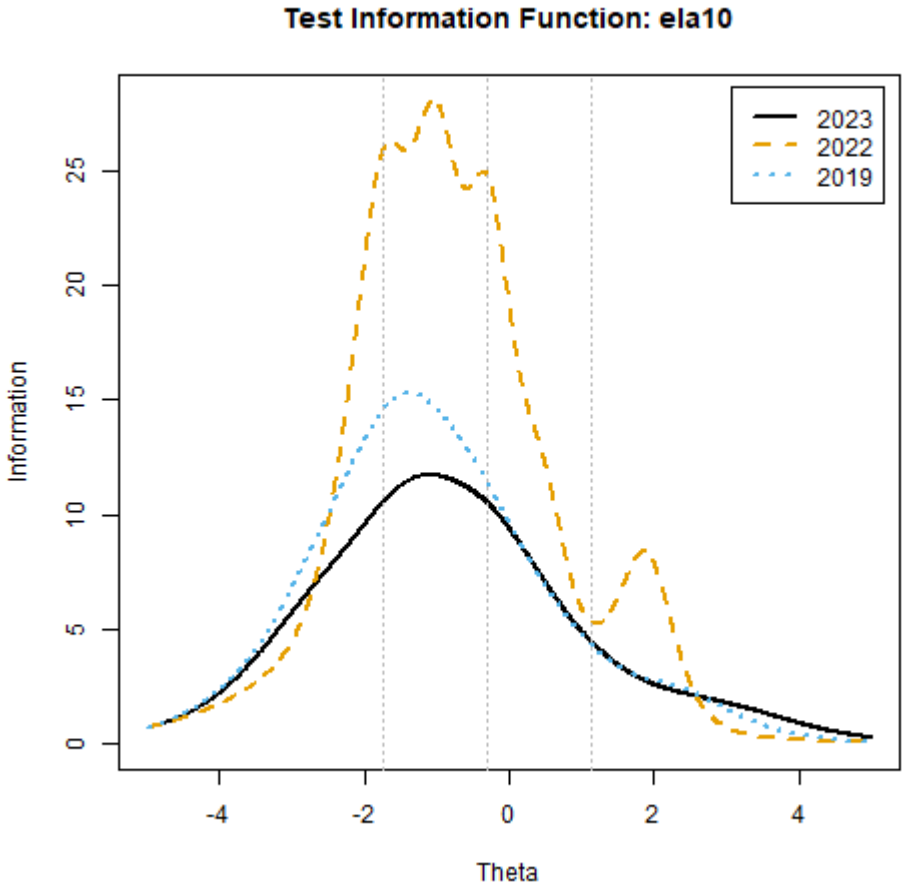


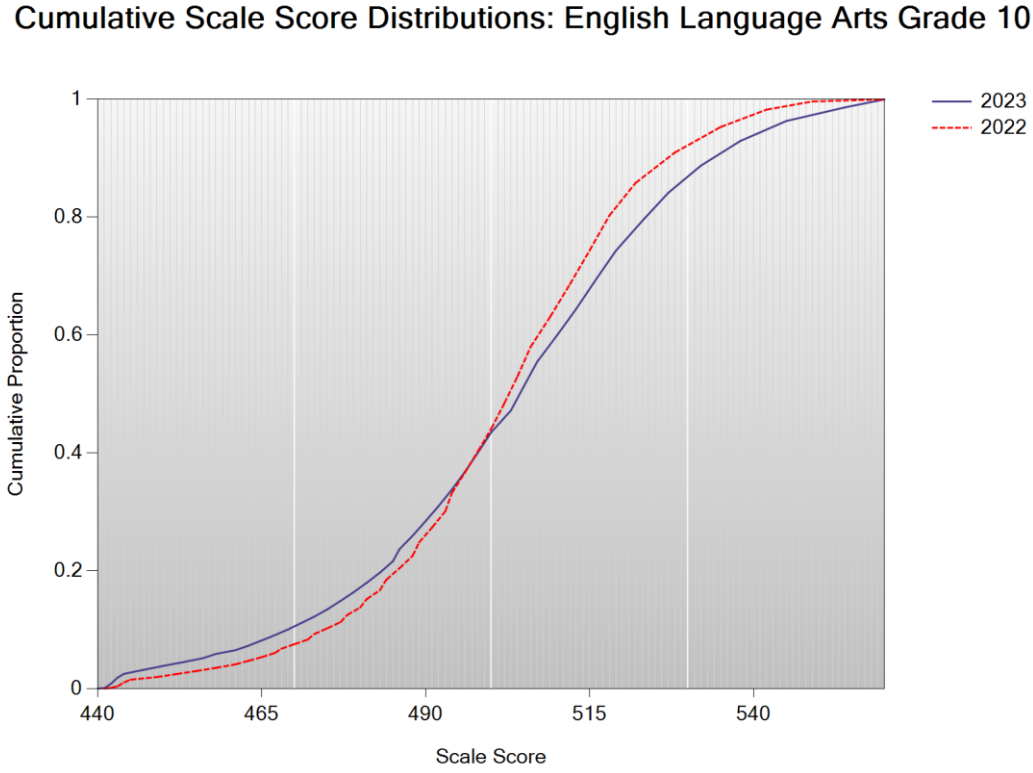
B/B Plot: English Language Arts Grade 10



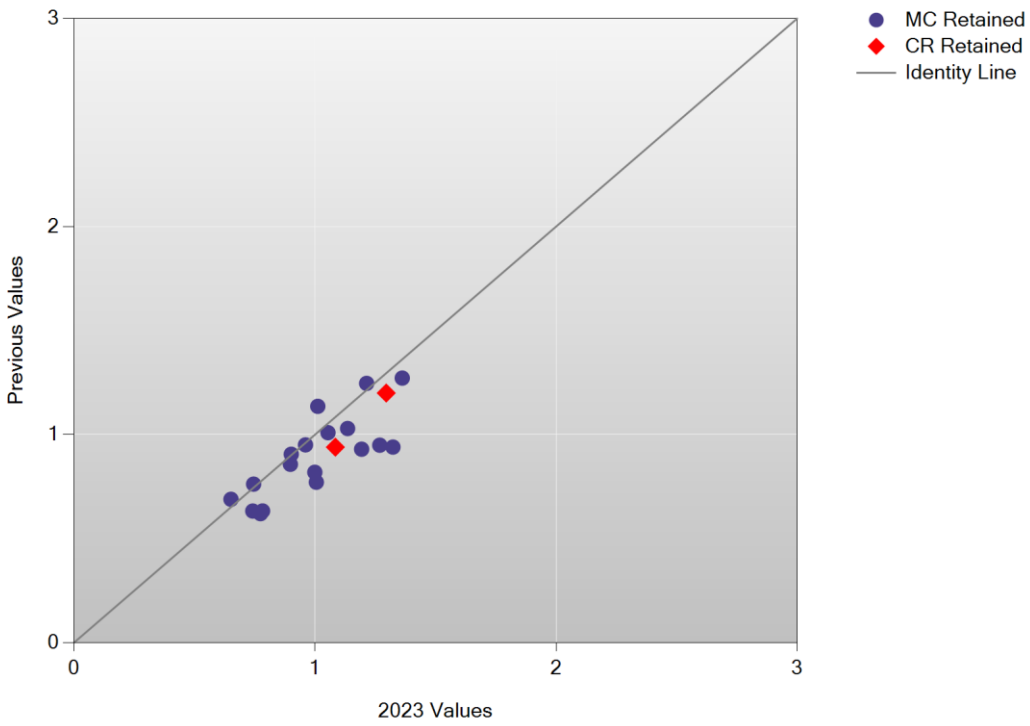

Delta Plot: English Language Arts Grade 10
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: ela10
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

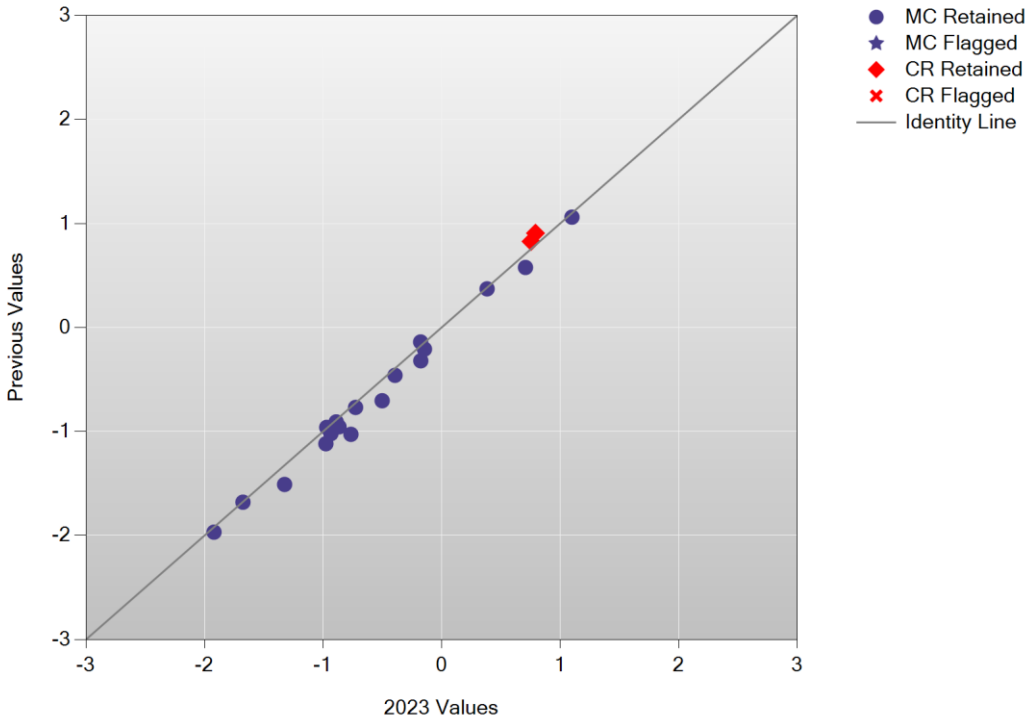

Test Information Function: ela10
2023
2022
2019
Information
0
5
10
15
20
25
-4
-2
0
2
4
Theta

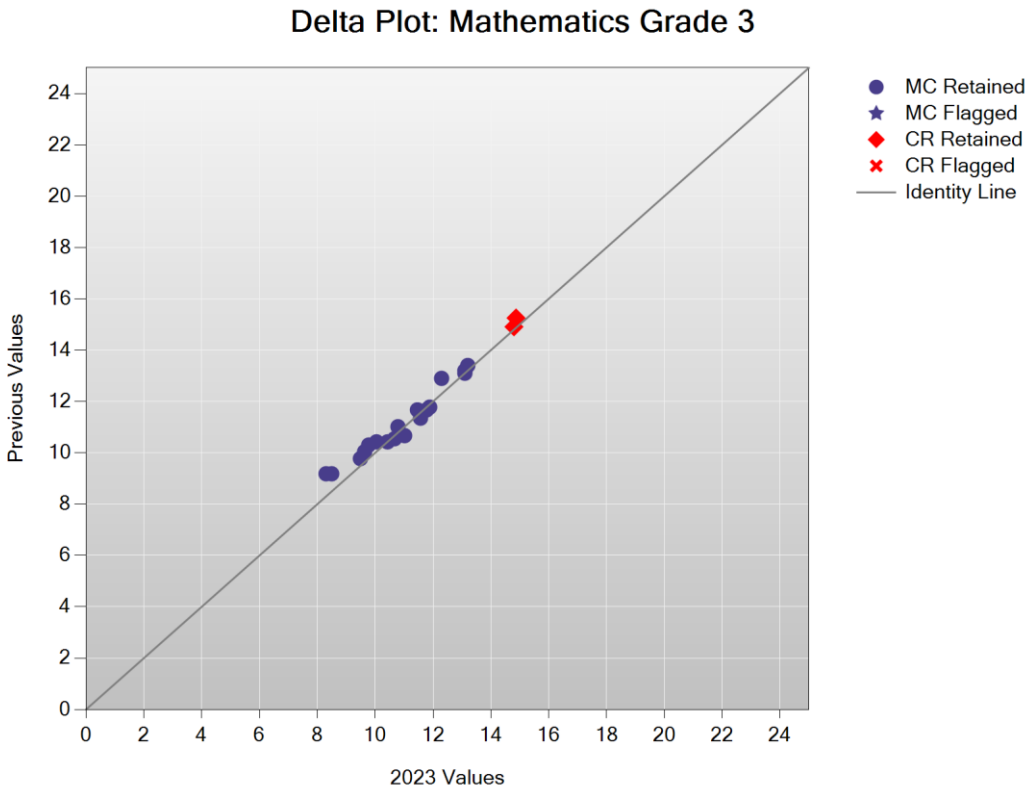

Cumulative Scale Score Distributions: English Language Arts Grade 10
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

A/A Plot: Mathematics Grade 3



B/B Plot: Mathematics Grade 3




Delta Plot: Mathematics Grade 3
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
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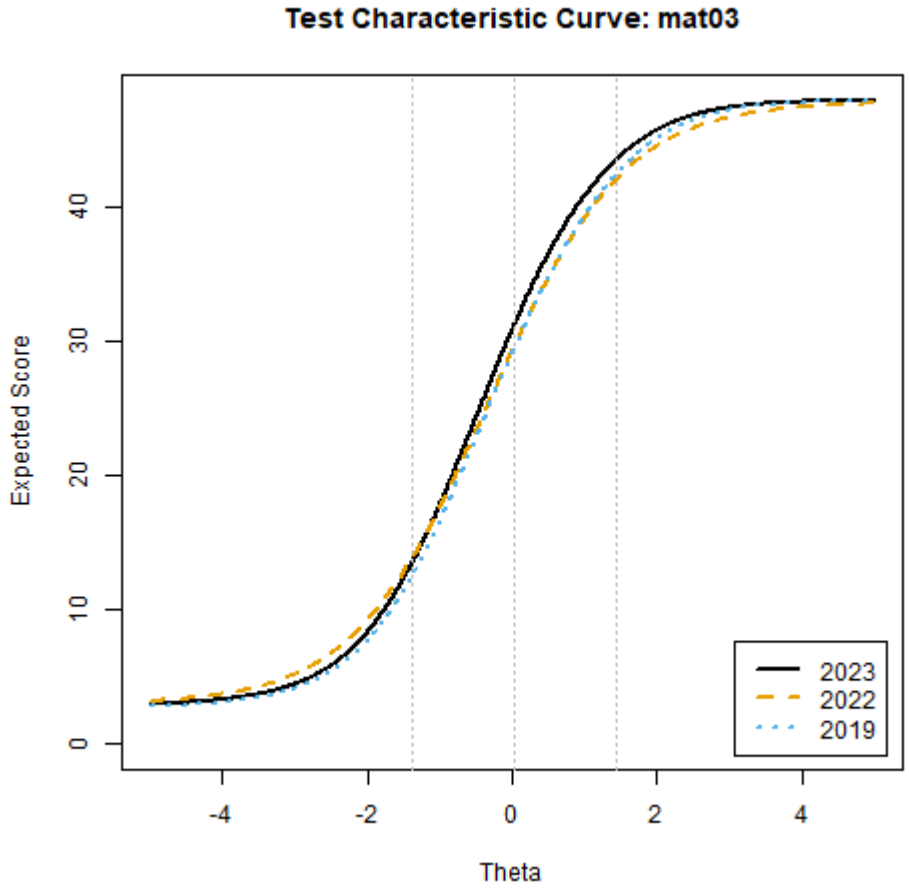
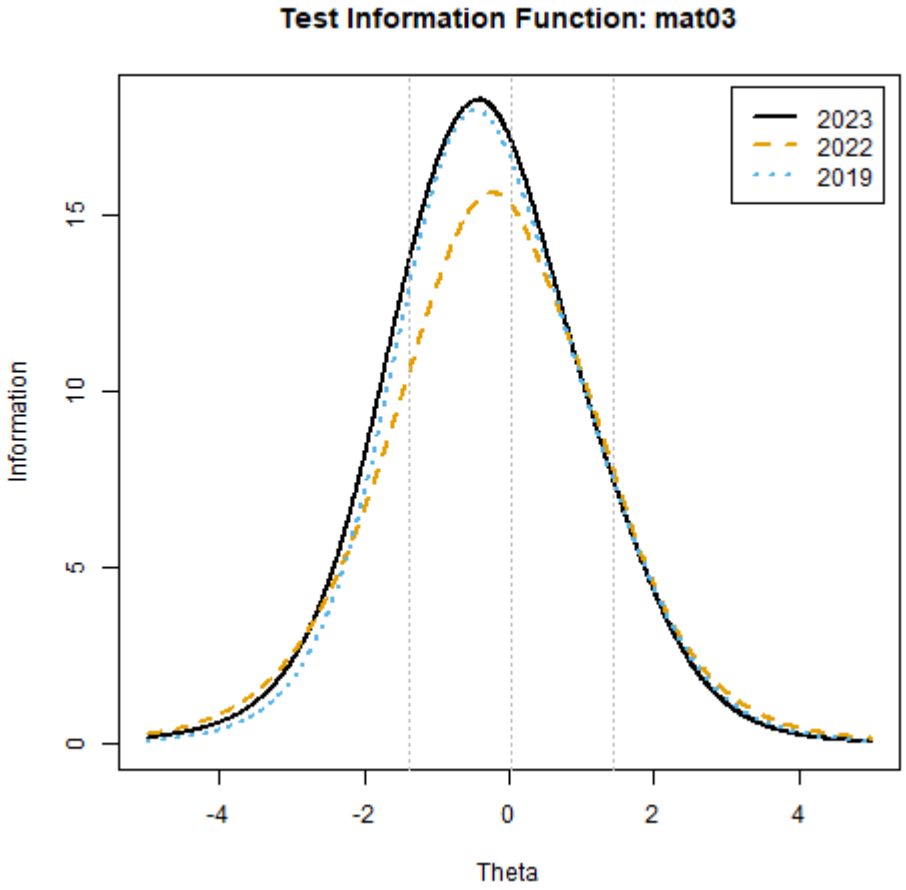
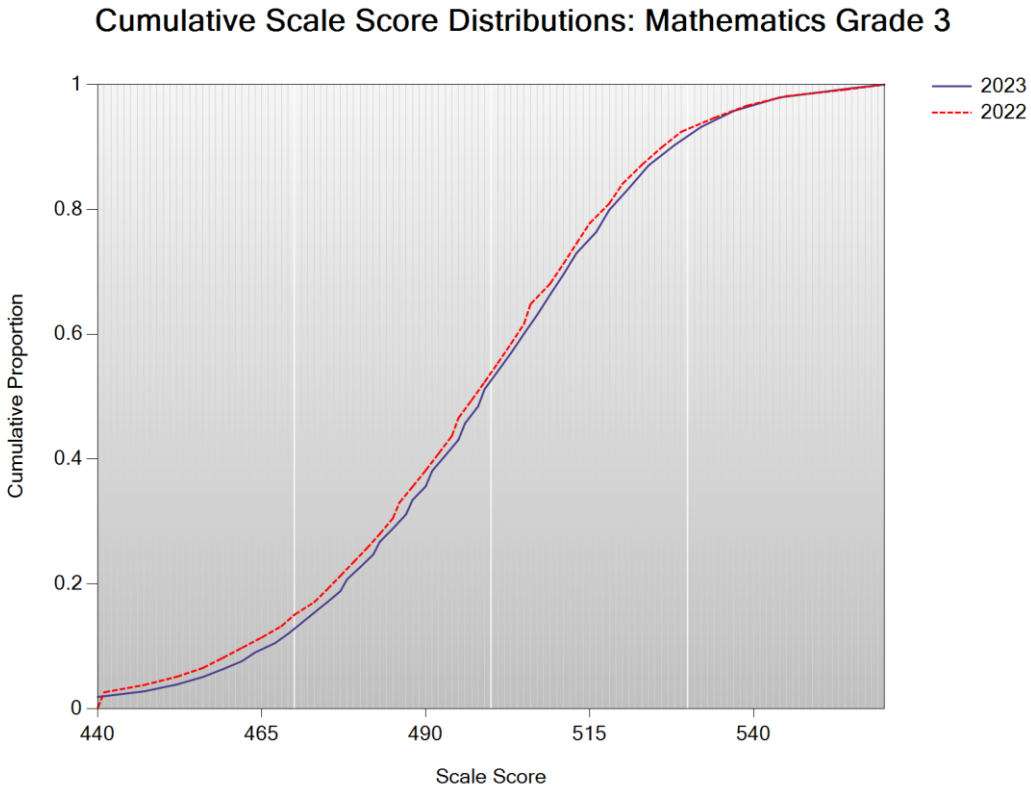
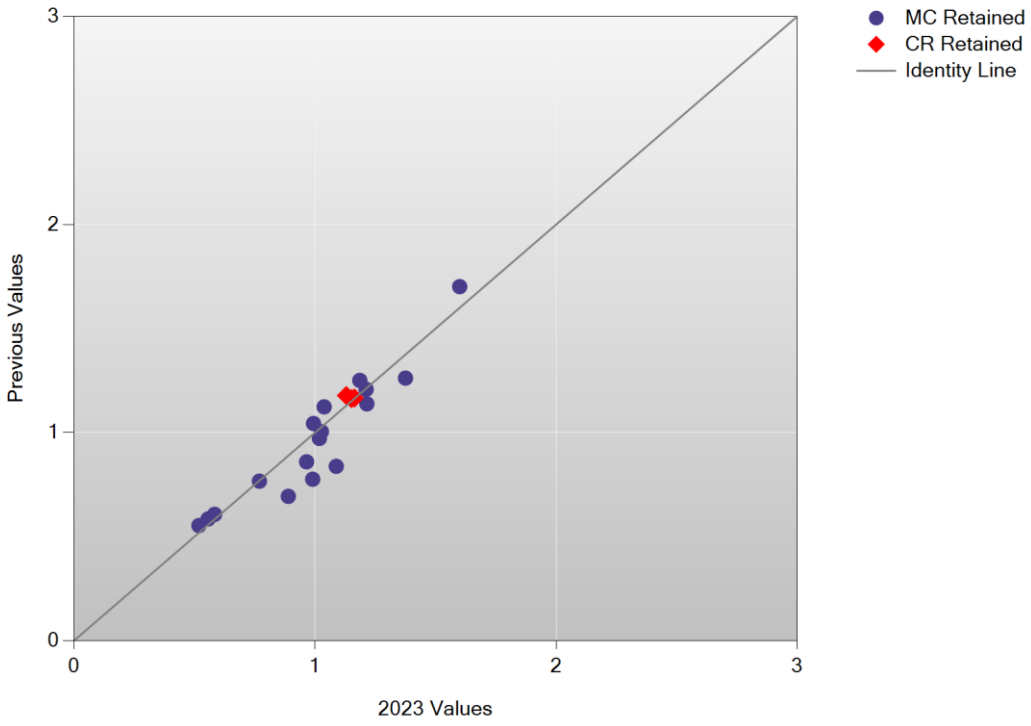
14
16
18
20
22
24


Test Characteristic Curve: mat03
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
-4
-2
0
2
4

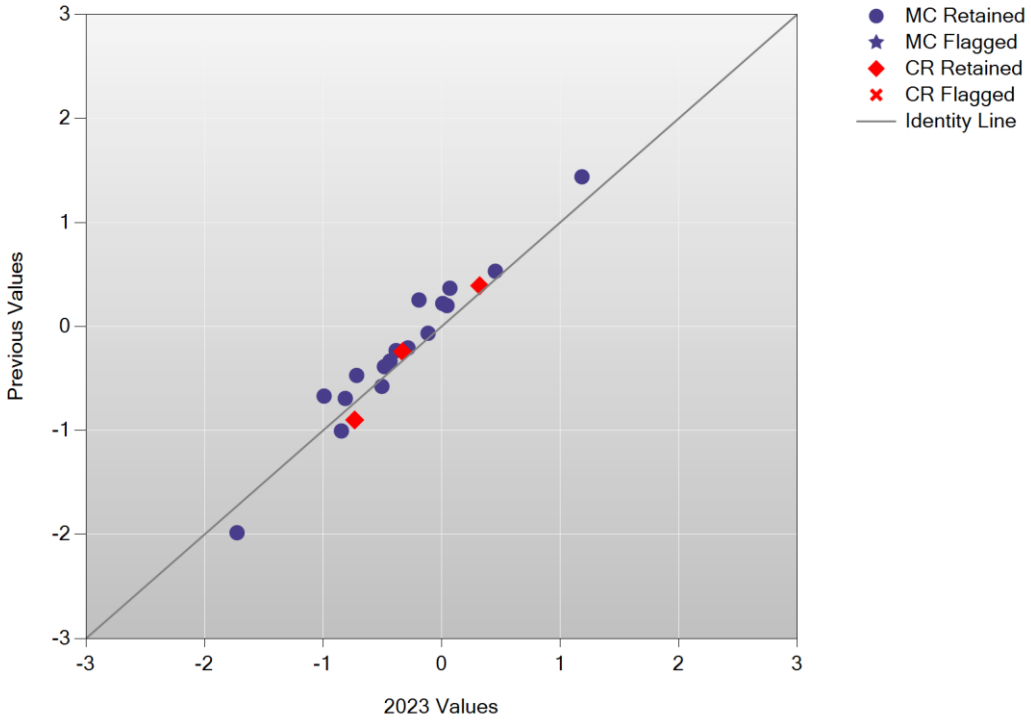

Test Information Function: mat03
2023
2022
2019
Information
0
5
10
15
-4
-2
0
2
4
Theta

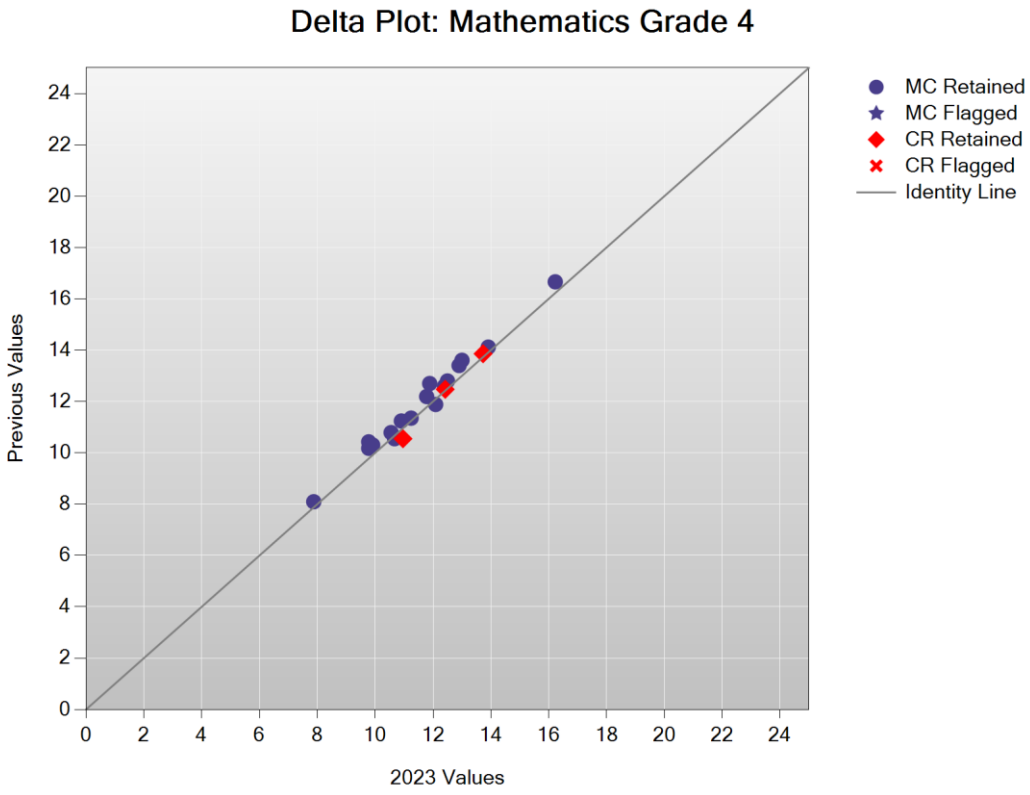

Cumulative Scale Score Distributions: Mathematics Grade 3
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

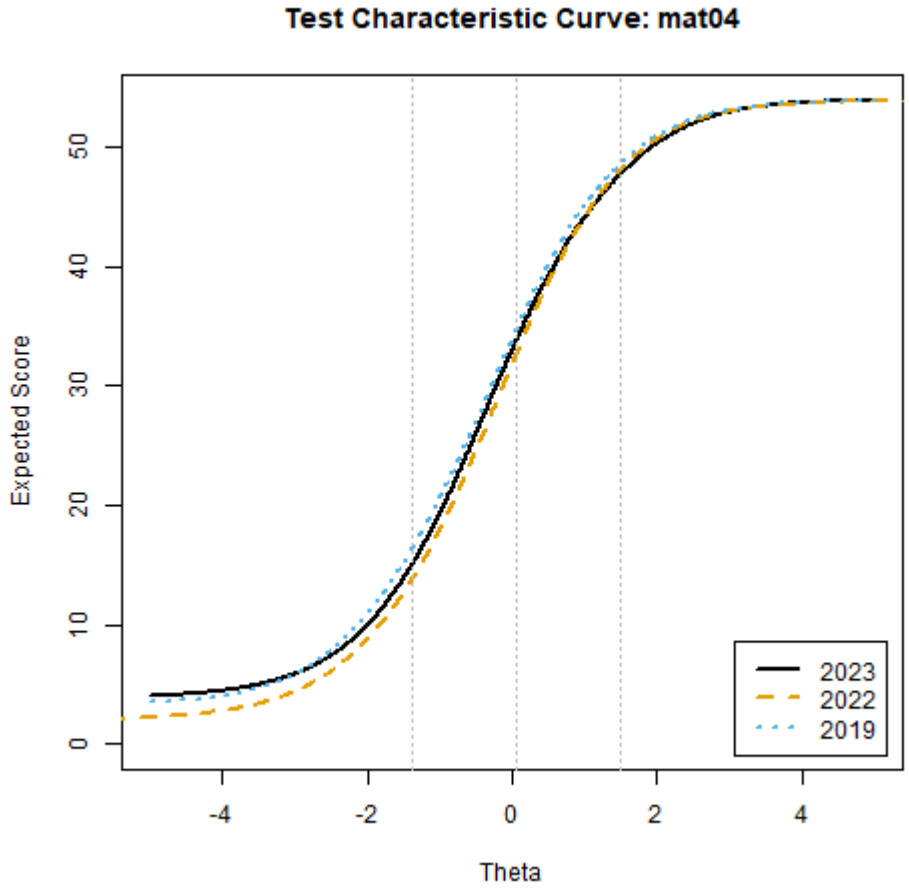
A/A Plot: Mathematics Grade 4

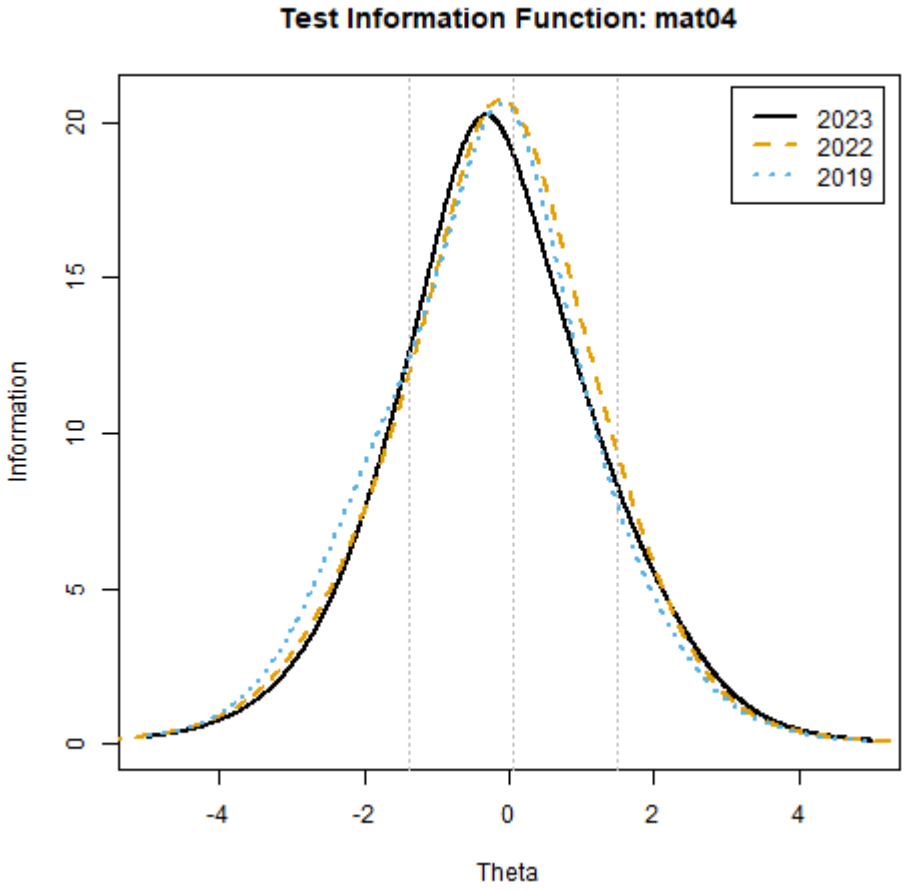


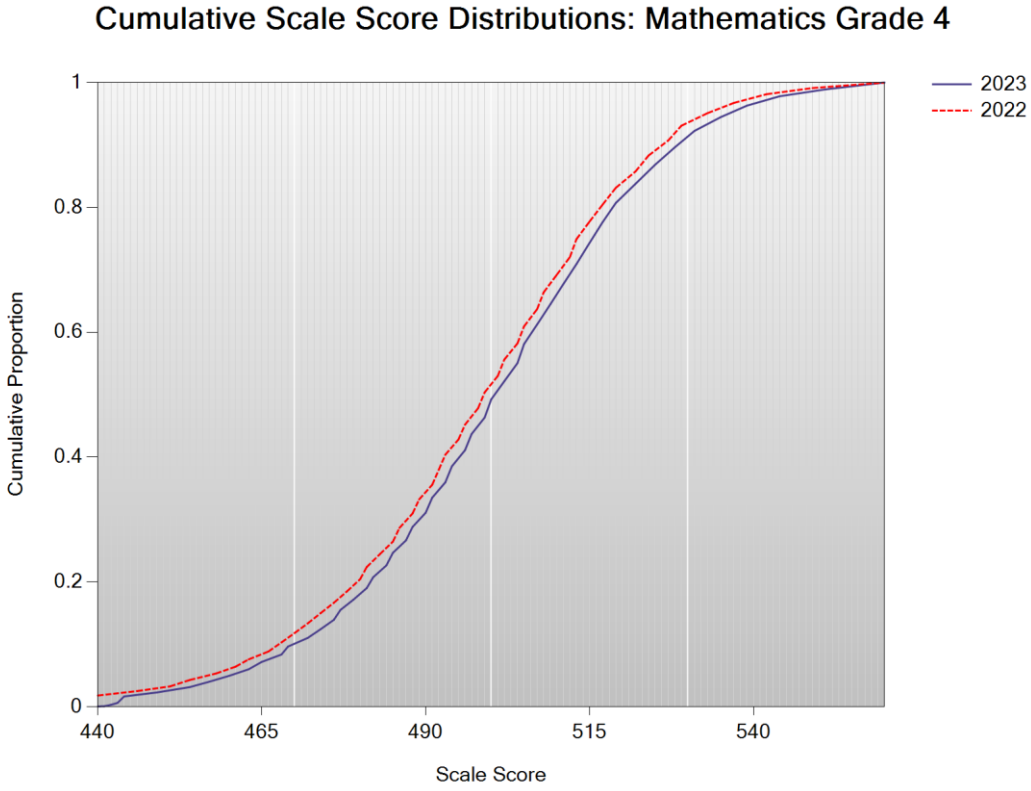
B/B Plot: Mathematics Grade 4



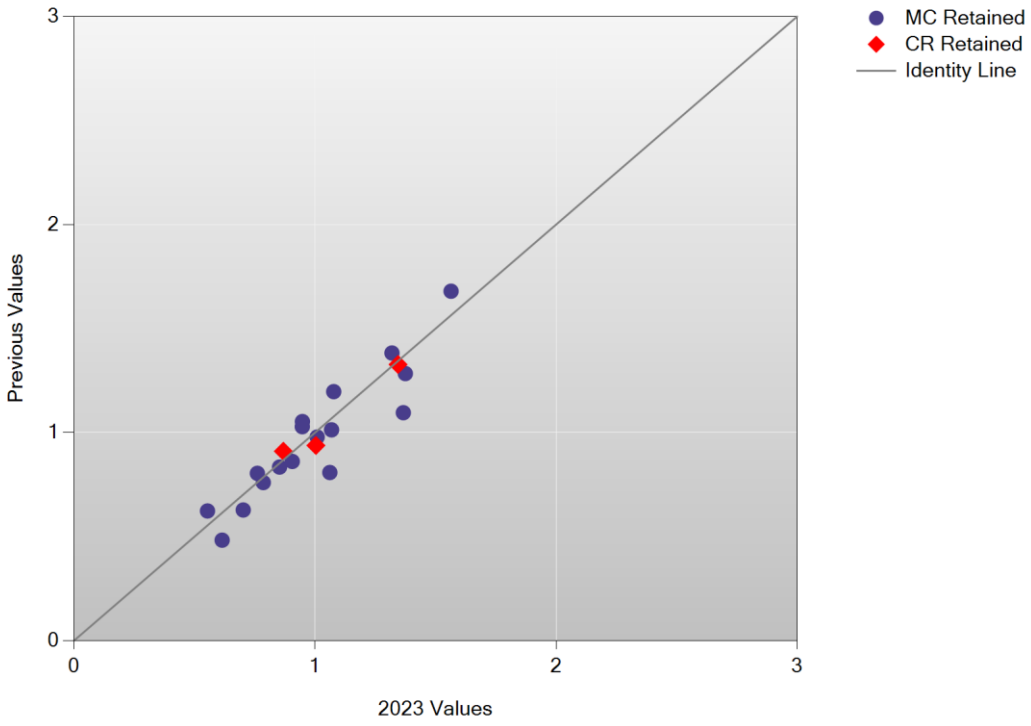

Delta Plot: Mathematics Grade 4
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: mat04
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

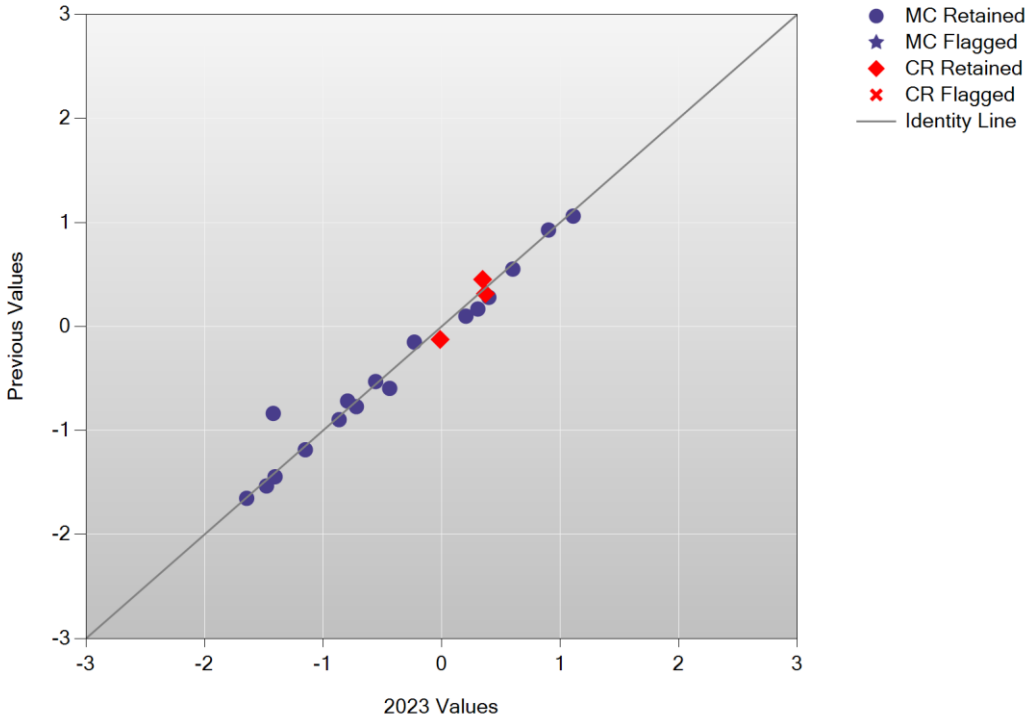

Test Information Function: mat04
2023
2022
2019
Information
0
5
10
15
20
-4
-2
0
2
4
Theta

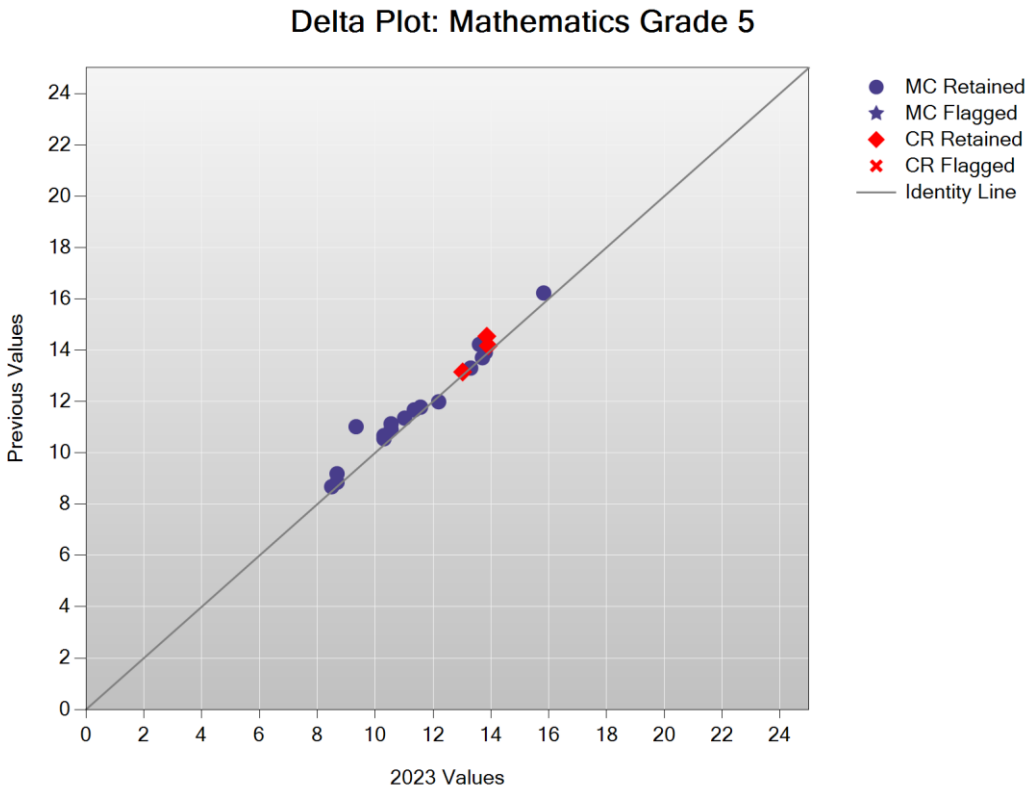

Cumulative Scale Score Distributions: Mathematics Grade 4
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

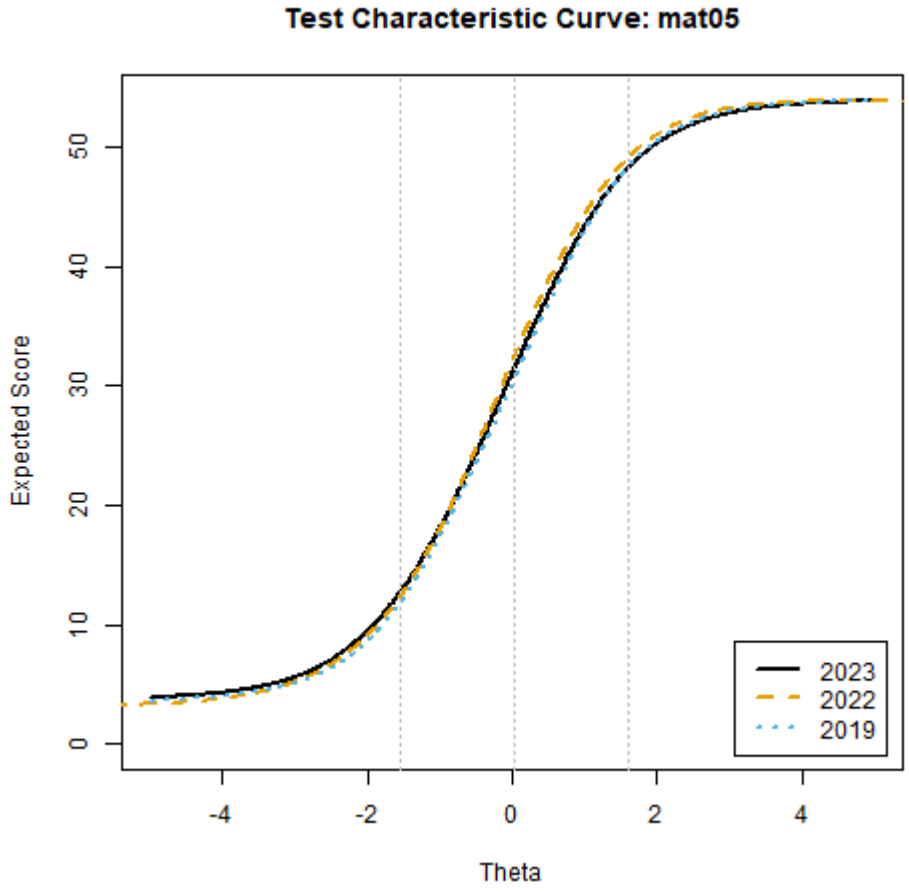
A/A Plot: Mathematics Grade 5

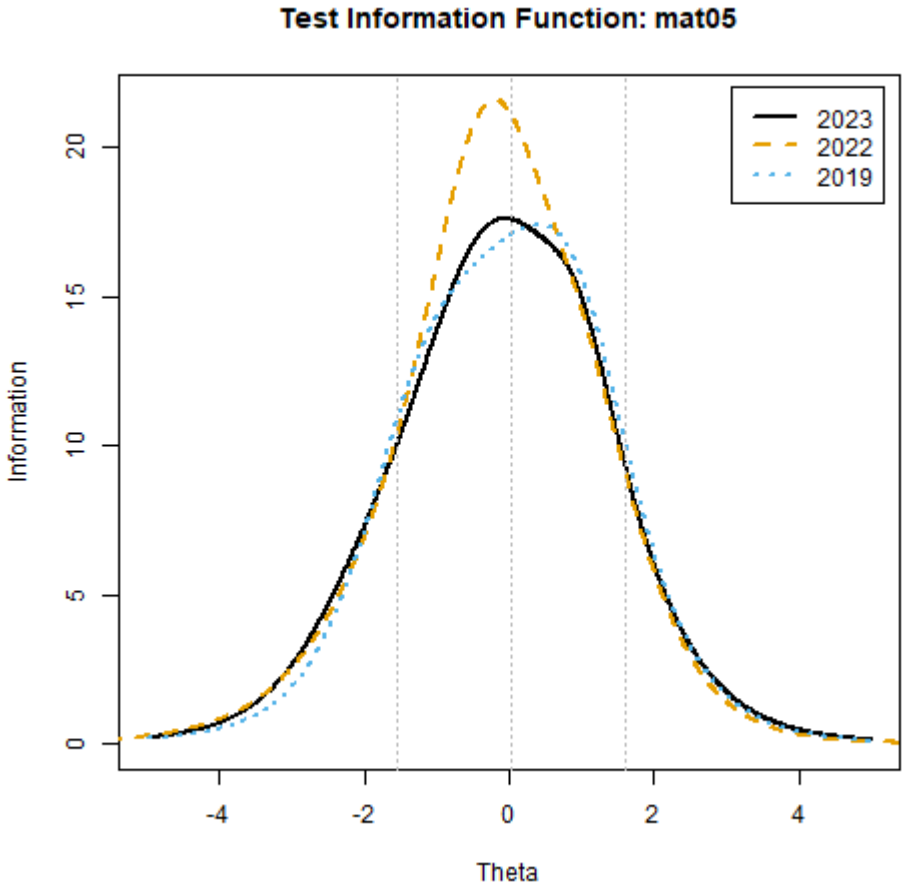


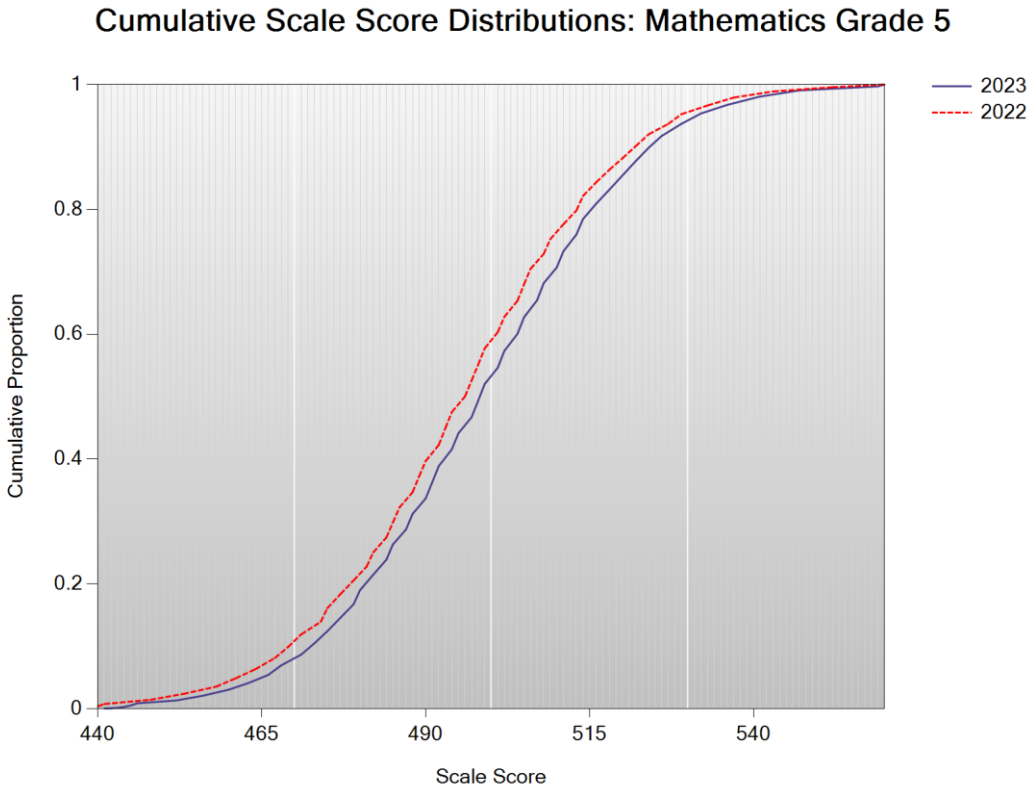
B/B Plot: Mathematics Grade 5

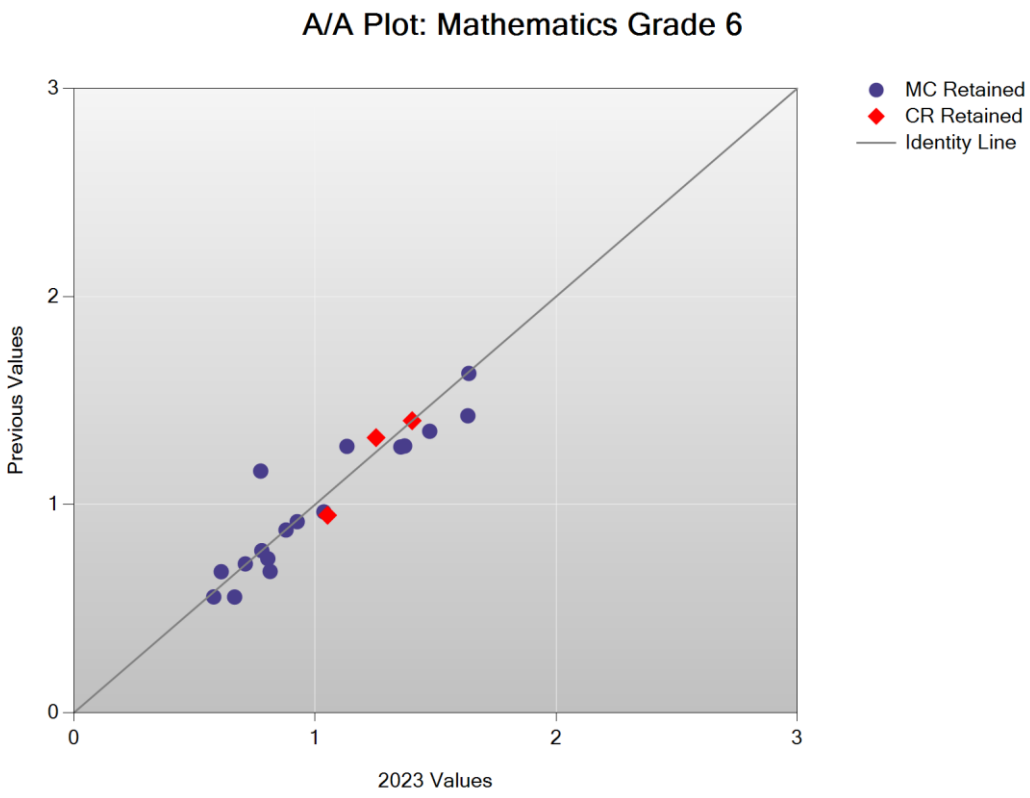


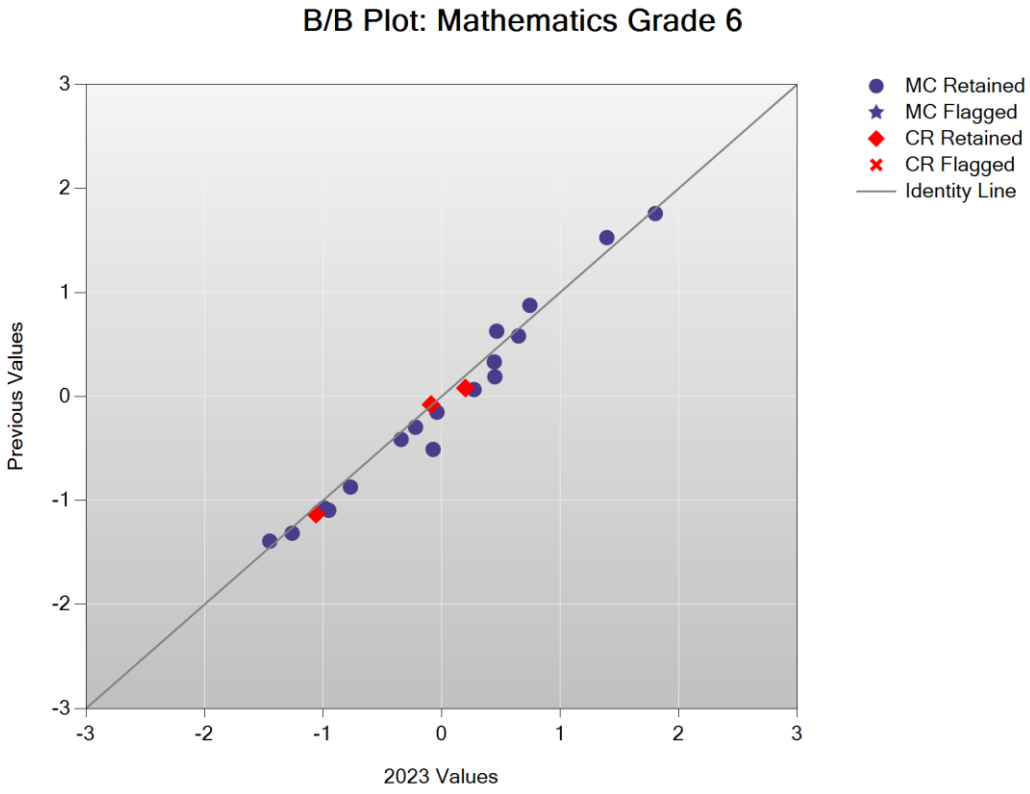

Delta Plot: Mathematics Grade 5
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24

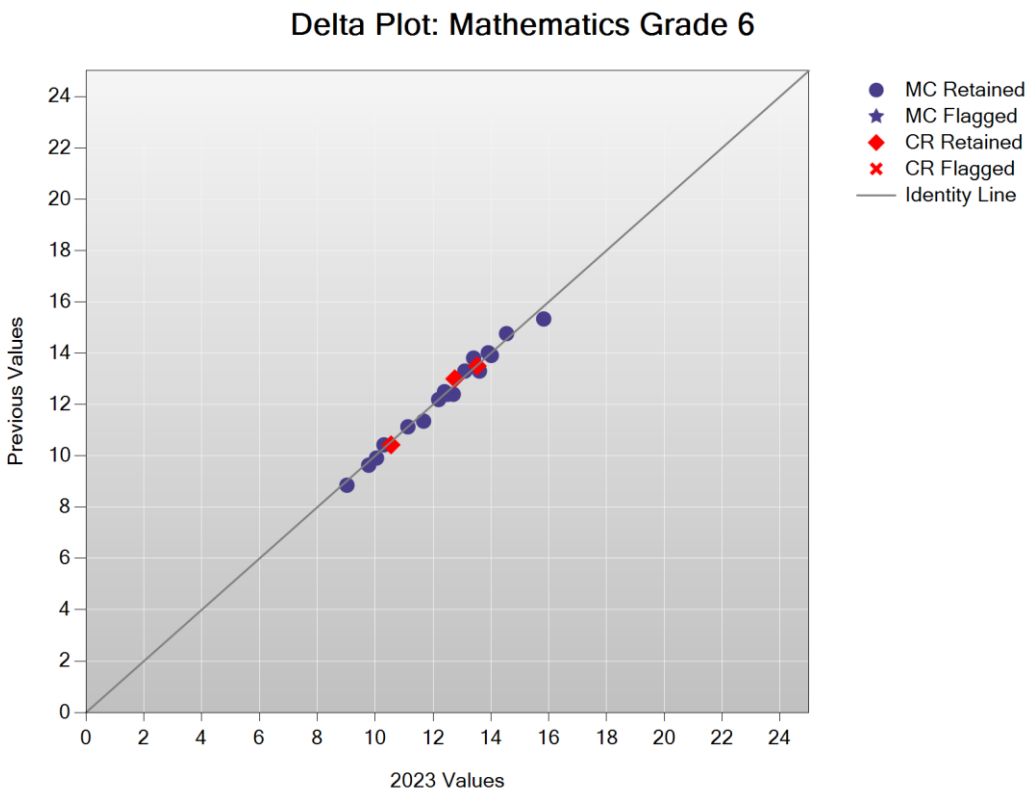

Test Characteristic Curve: mat05
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

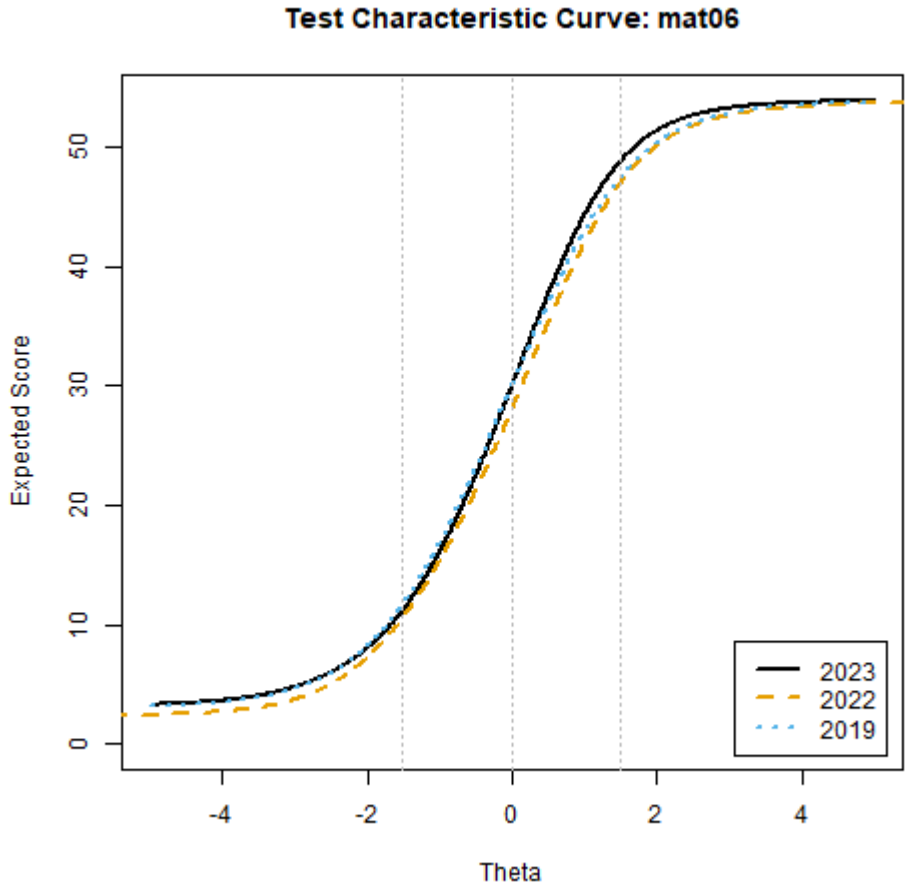

Test Information Function: mat05
2023
2022
2019
Information
0
5
10
15
20
-4
-2
0
2
4
Theta

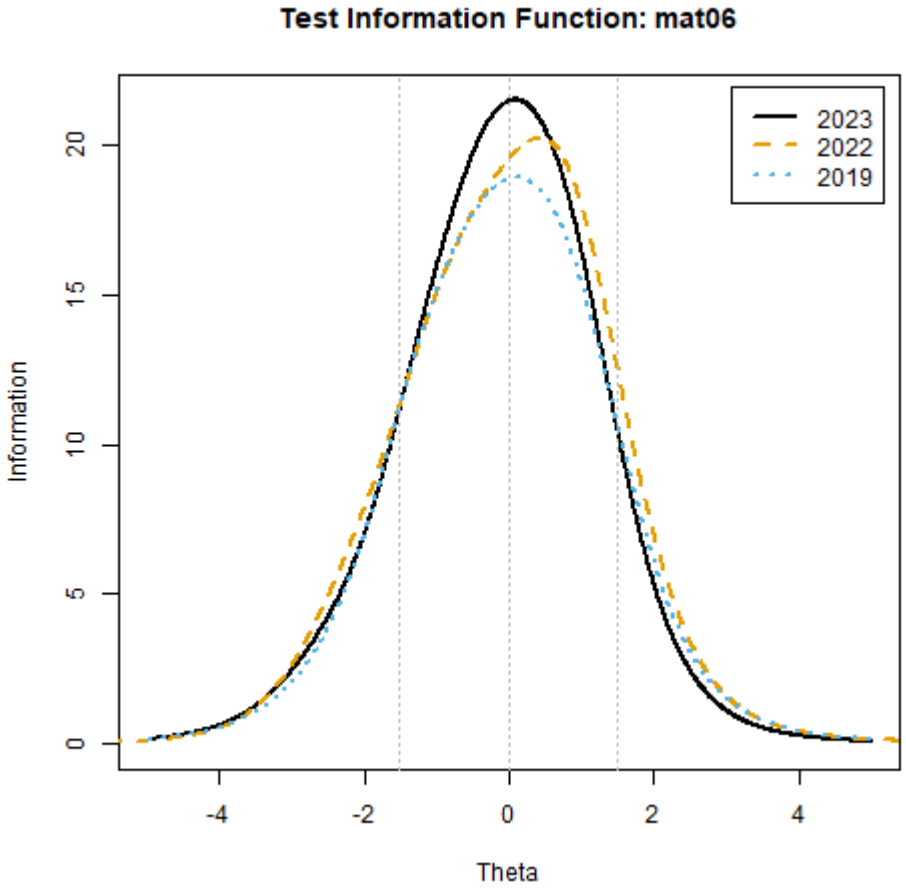

Cumulative Scale Score Distributions: Mathematics Grade 5
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

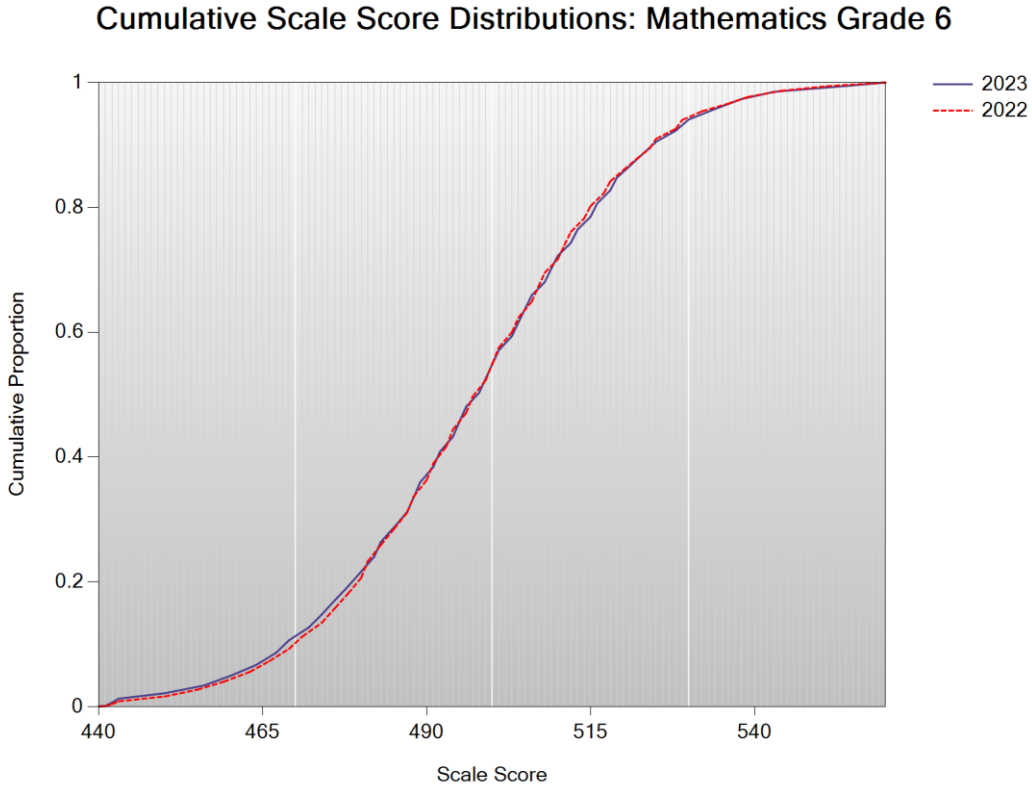

A/A Plot: Mathematics Grade 6
MC Retained
CR Retained
Identity Line
Previous Values
2023 Values
0
1
2
3

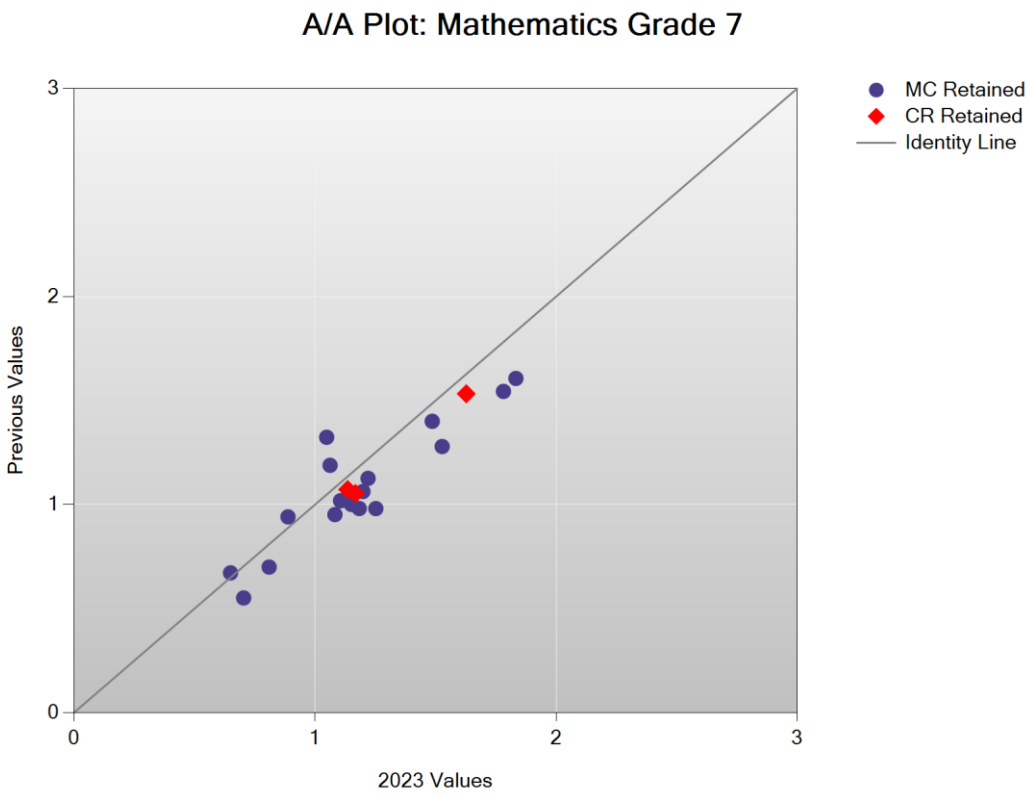

B/B Plot: Mathematics Grade 6
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
-3
-2
-1
0
1
2
3

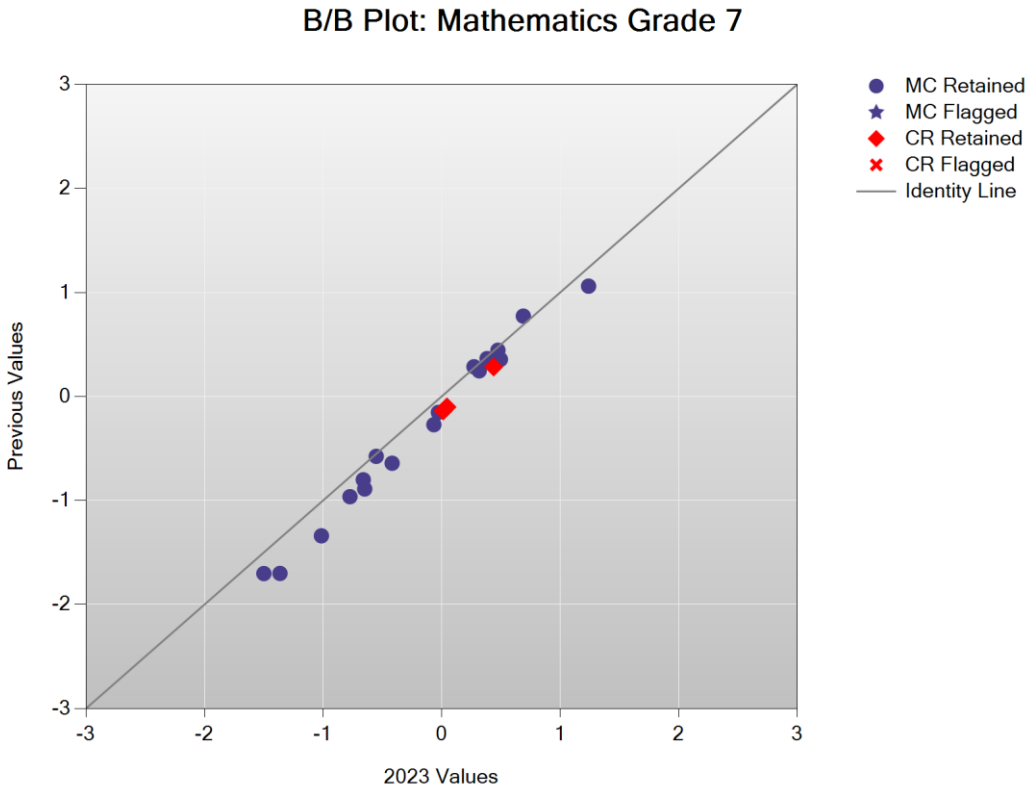

Delta Plot: Mathematics Grade 6
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24

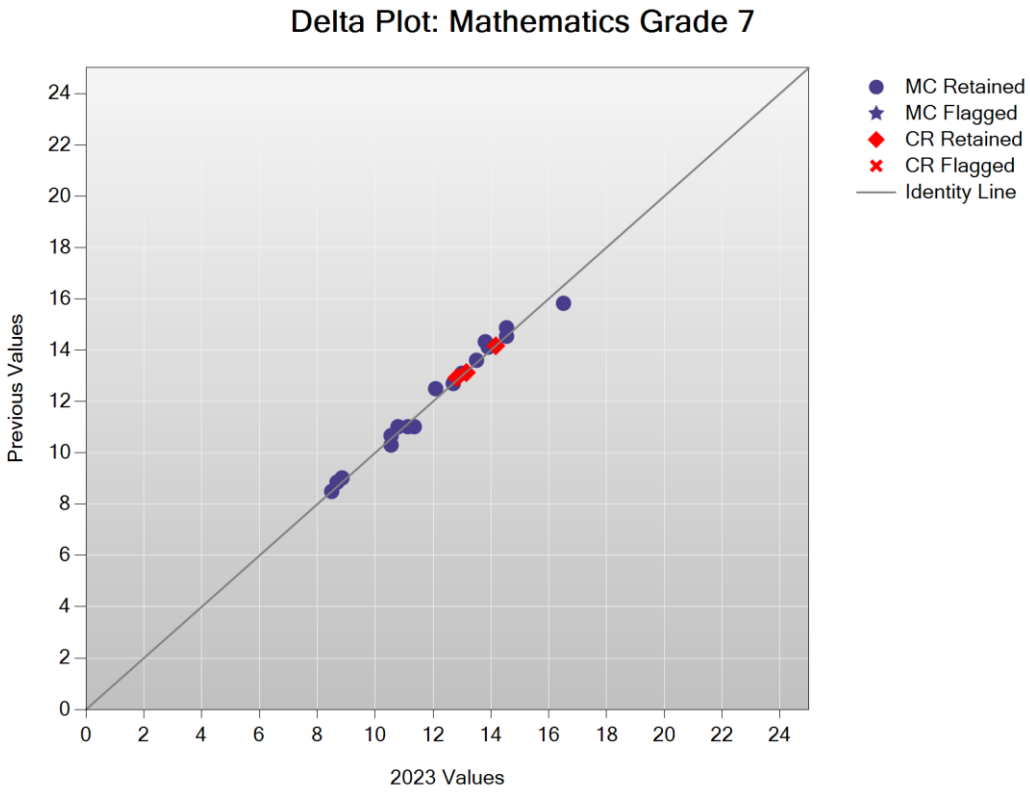

Test Characteristic Curve: mat06
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

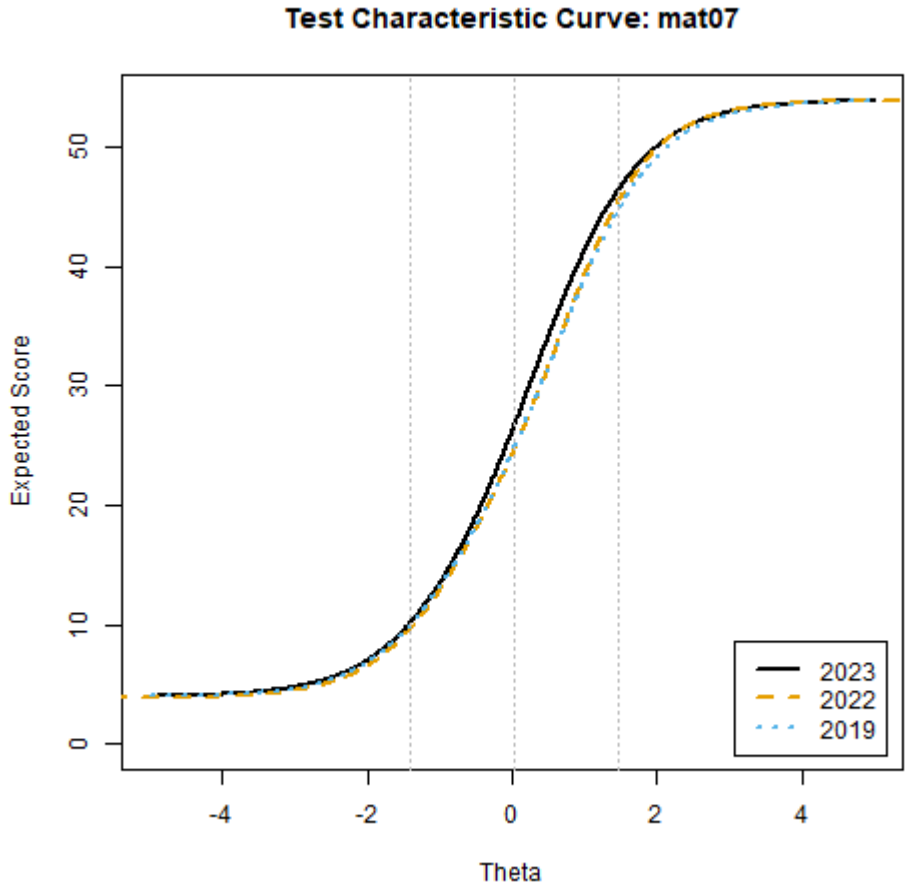

Test Information Function: mat06
2023
2022
2019
Information
0
5
10
15
20
-4
-2
0
2
4
Theta

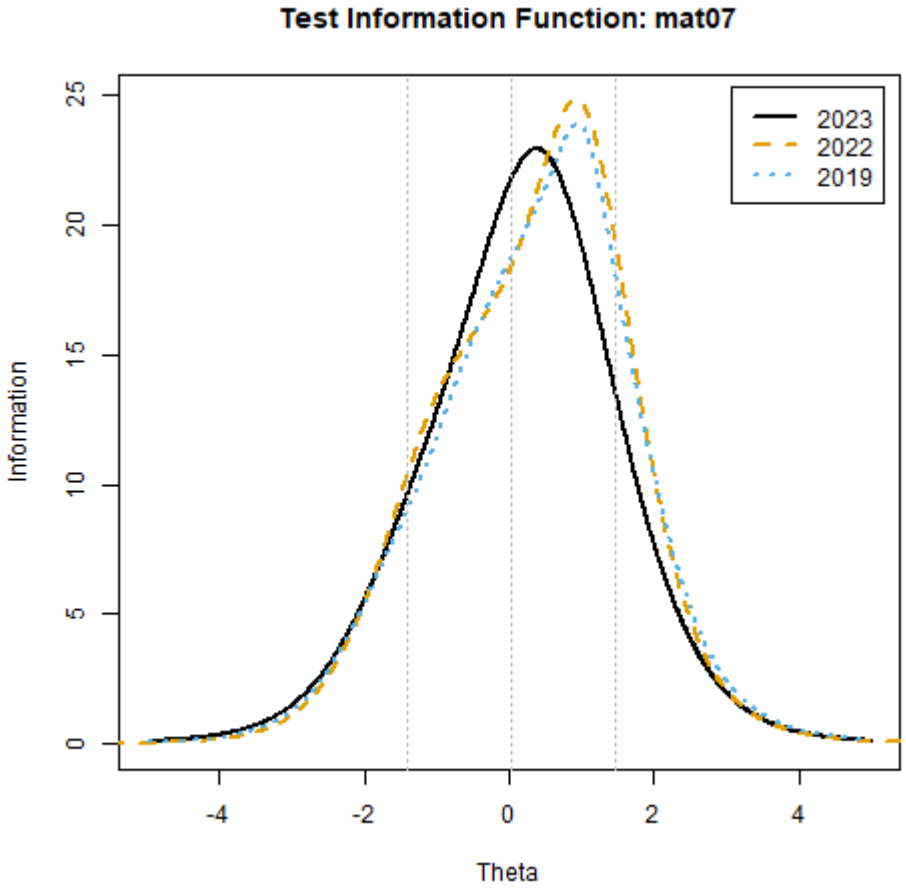

Cumulative Scale Score Distributions: Mathematics Grade 6
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

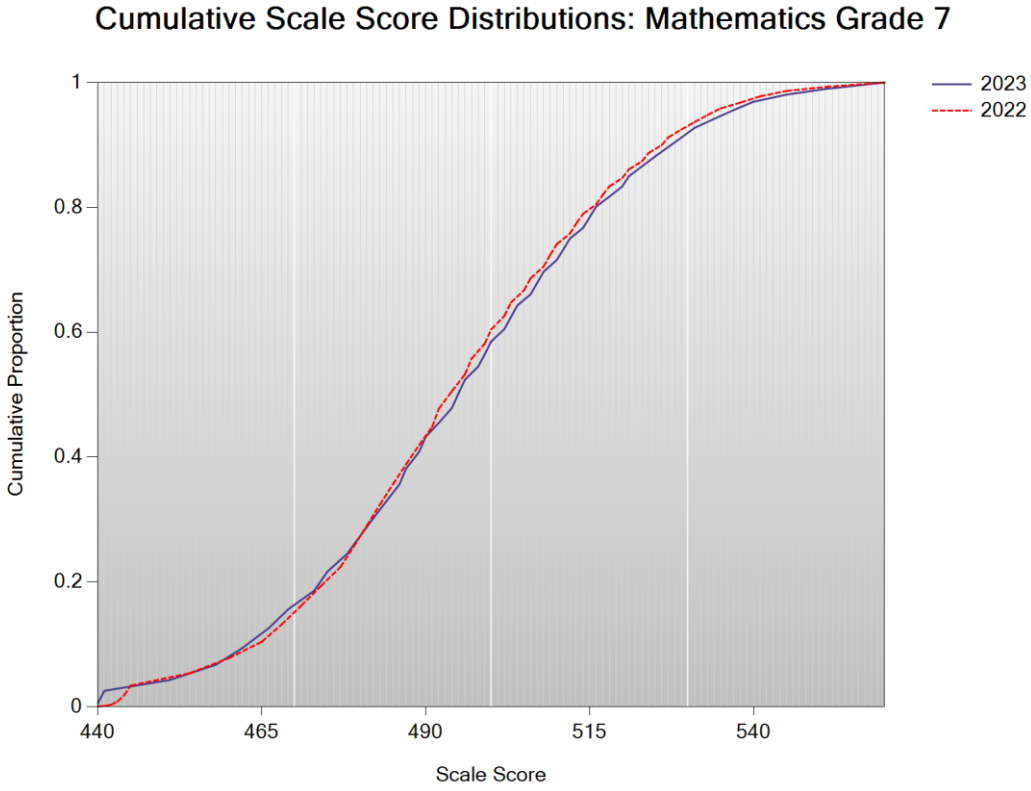

A/A Plot: Mathematics Grade 7
MC Retained
CR Retained
Identity Line
Previous Values
2023 Values
0
1
2
3


B/B Plot: Mathematics Grade 7
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
-3
-2
-1
0
1
2
3

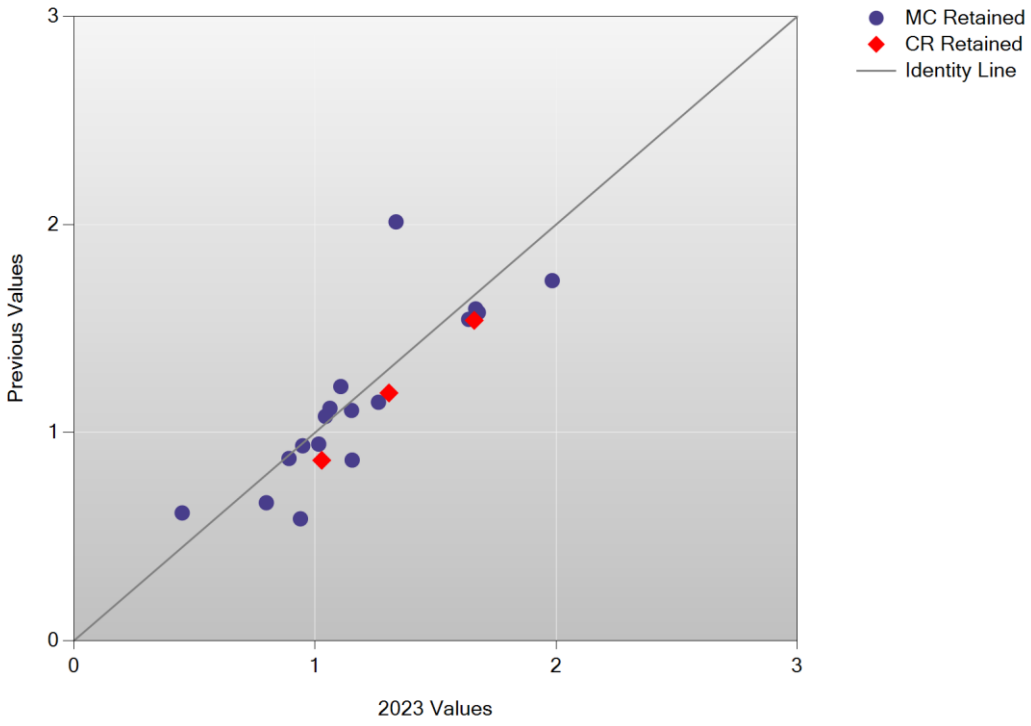

Delta Plot: Mathematics Grade 7
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: mat07
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

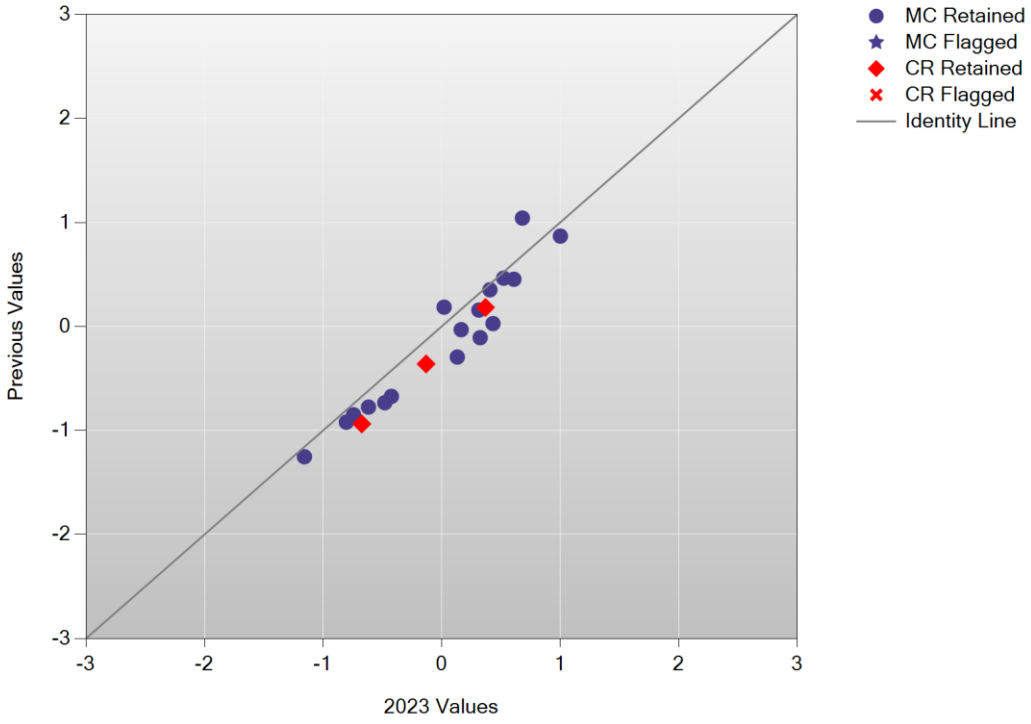

Test Information Function: mat07
2023
2022
2019
Information
0
5
10
15
20
25
-4
-2
0
2
4
Theta

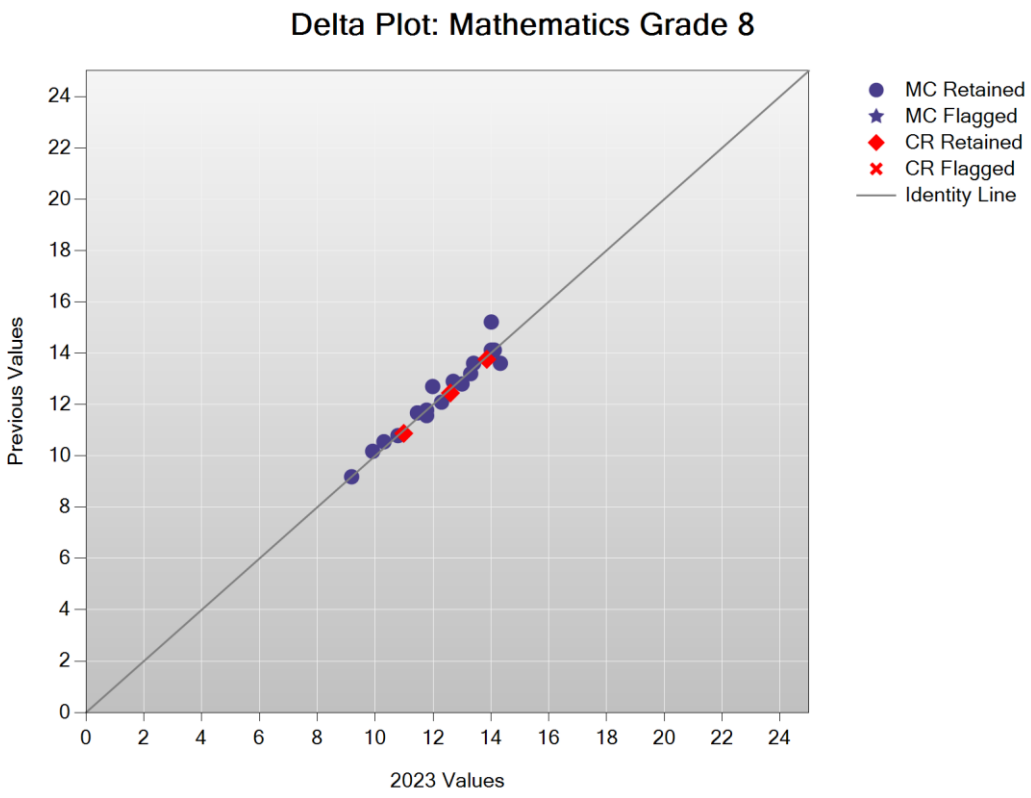

Cumulative Scale Score Distributions: Mathematics Grade 7
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

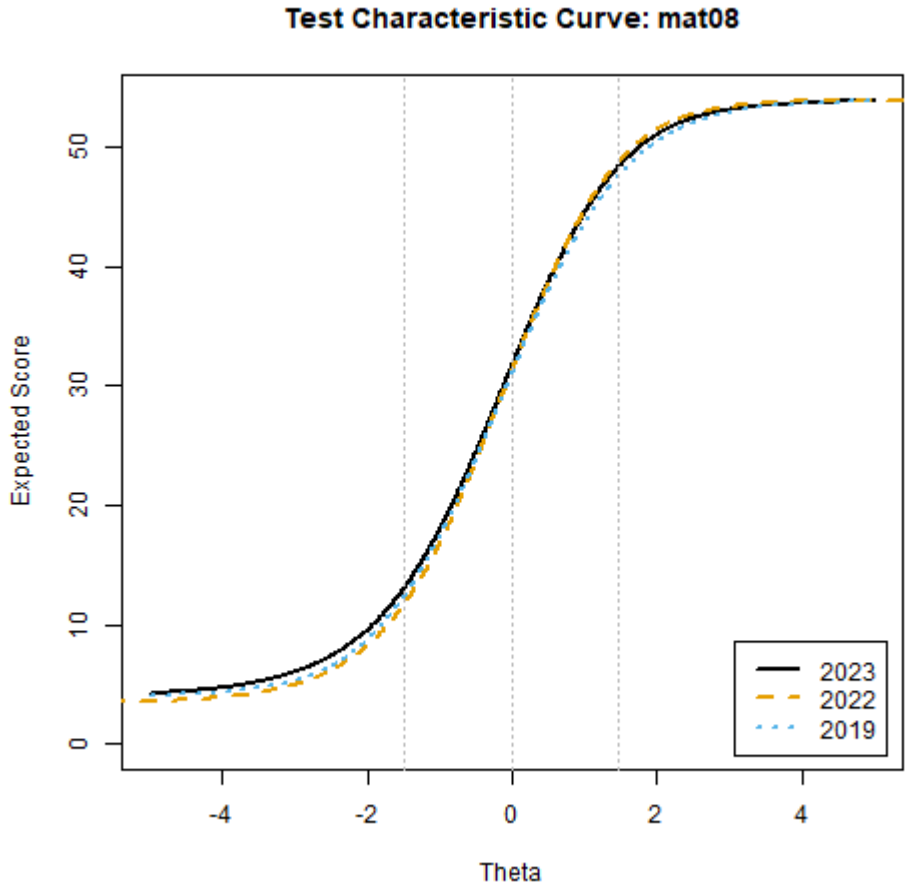
A/A Plot: Mathematics Grade 8

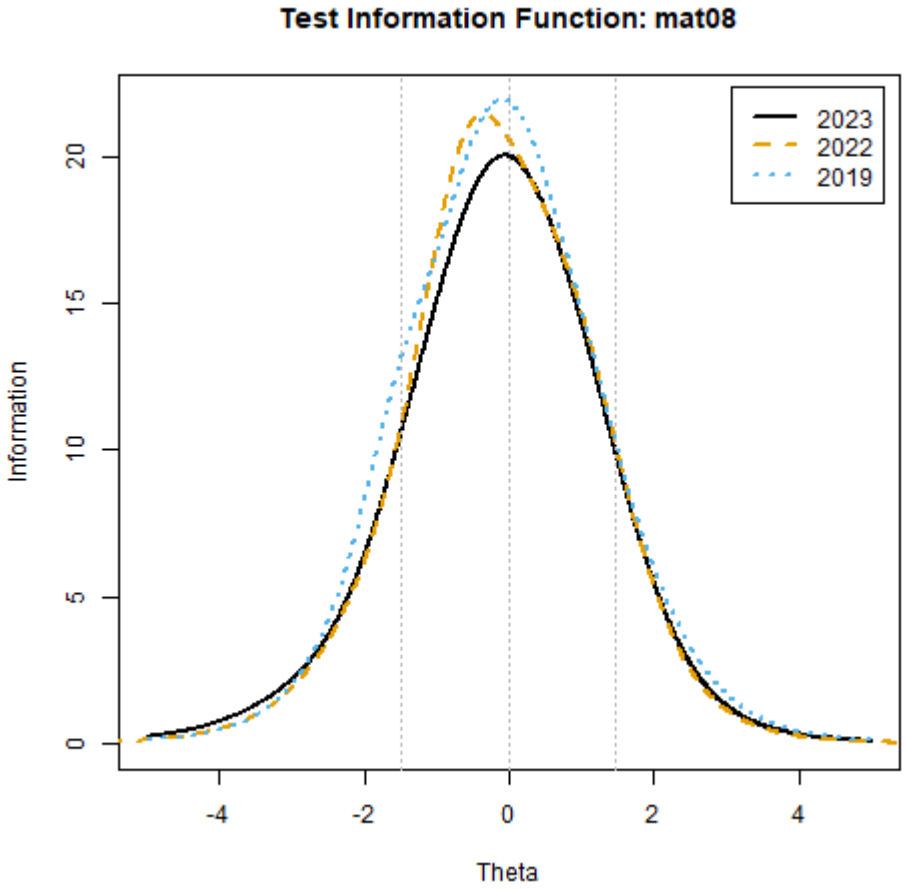


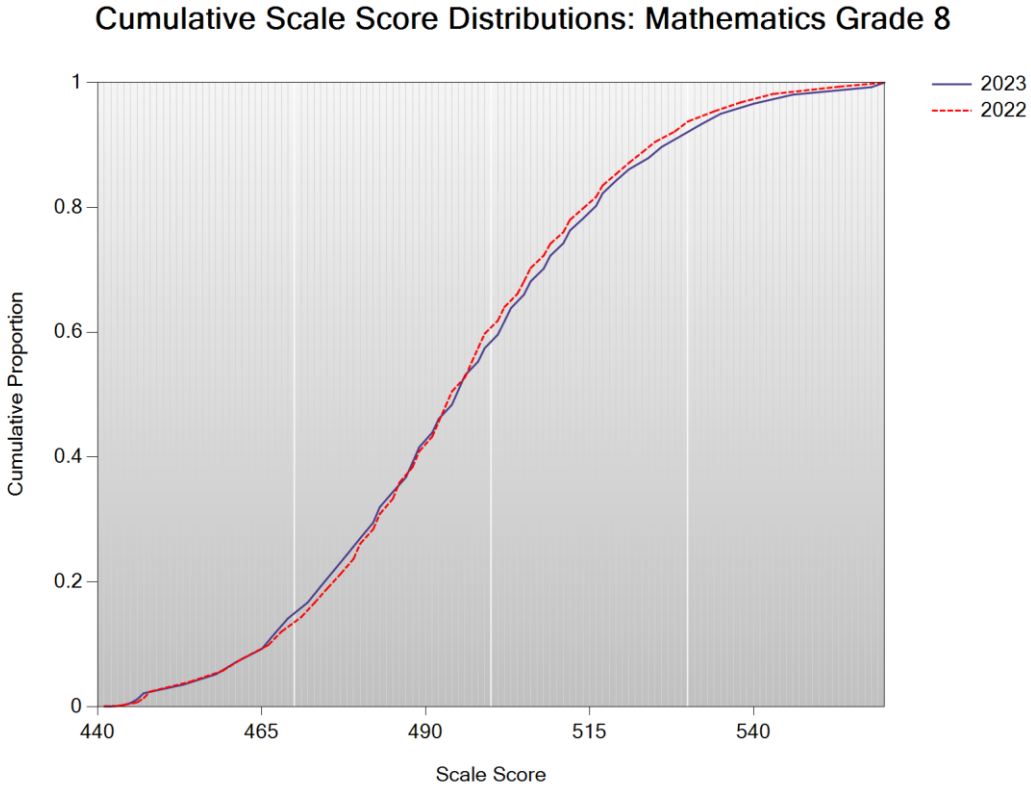
B/B Plot: Mathematics Grade 8



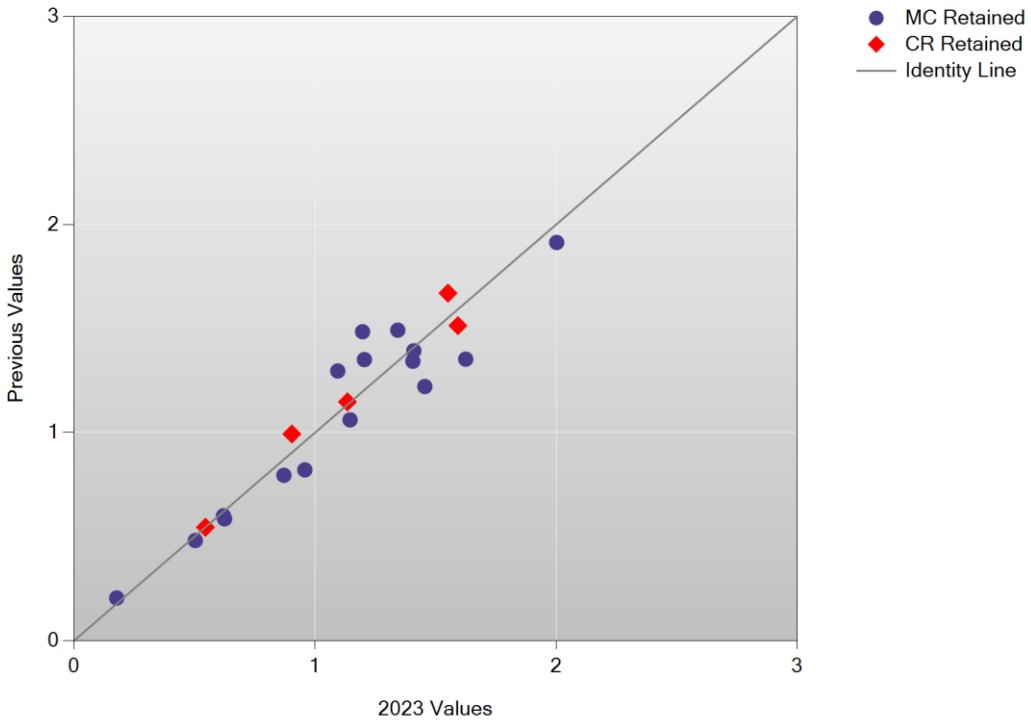

Delta Plot: Mathematics Grade 8
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: mat08
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

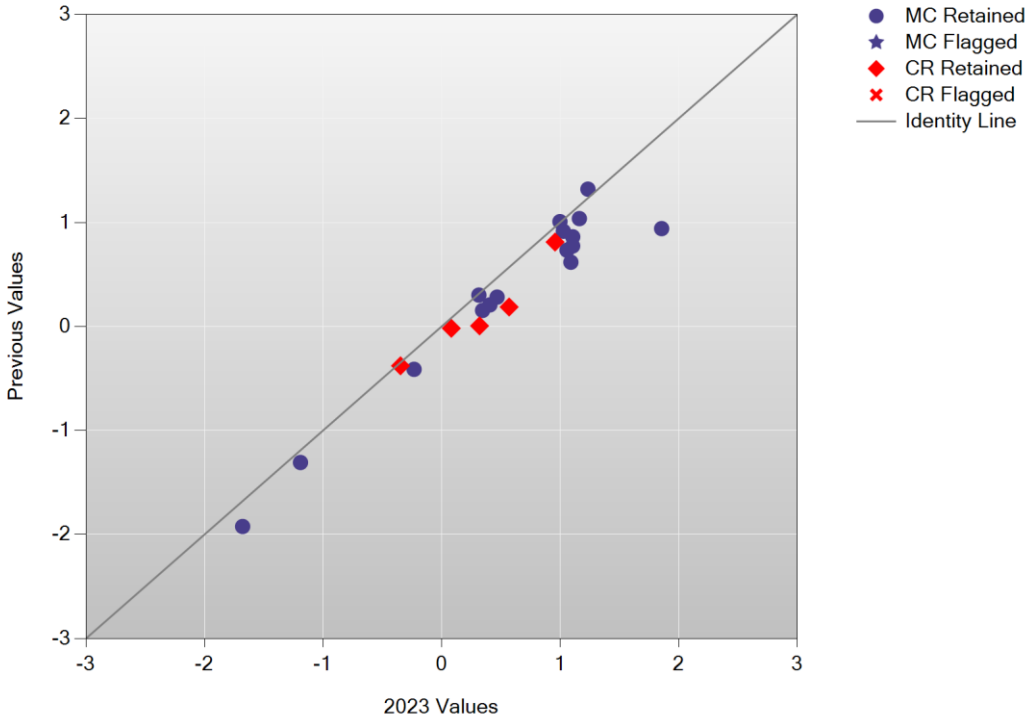

Test Information Function: mat08
2023
2022
2019
Information
0
5
10
15
20
-4
-2
0
2
4
Theta

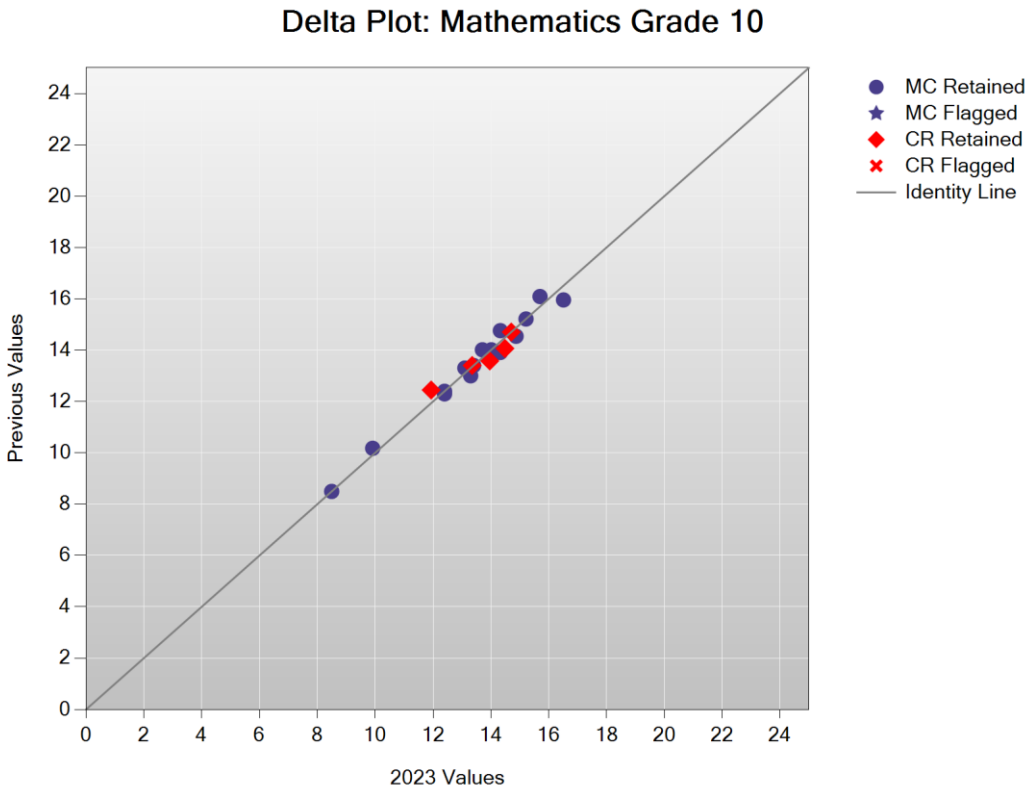

Cumulative Scale Score Distributions: Mathematics Grade 8
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

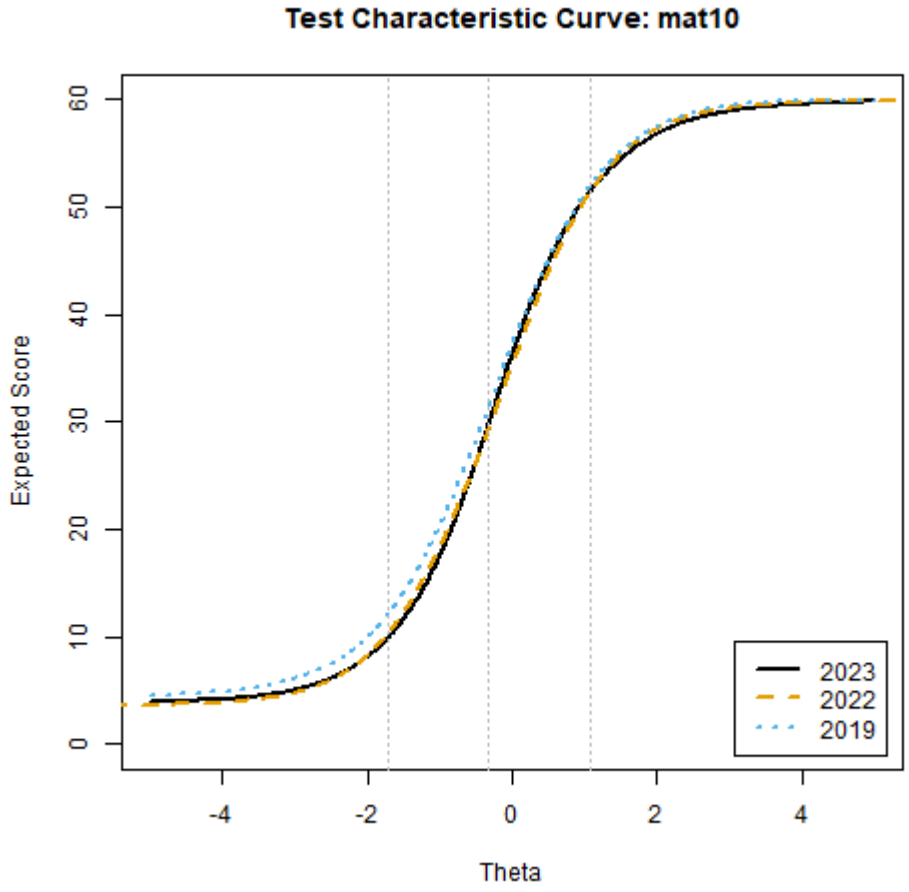
A/A Plot: Mathematics Grade 10

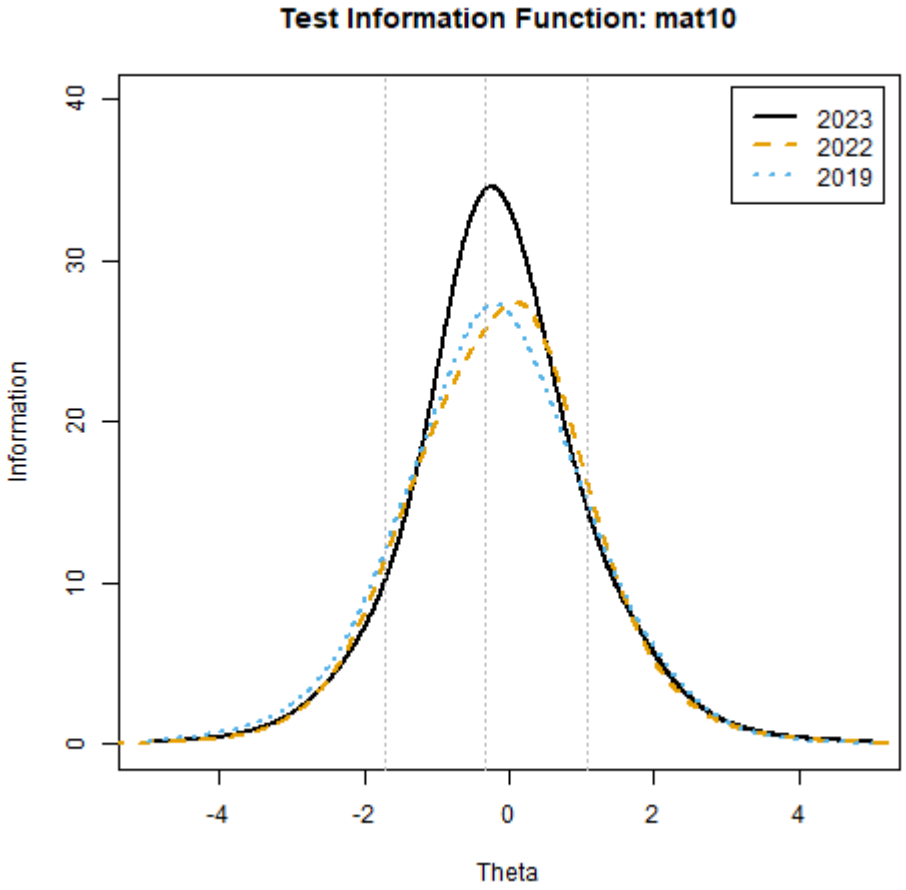


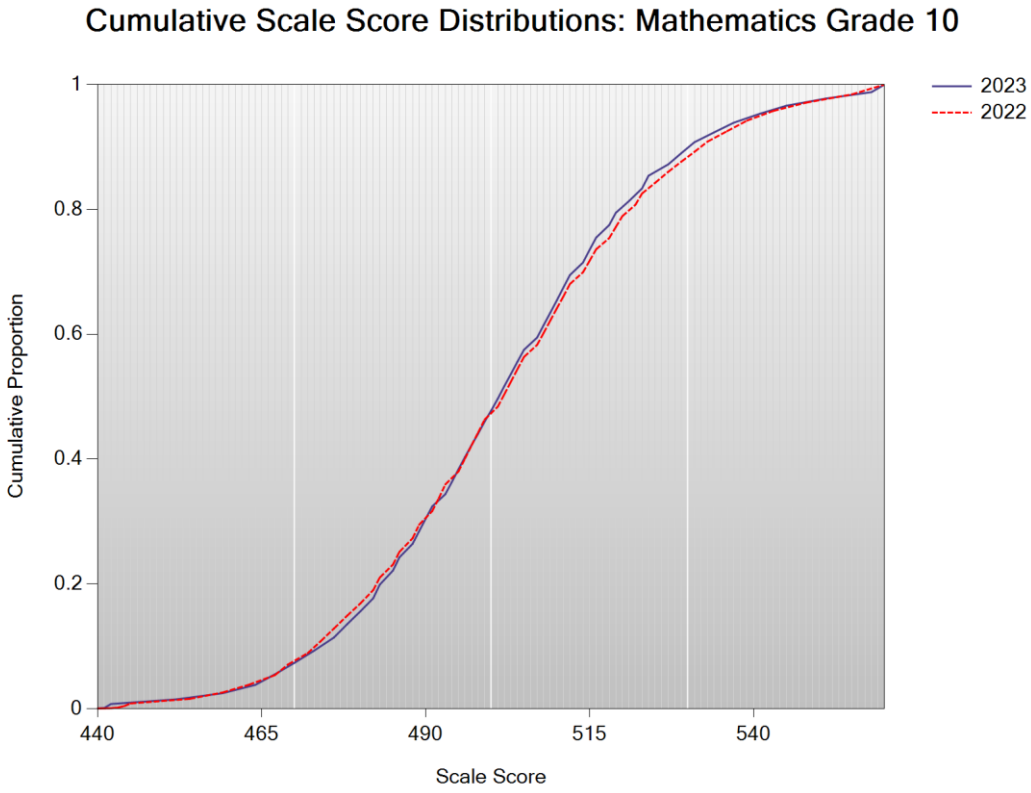
B/B Plot: Mathematics Grade 10

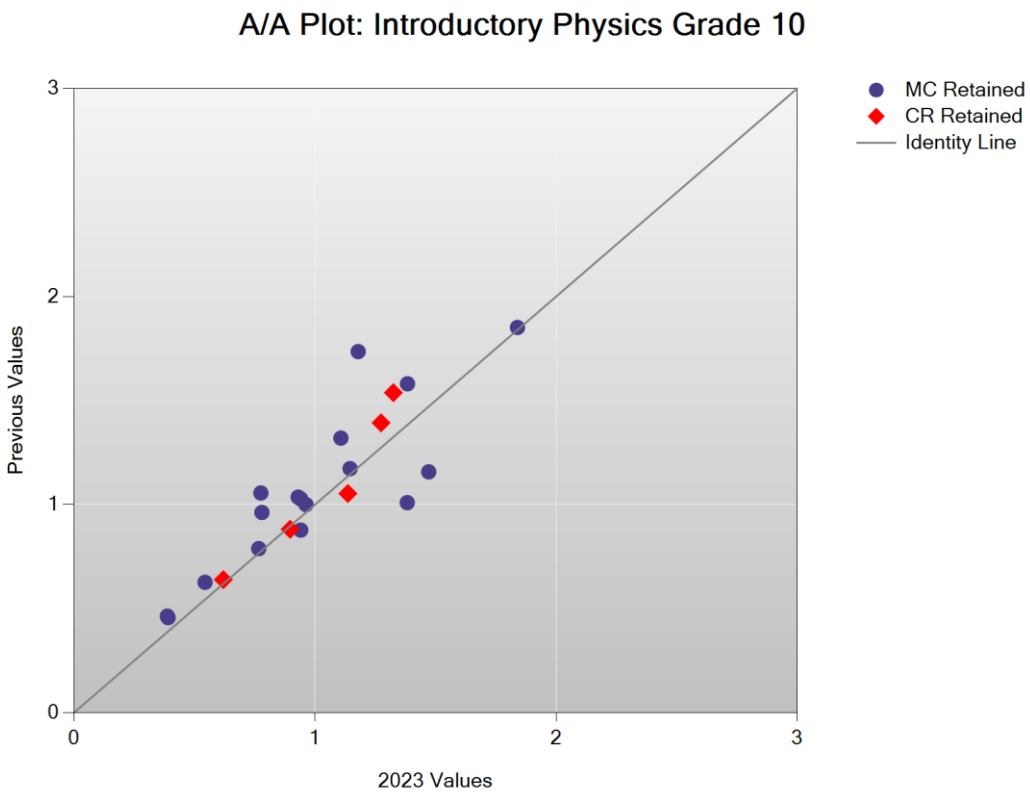


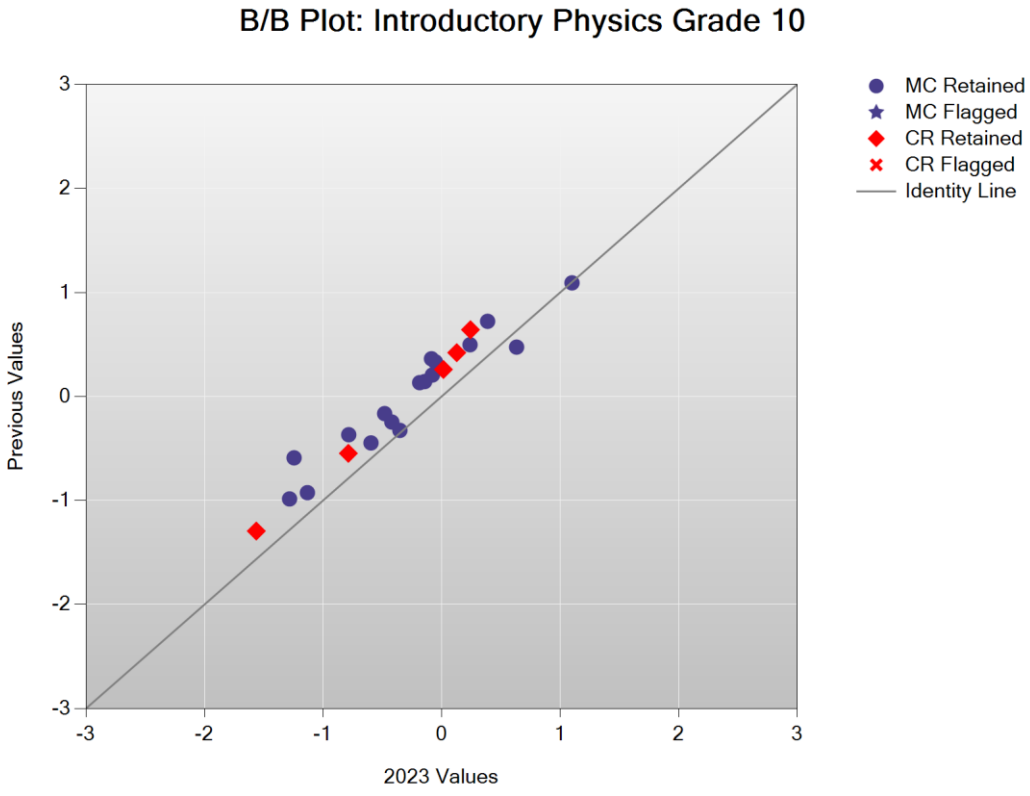

Delta Plot: Mathematics Grade 10
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24

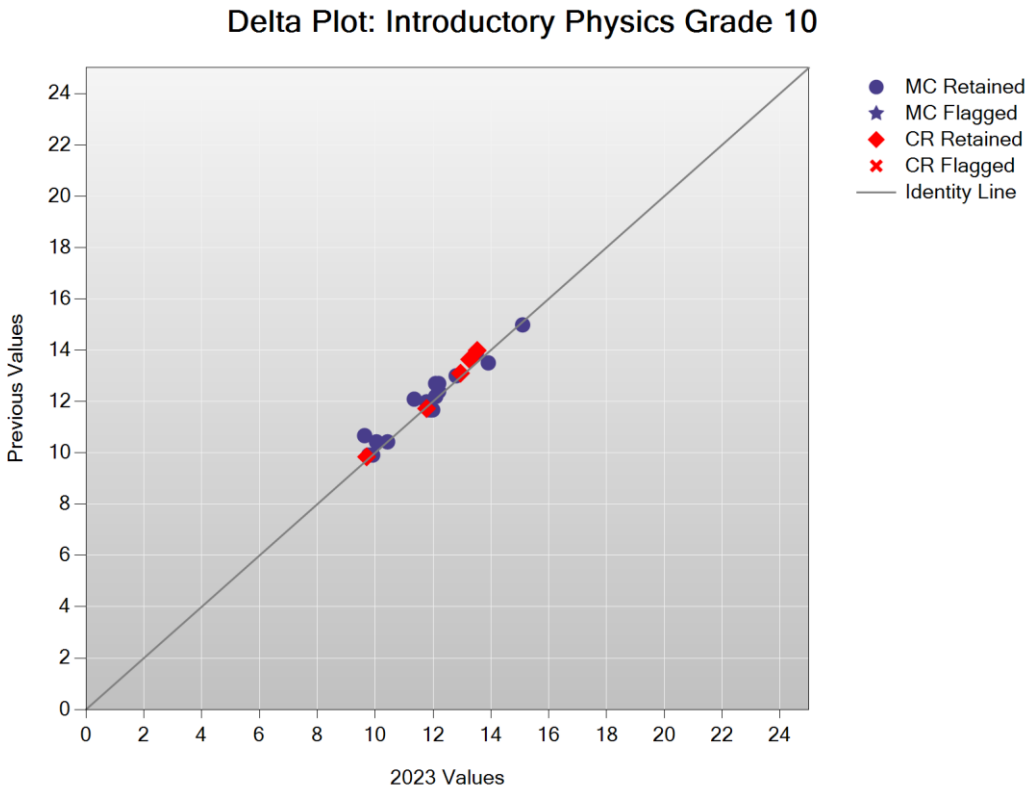

Test Characteristic Curve: mat10
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
60
-4
-2
0
2
4

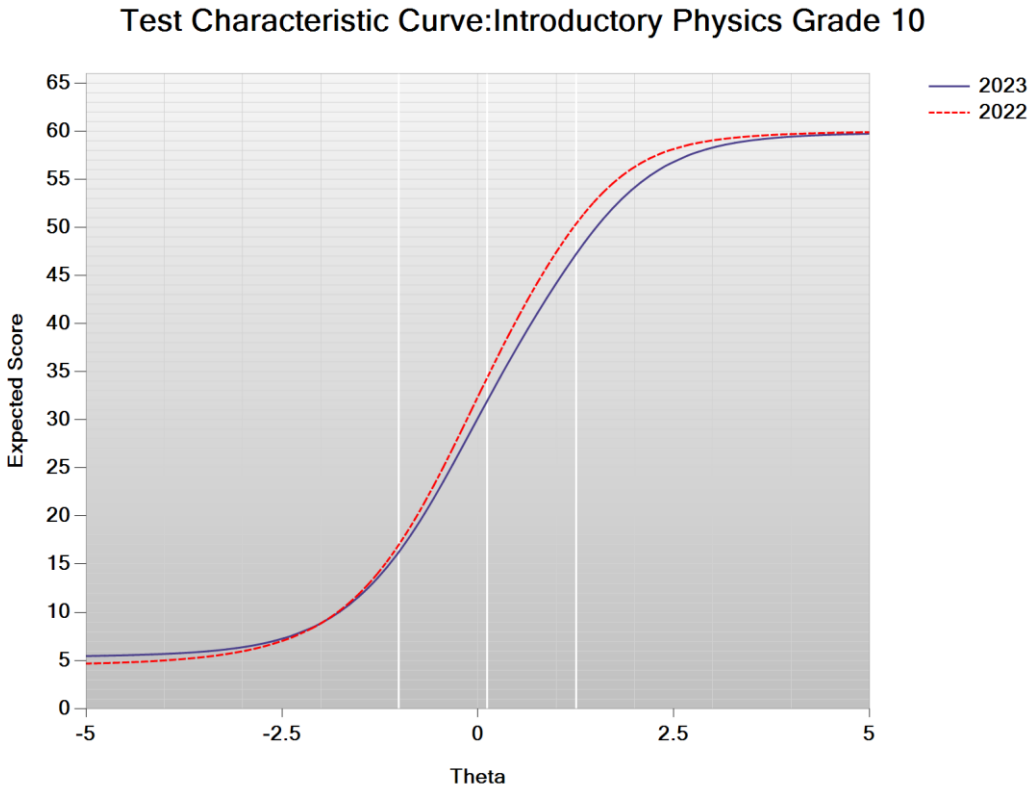

Test Information Function: mat10
2023
2022
2019
Information
0
10
20
30
40
-4
-2
0
2
4
Theta

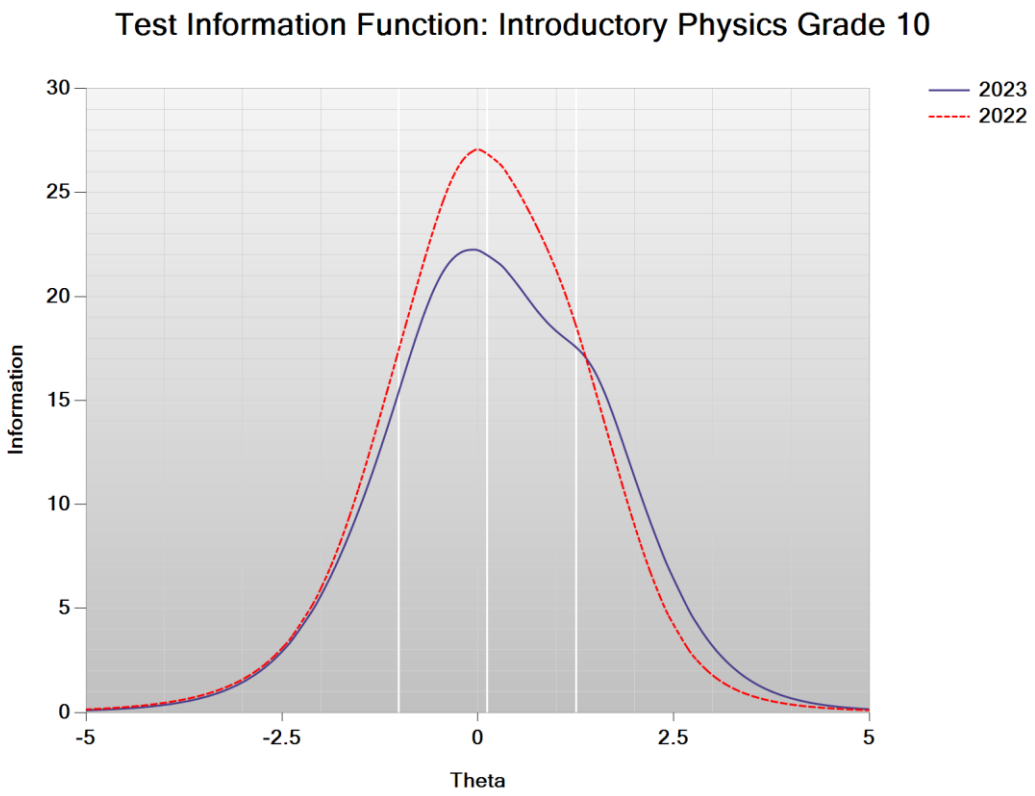

Cumulative Scale Score Distributions: Mathematics Grade 10
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

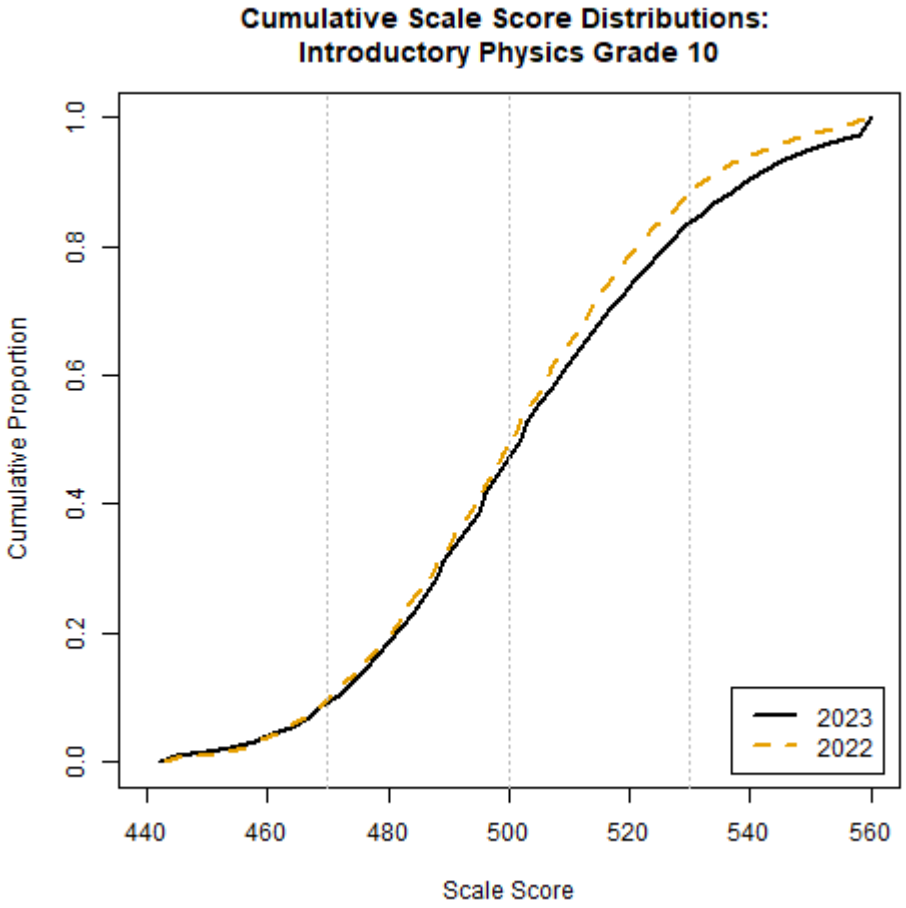

A/A Plot: Introductory Physics Grade 10
MC Retained
CR Retained
Identity Line
Previous Values
2023 Values
0
1
2
3


B/B Plot: Introductory Physics Grade 10
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
-3
-2
-1
0
1
2
3

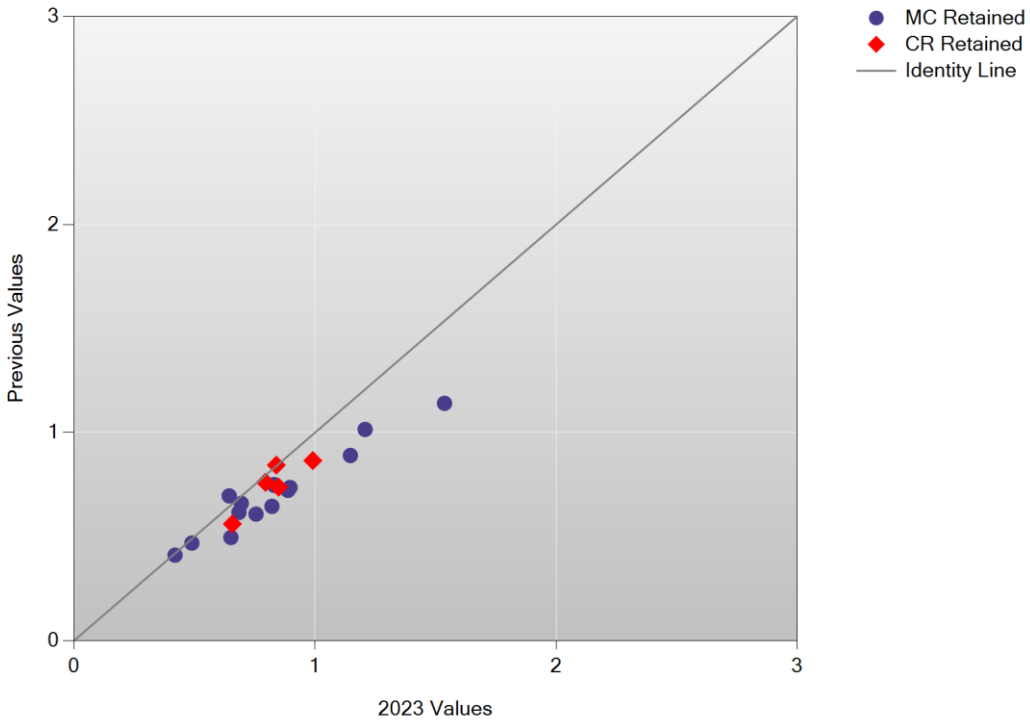

Delta Plot: Introductory Physics Grade 10
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve:Introductory Physics Grade 10
2023
2022
Expected Score
Theta
0
5
10
15
20
25
30
35
40
45
50
55
60
65
-5
-2.5
0
2.5
5

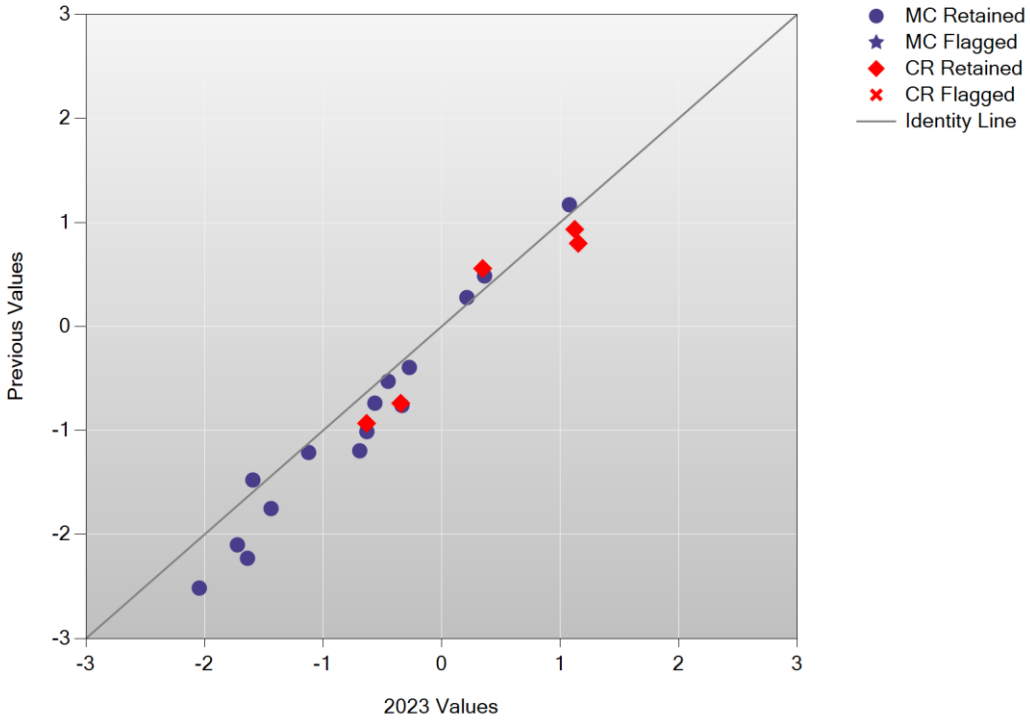

Test Information Function: Introductory Physics Grade 10
2023
2022
Information
Theta
30
25
20
15
10
5
0
-5
-2.5
0
2.5
5

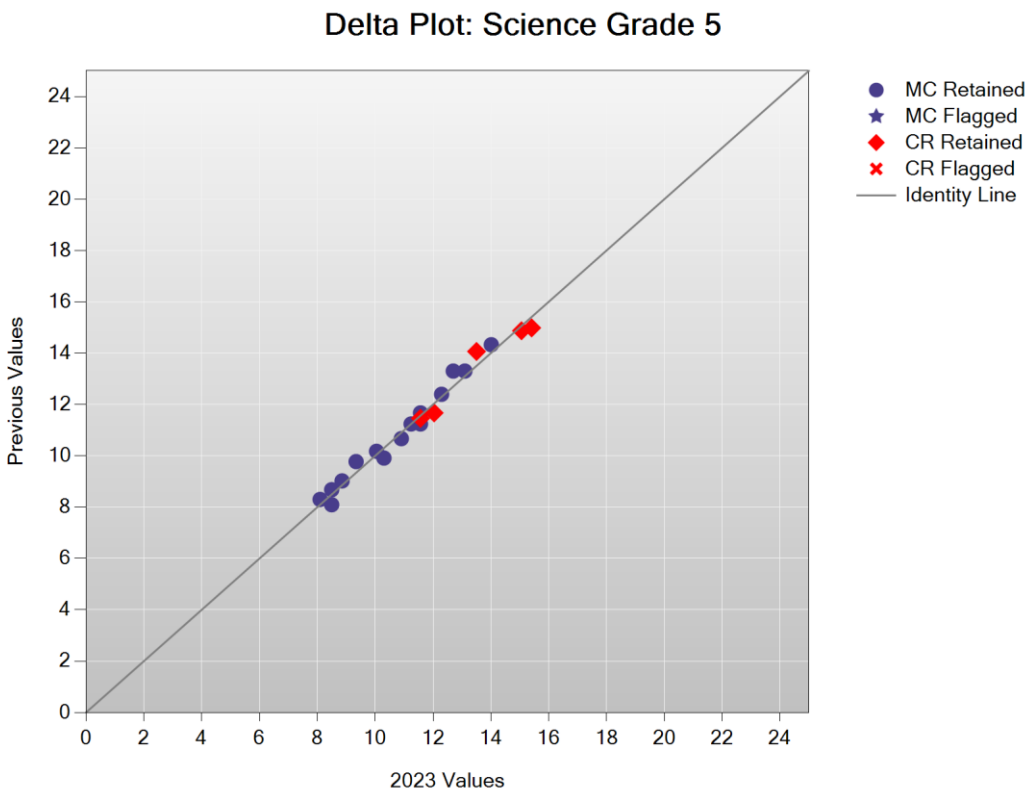

Cumulative Scale Score Distributions:
Introductory Physics Grade 10
Cumulative Proportion
Scale Score
2023
2022
0.0
0.2
0.4
0.6
0.8
1.0
440
460
480
500
520
540
560

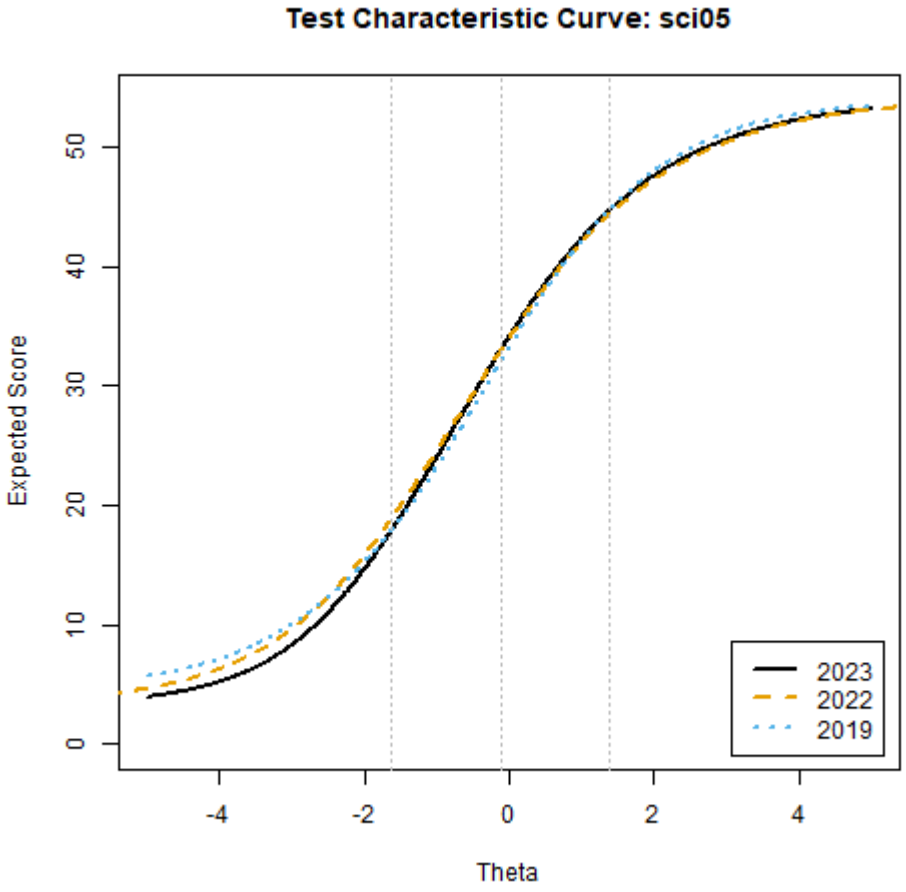
A/A Plot: Science Grade 5

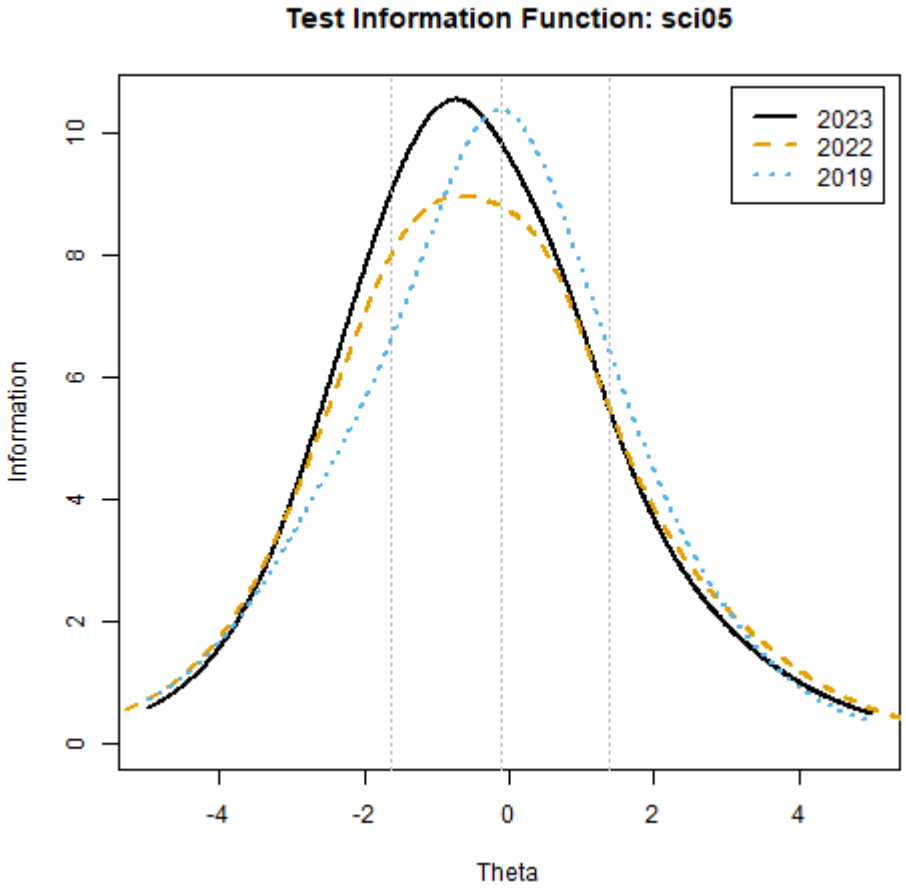


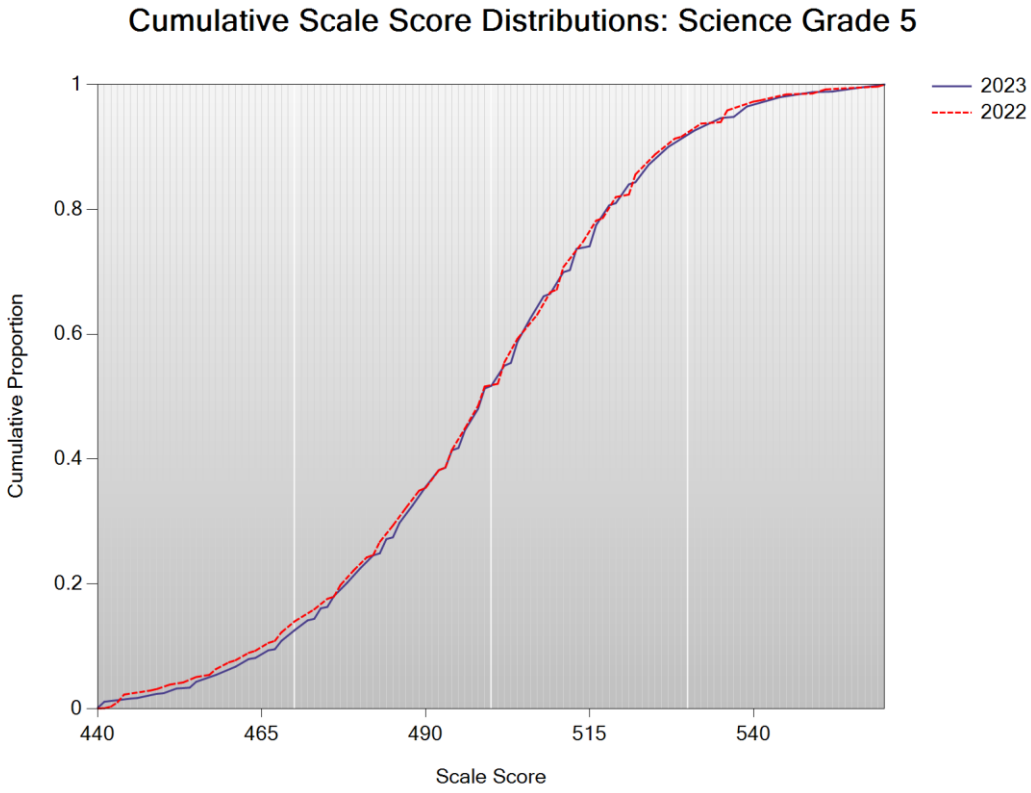
B/B Plot: Science Grade 5



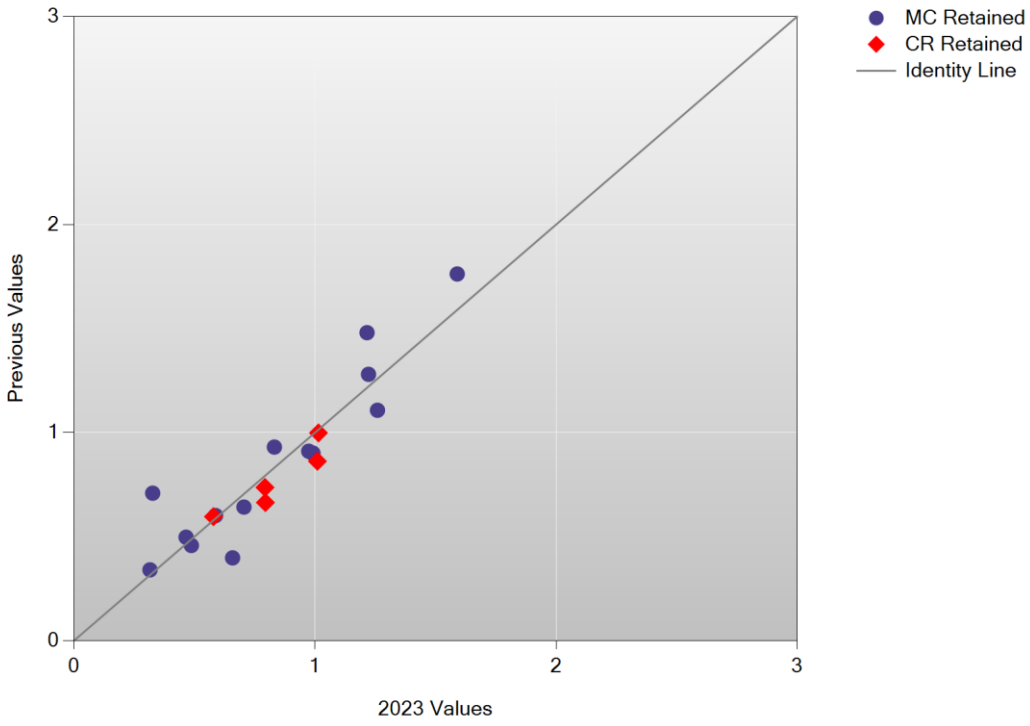

Delta Plot: Science Grade 5
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: sci05
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4

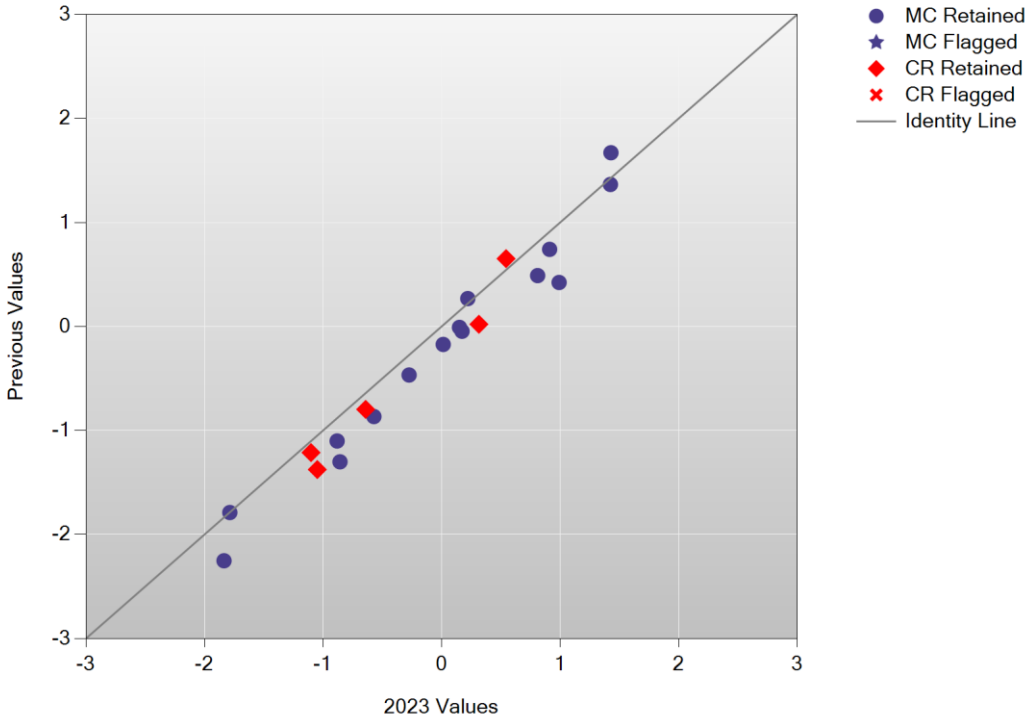

Test Information Function: sci05
2023
2022
2019
Information
0
2
4
6
8
10
-4
-2
0
2
4
Theta

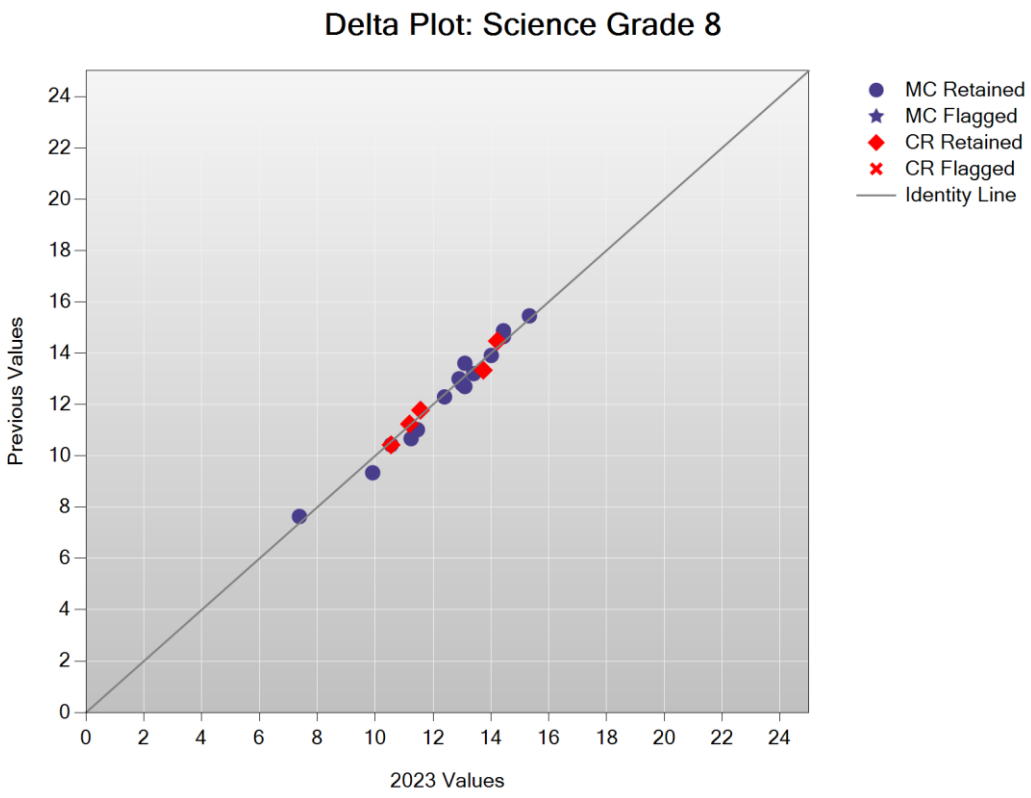

Cumulative Scale Score Distributions: Science Grade 5
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

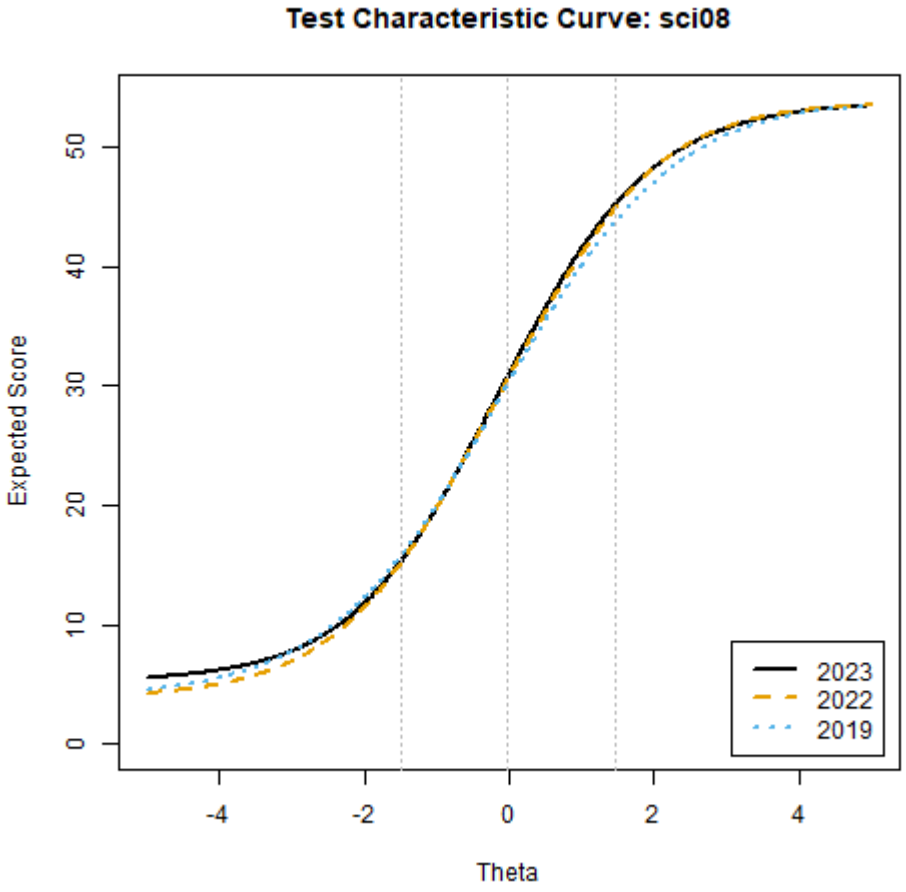
A/A Plot: Science Grade 8

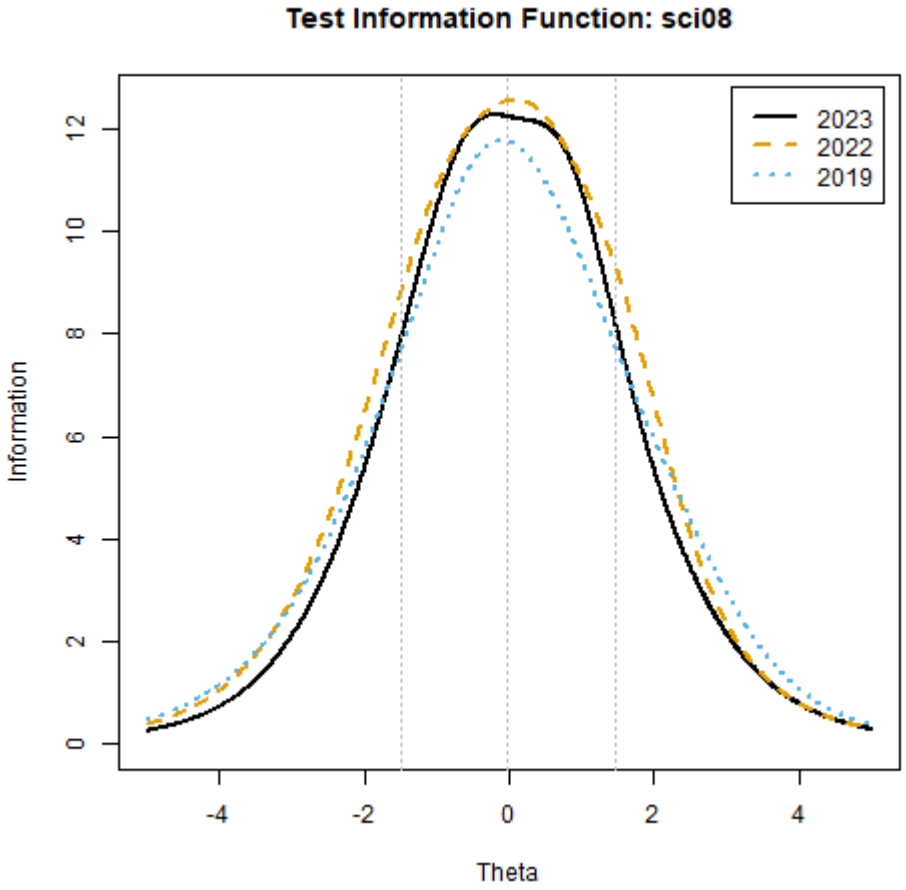


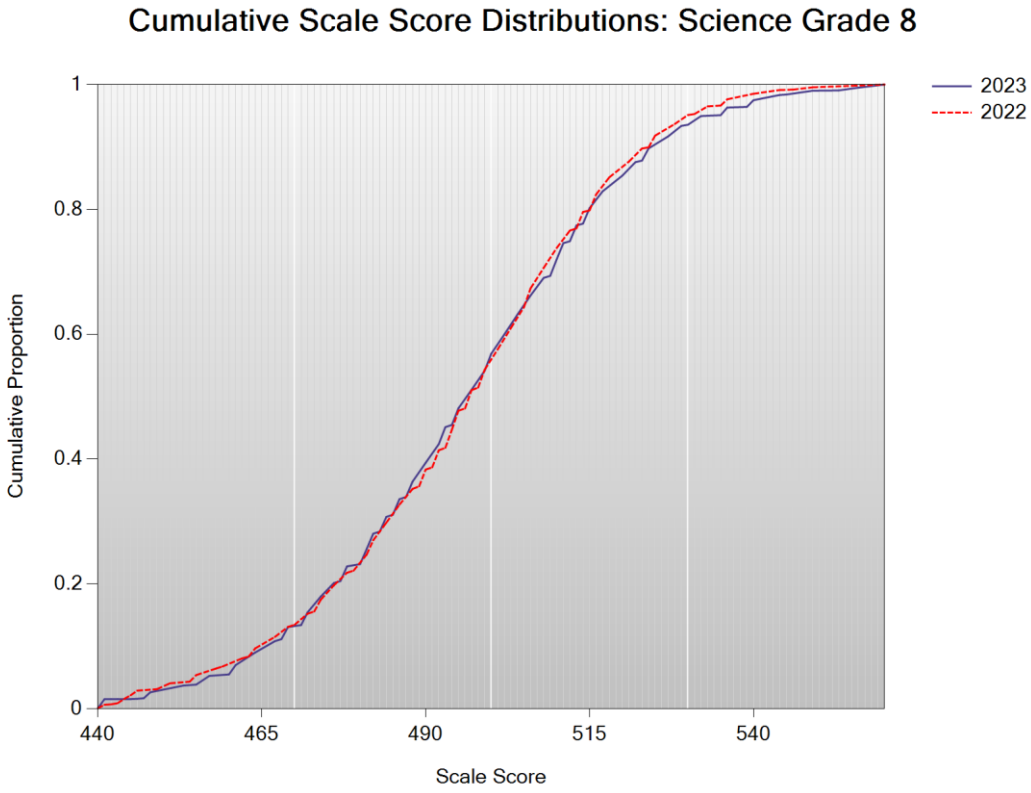
B/B Plot: Science Grade 8




Delta Plot: Science Grade 8
MC Retained
MC Flagged
CR Retained
CR Flagged
Identity Line
Previous Values
2023 Values
0
2
4
6
8
10
12
14
16
18
20
22
24


Test Characteristic Curve: sci08
Expected Score
Theta
2023
2022
2019
0
10
20
30
40
50
-4
-2
0
2
4


Test Information Function: sci08
2023
2022
2019
Information
0
2
4
6
8
10
12
-4
-2
0
2
4
Theta


Cumulative Scale Score Distributions: Science Grade 8
2023
2022
Cumulative Proportion
0
0.2
0.4
0.6
0.8
1
440
465
490
515
540
Scale Score

Section 2.2

Lookup Tables

Table 2.2.1
Raw Score to Scale Score Lookup Table
Biology Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-1.925	5.00	10.0	440	1	440	1
1	-1.906	5.11	10.0	441	1	440	1
2	-1.888	5.22	10.0	441	1	440	1
3	-1.869	5.33	10.0	442	1	440	1
4	-1.850	5.45	10.0	442	1	440	1
5	-1.831	5.57	10.0	443	1	441	1
6	-1.813	5.69	10.0	443	1	441	1
7	-1.794	5.82	10.0	444	1	441	1
8	-1.775	5.94	10.0	444	1	446	1
9	-1.756	6.08	10.0	445	1	450	1
10	-1.582	7.47	10.0	450	1	453	1
11	-1.433	8.91	9.3	454	1	456	1
12	-1.302	10.39	8.7	457	1	459	1
13	-1.186	11.86	8.1	461	1	461	1
14	-1.081	13.31	7.6	464	1	464	1
15	-0.985	14.73	7.3	466	1	466	1
16	-0.896	16.10	7.0	469	1	468	1
17	-0.813	17.41	6.7	471	2	470	2
18	-0.735	18.65	6.5	473	2	472	2
19	-0.661	19.81	6.3	475	2	474	2
20	-0.590	20.90	6.1	477	2	476	2
21	-0.523	21.90	6.0	479	2	478	2
22	-0.458	22.81	5.8	481	2	479	2
23	-0.395	23.65	5.7	483	2	481	2
24	-0.334	24.40	5.6	484	2	483	2
25	-0.274	25.08	5.6	486	2	485	2
26	-0.216	25.66	5.5	488	2	486	2
27	-0.158	26.17	5.5	489	2	488	2
28	-0.102	26.58	5.4	491	2	490	2
29	-0.045	26.91	5.4	492	2	491	2
30	0.010	27.15	5.4	494	2	493	2
31	0.066	27.30	5.3	496	2	495	2
32	0.122	27.38	5.3	497	2	496	2
33	0.177	27.38	5.3	499	2	498	2
34	0.233	27.32	5.3	500	3	500	3
35	0.289	27.20	5.4	502	3	501	3
36	0.346	27.02	5.4	503	3	503	3
37	0.403	26.81	5.4	505	3	505	3

Table 2.2.1 (continued)
Raw Score to Scale Score Lookup Table
Biology Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
38	0.460	26.54	5.4	507	3	507	3
39	0.519	26.24	5.4	508	3	508	3
40	0.578	25.89	5.5	510	3	510	3
41	0.639	25.50	5.5	512	3	512	3
42	0.700	25.06	5.6	513	3	514	3
43	0.764	24.57	5.6	515	3	516	3
44	0.828	24.03	5.7	517	3	518	3
45	0.895	23.44	5.8	519	3	520	3
46	0.964	22.78	5.8	521	3	522	3
47	1.035	22.04	5.9	523	3	525	3
48	1.110	21.22	6.1	525	3	527	3
49	1.188	20.30	6.2	527	3	529	3
50	1.271	19.25	6.4	529	3	532	4
51	1.360	18.05	6.6	532	4	535	4
52	1.456	16.71	6.8	534	4	539	4
53	1.561	15.20	7.2	537	4	542	4
54	1.679	13.52	7.6	541	4	547	4
55	1.813	11.65	8.2	544	4	552	4
56	1.973	9.57	9.0	549	4	558	4
57	2.175	7.23	10.0	554	4	560	4
58	2.375	5.30	10.0	560	4	560	4
59	2.375	5.30	10.0	560	4	560	4
60	2.375	5.30	10.0	560	4	560	4

Table 2.2.2
Raw Score to Scale Score Lookup Table
English Language Arts Grade 3

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.173	1.40	10.0	440	1	440	1
1	-3.170	1.41	10.0	440	1	441	1
2	-3.166	1.42	10.0	440	1	442	1
3	-3.162	1.42	10.0	440	1	443	1
4	-3.158	1.43	10.0	440	1	444	1
5	-3.154	1.44	10.0	440	1	445	1
6	-3.150	1.45	10.0	440	1	446	1
7	-2.707	2.51	10.0	449	1	447	1
8	-2.408	3.62	9.9	454	1	452	1
9	-2.178	4.73	8.7	459	1	457	1
10	-1.987	5.78	7.8	462	1	460	1
11	-1.823	6.75	7.2	465	1	463	1
12	-1.677	7.64	6.8	468	1	466	1
13	-1.543	8.44	6.5	471	2	469	1
14	-1.419	9.15	6.2	473	2	471	2
15	-1.302	9.78	6.0	475	2	474	2
16	-1.191	10.35	5.9	477	2	476	2
17	-1.084	10.84	5.7	479	2	478	2
18	-0.981	11.28	5.6	481	2	480	2
19	-0.880	11.65	5.5	483	2	482	2
20	-0.780	11.97	5.4	485	2	484	2
21	-0.682	12.23	5.4	487	2	486	2
22	-0.585	12.41	5.3	489	2	488	2
23	-0.487	12.53	5.3	491	2	490	2
24	-0.390	12.56	5.3	492	2	492	2
25	-0.291	12.49	5.3	494	2	494	2
26	-0.190	12.33	5.4	496	2	497	2
27	-0.087	12.07	5.4	498	2	499	2
28	0.020	11.69	5.5	500	3	502	3
29	0.131	11.21	5.6	502	3	504	3
30	0.247	10.63	5.8	504	3	507	3
31	0.371	9.94	6.0	507	3	510	3
32	0.503	9.17	6.2	509	3	513	3
33	0.646	8.31	6.5	512	3	516	3
34	0.803	7.40	6.9	515	3	520	3
35	0.979	6.45	7.4	518	3	524	3
36	1.179	5.48	8.0	522	3	528	3
37	1.411	4.55	8.8	526	3	533	4
38	1.685	3.69	9.8	532	4	538	4
39	2.015	2.96	10.0	538	4	544	4
40	2.415	2.38	10.0	545	4	551	4
41	2.905	1.91	10.0	555	4	559	4
42	3.196	1.70	10.0	560	4	560	4
43	3.196	1.70	10.0	560	4	560	4
44	3.196	1.70	10.0	560	4	560	4

Table 2.2.3
Raw Score to Scale Score Lookup Table
English Language Arts Grade 4

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.153	2.42	10.0	440	1	440	1
1	-3.130	2.47	10.0	440	1	440	1
2	-3.106	2.52	10.0	441	1	441	1
3	-3.083	2.57	10.0	441	1	441	1
4	-3.059	2.63	10.0	442	1	441	1
5	-3.036	2.68	10.0	442	1	442	1
6	-3.012	2.73	10.0	443	1	442	1
7	-2.989	2.78	10.0	443	1	442	1
8	-2.965	2.84	10.0	444	1	449	1
9	-2.681	3.51	10.0	449	1	454	1
10	-2.443	4.13	9.3	453	1	458	1
11	-2.236	4.72	8.7	457	1	461	1
12	-2.050	5.28	8.2	461	1	464	1
13	-1.880	5.82	7.8	464	1	467	1
14	-1.723	6.34	7.5	467	1	469	1
15	-1.576	6.84	7.2	469	1	471	2
16	-1.437	7.32	7.0	472	2	474	2
17	-1.305	7.77	6.8	475	2	476	2
18	-1.178	8.21	6.6	477	2	478	2
19	-1.056	8.62	6.4	480	2	480	2
20	-0.937	9.02	6.3	482	2	482	2
21	-0.822	9.40	6.1	484	2	484	2
22	-0.708	9.74	6.0	486	2	486	2
23	-0.596	10.05	5.9	488	2	488	2
24	-0.485	10.29	5.9	490	2	490	2
25	-0.374	10.46	5.8	492	2	492	2
26	-0.262	10.52	5.8	494	2	494	2
27	-0.148	10.47	5.8	497	2	496	2
28	-0.032	10.28	5.9	499	2	498	2
29	0.088	9.96	6.0	501	3	501	3
30	0.213	9.51	6.1	503	3	503	3
31	0.346	8.93	6.3	506	3	505	3
32	0.487	8.25	6.6	509	3	508	3
33	0.639	7.50	6.9	511	3	510	3
34	0.805	6.70	7.3	515	3	513	3
35	0.989	5.90	7.8	518	3	516	3
36	1.194	5.14	8.3	522	3	520	3
37	1.426	4.44	8.9	526	3	523	3
38	1.689	3.83	9.6	531	4	527	3
39	1.992	3.30	10.0	537	4	532	4
40	2.346	2.80	10.0	544	4	537	4
41	2.773	2.24	10.0	552	4	543	4
42	3.215	1.71	10.0	560	4	552	4
43	3.215	1.71	10.0	560	4	560	4
44	3.215	1.71	10.0	560	4	560	4

Table 2.2.4
Raw Score to Scale Score Lookup Table
English Language Arts Grade 5

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.360	2.14	10.0	440	1	440	1
1	-3.330	2.22	10.0	441	1	441	1
2	-3.300	2.30	10.0	441	1	442	1
3	-3.270	2.39	10.0	442	1	443	1
4	-3.239	2.48	10.0	442	1	444	1
5	-3.209	2.57	10.0	443	1	445	1
6	-3.179	2.66	10.0	443	1	446	1
7	-3.149	2.75	10.0	444	1	450	1
8	-2.870	3.76	9.1	449	1	454	1
9	-2.648	4.70	8.2	453	1	457	1
10	-2.462	5.57	7.5	456	1	459	1
11	-2.299	6.36	7.0	459	1	461	1
12	-2.152	7.08	6.6	461	1	464	1
13	-2.018	7.73	6.3	464	1	466	1
14	-1.892	8.33	6.0	466	1	467	1
15	-1.773	8.86	5.9	468	1	469	1
16	-1.660	9.33	5.7	469	1	471	2
17	-1.551	9.74	5.7	472	2	472	2
18	-1.445	10.09	5.6	474	2	474	2
19	-1.341	10.37	5.5	476	2	476	2
20	-1.239	10.58	5.4	477	2	477	2
21	-1.137	10.73	5.4	479	2	479	2
22	-1.036	10.80	5.4	481	2	481	2
23	-0.935	10.80	5.4	483	2	482	2
24	-0.833	10.74	5.4	485	2	484	2
25	-0.730	10.61	5.4	486	2	486	2
26	-0.626	10.43	5.5	488	2	487	2
27	-0.519	10.19	5.5	490	2	489	2
28	-0.410	9.90	5.6	492	2	491	2
29	-0.297	9.58	5.7	494	2	493	2
30	-0.181	9.22	5.8	496	2	495	2
31	-0.060	8.84	5.9	498	2	497	2
32	0.066	8.45	6.1	500	3	499	2
33	0.197	8.05	6.2	503	3	501	3
34	0.335	7.65	6.4	505	3	504	3
35	0.480	7.25	6.6	508	3	506	3
36	0.633	6.84	6.8	511	3	508	3
37	0.796	6.41	7.0	513	3	511	3
38	0.971	5.96	7.2	517	3	514	3
39	1.160	5.49	7.6	520	3	516	3
40	1.366	4.98	7.9	523	3	520	3
41	1.594	4.46	8.4	528	3	523	3
42	1.851	3.92	8.9	532	4	527	3
43	2.145	3.36	9.6	537	4	531	4
44	2.493	2.79	10.0	543	4	536	4
45	2.921	2.25	10.0	551	4	542	4
46	3.430	1.77	10.0	560	4	550	4
47	3.430	1.77	10.0	560	4	560	4
48	3.430	1.77	10.0	560	4	560	4

Table 2.2.5
Raw Score to Scale Score Lookup Table
English Language Arts Grade 6

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.171	2.84	10.0	440	1	440	1
1	-3.166	2.85	10.0	440	1	440	1
2	-3.160	2.86	10.0	440	1	441	1
3	-3.155	2.87	10.0	440	1	441	1
4	-3.150	2.88	10.0	440	1	441	1
5	-3.144	2.89	10.0	441	1	442	1
6	-3.139	2.91	10.0	441	1	442	1
7	-3.133	2.92	10.0	441	1	442	1
8	-3.128	2.93	10.0	441	1	443	1
9	-3.122	2.94	10.0	441	1	443	1
10	-3.117	2.95	10.0	441	1	447	1
11	-2.880	3.44	10.0	446	1	451	1
12	-2.669	3.87	9.6	450	1	454	1
13	-2.479	4.26	9.2	453	1	457	1
14	-2.302	4.59	8.9	456	1	460	1
15	-2.137	4.89	8.6	460	1	462	1
16	-1.980	5.15	8.4	463	1	465	1
17	-1.829	5.38	8.2	465	1	467	1
18	-1.685	5.59	8.0	468	1	469	1
19	-1.544	5.77	7.9	471	2	472	2
20	-1.407	5.93	7.8	473	2	474	2
21	-1.273	6.07	7.7	476	2	476	2
22	-1.140	6.18	7.6	479	2	479	2
23	-1.009	6.27	7.6	481	2	481	2
24	-0.879	6.32	7.5	484	2	483	2
25	-0.750	6.35	7.5	486	2	485	2
26	-0.620	6.35	7.5	488	2	488	2
27	-0.489	6.32	7.6	491	2	490	2
28	-0.358	6.25	7.6	493	2	492	2
29	-0.224	6.16	7.6	496	2	494	2
30	-0.088	6.04	7.7	499	2	497	2
31	0.051	5.90	7.8	501	3	499	2
32	0.193	5.74	7.9	504	3	501	3
33	0.340	5.56	8.1	507	3	504	3
34	0.492	5.37	8.2	510	3	506	3
35	0.649	5.16	8.4	513	3	509	3
36	0.814	4.94	8.5	516	3	512	3
37	0.986	4.70	8.8	519	3	514	3
38	1.168	4.44	9.0	522	3	517	3
39	1.360	4.16	9.3	526	3	520	3
40	1.567	3.86	9.7	529	3	524	3
41	1.790	3.53	10.0	534	4	527	3
42	2.035	3.18	10.0	539	4	531	4
43	2.306	2.83	10.0	544	4	535	4
44	2.611	2.47	10.0	550	4	540	4
45	2.961	2.13	10.0	556	4	546	4
46	3.150	1.97	10.0	560	4	552	4
47	3.150	1.97	10.0	560	4	560	4
48	3.150	1.97	10.0	560	4	560	4
49	3.150	1.97	10.0	560	4	560	4
50	3.150	1.97	10.0	560	4	560	4

Table 2.2.6
Raw Score to Scale Score Lookup Table
English Language Arts Grade 7

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.131	2.23	10.0	440	1	440	1
1	-3.113	2.27	10.0	440	1	440	1
2	-3.095	2.31	10.0	441	1	441	1
3	-3.078	2.34	10.0	441	1	441	1
4	-3.060	2.38	10.0	441	1	442	1
5	-3.043	2.42	10.0	442	1	442	1
6	-3.025	2.46	10.0	442	1	442	1
7	-3.007	2.50	10.0	442	1	443	1
8	-2.990	2.54	10.0	443	1	443	1
9	-2.713	3.23	10.0	448	1	448	1
10	-2.485	3.87	9.7	452	1	451	1
11	-2.289	4.46	9.0	456	1	455	1
12	-2.115	5.01	8.5	459	1	458	1
13	-1.958	5.52	8.1	462	1	460	1
14	-1.813	5.99	7.8	465	1	463	1
15	-1.677	6.43	7.5	468	1	465	1
16	-1.549	6.84	7.3	470	2	467	1
17	-1.428	7.22	7.1	473	2	469	1
18	-1.311	7.57	6.9	475	2	472	2
19	-1.199	7.89	6.8	477	2	474	2
20	-1.090	8.18	6.7	479	2	476	2
21	-0.984	8.43	6.6	481	2	478	2
22	-0.880	8.65	6.5	483	2	480	2
23	-0.777	8.84	6.4	485	2	482	2
24	-0.676	8.98	6.4	487	2	484	2
25	-0.576	9.08	6.3	489	2	486	2
26	-0.476	9.15	6.3	491	2	488	2
27	-0.377	9.17	6.3	493	2	490	2
28	-0.277	9.15	6.3	495	2	492	2
29	-0.176	9.09	6.3	496	2	494	2
30	-0.074	8.99	6.4	498	2	496	2
31	0.029	8.86	6.4	500	3	498	2
32	0.134	8.69	6.5	502	3	500	3
33	0.242	8.49	6.6	504	3	502	3
34	0.352	8.26	6.6	507	3	504	3
35	0.467	7.99	6.8	509	3	507	3
36	0.585	7.69	6.9	511	3	509	3
37	0.709	7.35	7.0	513	3	511	3
38	0.840	6.97	7.2	516	3	514	3
39	0.979	6.55	7.5	518	3	516	3
40	1.127	6.09	7.7	521	3	519	3
41	1.287	5.58	8.1	524	3	522	3
42	1.463	5.05	8.5	528	3	525	3
43	1.659	4.49	9.0	531	4	528	3
44	1.880	3.91	9.7	536	4	532	4
45	2.137	3.33	10.0	541	4	536	4
46	2.442	2.76	10.0	546	4	542	4
47	2.822	2.18	10.0	554	4	548	4
48	3.153	1.79	10.0	560	4	555	4
49	3.153	1.79	10.0	560	4	560	4
50	3.153	1.79	10.0	560	4	560	4

Table 2.2.7
Raw Score to Scale Score Lookup Table
English Language Arts Grade 8

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.964	3.32	10.0	440	1	440	1
1	-2.962	3.32	10.0	440	1	440	1
2	-2.959	3.33	10.0	440	1	440	1
3	-2.957	3.33	10.0	440	1	440	1
4	-2.955	3.33	10.0	440	1	440	1
5	-2.953	3.34	10.0	440	1	441	1
6	-2.950	3.34	10.0	440	1	441	1
7	-2.948	3.35	10.0	440	1	441	1
8	-2.946	3.35	10.0	440	1	441	1
9	-2.943	3.36	10.0	440	1	441	1
10	-2.941	3.36	10.0	440	1	441	1
11	-2.939	3.37	10.0	440	1	445	1
12	-2.937	3.37	10.0	441	1	448	1
13	-2.729	3.80	10.0	445	1	451	1
14	-2.539	4.22	9.7	448	1	454	1
15	-2.364	4.62	9.3	452	1	456	1
16	-2.201	4.99	8.9	455	1	458	1
17	-2.048	5.33	8.6	458	1	461	1
18	-1.901	5.65	8.4	461	1	463	1
19	-1.761	5.94	8.2	464	1	465	1
20	-1.626	6.20	8.0	467	1	467	1
21	-1.495	6.42	7.9	469	1	469	1
22	-1.367	6.61	7.7	472	2	471	2
23	-1.242	6.77	7.6	474	2	473	2
24	-1.118	6.89	7.6	477	2	475	2
25	-0.995	6.98	7.5	479	2	477	2
26	-0.873	7.05	7.5	482	2	479	2
27	-0.752	7.08	7.5	484	2	481	2
28	-0.630	7.09	7.5	486	2	483	2
29	-0.507	7.07	7.5	489	2	485	2
30	-0.383	7.03	7.5	491	2	487	2
31	-0.258	6.97	7.5	494	2	489	2
32	-0.130	6.89	7.6	496	2	492	2
33	0.001	6.78	7.6	499	2	494	2
34	0.135	6.64	7.7	502	3	497	2
35	0.273	6.47	7.8	504	3	499	2
36	0.417	6.25	8.0	507	3	502	3
37	0.567	5.99	8.1	510	3	504	3
38	0.726	5.67	8.4	513	3	507	3
39	0.894	5.29	8.6	517	3	510	3
40	1.076	4.87	9.0	520	3	513	3
41	1.275	4.40	9.5	524	3	516	3
42	1.495	3.90	10.0	529	3	520	3
43	1.741	3.40	10.0	534	4	524	3
44	2.022	2.91	10.0	539	4	528	3
45	2.347	2.45	10.0	546	4	533	4
46	2.730	2.05	10.0	553	4	539	4
47	3.066	1.79	10.0	560	4	545	4
48	3.066	1.79	10.0	560	4	553	4
49	3.066	1.79	10.0	560	4	560	4
50	3.066	1.79	10.0	560	4	560	4

Table 2.2.8
Raw Score to Scale Score Lookup Table
English Language Arts Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.157	5.10	9.3	440	1	440	1
1	-3.138	5.18	9.2	440	1	441	1
2	-3.119	5.25	9.2	441	1	441	1
3	-3.100	5.33	9.1	441	1	442	1
4	-3.081	5.40	9.0	442	1	442	1
5	-3.062	5.48	9.0	442	1	443	1
6	-3.044	5.56	8.9	442	1	443	1
7	-3.025	5.63	8.8	443	1	444	1
8	-3.006	5.71	8.8	443	1	444	1
9	-2.987	5.78	8.7	444	1	445	1
10	-2.822	6.44	8.3	447	1	449	1
11	-2.673	7.01	7.9	450	1	452	1
12	-2.536	7.52	7.7	453	1	455	1
13	-2.408	8.00	7.4	456	1	458	1
14	-2.288	8.45	7.2	458	1	461	1
15	-2.173	8.89	7.0	461	1	463	1
16	-2.064	9.32	6.9	463	1	465	1
17	-1.960	9.73	6.7	465	1	467	1
18	-1.859	10.12	6.6	467	1	468	1
19	-1.761	10.49	6.5	469	1	470	2
20	-1.665	10.81	6.4	471	2	472	2
21	-1.572	11.10	6.3	473	2	473	2
22	-1.480	11.33	6.2	475	2	475	2
23	-1.390	11.51	6.2	477	2	477	2
24	-1.300	11.63	6.2	479	2	478	2
25	-1.211	11.71	6.1	481	2	480	2
26	-1.122	11.74	6.1	483	2	481	2
27	-1.033	11.72	6.1	485	2	483	2
28	-0.943	11.67	6.1	486	2	484	2
29	-0.853	11.59	6.2	488	2	486	2
30	-0.762	11.49	6.2	490	2	488	2
31	-0.669	11.35	6.2	492	2	489	2
32	-0.575	11.19	6.3	494	2	491	2
33	-0.479	10.99	6.3	496	2	493	2
34	-0.380	10.75	6.4	498	2	494	2
35	-0.278	10.46	6.5	500	3	496	2
36	-0.172	10.11	6.6	503	3	498	2
37	-0.062	9.70	6.7	505	3	500	3
38	0.054	9.21	6.9	507	3	502	3
39	0.177	8.65	7.1	510	3	504	3
40	0.309	8.01	7.4	513	3	506	3
41	0.452	7.31	7.8	516	3	509	3
42	0.609	6.56	8.2	519	3	512	3
43	0.785	5.78	8.7	523	3	515	3
44	0.985	4.99	9.4	527	3	518	3
45	1.219	4.20	10.0	532	4	522	3
46	1.498	3.46	10.0	538	4	528	3
47	1.843	2.81	10.0	545	4	535	4
48	2.280	2.31	10.0	554	4	542	4
49	2.559	2.10	10.0	560	4	549	4
50	2.559	2.10	10.0	560	4	559	4
51	2.559	2.10	10.0	560	4	560	4

Table 2.2.9
Raw Score to Scale Score Lookup Table
Mathematics Grade 3

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.782	3.14	10.0	440	1	440	1
1	-2.781	3.14	10.0	440	1	440	1
2	-2.780	3.15	10.0	440	1	440	1
3	-2.780	3.15	10.0	440	1	441	1
4	-2.779	3.15	10.0	440	1	441	1
5	-2.778	3.16	10.0	440	1	441	1
6	-2.467	4.72	9.8	447	1	441	1
7	-2.238	6.23	8.6	452	1	447	1
8	-2.055	7.66	7.7	456	1	452	1
9	-1.900	8.99	7.1	459	1	456	1
10	-1.764	10.22	6.7	462	1	459	1
11	-1.643	11.34	6.3	464	1	462	1
12	-1.532	12.36	6.1	467	1	465	1
13	-1.428	13.27	5.9	469	1	468	1
14	-1.331	14.10	5.7	471	2	470	2
15	-1.239	14.83	5.5	473	2	473	2
16	-1.151	15.48	5.4	475	2	475	2
17	-1.066	16.06	5.3	477	2	477	2
18	-0.984	16.56	5.2	478	2	479	2
19	-0.904	17.00	5.2	480	2	481	2
20	-0.825	17.37	5.1	482	2	483	2
21	-0.748	17.67	5.1	483	2	485	2
22	-0.672	17.92	5.0	485	2	486	2
23	-0.597	18.10	5.0	487	2	488	2
24	-0.522	18.22	5.0	488	2	490	2
25	-0.447	18.28	5.0	490	2	492	2
26	-0.372	18.27	5.0	491	2	494	2
27	-0.297	18.20	5.0	493	2	495	2
28	-0.222	18.06	5.0	495	2	497	2
29	-0.145	17.85	5.1	496	2	499	2
30	-0.067	17.57	5.1	498	2	501	3
31	0.012	17.23	5.1	499	2	503	3
32	0.094	16.82	5.2	501	3	505	3
33	0.177	16.34	5.3	503	3	506	3
34	0.264	15.79	5.4	505	3	509	3
35	0.354	15.18	5.5	507	3	511	3
36	0.449	14.51	5.6	509	3	513	3
37	0.548	13.78	5.8	511	3	515	3
38	0.653	12.99	5.9	513	3	518	3
39	0.766	12.15	6.1	516	3	520	3
40	0.888	11.25	6.4	518	3	523	3
41	1.021	10.29	6.7	521	3	526	3
42	1.169	9.28	7.0	524	3	529	3
43	1.337	8.18	7.5	528	3	534	4
44	1.531	6.97	8.1	532	4	539	4
45	1.769	5.59	9.0	537	4	545	4
46	2.086	3.97	10.0	544	4	554	4
47	2.600	2.05	10.0	555	4	560	4
48	2.837	1.46	10.0	560	4	560	4

Table 2.2.10 Raw Score to Scale Score Lookup Table - Mathematics Grade 4

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.812	3.15	10.0	440	1	440	1
1	-2.783	3.25	10.0	441	1	440	1
2	-2.755	3.36	10.0	441	1	440	1
3	-2.726	3.47	10.0	442	1	440	1
4	-2.698	3.58	10.0	442	1	440	1
5	-2.670	3.70	10.0	443	1	440	1
6	-2.641	3.82	10.0	444	1	446	1
7	-2.613	3.94	10.0	444	1	451	1
8	-2.364	5.16	9.2	449	1	454	1
9	-2.165	6.35	8.3	454	1	458	1
10	-1.996	7.49	7.6	457	1	461	1
11	-1.849	8.59	7.1	460	1	463	1
12	-1.718	9.63	6.7	463	1	466	1
13	-1.598	10.63	6.4	465	1	468	1
14	-1.488	11.58	6.2	468	1	470	2
15	-1.385	12.50	5.9	469	1	472	2
16	-1.288	13.40	5.7	472	2	474	2
17	-1.196	14.27	5.5	474	2	476	2
18	-1.108	15.11	5.4	476	2	478	2
19	-1.024	15.92	5.2	477	2	480	2
20	-0.943	16.70	5.1	479	2	481	2
21	-0.865	17.42	5.0	481	2	483	2
22	-0.789	18.08	4.9	482	2	485	2
23	-0.715	18.67	4.8	484	2	486	2
24	-0.642	19.17	4.8	485	2	488	2
25	-0.570	19.59	4.7	487	2	489	2
26	-0.499	19.90	4.7	488	2	491	2
27	-0.429	20.11	4.7	490	2	492	2
28	-0.359	20.22	4.7	491	2	493	2
29	-0.289	20.23	4.7	493	2	495	2
30	-0.218	20.15	4.7	494	2	496	2
31	-0.147	19.97	4.7	496	2	498	2
32	-0.075	19.70	4.7	497	2	499	2
33	-0.002	19.35	4.8	499	2	501	3
34	0.073	18.92	4.8	500	3	502	3
35	0.149	18.42	4.9	502	3	504	3
36	0.228	17.85	5.0	504	3	505	3
37	0.309	17.24	5.0	505	3	507	3
38	0.393	16.58	5.1	507	3	508	3
39	0.480	15.88	5.3	509	3	510	3
40	0.570	15.15	5.4	511	3	512	3
41	0.665	14.39	5.5	513	3	513	3
42	0.765	13.61	5.7	515	3	515	3
43	0.871	12.79	5.9	517	3	517	3
44	0.983	11.93	6.1	519	3	519	3
45	1.104	11.03	6.3	522	3	522	3
46	1.234	10.08	6.6	525	3	524	3
47	1.377	9.10	6.9	528	3	527	3
48	1.534	8.08	7.4	531	4	529	3
49	1.712	7.04	7.9	535	4	533	4
50	1.918	5.95	8.6	539	4	537	4
51	2.166	4.77	9.6	544	4	542	4
52	2.493	3.41	10.0	551	4	549	4
53	2.920	2.04	10.0	560	4	560	4
54	2.920	2.04	10.0	560	4	560	4

Table 2.2.11 Raw Score to Scale Score Lookup Table - Mathematics Grade 5

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.126	2.25	10.0	440	1	440	1
1	-3.078	2.40	10.0	441	1	440	1
2	-3.029	2.55	10.0	442	1	440	1
3	-2.981	2.71	10.0	443	1	440	1
4	-2.932	2.87	10.0	444	1	440	1
5	-2.884	3.05	10.0	445	1	441	1
6	-2.835	3.23	10.0	446	1	448	1
7	-2.518	4.58	8.9	452	1	453	1
8	-2.278	5.77	7.9	456	1	458	1
9	-2.082	6.83	7.3	460	1	461	1
10	-1.914	7.79	6.8	463	1	464	1
11	-1.765	8.67	6.5	466	1	467	1
12	-1.631	9.51	6.2	468	1	469	1
13	-1.509	10.31	5.9	471	2	471	2
14	-1.396	11.07	5.7	473	2	474	2
15	-1.290	11.81	5.5	475	2	475	2
16	-1.190	12.52	5.4	477	2	477	2
17	-1.095	13.19	5.2	479	2	479	2
18	-1.005	13.83	5.1	480	2	481	2
19	-0.918	14.43	5.0	482	2	482	2
20	-0.834	14.98	4.9	484	2	484	2
21	-0.753	15.48	4.8	485	2	485	2
22	-0.673	15.94	4.8	487	2	486	2
23	-0.596	16.34	4.7	488	2	488	2
24	-0.519	16.69	4.7	490	2	489	2
25	-0.444	16.98	4.6	491	2	490	2
26	-0.370	17.22	4.6	492	2	492	2
27	-0.296	17.40	4.6	494	2	493	2
28	-0.223	17.53	4.5	495	2	494	2
29	-0.150	17.60	4.5	497	2	496	2
30	-0.077	17.63	4.5	498	2	497	2
31	-0.003	17.62	4.5	499	2	498	2
32	0.070	17.58	4.5	501	3	499	2
33	0.145	17.50	4.6	502	3	501	3
34	0.220	17.39	4.6	504	3	502	3
35	0.295	17.27	4.6	505	3	504	3
36	0.373	17.14	4.6	507	3	505	3
37	0.451	17.00	4.6	508	3	506	3
38	0.531	16.84	4.6	510	3	508	3
39	0.613	16.66	4.7	511	3	509	3
40	0.697	16.44	4.7	513	3	511	3
41	0.783	16.15	4.7	514	3	513	3
42	0.873	15.77	4.8	516	3	514	3
43	0.967	15.24	4.9	518	3	516	3
44	1.067	14.55	5.0	520	3	518	3
45	1.173	13.66	5.2	522	3	520	3
46	1.288	12.57	5.4	524	3	522	3
47	1.415	11.28	5.7	526	3	524	3
48	1.558	9.84	6.1	529	3	527	3
49	1.723	8.29	6.6	532	4	529	3
50	1.920	6.66	7.4	536	4	533	4
51	2.170	4.98	8.5	541	4	537	4
52	2.516	3.27	10.0	547	4	543	4
53	3.101	1.54	10.0	559	4	552	4
54	3.176	1.39	10.0	560	4	560	4

Table 2.2.12 Raw Score to Scale Score Lookup Table - Mathematics Grade 6

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.028	2.38	10.0	440	1	440	1
1	-3.001	2.46	10.0	441	1	441	1
2	-2.974	2.54	10.0	441	1	442	1
3	-2.947	2.62	10.0	442	1	442	1
4	-2.920	2.70	10.0	442	1	443	1
5	-2.893	2.79	10.0	443	1	450	1
6	-2.512	4.20	9.7	450	1	455	1
7	-2.234	5.54	8.4	456	1	459	1
8	-2.014	6.91	7.6	460	1	463	1
9	-1.831	8.28	6.9	464	1	466	1
10	-1.674	9.64	6.4	467	1	469	1
11	-1.537	10.92	6.0	469	1	471	2
12	-1.413	12.11	5.7	472	2	474	2
13	-1.301	13.20	5.5	474	2	476	2
14	-1.198	14.18	5.3	476	2	478	2
15	-1.101	15.07	5.1	478	2	480	2
16	-1.009	15.88	5.0	480	2	481	2
17	-0.923	16.63	4.9	482	2	483	2
18	-0.840	17.31	4.8	483	2	485	2
19	-0.760	17.94	4.7	485	2	487	2
20	-0.683	18.52	4.6	487	2	488	2
21	-0.609	19.05	4.6	488	2	490	2
22	-0.537	19.53	4.5	489	2	491	2
23	-0.466	19.95	4.4	491	2	493	2
24	-0.397	20.33	4.4	492	2	494	2
25	-0.329	20.65	4.4	494	2	496	2
26	-0.263	20.92	4.3	495	2	497	2
27	-0.197	21.14	4.3	496	2	499	2
28	-0.132	21.31	4.3	498	2	500	3
29	-0.067	21.43	4.3	499	2	501	3
30	-0.003	21.51	4.3	500	3	503	3
31	0.061	21.54	4.3	501	3	504	3
32	0.125	21.53	4.3	503	3	506	3
33	0.189	21.48	4.3	504	3	507	3
34	0.254	21.38	4.3	505	3	508	3
35	0.319	21.23	4.3	506	3	510	3
36	0.384	21.04	4.3	508	3	511	3
37	0.451	20.79	4.4	509	3	512	3
38	0.519	20.48	4.4	510	3	514	3
39	0.588	20.11	4.4	512	3	515	3
40	0.659	19.66	4.5	513	3	517	3
41	0.732	19.12	4.5	515	3	518	3
42	0.808	18.48	4.6	516	3	520	3
43	0.888	17.74	4.7	518	3	522	3
44	0.971	16.88	4.8	519	3	524	3
45	1.061	15.89	5.0	521	3	525	3
46	1.157	14.75	5.2	523	3	528	3
47	1.263	13.46	5.4	525	3	529	3
48	1.381	11.99	5.7	528	3	532	4
49	1.516	10.32	6.2	530	4	536	4
50	1.679	8.46	6.8	534	4	539	4
51	1.886	6.37	7.9	538	4	544	4
52	2.180	4.10	9.8	543	4	551	4
53	2.708	1.77	10.0	554	4	560	4
54	3.011	1.10	10.0	560	4	560	4

Table 2.2.13 Raw Score to Scale Score Lookup Table - Mathematics Grade 7

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.859	1.84	10.0	440	1	440	1
1	-2.852	1.86	10.0	440	1	441	1
2	-2.844	1.88	10.0	440	1	442	1
3	-2.837	1.90	10.0	440	1	443	1
4	-2.829	1.92	10.0	441	1	444	1
5	-2.822	1.94	10.0	441	1	445	1
6	-2.319	3.80	10.0	451	1	454	1
7	-2.008	5.49	8.9	458	1	460	1
8	-1.777	6.97	7.9	462	1	465	1
9	-1.590	8.27	7.2	466	1	468	1
10	-1.430	9.42	6.8	469	1	471	2
11	-1.290	10.47	6.4	473	2	474	2
12	-1.164	11.45	6.1	475	2	477	2
13	-1.050	12.38	5.9	478	2	479	2
14	-0.944	13.28	5.7	480	2	481	2
15	-0.846	14.14	5.5	482	2	483	2
16	-0.753	14.97	5.4	484	2	485	2
17	-0.666	15.76	5.2	486	2	487	2
18	-0.583	16.53	5.1	487	2	489	2
19	-0.503	17.27	5.0	489	2	491	2
20	-0.427	17.98	4.9	490	2	492	2
21	-0.353	18.66	4.8	492	2	494	2
22	-0.282	19.30	4.7	494	2	496	2
23	-0.213	19.91	4.7	495	2	497	2
24	-0.145	20.48	4.6	496	2	499	2
25	-0.079	21.00	4.5	498	2	500	3
26	-0.014	21.47	4.5	499	2	502	3
27	0.050	21.88	4.4	500	3	503	3
28	0.114	22.23	4.4	502	3	505	3
29	0.177	22.51	4.4	503	3	506	3
30	0.239	22.73	4.4	504	3	508	3
31	0.302	22.86	4.3	506	3	509	3
32	0.364	22.93	4.3	507	3	510	3
33	0.427	22.91	4.3	508	3	512	3
34	0.490	22.81	4.3	510	3	513	3
35	0.554	22.62	4.4	511	3	514	3
36	0.619	22.35	4.4	512	3	516	3
37	0.686	21.99	4.4	514	3	517	3
38	0.754	21.53	4.5	515	3	518	3
39	0.824	20.99	4.5	516	3	520	3
40	0.896	20.34	4.6	518	3	521	3
41	0.971	19.60	4.7	520	3	523	3
42	1.050	18.75	4.8	521	3	524	3
43	1.132	17.80	4.9	523	3	526	3
44	1.220	16.73	5.1	525	3	527	3
45	1.315	15.56	5.3	527	3	529	3
46	1.417	14.27	5.5	529	3	531	4
47	1.530	12.87	5.8	531	4	533	4
48	1.656	11.36	6.2	534	4	535	4
49	1.802	9.74	6.7	537	4	538	4
50	1.976	8.00	7.3	540	4	541	4
51	2.194	6.13	8.4	545	4	545	4
52	2.495	4.12	10.0	551	4	551	4
53	2.922	2.24	10.0	560	4	560	4
54	2.922	2.24	10.0	560	4	560	4

Table 2.2.14 Raw Score to Scale Score Lookup Table - Mathematics Grade 8

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.983	2.23	10.0	440	1	440	1
1	-2.932	2.35	10.0	441	1	441	1
2	-2.881	2.47	10.0	442	1	443	1
3	-2.830	2.61	10.0	443	1	444	1
4	-2.778	2.75	10.0	444	1	446	1
5	-2.727	2.90	10.0	445	1	447	1
6	-2.676	3.06	10.0	446	1	448	1
7	-2.625	3.23	10.0	447	1	454	1
8	-2.336	4.42	9.6	453	1	459	1
9	-2.110	5.68	8.5	458	1	462	1
10	-1.923	6.95	7.6	461	1	466	1
11	-1.764	8.20	7.0	465	1	468	1
12	-1.624	9.38	6.6	467	1	471	2
13	-1.499	10.50	6.2	469	1	473	2
14	-1.385	11.54	5.9	472	2	475	2
15	-1.279	12.52	5.7	474	2	477	2
16	-1.180	13.43	5.5	476	2	479	2
17	-1.087	14.28	5.3	478	2	480	2
18	-0.998	15.07	5.2	480	2	482	2
19	-0.914	15.81	5.1	482	2	483	2
20	-0.832	16.49	5.0	483	2	485	2
21	-0.754	17.11	4.9	485	2	486	2
22	-0.677	17.68	4.8	487	2	488	2
23	-0.603	18.18	4.7	488	2	489	2
24	-0.531	18.63	4.7	489	2	491	2
25	-0.459	19.01	4.6	491	2	492	2
26	-0.389	19.32	4.6	492	2	493	2
27	-0.320	19.58	4.6	494	2	494	2
28	-0.251	19.78	4.5	495	2	496	2
29	-0.183	19.92	4.5	496	2	497	2
30	-0.115	20.00	4.5	498	2	498	2
31	-0.048	20.02	4.5	499	2	499	2
32	0.021	19.98	4.5	501	3	501	3
33	0.089	19.89	4.5	502	3	502	3
34	0.158	19.73	4.5	503	3	504	3
35	0.228	19.52	4.6	505	3	505	3
36	0.299	19.25	4.6	506	3	506	3
37	0.371	18.92	4.6	508	3	508	3
38	0.445	18.54	4.7	509	3	509	3
39	0.521	18.09	4.7	511	3	511	3
40	0.599	17.58	4.8	512	3	512	3
41	0.681	17.01	4.9	514	3	514	3
42	0.766	16.36	5.0	516	3	516	3
43	0.855	15.64	5.1	517	3	517	3
44	0.949	14.83	5.2	519	3	519	3
45	1.050	13.93	5.4	521	3	521	3
46	1.159	12.93	5.6	524	3	523	3
47	1.278	11.80	5.9	526	3	525	3
48	1.411	10.54	6.2	529	3	528	3
49	1.563	9.12	6.7	532	4	530	4
50	1.744	7.52	7.4	535	4	534	4
51	1.972	5.73	8.4	540	4	538	4
52	2.291	3.74	10.0	546	4	543	4
53	2.854	1.62	10.0	558	4	553	4
54	2.966	1.37	10.0	560	4	560	4

Table 2.2.15
Raw Score to Scale Score Lookup Table
Mathematics Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.124	1.61	10.0	440	1	440	1
1	-3.101	1.67	10.0	440	1	441	1
2	-3.078	1.73	10.0	441	1	442	1
3	-3.055	1.79	10.0	441	1	443	1
4	-3.033	1.85	10.0	442	1	444	1
5	-3.010	1.92	10.0	442	1	445	1
6	-2.540	3.72	10.0	452	1	454	1
7	-2.245	5.40	9.2	459	1	459	1
8	-2.024	7.01	8.1	464	1	463	1
9	-1.847	8.64	7.3	467	1	467	1
10	-1.699	10.29	6.7	470	2	469	1
11	-1.571	11.97	6.2	473	2	472	2
12	-1.458	13.67	5.8	476	2	474	2
13	-1.357	15.38	5.5	478	2	476	2
14	-1.266	17.09	5.2	480	2	478	2
15	-1.182	18.81	4.9	482	2	480	2
16	-1.105	20.50	4.7	483	2	482	2
17	-1.032	22.15	4.5	485	2	483	2
18	-0.964	23.75	4.4	486	2	485	2
19	-0.899	25.27	4.3	488	2	486	2
20	-0.838	26.71	4.1	489	2	488	2
21	-0.778	28.04	4.0	490	2	489	2
22	-0.722	29.25	4.0	491	2	491	2
23	-0.666	30.35	3.9	493	2	492	2
24	-0.613	31.32	3.8	494	2	493	2
25	-0.560	32.16	3.8	495	2	495	2
26	-0.509	32.88	3.7	496	2	496	2
27	-0.458	33.47	3.7	497	2	497	2
28	-0.408	33.93	3.7	498	2	498	2
29	-0.359	34.27	3.7	499	2	499	2
30	-0.310	34.49	3.6	500	3	501	3
31	-0.260	34.59	3.6	501	3	502	3
32	-0.211	34.57	3.6	502	3	503	3
33	-0.162	34.44	3.6	503	3	504	3
34	-0.112	34.21	3.7	504	3	505	3
35	-0.062	33.88	3.7	505	3	507	3
36	-0.011	33.44	3.7	507	3	508	3
37	0.041	32.90	3.7	508	3	509	3

Table 2.2.15 (continued)
Raw Score to Scale Score Lookup Table
Mathematics Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
38	0.094	32.27	3.8	509	3	510	3
39	0.148	31.54	3.8	510	3	511	3
40	0.203	30.71	3.9	511	3	512	3
41	0.260	29.78	3.9	512	3	514	3
42	0.320	28.74	4.0	514	3	515	3
43	0.381	27.60	4.1	515	3	516	3
44	0.445	26.35	4.2	516	3	518	3
45	0.513	25.00	4.3	518	3	519	3
46	0.584	23.57	4.4	519	3	520	3
47	0.660	22.06	4.6	521	3	522	3
48	0.741	20.48	4.7	523	3	523	3
49	0.829	18.86	4.9	524	3	525	3
50	0.924	17.19	5.2	527	3	527	3
51	1.028	15.50	5.4	529	3	529	3
52	1.144	13.80	5.8	531	4	531	4
53	1.273	12.11	6.1	534	4	533	4
54	1.421	10.48	6.6	537	4	536	4
55	1.592	8.86	7.2	541	4	539	4
56	1.795	7.18	8.0	545	4	543	4
57	2.052	5.31	9.3	551	4	548	4
58	2.415	3.24	10.0	558	4	555	4
59	2.490	2.91	10.0	560	4	560	4
60	2.490	2.91	10.0	560	4	560	4

Table 2.2.16
Raw Score to Scale Score Lookup Table
Introductory Physics Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.145	4.70	10.0	440	1	440	1
1	-2.126	4.82	10.0	441	1	441	1
2	-2.106	4.94	10.0	441	1	441	1
3	-2.087	5.06	10.0	442	1	442	1
4	-2.068	5.18	10.0	442	1	442	1
5	-2.049	5.31	10.0	443	1	443	1
6	-2.029	5.44	10.0	443	1	443	1
7	-2.010	5.57	10.0	444	1	444	1
8	-1.991	5.71	10.0	444	1	444	1
9	-1.972	5.84	10.0	445	1	445	1
10	-1.773	7.39	9.7	450	1	449	1
11	-1.609	8.86	8.9	454	1	453	1
12	-1.468	10.24	8.3	458	1	457	1
13	-1.343	11.55	7.8	461	1	460	1
14	-1.231	12.80	7.4	464	1	463	1
15	-1.128	14.00	7.1	467	1	465	1
16	-1.032	15.14	6.8	469	1	468	1
17	-0.942	16.23	6.6	472	2	470	2
18	-0.857	17.24	6.4	474	2	472	2
19	-0.776	18.17	6.2	476	2	474	2
20	-0.699	19.02	6.1	478	2	476	2
21	-0.624	19.77	5.9	480	2	478	2
22	-0.552	20.41	5.9	482	2	480	2
23	-0.481	20.95	5.8	484	2	482	2
24	-0.412	21.38	5.7	486	2	483	2
25	-0.344	21.72	5.7	488	2	485	2
26	-0.276	21.96	5.6	489	2	487	2
27	-0.210	22.13	5.6	491	2	488	2
28	-0.144	22.22	5.6	493	2	490	2
29	-0.077	22.25	5.6	495	2	491	2
30	-0.011	22.22	5.6	496	2	493	2
31	0.055	22.14	5.6	498	2	495	2
32	0.121	22.02	5.6	500	3	496	2
33	0.188	21.86	5.7	502	3	498	2
34	0.256	21.65	5.7	503	3	499	2
35	0.324	21.40	5.7	505	3	501	3
36	0.393	21.11	5.8	507	3	502	3
37	0.463	20.78	5.8	509	3	504	3

Table 2.2.16 (continued)
Raw Score to Scale Score Lookup Table
Introductory Physics Grade 10

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
38	0.534	20.43	5.8	511	3	506	3
39	0.606	20.07	5.9	513	3	507	3
40	0.679	19.69	6.0	515	3	509	3
41	0.754	19.33	6.0	517	3	511	3
42	0.830	18.99	6.1	519	3	513	3
43	0.907	18.67	6.1	521	3	514	3
44	0.986	18.39	6.2	523	3	516	3
45	1.067	18.13	6.2	525	3	518	3
46	1.149	17.88	6.3	527	3	520	3
47	1.234	17.63	6.3	529	3	522	3
48	1.322	17.31	6.4	532	4	524	3
49	1.414	16.88	6.4	534	4	527	3
50	1.510	16.27	6.6	537	4	529	3
51	1.612	15.43	6.7	539	4	531	4
52	1.723	14.35	7.0	542	4	534	4
53	1.843	13.05	7.3	545	4	537	4
54	1.978	11.55	7.8	549	4	540	4
55	2.132	9.89	8.4	553	4	544	4
56	2.315	8.04	9.3	558	4	548	4
57	2.395	7.30	9.8	560	4	554	4
58	2.395	7.30	9.8	560	4	560	4
59	2.395	7.30	9.8	560	4	560	4
60	2.395	7.30	9.8	560	4	560	4

Table 2.2.17
Raw Score to Scale Score Lookup Table
Science Grade 5

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-3.130	3.57	10.0	440	1	440	1
1	-3.123	3.59	10.0	440	1	440	1
2	-3.115	3.61	10.0	440	1	441	1
3	-3.108	3.64	10.0	440	1	441	1
4	-3.100	3.66	10.0	441	1	442	1
5	-3.093	3.69	10.0	441	1	442	1
6	-3.085	3.71	10.0	441	1	442	1
7	-3.077	3.73	10.0	441	1	443	1
8	-3.070	3.76	10.0	441	1	443	1
9	-2.855	4.49	9.4	445	1	444	1
10	-2.669	5.18	8.7	449	1	444	1
11	-2.502	5.82	8.2	452	1	448	1
12	-2.351	6.41	7.9	455	1	451	1
13	-2.211	6.96	7.5	458	1	455	1
14	-2.079	7.46	7.3	461	1	458	1
15	-1.955	7.92	7.1	463	1	460	1
16	-1.836	8.34	6.9	466	1	463	1
17	-1.723	8.72	6.7	468	1	466	1
18	-1.613	9.07	6.6	470	2	468	1
19	-1.506	9.38	6.5	472	2	470	2
20	-1.402	9.65	6.4	474	2	473	2
21	-1.300	9.89	6.3	476	2	475	2
22	-1.199	10.10	6.3	478	2	477	2
23	-1.100	10.27	6.2	480	2	479	2
24	-1.002	10.39	6.2	482	2	481	2
25	-0.905	10.48	6.1	484	2	483	2
26	-0.808	10.53	6.1	486	2	485	2
27	-0.711	10.54	6.1	488	2	487	2
28	-0.614	10.51	6.1	490	2	489	2
29	-0.517	10.44	6.2	492	2	492	2
30	-0.419	10.34	6.2	494	2	494	2
31	-0.319	10.20	6.2	496	2	496	2
32	-0.219	10.04	6.3	498	2	498	2
33	-0.116	9.85	6.3	499	2	499	2
34	-0.012	9.65	6.4	502	3	502	3
35	0.094	9.42	6.5	504	3	504	3
36	0.203	9.18	6.6	506	3	507	3
37	0.316	8.91	6.7	508	3	509	3

Table 2.2.17 (continued)
Raw Score to Scale Score Lookup Table
Science Grade 5

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
38	0.432	8.61	6.8	511	3	511	3
39	0.552	8.29	6.9	513	3	514	3
40	0.678	7.92	7.1	516	3	516	3
41	0.809	7.50	7.3	518	3	519	3
42	0.949	7.03	7.5	521	3	522	3
43	1.097	6.51	7.8	524	3	525	3
44	1.258	5.94	8.2	527	3	528	3
45	1.432	5.34	8.6	531	4	532	4
46	1.626	4.72	9.1	535	4	536	4
47	1.842	4.10	9.8	539	4	540	4
48	2.090	3.49	10.0	544	4	545	4
49	2.379	2.89	10.0	549	4	551	4
50	2.726	2.32	10.0	556	4	558	4
51	2.907	2.07	10.0	560	4	560	4
52	2.907	2.07	10.0	560	4	560	4
53	2.907	2.07	10.0	560	4	560	4
54	2.907	2.07	10.0	560	4	560	4

Table 2.2.18
Raw Score to Scale Score Lookup Table
Science Grade 8

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
0	-2.978	2.16	10.0	440	1	440	1
1	-2.971	2.18	10.0	440	1	441	1
2	-2.963	2.19	10.0	440	1	441	1
3	-2.956	2.21	10.0	440	1	442	1
4	-2.949	2.23	10.0	441	1	443	1
5	-2.942	2.24	10.0	441	1	444	1
6	-2.935	2.26	10.0	441	1	444	1
7	-2.928	2.27	10.0	441	1	445	1
8	-2.921	2.29	10.0	441	1	446	1
9	-2.598	3.14	10.0	448	1	451	1
10	-2.346	3.97	10.0	453	1	455	1
11	-2.138	4.78	9.3	457	1	458	1
12	-1.959	5.56	8.6	461	1	462	1
13	-1.801	6.31	8.1	464	1	464	1
14	-1.658	7.03	7.7	467	1	467	1
15	-1.527	7.71	7.3	469	1	469	1
16	-1.406	8.36	7.0	472	2	472	2
17	-1.291	8.97	6.8	474	2	474	2
18	-1.183	9.54	6.6	476	2	476	2
19	-1.080	10.07	6.4	478	2	478	2
20	-0.981	10.54	6.2	481	2	481	2
21	-0.885	10.96	6.1	482	2	482	2
22	-0.792	11.32	6.0	484	2	484	2
23	-0.700	11.62	6.0	486	2	486	2
24	-0.610	11.86	5.9	488	2	488	2
25	-0.522	12.03	5.8	490	2	490	2
26	-0.434	12.16	5.8	492	2	492	2
27	-0.347	12.23	5.8	493	2	494	2
28	-0.260	12.27	5.8	495	2	495	2
29	-0.173	12.27	5.8	497	2	497	2
30	-0.086	12.26	5.8	499	2	499	2
31	0.002	12.23	5.8	500	3	501	3
32	0.090	12.21	5.8	502	3	503	3
33	0.178	12.18	5.8	504	3	505	3
34	0.268	12.16	5.8	506	3	506	3
35	0.358	12.14	5.8	508	3	508	3
36	0.450	12.10	5.8	510	3	510	3
37	0.544	12.03	5.9	511	3	512	3

Table 2.2.18 (continued)
Raw Score to Scale Score Lookup Table
Science Grade 8

				2023		2022	
Raw Score	Theta	Information	SE (Scale Score)	Scale Score	Achievement Levels	Scale Score	Achievement Levels
38	0.640	11.90	5.9	513	3	514	3
39	0.738	11.71	5.9	515	3	516	3
40	0.839	11.43	6.0	517	3	518	3
41	0.945	11.05	6.1	520	3	521	3
42	1.056	10.56	6.2	522	3	523	3
43	1.173	9.96	6.4	524	3	525	3
44	1.297	9.26	6.7	527	3	528	3
45	1.432	8.46	7.0	529	3	530	4
46	1.580	7.59	7.4	532	4	533	4
47	1.745	6.67	7.9	536	4	536	4
48	1.932	5.71	8.5	540	4	540	4
49	2.149	4.74	9.3	544	4	544	4
50	2.411	3.76	10.0	549	4	549	4
51	2.745	2.77	10.0	556	4	555	4
52	2.937	2.31	10.0	560	4	560	4
53	2.937	2.31	10.0	560	4	560	4
54	2.937	2.31	10.0	560	4	560	4

Section 2.3

Cumulative Scale Score Distribution Tables

Table 2.3.1 Cumulative Scale Score Distribution - Biology Grade 10

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
441	NM	1	0.00002	0.00002
442	NM	7	0.00014	0.00016
443	NM	64	0.00130	0.00146
444	NM	290	0.00587	0.00733
445	NM	270	0.00547	0.01279
450	NM	403	0.00816	0.02095
454	NM	580	0.01174	0.03269
457	NM	628	0.01271	0.04540
461	NM	761	0.01540	0.06081
464	NM	837	0.01694	0.07775
466	NM	933	0.01889	0.09663
469	NM	946	0.01915	0.11578
471	PM	989	0.02002	0.13580
473	PM	971	0.01965	0.15546
475	PM	899	0.01820	0.17365
477	PM	992	0.02008	0.19373
479	PM	1010	0.02044	0.21418
481	PM	1004	0.02032	0.23450
483	PM	1045	0.02115	0.25565
484	PM	1050	0.02125	0.27691
486	PM	1103	0.02233	0.29923
488	PM	1075	0.02176	0.32099
489	PM	1030	0.02085	0.34184
491	PM	1097	0.02221	0.36405
492	PM	1013	0.02050	0.38455
494	PM	1070	0.02166	0.40621
496	PM	1156	0.02340	0.42961
497	PM	1183	0.02395	0.45356
499	PM	1168	0.02364	0.47720
500	ME	1182	0.02393	0.50112
502	ME	1173	0.02374	0.52487
503	ME	1221	0.02472	0.54958
505	ME	1214	0.02457	0.57416
507	ME	1200	0.02429	0.59845
508	ME	1244	0.02518	0.62363
510	ME	1259	0.02548	0.64911
512	ME	1243	0.02516	0.67427
513	ME	1213	0.02455	0.69882
515	ME	1240	0.02510	0.72392
517	ME	1152	0.02332	0.74724
519	ME	1182	0.02393	0.77117
521	ME	1183	0.02395	0.79511
523	ME	1145	0.02318	0.81829
525	ME	1119	0.02265	0.84094
527	ME	1083	0.02192	0.86286
529	ME	1016	0.02057	0.88343
532	EE	899	0.01820	0.90163
534	EE	823	0.01666	0.91828
537	EE	866	0.01753	0.93581
541	EE	739	0.01496	0.95077
544	EE	656	0.01328	0.96405
549	EE	648	0.01312	0.97717
554	EE	473	0.00957	0.98674
560	EE	655	0.01326	1.00000

Table 2.3.2
Cumulative Scale Score Distribution
English Language Arts Grade 3

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	980	0.01619	0.01619
449	NM	823	0.01359	0.02978
454	NM	1098	0.01814	0.04792
459	NM	1210	0.01999	0.06790
462	NM	1431	0.02364	0.09154
465	NM	1433	0.02367	0.11521
468	NM	1420	0.02345	0.13866
471	PM	1403	0.02317	0.16184
473	PM	1377	0.02274	0.18458
475	PM	1371	0.02265	0.20723
477	PM	1405	0.02321	0.23044
479	PM	1421	0.02347	0.25391
481	PM	1413	0.02334	0.27725
483	PM	1460	0.02412	0.30136
485	PM	1570	0.02593	0.32729
487	PM	1646	0.02719	0.35448
489	PM	1710	0.02824	0.38273
491	PM	1743	0.02879	0.41152
492	PM	1758	0.02904	0.44055
494	PM	1896	0.03132	0.47187
496	PM	1965	0.03246	0.50433
498	PM	2085	0.03444	0.53877
500	ME	2145	0.03543	0.57420
502	ME	2185	0.03609	0.61029
504	ME	2424	0.04004	0.65033
507	ME	2429	0.04012	0.69045
509	ME	2480	0.04096	0.73141
512	ME	2465	0.04072	0.77213
515	ME	2546	0.04205	0.81418
518	ME	2436	0.04024	0.85442
522	ME	2337	0.03860	0.89302
526	ME	1989	0.03285	0.92587
532	EE	1651	0.02727	0.95314
538	EE	1237	0.02043	0.97357
545	EE	821	0.01356	0.98713
555	EE	466	0.00770	0.99483
560	EE	313	0.00517	1.00000

Table 2.3.3
Cumulative Scale Score Distribution
English Language Arts Grade 4

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	4	0.00006	0.00006
441	NM	29	0.00047	0.00053
442	NM	223	0.00361	0.00414
443	NM	711	0.01150	0.01564
444	NM	537	0.00868	0.02432
449	NM	700	0.01132	0.03564
453	NM	802	0.01297	0.04861
457	NM	952	0.01540	0.06401
461	NM	1104	0.01785	0.08186
464	NM	1165	0.01884	0.10070
467	NM	1207	0.01952	0.12022
469	NM	1424	0.02303	0.14325
472	PM	1527	0.02469	0.16794
475	PM	1645	0.02660	0.19455
477	PM	1727	0.02793	0.22248
480	PM	1876	0.03034	0.25281
482	PM	1999	0.03233	0.28514
484	PM	1996	0.03228	0.31742
486	PM	2134	0.03451	0.35193
488	PM	2235	0.03614	0.38807
490	PM	2248	0.03635	0.42443
492	PM	2308	0.03732	0.46175
494	PM	2304	0.03726	0.49901
497	PM	2523	0.04080	0.53981
499	PM	2564	0.04146	0.58128
501	ME	2663	0.04307	0.62435
503	ME	2729	0.04413	0.66848
506	ME	2741	0.04433	0.71280
509	ME	2698	0.04363	0.75644
511	ME	2736	0.04425	0.80068
515	ME	2513	0.04064	0.84132
518	ME	2348	0.03797	0.87929
522	ME	2199	0.03556	0.91486
526	ME	1749	0.02828	0.94314
531	EE	1348	0.02180	0.96494
537	EE	989	0.01599	0.98093
544	EE	605	0.00978	0.99072
552	EE	323	0.00522	0.99594
560	EE	251	0.00406	1.00000

Table 2.3.4
Cumulative Scale Score Distribution
English Language Arts Grade 5

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
441	NM	16	0.00026	0.00026
442	NM	130	0.00209	0.00234
443	NM	475	0.00762	0.00997
444	NM	429	0.00688	0.01685
449	NM	553	0.00887	0.02572
453	NM	633	0.01016	0.03588
456	NM	727	0.01167	0.04755
459	NM	805	0.01292	0.06047
461	NM	799	0.01282	0.07329
464	NM	826	0.01326	0.08654
466	NM	898	0.01441	0.10095
468	NM	993	0.01593	0.11689
469	NM	961	0.01542	0.13231
472	PM	1069	0.01715	0.14946
474	PM	1079	0.01731	0.16678
476	PM	1235	0.01982	0.18660
477	PM	1280	0.02054	0.20714
479	PM	1330	0.02134	0.22848
481	PM	1406	0.02256	0.25104
483	PM	1534	0.02462	0.27566
485	PM	1570	0.02519	0.30085
486	PM	1770	0.02840	0.32926
488	PM	1910	0.03065	0.35991
490	PM	1957	0.03140	0.39131
492	PM	2126	0.03412	0.42543
494	PM	2297	0.03686	0.46229
496	PM	2309	0.03705	0.49934
498	PM	2574	0.04131	0.54065
500	ME	2730	0.04381	0.58446
503	ME	2916	0.04679	0.63125
505	ME	2942	0.04721	0.67846
508	ME	2904	0.04660	0.72506
511	ME	2876	0.04615	0.77121
513	ME	2749	0.04411	0.81533
517	ME	2453	0.03936	0.85469
520	ME	2242	0.03598	0.89067
523	ME	1909	0.03063	0.92130
528	ME	1542	0.02474	0.94605
532	EE	1242	0.01993	0.96598
537	EE	879	0.01411	0.98009
543	EE	621	0.00997	0.99005
551	EE	358	0.00574	0.99580
560	EE	262	0.00420	1.00000

Table 2.3.5
Cumulative Scale Score Distribution
English Language Arts Grade 6

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	147	0.00231	0.00231
441	NM	3513	0.05526	0.05757
446	NM	1044	0.01642	0.07399
450	NM	1111	0.01748	0.09147
453	NM	1126	0.01771	0.10918
456	NM	1184	0.01862	0.12780
460	NM	1240	0.01950	0.14731
463	NM	1226	0.01928	0.16659
465	NM	1328	0.02089	0.18748
468	NM	1362	0.02142	0.20891
471	PM	1425	0.02241	0.23132
473	PM	1562	0.02457	0.25589
476	PM	1572	0.02473	0.28062
479	PM	1589	0.02499	0.30561
481	PM	1726	0.02715	0.33276
484	PM	1808	0.02844	0.36120
486	PM	1927	0.03031	0.39151
488	PM	1983	0.03119	0.42270
491	PM	2106	0.03313	0.45583
493	PM	2048	0.03221	0.48805
496	PM	2141	0.03368	0.52172
499	PM	2336	0.03674	0.55847
501	ME	2386	0.03753	0.59600
504	ME	2508	0.03945	0.63545
507	ME	2333	0.03670	0.67215
510	ME	2525	0.03972	0.71186
513	ME	2436	0.03832	0.75018
516	ME	2448	0.03851	0.78869
519	ME	2272	0.03574	0.82443
522	ME	2177	0.03424	0.85867
526	ME	1878	0.02954	0.88821
529	ME	1744	0.02743	0.91564
534	EE	1487	0.02339	0.93903
539	EE	1210	0.01903	0.95806
544	EE	975	0.01534	0.97340
550	EE	742	0.01167	0.98507
556	EE	505	0.00794	0.99302
560	EE	444	0.00698	1.00000

Table 2.3.6
Cumulative Scale Score Distribution
English Language Arts Grade 7

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	2	0.00003	0.00003
441	NM	161	0.00253	0.00256
442	NM	1208	0.01896	0.02152
443	NM	800	0.01256	0.03408
448	NM	968	0.01519	0.04927
452	NM	1087	0.01706	0.06633
456	NM	1074	0.01686	0.08319
459	NM	1281	0.02011	0.10329
462	NM	1270	0.01993	0.12323
465	NM	1326	0.02081	0.14404
468	NM	1369	0.02149	0.16553
470	PM	1408	0.02210	0.18763
473	PM	1482	0.02326	0.21089
475	PM	1543	0.02422	0.23511
477	PM	1544	0.02423	0.25934
479	PM	1564	0.02455	0.28389
481	PM	1593	0.02500	0.30889
483	PM	1743	0.02736	0.33625
485	PM	1793	0.02814	0.36440
487	PM	1847	0.02899	0.39339
489	PM	1927	0.03025	0.42363
491	PM	1907	0.02993	0.45356
493	PM	1972	0.03095	0.48452
495	PM	1981	0.03109	0.51561
496	PM	2024	0.03177	0.54738
498	PM	1956	0.03070	0.57808
500	ME	1958	0.03073	0.60881
502	ME	1960	0.03076	0.63958
504	ME	2038	0.03199	0.67156
507	ME	1961	0.03078	0.70234
509	ME	1872	0.02938	0.73173
511	ME	1805	0.02833	0.76006
513	ME	1854	0.02910	0.78916
516	ME	1801	0.02827	0.81743
518	ME	1728	0.02712	0.84455
521	ME	1706	0.02678	0.87133
524	ME	1589	0.02494	0.89627
528	ME	1429	0.02243	0.91870
531	EE	1365	0.02142	0.94012
536	EE	1178	0.01849	0.95861
541	EE	945	0.01483	0.97344
546	EE	767	0.01204	0.98548
554	EE	507	0.00796	0.99344
560	EE	418	0.00656	1.00000

Table 2.3.7
Cumulative Scale Score Distribution
English Language Arts Grade 8

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	3036	0.04631	0.04631
441	NM	711	0.01085	0.05716
445	NM	770	0.01175	0.06891
448	NM	842	0.01284	0.08175
452	NM	930	0.01419	0.09594
455	NM	1005	0.01533	0.11127
458	NM	1002	0.01529	0.12655
461	NM	1041	0.01588	0.14243
464	NM	1150	0.01754	0.15998
467	NM	1230	0.01876	0.17874
469	NM	1280	0.01953	0.19827
472	PM	1400	0.02136	0.21962
474	PM	1458	0.02224	0.24187
477	PM	1582	0.02413	0.26600
479	PM	1661	0.02534	0.29134
482	PM	1751	0.02671	0.31805
484	PM	1830	0.02792	0.34596
486	PM	1927	0.02940	0.37536
489	PM	2081	0.03175	0.40711
491	PM	2079	0.03171	0.43882
494	PM	2172	0.03313	0.47195
496	PM	2361	0.03602	0.50797
499	PM	2511	0.03830	0.54628
502	ME	2614	0.03988	0.58615
504	ME	2528	0.03856	0.62472
507	ME	2684	0.04094	0.66566
510	ME	2697	0.04114	0.70680
513	ME	2691	0.04105	0.74785
517	ME	2666	0.04067	0.78852
520	ME	2446	0.03731	0.82584
524	ME	2463	0.03757	0.86341
529	ME	2169	0.03309	0.89650
534	EE	1963	0.02995	0.92644
539	EE	1685	0.02570	0.95215
546	EE	1309	0.01997	0.97211
553	EE	886	0.01352	0.98563
560	EE	942	0.01437	1.00000

Table 2.3.8
Cumulative Scale Score Distribution
English Language Arts Grade 10

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	2	0.00003	0.00003
441	NM	38	0.00056	0.00059
442	NM	502	0.00737	0.00796
443	NM	711	0.01044	0.01840
444	NM	444	0.00652	0.02492
447	NM	461	0.00677	0.03169
450	NM	456	0.00670	0.03838
453	NM	425	0.00624	0.04462
456	NM	460	0.00675	0.05138
458	NM	490	0.00719	0.05857
461	NM	441	0.00648	0.06505
463	NM	525	0.00771	0.07276
465	NM	601	0.00882	0.08158
467	NM	608	0.00893	0.09051
469	NM	662	0.00972	0.10023
471	PM	731	0.01073	0.11096
473	PM	745	0.01094	0.12190
475	PM	843	0.01238	0.13428
477	PM	968	0.01421	0.14849
479	PM	1009	0.01482	0.16331
481	PM	1095	0.01608	0.17939
483	PM	1163	0.01708	0.19646
485	PM	1323	0.01943	0.21589
486	PM	1394	0.02047	0.23636
488	PM	1551	0.02277	0.25913
490	PM	1710	0.02511	0.28424
492	PM	1754	0.02575	0.31000
494	PM	1885	0.02768	0.33767
496	PM	2053	0.03015	0.36782
498	PM	2257	0.03314	0.40096
500	ME	2308	0.03389	0.43485
503	ME	2525	0.03708	0.47193
505	ME	2820	0.04141	0.51333
507	ME	2796	0.04105	0.55439
510	ME	3028	0.04446	0.59885
513	ME	3144	0.04616	0.64501
516	ME	3377	0.04959	0.69460
519	ME	3289	0.04829	0.74289
523	ME	3426	0.05031	0.79320
527	ME	3274	0.04807	0.84127
532	EE	3156	0.04634	0.88761
538	EE	2844	0.04176	0.92937
545	EE	2306	0.03386	0.96323
554	EE	1582	0.02323	0.98646
560	EE	922	0.01354	1.00000

Table 2.3.9
Cumulative Scale Score Distribution
Mathematics Grade 3

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	952	0.01841	0.01841
447	NM	462	0.00893	0.02735
452	NM	567	0.01097	0.03831
456	NM	626	0.01211	0.05042
459	NM	633	0.01224	0.06266
462	NM	685	0.01325	0.07591
464	NM	721	0.01394	0.08985
467	NM	764	0.01478	0.10463
469	NM	771	0.01491	0.11954
471	PM	874	0.01690	0.13644
473	PM	882	0.01706	0.15350
475	PM	876	0.01694	0.17044
477	PM	910	0.01760	0.18804
478	PM	977	0.01889	0.20694
480	PM	1005	0.01944	0.22637
482	PM	1048	0.02027	0.24664
483	PM	1058	0.02046	0.26710
485	PM	1096	0.02120	0.28830
487	PM	1173	0.02269	0.31098
488	PM	1200	0.02321	0.33419
490	PM	1120	0.02166	0.35585
491	PM	1293	0.02501	0.38086
493	PM	1277	0.02470	0.40555
495	PM	1293	0.02501	0.43056
496	PM	1368	0.02646	0.45702
498	PM	1406	0.02719	0.48421
499	PM	1430	0.02766	0.51186
501	ME	1481	0.02864	0.54051
503	ME	1495	0.02891	0.56942
505	ME	1609	0.03112	0.60054
507	ME	1562	0.03021	0.63075
509	ME	1694	0.03276	0.66351
511	ME	1647	0.03185	0.69536
513	ME	1775	0.03433	0.72969
516	ME	1743	0.03371	0.76340
518	ME	1839	0.03557	0.79896
521	ME	1800	0.03481	0.83377
524	ME	1892	0.03659	0.87037
528	ME	1697	0.03282	0.90319
532	EE	1486	0.02874	0.93192
537	EE	1334	0.02580	0.95772
544	EE	1117	0.02160	0.97933
555	EE	768	0.01485	0.99418
560	EE	301	0.00582	1.00000

Table 2.3.10
Cumulative Scale Score Distribution
Mathematics Grade 4

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	1	0.00002	0.00002
441	NM	22	0.00042	0.00044
442	NM	117	0.00223	0.00266
443	NM	162	0.00308	0.00575
444	NM	542	0.01031	0.01606
449	NM	337	0.00641	0.02247
454	NM	445	0.00847	0.03094
457	NM	458	0.00871	0.03965
460	NM	493	0.00938	0.04904
463	NM	556	0.01058	0.05961
465	NM	622	0.01184	0.07145
468	NM	618	0.01176	0.08321
469	NM	673	0.01281	0.09602
472	PM	723	0.01376	0.10977
474	PM	747	0.01421	0.12399
476	PM	784	0.01492	0.13890
477	PM	830	0.01579	0.15470
479	PM	876	0.01667	0.17137
481	PM	960	0.01827	0.18963
482	PM	924	0.01758	0.20722
484	PM	986	0.01876	0.22598
485	PM	1070	0.02036	0.24634
487	PM	1043	0.01985	0.26618
488	PM	1134	0.02158	0.28776
490	PM	1194	0.02272	0.31048
491	PM	1272	0.02420	0.33468
493	PM	1292	0.02458	0.35927
494	PM	1346	0.02561	0.38488
496	PM	1359	0.02586	0.41074
497	PM	1357	0.02582	0.43656
499	PM	1396	0.02656	0.46312
500	ME	1530	0.02911	0.49224
502	ME	1530	0.02911	0.52135
504	ME	1520	0.02892	0.55027
505	ME	1597	0.03039	0.58066
507	ME	1660	0.03159	0.61225
509	ME	1683	0.03202	0.64427
511	ME	1719	0.03271	0.67698
513	ME	1684	0.03204	0.70902
515	ME	1787	0.03400	0.74303
517	ME	1753	0.03336	0.77638
519	ME	1609	0.03062	0.80700
522	ME	1608	0.03060	0.83760
525	ME	1614	0.03071	0.86831
528	ME	1461	0.02780	0.89611
531	EE	1386	0.02637	0.92248
535	EE	1158	0.02203	0.94451
539	EE	971	0.01848	0.96299
544	EE	790	0.01503	0.97802
551	EE	580	0.01104	0.98906
560	EE	575	0.01094	1.00000

Table 2.3.11 Cumulative Scale Score Distribution - Mathematics Grade 5

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
441	NM	2	0.00004	0.00004
442	NM	12	0.00022	0.00026
443	NM	44	0.00081	0.00107
444	NM	76	0.00140	0.00247
445	NM	123	0.00227	0.00475
446	NM	191	0.00353	0.00827
452	NM	252	0.00465	0.01292
456	NM	405	0.00748	0.02040
460	NM	533	0.00984	0.03024
463	NM	577	0.01065	0.04090
466	NM	700	0.01292	0.05382
468	NM	841	0.01553	0.06935
471	PM	913	0.01686	0.08621
473	PM	973	0.01797	0.10417
475	PM	1065	0.01966	0.12384
477	PM	1167	0.02155	0.14539
479	PM	1169	0.02158	0.16697
480	PM	1239	0.02288	0.18985
482	PM	1327	0.02450	0.21435
484	PM	1304	0.02408	0.23843
485	PM	1324	0.02445	0.26287
487	PM	1300	0.02400	0.28688
488	PM	1346	0.02485	0.31173
490	PM	1345	0.02483	0.33656
491	PM	1403	0.02591	0.36247
492	PM	1411	0.02605	0.38852
494	PM	1461	0.02698	0.41550
495	PM	1389	0.02565	0.44115
497	PM	1387	0.02561	0.46676
498	PM	1423	0.02627	0.49303
499	PM	1459	0.02694	0.51997
501	ME	1423	0.02627	0.54624
502	ME	1452	0.02681	0.57305
504	ME	1479	0.02731	0.60036
505	ME	1439	0.02657	0.62693
507	ME	1484	0.02740	0.65433
508	ME	1477	0.02727	0.68160
510	ME	1370	0.02530	0.70690
511	ME	1395	0.02576	0.73266
513	ME	1465	0.02705	0.75971
514	ME	1339	0.02472	0.78443
516	ME	1325	0.02447	0.80890
518	ME	1213	0.02240	0.83129
520	ME	1234	0.02278	0.85408
522	ME	1232	0.02275	0.87683
524	ME	1177	0.02173	0.89856
526	ME	1033	0.01907	0.91763
529	ME	1046	0.01931	0.93694
532	EE	906	0.01673	0.95367
536	EE	741	0.01368	0.96736
541	EE	726	0.01340	0.98076
547	EE	533	0.00984	0.99060
559	EE	350	0.00646	0.99706
560	EE	159	0.00294	1.00000

Table 2.3.12 Cumulative Scale Score Distribution - Mathematics Grade 6

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	3	0.00005	0.00005
441	NM	54	0.00096	0.00101
442	NM	295	0.00523	0.00624
443	NM	351	0.00622	0.01247
450	NM	487	0.00864	0.02110
456	NM	702	0.01245	0.03355
460	NM	858	0.01522	0.04877
464	NM	1005	0.01782	0.06659
467	NM	1084	0.01922	0.08581
469	NM	1143	0.02027	0.10608
472	PM	1153	0.02045	0.12653
474	PM	1178	0.02089	0.14742
476	PM	1291	0.02289	0.17032
478	PM	1246	0.02210	0.19241
480	PM	1336	0.02369	0.21611
482	PM	1352	0.02398	0.24008
483	PM	1327	0.02353	0.26362
485	PM	1312	0.02327	0.28688
487	PM	1386	0.02458	0.31146
488	PM	1302	0.02309	0.33455
489	PM	1393	0.02470	0.35925
491	PM	1380	0.02447	0.38373
492	PM	1363	0.02417	0.40790
494	PM	1370	0.02430	0.43219
495	PM	1370	0.02430	0.45649
496	PM	1334	0.02366	0.48015
498	PM	1268	0.02249	0.50263
499	PM	1301	0.02307	0.52571
500	ME	1273	0.02258	0.54828
501	ME	1272	0.02256	0.57084
503	ME	1274	0.02259	0.59343
504	ME	1264	0.02242	0.61585
505	ME	1195	0.02119	0.63704
506	ME	1225	0.02172	0.65876
508	ME	1198	0.02125	0.68001
509	ME	1215	0.02155	0.70156
510	ME	1173	0.02080	0.72236
512	ME	1171	0.02077	0.74312
513	ME	1181	0.02094	0.76407
515	ME	1178	0.02089	0.78496
516	ME	1188	0.02107	0.80603
518	ME	1191	0.02112	0.82715
519	ME	1142	0.02025	0.84740
521	ME	1076	0.01908	0.86648
523	ME	1104	0.01958	0.88606
525	ME	1070	0.01898	0.90503
528	ME	1009	0.01789	0.92293
530	EE	1015	0.01800	0.94093
534	EE	942	0.01671	0.95763
538	EE	893	0.01584	0.97347
543	EE	662	0.01174	0.98521
554	EE	524	0.00929	0.99450
560	EE	310	0.00550	1.00000

Table 2.3.13
Cumulative Scale Score Distribution
Mathematics Grade 7

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	298	0.00521	0.00521
441	NM	1140	0.01992	0.02512
451	NM	993	0.01735	0.04247
458	NM	1394	0.02436	0.06683
462	NM	1521	0.02658	0.09341
466	NM	1804	0.03152	0.12493
469	NM	1743	0.03045	0.15538
473	PM	1730	0.03023	0.18561
475	PM	1738	0.03037	0.21597
478	PM	1633	0.02853	0.24451
480	PM	1633	0.02853	0.27304
482	PM	1629	0.02846	0.30150
484	PM	1572	0.02747	0.32897
486	PM	1543	0.02696	0.35592
487	PM	1443	0.02521	0.38114
489	PM	1539	0.02689	0.40803
490	PM	1382	0.02415	0.43217
492	PM	1279	0.02235	0.45452
494	PM	1361	0.02378	0.47830
495	PM	1335	0.02333	0.50162
496	PM	1280	0.02236	0.52399
498	PM	1176	0.02055	0.54454
499	PM	1125	0.01966	0.56419
500	ME	1197	0.02091	0.58511
502	ME	1126	0.01967	0.60478
503	ME	1109	0.01938	0.62416
504	ME	1068	0.01866	0.64282
506	ME	1011	0.01766	0.66048
507	ME	1041	0.01819	0.67867
508	ME	1045	0.01826	0.69693
510	ME	1071	0.01871	0.71564
511	ME	963	0.01683	0.73247
512	ME	1005	0.01756	0.75003
514	ME	966	0.01688	0.76690
515	ME	970	0.01695	0.78385
516	ME	989	0.01728	0.80113
518	ME	902	0.01576	0.81689
520	ME	957	0.01672	0.83361
521	ME	931	0.01627	0.84988
523	ME	899	0.01571	0.86559
525	ME	911	0.01592	0.88150
527	ME	867	0.01515	0.89665
529	ME	865	0.01511	0.91177
531	EE	887	0.01550	0.92726
534	EE	829	0.01448	0.94175
537	EE	816	0.01426	0.95601
540	EE	757	0.01323	0.96923
545	EE	648	0.01132	0.98055
551	EE	525	0.00917	0.98973
560	EE	588	0.01027	1.00000

Table 2.3.14 Cumulative Scale Score Distribution - Mathematics Grade 8

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
441	NM	2	0.00003	0.00003
442	NM	7	0.00012	0.00015
443	NM	37	0.00062	0.00077
444	NM	86	0.00144	0.00222
445	NM	201	0.00337	0.00559
446	NM	353	0.00593	0.01152
447	NM	583	0.00979	0.02130
453	NM	806	0.01353	0.03483
458	NM	995	0.01670	0.05153
461	NM	1134	0.01904	0.07057
465	NM	1291	0.02167	0.09224
467	NM	1488	0.02498	0.11722
469	NM	1430	0.02400	0.14122
472	PM	1511	0.02536	0.16659
474	PM	1549	0.02600	0.19259
476	PM	1509	0.02533	0.21792
478	PM	1521	0.02553	0.24345
480	PM	1550	0.02602	0.26947
482	PM	1504	0.02525	0.29472
483	PM	1477	0.02479	0.31951
485	PM	1451	0.02436	0.34387
487	PM	1405	0.02358	0.36745
488	PM	1409	0.02365	0.39111
489	PM	1443	0.02422	0.41533
491	PM	1411	0.02369	0.43901
492	PM	1309	0.02197	0.46099
494	PM	1343	0.02254	0.48353
495	PM	1416	0.02377	0.50730
496	PM	1401	0.02352	0.53082
498	PM	1302	0.02186	0.55268
499	PM	1288	0.02162	0.57430
501	ME	1289	0.02164	0.59593
502	ME	1236	0.02075	0.61668
503	ME	1290	0.02165	0.63834
505	ME	1301	0.02184	0.66018
506	ME	1247	0.02093	0.68111
508	ME	1229	0.02063	0.70174
509	ME	1223	0.02053	0.72227
511	ME	1194	0.02004	0.74231
512	ME	1219	0.02046	0.76277
514	ME	1143	0.01919	0.78196
516	ME	1213	0.02036	0.80232
517	ME	1200	0.02014	0.82247
519	ME	1190	0.01998	0.84244
521	ME	1094	0.01836	0.86081
524	ME	1092	0.01833	0.87914
526	ME	1053	0.01768	0.89681
529	ME	1070	0.01796	0.91478
532	EE	1084	0.01820	0.93297
535	EE	1009	0.01694	0.94991
540	EE	958	0.01608	0.96599
546	EE	868	0.01457	0.98056
558	EE	717	0.01204	0.99260
560	EE	441	0.00740	1.00000

Table 2.3.15 Cumulative Scale Score Distribution - Mathematics Grade 10

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	5	0.00008	0.00008
441	NM	54	0.00085	0.00093
442	NM	398	0.00626	0.00719
452	NM	474	0.00746	0.01464
459	NM	622	0.00978	0.02443
464	NM	844	0.01328	0.03770
467	NM	1083	0.01704	0.05474
470	PM	1175	0.01848	0.07322
473	PM	1241	0.01952	0.09274
476	PM	1329	0.02090	0.11365
478	PM	1348	0.02120	0.13485
480	PM	1298	0.02042	0.15527
482	PM	1356	0.02133	0.17660
483	PM	1389	0.02185	0.19845
485	PM	1430	0.02249	0.22094
486	PM	1354	0.02130	0.24224
488	PM	1371	0.02157	0.26380
489	PM	1289	0.02028	0.28408
490	PM	1270	0.01998	0.30406
491	PM	1259	0.01980	0.32386
493	PM	1246	0.01960	0.34346
494	PM	1246	0.01960	0.36306
495	PM	1286	0.02023	0.38329
496	PM	1256	0.01976	0.40304
497	PM	1209	0.01902	0.42206
498	PM	1169	0.01839	0.44045
499	PM	1233	0.01939	0.45984
500	ME	1132	0.01781	0.47765
501	ME	1196	0.01881	0.49646
502	ME	1285	0.02021	0.51667
503	ME	1233	0.01939	0.53607
504	ME	1254	0.01973	0.55579
505	ME	1214	0.01910	0.57489
507	ME	1246	0.01960	0.59449
508	ME	1275	0.02006	0.61454
509	ME	1244	0.01957	0.63411
510	ME	1263	0.01987	0.65398
511	ME	1310	0.02061	0.67458
512	ME	1276	0.02007	0.69466
514	ME	1277	0.02009	0.71474
515	ME	1290	0.02029	0.73503
516	ME	1247	0.01961	0.75465
518	ME	1282	0.02017	0.77481
519	ME	1247	0.01961	0.79443
521	ME	1186	0.01866	0.81308
523	ME	1295	0.02037	0.83345
524	ME	1299	0.02043	0.85389
527	ME	1155	0.01817	0.87205
529	ME	1144	0.01799	0.89005
531	EE	1116	0.01755	0.90760
534	EE	1005	0.01581	0.92341
537	EE	981	0.01543	0.93884
541	EE	920	0.01447	0.95331
545	EE	805	0.01266	0.96598
551	EE	733	0.01153	0.97751
558	EE	656	0.01032	0.98783
560	EE	774	0.01217	1.00000

Table 2.3.16
Cumulative Scale Score Distribution
Introductory Physics Grade 10

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
442	NM	1	0.00008	0.00008
443	NM	19	0.00148	0.00156
444	NM	56	0.00437	0.00593
445	NM	44	0.00343	0.00936
450	NM	67	0.00523	0.01458
454	NM	94	0.00733	0.02192
458	NM	130	0.01014	0.03205
461	NM	135	0.01053	0.04258
464	NM	148	0.01154	0.05413
467	NM	203	0.01583	0.06996
469	NM	208	0.01622	0.08618
472	PM	229	0.01786	0.10404
474	PM	265	0.02067	0.12471
476	PM	253	0.01973	0.14444
478	PM	269	0.02098	0.16542
480	PM	280	0.02184	0.18726
482	PM	279	0.02176	0.20902
484	PM	295	0.02301	0.23202
486	PM	332	0.02589	0.25792
488	PM	349	0.02722	0.28513
489	PM	340	0.02652	0.31165
491	PM	332	0.02589	0.33754
493	PM	318	0.02480	0.36235
495	PM	322	0.02511	0.38746
496	PM	366	0.02854	0.41600
498	PM	382	0.02979	0.44580
500	ME	360	0.02808	0.47387
502	ME	362	0.02823	0.50211
503	ME	336	0.02620	0.52831
505	ME	351	0.02737	0.55569
507	ME	308	0.02402	0.57971
509	ME	325	0.02535	0.60505
511	ME	322	0.02511	0.63017
513	ME	319	0.02488	0.65505
515	ME	331	0.02582	0.68086
517	ME	308	0.02402	0.70488
519	ME	272	0.02121	0.72610
521	ME	289	0.02254	0.74864
523	ME	262	0.02043	0.76907
525	ME	282	0.02199	0.79106
527	ME	235	0.01833	0.80939
529	ME	249	0.01942	0.82881
532	EE	253	0.01973	0.84854
534	EE	228	0.01778	0.86632
537	EE	235	0.01833	0.88465
539	EE	200	0.01560	0.90025
542	EE	218	0.01700	0.91725
545	EE	197	0.01536	0.93262
549	EE	197	0.01536	0.94798
553	EE	174	0.01357	0.96155
558	EE	154	0.01201	0.97356
560	EE	339	0.02644	1.00000

Table 2.3.17
Cumulative Scale Score Distribution
Science Grade 5

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	66	0.00122	0.00122
441	NM	520	0.00960	0.01082
445	NM	271	0.00500	0.01582
446	NM	50	0.00092	0.01675
449	NM	363	0.00670	0.02345
450	NM	50	0.00092	0.02437
452	NM	410	0.00757	0.03194
454	NM	75	0.00138	0.03333
455	NM	513	0.00947	0.04280
458	NM	593	0.01095	0.05375
461	NM	715	0.01320	0.06695
463	NM	662	0.01222	0.07917
464	NM	91	0.00168	0.08085
466	NM	668	0.01233	0.09318
467	NM	98	0.00181	0.09499
468	NM	723	0.01335	0.10834
470	PM	922	0.01702	0.12536
472	PM	858	0.01584	0.14121
473	PM	131	0.00242	0.14362
474	PM	912	0.01684	0.16046
475	PM	121	0.00223	0.16270
476	PM	938	0.01732	0.18002
478	PM	1147	0.02118	0.20119
480	PM	1257	0.02321	0.22440
482	PM	1138	0.02101	0.24541
483	PM	174	0.00321	0.24862
484	PM	1234	0.02278	0.27141
485	PM	156	0.00288	0.27429
486	PM	1249	0.02306	0.29735
488	PM	1524	0.02814	0.32549
490	PM	1614	0.02980	0.35529
492	PM	1440	0.02659	0.38187
493	PM	218	0.00402	0.38590
494	PM	1508	0.02784	0.41374
495	PM	201	0.00371	0.41745
496	PM	1551	0.02864	0.44609
498	PM	1853	0.03421	0.48030
499	PM	1763	0.03255	0.51285
500	ME	227	0.00419	0.51704
502	ME	1748	0.03227	0.54932

Table 2.3.17 (continued)
Cumulative Scale Score Distribution
Science Grade 5

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
503	ME	248	0.00458	0.55389
504	ME	1845	0.03406	0.58796
506	ME	2054	0.03792	0.62588
508	ME	1883	0.03477	0.66065
509	ME	223	0.00412	0.66476
511	ME	1864	0.03442	0.69918
512	ME	190	0.00351	0.70269
513	ME	1836	0.03390	0.73659
515	ME	223	0.00412	0.74070
516	ME	1841	0.03399	0.77469
518	ME	1719	0.03174	0.80643
519	ME	188	0.00347	0.80990
521	ME	1631	0.03011	0.84002
522	ME	188	0.00347	0.84349
524	ME	1505	0.02779	0.87128
527	ME	1558	0.02877	0.90004
531	EE	1422	0.02625	0.92630
535	EE	1078	0.01990	0.94620
537	EE	110	0.00203	0.94823
539	EE	899	0.01660	0.96483
544	EE	801	0.01479	0.97962
549	EE	443	0.00818	0.98780
552	EE	52	0.00096	0.98876
556	EE	328	0.00606	0.99481
560	EE	281	0.00519	1.00000

Table 2.3.18
Cumulative Scale Score Distribution
Science Grade 8

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
440	NM	16	0.00027	0.00027
441	NM	866	0.01455	0.01482
442	NM	1	0.00002	0.01483
443	NM	5	0.00008	0.01492
445	NM	8	0.00013	0.01505
446	NM	27	0.00045	0.01551
447	NM	54	0.00091	0.01641
448	NM	570	0.00958	0.02599
453	NM	630	0.01058	0.03657
455	NM	100	0.00168	0.03825
457	NM	830	0.01394	0.05219
460	NM	140	0.00235	0.05455
461	NM	884	0.01485	0.06940
464	NM	1209	0.02031	0.08971
467	NM	1080	0.01814	0.10785
468	NM	194	0.00326	0.11111
469	NM	1156	0.01942	0.13053
471	PM	187	0.00314	0.13367
472	PM	1223	0.02055	0.15422
474	PM	1499	0.02518	0.17940
476	PM	1289	0.02165	0.20105
477	PM	185	0.00311	0.20416
478	PM	1403	0.02357	0.22773
480	PM	217	0.00365	0.23137
481	PM	1438	0.02416	0.25553
482	PM	1465	0.02461	0.28014
483	PM	202	0.00339	0.28354
484	PM	1403	0.02357	0.30710
485	PM	203	0.00341	0.31051
486	PM	1486	0.02496	0.33548
487	PM	205	0.00344	0.33892
488	PM	1470	0.02469	0.36362
490	PM	1794	0.03014	0.39375
492	PM	1782	0.02994	0.42369
493	PM	1622	0.02725	0.45094
494	PM	212	0.00356	0.45450
495	PM	1586	0.02664	0.48114
497	PM	1767	0.02968	0.51083
499	PM	1812	0.03044	0.54127
500	ME	1626	0.02732	0.56858

Table 2.3.18 (continued)
Cumulative Scale Score Distribution
Science Grade 8

Scale Score	Achievement Levels	N	Proportion	Cumulative Proportion
502	ME	1841	0.03093	0.59951
504	ME	1897	0.03187	0.63138
506	ME	1815	0.03049	0.66187
508	ME	1682	0.02826	0.69012
509	ME	192	0.00323	0.69335
510	ME	1601	0.02690	0.72024
511	ME	1521	0.02555	0.74580
512	ME	186	0.00312	0.74892
513	ME	1500	0.02520	0.77412
514	ME	178	0.00299	0.77711
515	ME	1479	0.02485	0.80196
517	ME	1602	0.02691	0.82887
520	ME	1496	0.02513	0.85400
522	ME	1288	0.02164	0.87564
523	ME	147	0.00247	0.87811
524	ME	1158	0.01945	0.89756
527	ME	1156	0.01942	0.91698
529	ME	997	0.01675	0.93373
530	EE	106	0.00178	0.93551
532	EE	831	0.01396	0.94947
535	EE	86	0.00144	0.95091
536	EE	726	0.01220	0.96311
539	EE	63	0.00106	0.96417
540	EE	636	0.01068	0.97485
544	EE	501	0.00842	0.98327
545	EE	41	0.00069	0.98396
549	EE	363	0.00610	0.99005
553	EE	32	0.00054	0.99059
556	EE	262	0.00440	0.99499
560	EE	298	0.00501	1.00000

Section 2.4

Rescore Analysis Results

This section shows the results of rescore analyses. Rescore analyses are conducted on human-scored items to ensure consistency in scoring across years. To detect rater drift, 200 student responses from a previous administration are *rescored* using raters during the current administration. Then, the resulting scores from the current year are compared to the previous scores (on the same set of 200 student responses). Effect sizes (i.e., Cohen's *d*) are calculated using the means and standard deviations of the two sets of scores. The threshold for flagging an item is 0.5.

Table 2.4.1
Rescore Analysis
English Language Arts Grade 3

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA00287	3	1.16500	0.96000	0.83140	0.84971	-0.24657	False
IA00288	3	1.02000	0.87000	0.77628	0.73880	-0.19323	False

Table 2.4.2
Rescore Analysis
English Language Arts Grade 4

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA00225	3	1.44000	1.44500	0.83057	0.69959	0.00602	False
IA00226	3	1.20000	1.20000	0.78298	0.76349	0.00000	False

Table 2.4.3
Rescore Analysis
Mathematics Grade 3

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA01080	3	1.01000	0.97500	0.86233	0.91573	-0.04059	False
IA01081	3	0.78500	0.82000	0.89036	0.89533	0.03931	False

Table 2.4.4
Rescore Analysis
Mathematics Grade 4

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA00789	4	1.41000	1.38500	1.32312	1.41307	-0.01889	False
IA01057	4	2.13000	2.20000	1.20847	1.19041	0.05792	False

Table 2.4.5
Rescore Analysis
Mathematics Grade 5

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA01032	4	1.41500	1.45000	1.22486	1.30999	0.02857	False
IA02736	4	1.86000	1.95500	1.44250	1.45726	0.06586	False

Table 2.4.6
Rescore Analysis
Mathematics Grade 6

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA00881	4	1.82000	1.78500	1.64350	1.59105	-0.02130	False
IA00972	4	2.92000	2.90000	1.12245	1.07507	-0.01782	False

Table 2.4.7
Rescore Analysis
Mathematics Grade 7

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA01069	4	2.13500	2.15000	1.15909	1.17661	0.01294	False
IA02722	4	2.22000	2.12500	1.59194	1.56898	-0.05968	False

Table 2.4.8
Rescore Analysis
Mathematics Grade 8

Item Id	Max	Old Mean	New Mean	Old StDev	New StDev	Effect Size	Discard
IA00864	4	2.72000	2.70500	1.50764	1.53942	-0.00995	False
IA01066	4	2.12000	2.13000	1.64595	1.67545	0.00608	False

Section 2.5

Tabled Delta Analysis Results

Table 2.5.1
Delta Analysis
Biology Grade 10

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA10582 (SC129438142)	0.52500	0.56500	12.74917	12.34537	2	False	-0.39851
IA10635 (SC313409)	0.40250	0.47500	13.98753	13.25083	4	False	1.26093
IA10656 (SC630544518)	0.60000	0.63000	11.98661	11.67259	1	False	-1.00645
IA10684 (SC723337422)	0.81000	0.78000	9.48841	9.91123	1	False	1.94108
IA10696 (SC800163004)	0.79000	0.81000	9.77432	9.48841	1	False	-0.71214
IA10747 (SC804071827)	0.54000	0.60000	12.59827	11.98661	2	False	0.29176
IA10808 (SC815940509)	0.43000	0.41000	13.70550	13.91018	1	False	-0.42078
IA10809 (SC815948686)	0.58000	0.62000	12.19243	11.77808	1	False	-0.56899
IA10810 (SC815948962)	0.40000	0.38000	14.01339	14.22192	1	False	-0.52217
IA10926 (SC906349045)	0.57500	0.58000	12.24353	12.19243	2	False	-0.79263
IA10927 (SC906351730)	0.78000	0.83000	9.91123	9.18334	1	False	-0.29623
IA10930 (SC906544336)	0.64000	0.69000	11.56616	11.01660	1	False	-0.31756
IA10989 (SC910635381)	0.67000	0.79000	11.24035	9.77432	1	False	2.85315
IA10994 (SC910746953)	0.70000	0.69000	10.90240	11.01660	1	False	0.30316
IA10995 (SC910749140)	0.42000	0.45000	13.80757	13.50265	1	False	-0.35766
IA10998 (SC910752674)	0.30333	0.27333	15.05935	15.41105	3	False	-0.39925
IA11005 (SC911354147)	0.50000	0.54000	13.00000	12.59827	1	False	-0.31208
IA11014 (SC912353814)	0.71000	0.70000	10.78646	10.90240	1	False	0.35278
IA11031 (SC914149827)	0.57000	0.58000	12.29450	12.19243	1	False	-0.99485
IA11033 (SC914353987)	0.36000	0.32000	14.43384	14.87080	1	False	0.14116
IA11042 (SC915956318)	0.65000	0.68000	11.45872	11.12920	1	False	-1.14836
IA11054 (SC921067241)	0.63000	0.59000	11.67259	12.08982	1	False	1.10364

Table 2.5.2
Delta Analysis
English Language Arts Grade 3

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00279 (EL308822)	0.78000	0.78000	9.91123	9.91123	1	False	-0.86431
IA00280 (EL308824)	0.66000	0.66000	11.35015	11.35015	1	False	-0.73854
IA00281 (EL308826)	0.59000	0.56000	12.08982	12.39612	1	False	0.30730
IA00282 (EL308827)	0.65000	0.61000	11.45872	11.88272	1	False	0.91086
IA00283 (EL308835)	0.57000	0.57000	12.29450	12.29450	1	False	-0.65601
IA00284 (EL308837)	0.66000	0.66000	11.35015	11.35015	1	False	-0.73854
IA00285 (EL308838)	0.77000	0.77000	10.04461	10.04461	1	False	-0.85265
IA00286 (EL308842)	0.41000	0.49000	13.91018	13.10028	1	False	3.25869
IA00287 (EL308855)	0.37333	0.33333	14.29215	14.72291	3	False	0.69467
IA00288 (EL308857)	0.32000	0.29333	14.87080	15.17469	3	False	0.05303
IA00443 (EL626042844)	0.66000	0.65000	11.35015	11.45872	1	False	-0.54932
IA00444 (EL626043062)	0.67000	0.67000	11.24035	11.24035	1	False	-0.74814
IA00445 (EL626043435)	0.51500	0.52500	12.84957	12.74917	2	False	-0.13974
IA00446 (EL626049849)	0.53000	0.51000	12.69892	12.89972	1	False	-0.23747
IA00450 (EL626050679)	0.67000	0.66000	11.24035	11.35015	1	False	-0.53399
IA00451 (EL626050927)	0.51000	0.54000	12.89972	12.59827	1	False	0.80144
IA00452 (EL626051097)	0.55000	0.52000	12.49735	12.79939	2	False	0.25178
IA00453 (EL626051328)	0.64000	0.65000	11.56616	11.45872	1	False	-0.21905

Table 2.5.3
Delta Analysis
English Language Arts Grade 4

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00218 (EL307705)	0.81000	0.83000	9.48841	9.18334	1	False	0.70702
IA00219 (EL307709)	0.77000	0.76000	10.04461	10.17479	1	False	-0.38548
IA00220 (EL307710)	0.43000	0.48000	13.70550	13.20061	1	False	1.53502
IA00221 (EL307713)	0.52000	0.53000	12.79939	12.69892	1	False	-0.89187
IA00222 (EL307714)	0.76000	0.75000	10.17479	10.30204	1	False	-0.39087
IA00223 (EL307719)	0.56000	0.59000	12.39612	12.08982	1	False	0.42844
IA00224 (EL307724)	0.75000	0.73000	10.30204	10.54875	1	False	0.36485
IA00225 (EL307728)	0.45333	0.48000	13.46898	13.20061	3	False	0.08678
IA00226 (EL307729)	0.41667	0.41333	13.84171	13.87591	3	False	-0.60884
IA00289 (EL309792)	0.64000	0.58000	11.56616	12.19243	1	False	2.85068
IA00407 (EL624647403)	0.41000	0.42000	13.91018	13.80757	1	False	-0.98789
IA00408 (EL624647580)	0.58000	0.57000	12.19243	12.29450	1	False	-0.34889
IA00411 (EL624652450)	0.78000	0.76000	9.91123	10.17479	1	False	0.43125
IA00412 (EL624652621)	0.90000	0.91000	7.87379	7.63698	1	False	0.44126
IA00414 (EL624652989)	0.43000	0.43000	13.70550	13.70550	1	False	-0.83503
IA00415 (EL624653348)	0.67000	0.67000	11.24035	11.24035	1	False	-1.07768
IA00416 (EL624653492)	0.72000	0.73000	10.66863	10.54875	2	False	-0.56131
IA00419 (EL624654711)	0.80000	0.80500	9.63352	9.56153	2	False	-0.75744

Table 2.5.4

Delta Analysis

English Language Arts Grade 5

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00495 (EL626304658)	0.75000	0.75000	10.30204	10.30204	1	False	-1.34700
IA00497 (EL626304969)	0.73000	0.72000	10.54875	10.66863	1	False	0.57721
IA00500 (EL626332335)	0.66000	0.66000	11.35015	11.35015	1	False	-0.75796
IA00501 (EL626332592)	0.84000	0.84000	9.02217	9.02217	1	False	-1.75129
IA00502 (EL626333002)	0.82000	0.83000	9.33854	9.18334	1	False	0.38243
IA00505 (EL626355215)	0.60000	0.62000	11.98661	11.77808	1	False	-0.31145
IA00506 (EL626355557)	0.64000	0.67000	11.56616	11.24035	1	False	1.67163
IA00508 (EL626356291)	0.36500	0.39000	14.38050	14.11728	2	False	-0.84227
IA00638 (EL627351056)	0.66000	0.68000	11.35015	11.12920	1	False	0.23105
IA01669 (EL711809263)	0.76000	0.77000	10.17479	10.04461	1	False	-0.46024
IA01670 (EL711809592)	0.76000	0.75000	10.17479	10.30204	1	False	0.47674
IA01671 (EL711827203)	0.90000	0.90000	7.87379	7.87379	1	False	-1.10590
IA01672 (EL711827807)	0.73000	0.72000	10.54875	10.66863	1	False	0.57721
IA01679 (EL711868011)	0.49500	0.48500	13.05013	13.15043	2	False	1.69129
IA01680 (EL711900602)	0.70000	0.69000	10.90240	11.01660	1	False	0.69129
IA01691 (EL712167015)	0.46000	0.49000	13.40173	13.10028	1	False	0.27724

Table 2.5.5
Delta Analysis
English Language Arts Grade 6

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00173 (EL303496)	0.74000	0.75000	10.42662	10.30204	1	False	-0.01385
IA00174 (EL303500)	0.64000	0.63000	11.56616	11.67259	1	False	-0.65780
IA00175 (EL303504)	0.61000	0.63000	11.88272	11.67259	1	False	0.85814
IA00176 (EL303508)	0.71000	0.73000	10.78646	10.54875	1	False	1.02461
IA00177 (EL303510)	0.87000	0.87000	8.49444	8.49444	1	False	-1.26973
IA00178 (EL303513)	0.66000	0.66000	11.35015	11.35015	1	False	-1.06074
IA00179 (EL303514)	0.63000	0.60000	11.67259	11.98661	1	False	1.19165
IA00180 (EL303518)	0.57000	0.53000	12.29450	12.69892	1	False	1.95480
IA00515 (EL626864414)	0.83000	0.82000	9.18334	9.33854	1	False	-0.04704
IA00517 (EL626864724)	0.69000	0.71000	11.01660	10.78646	1	False	0.97368
IA00518 (EL626865003)	0.67000	0.67000	11.24035	11.24035	1	False	-1.06877
IA00520 (EL626865416)	0.41000	0.42000	13.91018	13.80757	1	False	0.04453
IA00522 (EL626865773)	0.72000	0.70000	10.66863	10.90240	1	False	0.54710
IA00523 (EL626865942)	0.64000	0.64000	11.56616	11.56616	1	False	-1.04493
IA00528 (EL626867605)	0.77000	0.76000	10.04461	10.17479	2	False	-0.33393
IA00530 (EL626868748)	0.70500	0.70500	10.84466	10.84466	2	False	-1.09773

Table 2.5.6

Delta Analysis

English Language Arts Grade 7

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00065 (EL292160)	0.73000	0.72051	10.54875	10.66252	1	False	0.17679
IA00066 (EL292163)	0.65000	0.62829	11.45872	11.69065	1	False	1.38684
IA00067 (EL292168)	0.50000	0.48588	13.00000	13.14156	1	False	0.76163
IA00068 (EL292170)	0.71000	0.71518	10.78646	10.72565	1	False	-1.39867
IA00069 (EL292172)	0.62000	0.65699	11.77808	11.38290	1	False	1.52278
IA00070 (EL292176)	0.62000	0.60853	11.77808	11.89802	1	False	0.39862
IA00081 (EL293802)	0.68000	0.70373	11.12920	10.85933	1	False	0.45617
IA00082 (EL293804)	0.54000	0.56885	12.59827	12.30619	1	False	0.46340
IA00257 (EL308358)	0.85000	0.84836	8.85427	8.88234	1	False	-0.83962
IA00258 (EL308360)	0.75500	0.75852	10.23876	10.19375	2	False	-1.32675
IA00262 (EL308382)	0.65000	0.65515	11.45872	11.40300	1	False	-1.26156
IA00265 (EL308389)	0.90000	0.89974	7.87379	7.87982	1	False	-1.17423
IA00269 (EL308397)	0.84000	0.82967	9.02217	9.18848	1	False	0.45563
IA00655 (EL628647210)	0.72000	0.74311	10.66863	10.38814	1	False	0.61580
IA00657 (EL628647689)	0.77000	0.77721	10.04461	9.94882	1	False	-1.00103
IA00658 (EL628653398)	0.74000	0.76319	10.42662	10.13353	2	False	0.76420

Table 2.5.7
Delta Analysis
English Language Arts Grade 8

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00056 (EL290795)	0.77000	0.79000	10.04461	9.77432	1	False	0.46444
IA00057 (EL290798)	0.78000	0.79000	9.91123	9.77432	1	False	-0.77635
IA00058 (EL290799)	0.75000	0.76000	10.30204	10.17479	1	False	-0.71010
IA00059 (EL290800)	0.67000	0.67000	11.24035	11.24035	1	False	-1.17573
IA00060 (EL290801)	0.77000	0.76000	10.04461	10.17479	1	False	0.45062
IA00061 (EL290805)	0.56000	0.56000	12.39612	12.39612	1	False	-1.02786
IA00062 (EL290808)	0.54000	0.55000	12.59827	12.49735	1	False	-0.04969
IA00063 (EL290814)	0.44000	0.40000	13.60388	14.01339	1	False	1.55263
IA00368 (EL623873883)	0.72000	0.73000	10.66863	10.54875	1	False	-0.63283
IA00371 (EL623951471)	0.60500	0.59000	11.93476	12.08982	2	False	-0.06445
IA00373 (EL623952377)	0.42000	0.42500	13.80757	13.75647	2	False	-0.02219
IA00374 (EL623952612)	0.73000	0.72000	10.54875	10.66863	1	False	0.16237
IA00378 (EL623955555)	0.51000	0.55000	12.89972	12.49735	1	False	2.75458
IA00379 (EL623955757)	0.54000	0.52000	12.59827	12.79939	1	False	0.08738
IA00383 (EL623959265)	0.65000	0.64000	11.45872	11.56616	1	False	-0.30324
IA00699 (EL632808123)	0.77000	0.77000	10.04461	10.04461	1	False	-0.70958

Table 2.5.8
Delta Analysis
English Language Arts Grade 10

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA04110 (EL807953958)	0.54000	0.57500	12.59827	12.24353	2	False	1.24220
IA04111 (EL807957225)	0.79000	0.77000	9.77432	10.04461	1	False	0.64584
IA04132 (EL808046697)	0.88000	0.87000	8.30005	8.49444	1	False	-1.06177
IA04260 (EL811034362)	0.73000	0.72000	10.54875	10.66863	1	False	-0.50686
IA04297 (EL811428116)	0.61000	0.58000	11.88272	12.19243	1	False	2.34297
IA04412 (EL813438114)	0.74000	0.72000	10.42662	10.66863	1	False	0.73495
IA04439 (EL816956706)	0.67000	0.67000	11.24035	11.24035	1	False	-1.38075
IA04440 (EL817235657)	0.63500	0.63000	11.61950	11.67259	2	False	-0.58004
IA06629 (EL811608986)	0.75000	0.76500	10.30204	10.11008	2	False	0.87484
IA06631 (EL811610832)	0.59000	0.61000	12.08982	11.88272	2	False	-0.04123
IA06633 (EL811612272)	0.60000	0.60000	11.98661	11.98661	1	False	-0.93029
IA06635 (EL811612951)	0.80000	0.79000	9.63352	9.77432	1	False	-0.83403
IA06636 (EL811614524)	0.82000	0.82000	9.33854	9.33854	1	False	-0.61124
IA06638 (EL811616340)	0.62000	0.64000	11.77808	11.56616	1	False	0.19882
IA06641 (EL811617473)	0.78000	0.79000	9.91123	9.77432	1	False	0.51783
IA06642 (EL811618006)	0.82000	0.82000	9.33854	9.33854	1	False	-0.61124

Table 2.5.9
Delta Analysis
Mathematics Grade 3

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00769 (MA203641)	0.83000	0.88000	9.18334	8.30005	1	False	1.57790
IA00799 (MA260559)	0.49000	0.49000	13.10028	13.10028	1	False	-0.68268
IA00834 (MA293457)	0.79000	0.81000	9.77432	9.48841	1	False	-1.18663
IA00838 (MA293524)	0.74000	0.77000	10.42662	10.04461	1	False	-0.71070
IA00850 (MA297405)	0.69000	0.71000	11.01660	10.78646	1	False	-1.27010
IA00852 (MA297438)	0.63000	0.65000	11.67259	11.45872	1	False	-1.22450
IA00924 (MA306310)	0.46000	0.48000	13.40173	13.20061	1	False	-0.76288
IA00925 (MA306315)	0.75000	0.79000	10.30204	9.77432	1	False	0.02711
IA00930 (MA306359)	0.66000	0.64000	11.35015	11.56616	1	False	1.00353
IA00932 (MA306375)	0.48000	0.49000	13.20061	13.10028	1	False	-1.24771
IA00993 (MA310834)	0.63000	0.62000	11.67259	11.77808	1	False	0.31624
IA01019 (MA311277)	0.74000	0.74000	10.42662	10.42662	1	False	0.13604
IA01071 (MA623063509)	0.73000	0.72000	10.54875	10.66863	1	False	0.73703
IA01080 (MA623654449)	0.31667	0.32667	14.90816	14.79655	3	False	-0.77820
IA01081 (MA623656013)	0.28667	0.32000	15.25260	14.87080	3	False	0.76601
IA02323 (MA301611A)	0.83000	0.87000	9.18334	8.49444	1	False	0.54281
IA04760 (MA713752330)	0.77000	0.80000	10.04461	9.63352	1	False	-0.67277
IA04813 (MA735572247)	0.72000	0.69000	10.66863	11.01660	1	False	1.91484
IA04828 (MA735653938)	0.51000	0.57000	12.89972	12.29450	1	False	1.23523
IA04844 (MA735735757)	0.62000	0.61000	11.77808	11.88272	1	False	0.27944

Table 2.5.10
Delta Analysis
Mathematics Grade 4

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00789 (MA250543)	0.41500	0.42750	13.85881	13.73097	4	False	-0.21097
IA00828 (MA287237)	0.76000	0.79000	10.17479	9.77432	1	False	-0.21310
IA00841 (MA293718)	0.71000	0.73000	10.78646	10.54875	1	False	-1.20028
IA00861 (MA297629)	0.89000	0.90000	8.09389	7.87379	1	False	-0.93982
IA00869 (MA297988)	0.18000	0.21000	16.66146	16.22568	1	False	-0.88035
IA00906 (MA301811)	0.73000	0.72000	10.54875	10.66863	1	False	0.72683
IA00958 (MA307055)	0.46000	0.51000	13.40173	12.89972	1	False	-0.07774
IA00961 (MA307081)	0.53000	0.61000	12.69892	11.88272	1	False	1.76423
IA00963 (MA307085)	0.67000	0.70000	11.24035	10.90240	1	False	-0.70292
IA01048 (MA311534)	0.54000	0.56000	12.59827	12.39612	1	False	-0.79230
IA01049 (MA311537)	0.66000	0.67000	11.35015	11.24035	1	False	-0.44462
IA01055 (MA311572)	0.52000	0.55000	12.79939	12.49735	1	False	-1.11038
IA01057 (MA311581)	0.55250	0.55750	12.47208	12.42146	4	False	0.03411
IA01093 (MA623879088)	0.73000	0.69500	10.54875	10.95971	2	False	2.34659
IA02175 (MA286769)	0.75000	0.78000	10.30204	9.91123	1	False	-0.28381
IA02819 (MA713583365)	0.61000	0.59000	11.88272	12.08982	1	False	1.38976
IA02841 (MA713774890)	0.44000	0.50000	13.60388	13.00000	1	False	0.46221
IA02902 (MA714251321)	0.39000	0.41000	14.11728	13.91018	1	False	-0.61762
IA04661 (MA307327)	0.74000	0.79000	10.42662	9.77432	1	False	1.15474
IA04965 (MA800867144)	0.58000	0.62000	12.19243	11.77808	1	False	-0.40454

Table 2.5.11
Delta Analysis
Mathematics Grade 5

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00771 (MA204911)	0.73000	0.75000	10.54875	10.30204	1	False	-0.36791
IA00776 (MA221207)	0.66000	0.69000	11.35015	11.01660	1	False	-0.75606
IA00803 (MA262207)	0.72000	0.75000	10.66863	10.30204	1	False	-0.80042
IA00806 (MA272292)	0.47000	0.47000	13.30108	13.30108	1	False	0.20796
IA00826 (MA287178)	0.85000	0.86000	8.85427	8.67872	1	False	0.05888
IA00872 (MA298003)	0.63000	0.66000	11.67259	11.35015	1	False	-0.75092
IA00880 (MA298106)	0.21000	0.24000	16.22568	15.82521	1	False	-0.25178
IA00885 (MA299556)	0.68000	0.73000	11.12920	10.54875	1	False	-0.15522
IA00936 (MA306420)	0.69000	0.82000	11.01660	9.33854	1	False	3.67778
IA00943 (MA306466)	0.62000	0.64000	11.77808	11.56616	1	False	-0.37481
IA00989 (MA307638)	0.86000	0.87000	8.67872	8.49444	1	False	0.04665
IA01020 (MA311280)	0.43000	0.43000	13.70550	13.70550	1	False	0.16559
IA01029 (MA311337)	0.83000	0.86000	9.18334	8.67872	1	False	-0.62473
IA01032 (MA311366)	0.38500	0.41000	14.16950	13.91018	4	False	-0.79139
IA01149 (MA624347774)	0.41000	0.42000	13.91018	13.80757	1	False	-0.21527
IA01155 (MA624357395)	0.35000	0.41500	14.54128	13.85881	2	False	0.55958
IA02552 (MA311324)	0.38000	0.44000	14.22192	13.60388	1	False	0.30044
IA02736 (MA704359678)	0.48500	0.49750	13.15043	13.02507	4	False	-0.21541
IA04970 (MA800974344)	0.70000	0.73000	10.90240	10.54875	1	False	-0.77957
IA05002 (MA801652356)	0.60000	0.58000	11.98661	12.19243	1	False	1.06661

Table 2.5.12
Delta Analysis
Mathematics Grade 6

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00777 (MA221667)	0.85000	0.84000	8.85427	9.02217	1	False	-0.66392
IA00778 (MA221669)	0.80000	0.79000	9.63352	9.77432	1	False	-0.78936
IA00804 (MA264305)	0.74000	0.75000	10.42662	10.30204	1	False	0.13826
IA00817 (MA280989)	0.47000	0.49000	13.30108	13.10028	1	False	0.42433
IA00818 (MA282268)	0.40000	0.41000	14.01339	13.91018	1	False	-0.37124
IA00819 (MA282277)	0.47000	0.44000	13.30108	13.60388	1	False	0.77408
IA00827 (MA287186)	0.56000	0.55000	12.39612	12.49735	1	False	-0.81368
IA00845 (MA296349)	0.56000	0.53000	12.39612	12.69892	1	False	0.68564
IA00881 (MA298139)	0.45000	0.44750	13.50265	13.52792	4	False	-1.27053
IA00899 (MA301508)	0.33000	0.35000	14.75965	14.54128	1	False	0.41244
IA00972 (MA307339)	0.74000	0.73000	10.42662	10.54875	4	False	-0.85072
IA00992 (MA309941)	0.41000	0.40000	13.91018	14.01339	1	False	-0.65100
IA01058 (MA311658)	0.42000	0.46000	13.80757	13.40173	1	False	1.89995
IA02037 (MA217493)	0.66000	0.63000	11.35015	11.67259	1	False	0.72951
IA02597 (MA311693)	0.78000	0.77000	9.91123	10.04461	1	False	-0.81737
IA02698 (MA703179529)	0.28000	0.24000	15.33137	15.82521	1	False	2.39358
IA04745 (MA703231515)	0.50000	0.52500	13.00000	12.74917	2	False	0.82584
IA04884 (MA736365836)	0.68000	0.68000	11.12920	11.12920	1	False	-0.85706
IA05126 (MA805103779)	0.55000	0.56000	12.49735	12.39612	1	False	-0.23778
IA05135 (MA805171807)	0.58000	0.58000	12.19243	12.19243	1	False	-0.96097

Table 2.5.13
Delta Analysis
Mathematics Grade 7

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00796 (MA259267)	0.44000	0.45000	13.60388	13.50265	1	False	-0.66698
IA00831 (MA288414)	0.72000	0.73000	10.66863	10.54875	1	False	-0.76147
IA00847 (MA296358)	0.53000	0.53000	12.69892	12.69892	1	False	-0.75606
IA00909 (MA301846)	0.87000	0.87000	8.49444	8.49444	1	False	-0.47584
IA00910 (MA301854)	0.35000	0.35000	14.54128	14.54128	1	False	-0.87885
IA00945 (MA306538)	0.69000	0.71000	11.01660	10.78646	1	False	-0.14051
IA00948 (MA306600)	0.84000	0.85000	9.02217	8.85427	1	False	-0.61087
IA00949 (MA306605)	0.49000	0.50000	13.10028	13.00000	1	False	-0.70573
IA01006 (MA311093)	0.85000	0.86000	8.85427	8.67872	1	False	-0.58063
IA01011 (MA311109)	0.39000	0.41000	14.11728	13.91018	1	False	-0.05878
IA01016 (MA311125)	0.55000	0.59000	12.49735	12.08982	1	False	0.92001
IA01017 (MA311135)	0.75000	0.73000	10.30204	10.54875	1	False	0.74130
IA01018 (MA311140)	0.37000	0.42000	14.32741	13.80757	1	False	1.65088
IA01069 (MA316886)	0.50750	0.51750	12.92480	12.82448	4	False	-0.71720
IA01097 (MA623950280)	0.32000	0.35000	14.87080	14.54128	1	False	0.65517
IA01108 (MA624149677)	0.38500	0.38500	14.16950	14.16950	2	False	-0.85408
IA02722 (MA703943185)	0.48750	0.48500	13.12535	13.15043	4	False	-0.64850
IA04486 (MA227988)	0.69000	0.68000	11.01660	11.12920	1	False	-0.03340
IA04538 (MA282218)	0.69000	0.66000	11.01660	11.35015	1	False	1.16452
IA04593 (MA298192)	0.24000	0.19000	15.82521	16.51159	1	False	2.75701

Table 2.5.14
Delta Analysis
Mathematics Grade 8

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA00849 (MA296757)	0.62000	0.62000	11.77808	11.77808	1	False	-0.72911
IA00858 (MA297513)	0.76000	0.78000	10.17479	9.91123	1	False	-0.07380
IA00864 (MA297652)	0.70250	0.69250	10.87358	10.98820	4	False	-0.37359
IA00865 (MA297656)	0.53000	0.60000	12.69892	11.98661	1	False	1.38560
IA00903 (MA301674)	0.73000	0.75000	10.54875	10.30204	1	False	-0.15975
IA00905 (MA301702)	0.44000	0.46000	13.60388	13.40173	1	False	-0.52420
IA00979 (MA307472)	0.63000	0.65000	11.67259	11.45872	1	False	-0.35344
IA00985 (MA307570)	0.51000	0.53000	12.89972	12.69892	1	False	-0.48230
IA01033 (MA311384)	0.59000	0.57000	12.08982	12.29450	1	False	0.03372
IA01037 (MA311414)	0.39000	0.39000	14.11728	14.11728	1	False	-0.57377
IA01042 (MA311448)	0.52000	0.50000	12.79939	13.00000	1	False	0.06608
IA01044 (MA311463)	0.64000	0.62000	11.56616	11.77808	1	False	0.02515
IA01066 (MA314812)	0.55500	0.54000	12.44678	12.59827	4	False	-0.13547
IA01125 (MA624247061)	0.42500	0.41500	13.75647	13.85881	2	False	-0.22670
IA02495 (MA309741)	0.44000	0.37000	13.60388	14.32741	1	False	2.01547
IA04665 (MA307399)	0.48000	0.47000	13.20061	13.30108	1	False	-0.27038
IA04678 (MA309738)	0.39000	0.40000	14.11728	14.01339	1	False	-0.91454
IA05057 (MA803856437)	0.83000	0.83000	9.18334	9.18334	1	False	-0.90141
IA05059 (MA803856627)	0.71000	0.71000	10.78646	10.78646	1	False	-0.79496
IA05070 (MA804042487)	0.29000	0.40000	15.21354	14.01339	1	False	2.98739

Table 2.5.15
Delta Analysis
Mathematics Grade 10

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA04800 (MA717740737)	0.40000	0.43000	14.01339	13.70550	1	False	0.66893
IA04810 (MA735534256)	0.33500	0.33500	14.70459	14.70459	2	False	-1.01411
IA04819 (MA735579095)	0.57000	0.56000	12.29450	12.39612	1	False	-0.78106
IA04824 (MA735632759)	0.46000	0.46000	13.40173	13.40173	1	False	-1.35230
IA04842 (MA735734830)	0.40000	0.40000	14.01339	14.01339	1	False	-1.19353
IA04846 (MA735743236)	0.76000	0.78000	10.17479	9.91123	1	False	-0.59560
IA04847 (MA735745569)	0.43000	0.40000	13.70550	14.01339	1	False	0.10044
IA04871 (MA736059227)	0.50000	0.47000	13.00000	13.30108	1	False	0.24236
IA04913 (MA800433428)	0.56000	0.56000	12.39612	12.39612	1	False	-1.42215
IA04991 (MA801426792)	0.33000	0.37000	14.75965	14.32741	1	False	1.61483
IA04993 (MA801434971)	0.22000	0.25000	16.08877	15.69796	1	False	1.70924
IA04997 (MA801564574)	0.39500	0.35500	14.06524	14.48742	2	False	0.69842
IA05048 (MA803762212)	0.47000	0.49000	13.30108	13.10028	1	False	-0.16374
IA05096 (MA804566054)	0.55500	0.60500	12.44678	11.93476	2	False	1.49711
IA05117 (MA804678931)	0.35000	0.32000	14.54128	14.87080	1	False	0.01429
IA05144 (MA805372590)	0.41000	0.37000	13.91018	14.32741	1	False	0.70873
IA05145 (MA805373539)	0.23000	0.19000	15.95539	16.51159	1	False	1.01846
IA05147 (MA805376549)	0.87000	0.87000	8.49444	8.49444	1	False	-0.40939
IA05155 (MA806051920)	0.29000	0.29000	15.21354	15.21354	1	False	-0.88201
IA05165 (MA806383722)	0.46000	0.46500	13.40173	13.35138	4	False	-1.04769
IA05170 (MA806408603)	0.44250	0.40500	13.57854	13.96170	4	False	0.58876

Table 2.5.16
Delta Analysis
Introductory Physics Grade 10

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA03500 (SC717283221)	0.62500	0.62000	11.72544	11.77808	2	False	0.00238
IA05503 (SC701073429)	0.56000	0.58000	12.39612	12.19243	1	False	-1.28789
IA05859 (SC800552298)	0.60000	0.62000	11.98661	11.77808	1	False	-1.30567
IA10657 (SC630578145)	0.63000	0.60000	11.67259	11.98661	1	False	1.27807
IA10680 (SC717246368)	0.78500	0.79500	9.84323	9.70443	2	False	-0.62365
IA10702 (SC800954781)	0.58000	0.59000	12.19243	12.08982	1	False	-0.82517
IA10704 (SC800964236)	0.45000	0.41000	13.50265	13.91018	1	False	1.43769
IA10788 (SC814181163)	0.53000	0.58000	12.69892	12.19243	1	False	0.22865
IA10802 (SC815652038)	0.40250	0.44750	13.98753	13.52792	4	False	0.20814
IA10919 (SC906339928)	0.41000	0.45000	13.91018	13.50265	1	False	-0.05670
IA10920 (SC906340047)	0.49000	0.50500	13.10028	12.94987	2	False	-1.20262
IA10921 (SC906340140)	0.74000	0.74000	10.42662	10.42662	1	False	-0.04434
IA10922 (SC906340259)	0.78000	0.79000	9.91123	9.77432	1	False	-0.62537
IA10923 (SC906340744)	0.43667	0.47333	13.63770	13.26757	3	False	-0.28177
IA10931 (SC906631611)	0.53000	0.59000	12.69892	12.08982	1	False	0.72608
IA10936 (SC906662706)	0.72000	0.80000	10.66863	9.63352	1	False	2.46555
IA10941 (SC906953250)	0.31000	0.30000	14.98340	15.09760	1	False	-0.22203
IA10943 (SC906965456)	0.74000	0.77000	10.42662	10.04461	1	False	-0.73955
IA10958 (SC908950033)	0.78000	0.78000	9.91123	9.91123	1	False	0.03838
IA10980 (SC910170718)	0.59000	0.66000	12.08982	11.35015	1	False	1.26133
IA10983 (SC910436447)	0.50000	0.52000	13.00000	12.79939	1	False	-1.20592
IA11025 (SC913743446)	0.63000	0.61000	11.67259	11.88272	1	False	0.77442

Table 2.5.17
Delta Analysis
Science Grade 5

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA05192 (SC264893)	0.31000	0.27333	14.98340	15.41105	3	False	1.26844
IA05466 (SC628483066)	0.89000	0.87000	8.09389	8.49444	1	False	0.86704
IA05523 (SC718127878)	0.67000	0.67000	11.24035	11.24035	1	False	-1.50097
IA05526 (SC735264282)	0.86000	0.87000	8.67872	8.49444	1	False	-0.61377
IA05530 (SC735267831)	0.79000	0.82000	9.77432	9.33854	1	False	0.90289
IA05545 (SC735535118)	0.47000	0.49000	13.30108	13.10028	1	False	-0.66868
IA05560 (SC736074266)	0.78000	0.75000	9.91123	10.30204	1	False	0.86861
IA05562 (SC736074942)	0.63000	0.59500	11.67259	12.03830	2	False	0.77331
IA05628 (SC802729980)	0.63000	0.64000	11.67259	11.56616	1	False	-1.19653
IA05630 (SC802758131)	0.72000	0.70000	10.66863	10.90240	1	False	-0.07603
IA05631 (SC802758561)	0.56000	0.57000	12.39612	12.29450	1	False	-1.25077
IA05634 (SC802761427)	0.32000	0.30333	14.87080	15.05935	3	False	-0.21267
IA05657 (SC803732869)	0.39500	0.45000	14.06524	13.50265	2	False	1.54077
IA05661 (SC803837124)	0.67000	0.64000	11.24035	11.56616	1	False	0.51215
IA05662 (SC803844809)	0.65000	0.64000	11.45872	11.56616	2	False	-0.82968
IA05664 (SC803847645)	0.76000	0.77000	10.17479	10.04461	1	False	-0.99890
IA05678 (SC804048131)	0.88000	0.89000	8.30005	8.09389	1	False	-0.46573
IA05681 (SC804060300)	0.37000	0.40000	14.32741	14.01339	1	False	-0.00397
IA05688 (SC804141602)	0.84000	0.85000	9.02217	8.85427	1	False	-0.72667
IA05702 (SC806382697)	0.47000	0.53000	13.30108	12.69892	1	False	1.81116

Table 2.5.18
Delta Analysis
Science Grade 8

Item Id	Old P	New P	Old Delta	New Delta	Max	Discard	Std Dist
IA05243 (SC289702)	0.32000	0.36000	14.87080	14.43384	1	False	0.77898
IA05245 (SC290144)	0.53000	0.49000	12.69892	13.10028	1	False	0.74902
IA05499 (SC633066301)	0.91000	0.92000	7.63698	7.37971	1	False	1.83060
IA05522 (SC717662167)	0.50000	0.51000	13.00000	12.89972	1	False	-0.72940
IA05550 (SC735560046)	0.27000	0.28000	15.45125	15.33137	1	False	-1.33899
IA05551 (SC735569222)	0.52000	0.50000	12.79939	13.00000	1	False	-0.45254
IA05555 (SC735663104)	0.34000	0.36000	14.64985	14.43384	1	False	-0.51064
IA05581 (SC800285340)	0.41000	0.40000	13.91018	14.01339	1	False	-0.71933
IA05649 (SC803174786)	0.69000	0.65000	11.01660	11.45872	1	False	0.49815
IA05665 (SC803856876)	0.82000	0.78000	9.33854	9.91123	1	False	0.79947
IA05675 (SC803981496)	0.72000	0.67000	10.66863	11.24035	1	False	1.18955
IA05687 (SC804132888)	0.74000	0.73000	10.42662	10.54875	2	False	-1.32751
IA05690 (SC804367702)	0.44000	0.49000	13.60388	13.10028	1	False	1.56504
IA05693 (SC804372985)	0.67000	0.67500	11.24035	11.18495	2	False	-0.48075
IA05718 (SC807245653)	0.74000	0.73000	10.42662	10.54875	1	False	-1.32751
IA05720 (SC807247887)	0.57000	0.56000	12.29450	12.39612	1	False	-1.21017
IA05727 (SC809171062)	0.48000	0.46000	13.20061	13.40173	1	False	-0.32996
IA05729 (SC809178849)	0.35667	0.38000	14.46953	14.22192	3	False	-0.26314
IA05750 (SC814258458)	0.46667	0.42667	13.33461	13.73947	3	False	0.95981
IA05777 (SC816343670)	0.62000	0.64000	11.77808	11.56616	2	False	0.31930

Section 2.6

Tabled B/B Analysis Results

Table 2.6.1

b/b Analysis

Biology Grade 10

Item Id	Old b	New b	Std Dist	Flag
IA10582 (SC129438142)	0.06140	-0.31340	-0.26123	False
IA10635 (SC313409)	0.62070	0.13535	1.53706	False
IA10656 (SC630544518)	0.10580	-0.16050	-0.96443	False
IA10684 (SC723337422)	-1.26640	-1.43240	1.93552	False
IA10696 (SC800163004)	-0.65410	-1.05650	-0.86542	False
IA10747 (SC804071827)	0.02510	-0.34800	-0.33845	False
IA10808 (SC815940509)	1.29250	1.34420	-1.07316	False
IA10809 (SC815948686)	-0.04430	-0.29600	-0.86957	False
IA10810 (SC815948962)	0.76270	0.82350	-0.05947	False
IA10926 (SC906349045)	-0.15460	-0.40530	-0.66498	False
IA10927 (SC906351730)	-0.81160	-1.39860	-0.29274	False
IA10930 (SC906544336)	-0.35940	-1.07730	1.46069	False
IA10989 (SC910635381)	-0.50130	-1.29490	1.75282	False
IA10994 (SC910746953)	-0.30860	-0.44620	0.42644	False
IA10995 (SC910749140)	0.46570	0.20180	-0.33772	False
IA10998 (SC910752674)	0.90940	1.04620	0.22624	False
IA11005 (SC911354147)	0.15180	-0.13470	-0.73641	False
IA11014 (SC912353814)	-0.19020	-0.32340	0.24630	False
IA11031 (SC914149827)	0.48900	0.35410	-0.98136	False
IA11033 (SC914353987)	1.18850	1.15630	-0.71565	False
IA11042 (SC915956318)	-0.41720	-0.76480	-0.89405	False
IA11054 (SC921067241)	-0.33160	-0.33030	1.46954	False

Table 2.6.2

b/b Analysis

English Language Arts Grade 3

Item Id	Old b	New b	Std Dist	Flag
IA00279 (EL308822)	-1.18760	-0.87340	-0.55775	False
IA00280 (EL308824)	-0.45090	-0.33680	-0.18995	False
IA00281 (EL308826)	0.12140	0.38150	0.20141	False
IA00282 (EL308827)	-0.58060	-0.23860	0.51369	False
IA00283 (EL308835)	-0.21220	0.01710	-0.59857	False
IA00284 (EL308837)	-0.40770	-0.21030	-1.25578	False
IA00285 (EL308838)	-0.79560	-0.59680	-0.94841	False
IA00286 (EL308842)	0.68750	0.48310	2.84228	False
IA00287 (EL308855)	0.62903	0.87387	0.57357	False
IA00288 (EL308857)	0.95470	1.20053	0.95909	False
IA00443 (EL626042844)	-0.82100	-0.50270	-0.08327	False
IA00444 (EL626043062)	-0.47130	-0.24520	-0.93803	False
IA00445 (EL626043435)	-0.26400	-0.14830	-0.42518	False
IA00446 (EL626049849)	0.08860	0.23660	-1.26727	False
IA00450 (EL626050679)	-0.33230	-0.21730	-0.33765	False
IA00451 (EL626050927)	0.33820	0.30180	0.95599	False
IA00452 (EL626051097)	-0.36570	-0.08895	-0.12844	False
IA00453 (EL626051328)	-0.36360	-0.32110	0.68429	False

Table 2.6.3

b/b Analysis

English Language Arts Grade 4

Item Id	Old b	New b	Std Dist	Flag
IA00218 (EL307705)	-1.63480	-1.36810	0.01561	False
IA00219 (EL307709)	-1.30830	-0.75530	0.53035	False
IA00220 (EL307710)	0.36960	0.42110	1.42753	False
IA00221 (EL307713)	0.03850	0.33620	-1.46460	False
IA00222 (EL307714)	-1.38880	-0.81150	0.78469	False
IA00223 (EL307719)	0.04010	0.13280	1.12192	False
IA00224 (EL307724)	-0.83660	-0.56750	-0.53412	False
IA00225 (EL307728)	-0.01553	0.15157	0.21907	False
IA00226 (EL307729)	0.22513	0.77117	1.44036	False
IA00289 (EL309792)	-0.73060	-0.11490	1.69771	False
IA00407 (EL624647403)	0.69700	0.98800	-1.47171	False
IA00408 (EL624647580)	-0.61600	-0.15950	-0.23717	False
IA00411 (EL624652450)	-1.23730	-0.81050	-1.01637	False
IA00412 (EL624652621)	-1.94330	-1.66390	0.05607	False
IA00414 (EL624652989)	0.67400	0.90240	-1.00344	False
IA00415 (EL624653348)	-0.72190	-0.24810	-0.08772	False
IA00416 (EL624653492)	-1.29545	-0.98225	-0.79216	False
IA00419 (EL624654711)	-1.70685	-1.38085	-0.68600	False

Table 2.6.4

b/b Analysis

English Language Arts Grade 5

Item Id	Old b	New b	Std Dist	Flag
IA00495 (EL626304658)	-1.32450	-0.78860	1.24122	False
IA00497 (EL626304969)	-0.62920	-0.20410	0.97243	False
IA00500 (EL626332335)	-0.80010	-0.24030	2.46249	False
IA00501 (EL626332592)	-2.05630	-1.61000	-1.16952	False
IA00502 (EL626333002)	-1.55440	-1.21770	-0.58302	False
IA00505 (EL626355215)	-0.31660	-0.24020	0.73092	False
IA00506 (EL626355557)	-0.49820	-0.32940	-0.18018	False
IA00508 (EL626356291)	0.50945	0.52635	0.09440	False
IA00638 (EL627351056)	-0.31920	-0.21860	0.41474	False
IA01669 (EL711809263)	-1.14070	-0.88000	-0.28961	False
IA01670 (EL711809592)	-0.80730	-0.48550	-0.70357	False
IA01671 (EL711827203)	-2.00420	-1.68540	0.43006	False
IA01672 (EL711827807)	-1.34330	-1.00210	-1.00680	False
IA01679 (EL711868011)	-0.17220	0.08940	-0.40572	False
IA01680 (EL711900602)	-0.54940	-0.32200	-0.86835	False
IA01691 (EL712167015)	0.41820	0.54010	-1.13950	False

Table 2.6.5

b/b Analysis

English Language Arts Grade 6

Item Id	Old b	New b	Std Dist	Flag
IA00173 (EL303496)	-1.31980	-0.72360	-0.11057	False
IA00174 (EL303500)	-1.08450	-0.35410	1.11142	False
IA00175 (EL303504)	0.05690	0.09160	1.99640	False
IA00176 (EL303508)	-1.49590	-0.93120	1.56865	False
IA00177 (EL303510)	-2.47490	-1.37010	-0.39480	False
IA00178 (EL303513)	-0.95990	-0.37020	-0.77446	False
IA00179 (EL303514)	-0.18000	0.22420	0.53263	False
IA00180 (EL303518)	0.24010	0.46220	-0.31321	False
IA00515 (EL626864414)	-2.29240	-1.32600	-1.09959	False
IA00517 (EL626864724)	-1.18330	-0.61830	-0.36323	False
IA00518 (EL626865003)	-1.12900	-0.40060	0.79950	False
IA00520 (EL626865416)	1.51200	1.20810	-0.58371	False
IA00522 (EL626865773)	-0.95790	-0.30290	0.46945	False
IA00523 (EL626865942)	-0.94700	-0.39630	-1.43052	False
IA00528 (EL626867605)	-1.79435	-0.98285	-1.24707	False
IA00530 (EL626868748)	-1.56920	-0.88885	-0.16089	False

Table 2.6.6

b/b Analysis

English Language Arts Grade 7

Item Id	Old b	New b	Std Dist	Flag
IA00065 (EL292160)	-1.07830	-0.49410	0.28880	False
IA00066 (EL292163)	-0.81990	-0.03900	2.98005	False
IA00067 (EL292168)	0.24900	0.50380	-0.72789	False
IA00068 (EL292170)	-0.99950	-0.63780	0.08614	False
IA00069 (EL292172)	-0.55490	-0.35390	0.98455	False
IA00070 (EL292176)	-0.70340	-0.28570	-0.81208	False
IA00081 (EL293802)	-0.86670	-0.51780	-0.03542	False
IA00082 (EL293804)	-0.14160	0.17670	-0.79907	False
IA00257 (EL308358)	-1.85270	-1.22970	-0.81706	False
IA00258 (EL308360)	-1.79950	-1.17955	-0.74535	False
IA00262 (EL308382)	-0.75300	-0.38100	-0.51677	False
IA00265 (EL308389)	-2.79690	-1.95330	-0.24585	False
IA00269 (EL308397)	-2.38720	-1.63330	-0.42701	False
IA00655 (EL628647210)	-1.07690	-0.77780	0.93304	False
IA00657 (EL628647689)	-1.42330	-0.86010	-0.62796	False
IA00658 (EL628653398)	-1.70655	-1.25400	0.48189	False

Table 2.6.7
b/b Analysis
English Language Arts Grade 8

Item Id	Old b	New b	Std Dist	Flag
IA00056 (EL290795)	-1.91590	-1.38520	-0.38054	False
IA00057 (EL290798)	-1.97670	-1.35960	-0.76962	False
IA00058 (EL290799)	-0.71570	-0.44760	-0.45879	False
IA00059 (EL290800)	-0.49090	-0.35340	0.32782	False
IA00060 (EL290801)	-0.86570	-0.40120	0.19333	False
IA00061 (EL290805)	0.05680	0.06920	0.34393	False
IA00062 (EL290808)	0.15650	0.26900	-0.86242	False
IA00063 (EL290814)	0.77490	0.78060	-0.68233	False
IA00368 (EL623873883)	-0.91740	-0.58870	-0.60772	False
IA00371 (EL623951471)	-0.82355	-0.41210	-0.23527	False
IA00373 (EL623952377)	0.38275	0.39235	-0.35165	False
IA00374 (EL623952612)	-1.13630	-0.66400	-0.33024	False
IA00378 (EL623955555)	0.12560	-0.04470	1.98938	False
IA00379 (EL623955757)	0.03080	0.55220	2.74224	False
IA00383 (EL623959265)	-0.57360	-0.23020	-0.35047	False
IA00699 (EL632808123)	-1.31650	-0.82770	-0.56763	False

Table 2.6.8
b/b Analysis
English Language Arts Grade 10

Item Id	Old b	New b	Std Dist	Flag
IA04110 (EL807953958)	-0.35580	-0.29165	0.44458	False
IA04111 (EL807957225)	-1.82820	-1.41920	-0.09302	False
IA04132 (EL808046697)	-1.77250	-1.29180	0.66408	False
IA04260 (EL811034362)	-0.84350	-0.76340	0.63429	False
IA04297 (EL811428116)	-0.30010	0.01520	0.06400	False
IA04412 (EL813438114)	-0.96480	-0.30780	3.00601	False
IA04439 (EL816956706)	-0.58180	-0.35920	-0.97854	False
IA04440 (EL817235657)	-0.77145	-0.50895	-0.80170	False
IA06629 (EL811608986)	-2.73620	-2.35875	-0.98469	False
IA06631 (EL811610832)	-0.60130	-0.42735	-0.47793	False
IA06633 (EL811612272)	-0.44200	-0.20250	-0.79584	False
IA06635 (EL811612951)	-0.95050	-0.78150	-0.17835	False
IA06636 (EL811614524)	-1.35450	-1.19580	0.21399	False
IA06638 (EL811616340)	-0.21270	-0.04770	-0.66669	False
IA06641 (EL811617473)	-1.29180	-1.04460	-0.71617	False
IA06642 (EL811618006)	-1.34450	-1.23170	0.66597	False

Table 2.6.9
b/b Analysis
Mathematics Grade 3

Item Id	Old b	New b	Std Dist	Flag
IA00769 (MA203641)	-1.96785	-1.92040	0.13183	False
IA00799 (MA260559)	0.37165	0.38390	-1.03904	False
IA00834 (MA293457)	-1.02068	-0.93390	-1.39267	False
IA00838 (MA293524)	-0.96025	-0.96950	0.48479	False
IA00850 (MA297405)	-0.76843	-0.72590	-0.73934	False
IA00852 (MA297438)	-0.46005	-0.39330	-1.35136	False
IA00924 (MA306310)	1.06135	1.09990	-0.69949	False
IA00925 (MA306315)	-0.95483	-0.86560	-1.28871	False
IA00930 (MA306359)	-0.70412	-0.50150	1.25461	False
IA00932 (MA306375)	0.57731	0.70770	0.80323	False
IA00993 (MA310834)	-0.32025	-0.17550	0.37167	False
IA01019 (MA311277)	-0.90789	-0.88930	-0.13220	False
IA01071 (MA623063509)	-1.11798	-0.97640	-0.34069	False
IA01080 (MA623654449)	0.90717	0.79200	1.15619	False
IA01081 (MA623656013)	0.82747	0.75467	0.34651	False
IA02323 (MA301611A)	-1.67972	-1.67600	0.80060	False
IA04760 (MA713752330)	-1.50904	-1.32490	0.22047	False
IA04813 (MA735572247)	-1.02722	-0.76520	2.21840	False
IA04828 (MA735653938)	-0.13916	-0.17710	0.41097	False
IA04844 (MA735735757)	-0.20812	-0.14470	-1.21577	False

Table 2.6.10
b/b Analysis
Mathematics Grade 4

Item Id	Old b	New b	Std Dist	Flag
IA00789 (MA250543)	0.39264	0.32140	0.19720	False
IA00828 (MA287237)	-1.00453	-0.84530	0.63616	False
IA00841 (MA293718)	-0.20587	-0.28400	-0.93557	False
IA00861 (MA297629)	-1.98288	-1.72590	0.14776	False
IA00869 (MA297988)	1.43941	1.18430	-0.27173	False
IA00906 (MA301811)	-0.47012	-0.71660	0.89852	False
IA00958 (MA307055)	0.36789	0.07010	0.07476	False
IA00961 (MA307081)	0.25488	-0.19080	2.12184	False
IA00963 (MA307085)	-0.38578	-0.48250	-1.12181	False
IA01048 (MA311534)	0.20108	0.04570	-1.19000	False
IA01049 (MA311537)	-0.23132	-0.38380	-0.69460	False
IA01055 (MA311572)	-0.06492	-0.11410	-0.32705	False
IA01057 (MA311581)	-0.24249	-0.32923	-1.10722	False
IA01093 (MA623879088)	-0.89879	-0.73315	0.90123	False
IA02175 (MA286769)	-0.69178	-0.81270	-0.28408	False
IA02819 (MA713583365)	-0.57544	-0.50380	0.29114	False
IA02841 (MA713774890)	0.22164	0.00960	-0.74185	False
IA02902 (MA714251321)	0.53170	0.45370	0.35584	False
IA04661 (MA307327)	-0.66913	-0.99140	2.19433	False
IA04965 (MA800867144)	-0.33270	-0.43500	-1.14485	False

Table 2.6.11

b/b Analysis

Mathematics Grade 5

Item Id	Old b	New b	Std Dist	Flag
IA00771 (MA204911)	-1.18544	-1.14990	-0.26895	False
IA00776 (MA221207)	-0.77091	-0.71900	-0.28627	False
IA00803 (MA262207)	-0.71683	-0.79320	-0.30460	False
IA00806 (MA272292)	0.16842	0.30560	0.08547	False
IA00826 (MA287178)	-1.44487	-1.40520	-0.13547	False
IA00872 (MA298003)	-0.59493	-0.43800	0.54304	False
IA00880 (MA298106)	1.06174	1.11020	-0.69602	False
IA00885 (MA299556)	-0.52914	-0.55660	-0.65079	False
IA00936 (MA306420)	-0.83569	-1.42050	3.98800	False
IA00943 (MA306466)	0.09940	0.20500	-0.15781	False
IA00989 (MA307638)	-1.53346	-1.47740	0.03791	False
IA01020 (MA311280)	0.55217	0.60080	-0.81529	False
IA01029 (MA311337)	-1.65213	-1.64470	-0.33203	False
IA01032 (MA311366)	0.31569	0.37018	-0.67579	False
IA01149 (MA624347774)	0.28042	0.39840	-0.12074	False
IA01155 (MA624357395)	0.45272	0.34610	0.39637	False
IA02552 (MA311324)	0.92804	0.90200	-0.11108	False
IA02736 (MA704359678)	-0.12435	-0.01200	-0.01549	False
IA04970 (MA800974344)	-0.89563	-0.86460	-0.41717	False
IA05002 (MA801652356)	-0.15010	-0.22960	-0.06328	False

Table 2.6.12

b/b Analysis

Mathematics Grade 6

Item Id	Old b	New b	Std Dist	Flag
IA00777 (MA221667)	-1.39100	-1.45010	0.93006	False
IA00778 (MA221669)	-1.07161	-0.99080	-0.72912	False
IA00804 (MA264305)	-1.31464	-1.26100	-0.33555	False
IA00817 (MA280989)	0.33230	0.44460	-0.41010	False
IA00818 (MA282268)	0.87654	0.74490	0.83104	False
IA00819 (MA282277)	0.06705	0.27390	0.52148	False
IA00827 (MA287186)	-0.15051	-0.03900	-0.60911	False
IA00845 (MA296349)	0.18948	0.44960	1.15353	False
IA00881 (MA298139)	0.08142	0.20220	-0.41608	False
IA00899 (MA301508)	0.58200	0.64890	-0.80919	False
IA00972 (MA307339)	-1.13141	-1.05963	-0.60664	False
IA00992 (MA309941)	1.75926	1.80310	-0.59777	False
IA01058 (MA311658)	0.62836	0.46490	1.27760	False
IA02037 (MA217493)	-0.50899	-0.07170	2.81975	False
IA02597 (MA311693)	-1.09414	-0.95220	-0.64765	False
IA02698 (MA703179529)	1.52821	1.39440	0.59791	False
IA04745 (MA703231515)	-0.07723	-0.08855	-0.11151	False
IA04884 (MA736365836)	-0.87050	-0.76920	-1.00485	False
IA05126 (MA805103779)	-0.29546	-0.22020	-0.97429	False
IA05135 (MA805171807)	-0.41273	-0.34190	-0.87951	False

Table 2.6.13

b/b Analysis

Mathematics Grade 7

Item Id	Old b	New b	Std Dist	Flag
IA00796 (MA259267)	0.36479	0.38380	0.00009	False
IA00831 (MA288414)	-0.57561	-0.55170	1.87147	False
IA00847 (MA296358)	-0.27118	-0.06520	0.03125	False
IA00909 (MA301846)	-1.70161	-1.36350	0.11234	False
IA00910 (MA301854)	0.35704	0.49630	-0.20844	False
IA00945 (MA306538)	-0.96347	-0.77320	-1.21566	False
IA00948 (MA306600)	-1.33959	-1.01400	0.58306	False
IA00949 (MA306605)	-0.15288	-0.02730	-1.40887	False
IA01006 (MA311093)	-1.70269	-1.49980	0.04948	False
IA01011 (MA311109)	0.77310	0.68930	1.55176	False
IA01016 (MA311125)	0.24681	0.31730	-0.95954	False
IA01017 (MA311135)	-0.80092	-0.66110	-0.37437	False
IA01018 (MA311140)	0.28610	0.27290	0.92266	False
IA01069 (MA316886)	-0.13840	0.01365	-0.95464	False
IA01097 (MA623950280)	0.44499	0.47540	-0.43702	False
IA01108 (MA624149677)	0.28427	0.43955	0.01403	False
IA02722 (MA703943185)	-0.10107	0.04570	-0.99977	False
IA04486 (MA227988)	-0.64182	-0.41750	-0.32101	False
IA04538 (MA282218)	-0.88898	-0.64870	-0.46833	False
IA04593 (MA298192)	1.06123	1.24020	2.21152	False

Table 2.6.14

b/b Analysis

Mathematics Grade 8

Item Id	Old b	New b	Std Dist	Flag
IA00849 (MA296757)	-0.67172	-0.42370	-0.64723	False
IA00858 (MA297513)	-0.92047	-0.80400	-0.18698	False
IA00864 (MA297652)	-0.93695	-0.67328	-0.69607	False
IA00865 (MA297656)	0.18595	0.02110	1.49715	False
IA00903 (MA301674)	-0.84896	-0.74230	-0.15130	False
IA00905 (MA301702)	0.35314	0.40760	-0.53651	False
IA00979 (MA307472)	-0.29387	0.13240	1.17505	False
IA00985 (MA307570)	0.46466	0.52340	-0.65198	False
IA01033 (MA311384)	-0.03049	0.16520	-0.65574	False
IA01037 (MA311414)	0.15802	0.31440	-0.86734	False
IA01042 (MA311448)	-0.10728	0.32520	1.35992	False
IA01044 (MA311463)	-0.73317	-0.47920	-0.63825	False
IA01066 (MA314812)	-0.36007	-0.13078	-0.59274	False
IA01125 (MA624247061)	0.18351	0.37075	-0.57980	False
IA02495 (MA309741)	0.02810	0.43390	1.22151	False
IA04665 (MA307399)	0.45471	0.61020	-0.66745	False
IA04678 (MA309738)	0.86892	1.00240	-0.56987	False
IA05057 (MA803856437)	-1.25271	-1.15710	0.22788	False
IA05059 (MA803856627)	-0.77502	-0.61670	-0.65453	False
IA05070 (MA804042487)	1.04291	0.68160	2.61427	False

Table 2.6.15
b/b Analysis
Mathematics Grade 10

Item Id	Old b	New b	Std Dist	Flag
IA04800 (MA717740737)	0.30217	0.31440	0.39151	False
IA04810 (MA735534256)	0.81211	0.95725	-0.29925	False
IA04819 (MA735579095)	-0.41188	-0.23220	-0.93395	False
IA04824 (MA735632759)	0.28275	0.46830	-0.75826	False
IA04842 (MA735734830)	0.91616	1.02740	-0.03789	False
IA04846 (MA735743236)	-1.30768	-1.19080	-0.88412	False
IA04847 (MA735745569)	0.61826	1.09090	0.62278	False
IA04871 (MA736059227)	0.15503	0.34570	-0.83848	False
IA04913 (MA800433428)	1.03795	1.16220	-0.07936	False
IA04991 (MA801426792)	1.00858	0.99870	0.79428	False
IA04993 (MA801434971)	1.32106	1.23460	1.41286	False
IA04997 (MA801564574)	0.18751	0.57035	0.18743	False
IA05048 (MA803762212)	0.20803	0.40750	-0.87722	False
IA05096 (MA804566054)	-0.37784	-0.34700	0.02142	False
IA05117 (MA804678931)	0.73352	1.05800	-0.39598	False
IA05144 (MA805372590)	0.94140	1.85650	3.42238	False
IA05145 (MA805373539)	0.77425	1.10570	-0.36484	False
IA05147 (MA805376549)	-1.92328	-1.67870	0.04380	False
IA05155 (MA806051920)	0.86285	1.10640	-0.92962	False
IA05165 (MA806383722)	-0.01714	0.08215	-0.29865	False
IA05170 (MA806408603)	0.00606	0.32030	-0.19884	False

Table 2.6.16
b/b Analysis
Introductory Physics Grade 10

Item Id	Old b	New b	Std Dist	Flag
IA03500 (SC717283221)	-0.54675	-0.78625	-0.61381	False
IA05503 (SC701073429)	0.20670	-0.07780	-0.91590	False
IA05859 (SC800552298)	-0.16430	-0.48080	-0.90003	False
IA10657 (SC630578145)	-0.24570	-0.41990	-0.20947	False
IA10680 (SC717246368)	-1.29390	-1.56340	-0.30297	False
IA10702 (SC800954781)	0.14390	-0.14280	-0.94523	False
IA10704 (SC800964236)	0.47510	0.63260	2.50379	False
IA10788 (SC814181163)	0.33380	-0.05300	0.20589	False
IA10802 (SC815652038)	0.64207	0.24378	0.57173	False
IA10919 (SC906339928)	0.72320	0.38820	0.00797	False
IA10920 (SC906340047)	0.25990	0.01545	-1.27110	False
IA10921 (SC906340140)	-0.32570	-0.35180	1.32972	False
IA10922 (SC906340259)	-0.98510	-1.28300	-0.83749	False
IA10923 (SC906340744)	0.42153	0.12790	-0.64981	False
IA10931 (SC906631611)	0.36280	-0.08540	0.84062	False
IA10936 (SC906662706)	-0.58990	-1.24470	2.11970	False
IA10941 (SC906953250)	1.09300	1.10020	0.50397	False
IA10943 (SC906965456)	-0.36730	-0.78350	-0.07336	False
IA10958 (SC908950033)	-0.92500	-1.13220	0.01617	False
IA10980 (SC910170718)	0.13340	-0.18500	-0.63831	False
IA10983 (SC910436447)	0.49770	0.23990	-0.94428	False
IA11025 (SC913743446)	-0.44660	-0.59590	0.20220	False

Table 2.6.17
b/b Analysis
Science Grade 5

Item Id	Old b	New b	Std Dist	Flag
IA05192 (SC264893)	0.79927	1.15280	1.51265	False
IA05466 (SC628483066)	-2.22893	-1.63780	0.44487	False
IA05523 (SC718127878)	-0.39351	-0.27210	-0.95141	False
IA05526 (SC735264282)	-2.09984	-1.72300	-1.42885	False
IA05530 (SC735267831)	-1.47629	-1.59280	2.46562	False
IA05545 (SC735535118)	0.27843	0.21360	0.06680	False
IA05560 (SC736074266)	-1.19534	-0.69090	0.75676	False
IA05562 (SC736074942)	-0.73855	-0.34445	0.21749	False
IA05628 (SC802729980)	-0.73736	-0.56300	-1.07431	False
IA05630 (SC802758131)	-0.75867	-0.33460	0.47729	False
IA05631 (SC802758561)	-0.52690	-0.45120	-0.37629	False
IA05634 (SC802761427)	0.93466	1.12393	0.11614	False
IA05657 (SC803732869)	0.55763	0.34700	1.13302	False
IA05661 (SC803837124)	-1.01072	-0.63060	-0.21065	False
IA05662 (SC803844809)	-0.93155	-0.63290	-0.89020	False
IA05664 (SC803847645)	-1.21143	-1.12220	0.24280	False
IA05678 (SC804048131)	-2.51521	-2.04410	-0.99549	False
IA05681 (SC804060300)	1.17115	1.07810	-0.64116	False
IA05688 (SC804141602)	-1.75067	-1.43900	-1.26038	False
IA05702 (SC806382697)	0.48628	0.36240	0.39531	False

Table 2.6.18
b/b Analysis
Science Grade 8

Item Id	Old b	New b	Std Dist	Flag
IA05243 (SC289702)	1.36616	1.42440	-0.92952	False
IA05245 (SC290144)	0.42343	0.99150	2.58405	False
IA05499 (SC633066301)	-1.78899	-1.78670	1.35047	False
IA05522 (SC717662167)	-0.17244	0.01360	-1.03338	False
IA05550 (SC735560046)	0.74179	0.91140	-0.65278	False
IA05551 (SC735569222)	-0.04589	0.17220	-0.68622	False
IA05555 (SC735663104)	1.67091	1.42880	1.47337	False
IA05581 (SC800285340)	0.48953	0.81030	0.50014	False
IA05649 (SC803174786)	-1.30133	-0.85720	0.53679	False
IA05665 (SC803856876)	-2.25255	-1.83570	-0.23991	False
IA05675 (SC803981496)	-0.86584	-0.57110	-0.49640	False
IA05687 (SC804132888)	-1.37550	-1.04860	-0.51126	False
IA05690 (SC804367702)	0.26849	0.22090	0.60463	False
IA05693 (SC804372985)	-1.21265	-1.10135	0.08646	False
IA05718 (SC807245653)	-1.10093	-0.88150	-0.90494	False
IA05720 (SC807247887)	-0.46650	-0.27420	-1.03412	False
IA05727 (SC809171062)	-0.00859	0.15060	-1.01130	False
IA05729 (SC809178849)	0.65243	0.54427	0.90526	False
IA05750 (SC814258458)	0.02174	0.31520	-0.00103	False
IA05777 (SC816343670)	-0.79702	-0.64030	-0.54032	False

Section 2.7

Tabled Beta Analysis Results

Table 2.7.1
Beta Analysis
Biology Grade 10

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA10582 (SC129438142)	3	1.05000	1.13000	ON13	ON14	0.01612	False
IA10635 (SC313409)	5	1.61000	1.90000	ON04	ON03	0.04740	False
IA10656 (SC630544518)	2	0.60000	0.63000	ON04	ON06	0.00987	False
IA10684 (SC723337422)	2	0.81000	0.78000	ON10	ON06	-0.05091	True
IA10696 (SC800163004)	2	0.79000	0.81000	ON12	ON11	-0.00209	False
IA10747 (SC804071827)	3	1.08000	1.20000	ON03	ON15	0.01730	False
IA10808 (SC815940509)	2	0.43000	0.41000	ON11	ON08	-0.02482	False
IA10809 (SC815948686)	2	0.58000	0.62000	ON04	ON10	0.01922	False
IA10810 (SC815948962)	2	0.40000	0.38000	ON03	ON02	-0.02850	False
IA10926 (SC906349045)	3	1.15000	1.16000	ON13	ON04	-0.01710	False
IA10927 (SC906351730)	2	0.78000	0.83000	ON02	ON05	0.02860	False
IA10930 (SC906544336)	2	0.64000	0.69000	ON06	ON13	0.04668	False
IA10989 (SC910635381)	2	0.67000	0.79000	ON04	ON08	0.10074	True
IA10994 (SC910746953)	2	0.70000	0.69000	ON13	ON14	-0.02909	False
IA10995 (SC910749140)	2	0.42000	0.45000	ON12	ON14	0.00465	False
IA10998 (SC910752674)	4	0.91000	0.82000	ON12	ON14	-0.03641	False
IA11005 (SC911354147)	2	0.50000	0.54000	ON07	ON02	0.00145	False
IA11014 (SC912353814)	2	0.71000	0.70000	ON04	ON12	-0.04471	False
IA11031 (SC914149827)	2	0.57000	0.58000	ON11	ON10	-0.00826	False
IA11033 (SC914353987)	2	0.36000	0.32000	ON07	ON03	-0.05177	True
IA11042 (SC915956318)	2	0.65000	0.68000	ON12	ON07	-0.00419	False
IA11054 (SC921067241)	2	0.63000	0.59000	ON13	ON14	-0.05887	True

Table 2.7.2
Beta Analysis
English Language Arts Grade 3

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00279 (EL308822)	2	0.78000	0.78000	ON03	ON03	0.00181	False
IA00280 (EL308824)	2	0.66000	0.66000	ON03	ON03	0.01213	False
IA00281 (EL308826)	2	0.59000	0.56000	ON03	ON03	-0.02565	False
IA00282 (EL308827)	2	0.65000	0.61000	ON03	ON03	-0.03644	False
IA00283 (EL308835)	2	0.57000	0.57000	ON03	ON03	0.00748	False
IA00284 (EL308837)	2	0.66000	0.66000	ON03	ON03	0.00326	False
IA00285 (EL308838)	2	0.77000	0.77000	ON03	ON03	0.00105	False
IA00286 (EL308842)	2	0.41000	0.49000	ON03	ON03	0.09562	True
IA00287 (EL308855)	4	1.12000	1.00000	ON03	ON03	-0.02951	False
IA00288 (EL308857)	4	0.96000	0.88000	ON03	ON03	-0.01706	False
IA00443 (EL626042844)	2	0.66000	0.65000	ON04	ON04	-0.00156	False
IA00444 (EL626043062)	2	0.67000	0.67000	ON04	ON04	0.00933	False
IA00445 (EL626043435)	3	1.03000	1.05000	ON04	ON04	0.02025	False
IA00446 (EL626049849)	2	0.53000	0.51000	ON04	ON04	-0.01027	False
IA00450 (EL626050679)	2	0.67000	0.66000	ON04	ON04	0.00993	False
IA00451 (EL626050927)	2	0.51000	0.54000	ON04	ON04	0.03056	False
IA00452 (EL626051097)	3	1.10000	1.04000	ON04	ON04	-0.01435	False
IA00453 (EL626051328)	2	0.64000	0.65000	ON04	ON04	0.02038	False

Table 2.7.3
Beta Analysis
English Language Arts Grade 4

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00218 (EL307705)	2	0.81000	0.83000	ON03	ON03	0.01254	False
IA00219 (EL307709)	2	0.77000	0.76000	ON03	ON03	-0.01018	False
IA00220 (EL307710)	2	0.43000	0.48000	ON03	ON03	0.04259	False
IA00221 (EL307713)	2	0.52000	0.53000	ON03	ON03	0.00436	False
IA00222 (EL307714)	2	0.76000	0.75000	ON03	ON03	-0.00578	False
IA00223 (EL307719)	2	0.56000	0.59000	ON03	ON03	0.01970	False
IA00224 (EL307724)	2	0.75000	0.73000	ON03	ON03	-0.01615	False
IA00225 (EL307728)	4	1.36000	1.44000	ON03	ON03	0.01917	False
IA00226 (EL307729)	4	1.25000	1.24000	ON03	ON03	-0.01178	False
IA00289 (EL309792)	2	0.64000	0.58000	ON03	ON03	-0.05748	True
IA00407 (EL624647403)	2	0.41000	0.42000	ON04	ON04	-0.00533	False
IA00408 (EL624647580)	2	0.58000	0.57000	ON04	ON04	-0.01509	False
IA00411 (EL624652450)	2	0.78000	0.76000	ON04	ON04	-0.02399	False
IA00412 (EL624652621)	2	0.90000	0.91000	ON04	ON04	0.01028	False
IA00414 (EL624652989)	2	0.43000	0.43000	ON04	ON04	-0.00387	False
IA00415 (EL624653348)	2	0.67000	0.67000	ON04	ON04	-0.01364	False
IA00416 (EL624653492)	3	1.44000	1.46000	ON04	ON04	0.00631	False
IA00419 (EL624654711)	3	1.60000	1.61000	ON04	ON04	0.00563	False

Table 2.7.4
Beta Analysis
English Language Arts Grade 5

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00495 (EL626304658)	2	0.75000	0.75000	ON03	ON03	-0.01253	False
IA00497 (EL626304969)	2	0.73000	0.72000	ON03	ON03	-0.01012	False
IA00500 (EL626332335)	2	0.66000	0.66000	ON03	ON03	-0.00490	False
IA00501 (EL626332592)	2	0.84000	0.84000	ON03	ON03	-0.00450	False
IA00502 (EL626333002)	2	0.82000	0.83000	ON03	ON03	0.00188	False
IA00505 (EL626355215)	2	0.60000	0.62000	ON03	ON03	0.01512	False
IA00506 (EL626355557)	2	0.64000	0.67000	ON03	ON03	0.01867	False
IA00508 (EL626356291)	3	0.73000	0.78000	ON03	ON03	0.01949	False
IA00638 (EL627351056)	2	0.66000	0.68000	ON03	ON03	0.01137	False
IA01669 (EL711809263)	2	0.76000	0.77000	ON04	ON04	0.00565	False
IA01670 (EL711809592)	2	0.76000	0.75000	ON04	ON04	-0.01361	False
IA01671 (EL711827203)	2	0.90000	0.90000	ON04	ON04	0.00270	False
IA01672 (EL711827807)	2	0.73000	0.72000	ON04	ON04	-0.01497	False
IA01679 (EL711868011)	3	0.99000	0.97000	ON04	ON04	-0.01713	False
IA01680 (EL711900602)	2	0.70000	0.69000	ON04	ON04	-0.01796	False
IA01691 (EL712167015)	2	0.46000	0.49000	ON04	ON04	0.02173	False

Table 2.7.5
Beta Analysis
English Language Arts Grade 6

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00173 (EL303496)	2	0.74000	0.75000	ON04	ON04	0.00197	False
IA00174 (EL303500)	2	0.64000	0.63000	ON04	ON04	-0.00988	False
IA00175 (EL303504)	2	0.61000	0.63000	ON04	ON04	0.03108	False
IA00176 (EL303508)	2	0.71000	0.73000	ON04	ON04	0.02470	False
IA00177 (EL303510)	2	0.87000	0.87000	ON04	ON04	-0.00571	False
IA00178 (EL303513)	2	0.66000	0.66000	ON04	ON04	-0.00245	False
IA00179 (EL303514)	2	0.63000	0.60000	ON04	ON04	-0.03293	False
IA00180 (EL303518)	2	0.57000	0.53000	ON04	ON04	-0.04121	False
IA00515 (EL626864414)	2	0.83000	0.82000	ON03	ON03	0.00010	False
IA00517 (EL626864724)	2	0.69000	0.71000	ON03	ON03	0.03048	False
IA00518 (EL626865003)	2	0.67000	0.67000	ON03	ON03	-0.00034	False
IA00520 (EL626865416)	2	0.41000	0.42000	ON03	ON03	0.00940	False
IA00522 (EL626865773)	2	0.72000	0.70000	ON03	ON03	-0.01567	False
IA00523 (EL626865942)	2	0.64000	0.64000	ON03	ON03	0.00973	False
IA00528 (EL626867605)	3	1.54000	1.52000	ON03	ON03	-0.00381	False
IA00530 (EL626868748)	3	1.41000	1.41000	ON03	ON03	0.00486	False

Table 2.7.6
Beta Analysis
English Language Arts Grade 7

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00065 (EL292160)	2	0.73000	0.72051	ON04	ON04	-0.02028	False
IA00066 (EL292163)	2	0.65000	0.62829	ON04	ON04	-0.03191	False
IA00067 (EL292168)	2	0.50000	0.48588	ON04	ON04	-0.00818	False
IA00068 (EL292170)	2	0.71000	0.71518	ON04	ON04	0.00436	False
IA00069 (EL292172)	2	0.62000	0.65699	ON04	ON04	0.03377	False
IA00070 (EL292176)	2	0.62000	0.60853	ON04	ON04	-0.01409	False
IA00081 (EL293802)	2	0.68000	0.70373	ON04	ON04	0.02489	False
IA00082 (EL293804)	2	0.54000	0.56885	ON04	ON04	0.02950	False
IA00257 (EL308358)	2	0.85000	0.84836	ON03	ON03	-0.00959	False
IA00258 (EL308360)	3	1.51000	1.51705	ON03	ON03	-0.00391	False
IA00262 (EL308382)	2	0.65000	0.65515	ON03	ON03	0.00053	False
IA00265 (EL308389)	2	0.90000	0.89974	ON03	ON03	-0.00639	False
IA00269 (EL308397)	2	0.84000	0.82967	ON03	ON03	-0.01947	False
IA00655 (EL628647210)	2	0.72000	0.74311	ON03	ON03	0.01708	False
IA00657 (EL628647689)	2	0.77000	0.77721	ON03	ON03	-0.00660	False
IA00658 (EL628653398)	3	1.48000	1.52639	ON03	ON03	0.01185	False

Table 2.7.7
Beta Analysis
English Language Arts Grade 8

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00056 (EL290795)	2	0.77000	0.79000	ON04	ON04	0.03591	False
IA00057 (EL290798)	2	0.78000	0.79000	ON04	ON04	0.01306	False
IA00058 (EL290799)	2	0.75000	0.76000	ON04	ON04	0.01272	False
IA00059 (EL290800)	2	0.67000	0.67000	ON04	ON04	0.00331	False
IA00060 (EL290801)	2	0.77000	0.76000	ON04	ON04	-0.01902	False
IA00061 (EL290805)	2	0.56000	0.56000	ON04	ON04	0.00570	False
IA00062 (EL290808)	2	0.54000	0.55000	ON04	ON04	0.00728	False
IA00063 (EL290814)	2	0.44000	0.40000	ON04	ON04	-0.05278	True
IA00368 (EL623873883)	2	0.72000	0.73000	ON03	ON03	0.01526	False
IA00371 (EL623951471)	3	1.21000	1.18000	ON03	ON03	-0.01466	False
IA00373 (EL623952377)	3	0.84000	0.85000	ON03	ON03	0.00548	False
IA00374 (EL623952612)	2	0.73000	0.72000	ON03	ON03	-0.01059	False
IA00378 (EL623955555)	2	0.51000	0.55000	ON03	ON03	0.03766	False
IA00379 (EL623955757)	2	0.54000	0.52000	ON03	ON03	-0.02420	False
IA00383 (EL623959265)	2	0.65000	0.64000	ON03	ON03	-0.00713	False
IA00699 (EL632808123)	2	0.77000	0.77000	ON03	ON03	0.00064	False

Table 2.7.8

Beta Analysis

English Language Arts Grade 10

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA04110 (EL807953958)	3	1.08000	1.15000	ON01	ON03	0.02899	False
IA04111 (EL807957225)	2	0.79000	0.77000	ON01	ON03	-0.02209	False
IA04132 (EL808046697)	2	0.88000	0.87000	ON01	ON03	-0.00940	False
IA04260 (EL811034362)	2	0.73000	0.72000	ON01	ON04	-0.00597	False
IA04297 (EL811428116)	2	0.61000	0.58000	ON01	ON04	-0.04111	False
IA04412 (EL813438114)	2	0.74000	0.72000	ON01	ON03	-0.02356	False
IA04439 (EL816956706)	2	0.67000	0.67000	ON01	ON04	-0.00296	False
IA04440 (EL817235657)	3	1.27000	1.26000	ON01	ON04	-0.01390	False
IA06629 (EL811608986)	3	1.50000	1.53000	ON01	ON03	0.01602	False
IA06631 (EL811610832)	3	1.18000	1.22000	ON01	ON03	0.01683	False
IA06633 (EL811612272)	2	0.60000	0.60000	ON01	ON03	-0.00866	False
IA06635 (EL811612951)	2	0.80000	0.79000	ON01	ON03	-0.00647	False
IA06636 (EL811614524)	2	0.82000	0.82000	ON01	ON03	-0.00380	False
IA06638 (EL811616340)	2	0.62000	0.64000	ON01	ON03	0.01187	False
IA06641 (EL811617473)	2	0.78000	0.79000	ON01	ON03	0.01343	False
IA06642 (EL811618006)	2	0.82000	0.82000	ON01	ON03	0.00337	False

Table 2.7.9
Beta Analysis
Mathematics Grade 3

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00769 (MA203641)	2	0.83000	0.88000	ON19	ON19	0.03796	False
IA00799 (MA260559)	2	0.49000	0.49000	ON05	ON05	-0.00792	False
IA00834 (MA293457)	2	0.79000	0.81000	ON03	ON03	-0.01471	False
IA00838 (MA293524)	2	0.74000	0.77000	ON07	ON07	0.01914	False
IA00850 (MA297405)	2	0.69000	0.71000	ON09	ON09	0.01376	False
IA00852 (MA297438)	2	0.63000	0.65000	ON06	ON06	0.00331	False
IA00924 (MA306310)	2	0.46000	0.48000	ON14	ON14	0.01234	False
IA00925 (MA306315)	2	0.75000	0.79000	ON02	ON02	0.02920	False
IA00930 (MA306359)	2	0.66000	0.64000	ON04	ON04	-0.04767	False
IA00932 (MA306375)	2	0.48000	0.49000	ON13	ON13	0.00173	False
IA00993 (MA310834)	2	0.63000	0.62000	ON18	ON18	-0.03100	False
IA01019 (MA311277)	2	0.74000	0.74000	ON17	ON17	-0.00705	False
IA01071 (MA623063509)	2	0.73000	0.72000	ON16	ON16	-0.01847	False
IA01080 (MA623654449)	4	0.95000	0.98000	ON21	ON21	0.00039	False
IA01081 (MA623656013)	4	0.86000	0.96000	ON08	ON08	0.00980	False
IA02323 (MA301611A)	2	0.83000	0.87000	ON15	ON15	0.01100	False
IA04760 (MA713752330)	2	0.77000	0.80000	ON11	ON11	0.01359	False
IA04813 (MA735572247)	2	0.72000	0.69000	ON12	ON12	-0.03889	False
IA04828 (MA735653938)	2	0.51000	0.57000	ON10	ON10	0.02588	False
IA04844 (MA735735757)	2	0.62000	0.61000	ON20	ON20	-0.02290	False

Table 2.7.10
Beta Analysis
Mathematics Grade 4

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00789 (MA250543)	5	1.66000	1.71000	ON20	ON20	-0.00600	False
IA00828 (MA287237)	2	0.76000	0.79000	ON06	ON06	0.00209	False
IA00841 (MA293718)	2	0.71000	0.73000	ON08	ON08	0.00094	False
IA00861 (MA297629)	2	0.89000	0.90000	ON21	ON21	-0.00679	False
IA00869 (MA297988)	2	0.18000	0.21000	ON16	ON16	0.00972	False
IA00906 (MA301811)	2	0.73000	0.72000	ON09	ON09	-0.02302	False
IA00958 (MA307055)	2	0.46000	0.51000	ON10	ON10	0.02794	False
IA00961 (MA307081)	2	0.53000	0.61000	ON13	ON13	0.06627	True
IA00963 (MA307085)	2	0.67000	0.70000	ON15	ON15	0.00835	False
IA01048 (MA311534)	2	0.54000	0.56000	ON12	ON12	-0.00296	False
IA01049 (MA311537)	2	0.66000	0.67000	ON18	ON18	0.00484	False
IA01055 (MA311572)	2	0.52000	0.55000	ON19	ON19	-0.01331	False
IA01057 (MA311581)	5	2.21000	2.23000	ON11	ON11	0.00099	False
IA01093 (MA623879088)	3	1.46000	1.39000	ON14	ON14	-0.06007	True
IA02175 (MA286769)	2	0.75000	0.78000	ON03	ON03	0.01259	False
IA02819 (MA713583365)	2	0.61000	0.59000	ON17	ON17	-0.03460	False
IA02841 (MA713774890)	2	0.44000	0.50000	ON05	ON05	0.03494	False
IA02902 (MA714251321)	2	0.39000	0.41000	ON04	ON04	-0.00018	False
IA04661 (MA307327)	2	0.74000	0.79000	ON07	ON07	0.02060	False
IA04965 (MA800867144)	2	0.58000	0.62000	ON02	ON02	0.01522	False

Table 2.7.11
Beta Analysis
Mathematics Grade 5

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00771 (MA204911)	2	0.73000	0.75000	ON08	ON08	0.00127	False
IA00776 (MA221207)	2	0.66000	0.69000	ON20	ON20	-0.00314	False
IA00803 (MA262207)	2	0.72000	0.75000	ON05	ON05	0.00079	False
IA00806 (MA272292)	2	0.47000	0.47000	ON23	ON23	-0.02252	False
IA00826 (MA287178)	2	0.85000	0.86000	ON06	ON06	-0.01229	False
IA00872 (MA298003)	2	0.63000	0.66000	ON07	ON07	0.00290	False
IA00880 (MA298106)	2	0.21000	0.24000	ON04	ON04	-0.00626	False
IA00885 (MA299556)	2	0.68000	0.73000	ON18	ON18	0.01118	False
IA00936 (MA306420)	2	0.69000	0.82000	ON09	ON09	0.09850	True
IA00943 (MA306466)	2	0.62000	0.64000	ON11	ON11	-0.00584	False
IA00989 (MA307638)	2	0.86000	0.87000	ON12	ON12	-0.00494	False
IA01020 (MA311280)	2	0.43000	0.43000	ON13	ON13	-0.02726	False
IA01029 (MA311337)	2	0.83000	0.86000	ON17	ON17	0.00483	False
IA01032 (MA311366)	5	1.54000	1.64000	ON19	ON19	-0.00854	False
IA01149 (MA624347774)	2	0.41000	0.42000	ON16	ON16	-0.01537	False
IA01155 (MA624357395)	3	0.70000	0.83000	ON03	ON03	0.02620	False
IA02552 (MA311324)	2	0.38000	0.44000	ON14	ON14	0.03076	False
IA02736 (MA704359678)	5	1.94000	1.99000	ON02	ON02	-0.02408	False
IA04970 (MA800974344)	2	0.70000	0.73000	ON10	ON10	0.00232	False
IA05002 (MA801652356)	2	0.60000	0.58000	ON19	ON15	0.03161	False

Table 2.7.12
Beta Analysis
Mathematics Grade 6

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00777 (MA221667)	2	0.85000	0.84000	ON10	ON10	-0.01390	False
IA00778 (MA221669)	2	0.80000	0.79000	ON11	ON11	-0.00538	False
IA00804 (MA264305)	2	0.74000	0.75000	ON17	ON17	-0.00487	False
IA00817 (MA280989)	2	0.47000	0.49000	ON14	ON14	0.00970	False
IA00818 (MA282268)	2	0.40000	0.41000	ON05	ON05	0.00829	False
IA00819 (MA282277)	2	0.47000	0.44000	ON03	ON03	-0.02477	False
IA00827 (MA287186)	2	0.56000	0.55000	ON09	ON09	-0.01653	False
IA00845 (MA296349)	2	0.56000	0.53000	ON16	ON16	-0.01955	False
IA00881 (MA298139)	5	1.80000	1.79000	ON03	ON03	-0.00455	False
IA00899 (MA301508)	2	0.33000	0.35000	ON06	ON06	0.00756	False
IA00972 (MA307339)	5	2.96000	2.92000	ON02	ON02	-0.00705	False
IA00992 (MA309941)	2	0.41000	0.40000	ON02	ON02	-0.00518	False
IA01058 (MA311658)	2	0.42000	0.46000	ON13	ON13	0.04330	False
IA02037 (MA217493)	2	0.66000	0.63000	ON03	ON03	-0.02956	False
IA02597 (MA311693)	2	0.78000	0.77000	ON04	ON04	0.00179	False
IA02698 (MA703179529)	2	0.28000	0.24000	06	ON15	0.02843	False
IA04745 (MA703231515)	3	1.00000	1.05000	ON03	ON03	0.02932	False
IA04884 (MA736365836)	2	0.68000	0.68000	ON12	ON12	0.00331	False
IA05126 (MA805103779)	2	0.55000	0.56000	ON07	ON07	0.01207	False
IA05135 (MA805171807)	2	0.58000	0.58000	ON08	ON08	0.01130	False

Table 2.7.13
Beta Analysis
Mathematics Grade 7

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00796 (MA259267)	2	0.44000	0.45000	ON08	ON08	0.00721	False
IA00831 (MA288414)	2	0.72000	0.73000	ON18	ON18	0.00873	False
IA00847 (MA296358)	2	0.53000	0.53000	ON17	ON17	-0.01687	False
IA00909 (MA301846)	2	0.87000	0.87000	ON13	ON13	0.00272	False
IA00910 (MA301854)	2	0.35000	0.35000	ON07	ON07	-0.01418	False
IA00945 (MA306538)	2	0.69000	0.71000	ON21	ON21	0.02100	False
IA00948 (MA306600)	2	0.84000	0.85000	ON11	ON11	0.00366	False
IA00949 (MA306605)	2	0.49000	0.50000	ON05	ON05	0.00588	False
IA01006 (MA311093)	2	0.85000	0.86000	ON20	ON20	0.00979	False
IA01011 (MA311109)	2	0.39000	0.41000	ON12	ON12	0.01785	False
IA01016 (MA311125)	2	0.55000	0.59000	ON19	ON19	0.02234	False
IA01017 (MA311135)	2	0.75000	0.73000	ON14	ON14	-0.01428	False
IA01018 (MA311140)	2	0.37000	0.42000	ON10	ON10	0.03499	False
IA01069 (MA316886)	5	2.03000	2.07000	ON03	ON03	-0.00073	False
IA01097 (MA623950280)	2	0.32000	0.35000	ON06	ON06	0.01919	False
IA01108 (MA624149677)	3	0.77000	0.77000	ON04	ON04	-0.01757	False
IA02722 (MA703943185)	5	1.95000	1.94000	ON02	ON02	-0.00334	False
IA04486 (MA227988)	2	0.69000	0.68000	ON09	ON09	-0.00233	False
IA04538 (MA282218)	2	0.69000	0.66000	ON16	ON16	-0.02638	False
IA04593 (MA298192)	2	0.24000	0.19000	0102	ON15	-0.03773	False

Table 2.7.14
Beta Analysis
Mathematics Grade 8

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA00849 (MA296757)	2	0.62000	0.62000	ON17	ON17	-0.00824	False
IA00858 (MA297513)	2	0.76000	0.78000	ON04	ON04	0.02203	False
IA00864 (MA297652)	5	2.81000	2.77000	ON03	ON03	-0.00570	False
IA00865 (MA297656)	2	0.53000	0.60000	ON11	ON11	0.06613	True
IA00903 (MA301674)	2	0.73000	0.75000	ON13	ON13	0.00976	False
IA00905 (MA301702)	2	0.44000	0.46000	ON07	ON07	0.00912	False
IA00979 (MA307472)	2	0.63000	0.65000	ON13	ON13	0.01897	False
IA00985 (MA307570)	2	0.51000	0.53000	ON18	ON18	-0.00342	False
IA01033 (MA311384)	2	0.59000	0.57000	ON08	ON08	-0.01183	False
IA01037 (MA311414)	2	0.39000	0.39000	ON10	ON10	0.00026	False
IA01042 (MA311448)	2	0.52000	0.50000	ON05	ON05	-0.04553	False
IA01044 (MA311463)	2	0.64000	0.62000	ON15	ON15	-0.00589	False
IA01066 (MA314812)	5	2.22000	2.16000	ON02	ON02	-0.00571	False
IA01125 (MA624247061)	3	0.85000	0.83000	ON14	ON14	-0.00690	False
IA02495 (MA309741)	2	0.44000	0.37000	ON15	ON15	-0.06741	True
IA04665 (MA307399)	2	0.48000	0.47000	ON16	ON16	-0.03019	False
IA04678 (MA309738)	2	0.39000	0.40000	ON04	ON04	-0.00306	False
IA05057 (MA803856437)	2	0.83000	0.83000	ON12	ON12	-0.00165	False
IA05059 (MA803856627)	2	0.71000	0.71000	ON09	ON09	0.00568	False
IA05070 (MA804042487)	2	0.29000	0.40000	ON04	ON04	0.10769	True

Table 2.7.15
Beta Analysis
Mathematics Grade 10

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA04800 (MA717740737)	2	0.40000	0.43000	ON11	ON11	0.03504	False
IA04810 (MA735534256)	3	0.67000	0.67000	ON02	ON02	0.00614	False
IA04819 (MA735579095)	2	0.57000	0.56000	ON10	ON10	-0.00646	False
IA04824 (MA735632759)	2	0.46000	0.46000	ON17	ON17	0.01575	False
IA04842 (MA735734830)	2	0.40000	0.40000	ON09	ON09	0.01732	False
IA04846 (MA735743236)	2	0.76000	0.78000	ON10	ON20	0.02022	False
IA04847 (MA735745569)	2	0.43000	0.40000	ON06	ON06	-0.03047	False
IA04871 (MA736059227)	2	0.50000	0.47000	ON03	ON03	-0.02415	False
IA04913 (MA800433428)	2	0.56000	0.56000	ON11	ON11	0.00135	False
IA04991 (MA801426792)	2	0.33000	0.37000	ON14	ON14	0.04790	False
IA04993 (MA801434971)	2	0.22000	0.25000	ON07	ON07	0.03833	False
IA04997 (MA801564574)	3	0.79000	0.71000	ON08	ON08	-0.04375	False
IA05048 (MA803762212)	2	0.47000	0.49000	ON16	ON16	0.02575	False
IA05096 (MA804566054)	3	1.11000	1.21000	ON05	ON05	0.04079	False
IA05117 (MA804678931)	2	0.35000	0.32000	ON19	ON19	-0.02735	False
IA05144 (MA805372590)	2	0.41000	0.37000	ON20	ON10	-0.04147	False
IA05145 (MA805373539)	2	0.23000	0.19000	ON13	ON13	-0.02609	False
IA05147 (MA805376549)	2	0.87000	0.87000	ON12	ON12	0.00858	False
IA05155 (MA806051920)	2	0.29000	0.29000	ON18	ON18	-0.00263	False
IA05165 (MA806383722)	5	1.84000	1.86000	ON04	ON04	0.01810	False
IA05170 (MA806408603)	5	1.77000	1.62000	ON07	ON07	-0.03069	False

Table 2.7.16
Beta Analysis
Introductory Physics Grade 10

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA03500 (SC717283221)	3	1.25000	1.24000	ON08	ON03	-0.02116	False
IA05503 (SC701073429)	2	0.56000	0.58000	ON08	ON07	0.00771	False
IA05859 (SC800552298)	2	0.60000	0.62000	ON05	ON11	-0.00262	False
IA10657 (SC630578145)	2	0.63000	0.60000	ON02	ON13	-0.04174	False
IA10680 (SC717246368)	3	1.57000	1.59000	ON09	ON11	-0.00494	False
IA10702 (SC800954781)	2	0.58000	0.59000	ON09	ON08	-0.00810	False
IA10704 (SC800964236)	2	0.45000	0.41000	ON05	ON12	-0.05659	True
IA10788 (SC814181163)	2	0.53000	0.58000	ON11	ON05	0.02334	False
IA10802 (SC815652038)	5	1.61000	1.79000	ON07	ON02	0.02648	False
IA10919 (SC906339928)	2	0.41000	0.45000	ON03	ON14	0.02079	False
IA10920 (SC906340047)	3	0.98000	1.01000	ON02	ON14	-0.01758	False
IA10921 (SC906340140)	2	0.74000	0.74000	ON02	ON14	-0.01672	False
IA10922 (SC906340259)	2	0.78000	0.79000	ON02	ON14	-0.01157	False
IA10923 (SC906340744)	4	1.31000	1.42000	ON02	ON14	0.00579	False
IA10931 (SC906631611)	2	0.53000	0.59000	ON03	ON12	0.03284	False
IA10936 (SC906662706)	2	0.72000	0.80000	ON05	ON03	0.06780	True
IA10941 (SC906953250)	2	0.31000	0.30000	ON07	ON06	-0.04172	False
IA10943 (SC906965456)	2	0.74000	0.77000	ON12	ON09	0.01162	False
IA10958 (SC908950033)	2	0.78000	0.78000	ON09	ON10	-0.02272	False
IA10980 (SC910170718)	2	0.59000	0.66000	ON02	ON06	0.02929	False
IA10983 (SC910436447)	2	0.50000	0.52000	ON13	ON13	-0.00479	False
IA11025 (SC913743446)	2	0.63000	0.61000	ON11	ON04	-0.04104	False

Table 2.7.17
Beta Analysis
Science Grade 5

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA05192 (SC264893)	4	0.93000	0.82000	ON16	ON08	-0.03583	False
IA05466 (SC628483066)	2	0.89000	0.87000	ON17	ON10	-0.03188	False
IA05523 (SC718127878)	2	0.67000	0.67000	ON08	ON05	0.00644	False
IA05526 (SC735264282)	2	0.86000	0.87000	ON09	ON05	0.01059	False
IA05530 (SC735267831)	2	0.79000	0.82000	ON02	ON10	0.02783	False
IA05545 (SC735535118)	2	0.47000	0.49000	ON19	ON09	0.03544	False
IA05560 (SC736074266)	2	0.78000	0.75000	ON15	ON10	-0.02625	False
IA05562 (SC736074942)	3	1.26000	1.19000	ON06	ON03	-0.03743	False
IA05628 (SC802729980)	2	0.63000	0.64000	ON02	ON02	0.02554	False
IA05630 (SC802758131)	2	0.72000	0.70000	ON02	ON02	-0.01651	False
IA05631 (SC802758561)	2	0.56000	0.57000	ON02	ON02	0.01494	False
IA05634 (SC802761427)	4	0.96000	0.91000	ON02	ON02	-0.01283	False
IA05657 (SC803732869)	3	0.79000	0.90000	ON12	ON08	0.05202	True
IA05661 (SC803837124)	2	0.67000	0.64000	ON14	ON09	-0.02623	False
IA05662 (SC803844809)	3	1.30000	1.28000	ON18	ON12	-0.01706	False
IA05664 (SC803847645)	2	0.76000	0.77000	ON06	ON04	0.01281	False
IA05678 (SC804048131)	2	0.88000	0.89000	ON05	ON03	0.00990	False
IA05681 (SC804060300)	2	0.37000	0.40000	ON13	ON08	0.03008	False
IA05688 (SC804141602)	2	0.84000	0.85000	ON18	ON12	0.01040	False
IA05702 (SC806382697)	2	0.47000	0.53000	ON10	ON05	0.06111	True

Table 2.7.18
Beta Analysis
Science Grade 8

Item Id	NumScoreCats	Old Mean	New Mean	Old Form	Form	Beta	Flag Beta
IA05243 (SC289702)	2	0.32000	0.36000	ON12	ON06	0.02936	False
IA05245 (SC290144)	2	0.53000	0.49000	ON04	ON11	-0.05502	True
IA05499 (SC633066301)	2	0.91000	0.92000	ON05	ON08	0.00982	False
IA05522 (SC717662167)	2	0.50000	0.51000	ON18	ON12	-0.00007	False
IA05550 (SC735560046)	2	0.27000	0.28000	ON17	ON11	0.00409	False
IA05551 (SC735569222)	2	0.52000	0.50000	ON16	ON10	-0.00999	False
IA05555 (SC735663104)	2	0.34000	0.36000	ON03	ON07	0.02486	False
IA05581 (SC800285340)	2	0.41000	0.40000	ON11	ON05	-0.01384	False
IA05649 (SC803174786)	2	0.69000	0.65000	ON14	ON12	-0.03044	False
IA05665 (SC803856876)	2	0.82000	0.78000	ON13	ON07	-0.03644	False
IA05675 (SC803981496)	2	0.72000	0.67000	ON06	ON10	-0.03711	False
IA05687 (SC804132888)	3	1.48000	1.46000	ON10	ON03	-0.01423	False
IA05690 (SC804367702)	2	0.44000	0.49000	ON15	ON06	0.05908	True
IA05693 (SC804372985)	3	1.34000	1.35000	ON09	ON10	0.00708	False
IA05718 (SC807245653)	2	0.74000	0.73000	ON02	ON04	0.00580	False
IA05720 (SC807247887)	2	0.57000	0.56000	ON02	ON04	-0.00361	False
IA05727 (SC809171062)	2	0.48000	0.46000	ON02	ON04	0.00434	False
IA05729 (SC809178849)	4	1.07000	1.14000	ON02	ON04	0.03451	False
IA05750 (SC814258458)	4	1.40000	1.28000	ON07	ON07	-0.02679	False
IA05777 (SC816343670)	3	1.24000	1.28000	ON08	ON02	0.02206	False

Section 2.8

Final Item Parameters

Table 2.8.1
IRT Parameters for Dichotomous Items
Biology Grade 10

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA05324 (SC306327)	0.73128	0.02026	-0.14510	0.04998	0.13220	0.02250
IA05421 (SC316159)	0.60615	0.02040	0.58643	0.04288	0.10500	0.01650
IA05884 (SC802460401)	0.67466	0.01407	-0.57046	0.04764	0.01740	0.02400
IA10719 (SC802140161)	1.18888	0.02490	0.16893	0.01805	0.20460	0.00920
IA10740 (SC803772254)	1.09899	0.02040	-0.17836	0.02148	0.08830	0.01270
IA10821 (SC831345559)	0.87357	0.02173	-0.08183	0.03561	0.16430	0.01710
IA10834 (SC903434684)	0.73395	0.01498	-1.15454	0.06177	0.04080	0.03760
IA10840 (SC903665008)	1.09111	0.02680	-0.19985	0.03126	0.29040	0.01540
IA10844 (SC903668548)	1.56482	0.03390	-0.00250	0.01638	0.32130	0.00870
IA10991 (SC910651771)	1.29143	0.03601	1.17277	0.01270	0.22840	0.00440
IA11017 (SC912737872)	1.41015	0.02799	0.24624	0.01354	0.19800	0.00720
IA11055 (SC924640143)	0.79177	0.02638	-0.33116	0.06511	0.31430	0.02590
IA12928 (SC294820)	1.22095	0.02469	-0.01997	0.01856	0.13840	0.01070
IA12930 (SC295278)	1.02802	0.01983	-0.01588	0.02056	0.06830	0.01140
IA12931 (SC296662)	1.25366	0.01583	0.16241	0.00894	0.00050	0.00350
IA12933 (SC299071)	1.40826	0.03728	1.00309	0.01245	0.27870	0.00460
IA12935 (SC299739)	1.17137	0.01688	0.09780	0.01195	0.01350	0.00590
IA12940 (SC301337)	1.04089	0.02293	-0.33166	0.03051	0.12850	0.01800
IA12945 (SC304863)	1.34172	0.02954	0.93087	0.01070	0.15150	0.00430
IA12947 (SC304901)	0.80858	0.01090	-0.10205	0.01530	0.00120	0.00690
IA12948 (SC304905)	0.62535	0.01709	0.07172	0.04748	0.03060	0.02050
IA12952 (SC310087)	0.78361	0.01892	-0.53167	0.05115	0.07160	0.02760
IA12960 (SC313347)	0.60024	0.02518	0.39209	0.06620	0.24510	0.02160
IA12990 (SC317087)	0.99911	0.02328	0.43798	0.01922	0.15620	0.00910
IA12999 (SC632554377)	1.41522	0.02820	-0.17770	0.01822	0.21290	0.01100
IA13007 (SC706031065)	0.66460	0.01815	-1.06201	0.09336	0.10250	0.04830
IA13010 (SC707646320)	0.80274	0.01822	-0.15596	0.03511	0.03690	0.01830
IA06024 (SC815749586)	0.79528	0.00985	-0.04630	0.00894	0.00000	0.00000
IA10727 (SC802367082)	1.06544	0.01175	0.58275	0.00769	0.00000	0.00000
IA10838 (SC903436569)	0.72213	0.00992	-0.90203	0.01521	0.00000	0.00000
IA10843 (SC903667486)	0.49164	0.00795	0.48872	0.01312	0.00000	0.00000
IA11019 (SC913054446)	0.96690	0.01062	0.38909	0.00777	0.00000	0.00000

Table 2.8.2
IRT Parameters for Polytomous Items
Biology Grade 10

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA10832 (SC903432965)	0.73001	0.00795	-0.10055	0.00953	0.98737	0.01838	-0.98737	0.01439	0.00000	0.00000
IA10839 (SC903436994)	1.24079	0.01048	0.17570	0.00472	0.94441	0.01063	-0.13173	0.00811	-0.81268	0.00938
IA10842 (SC903667169)	1.44370	0.01182	0.01770	0.00467	1.00950	0.01061	0.04678	0.00795	-1.05628	0.00929
IA10999 (SC910985231)	0.74527	0.00816	0.68547	0.00961	1.02131	0.01420	-1.02131	0.01878	0.00000	0.00000
IA11001 (SC911246035)	1.52093	0.01224	0.89082	0.00423	1.01301	0.00777	0.23585	0.00777	-0.33268	0.00929
IA11013 (SC912238529)	0.75857	0.00844	-0.18033	0.00901	0.85460	0.01761	-0.85460	0.01330	0.00000	0.00000
IA11037 (SC915044062)	0.91893	0.01217	-1.74873	0.01685	0.74598	0.03500	-0.74598	0.02188	0.00000	0.00000
IA11051 (SC920841277)	0.69667	0.00830	-0.69303	0.01212	1.07610	0.02539	-1.07610	0.01536	0.00000	0.00000
IA12937 (SC299759)	1.56820	0.01231	0.48529	0.00404	1.09553	0.00868	0.36593	0.00732	-0.23111	0.00767
IA12978 (SC316255)	1.88914	0.01505	0.32742	0.00331	0.78855	0.00754	0.37723	0.00679	-0.31317	0.00687

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA10839 (SC903436994)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA10842 (SC903667169)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA11001 (SC911246035)	-0.91618	0.01229	0.00000	0.00000	n/a	n/a
IA12937 (SC299759)	-1.23035	0.01175	0.00000	0.00000	n/a	n/a
IA12978 (SC316255)	-0.85262	0.00829	0.00000	0.00000	n/a	n/a

Table 2.8.3
IRT Parameters for Dichotomous Items
English Language Arts Grade 3

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA09406 (EL015503476)	1.06961	0.00000	-0.20230	0.00000	0.21540	0.00000
IA09410 (EL015607246)	1.09647	0.00000	0.17350	0.00000	0.25430	0.00000
IA09411 (EL015611981)	0.49324	0.00000	0.67290	0.00000	0.14920	0.00000
IA09413 (EL015628878)	1.19706	0.00000	0.01890	0.00000	0.23060	0.00000
IA09414 (EL015629502)	0.82634	0.00000	-1.05020	0.00000	0.22350	0.00000
IA09415 (EL015630515)	0.34874	0.00000	1.16130	0.00000	0.14010	0.00000
IA09540 (EL028131763)	1.05173	0.00000	-0.63480	0.00000	0.21450	0.00000
IA09543 (EL028160220)	0.78989	0.00000	0.15690	0.00000	0.23380	0.00000
IA09548 (EL028217140)	0.58242	0.00000	-0.62910	0.00000	0.06020	0.00000
IA09549 (EL028217627)	0.88477	0.00000	-0.43430	0.00000	0.26350	0.00000
IA09602 (EL028709466)	0.69859	0.00000	0.45830	0.00000	0.24870	0.00000
IA09603 (EL028717847)	0.66814	0.00000	-0.57490	0.00000	0.08020	0.00000
IA09605 (EL028823014)	0.82704	0.00000	-0.22520	0.00000	0.21730	0.00000
IA09611 (EL028907379)	1.18031	0.00000	-0.29150	0.00000	0.27800	0.00000
IA09614 (EL028914863)	0.63892	0.00000	0.23000	0.00000	0.21440	0.00000
IA09826 (EL909469479)	1.16208	0.00000	-1.06660	0.00000	0.10130	0.00000
IA09827 (EL909470939)	0.85850	0.00000	0.33710	0.00000	0.23580	0.00000
IA09828 (EL909472828)	0.83827	0.00000	-0.74870	0.00000	0.15680	0.00000
IA09829 (EL909473433)	0.82263	0.00000	-0.47020	0.00000	0.10470	0.00000
IA09831 (EL909478450)	1.22122	0.00000	-1.52500	0.00000	0.11040	0.00000
IA09832 (EL909479176)	0.83445	0.00000	-1.52760	0.00000	0.20110	0.00000
IA09833 (EL909480023)	0.56531	0.00000	-0.79240	0.00000	0.00650	0.00000
IA09835 (EL909865165)	1.13686	0.00000	-0.87310	0.00000	0.23530	0.00000
IA09836 (EL909869416)	0.99882	0.00000	-1.23690	0.00000	0.00620	0.00000
IA09846 (EL912636232)	1.03239	0.00000	-1.08140	0.00000	0.08390	0.00000
IA09847 (EL919652746)	1.35926	0.00000	-0.36560	0.00000	0.13980	0.00000

Table 2.8.4
IRT Parameters for Polytomous Items
English Language Arts Grade 3

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA09439 (EL019650296)	0.60135	0.00000	-1.66395	0.00000	0.89665	0.00000	-0.89665	0.00000	0.00000	0.00000
IA09547 (EL028215856)	0.76508	0.00000	-0.29635	0.00000	0.54835	0.00000	-0.54835	0.00000	0.00000	0.00000
IA09604 (EL028753268)	0.88777	0.00000	-0.94790	0.00000	0.86670	0.00000	-0.86670	0.00000	0.00000	0.00000
IA09608 (EL028832702)	0.71470	0.00000	1.00717	0.00000	2.11047	0.00000	0.28657	0.00000	-2.39703	0.00000
IA09838A (EL909882556#SCORE_TRAIT_Conv)	0.77984	0.00882	0.65813	0.01091	1.81453	0.01713	0.00783	0.01629	-1.82237	0.02949
IA09838D (EL909882556#SCORE_TRAIT_Ideadev)	0.82334	0.00911	1.46605	0.01717	2.75175	0.02185	0.82665	0.02067	-0.89345	0.03050
IA09840 (EL911945550)	1.00394	0.00000	-1.07355	0.00000	0.49495	0.00000	-0.49495	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA09608 (EL028832702)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09838A (EL909882556#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09838D (EL909882556#SCORE_TRAIT_Ideadev)	-2.68495	0.06376	0.00000	0.00000	n/a	n/a

Table 2.8.5
IRT Parameters for Dichotomous Items
English Language Arts Grade 4

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA08906 (EL006458075)	0.90941	0.00000	-2.21740	0.00000	0.04800	0.00000
IA08926 (EL006549511)	1.04803	0.00000	-0.41950	0.00000	0.17380	0.00000
IA09165 (EL007440160)	0.60517	0.00000	-1.87480	0.00000	0.01720	0.00000
IA09168 (EL007444742)	1.08348	0.00000	-1.17900	0.00000	0.12930	0.00000
IA09170 (EL007446608)	0.62816	0.00000	-1.41940	0.00000	0.02740	0.00000
IA09172 (EL007452066)	1.17972	0.00000	-1.57190	0.00000	0.19250	0.00000
IA09235 (EL009344832)	0.72575	0.00000	-0.17090	0.00000	0.23140	0.00000
IA09359 (EL013314332)	0.66384	0.00000	0.18260	0.00000	0.20750	0.00000
IA09370 (EL014208236)	1.01793	0.00000	-0.94110	0.00000	0.15010	0.00000
IA09446 (EL024031609)	0.39018	0.00000	0.20110	0.00000	0.14970	0.00000
IA09447 (EL024132276)	1.13804	0.00000	-0.97200	0.00000	0.18360	0.00000
IA09449 (EL024134327)	1.14874	0.00000	-0.49270	0.00000	0.13330	0.00000
IA09453 (EL024148759)	0.67784	0.00000	-2.04860	0.00000	0.03350	0.00000
IA09454 (EL024437543)	0.52728	0.00000	0.02380	0.00000	0.10540	0.00000
IA09455 (EL024440140)	0.47713	0.00000	-1.34260	0.00000	0.02990	0.00000
IA09456 (EL024442344)	0.73422	0.00000	0.71270	0.00000	0.19320	0.00000
IA09459 (EL024455037)	0.35720	0.00000	-1.37420	0.00000	0.04180	0.00000
IA09462 (EL024527106)	0.38372	0.00000	-0.52480	0.00000	0.11310	0.00000
IA09463 (EL024532504)	0.67913	0.00000	1.24720	0.00000	0.22750	0.00000
IA09618 (EL029280667)	0.96143	0.00000	-0.07630	0.00000	0.21080	0.00000
IA09623 (EL029415206)	1.20071	0.00000	-0.13550	0.00000	0.31820	0.00000
IA09624 (EL029417376)	1.35438	0.00000	-0.31450	0.00000	0.29870	0.00000
IA09625 (EL029429384)	0.77484	0.00000	0.56180	0.00000	0.25430	0.00000
IA09647 (EL030430678)	1.23627	0.00000	-0.02300	0.00000	0.28440	0.00000
IA09655 (EL030741768)	1.18107	0.00000	-0.15410	0.00000	0.25440	0.00000
IA09673 (EL033943069)	0.96755	0.00000	-0.71200	0.00000	0.24670	0.00000

Table 2.8.6
IRT Parameters for Polytomous Items
English Language Arts Grade 4

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA09177A (EL007459900#SCORE_TRAIT_Conv)	0.91182	0.01058	0.08870	0.01131	2.45650	0.02315	-0.28880	0.01503	-2.16770	0.02780
IA09177D (EL007459900#SCORE_TRAIT_Ideadev)	0.82387	0.00964	1.32518	0.01872	3.17928	0.02529	0.84528	0.02187	-1.21303	0.03519
IA09178 (EL007464016)	0.42234	0.00000	-1.74475	0.00000	0.17395	0.00000	-0.17395	0.00000	0.00000	0.00000
IA09234 (EL009343264)	0.87190	0.00000	-0.66810	0.00000	0.47850	0.00000	-0.47850	0.00000	0.00000	0.00000
IA09460 (EL024480931)	0.66655	0.00000	-0.46665	0.00000	0.41175	0.00000	-0.41175	0.00000	0.00000	0.00000
IA09465 (EL024539092)	0.70323	0.00000	-0.31373	0.00000	2.36107	0.00000	0.10907	0.00000	-2.47013	0.00000
IA09619 (EL029323184)	0.64027	0.00000	-0.13125	0.00000	1.07315	0.00000	-1.07315	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA09177A (EL007459900#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09177D (EL007459900#SCORE_TRAIT_Ideadev)	-2.81153	0.06822	0.00000	0.00000	n/a	n/a
IA09465 (EL024539092)	0.00000	0.00000	n/a	n/a	n/a	n/a

Table 2.8.7
IRT Parameters for Dichotomous Items
English Language Arts Grade 5

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA01339 (EL624175088)	0.87454	0.00000	-1.48780	0.00000	0.09500	0.00000
IA01341 (EL624176741)	0.42287	0.00000	-0.00190	0.00000	0.04620	0.00000
IA01342 (EL624177026)	0.26185	0.00000	-3.09710	0.00000	0.03400	0.00000
IA01344 (EL624178677)	0.47554	0.00000	-0.77190	0.00000	0.19040	0.00000
IA01345 (EL624179162)	0.85603	0.00000	-1.69160	0.00000	0.07410	0.00000
IA01346 (EL624179855)	0.57066	0.00000	-1.29120	0.00000	0.06040	0.00000
IA01348 (EL624180347)	0.65326	0.00000	-0.85290	0.00000	0.31190	0.00000
IA01349 (EL624180539)	0.87084	0.00000	-0.97360	0.00000	0.32450	0.00000
IA01387 (EL627148548)	0.98742	0.00000	-0.64460	0.00000	0.22670	0.00000
IA09629 (EL029961019)	0.79553	0.00000	-0.93320	0.00000	0.21550	0.00000
IA09632 (EL029974201)	1.09359	0.00000	-0.76900	0.00000	0.14060	0.00000
IA09634 (EL029980757)	0.73398	0.00000	-0.14600	0.00000	0.19580	0.00000
IA09637 (EL030062229)	0.92357	0.00000	-1.08780	0.00000	0.20340	0.00000
IA09638 (EL030080040)	0.70364	0.00000	-1.32730	0.00000	0.04630	0.00000
IA09639 (EL030171711)	0.72569	0.00000	-0.92760	0.00000	0.10760	0.00000
IA09643 (EL030337822)	0.64327	0.00000	1.32270	0.00000	0.21250	0.00000
IA09650 (EL030483081)	0.95026	0.00000	-1.38560	0.00000	0.21460	0.00000
IA09652 (EL030659380)	0.89430	0.00000	0.82610	0.00000	0.18520	0.00000
IA09659 (EL033541180)	0.82610	0.00000	-1.98660	0.00000	0.10900	0.00000
IA09660 (EL033604260)	1.17925	0.00000	-1.15570	0.00000	0.22780	0.00000
IA09663 (EL033665287)	0.43316	0.00000	-0.27560	0.00000	0.13480	0.00000
IA09664 (EL033679189)	0.73780	0.00000	-0.63230	0.00000	0.05290	0.00000
IA09668 (EL033800505)	0.28954	0.00000	-0.27400	0.00000	0.01230	0.00000
IA09671 (EL033843854)	1.12651	0.00000	0.66240	0.00000	0.27850	0.00000

Table 2.8.8
IRT Parameters for Polytomous Items
English Language Arts Grade 5

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA01340 (EL624176168)	1.13516	0.00000	-1.84640	0.00000	0.28310	0.00000	-0.28310	0.00000	0.00000	0.00000
IA01343 (EL624177447)	0.60905	0.00000	-1.32425	0.00000	0.92935	0.00000	-0.92935	0.00000	0.00000	0.00000
IA01350A (EL624182427#SCORE_TRAIT_Conv)	0.84762	0.00899	-0.30340	0.00893	1.84900	0.02036	-0.04490	0.01319	-1.80410	0.01920
IA01350D (EL624182427#SCORE_TRAIT_Ideadev)	0.82257	0.00876	0.51043	0.01243	2.76723	0.02313	0.89883	0.01596	-0.77548	0.02003
IA09630 (EL029964018)	0.58795	0.00000	-0.79505	0.00000	0.39235	0.00000	-0.39235	0.00000	0.00000	0.00000
IA09645A (EL030400392#SCORE_TRAIT_Conv)	0.85814	0.00935	0.48343	0.00941	1.72723	0.01605	-0.10457	0.01447	-1.62267	0.02439
IA09645D (EL030400392#SCORE_TRAIT_Ideadev)	0.83633	0.00917	1.25553	0.01502	2.70733	0.02081	0.66523	0.01879	-0.80828	0.02705
IA09649 (EL030463527)	0.81346	0.00000	-0.84670	0.00000	0.42830	0.00000	-0.42830	0.00000	0.00000	0.00000
IA09661 (EL033646585)	0.98383	0.00000	-0.92450	0.00000	0.62430	0.00000	-0.62430	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA01350A (EL624182427#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA01350D (EL624182427#SCORE_TRAIT_Ideadev)	-2.89058	0.04361	0.00000	0.00000	n/a	n/a
IA09645A (EL030400392#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09645D (EL030400392#SCORE_TRAIT_Ideadev)	-2.56428	0.05470	0.00000	0.00000	n/a	n/a

Table 2.8.9
IRT Parameters for Dichotomous Items
English Language Arts Grade 6

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA03973 (EL806979864)	0.62034	0.00000	-1.52900	0.00000	0.08280	0.00000
IA03974 (EL807001596)	0.52205	0.00000	-0.38080	0.00000	0.27790	0.00000
IA03975 (EL807002174)	0.34139	0.00000	-2.02870	0.00000	0.02940	0.00000
IA03977 (EL807009150)	0.50370	0.00000	-0.87910	0.00000	0.33410	0.00000
IA03979 (EL807010236)	0.76919	0.00000	0.69010	0.00000	0.22430	0.00000
IA03981 (EL807011414)	0.37025	0.00000	-0.72710	0.00000	0.10170	0.00000
IA03982 (EL807011890)	0.54897	0.00000	-0.67320	0.00000	0.24070	0.00000
IA04006 (EL807061702)	0.19453	0.00000	-2.42500	0.00000	0.04900	0.00000
IA04141 (EL808245411)	0.70994	0.00000	-0.53070	0.00000	0.37100	0.00000
IA08942 (EL006639933)	0.66455	0.00000	0.15750	0.00000	0.21240	0.00000
IA08960 (EL006738734)	0.41922	0.00000	-0.01390	0.00000	0.05610	0.00000
IA08964 (EL006742548)	0.43186	0.00000	1.16040	0.00000	0.07560	0.00000
IA09078 (EL007074213)	0.62381	0.00000	-1.99180	0.00000	0.15380	0.00000
IA09079 (EL007074445)	0.50312	0.00000	-1.35130	0.00000	0.05370	0.00000
IA09081 (EL007075911)	0.75262	0.00000	-1.64430	0.00000	0.02950	0.00000
IA09082 (EL007076177)	0.46655	0.00000	-1.35100	0.00000	0.21310	0.00000
IA09084 (EL007077078)	0.91834	0.00000	-1.26660	0.00000	0.27560	0.00000
IA09086 (EL007077860)	0.58430	0.00000	-0.31260	0.00000	0.20680	0.00000
IA09087 (EL007078526)	0.58801	0.00000	-1.32100	0.00000	0.12630	0.00000
IA09186 (EL008281454)	0.26008	0.00000	0.07310	0.00000	0.15830	0.00000
IA09190 (EL008445593)	0.72169	0.00000	-1.00420	0.00000	0.15020	0.00000
IA09239 (EL009514238)	0.59012	0.00000	-0.67510	0.00000	0.14980	0.00000
IA09242 (EL009564267)	0.35750	0.00000	-0.35830	0.00000	0.02340	0.00000
IA09254 (EL009978066)	0.64539	0.00000	-0.91640	0.00000	0.14300	0.00000

Table 2.8.10
IRT Parameters for Polytomous Items
English Language Arts Grade 6

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA03984A (EL807016586#SCORE_TRAIT_Conv)	0.77084	0.00794	-0.43287	0.00887	1.83833	0.02025	-0.11027	0.01413	-1.72807	0.01829
IA03984D (EL807016586#SCORE_TRAIT_Ideadev)	0.79976	0.00794	0.77488	0.01041	3.20388	0.02105	1.26028	0.01507	-0.20432	0.01713
IA04007 (EL807062301)	0.46302	0.00000	-0.18550	0.00000	0.22650	0.00000	-0.22650	0.00000	0.00000	0.00000
IA04142 (EL808246461)	0.27901	0.00000	-1.86625	0.00000	3.25905	0.00000	-3.25905	0.00000	0.00000	0.00000
IA09048A (EL007051004#SCORE_TRAIT_Conv)	0.73486	0.00770	-0.57440	0.00922	1.78280	0.02112	0.02920	0.01482	-1.81200	0.01881
IA09048D (EL007051004#SCORE_TRAIT_Ideadev)	0.76955	0.00776	1.47268	0.01865	3.34588	0.02425	1.75298	0.02170	0.05118	0.02503
IA09185 (EL008181021)	0.57331	0.00000	-1.69175	0.00000	1.53755	0.00000	-1.53755	0.00000	0.00000	0.00000
IA09188 (EL008355)	0.77266	0.00000	-1.42415	0.00000	0.90245	0.00000	-0.90245	0.00000	0.00000	0.00000
IA09237 (EL009438210)	0.31440	0.00000	-0.19545	0.00000	1.88105	0.00000	-1.88105	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA03984A (EL807016586#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA03984D (EL807016586#SCORE_TRAIT_Ideadev)	-1.52582	0.02534	-2.73402	0.04056	0.00000	0.00000
IA09048A (EL007051004#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09048D (EL007051004#SCORE_TRAIT_Ideadev)	-1.56992	0.03730	-3.58012	0.08575	0.00000	0.00000

Table 2.8.11
IRT Parameters for Dichotomous Items
English Language Arts Grade 7

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA01781 (EL713378067)	0.41881	0.00000	-1.95130	0.00000	0.01160	0.00000
IA01791 (EL713476504)	0.57872	0.00000	0.49710	0.00000	0.20410	0.00000
IA01793 (EL713479099)	0.87790	0.00000	-0.29150	0.00000	0.23630	0.00000
IA01794 (EL713479631)	0.85397	0.00000	-1.07190	0.00000	0.27300	0.00000
IA01795 (EL713480064)	0.60982	0.00000	-0.40250	0.00000	0.17530	0.00000
IA01797 (EL713480958)	0.58207	0.00000	-1.31520	0.00000	0.07040	0.00000
IA01798 (EL713481518)	0.89847	0.00000	-0.46660	0.00000	0.21040	0.00000
IA01964 (EL723632935)	0.59248	0.00000	-0.18310	0.00000	0.20920	0.00000
IA01973 (EL730170770)	1.01640	0.00000	-1.25480	0.00000	0.21290	0.00000
IA08887 (EL006357067)	0.86114	0.00000	-0.85190	0.00000	0.24240	0.00000
IA08897 (EL006439224)	0.40988	0.00000	0.10130	0.00000	0.15890	0.00000
IA08903 (EL006446884)	0.66226	0.00000	0.17790	0.00000	0.17550	0.00000
IA08905 (EL006454205)	0.81287	0.00000	-1.54300	0.00000	0.08150	0.00000
IA08913 (EL006537445)	0.41952	0.00000	-0.33260	0.00000	0.06070	0.00000
IA08919 (EL006544709)	0.90958	0.00000	0.88220	0.00000	0.21010	0.00000
IA08922 (EL006545529)	0.49124	0.00000	-0.39990	0.00000	0.13030	0.00000
IA08923 (EL006546235)	0.55750	0.00000	-0.66960	0.00000	0.19680	0.00000
IA08928 (EL006560393)	0.79242	0.00000	0.22860	0.00000	0.29540	0.00000
IA08943 (EL006640130)	0.88101	0.00000	-0.07710	0.00000	0.20670	0.00000
IA09023 (EL006977006)	0.84815	0.00000	-0.26420	0.00000	0.29910	0.00000
IA09298 (EL011362473)	0.62845	0.00000	-2.24710	0.00000	0.02570	0.00000
IA09299 (EL011363661)	0.69747	0.00000	-0.99970	0.00000	0.21660	0.00000
IA09434 (EL016833358)	0.83286	0.00000	-0.26690	0.00000	0.20860	0.00000
IA09818 (EL113429887)	0.90805	0.00000	-0.96150	0.00000	0.22570	0.00000

Table 2.8.12
IRT Parameters for Polytomous Items
English Language Arts Grade 7

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA01776 (EL713370326)	0.45426	0.00000	-1.41715	0.00000	1.29335	0.00000	-1.29335	0.00000	0.00000	0.00000
IA01779A (EL713375305#SCORE_TRAIT_Conv)	0.98301	0.00999	-0.53300	0.00649	1.30260	0.01525	-0.20460	0.01110	-1.09800	0.01226
IA01779D (EL713375305#SCORE_TRAIT_Ideadev)	0.85726	0.00952	0.81368	0.00715	1.19008	0.01189	0.83168	0.01245	0.23998	0.01362
IA01788 (EL713475622)	0.66725	0.00000	-0.30075	0.00000	0.59135	0.00000	-0.59135	0.00000	0.00000	0.00000
IA08948A (EL006653237#SCORE_TRAIT_Conv)	0.86138	0.00888	-0.55247	0.00742	1.35863	0.01728	0.02813	0.01229	-1.38677	0.01454
IA08948D (EL006653237#SCORE_TRAIT_Ideadev)	0.85461	0.00841	0.72594	0.01147	3.09444	0.02168	1.37284	0.01529	-0.03846	0.01653
IA09028 (EL006978834)	0.49730	0.00000	-0.47815	0.00000	0.50925	0.00000	-0.50925	0.00000	0.00000	0.00000
IA09297 (EL011353608)	0.46814	0.00000	0.28525	0.00000	1.23695	0.00000	-1.23695	0.00000	0.00000	0.00000
IA09437 (EL017655451)	0.84697	0.00000	-1.33035	0.00000	0.33205	0.00000	-0.33205	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA01779A (EL713375305#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA01779D (EL713375305#SCORE_TRAIT_Ideadev)	-0.59402	0.01752	-1.66772	0.02725	0.00000	0.00000
IA08948A (EL006653237#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA08948D (EL006653237#SCORE_TRAIT_Ideadev)	-1.39926	0.02437	-3.02956	0.04877	0.00000	0.00000

Table 2.8.13
IRT Parameters for Dichotomous Items
English Language Arts Grade 8

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA08951 (EL006655733)	0.79571	0.00000	-0.04280	0.00000	0.14300	0.00000
IA09049 (EL007061131)	0.36673	0.00000	-2.31380	0.00000	0.01520	0.00000
IA09050 (EL007061194)	0.50870	0.00000	-1.40660	0.00000	0.04270	0.00000
IA09054 (EL007061650)	0.29359	0.00000	-0.61170	0.00000	0.41620	0.00000
IA09058 (EL007062053)	0.69588	0.00000	-0.19040	0.00000	0.24910	0.00000
IA09127 (EL007253045)	0.95773	0.00000	-1.07280	0.00000	0.17980	0.00000
IA09131 (EL007256618)	0.54386	0.00000	-1.20140	0.00000	0.13300	0.00000
IA09133 (EL007257202)	0.18436	0.00000	-2.72570	0.00000	0.04970	0.00000
IA09134 (EL007257390)	0.49859	0.00000	-0.69550	0.00000	0.16760	0.00000
IA09138 (EL007335795)	0.41534	0.00000	-1.45940	0.00000	0.00990	0.00000
IA09139 (EL007335808)	0.89459	0.00000	0.07270	0.00000	0.24000	0.00000
IA09141 (EL007350397)	0.64256	0.00000	0.05730	0.00000	0.20310	0.00000
IA09145 (EL007353056)	0.86978	0.00000	0.37970	0.00000	0.22700	0.00000
IA09194 (EL008544460)	0.51411	0.00000	-0.70520	0.00000	0.09560	0.00000
IA09218 (EL009149967)	0.44844	0.00000	-2.24180	0.00000	0.01140	0.00000
IA09222 (EL009246409)	0.81511	0.00000	-1.17170	0.00000	0.23340	0.00000
IA09226 (EL009308236)	1.03780	0.00000	-1.71090	0.00000	0.07350	0.00000
IA09227 (EL009308819)	0.32934	0.00000	-0.50140	0.00000	0.03150	0.00000
IA09233 (EL009343097)	0.40664	0.00000	-3.25630	0.00000	0.01840	0.00000
IA09245 (EL009737508)	0.88083	0.00000	0.14520	0.00000	0.28790	0.00000
IA09426 (EL016259168)	0.82916	0.00000	-1.46820	0.00000	0.12560	0.00000
IA09427 (EL016259978)	0.42404	0.00000	-0.15520	0.00000	0.23020	0.00000
IA09430 (EL016352526)	0.16514	0.00000	-1.30970	0.00000	0.02290	0.00000
IA09443 (EL022460231)	0.90165	0.00000	-0.90080	0.00000	0.20030	0.00000

Table 2.8.14
IRT Parameters for Polytomous Items
English Language Arts Grade 8

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA08949 (EL006653570)	0.31117	0.00000	-1.60220	0.00000	2.46880	0.00000	-2.46880	0.00000	0.00000	0.00000
IA09059 (EL007062608)	0.37901	0.00000	-2.24165	0.00000	0.30075	0.00000	-0.30075	0.00000	0.00000	0.00000
IA09060A (EL007062902#SCORE_TRAIT_Conv)	0.78912	0.00811	-1.19327	0.00950	1.66493	0.02489	-0.06457	0.01562	-1.60037	0.01484
IA09060D (EL007062902#SCORE_TRAIT_Ideadev)	0.76796	0.00747	0.30384	0.00932	3.07344	0.02426	1.39484	0.01567	-0.04396	0.01449
IA09122 (EL007243506)	0.67014	0.00000	-0.64940	0.00000	0.33070	0.00000	-0.33070	0.00000	0.00000	0.00000
IA09130A (EL007253494#SCORE_TRAIT_Conv)	0.88618	0.00894	-0.74167	0.00764	1.43813	0.01837	0.02393	0.01315	-1.46207	0.01381
IA09130D (EL007253494#SCORE_TRAIT_Ideadev)	0.87701	0.00847	0.70690	0.00959	2.76460	0.01865	1.44720	0.01437	0.03640	0.01467
IA09197 (EL008553781)	0.38372	0.00000	-2.34500	0.00000	2.06490	0.00000	-2.06490	0.00000	0.00000	0.00000
IA09224 (EL009257746)	0.42099	0.00000	-1.12025	0.00000	1.77075	0.00000	-1.77075	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA09060A (EL007062902#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09060D (EL007062902#SCORE_TRAIT_Ideadev)	-1.51256	0.02045	-2.91176	0.03381	0.00000	0.00000
IA09130A (EL007253494#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09130D (EL007253494#SCORE_TRAIT_Ideadev)	-1.34850	0.02110	-2.89970	0.03929	0.00000	0.00000

Table 2.8.15
IRT Parameters for Dichotomous Items
English Language Arts Grade 10

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA06950 (EL910037105)	0.54768	0.00000	-1.23020	0.00000	0.16880	0.00000
IA06952 (EL910038096)	0.57507	0.00000	-2.04100	0.00000	0.02280	0.00000
IA06976 (EL910182760)	0.19882	0.00000	-1.22500	0.00000	0.03920	0.00000
IA06977 (EL910186190)	0.59024	0.00000	-1.81600	0.00000	0.01790	0.00000
IA07013 (EL910752412)	0.93374	0.00000	-1.38330	0.00000	0.13310	0.00000
IA07034 (EL910856535)	0.81405	0.00000	-0.28630	0.00000	0.25590	0.00000
IA07038 (EL910859790)	1.34227	0.00000	-0.08780	0.00000	0.16020	0.00000
IA07328 (EL915848124)	0.46243	0.00000	-1.12330	0.00000	0.03390	0.00000
IA07331 (EL915856523)	0.31993	0.00000	-1.02040	0.00000	0.00060	0.00000
IA09712 (EL108655218)	0.58025	0.00000	-0.98000	0.00000	0.27630	0.00000
IA09714 (EL108735624)	0.64668	0.00000	-0.42090	0.00000	0.25000	0.00000
IA09719 (EL108748372)	1.22875	0.00000	-1.55690	0.00000	0.11650	0.00000
IA09720 (EL108755819)	0.76255	0.00000	-1.22150	0.00000	0.10920	0.00000
IA09723 (EL108759765)	0.61781	0.00000	-0.46300	0.00000	0.17660	0.00000
IA09724 (EL108762851)	1.02381	0.00000	-0.82910	0.00000	0.21970	0.00000
IA09745 (EL110674270)	1.21358	0.00000	-1.25760	0.00000	0.17810	0.00000
IA09771 (EL111645342)	0.92499	0.00000	-1.84350	0.00000	0.17430	0.00000
IA09772 (EL111647089)	0.79265	0.00000	-1.36700	0.00000	0.21080	0.00000
IA09775 (EL111666619)	0.66467	0.00000	-1.18070	0.00000	0.08470	0.00000
IA09777 (EL111730630)	0.59918	0.00000	-2.09240	0.00000	0.01170	0.00000
IA09822 (EL117657201)	0.78307	0.00000	-1.73860	0.00000	0.02150	0.00000

Table 2.8.16
IRT Parameters for Polytomous Items
English Language Arts Grade 10

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA06961A (EL910055845#SCORE_TRAIT_Conv)	1.03868	0.01099	-1.42180	0.00876	1.13280	0.02349	-0.02950	0.01510	-1.10330	0.01186
IA06961D (EL910055845#SCORE_TRAIT_Ideadev)	0.96661	0.00947	-0.04948	0.00996	2.84892	0.02691	1.43982	0.01670	0.30982	0.01316
IA06975 (EL910161517)	0.58266	0.00000	-1.35830	0.00000	0.79210	0.00000	-0.79210	0.00000	0.00000	0.00000
IA07009 (EL910748365)	0.62728	0.00000	-0.18415	0.00000	1.19375	0.00000	-1.19375	0.00000	0.00000	0.00000
IA07030 (EL910841373)	0.59512	0.00000	-0.33470	0.00000	0.29710	0.00000	-0.29710	0.00000	0.00000	0.00000
IA09708A (EL108631124#SCORE_TRAIT_Conv)	1.12040	0.01188	-1.48853	0.00831	1.06227	0.02203	-0.04073	0.01459	-1.02153	0.01139
IA09708D (EL108631124#SCORE_TRAIT_Ideadev)	1.01370	0.00958	-0.33414	0.00728	2.34196	0.02317	1.17496	0.01481	0.14276	0.01112
IA09709 (EL108640648)	0.66467	0.00000	-1.59825	0.00000	1.62635	0.00000	-1.62635	0.00000	0.00000	0.00000
IA09711 (EL108650704)	0.70541	0.00000	-0.66595	0.00000	0.18295	0.00000	-0.18295	0.00000	0.00000	0.00000
IA09768 (EL111540952)	0.82787	0.00000	-1.53750	0.00000	0.93420	0.00000	-0.93420	0.00000	0.00000	0.00000
IA09769 (EL111562949)	0.60259	0.00000	-0.92670	0.00000	0.30900	0.00000	-0.30900	0.00000	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA06961A (EL910055845#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA06961D (EL910055845#SCORE_TRAIT_Ideadev)	-1.17958	0.01560	-3.41898	0.03948	0.00000	0.00000
IA09708A (EL108631124#SCORE_TRAIT_Conv)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA09708D (EL108631124#SCORE_TRAIT_Ideadev)	-0.83724	0.01158	-2.82244	0.02403	0.00000	0.00000

Table 2.8.17 IRT Parameters for Dichotomous Items—Mathematics Grade 3

Item ID	Parameters and Measures of Standard Error					
	a	SE(a)	b	SE(b)	c	SE(c)
IA00793 (MA253641)	1.12128	0.02082	-0.79544	0.02332	0.21380	0.01140
IA00801 (MA260962)	0.60921	0.01475	-0.51911	0.04804	0.10020	0.01780
IA02033 (MA212474)	1.14535	0.02044	-1.01840	0.02353	0.14340	0.01280
IA02052 (MA227232)	1.16909	0.01952	-0.45936	0.01692	0.17760	0.00790
IA02056 (MA227485)	0.69692	0.01583	0.54518	0.02050	0.08730	0.00740
IA02515 (MA310880)	0.89842	0.02689	1.12776	0.01800	0.24630	0.00510
IA04473 (MA207001)	0.89782	0.01578	-0.94705	0.02885	0.09690	0.01430
IA04681 (MA310870)	1.08609	0.02694	0.41678	0.01865	0.34330	0.00610
IA07601 (MA306285)	0.84340	0.01653	-0.17707	0.02353	0.15510	0.00940
IA07801 (MA900372676)	1.09520	0.02163	0.19132	0.01572	0.22380	0.00600
IA09906 (MA001049099)	0.66375	0.02136	0.78854	0.02841	0.24390	0.00880
IA09912 (MA001056175)	0.90953	0.01556	0.12192	0.01518	0.06990	0.00600
IA09920 (MA001137862)	0.76355	0.01306	-0.87916	0.03058	0.01750	0.01440
IA10018 (MA001633319)	0.70440	0.01480	-0.36002	0.03221	0.09270	0.01280
IA10334 (MA297500)	1.11792	0.02504	0.33740	0.01594	0.25850	0.00590
IA12370 (MA202994)	0.84903	0.01735	-1.02296	0.03861	0.17800	0.01780
IA02516 (MA310884)	0.99486	0.01019	-0.54406	0.00878	0.00000	0.00000
IA02521 (MA310889)	0.85662	0.00987	-1.12750	0.01247	0.00000	0.00000
IA02682 (MA703056978)	0.87815	0.00938	-0.36827	0.00933	0.00000	0.00000
IA04754 (MA713536927)	0.72153	0.00851	-1.09584	0.01323	0.00000	0.00000
IA04834 (MA735663821)	0.88433	0.00900	0.08201	0.00889	0.00000	0.00000
IA04851 (MA735756531)	0.93333	0.00992	0.30671	0.00878	0.00000	0.00000
IA04860 (MA735954511)	0.97046	0.01014	-0.06429	0.00846	0.00000	0.00000
IA07645 (MA309747)	1.20021	0.01225	-0.33519	0.00792	0.00000	0.00000
IA07814 (MA900425126)	0.71367	0.00791	-0.00996	0.00976	0.00000	0.00000
IA09854 (MA000749172)	0.97556	0.01025	-0.65055	0.00933	0.00000	0.00000
IA09894 (MA001038775)	0.70522	0.00949	-1.41825	0.01605	0.00000	0.00000
IA09904 (MA001047582)	0.84248	0.00965	-1.35589	0.01366	0.00000	0.00000
IA09961 (MA001335228)	1.02841	0.01041	-0.20234	0.00824	0.00000	0.00000
IA09964 (MA001338241)	0.69540	0.00813	-1.31902	0.01507	0.00000	0.00000
IA09967 (MA001344527)	0.31317	0.00645	-2.20937	0.04414	0.00000	0.00000
IA09977 (MA001439533)	0.72766	0.00857	-1.20168	0.01377	0.00000	0.00000
IA10392 (MA703078093)	1.14421	0.01393	-1.51054	0.01247	0.00000	0.00000
IA10405 (MA734752477)	0.78138	0.00965	-1.15472	0.01301	0.00000	0.00000
IA10407 (MA735736004A)	0.81748	0.00878	-0.36827	0.00943	0.00000	0.00000
IA10480 (MA935136577)	0.71031	0.00829	-0.93132	0.01247	0.00000	0.00000

Table 2.8.18
IRT Parameters for Polytomous Items
Mathematics Grade 3

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA02202 (MA293460A)	1.07563	0.00884	-0.24944	0.00518	0.84075	0.01124	0.01851	0.00955	-0.85926	0.01020
IA04548 (MA286750A)	1.07064	0.00867	-0.21535	0.00567	1.12156	0.01262	0.07483	0.00974	-1.19639	0.01148
IA04686 (MA310899A)	1.07270	0.00884	-0.02196	0.00633	1.41093	0.01303	0.22886	0.01022	-1.63979	0.01437
IA07524 (MA253711A)	1.14822	0.00916	0.10912	0.00567	1.22296	0.01129	0.09836	0.00956	-1.32132	0.01291

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA02202 (MA293460A)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA04548 (MA286750A)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA04686 (MA310899A)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA07524 (MA253711A)	0.00000	0.00000	n/a	n/a	n/a	n/a

Table 2.8.19
IRT Parameters for Dichotomous Items
Mathematics Grade 4

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA00787 (MA247691)	0.99750	0.02482	-1.35704	0.05133	0.28770	0.02610
IA00812 (MA279759)	0.72728	0.01091	-0.98136	0.03012	0.00700	0.01440
IA00960 (MA307075)	1.29635	0.02931	-1.47885	0.03715	0.26380	0.02390
IA02072 (MA247705)	0.70575	0.01539	0.02727	0.02929	0.11320	0.01140
IA02432 (MA307060)	0.81618	0.02153	0.25051	0.02867	0.29240	0.00980
IA04580 (MA297614)	0.47756	0.01165	-1.08599	0.08228	0.03430	0.02990
IA04653 (MA307067)	1.36202	0.02409	-0.67171	0.01677	0.13680	0.00970
IA05045 (MA803747806)	1.24988	0.02278	-0.23425	0.01646	0.20590	0.00800
IA07659 (MA311543)	1.02232	0.02005	-0.37086	0.02401	0.24370	0.01070
IA08145 (MA903571693)	1.19813	0.01625	0.04984	0.01025	0.04450	0.00420
IA08183 (MA903776098)	1.44802	0.02937	0.75855	0.01066	0.18960	0.00380
IA10047 (MA001750121)	1.19399	0.02374	0.04777	0.01646	0.24610	0.00710
IA10077 (MA002034926)	1.09855	0.02414	-0.39787	0.02587	0.34460	0.01070
IA10097 (MA002135528)	0.55930	0.01602	0.20787	0.04523	0.12000	0.01530
IA10101 (MA002139080)	0.97478	0.03255	1.08683	0.01956	0.36630	0.00560
IA10104 (MA002140372)	1.10367	0.02477	-0.28206	0.02494	0.36500	0.00990
IA10224 (MA003747173)	0.46177	0.01511	0.04601	0.06965	0.08040	0.02160
IA12450 (MA301798)	0.61565	0.01261	-0.84517	0.04988	0.04130	0.02110
IA12462 (MA303324)	1.56816	0.02437	0.04404	0.00983	0.11870	0.00450
IA12478 (MA306990)	1.38133	0.03408	0.96119	0.01232	0.25950	0.00400
IA01054 (MA311567)	0.97852	0.01034	-0.40801	0.00869	0.00000	0.00000
IA02582 (MA311568)	0.79720	0.00903	-0.70918	0.01097	0.00000	0.00000
IA04887 (MA736377105)	1.06725	0.01091	-0.26230	0.00807	0.00000	0.00000
IA04942 (MA800727128)	0.74665	0.00841	0.06329	0.00942	0.00000	0.00000
IA05066 (MA803956738)	0.99074	0.01051	-0.64232	0.00942	0.00000	0.00000
IA07924 (MA900756471)	1.10605	0.01113	-0.36030	0.00807	0.00000	0.00000
IA07963 (MA900846441)	0.87866	0.00966	0.43959	0.00880	0.00000	0.00000
IA09849 (MA000732007)	0.77988	0.00852	-0.16056	0.00931	0.00000	0.00000
IA10060 (MA001851276)	0.84833	0.00932	-0.74747	0.01076	0.00000	0.00000
IA10093 (MA002128911)	0.82856	0.00949	-0.71528	0.01087	0.00000	0.00000
IA10111 (MA002145158)	0.61946	0.00818	-1.42100	0.01863	0.00000	0.00000
IA10151 (MA002334462)	1.00647	0.01057	-0.46131	0.00880	0.00000	0.00000
IA10213 (MA003540652)	1.09622	0.01346	-1.21174	0.01201	0.00000	0.00000
IA10222 (MA003744055)	1.71103	0.01818	-0.53893	0.00735	0.00000	0.00000

Table 2.8.20
IRT Parameters for Polytomous Items
Mathematics Grade 4

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA02457 (MA307317)	1.00738	0.00790	0.02081	0.00564	1.48299	0.01383	0.87539	0.01115	-0.50427	0.00993
IA02742 (MA704653374)	0.63309	0.00659	-1.00449	0.01176	1.06416	0.02426	-1.06416	0.01553	0.00000	0.00000
IA04568 (MA293812)	0.99914	0.00801	0.40161	0.00578	1.69169	0.01323	0.83891	0.01036	-0.94489	0.01222
IA04621 (MA303335)	0.95785	0.00756	-0.08846	0.00598	1.96074	0.01712	0.40008	0.01046	-0.60804	0.01029
IA04757 (MA713677363)	0.66229	0.00716	-1.38291	0.01295	0.96434	0.02691	-0.96434	0.01677	0.00000	0.00000
IA04975 (MA801035466)	1.09054	0.00858	0.05410	0.00537	1.71169	0.01468	0.46719	0.00978	-0.52841	0.00961

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA02457 (MA307317)	-1.85412	0.01487	0.00000	0.00000	n/a	n/a
IA04568 (MA293812)	-1.58571	0.01541	0.00000	0.00000	n/a	n/a
IA04621 (MA303335)	-1.75277	0.01434	0.00000	0.00000	n/a	n/a
IA04975 (MA801035466)	-1.65047	0.01315	0.00000	0.00000	n/a	n/a

Table 2.8.21
IRT Parameters for Dichotomous Items
Mathematics Grade 5

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA00871 (MA297992)	1.06449	0.02427	0.07599	0.02025	0.29230	0.00790
IA02322 (MA301602)	0.96549	0.01908	-1.08193	0.03597	0.11560	0.02120
IA02385 (MA306408)	1.81114	0.04393	0.95962	0.01008	0.21840	0.00300
IA02398 (MA306458)	0.89764	0.01622	0.33607	0.01471	0.06630	0.00600
IA04604 (MA301157)	1.03270	0.03045	0.34867	0.02418	0.46080	0.00700
IA04931 (MA800650803)	1.25497	0.02736	0.86329	0.01189	0.19090	0.00380
IA04932 (MA800651876)	1.22738	0.02024	0.01784	0.01209	0.08830	0.00560
IA05072 (MA804073907)	1.43700	0.03226	0.83789	0.01129	0.21780	0.00360
IA07576 (MA301169)	0.78900	0.01692	0.71616	0.01592	0.06480	0.00600
IA07890 (MA900727061)	0.51673	0.01645	-0.40498	0.07809	0.11770	0.02640
IA07974 (MA900982012)	0.35191	0.01651	-0.54857	0.17896	0.11250	0.04460
IA09862 (MA000846578)	0.93550	0.01867	-0.12414	0.02237	0.18930	0.00960
IA09867 (MA000859040)	1.02103	0.03110	0.08939	0.02942	0.48460	0.00860
IA09870 (MA000927731)	0.89408	0.01231	0.01815	0.01290	0.00310	0.00520
IA09876 (MA000937699)	1.12336	0.02830	0.97907	0.01401	0.22420	0.00430
IA09882 (MA000953421)	1.41162	0.02637	-0.38533	0.01632	0.25880	0.00820
IA09884 (MA000957282)	1.15941	0.01972	-0.34714	0.01703	0.15300	0.00860
IA12452 (MA301830)	0.85534	0.02386	0.43653	0.02519	0.31520	0.00830
IA00876 (MA298032)	0.86006	0.00933	0.41618	0.00887	0.00000	0.00000
IA02734 (MA704359624)	0.39089	0.00677	-1.85805	0.03194	0.00000	0.00000
IA04971 (MA800975677)	0.95586	0.00998	-0.28728	0.00846	0.00000	0.00000
IA04983 (MA801235389)	0.72547	0.00846	-0.76996	0.01139	0.00000	0.00000
IA04999 (MA801646735)	1.17225	0.01383	-0.96081	0.00937	0.00000	0.00000
IA05071 (MA804073329)	0.88859	0.00922	0.19792	0.00836	0.00000	0.00000
IA08213 (MA904453014)	0.75406	0.00863	-0.68400	0.01058	0.00000	0.00000
IA09863 (MA000846693)	0.91706	0.00957	0.08949	0.00816	0.00000	0.00000
IA09877 (MA000938134)	0.66643	0.00823	-0.99114	0.01340	0.00000	0.00000
IA09883 (MA000955730)	0.81030	0.00863	-0.34915	0.00917	0.00000	0.00000
IA09898 (MA001042212)	0.56795	0.00712	-0.16323	0.01098	0.00000	0.00000
IA09918 (MA001066377)	1.15346	0.01237	-0.73469	0.00877	0.00000	0.00000
IA09926 (MA001142456)	0.59450	0.00758	-0.55341	0.01169	0.00000	0.00000
IA10188 (MA002837526)	0.91922	0.01044	-0.82155	0.01008	0.00000	0.00000
IA10284 (MA006336846)	0.52163	0.00758	-0.84382	0.01562	0.00000	0.00000
IA10481 (MA935150419)	0.95825	0.01003	-0.22883	0.00836	0.00000	0.00000

Table 2.8.22
IRT Parameters for Polytomous Items
Mathematics Grade 5

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA07728 (MA802371654)	1.24949	0.00939	-0.30580	0.00486	1.52968	0.01397	0.49862	0.00950	-0.56347	0.00865
IA08179 (MA903746975)	1.14605	0.00898	-0.67760	0.00571	1.67380	0.01863	0.27968	0.01072	-0.51326	0.00932
IA08243 (MA908434516)	0.67629	0.00683	0.07825	0.00945	1.12825	0.01599	-1.12825	0.01673	0.00000	0.00000
IA09886 (MA000965213)	0.68650	0.00694	0.15585	0.00935	1.13207	0.01560	-1.13207	0.01676	0.00000	0.00000
IA10152 (MA002343629)	1.14238	0.00881	0.04311	0.00508	1.54011	0.01274	0.54452	0.00927	-0.37014	0.00911
IA10278 (MA005852277)	0.83381	0.00712	-0.02317	0.00664	1.62901	0.01716	0.90056	0.01284	-0.46776	0.01108

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA07728 (MA802371654)	-1.46483	0.01055	0.00000	0.00000	n/a	n/a
IA08179 (MA903746975)	-1.44022	0.01021	0.00000	0.00000	n/a	n/a
IA10152 (MA002343629)	-1.71449	0.01358	0.00000	0.00000	n/a	n/a
IA10278 (MA005852277)	-2.06181	0.01734	0.00000	0.00000	n/a	n/a

Table 2.8.23
IRT Parameters for Dichotomous Items
Mathematics Grade 6

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA02145 (MA282127)	1.22191	0.02110	0.41646	0.01144	0.16020	0.00420
IA02464 (MA307338)	0.88150	0.01409	-0.73768	0.02422	0.08650	0.01170
IA02470 (MA307363)	0.55614	0.01728	-1.72886	0.12863	0.18480	0.05050
IA05125 (MA805101277)	1.19579	0.04227	1.40764	0.01752	0.32770	0.00350
IA07619 (MA307340)	0.61084	0.01551	0.40058	0.02824	0.07530	0.01040
IA07694 (MA736509125)	0.71015	0.01363	-0.95484	0.04071	0.03610	0.01940
IA07740 (MA805104566)	1.38608	0.02641	0.41522	0.01144	0.22120	0.00420
IA07742 (MA805111429)	0.93346	0.02424	0.35750	0.02226	0.36290	0.00700
IA07772 (MA900283487)	1.11228	0.01677	-0.48259	0.01494	0.07170	0.00740
IA09952 (MA001264865)	0.84094	0.01517	-0.13278	0.01989	0.06960	0.00840
IA09990 (MA001529070)	1.14485	0.02367	0.09809	0.01618	0.27880	0.00630
IA10012 (MA001585164)	1.07544	0.02464	-0.15175	0.02195	0.34940	0.00820
IA10159 (MA002536621)	0.51091	0.03092	1.69035	0.04277	0.34420	0.01000
IA10161 (MA002538062)	0.76793	0.01278	-1.71278	0.04628	0.03000	0.02730
IA10276 (MA005664640)	1.24838	0.02264	0.40110	0.01154	0.17590	0.00430
IA12436 (MA296382)	1.23178	0.03040	0.72802	0.01412	0.32580	0.00430
IA00782 (MA223217)	0.83792	0.00873	-0.29934	0.00866	0.00000	0.00000
IA00974 (MA307362)	1.07680	0.01118	-1.05821	0.00969	0.00000	0.00000
IA01129 (MA624248796)	0.61421	0.00724	-0.53072	0.01103	0.00000	0.00000
IA02284 (MA299673)	0.93877	0.00953	-0.73118	0.00928	0.00000	0.00000
IA02691 (MA703149512)	0.72110	0.00799	-0.85507	0.01113	0.00000	0.00000
IA04875 (MA736063629)	0.87277	0.00884	0.13436	0.00876	0.00000	0.00000
IA04885 (MA736368137)	1.00254	0.01032	-0.70490	0.00855	0.00000	0.00000
IA05128 (MA805109765)	0.46990	0.00667	-0.13783	0.01319	0.00000	0.00000
IA05141 (MA805280170)	0.75316	0.00833	-0.91577	0.01113	0.00000	0.00000
IA07692 (MA736452404)	0.66018	0.00753	0.25670	0.01062	0.00000	0.00000
IA08104 (MA902758854)	0.47446	0.00719	-1.23177	0.01855	0.00000	0.00000
IA09997 (MA001549477)	0.74654	0.00861	-1.05131	0.01196	0.00000	0.00000
IA10001 (MA001554177)	0.65990	0.00764	-0.41271	0.01010	0.00000	0.00000
IA10011 (MA001577731)	0.90682	0.00953	-0.56669	0.00866	0.00000	0.00000
IA10014 (MA001604473)	1.15472	0.01084	0.25289	0.00763	0.00000	0.00000
IA10210 (MA003477341)	0.94447	0.00941	-0.13361	0.00794	0.00000	0.00000
IA10230 (MA003861140)	0.68688	0.00759	-0.32108	0.00979	0.00000	0.00000
IA10414 (MA800385560)	1.00938	0.01078	-0.61729	0.00876	0.00000	0.00000

Table 2.8.24
IRT Parameters for Polytomous Items
Mathematics Grade 6

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA04565 (MA290253)	1.42578	0.01032	0.19043	0.00405	1.25833	0.00928	0.32589	0.00783	-0.53440	0.00873
IA04596 (MA298252)	1.43496	0.01112	0.35992	0.00373	0.73337	0.00776	0.14816	0.00785	-0.25019	0.00830
IA04912 (MA800203270)	1.45281	0.01181	0.32900	0.00516	0.46560	0.00837	-0.46560	0.00947	0.00000	0.00000
IA07810 (MA900378821)	1.17280	0.00907	-0.17772	0.00570	2.31002	0.01784	-0.04566	0.00920	-0.73641	0.00977
IA10413 (MA800301627)	1.45903	0.01055	-0.17138	0.00384	1.08822	0.00966	0.31080	0.00781	-0.42272	0.00781
IA10435 (MA900578720)	0.97339	0.00793	-0.04549	0.00660	0.80804	0.01130	-0.80804	0.01155	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA04565 (MA290253)	-1.04983	0.01022	0.00000	0.00000	n/a	n/a
IA04596 (MA298252)	-0.63133	0.00933	0.00000	0.00000	n/a	n/a
IA07810 (MA900378821)	-1.52795	0.01232	0.00000	0.00000	n/a	n/a
IA10413 (MA800301627)	-0.97629	0.00891	0.00000	0.00000	n/a	n/a

Table 2.8.25

IRT Parameters for Dichotomous Items–Mathematics Grade 7

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA00920 (MA304467)	1.18324	0.02198	-0.36628	0.01702	0.17490	0.00730
IA00952 (MA306626)	1.19069	0.03830	1.15262	0.01714	0.41290	0.00370
IA00953 (MA306627)	0.92129	0.01585	0.33553	0.01402	0.08710	0.00500
IA02039 (MA219417)	0.95305	0.01516	0.24050	0.01313	0.07100	0.00480
IA02526 (MA311074)	1.12317	0.02615	1.07628	0.01402	0.22650	0.00340
IA04501 (MA259175)	0.56784	0.02346	0.61316	0.05030	0.40090	0.01140
IA04513 (MA272764)	1.03832	0.03154	0.88200	0.01981	0.44740	0.00450
IA04541 (MA282221)	1.26951	0.02969	1.00651	0.01280	0.22810	0.00330
IA04587 (MA298072)	1.33952	0.02367	0.53215	0.01068	0.15100	0.00340
IA07778 (MA900336138)	1.41908	0.02420	0.64710	0.00990	0.12450	0.00290
IA07843 (MA900557823)	0.67853	0.01585	-0.13238	0.03450	0.17520	0.01210
IA08188 (MA903983773)	0.74441	0.01902	1.00796	0.01869	0.15570	0.00560
IA08189 (MA904000450)	0.74832	0.02251	1.18366	0.02103	0.24160	0.00560
IA08199 (MA904169987)	0.90719	0.01939	0.73656	0.01558	0.18040	0.00480
IA09888 (MA000971342)	1.16226	0.02198	-0.12514	0.01580	0.17180	0.00620
IA10256 (MA005170212)	0.91443	0.02309	0.19555	0.02459	0.38570	0.00720
IA10270 (MA005207399)	1.13157	0.02002	-0.01743	0.01558	0.23900	0.00600
IA02876 (MA713848056)	0.88801	0.00861	0.24006	0.00879	0.00000	0.00000
IA02885 (MA713849125)	0.96425	0.00930	-0.42013	0.00835	0.00000	0.00000
IA02887 (MA713849162)	0.81336	0.00803	0.26265	0.00935	0.00000	0.00000
IA04689 (MA311092)	1.44803	0.01442	0.35489	0.00734	0.00000	0.00000
IA04770 (MA713848251)	0.60705	0.00676	0.20668	0.01090	0.00000	0.00000
IA04773 (MA713848348)	0.90291	0.00866	0.02296	0.00846	0.00000	0.00000
IA05115 (MA804676692)	1.37840	0.01374	0.47106	0.00768	0.00000	0.00000
IA07848 (MA900567252)	0.86017	0.00851	0.28112	0.00901	0.00000	0.00000
IA07897 (MA900739359)	1.03055	0.01014	-0.27347	0.00812	0.00000	0.00000
IA07905 (MA900743031)	0.89202	0.00856	0.20456	0.00901	0.00000	0.00000
IA07908 (MA900749529)	0.81346	0.00814	-0.21517	0.00890	0.00000	0.00000
IA10027 (MA001678587)	0.70505	0.00724	0.01473	0.00957	0.00000	0.00000
IA10032 (MA001702061)	1.17013	0.01342	-1.33714	0.01035	0.00000	0.00000
IA10050 (MA001759197)	0.50640	0.00713	-1.09334	0.01536	0.00000	0.00000
IA10081 (MA002046543)	0.88415	0.00888	0.25719	0.00879	0.00000	0.00000
IA10252 (MA005077116)	0.68577	0.00719	0.05545	0.00990	0.00000	0.00000
IA12459 (MA302328)	0.94385	0.00919	-0.07563	0.00823	0.00000	0.00000

Table 2.8.26
IRT Parameters for Polytomous Items
Mathematics Grade 7

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA01160 (MA624562376)	0.57339	0.00544	0.00827	0.01115	1.37090	0.01871	-1.37090	0.01989	0.00000	0.00000
IA07679 (MA717248260)	1.16152	0.00845	0.30521	0.00542	1.90985	0.01218	0.32487	0.00922	-0.49022	0.01042
IA07730 (MA802907874)	1.33048	0.00962	0.45877	0.00445	1.25222	0.00907	0.39107	0.00840	-0.55008	0.00995
IA10090 (MA002119133)	1.40962	0.00999	-0.23823	0.00406	1.11071	0.01009	0.39344	0.00839	-0.39527	0.00820
IA10445 (MA900765087)	1.05168	0.00888	-0.90890	0.00805	1.08019	0.01607	-1.08019	0.01144	0.00000	0.00000
IA12412 (MA261648)	1.31764	0.00993	0.17009	0.00398	0.83703	0.00855	0.23203	0.00816	-0.10757	0.00835

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA07679 (MA717248260)	-1.74450	0.01566	0.00000	0.00000	n/a	n/a
IA07730 (MA802907874)	-1.09321	0.01198	0.00000	0.00000	n/a	n/a
IA10090 (MA002119133)	-1.10888	0.00948	0.00000	0.00000	n/a	n/a
IA12412 (MA261648)	-0.96149	0.01036	0.00000	0.00000	n/a	n/a

Table 2.8.27
IRT Parameters for Dichotomous Items
Mathematics Grade 8

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA00792 (MA252991)	1.56012	0.05282	0.60178	0.01809	0.63240	0.00340
IA00859 (MA297517)	0.95291	0.02814	0.92010	0.01875	0.35830	0.00470
IA02480 (MA307585)	1.00019	0.02095	-0.87045	0.03088	0.29480	0.01340
IA04553 (MA287538)	0.80660	0.01908	-0.67104	0.03971	0.30600	0.01440
IA04594 (MA298198)	0.64952	0.01636	0.62958	0.02371	0.13920	0.00780
IA05094 (MA804535837)	1.32586	0.03395	0.66278	0.01456	0.39130	0.00390
IA08003 (MA901143033)	1.35086	0.02921	0.25821	0.01346	0.31960	0.00460
IA10039 (MA001736920)	0.83773	0.01855	-0.17294	0.02658	0.25550	0.00950
IA10064 (MA001865159)	0.96762	0.01572	-0.02900	0.01412	0.07910	0.00570
IA10132 (MA002180558)	1.13963	0.02089	-0.29206	0.01677	0.22030	0.00710
IA10134 (MA002181298)	1.00995	0.01929	-0.33949	0.01985	0.20080	0.00840
IA10231 (MA003932801)	0.87568	0.01455	-0.79049	0.02471	0.07170	0.01200
IA10477 (MA908446890)	1.00344	0.02132	-0.63883	0.02757	0.31530	0.01100
IA10478 (MA908450808)	1.03644	0.01594	0.07611	0.01279	0.10480	0.00480
IA12461 (MA303244)	0.88405	0.02431	1.09315	0.01732	0.23050	0.00450
IA12480 (MA307586)	0.58023	0.01151	-0.36287	0.03541	0.01180	0.01350
IA02938 (MA715919661)	0.34726	0.00618	-1.64142	0.02691	0.00000	0.00000
IA02940 (MA715919716)	0.95382	0.00981	-1.00821	0.00993	0.00000	0.00000
IA02943 (MA715919788)	1.00344	0.00970	0.10953	0.00849	0.00000	0.00000
IA02947 (MA715919853)	1.15295	0.01109	-0.17195	0.00761	0.00000	0.00000
IA04779 (MA715919758)	0.47992	0.00624	-0.64258	0.01313	0.00000	0.00000
IA07568 (MA297651)	0.81902	0.00821	-0.29349	0.00893	0.00000	0.00000
IA07701 (MA800472975)	0.91203	0.00895	0.12652	0.00871	0.00000	0.00000
IA07707 (MA800659905)	0.59873	0.00656	0.73226	0.01335	0.00000	0.00000
IA07733 (MA804043870)	1.00792	0.00981	0.21828	0.00816	0.00000	0.00000
IA08010 (MA901253257)	0.53557	0.00618	0.08141	0.01180	0.00000	0.00000
IA08088 (MA902308680)	1.14794	0.01082	-0.12562	0.00761	0.00000	0.00000
IA08226 (MA905179612)	0.98601	0.00917	0.62627	0.00949	0.00000	0.00000
IA10041 (MA001737758)	0.86518	0.00874	-0.40280	0.00893	0.00000	0.00000
IA10042 (MA001737991)	0.38782	0.00565	-0.18430	0.01445	0.00000	0.00000
IA10130 (MA002177981)	0.82776	0.00826	-0.74560	0.00960	0.00000	0.00000
IA10201 (MA003128642)	0.57938	0.00650	-0.27540	0.01070	0.00000	0.00000
IA10234 (MA003936639)	1.04539	0.01045	-0.68560	0.00849	0.00000	0.00000
IA12479 (MA307492)	1.08169	0.01093	-0.94832	0.00904	0.00000	0.00000

Table 2.8.28
IRT Parameters for Polytomous Items
Mathematics Grade 8

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA04612 (MA301714)	1.49568	0.01109	0.33851	0.00393	0.88458	0.00818	0.25445	0.00798	-0.25578	0.00857
IA04717 (MA311433)	1.30576	0.00938	0.28498	0.00485	1.69865	0.01105	0.29479	0.00866	-0.55669	0.00988
IA07709 (MA800738445)	1.34030	0.00938	-0.13560	0.00415	1.09100	0.01005	0.41300	0.00848	-0.30712	0.00828
IA10143 (MA002243883)	0.85052	0.00800	-1.11945	0.00897	0.70661	0.01795	-0.70661	0.01266	0.00000	0.00000
IA10290 (MA010701848)	0.92280	0.00725	-1.44190	0.00694	1.52132	0.02197	0.47648	0.01504	-0.45530	0.01166
IA10455 (MA902278325)	0.76050	0.00688	-0.23167	0.00761	0.83279	0.01349	-0.83279	0.01286	0.00000	0.00000

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA04612 (MA301714)	-0.88325	0.01027	0.00000	0.00000	n/a	n/a
IA04717 (MA311433)	-1.43675	0.01327	0.00000	0.00000	n/a	n/a
IA07709 (MA800738445)	-1.19688	0.01015	0.00000	0.00000	n/a	n/a
IA10290 (MA010701848)	-1.54250	0.01088	0.00000	0.00000	n/a	n/a

Table 2.8.29
IRT Parameters for Dichotomous Items
Mathematics Grade 10

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA02616 (MA314988)	0.77576	0.01580	-0.64590	0.03466	0.13670	0.01560
IA02623 (MA315436)	1.46627	0.03191	-0.02432	0.01408	0.40760	0.00530
IA04617 (MA303279)	1.84743	0.02961	-0.36278	0.00903	0.14920	0.00490
IA04740 (MA315737)	1.01015	0.01623	-0.73202	0.02068	0.08450	0.01130
IA04783 (MA717049810)	1.17660	0.01350	-0.34977	0.00942	0.01010	0.00400
IA07751 (MA805406621)	0.55821	0.01211	-0.29540	0.03990	0.01540	0.01530
IA10185 (MA002776824)	0.96952	0.01520	-0.61736	0.01884	0.03730	0.01010
IA12413 (MA273263)	1.72427	0.02713	-0.44346	0.01029	0.18790	0.00560
IA12422 (MA281703)	0.88076	0.02470	0.38095	0.02340	0.38690	0.00710
IA12425 (MA287711)	1.64283	0.02991	-0.88261	0.01651	0.30850	0.00980
IA12441 (MA299944)	0.92768	0.01798	0.00462	0.01767	0.15650	0.00750
IA12448 (MA301385)	1.59676	0.02192	-0.07869	0.00854	0.12130	0.00380
IA12453 (MA301994)	1.28414	0.02791	-0.52706	0.02175	0.44890	0.00860
IA12455 (MA302009)	0.67876	0.01907	0.45464	0.02806	0.23620	0.00920
IA12460 (MA303236)	1.35117	0.01756	-0.30394	0.00952	0.05440	0.00460
IA12500 (MA311971)	0.74331	0.00932	-0.65153	0.01689	0.00140	0.00730
IA12501 (MA312323)	0.82475	0.01974	0.33327	0.02068	0.22050	0.00750
IA12504 (MA313775)	1.19192	0.02028	-1.57798	0.03107	0.05410	0.02520
IA12506 (MA313793)	1.00173	0.01889	-0.06218	0.01680	0.17550	0.00730
IA12507 (MA314947)	1.42794	0.02531	-0.81212	0.01680	0.19640	0.01010
IA12509 (MA315396)	1.88921	0.03130	0.31619	0.00816	0.20290	0.00310
IA12511 (MA315401)	1.24508	0.02119	-0.58386	0.01738	0.22680	0.00890
IA02821 (MA713647003)	0.84085	0.00836	0.18016	0.00845	0.00000	0.00000
IA05138 (MA805276190)	1.08505	0.00969	0.05899	0.00709	0.00000	0.00000
IA08054 (MA901757179)	1.39204	0.01253	-0.01354	0.00641	0.00000	0.00000
IA09859 (MA000774815)	1.49824	0.01350	-0.23161	0.00621	0.00000	0.00000
IA09954 (MA001272700)	0.83098	0.00817	-0.15413	0.00796	0.00000	0.00000
IA09957 (MA001275174)	1.26234	0.01120	-0.15520	0.00651	0.00000	0.00000
IA10166 (MA002634895)	0.55294	0.00666	-0.13131	0.01039	0.00000	0.00000
IA10202 (MA003332783)	0.46684	0.00642	1.05205	0.01884	0.00000	0.00000
IA10203 (MA003336082)	1.17212	0.01048	-0.46133	0.00689	0.00000	0.00000
IA12516 (MA315759)	1.17497	0.01054	-0.72532	0.00748	0.00000	0.00000

Table 2.8.30
IRT Parameters for Polytomous Items
Mathematics Grade 10

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA02861 (MA713808267)	1.27536	0.00872	-0.03075	0.00528	2.14425	0.01395	0.53554	0.00853	-0.82288	0.00963
IA09969 (MA001368680)	0.69281	0.00654	-0.54094	0.00849	0.94869	0.01619	-0.94869	0.01304	0.00000	0.00000
IA09988 (MA001478687)	0.47483	0.00545	0.65911	0.01405	1.38813	0.01908	-1.38813	0.02864	0.00000	0.00000
IA10083 (MA002057230)	0.99423	0.00902	-1.38754	0.00784	0.54755	0.01553	-0.54755	0.01131	0.00000	0.00000
IA10087 (MA002069968)	1.66203	0.01144	-0.52772	0.00333	0.79841	0.00872	0.16848	0.00713	-0.24057	0.00679
IA10193 (MA002880198)	0.95784	0.00805	0.40682	0.00634	0.69455	0.00966	-0.69455	0.01217	0.00000	0.00000
IA10389 (MA316870)	0.73253	0.00666	0.17841	0.00830	1.02500	0.01285	-1.02500	0.01576	0.00000	0.00000
IA10399 (MA717336908)	1.26198	0.00999	-0.40497	0.00502	0.55056	0.00909	-0.55056	0.00830	0.00000	0.00000
IA12432 (MA294334)	1.87686	0.01314	0.09559	0.00317	0.74703	0.00689	0.24758	0.00655	-0.19147	0.00680
IA12488 (MA308930)	1.64417	0.01126	0.37672	0.00382	0.91252	0.00729	0.44958	0.00705	-0.17297	0.00763

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA02861 (MA713808267)	-1.85691	0.01404	0.00000	0.00000	n/a	n/a
IA10087 (MA002069968)	-0.72632	0.00696	0.00000	0.00000	n/a	n/a
IA12432 (MA294334)	-0.80315	0.00803	0.00000	0.00000	n/a	n/a
IA12488 (MA308930)	-1.18914	0.01143	0.00000	0.00000	n/a	n/a

Table 2.8.31
IRT Parameters for Dichotomous Items
Introductory Physics Grade 10

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA05488 (SC630642496)	1.15201	0.04122	-1.19929	0.07401	0.15220	0.05850
IA05699 (SC805343036)	1.63151	0.07081	0.30395	0.02648	0.31270	0.01250
IA05893 (SC803254164)	1.26832	0.05504	0.90050	0.02629	0.23600	0.00970
IA05894 (SC803255498)	1.13109	0.07025	1.21973	0.03527	0.36900	0.01030
IA05897 (SC803313338)	1.62315	0.08696	1.38954	0.02320	0.23660	0.00630
IA10692 (SC736226112)	2.31892	0.24663	1.42837	0.03069	0.59800	0.00590
IA10776 (SC813625710)	1.41605	0.08872	1.19886	0.03022	0.40300	0.00850
IA10876 (SC904262622)	1.08579	0.05064	1.07321	0.02957	0.21350	0.01020
IA10878 (SC904339575)	1.35698	0.07691	1.44746	0.02826	0.29750	0.00730
IA10883 (SC904349855)	1.20291	0.03820	-0.40112	0.03995	0.10300	0.02540
IA11041 (SC915751239)	1.23741	0.04078	-0.33348	0.03509	0.06140	0.02220
IA11044 (SC916955396)	0.64915	0.02319	-0.72672	0.08608	0.04540	0.04110
IA12902 (SC230808)	1.61781	0.05536	-0.41226	0.02994	0.12730	0.02080
IA12908 (SC280839)	0.93473	0.04669	0.35055	0.05305	0.27810	0.02110
IA12910 (SC287048)	1.05701	0.04851	-0.03193	0.05137	0.23550	0.02490
IA12924 (SC293975)	1.19380	0.06478	0.30751	0.04425	0.38180	0.01750
IA12944 (SC304783)	1.17011	0.05335	0.21797	0.04023	0.28620	0.01820
IA12949 (SC305503)	1.30175	0.04084	-0.06580	0.02835	0.09010	0.01620
IA12964 (SC313738)	1.44803	0.08696	1.24780	0.02919	0.38770	0.00810
IA12965 (SC315642)	1.42842	0.05617	0.24492	0.02826	0.25060	0.01390
IA12982 (SC316347)	1.14975	0.04015	-0.40739	0.04472	0.11750	0.02760
IA05858 (SC800542273)	0.83156	0.02067	-0.52724	0.02255	0.00000	0.00000
IA05863 (SC801152950)	0.75791	0.01847	-0.52303	0.02367	0.00000	0.00000
IA05902 (SC803633622)	0.65097	0.01860	-0.60686	0.02788	0.00000	0.00000
IA05934 (SC805732725)	0.17933	0.01219	-0.27444	0.07045	0.00000	0.00000
IA06023 (SC814931121)	1.06040	0.02375	-0.17443	0.01675	0.00000	0.00000
IA10560 (SC005926735)	0.94233	0.02080	0.04554	0.01665	0.00000	0.00000
IA10564 (SC007257568)	0.90470	0.02532	-1.31409	0.03593	0.00000	0.00000
IA10710 (SC801643310)	0.80397	0.01879	-0.14318	0.01918	0.00000	0.00000
IA10938 (SC906755093)	0.90539	0.02111	-0.27762	0.01890	0.00000	0.00000
IA10949 (SC907464800)	1.28202	0.02564	-0.30812	0.01656	0.00000	0.00000
IA10972 (SC909633335)	0.41810	0.01364	0.44598	0.02844	0.00000	0.00000

Table 2.8.32
IRT Parameters for Polytomous Items
Introductory Physics Grade 10

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA05899 (SC803424446)	0.74019	0.01521	0.81260	0.01802	0.94604	0.02708	-0.94604	0.03487	0.00000	0.00000
IA05901 (SC803432596)	1.21076	0.01986	-0.25149	0.01164	1.12435	0.02884	0.08583	0.02001	-1.21018	0.01986
IA10705 (SC801132834)	0.95484	0.01992	-0.63521	0.01772	0.70957	0.03609	-0.70957	0.02413	0.00000	0.00000
IA10780 (SC813853029)	0.71833	0.01602	-0.24207	0.02062	0.96396	0.04126	-0.96396	0.02914	0.00000	0.00000
IA10879 (SC904340389)	0.98249	0.01854	-0.08681	0.01383	0.70896	0.02629	-0.70896	0.02136	0.00000	0.00000
IA10886 (SC904352276)	0.95352	0.01703	0.92136	0.01321	1.21508	0.02253	0.02807	0.02185	-1.24315	0.03333
IA10971 (SC909552364)	0.82552	0.01860	-0.68443	0.01998	0.62265	0.04070	-0.62265	0.02718	0.00000	0.00000
IA12911 (SC287206)	1.27724	0.01992	0.53984	0.00977	1.48858	0.02338	0.61435	0.01772	-0.63741	0.01923
IA12941 (SC301782)	1.08195	0.01747	0.87994	0.01171	1.80734	0.02541	0.37464	0.01901	-0.59353	0.02336
IA12985 (SC316441)	1.61259	0.02501	0.78589	0.00843	1.32192	0.01850	0.23231	0.01550	-0.37799	0.01726

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA05901 (SC803432596)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA10886 (SC904352276)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA12911 (SC287206)	-1.46552	0.02604	0.00000	0.00000	n/a	n/a
IA12941 (SC301782)	-1.58846	0.03451	0.00000	0.00000	n/a	n/a
IA12985 (SC316441)	-1.17625	0.02329	0.00000	0.00000	n/a	n/a

Table 2.8.33
IRT Parameters for Dichotomous Items
Science Grade 5

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA03052 (SC294524)	0.67519	0.01372	-0.34959	0.02951	0.07980	0.01120
IA03124 (SC315987)	0.70883	0.01690	0.28269	0.02285	0.11470	0.00830
IA03147 (SC627204024)	1.14462	0.02708	0.63450	0.01387	0.21140	0.00450
IA03155 (SC629148346)	0.90664	0.02146	-2.14613	0.06646	0.15150	0.04090
IA03165 (SC629551835)	0.77973	0.01833	0.17297	0.02341	0.21210	0.00800
IA03194 (SC630756314)	1.07202	0.01696	-0.84551	0.01808	0.08000	0.00880
IA05573 (SC736232773)	0.64758	0.01054	-1.84469	0.04882	0.01810	0.02390
IA05586 (SC801062661)	0.90034	0.01892	-1.33134	0.03950	0.18200	0.01920
IA05591 (SC801064879)	0.39042	0.01669	0.42836	0.07777	0.12690	0.02020
IA05625 (SC802352255)	0.75213	0.01796	-0.47296	0.03606	0.24920	0.01270
IA05755 (SC814668478)	0.86611	0.01632	-1.47158	0.03961	0.12150	0.02040
IA08524 (SC804037841)	0.81661	0.02029	-0.01087	0.02707	0.26860	0.00920
IA08537 (SC809002676)	0.78392	0.01881	-2.16088	0.08044	0.17140	0.04380
IA08605 (SC904845052)	0.39148	0.01616	0.03850	0.09453	0.14330	0.02370
IA10513 (SC001657113)	0.70020	0.01754	-2.22878	0.09508	0.15800	0.04860
IA10518 (SC002002025)	1.09671	0.02824	0.65403	0.01564	0.29070	0.00480
IA10595 (SC291284)	0.85954	0.01881	-1.46403	0.04771	0.21080	0.02260
IA12943 (SC304600)	0.66422	0.01574	-0.25928	0.03495	0.15630	0.01230
IA12950 (SC309964)	1.01999	0.01775	-0.56970	0.01853	0.09870	0.00840
IA12969 (SC315956)	0.87644	0.01531	-0.55406	0.02119	0.07700	0.00920
IA03095 (SC315784)	0.56502	0.00763	-1.65952	0.01875	0.00000	0.00000
IA05558 (SC736074020)	0.61351	0.00864	-2.10230	0.02330	0.00000	0.00000
IA05587 (SC801063145)	0.52210	0.00662	-0.87791	0.01387	0.00000	0.00000
IA05623 (SC802343884)	0.73846	0.00901	-1.69979	0.01598	0.00000	0.00000
IA05672 (SC803937429)	0.65542	0.00768	-0.91696	0.01187	0.00000	0.00000
IA05724 (SC808520381)	0.41369	0.00625	1.14452	0.02208	0.00000	0.00000
IA08564 (SC903833986)	0.59485	0.00710	-0.69906	0.01187	0.00000	0.00000
IA10488 (SC000640531)	0.64345	0.00737	-0.39174	0.01043	0.00000	0.00000
IA10502 (SC000876847)	0.62236	0.00763	-1.43330	0.01553	0.00000	0.00000
IA10563 (SC006940380)	0.61255	0.00710	-0.29445	0.01065	0.00000	0.00000
IA10742 (SC803868033)	0.57514	0.00721	-1.11267	0.01420	0.00000	0.00000
IA10763 (SC809480016)	0.61759	0.00747	-1.47846	0.01609	0.00000	0.00000

Table 2.8.34
IRT Parameters for Polytomous Items
Science Grade 5

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA03138 (SC62523872)	0.65563	0.00684	0.38565	0.01066	1.16127	0.01604	-1.16127	0.02061	0.00000	0.00000
IA03235 (SC632638762)	0.83463	0.00827	-1.44728	0.00934	0.56493	0.01841	-0.56493	0.01359	0.00000	0.00000
IA03279 (SC711452664)	0.74921	0.00721	-1.03162	0.00961	1.08177	0.01931	-1.08177	0.01347	0.00000	0.00000
IA05569 (SC736182092)	0.50329	0.00562	-0.02562	0.01372	2.34594	0.02858	0.13302	0.01851	-2.47897	0.03315
IA05592 (SC801065906)	0.48400	0.00572	1.01061	0.01914	3.19645	0.03024	-0.32696	0.02782	-2.86949	0.05202
IA05598 (SC801629720)	0.85026	0.00800	0.77892	0.00678	0.87787	0.01108	-0.14005	0.01310	-0.73782	0.01604
IA08526 (SC804065269)	0.47568	0.00572	-0.11987	0.01669	1.89955	0.02803	-1.89955	0.02975	0.00000	0.00000
IA08542 (SC809483803)	0.57970	0.00604	-0.55239	0.00986	0.91408	0.01859	-0.91408	0.01543	0.00000	0.00000
IA10798 (SC814972728)	0.70830	0.00684	0.48617	0.01117	1.96595	0.01815	0.36102	0.01513	-2.32697	0.03062

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA05569 (SC736182092)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA05592 (SC801065906)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA05598 (SC801629720)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA10798 (SC814972728)	0.00000	0.00000	n/a	n/a	n/a	n/a

Table 2.8.35
IRT Parameters for Dichotomous Items
Science Grade 8

	Parameters and Measures of Standard Error					
Item ID	a	SE(a)	b	SE(b)	c	SE(c)
IA02996 (SC289633)	0.83075	0.01390	-0.59278	0.02252	0.04160	0.01030
IA03018 (SC291776)	0.46376	0.01340	-1.20432	0.10233	0.07510	0.03470
IA03133 (SC316056)	1.14340	0.03059	1.14235	0.01448	0.22560	0.00340
IA05534 (SC735347597)	0.69761	0.01741	-0.24986	0.03573	0.16580	0.01320
IA05614 (SC802143530)	0.64111	0.02703	1.43380	0.02822	0.24870	0.00680
IA05617 (SC802144364)	0.66046	0.01396	0.04359	0.02474	0.04510	0.00950
IA05666 (SC803872056)	1.37937	0.02953	0.66295	0.01152	0.24630	0.00360
IA08391 (SC299423)	0.74621	0.01813	0.12848	0.02696	0.23970	0.00910
IA08567 (SC903843634)	1.01282	0.01963	-0.95400	0.02770	0.18850	0.01370
IA08582 (SC903854067)	1.43960	0.02319	-0.58782	0.01300	0.14950	0.00660
IA08619 (SC909357115)	0.84248	0.01974	0.57099	0.01787	0.20870	0.00600
IA10499 (SC000757503)	0.96483	0.02174	-0.11857	0.02283	0.32560	0.00810
IA10899 (SC905284974)	0.47705	0.01691	0.66930	0.04366	0.13750	0.01320
IA10900 (SC905334273)	1.20602	0.02269	-0.36075	0.01702	0.26180	0.00740
IA11078 (SC933775118)	0.71068	0.01251	-0.34849	0.02357	0.01150	0.00980
IA11083 (SC933938027)	1.02333	0.01985	-0.33041	0.02114	0.28140	0.00830
IA11085 (SC933941764)	0.65356	0.01262	-1.47875	0.05508	0.03710	0.02650
IA12913 (SC288298)	0.81173	0.02169	-0.64014	0.04313	0.35130	0.01470
IA12914 (SC288343)	1.51289	0.03643	0.69604	0.01184	0.28010	0.00370
IA12916 (SC289731)	0.72647	0.01318	-1.18804	0.03922	0.02320	0.01920
IA12918 (SC291714)	0.77258	0.02397	1.12808	0.01987	0.23030	0.00550
IA12919 (SC291825)	1.29011	0.03348	1.05779	0.01311	0.22950	0.00320
IA12953 (SC310230)	1.00176	0.02280	0.42532	0.01628	0.23890	0.00570
IA12958 (SC313155)	0.52510	0.01885	0.11019	0.05835	0.24370	0.01630
IA12959 (SC313164)	1.19990	0.02341	0.26210	0.01279	0.21590	0.00480
IA12972 (SC316009)	1.08234	0.02358	-1.27906	0.03594	0.29310	0.01800
IA05685 (SC804130460)	1.18450	0.01257	-1.00231	0.00856	0.00000	0.00000
IA05781 (SC832348897)	0.47872	0.00634	-0.77514	0.01343	0.00000	0.00000
IA08496 (SC631443367)	0.28707	0.00534	-0.09404	0.01808	0.00000	0.00000
IA08531 (SC804373650)	0.75217	0.00801	-0.87556	0.01036	0.00000	0.00000
IA08579 (SC903853174)	0.54356	0.00640	-0.02628	0.01099	0.00000	0.00000
IA10690 (SC735656788)	0.23608	0.00512	0.42341	0.02484	0.00000	0.00000

Table 2.8.36
IRT Parameters for Polytomous Items
Science Grade 8

Item ID	Parameters and Measures of Standard Error									
	a	SE(a)	b	SE(b)	d0	SE(d0)	d1	SE(d1)	d2	SE(d2)
IA05306 (SC304510)	0.86956	0.00745	0.15875	0.00643	1.29563	0.01246	-0.06667	0.01079	-1.22896	0.01498
IA05495 (SC631658368)	0.76151	0.00729	-0.08231	0.00811	0.92053	0.01375	-0.92053	0.01435	0.00000	0.00000
IA05621 (SC802269586)	0.73242	0.00667	0.41439	0.00699	1.19228	0.01224	-0.02868	0.01198	-1.16360	0.01714
IA08512 (SC803667588)	0.58666	0.00601	0.56295	0.01059	1.04104	0.01504	-1.04104	0.02113	0.00000	0.00000
IA08541 (SC809260838)	0.40397	0.00517	-0.14637	0.01570	1.50881	0.02727	-1.50881	0.02710	0.00000	0.00000
IA08583 (SC903855126)	0.86106	0.00729	0.35780	0.00810	1.49986	0.01315	0.42764	0.01148	-1.92750	0.02195
IA10500 (SC000777619)	0.90649	0.00784	-1.07430	0.00800	0.82148	0.01600	-0.82148	0.01134	0.00000	0.00000
IA11067 (SC932754119)	0.69088	0.00656	-0.38686	0.00815	0.83332	0.01499	-0.83332	0.01318	0.00000	0.00000
IA11093 (SC934045224)	0.67069	0.00623	-0.69539	0.00790	1.43432	0.01963	-0.09754	0.01278	-1.33678	0.01414

Item ID	Parameters and Measures of Standard Error					
	d3	SE(d3)	d4	SE(d4)	d5	SE(d5)
IA05306 (SC304510)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA05621 (SC802269586)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA08583 (SC903855126)	0.00000	0.00000	n/a	n/a	n/a	n/a
IA11093 (SC934045224)	0.00000	0.00000	n/a	n/a	n/a	n/a

Section 2.9

Decision Accuracy and Consistency (DAC)

Table 2.9.1

DAC Results

Biology Grade 10

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
49403	0.93	0.65	Overall	0.83	0.76	0.09	0.08
			Cut 1	0.96	0.94	0.02	0.02
			Cut 2	0.92	0.89	0.05	0.03
			Cut 3	0.96	0.94	0.02	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.82	0.74		
			Perf 2	0.81	0.75		
			Perf 3	0.85	0.79		
			Perf 4	0.83	0.72		

Table 2.9.2

DAC Results

English Language Arts Grade 3

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
60542	0.91	0.61	Overall	0.82	0.74	0.09	0.09
			Cut 1	0.95	0.93	0.02	0.03
			Cut 2	0.91	0.87	0.05	0.04
			Cut 3	0.96	0.94	0.02	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.84	0.73		
			Perf 2	0.81	0.75		
			Perf 3	0.83	0.77		
			Perf 4	0.77	0.61		

Table 2.9.3

DAC Results

English Language Arts Grade 4

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
61836	0.90	0.59	Overall	0.81	0.73	0.10	0.09
			Cut 1	0.95	0.92	0.02	0.03
			Cut 2	0.90	0.86	0.05	0.05
			Cut 3	0.96	0.95	0.03	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.83	0.72		
			Perf 2	0.82	0.76		
			Perf 3	0.80	0.73		
			Perf 4	0.74	0.54		

Table 2.9.4

DAC Results

English Language Arts Grade 5

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
62316	0.91	0.61	Overall	0.82	0.75	0.10	0.08
			Cut 1	0.95	0.93	0.02	0.03
			Cut 2	0.91	0.87	0.05	0.04
			Cut 3	0.96	0.95	0.03	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.83	0.74		
			Perf 2	0.81	0.75		
			Perf 3	0.84	0.78		
			Perf 4	0.72	0.52		

Table 2.9.5

DAC Results

English Language Arts Grade 6

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
63574	0.91	0.56	Overall	0.78	0.69	0.11	0.11
			Cut 1	0.94	0.91	0.03	0.03
			Cut 2	0.91	0.87	0.05	0.05
			Cut 3	0.94	0.91	0.03	0.03
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.85	0.77		
			Perf 2	0.77	0.69		
			Perf 3	0.78	0.70		
			Perf 4	0.64	0.48		

Table 2.9.6

DAC Results

English Language Arts Grade 7

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
63711	0.91	0.60	Overall	0.81	0.73	0.10	0.09
			Cut 1	0.94	0.92	0.03	0.03
			Cut 2	0.91	0.87	0.05	0.05
			Cut 3	0.96	0.94	0.03	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.83	0.73		
			Perf 2	0.81	0.75		
			Perf 3	0.79	0.72		
			Perf 4	0.78	0.62		

Table 2.9.7

DAC Results

English Language Arts Grade 8

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
65553	0.91	0.57	Overall	0.78	0.69	0.11	0.11
			Cut 1	0.94	0.91	0.03	0.03
			Cut 2	0.91	0.87	0.04	0.05
			Cut 3	0.94	0.91	0.03	0.03
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.85	0.76		
			Perf 2	0.78	0.69		
			Perf 3	0.77	0.69		
			Perf 4	0.70	0.55		

Table 2.9.8

DAC Results

English Language Arts Grade 10

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
68104	0.91	0.58	Overall	0.80	0.71	0.10	0.10
			Cut 1	0.96	0.94	0.02	0.02
			Cut 2	0.91	0.87	0.05	0.04
			Cut 3	0.93	0.90	0.04	0.03
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.83	0.71		
			Perf 2	0.77	0.69		
			Perf 3	0.82	0.75		
			Perf 4	0.78	0.67		

Table 2.9.9

DAC Results

Mathematics Grade 3

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
51707	0.93	0.65	Overall	0.83	0.76	0.08	0.08
			Cut 1	0.96	0.94	0.02	0.02
			Cut 2	0.92	0.88	0.04	0.04
			Cut 3	0.96	0.94	0.02	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.84	0.74		
			Perf 2	0.84	0.78		
			Perf 3	0.83	0.78		
			Perf 4	0.80	0.67		

Table 2.9.10

DAC Results

Mathematics Grade 4

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
52554	0.93	0.66	Overall	0.84	0.78	0.08	0.08
			Cut 1	0.96	0.95	0.01	0.02
			Cut 2	0.92	0.89	0.04	0.04
			Cut 3	0.96	0.94	0.02	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.85	0.74		
			Perf 2	0.83	0.77		
			Perf 3	0.85	0.80		
			Perf 4	0.82	0.70		

Table 2.9.11

DAC Results

Mathematics Grade 5

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
54159	0.93	0.67	Overall	0.86	0.80	0.08	0.06
			Cut 1	0.97	0.95	0.02	0.02
			Cut 2	0.92	0.88	0.05	0.04
			Cut 3	0.97	0.96	0.02	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.76	0.66		
			Perf 2	0.86	0.82		
			Perf 3	0.87	0.82		
			Perf 4	0.82	0.68		

Table 2.9.12

DAC Results

Mathematics Grade 6

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
56389	0.94	0.69	Overall	0.86	0.80	0.07	0.07
			Cut 1	0.96	0.95	0.01	0.02
			Cut 2	0.92	0.89	0.04	0.04
			Cut 3	0.97	0.96	0.02	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.85	0.75		
			Perf 2	0.86	0.81		
			Perf 3	0.86	0.81		
			Perf 4	0.83	0.72		

Table 2.9.13
DAC Results
Mathematics Grade 7

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
57234	0.94	0.68	Overall	0.85	0.78	0.08	0.08
			Cut 1	0.95	0.93	0.02	0.03
			Cut 2	0.93	0.90	0.04	0.04
			Cut 3	0.97	0.95	0.02	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.86	0.78		
			Perf 2	0.85	0.79		
			Perf 3	0.84	0.78		
			Perf 4	0.84	0.73		

Table 2.9.14
DAC Results
Mathematics Grade 8

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
59572	0.94	0.67	Overall	0.84	0.78	0.09	0.07
			Cut 1	0.95	0.92	0.03	0.03
			Cut 2	0.93	0.90	0.04	0.03
			Cut 3	0.97	0.96	0.02	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.80	0.72		
			Perf 2	0.85	0.79		
			Perf 3	0.85	0.79		
			Perf 4	0.85	0.73		

Table 2.9.15
DAC Results
Mathematics Grade 10

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
63574	0.95	0.69	Overall	0.86	0.80	0.07	0.07
			Cut 1	0.97	0.95	0.01	0.02
			Cut 2	0.93	0.90	0.04	0.03
			Cut 3	0.97	0.95	0.02	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.73	0.58		
			Perf 2	0.86	0.82		
			Perf 3	0.88	0.84		
			Perf 4	0.85	0.76		

Table 2.9.16
DAC Results
Introductory Physics Grade 10

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
12822	0.94	0.64	Overall	0.82	0.75	0.10	0.07
			Cut 1	0.95	0.93	0.03	0.02
			Cut 2	0.92	0.89	0.05	0.03
			Cut 3	0.95	0.93	0.03	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.68	0.58		
			Perf 2	0.81	0.75		
			Perf 3	0.85	0.79		
			Perf 4	0.88	0.79		

Table 2.9.17
DAC Results
Science Grade 5

N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
54162	0.91	0.59	Overall	0.81	0.73	0.10	0.09
			Cut 1	0.95	0.93	0.02	0.03
			Cut 2	0.90	0.87	0.05	0.05
			Cut 3	0.95	0.93	0.03	0.02
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.81	0.68		
			Perf 2	0.82	0.76		
			Perf 3	0.80	0.73		
			Perf 4	0.79	0.65		

Table 2.9.18
DAC Results
Science Grade 8

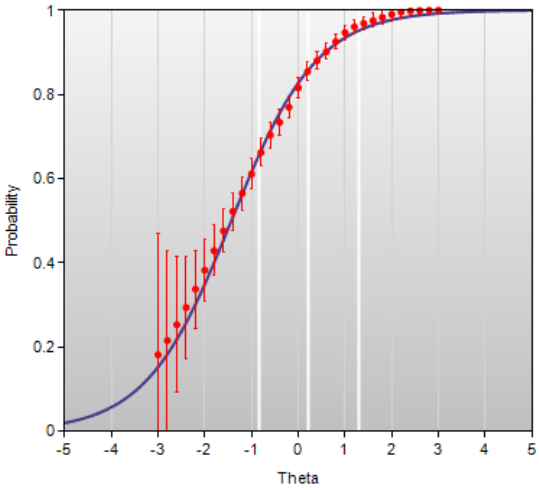
N	Reliability	Kappa		Accuracy	Consistency	F Pos	F Neg
59527	0.91	0.62	Overall	0.82	0.75	0.09	0.09
			Cut 1	0.95	0.93	0.02	0.03
			Cut 2	0.91	0.87	0.05	0.04
			Cut 3	0.96	0.95	0.02	0.01
			Cut 4	1.00	1.00	0.00	0.00
			Perf 1	0.84	0.73		
			Perf 2	0.82	0.76		
			Perf 3	0.83	0.77		
			Perf 4	0.76	0.59		

Section 2.10

Fit Plots of Watchlist Items

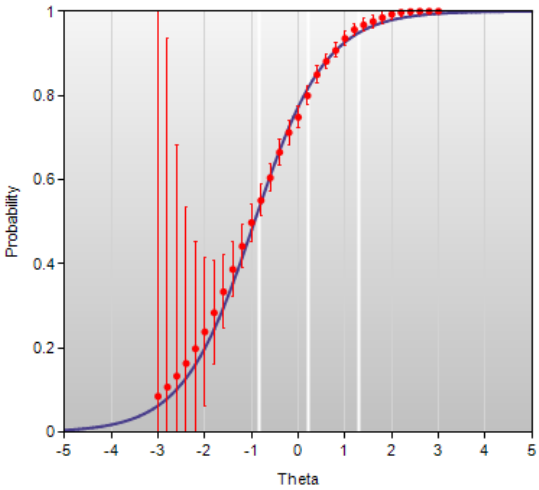
Initial Calibration

Biology Grade 10: IA10684



Final Calibration

Biology Grade 10: IA10684



Beta Chart

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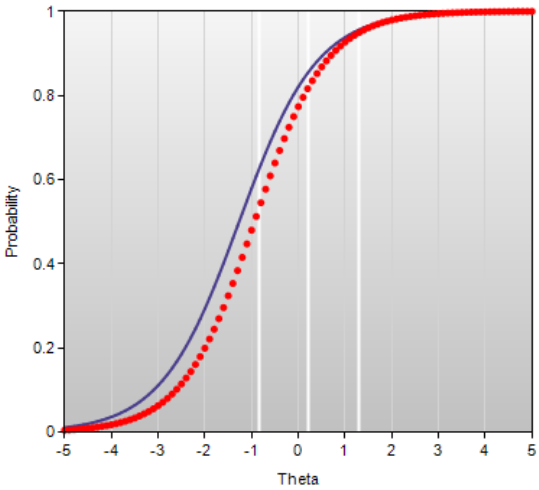
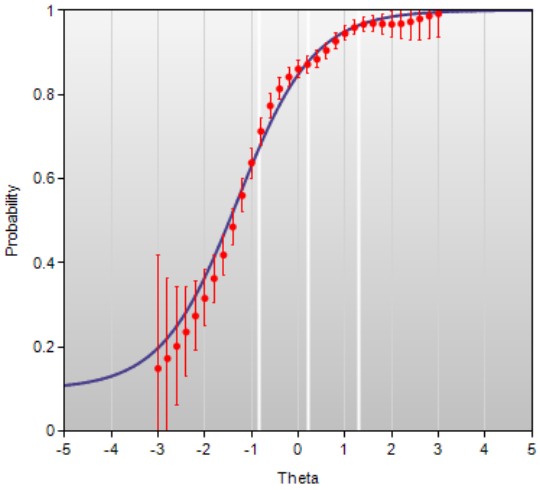


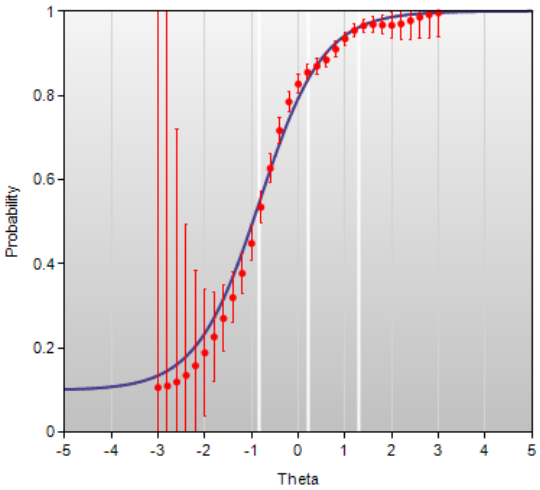
Initial Calibration

Biology Grade 10: IA10989



Final Calibration

Biology Grade 10: IA10989



Beta Chart

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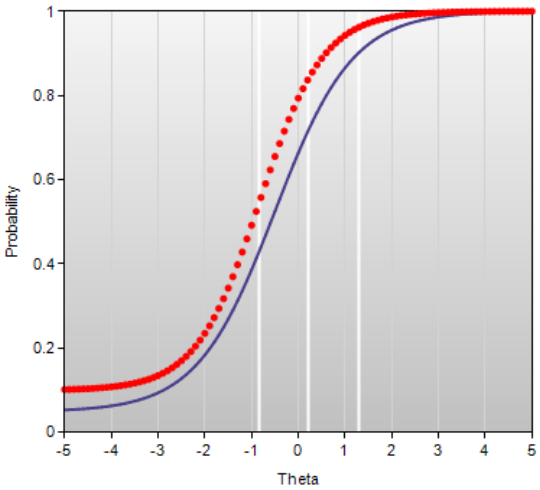
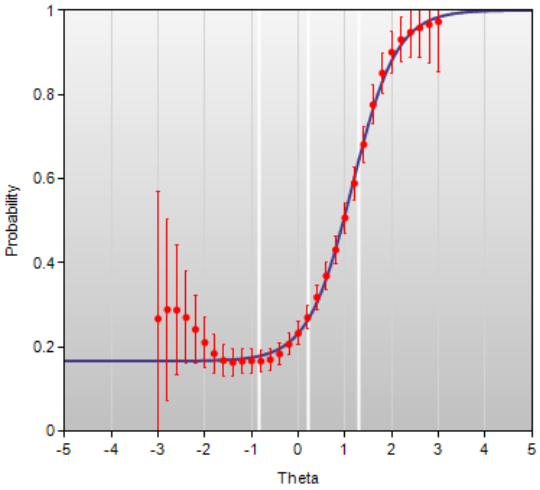


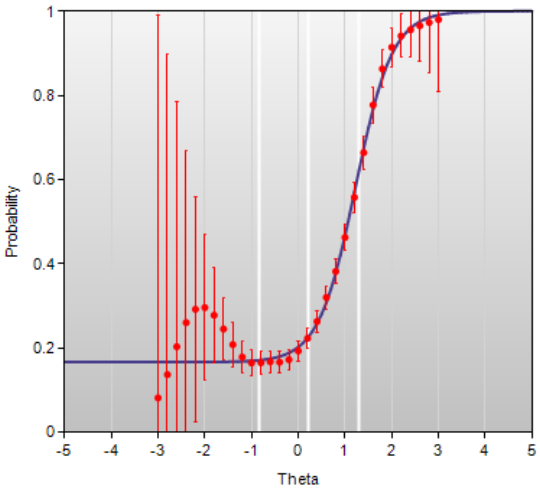
Initial Calibration

Biology Grade 10: IA11033



Final Calibration

Biology Grade 10: IA11033



Beta Chart

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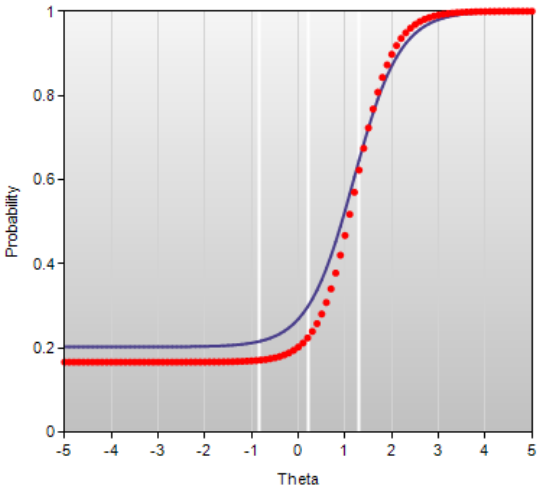

Initial Calibration

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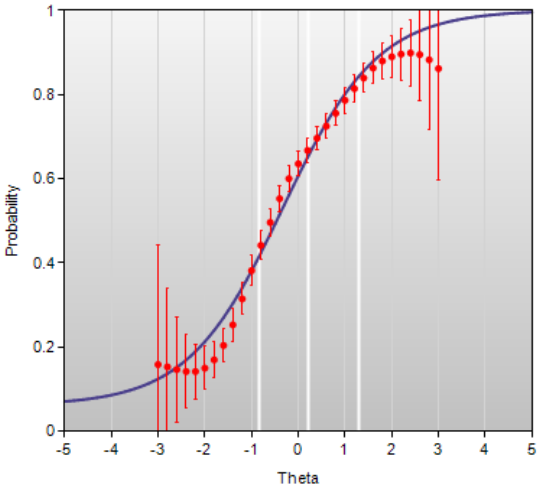

Final Calibration

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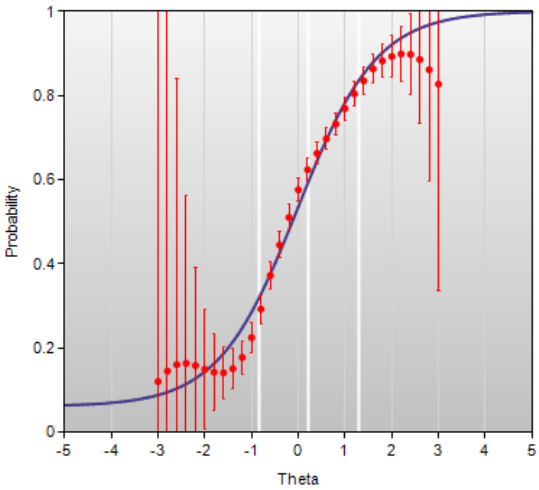

Beta Chart

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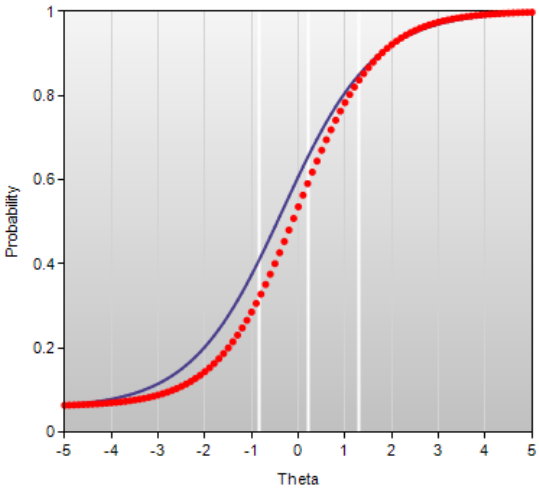
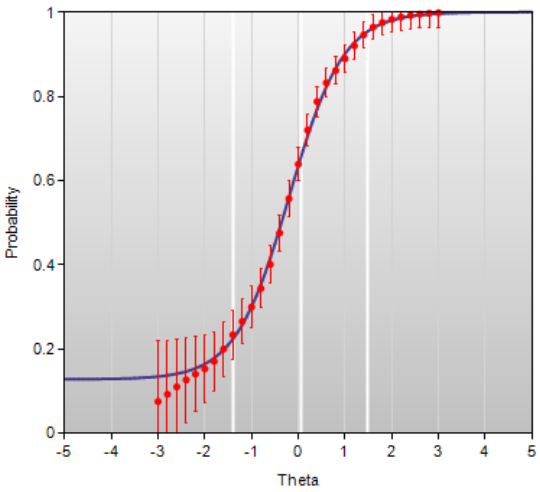


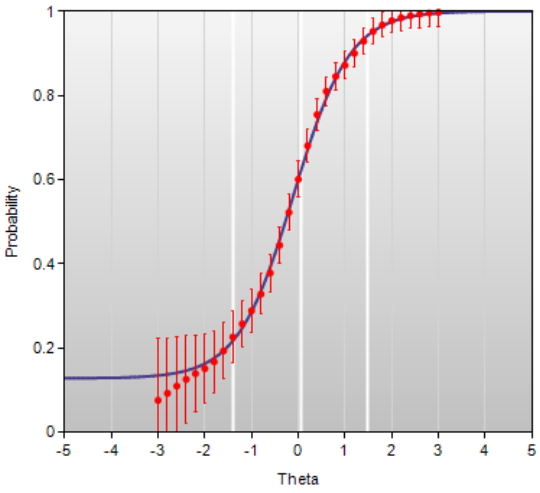
Initial Calibration

Mathematics Grade 4: IA00961



Final Calibration

Mathematics Grade 4: IA00961



Beta Chart

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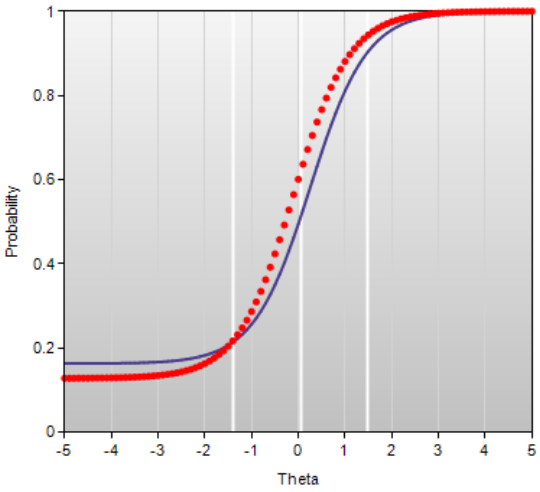
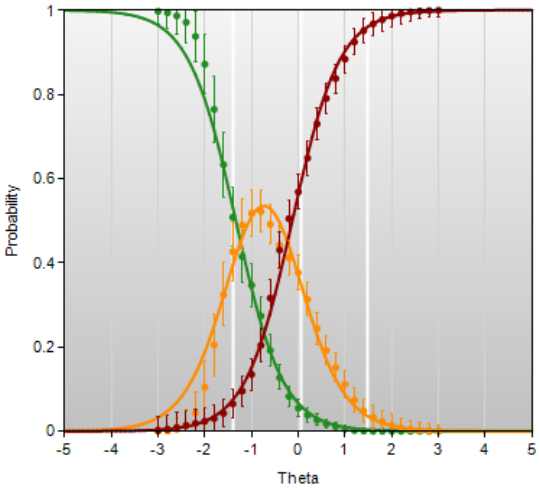


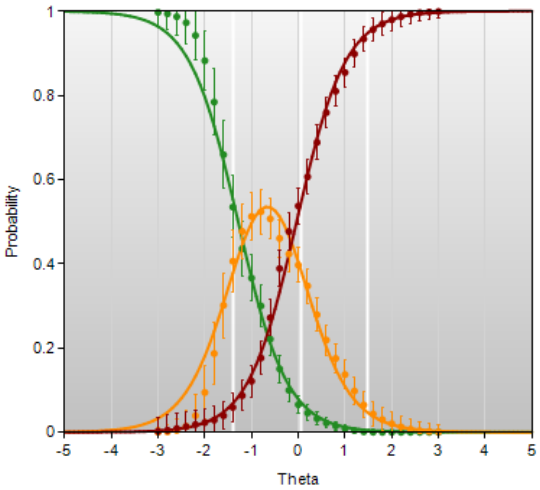
Initial Calibration

Mathematics Grade 4: IA01093



Final Calibration

Mathematics Grade 4: IA01093



Beta Chart

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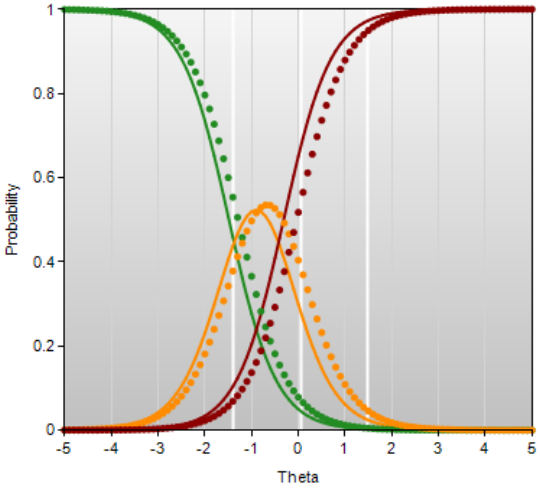
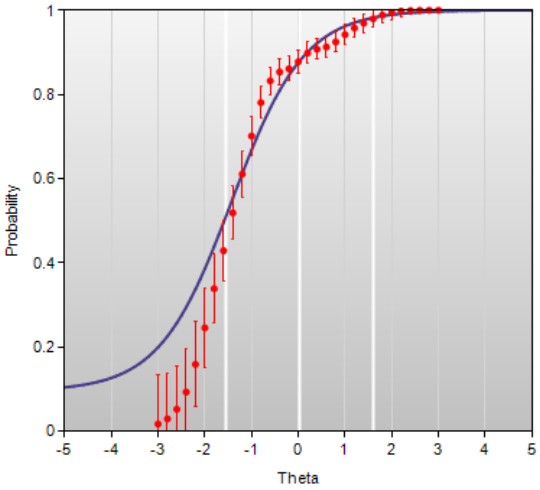


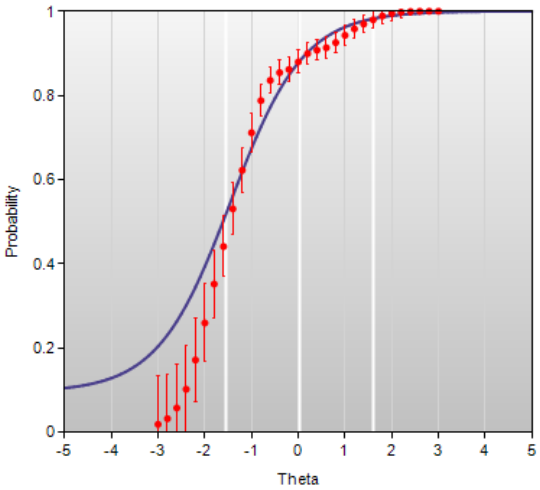
Initial Calibration

Mathematics Grade 5: IA00936



Final Calibration

Mathematics Grade 5: IA00936



Beta Chart

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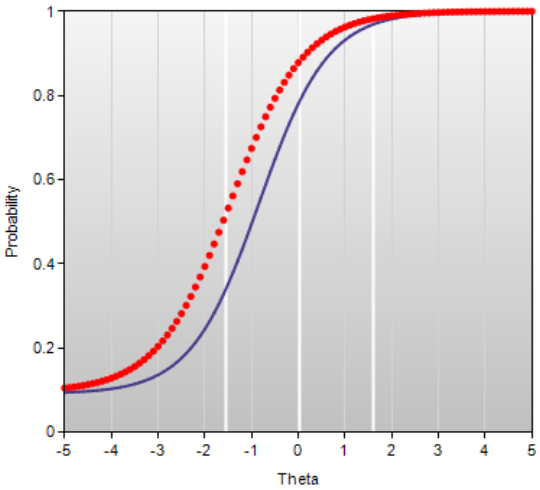
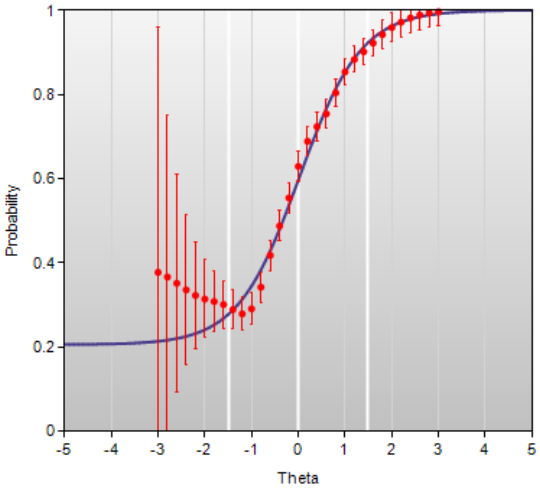


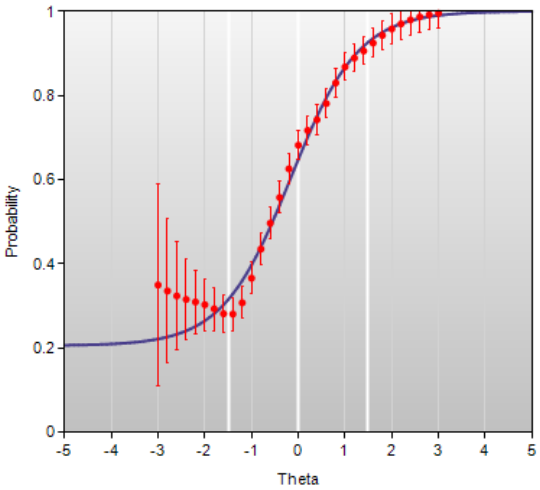
Initial Calibration

Mathematics Grade 8: IA00865



Final Calibration

Mathematics Grade 8: IA00865



Beta Chart

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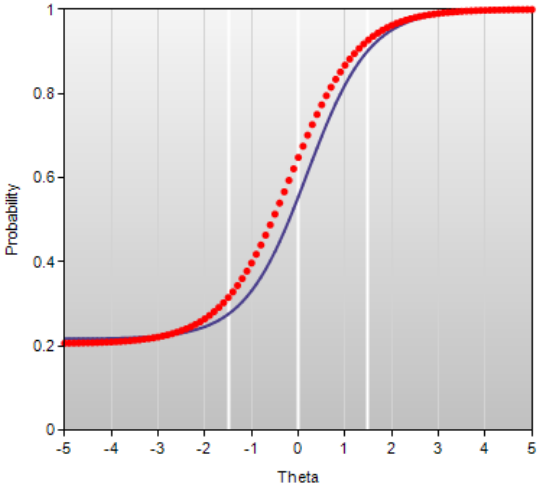
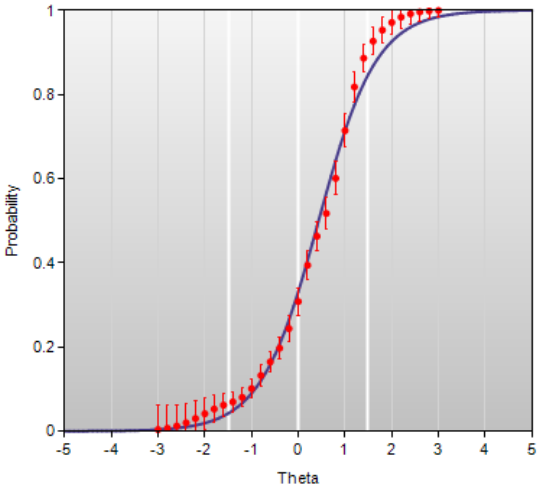


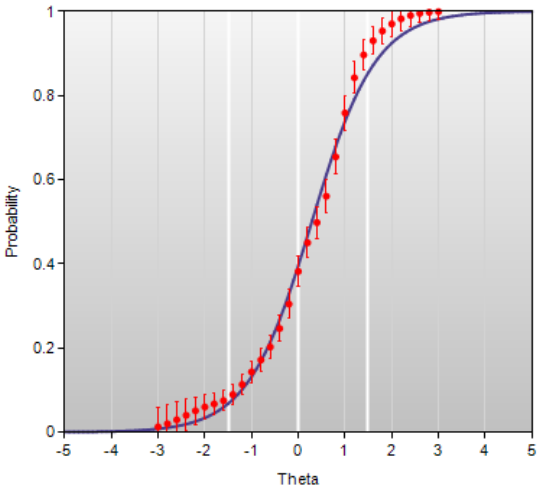
Initial Calibration

Mathematics Grade 8: IA02495



Final Calibration

Mathematics Grade 8: IA02495



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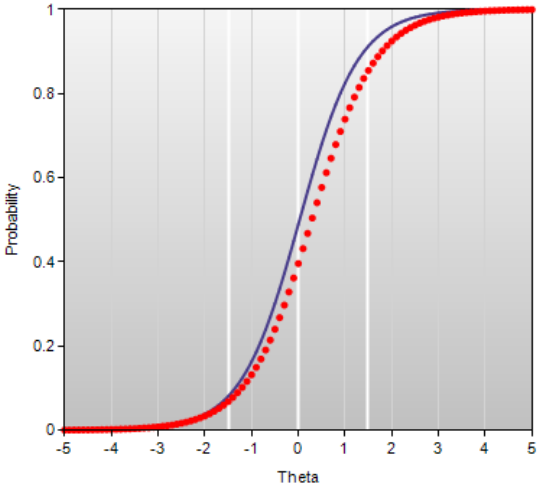
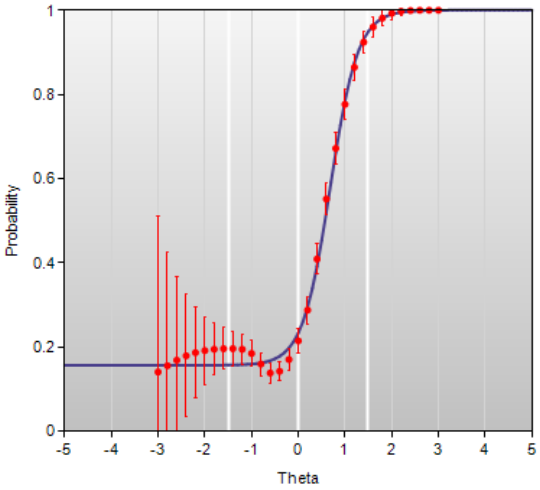


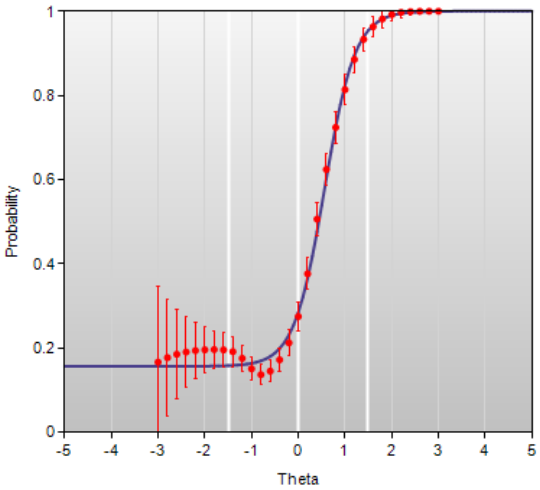
Initial Calibration

Mathematics Grade 8: IA05070



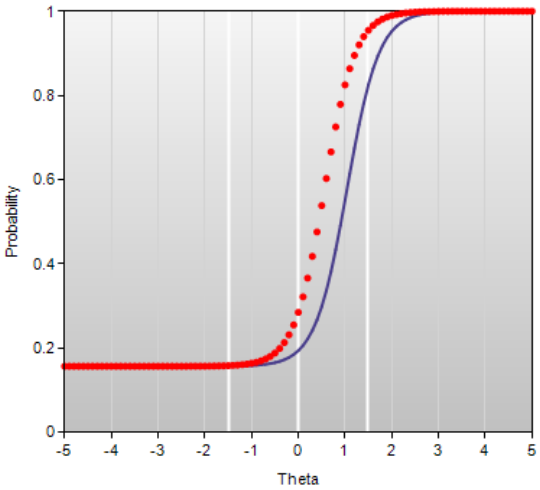
Final Calibration

Mathematics Grade 8: IA05070

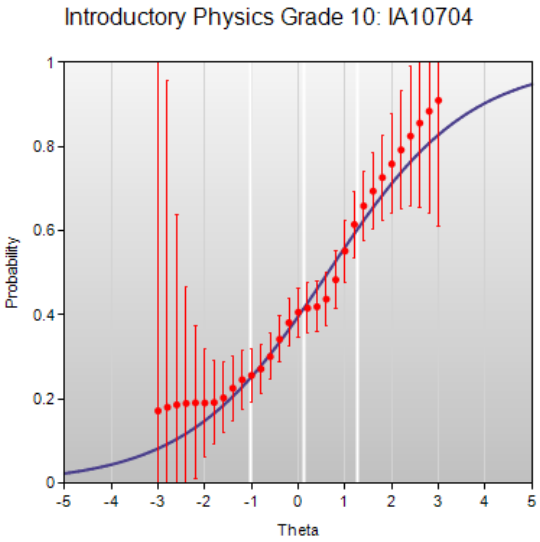


Beta Chart

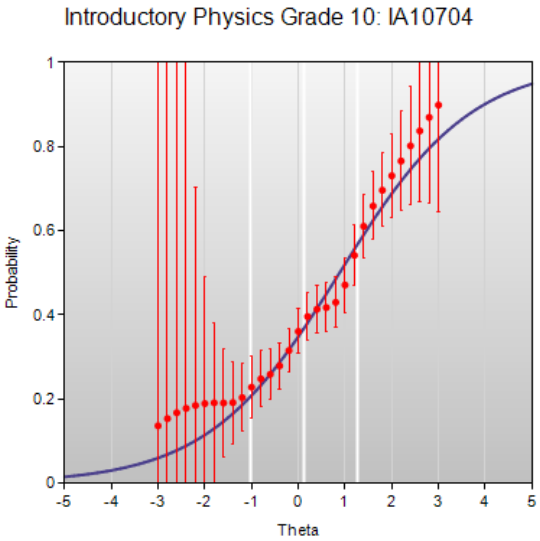
Mathematics Grade 8: IA05070 (MA804042487)



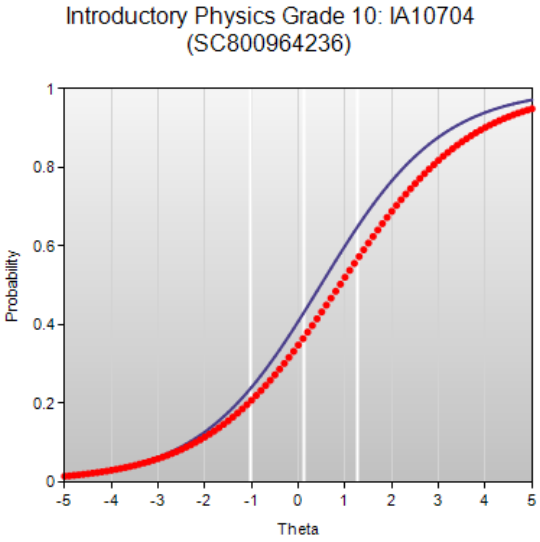
Initial Calibration



Final Calibration



Beta Chart



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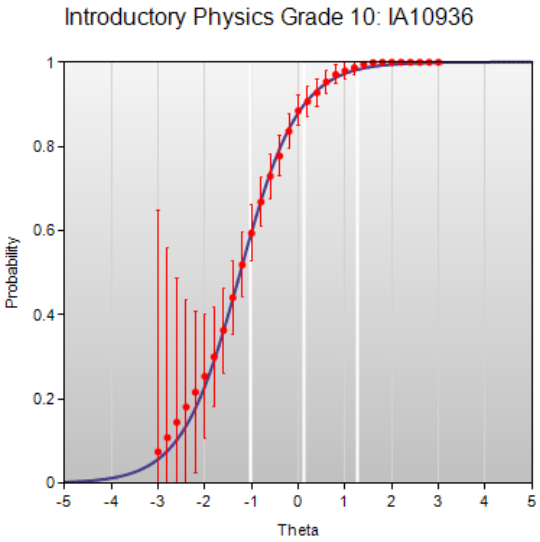

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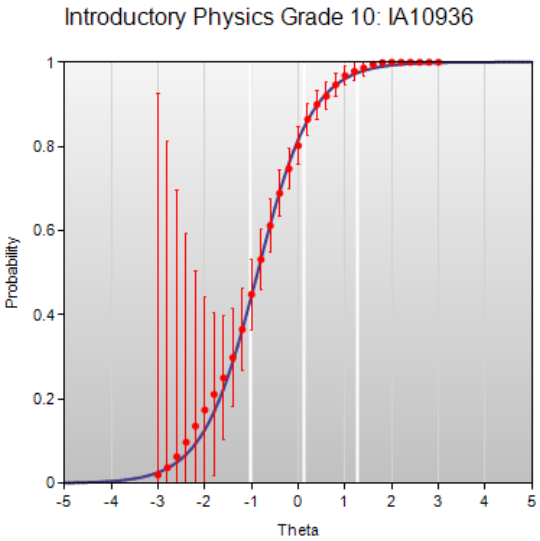
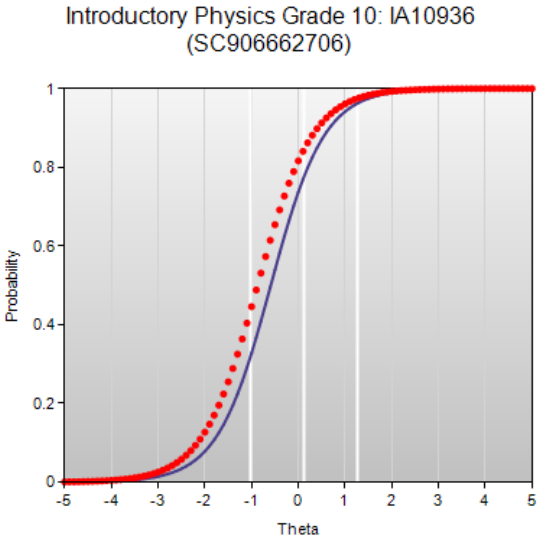
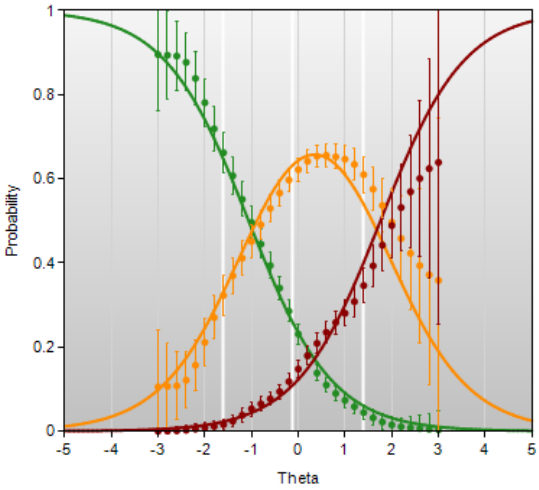


Beta Chart



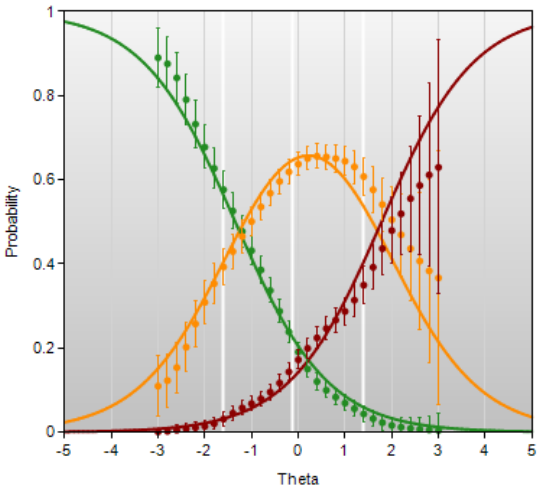
Initial Calibration

Science Grade 5: IA05657



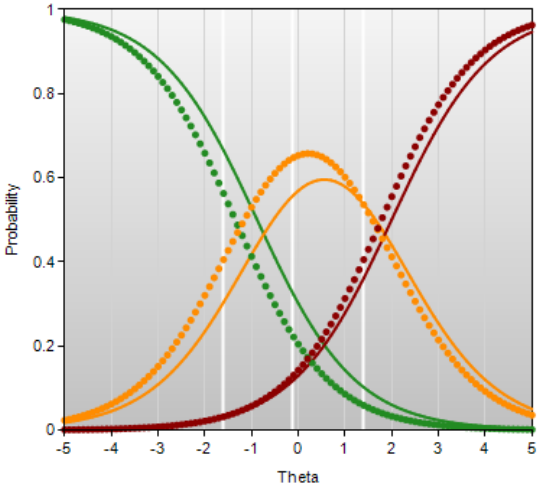
Final Calibration

Science Grade 5: IA05657



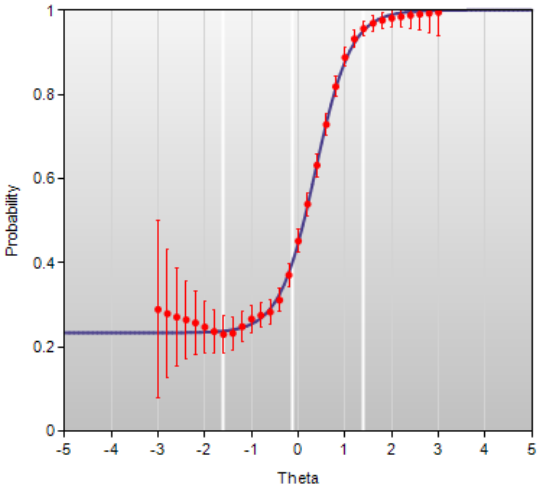
Beta Chart

Science Grade 5: IA05657 (SC803732869)



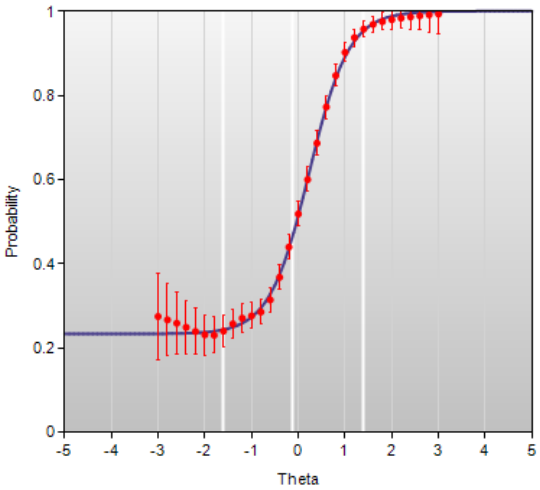
Initial Calibration

Science Grade 5: IA05702



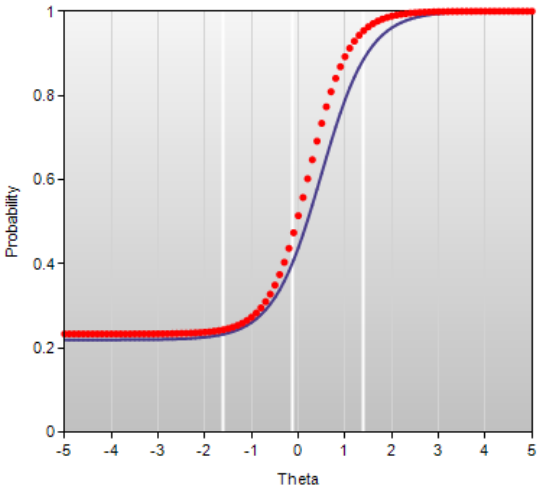
Final Calibration

Science Grade 5: IA05702



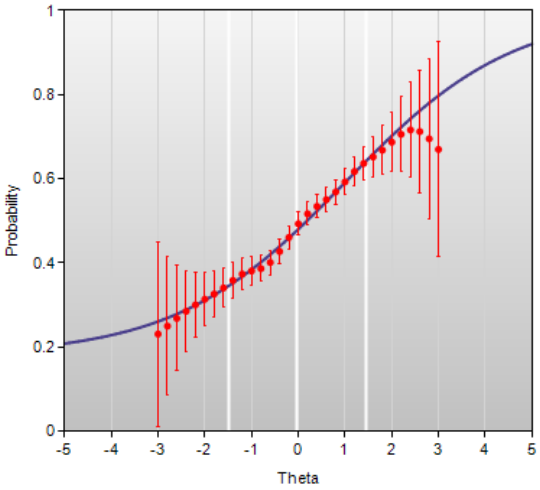
Beta Chart

Science Grade 5: IA05702 (SC806382697)



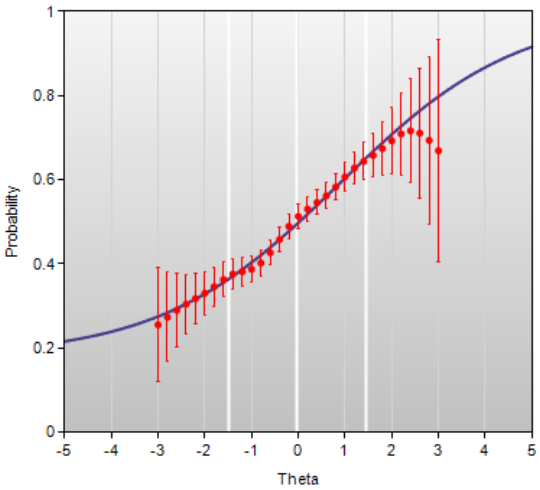
Initial Calibration

Science Grade 8: IA05245



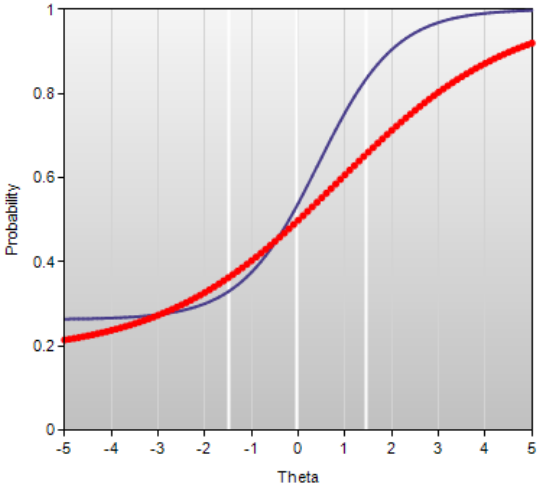
Final Calibration

Science Grade 8: IA05245



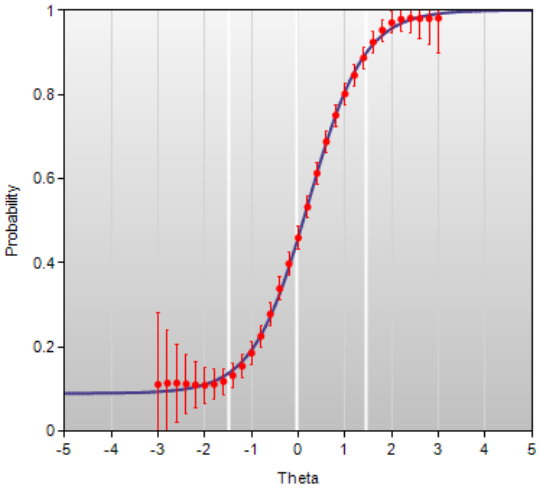
Beta Chart

Science Grade 8: IA05245 (SC290144)



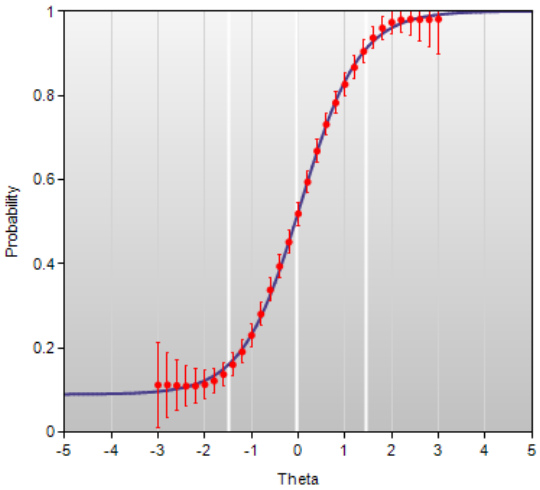
Initial Calibration

Science Grade 8: IA05690



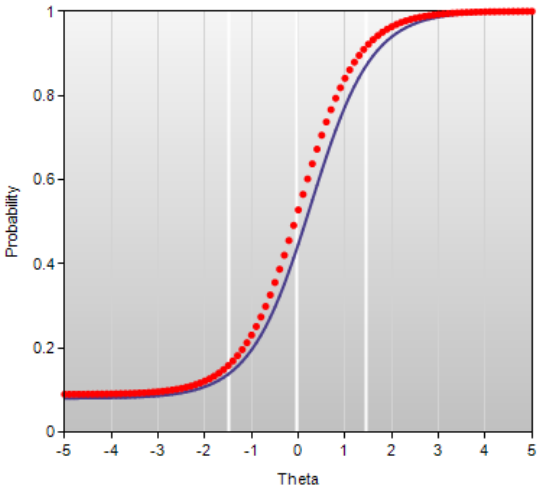
Final Calibration

Science Grade 8: IA05690



Beta Chart

Science Grade 8: IA05690 (SC804367702)



APPENDIX M
CLASSICAL RELIABILITY AND SEM

Table M-1. Subgroup Reliabilities—ELA

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	All Students	60,542	44	25.01	9.51	0.91	2.81
	EL/FEL	12,677	44	19.70	9.47	0.91	2.91
	Low Income	25,543	44	20.56	9.14	0.90	2.91
	African American/Black	5,170	44	21.34	9.25	0.90	2.91
	Asian	4,570	44	29.33	8.60	0.90	2.69
	Hispanic/Latino	13,903	44	19.87	9.23	0.90	2.90
	Native American	126	44	22.12	9.12	0.90	2.87
	White	33,643	44	26.96	8.71	0.90	2.75
	Pacific Islander/Hawaiian	44	44	27.80	8.72	0.91	2.66
	Multi-Race; Non-Hispanic/Latino	2,996	44	26.91	9.38	0.91	2.75
	Male	30,519	44	24.41	9.48	0.91	2.80
	Female	29,927	44	25.63	9.48	0.91	2.81
	Title 1	32,938	44	22.08	9.38	0.91	2.88
	English Learner	9,276	44	16.70	7.90	0.86	2.92
	Former EL	3,401	44	27.90	8.49	0.89	2.77
	SWD	10,616	44	18.12	8.66	0.89	2.87
	Plan504	2,846	44	25.31	8.69	0.90	2.80
4	All Students	61,836	44	25.59	8.43	0.88	2.86
	EL/FEL	11,917	44	20.91	8.40	0.87	2.97
	Low Income	26,196	44	21.82	8.07	0.87	2.96
	African American/Black	5,573	44	22.38	8.15	0.87	2.94
	Asian	4,889	44	29.56	7.71	0.88	2.72
	Hispanic/Latino	14,110	44	21.26	8.12	0.87	2.97
	Native American	136	44	20.99	9.06	0.90	2.86
	White	34,090	44	27.26	7.78	0.87	2.81
	Pacific Islander/Hawaiian	55	44	24.07	8.36	0.88	2.84
	Multi-Race; Non-Hispanic/Latino	2,911	44	27.01	8.40	0.89	2.81
	Male	31,061	44	25.18	8.38	0.88	2.86
	Female	30,692	44	26.02	8.44	0.89	2.86
	Title 1	32,939	44	23.11	8.27	0.87	2.93
	English Learner	8,126	44	17.63	6.96	0.81	3.00
	Former EL	3,791	44	27.95	6.74	0.83	2.82
	SWD	11,088	44	19.13	7.87	0.86	2.96
	Plan504	3,539	44	25.94	7.46	0.85	2.85
5	All Students	62,316	48	28.76	9.43	0.90	2.96
	EL/FEL	12,016	48	23.80	9.98	0.90	3.09
	Low Income	26,253	48	24.65	9.48	0.90	3.07
	African American/Black	5,603	48	25.50	9.56	0.90	3.05
	Asian	4,856	48	33.41	8.16	0.88	2.77
	Hispanic/Latino	14,213	48	24.12	9.62	0.90	3.08
	Native American	126	48	26.10	9.96	0.91	2.96
	White	34,450	48	30.46	8.56	0.89	2.89
	Pacific Islander/Hawaiian	39	48	28.72	9.48	0.90	2.98
	Multi-Race; Non-Hispanic/Latino	2,935	48	30.35	9.25	0.90	2.89
	Male	31,473	48	27.66	9.52	0.90	2.97
	Female	30,727	48	29.91	9.17	0.90	2.92
	Title 1	29,429	48	26.04	9.61	0.90	3.05
	English Learner	5,396	48	17.01	7.91	0.85	3.09
	Former EL	6,620	48	29.34	7.85	0.86	2.97
	SWD	11,470	48	20.96	9.09	0.89	3.07
	Plan504	4,069	48	29.12	8.21	0.87	2.93
6	All Students	63,574	50	27.63	9.90	0.90	3.17
	EL/FEL	11,732	50	21.60	9.63	0.89	3.23
	Low Income	26,861	50	23.09	9.55	0.89	3.21
	African American/Black	5,769	50	23.96	9.43	0.88	3.20

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	Asian	4,738	50	32.23	9.00	0.88	3.06
	Hispanic/Latino	14,653	50	22.51	9.73	0.89	3.21
	Native American	163	50	24.25	9.92	0.89	3.27
	White	35,213	50	29.66	9.08	0.88	3.12
	Pacific Islander/Hawaiian	65	50	27.92	10.13	0.90	3.21
	Multi-Race; Non-Hispanic/Latino	2,886	50	29.24	9.95	0.90	3.15
6	Male	32,267	50	26.23	9.86	0.90	3.17
	Female	31,174	50	29.10	9.71	0.89	3.15
	Title 1	27,358	50	24.34	9.84	0.89	3.22
	English Learner	4,483	50	14.34	6.67	0.80	3.00
	Former EL	7,249	50	26.08	8.37	0.85	3.24
	SWD	11,624	50	19.49	8.81	0.87	3.12
	Plan504	4,460	50	27.71	8.95	0.88	3.15
	All Students	63,711	50	27.50	10.71	0.90	3.44
	EL/FEL	10,897	50	20.13	9.57	0.88	3.38
	Low Income	26,689	50	22.48	9.90	0.88	3.41
	African American/Black	5,849	50	23.28	9.78	0.88	3.43
	Asian	4,712	50	33.36	9.93	0.89	3.32
	Hispanic/Latino	14,597	50	21.92	10.05	0.89	3.40
	Native American	136	50	24.63	10.18	0.89	3.44
	White	35,532	50	29.63	9.99	0.88	3.41
7	Pacific Islander/Hawaiian	52	50	29.63	9.94	0.89	3.27
	Multi-Race; Non-Hispanic/Latino	2,757	50	29.01	10.92	0.90	3.40
	Male	32,368	50	26.06	10.56	0.90	3.39
	Female	31,181	50	29.01	10.64	0.89	3.45
	Title 1	26,827	50	23.74	10.30	0.89	3.43
	English Learner	4,731	50	14.04	6.60	0.78	3.10
	Former EL	6,166	50	24.80	8.84	0.85	3.46
	SWD	11,364	50	18.97	9.05	0.87	3.26
	Plan504	4,920	50	27.70	9.69	0.88	3.41
	All Students	65,553	50	30.67	9.96	0.90	3.22
	EL/FEL	9,971	50	23.05	9.91	0.89	3.34
	Low Income	27,584	50	26.27	9.92	0.89	3.30
	African American/Black	6,215	50	27.20	9.61	0.88	3.27
	Asian	4,917	50	36.30	8.57	0.88	2.96
	Hispanic/Latino	15,012	50	25.89	10.11	0.89	3.31
	Native American	160	50	28.48	9.82	0.89	3.28
	White	36,259	50	32.44	9.10	0.88	3.15
8	Pacific Islander/Hawaiian	66	50	30.33	11.42	0.92	3.24
	Multi-Race; Non-Hispanic/Latino	2,824	50	31.69	9.96	0.90	3.19
	Male	33,468	50	29.19	10.16	0.90	3.25
	Female	31,846	50	32.23	9.47	0.89	3.15
	Title 1	27,405	50	27.41	10.03	0.89	3.27
	English Learner	4,427	50	16.62	7.54	0.82	3.21
	Former EL	5,544	50	28.19	8.48	0.85	3.29
	SWD	11,479	50	22.39	9.25	0.88	3.26
	Plan504	5,308	50	30.92	8.94	0.87	3.20
	All Students	68,104	51	34.77	10.17	0.91	3.13
	EL/FEL	7,414	51	22.73	11.02	0.90	3.44
	Low Income	26,918	51	30.35	10.62	0.90	3.31
	African American/Black	6,199	51	31.85	9.72	0.89	3.22
	Asian	4,987	51	39.97	8.05	0.89	2.71
10	Hispanic/Latino	15,392	51	29.36	11.27	0.91	3.34
	Native American	152	51	30.95	10.34	0.90	3.26
	White	37,785	51	37.19	8.27	0.87	2.99
	Pacific Islander/Hawaiian	65	51	32.38	9.89	0.89	3.24
	Multi-Race; Non-Hispanic/Latino	2,568	51	36.51	9.32	0.89	3.04
	Male	34,114	51	33.89	10.21	0.90	3.17

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
10	Female	32,727	51	36.25	9.39	0.90	3.01
	Title 1	23,956	51	31.71	10.52	0.90	3.27
	English Learner	4,858	51	17.62	8.66	0.85	3.32
	Former EL	2,556	51	32.44	8.12	0.84	3.24
	SWD	10,238	51	27.47	9.71	0.88	3.34
	Plan504	5,950	51	36.10	8.20	0.86	3.06

Form 1, predominantly given to students with the text-to-speech special access accommodation, is excluded from these results.

Table M-2. Subgroup Reliabilities—Mathematics

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	All Students	51,707	48	29.38	11.52	0.93	2.99
	EL/FEL	6,924	48	26.36	12.46	0.94	3.02
	Low Income	19,183	48	23.78	11.40	0.93	3.07
	African American/Black	4,312	48	23.12	11.52	0.93	3.06
	Asian	4,155	48	35.95	9.90	0.93	2.71
	Hispanic/Latino	9,371	48	23.44	11.61	0.93	3.05
	Native American	97	48	25.36	11.55	0.93	3.08
	White	30,909	48	31.08	10.56	0.92	2.95
	Pacific Islander/Hawaiian	39	48	31.64	10.80	0.92	2.97
	Multi-Race; Non-Hispanic/Latino	2,781	48	30.40	11.58	0.93	2.96
	Male	25,677	48	30.33	11.60	0.94	2.95
	Female	25,989	48	28.42	11.35	0.93	3.02
	Title 1	26,069	48	25.86	11.57	0.93	3.05
	English Learner	3,638	48	21.48	11.37	0.93	3.05
	Former EL	3,286	48	31.77	11.35	0.93	2.90
	SWD	6,527	48	21.78	11.97	0.94	3.04
	Plan504	2,620	48	28.35	11.07	0.93	3.02
4	All Students	52,554	54	33.18	11.79	0.93	3.22
	EL/FEL	6,460	54	29.68	12.76	0.93	3.28
	Low Income	19,659	54	27.32	11.61	0.92	3.29
	African American/Black	4,615	54	26.28	11.79	0.92	3.29
	Asian	4,465	54	40.32	10.24	0.92	2.96
	Hispanic/Latino	9,717	54	27.02	11.69	0.92	3.28
	Native American	94	54	27.90	11.88	0.92	3.26
	White	30,889	54	35.06	10.65	0.91	3.17
	Pacific Islander/Hawaiian	48	54	31.13	12.29	0.93	3.14
	Multi-Race; Non-Hispanic/Latino	2,692	54	34.00	12.36	0.93	3.22
	Male	26,052	54	34.33	11.70	0.92	3.20
	Female	26,456	54	32.03	11.77	0.92	3.24
	Title 1	26,000	54	29.34	11.77	0.92	3.27
	English Learner	2,942	54	23.01	11.49	0.92	3.27
	Former EL	3,518	54	35.25	10.97	0.92	3.18
	SWD	6,218	54	24.83	12.53	0.93	3.31
	Plan504	3,252	54	32.00	10.98	0.91	3.25
5	All Students	54,159	54	30.52	11.90	0.92	3.36
	EL/FEL	7,794	54	27.04	11.98	0.92	3.35
	Low Income	20,746	54	24.70	10.88	0.90	3.37
	African American/Black	4,718	54	24.29	10.93	0.91	3.35
	Asian	4,486	54	39.05	10.74	0.92	3.06
	Hispanic/Latino	10,665	54	24.41	10.88	0.90	3.36
	Native American	99	54	27.15	11.88	0.92	3.36
	White	31,419	54	32.21	11.12	0.91	3.36
	Pacific Islander/Hawaiian	37	54	27.46	11.47	0.91	3.39
	Multi-Race; Non-Hispanic/Latino	2,694	54	31.94	12.31	0.93	3.35

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	Male	26,923	54	31.52	12.15	0.92	3.34
	Female	27,174	54	29.52	11.55	0.91	3.38
	Title 1	24,044	54	26.37	11.35	0.91	3.37
5	English Learner	1,951	54	19.34	10.10	0.90	3.25
	Former EL	5,843	54	29.61	11.44	0.91	3.34
	SWD	6,464	54	22.08	11.48	0.91	3.36
	Plan504	3,830	54	29.46	11.27	0.91	3.40
	All Students	56,389	54	28.84	13.12	0.93	3.56
	EL/FEL	8,293	54	23.21	12.61	0.92	3.46
	Low Income	21,999	54	22.13	11.58	0.91	3.41
	African American/Black	4,964	54	21.89	11.57	0.92	3.37
	Asian	4,497	54	39.03	12.26	0.93	3.32
	Hispanic/Latino	11,629	54	21.65	11.59	0.91	3.39
	Native American	132	54	24.14	12.54	0.92	3.53
	White	32,443	54	30.97	12.19	0.91	3.55
6	Pacific Islander/Hawaiian	59	54	27.68	13.58	0.93	3.52
	Multi-Race; Non-Hispanic/Latino	2,651	54	30.44	13.60	0.93	3.57
	Male	28,306	54	29.35	13.30	0.93	3.56
	Female	28,026	54	28.32	12.92	0.92	3.55
	Title 1	23,104	54	23.61	12.14	0.92	3.46
	English Learner	1,932	54	14.98	9.82	0.90	3.06
	Former EL	6,360	54	25.71	12.30	0.92	3.51
	SWD	6,904	54	19.23	11.71	0.92	3.30
	Plan504	4,248	54	27.61	12.27	0.92	3.54
	All Students	57,234	54	25.42	13.58	0.93	3.49
	EL/FEL	7,674	54	18.56	12.03	0.92	3.30
	Low Income	22,255	54	18.48	11.18	0.91	3.32
	African American/Black	5,152	54	18.14	11.09	0.91	3.28
	Asian	4,484	54	36.74	13.40	0.94	3.25
	Hispanic/Latino	11,746	54	18.13	11.24	0.91	3.29
	Native American	116	54	21.85	13.00	0.93	3.39
	White	33,099	54	27.51	12.81	0.93	3.50
7	Pacific Islander/Hawaiian	45	54	28.62	14.98	0.95	3.43
	Multi-Race; Non-Hispanic/Latino	2,561	54	26.93	14.54	0.94	3.50
	Male	28,746	54	26.32	13.75	0.94	3.48
	Female	28,378	54	24.51	13.35	0.93	3.50
	Title 1	22,888	54	19.98	11.95	0.92	3.38
	English Learner	2,309	54	12.54	9.16	0.90	2.91
	Former EL	5,365	54	21.15	12.19	0.92	3.38
	SWD	7,276	54	16.09	10.98	0.92	3.20
	Plan504	4,699	54	24.23	12.47	0.92	3.48
	All Students	59,572	54	28.94	13.10	0.93	3.47
	EL/FEL	7,116	54	21.70	11.99	0.92	3.42
	Low Income	23,448	54	22.54	11.52	0.91	3.43
	African American/Black	5,510	54	22.62	11.63	0.91	3.44
	Asian	4,686	54	40.01	12.21	0.94	3.10
	Hispanic	12,418	54	22.22	11.56	0.91	3.42
	Native American	142	54	25.83	12.52	0.92	3.48
	White	34,102	54	30.84	12.23	0.92	3.44
8	Pacific Islander/Hawaiian	56	54	29.77	12.17	0.92	3.46
	Multi-Race; Non-Hispanic/Latino	2,630	54	29.69	13.82	0.94	3.46
	Male	30,119	54	29.09	13.27	0.93	3.46
	Female	29,291	54	28.77	12.92	0.93	3.47
	Title 1	23,701	54	23.96	12.06	0.92	3.45
	English Learner	2,174	54	15.84	9.83	0.90	3.16
	Former EL	4,942	54	24.28	11.95	0.92	3.45
	SWD	7,699	54	19.09	10.68	0.90	3.31
	Plan504	5,090	54	27.69	12.11	0.92	3.47

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	All Students	63,574	60	31.75	14.78	0.94	3.61
	EL/FEL	5,392	60	19.75	12.38	0.92	3.41
	Low Income	24,185	60	24.10	12.99	0.93	3.55
	African American/Black	5,928	60	23.29	12.57	0.92	3.53
	Asian	4,914	60	43.57	13.74	0.94	3.26
	Hispanic/Latino	13,180	60	23.52	12.91	0.92	3.54
	Native American	132	60	26.30	13.90	0.93	3.61
	White	36,850	60	34.42	13.70	0.93	3.57
10	Pacific Islander/Hawaiian	62	60	27.16	13.78	0.93	3.60
	Multi-Race; Non-Hispanic/Latino	2,475	60	33.14	15.48	0.95	3.60
	Male	32,003	60	32.27	14.97	0.94	3.61
	Female	31,237	60	31.19	14.58	0.94	3.61
	Title 1	21,720	60	26.05	13.59	0.93	3.58
	English Learner	3,143	60	15.02	9.33	0.89	3.13
	Former EL	2,249	60	26.36	13.06	0.92	3.61
	SWD	8,703	60	20.22	12.07	0.92	3.44
	Plan504	5,793	60	31.24	13.39	0.93	3.63

Form 1, predominantly given to students with the text-to-speech special access accommodation, is excluded from these results.

Table M-3. Subgroup Reliabilities—STE

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	All Students	49,237	54	31.91	10.22	0.90	3.18
	EL/FEL	6,872	54	27.47	10.48	0.90	3.24
	Low Income	18,447	54	26.91	9.96	0.89	3.25
	African American/Black	4,226	54	26.18	9.98	0.89	3.24
	Asian	4,131	54	36.79	9.29	0.89	3.05
	Hispanic/Latino	9,393	54	26.50	10.07	0.90	3.24
	Native American	95	54	30.71	10.11	0.90	3.20
	White	28,958	54	33.69	9.36	0.89	3.14
5	Pacific Islander/Hawaiian	35	54	30.49	10.84	0.91	3.18
	Multi-Race; Non-Hispanic/Latino	2,367	54	33.48	10.26	0.91	3.14
	Male	24,494	54	32.41	10.29	0.91	3.14
	Female	24,691	54	31.41	10.13	0.90	3.20
	Title 1	21,093	54	28.37	10.14	0.90	3.23
	English Learner	1,748	54	19.61	9.25	0.88	3.20
	Former EL	5,124	54	30.15	9.48	0.88	3.24
	SWD	5,964	54	25.06	10.90	0.91	3.21
	Plan504	3,537	54	32.20	9.68	0.89	3.16
	All Students	54,215	54	29.09	10.92	0.90	3.42
	EL/FEL	6,406	54	21.63	9.67	0.87	3.43
	Low Income	20,964	54	23.82	9.93	0.88	3.45
	African American/Black	4,898	54	23.38	9.70	0.87	3.44
	Asian	4,317	54	35.99	10.17	0.90	3.26
	Hispanic/Latino	11,018	54	23.25	9.93	0.88	3.44
	Native American	127	54	25.67	10.23	0.89	3.42
	White	31,443	54	31.02	10.22	0.89	3.40
8	Pacific Islander/Hawaiian	54	54	29.78	11.14	0.91	3.36
	Multi-Race; Non-Hispanic/Latino	2,337	54	30.17	11.22	0.91	3.39
	Male	27,410	54	29.47	11.14	0.91	3.39
	Female	26,656	54	28.67	10.67	0.90	3.44
	Title 1	20,990	54	24.78	10.21	0.89	3.45
	English Learner	1,990	54	15.96	7.33	0.81	3.24
	Former EL	4,416	54	24.19	9.50	0.87	3.46
	SWD	7,107	54	21.53	9.98	0.88	3.39
	Plan504	4,726	54	29.05	10.32	0.89	3.42

Form 1, predominantly given to students with the text-to-speech special access accommodation, is excluded from these results.

Table M-4. Subgroup Reliabilities—Biology

Grade	Subgroup	Number of Students	Raw Score		Standard Deviation	Alpha	SEM
			Maximum	Mean			
	All Students	49,403	60	33.94	13.08	0.92	3.61
	EL/FEL	5,047	60	22.80	11.42	0.91	3.51
	Low Income	20,006	60	27.82	12.10	0.91	3.59
	African American/Black	4,686	60	27.59	11.90	0.91	3.58
	Asian	3,672	60	42.35	12.52	0.93	3.41
	Hispanic/Latino	10,590	60	27.06	12.03	0.91	3.58
	Native American	114	60	30.47	12.48	0.92	3.61
	White	28,344	60	36.47	12.12	0.91	3.57
HS	Pacific Islander/Hawaiian	58	60	31.66	12.23	0.91	3.66
	Multi-Race; Non-Hispanic/Latino	1,926	60	34.36	13.49	0.93	3.62
	Male	24,579	60	33.88	13.25	0.93	3.60
	Female	24,626	60	33.96	12.91	0.92	3.62
	Title 1	17,631	60	29.47	12.61	0.92	3.59
	English Learner	2,664	60	17.87	8.60	0.85	3.31
	Former EL	2,383	60	28.31	11.66	0.90	3.61
	SWD	6,495	60	25.06	11.71	0.91	3.52
	Plan504	4,283	60	34.22	12.26	0.91	3.59

Form 1, predominantly given to students with the text-to-speech special access accommodation, is excluded from these results.

Table M-5. Subgroup Reliabilities—Introductory Physics

Grade	Subgroup	Number of Students	Raw Score		Standard Deviation	Alpha	SEM
			Maximum	Mean			
	All Students	12,822	60	33.89	12.48	0.92	3.49
	EL/FEL	1,249	60	24.65	11.63	0.91	3.48
	Low Income	4,387	60	26.65	10.78	0.89	3.50
	African American/Black	1,313	60	25.73	10.24	0.89	3.47
	Asian	1,166	60	42.87	11.97	0.93	3.25
	Hispanic/Latino	2,394	60	26.93	10.78	0.89	3.49
	Native American	22	60	28.32	10.43	0.89	3.41
	White	7,329	60	35.98	11.53	0.91	3.44
HS	Pacific Islander/Hawaiian	8	60	32.13	12.27	0.93	3.19
	Multi-Race; Non-Hispanic/Latino	589	60	36.79	13.05	0.93	3.46
	Male	6,543	60	34.58	12.66	0.93	3.46
	Female	6,216	60	33.15	12.23	0.92	3.50
	Title 1	3,953	60	27.41	10.73	0.89	3.50
	English Learner	546	60	19.75	10.22	0.89	3.35
	Former EL	703	60	28.46	11.23	0.90	3.51
	SWD	1,608	60	25.37	10.86	0.90	3.46
	Plan504	1,143	60	33.40	11.73	0.91	3.47

Form 1, predominantly given to students with the text-to-speech special access accommodation, is excluded from these results.

Table M-6. Subgroup Reliabilities—Alt/ELA

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	All Students	856	39	28.01	3.65	0.62	2.24
	EL/FEL	213	39	28.39	3.55	0.69	1.97
	Low Income	615	39	27.96	3.72	0.64	2.23
	African American/Black	146	39	28.10	3.77	0.59	2.42
	Asian	71	39	28.07	3.69	0.43	2.79
	Hispanic/Latino	273	39	27.89	3.88	0.69	2.16
	Native American	1					
	White	334	39	27.97	3.48	0.60	2.19
	Pacific Islander/Hawaiian	2					
	Multi-Race; Non-Hispanic/Latino	26	39	28.65	2.86	0.54	1.94
	Male	615	39	27.99	3.70	0.63	2.24
	Female	240	39	28.05	3.53	0.60	2.22
	Title 1	487	39	27.98	3.73	0.63	2.27
	English Learner	172	39	28.51	3.50	0.69	1.96
	Former EL	41	39	27.85	3.75	0.71	2.02
	SWD	848	39	28.01	3.65	0.62	2.24
	Plan504	3					
4	All Students	917	39	28.24	3.83	0.67	2.21
	EL/FEL	217	39	28.79	3.48	0.67	2.00
	Low Income	637	39	28.33	3.80	0.69	2.12
	African American/Black	117	39	28.81	3.51	0.69	1.97
	Asian	80	39	28.66	3.22	0.57	2.11
	Hispanic/Latino	288	39	28.30	4.00	0.71	2.16
	Native American	3					
	White	377	39	28.01	3.88	0.63	2.37
	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	51	39	27.59	3.99	0.72	2.12
	Male	643	39	28.28	3.82	0.64	2.30
	Female	274	39	28.16	3.86	0.72	2.05
	Title 1	530	39	28.60	3.83	0.67	2.20
	English Learner	197	39	28.79	3.51	0.65	2.09
	Former EL	20	39	28.75	3.26	0.85	1.27
	SWD	916	39	28.24	3.83	0.67	2.21
	Plan504	3					
5	All Students	802	39	28.62	3.37	0.61	2.12
	EL/FEL	159	39	28.89	3.50	0.66	2.04
	Low Income	548	39	28.70	3.37	0.60	2.12
	African American/Black	138	39	28.56	3.54	0.66	2.07
	Asian	43	39	29.00	2.72	0.56	1.80
	Hispanic/Latino	239	39	28.65	3.69	0.60	2.33
	Native American	1					
	White	337	39	28.54	3.22	0.60	2.05
	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	42	39	28.81	2.80	0.62	1.71
	Male	571	39	28.55	3.44	0.62	2.12
	Female	230	39	28.79	3.21	0.57	2.12
	Title 1	435	39	29.03	3.31	0.57	2.18
	English Learner	139	39	28.92	3.53	0.61	2.22
	Former EL	20	39	28.65	3.38	0.82	1.45
	SWD	798	39	28.64	3.36	0.61	2.11
	Plan504	3					
6	All Students	757	39	28.33	3.65	0.68	2.07
	EL/FEL	142	39	28.87	3.39	0.68	1.91

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	Low Income	512	39	28.35	3.69	0.71	1.97
	African American/Black	106	39	28.76	3.77	0.72	1.98
	Asian	55	39	28.64	3.05	0.65	1.79
	Hispanic/Latino	225	39	28.65	3.70	0.72	1.95
	Native American	2					
	White	338	39	28.07	3.56	0.64	2.13
	Pacific Islander/Hawaiian	1					
6	Multi-Race; Non-Hispanic/Latino	28	39	26.93	4.19	0.58	2.70
	Male	493	39	28.34	3.72	0.67	2.13
	Female	264	39	28.32	3.51	0.69	1.96
	Title 1	365	39	28.97	3.50	0.68	1.99
	English Learner	127	39	28.92	3.38	0.66	1.97
	Former EL	15	39	28.47	3.52	0.84	1.42
	SWD	751	39	28.34	3.65	0.68	2.06
	Plan504	2					
	All Students	719	39	28.25	3.74	0.70	2.04
	EL/FEL	156	39	28.39	4.08	0.75	2.04
	Low Income	501	39	28.33	3.71	0.71	2.01
	African American/Black	121	39	28.06	3.65	0.68	2.06
	Asian	42	39	28.02	4.09	0.56	2.73
	Hispanic/Latino	217	39	28.68	3.79	0.72	2.01
	Native American	3					
	White	305	39	27.96	3.71	0.73	1.93
7	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	26	39	29.00	3.68	0.56	2.44
	Male	505	39	28.04	3.81	0.70	2.09
	Female	214	39	28.74	3.51	0.71	1.88
	Title 1	355	39	28.72	3.61	0.70	1.97
	English Learner	135	39	28.58	3.93	0.73	2.06
	Former EL	21	39	27.19	4.86	0.84	1.95
	SWD	712	39	28.25	3.74	0.70	2.03
	Plan504	3					
	All Students	722	39	28.66	3.48	0.67	2.00
	EL/FEL	138	39	29.22	3.40	0.72	1.80
	Low Income	504	39	28.69	3.50	0.71	1.88
	African American/Black	118	39	28.86	3.71	0.79	1.71
	Asian	54	39	28.48	3.59	0.58	2.32
	Hispanic/Latino	212	39	28.69	3.48	0.69	1.94
	Native American	1					
8	White	303	39	28.48	3.49	0.64	2.10
	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	29	39	29.83	2.25	0.33	1.84
	Male	491	39	28.66	3.41	0.62	2.10
	Female	229	39	28.66	3.64	0.74	1.84
	Title 1	334	39	29.40	3.21	0.72	1.71
	English Learner	121	39	29.26	3.42	0.74	1.74

continued

Grade	Subgroup	Number of Students	Raw Score				
			Maximum	Mean	Standard Deviation	Alpha	SEM
	Former EL	17	39	28.94	3.34	0.42	2.55
8	SWD	714	39	28.68	3.47	0.67	1.99
	Plan504	1					
	All Students	694	39	28.16	4.02	0.61	2.51
	EL/FEL	123	39	28.13	4.54	0.65	2.70
	Low Income	468	39	28.06	4.07	0.61	2.56
	African American/Black	113	39	28.86	3.79	0.68	2.14
	Asian	37	39	28.05	3.90	0.65	2.30
	Hispanic/Latino	202	39	28.16	4.35	0.63	2.64
	Native American	2					
	White	314	39	27.87	3.91	0.57	2.57
10	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	25	39	28.68	3.67	0.20	3.29
	Male	456	39	28.17	4.01	0.60	2.55
	Female	238	39	28.14	4.03	0.63	2.44
	Title 1	248	39	28.52	4.23	0.64	2.55
	English Learner	119	39	28.08	4.60	0.65	2.72
	Former EL	4					
	SWD	689	39	28.14	4.02	0.61	2.52
	Plan504	3					

No reliability or SEM values are reported for some subgroups, because there were some items for which only one student in the subgroup received a score.

Table M-7. Subgroup Reliabilities—Alt/Mathematics

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	All Students	747	26	21.08	1.49	0.55	1.00
	EL/FEL	189	26	21.00	1.53	0.52	1.06
	Low Income	542	26	21.11	1.50	0.59	0.96
	African American/Black	129	26	21.35	1.14	0.51	0.80
	Asian	58	26	20.97	1.73	0.57	1.13
	Hispanic/Latino	241	26	21.04	1.55	0.59	0.99
	Native American	0					
	White	292	26	20.99	1.54	0.52	1.06
3	Pacific Islander/Hawaiian	2					
	Multi-Race; Non-Hispanic/Latino	23	26	21.39	1.23	0.48	0.89
	Male	536	26	21.12	1.46	0.54	0.99
	Female	210	26	20.97	1.56	0.56	1.03
	Title 1	434	26	21.10	1.47	0.59	0.94
	English Learner	154	26	21.08	1.48	0.54	1.00
	Former EL	35	26	20.66	1.70	0.43	1.28
	SWD	741	26	21.08	1.48	0.55	1.00
	Plan504	2					
	All Students	809	26	21.02	1.56	0.58	1.01
	EL/FEL	194	26	21.08	1.54	0.62	0.96
	Low Income	565	26	21.04	1.54	0.60	0.97
	African American/Black	105	26	21.33	1.31	0.66	0.77
	Asian	67	26	20.87	1.80	0.60	1.14
	Hispanic/Latino	269	26	21.06	1.60	0.62	0.98
	Native American	2					
	White	325	26	20.94	1.52	0.50	1.08
4	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	40	26	20.80	1.74	0.67	1.00
	Male	564	26	21.04	1.53	0.56	1.02
	Female	245	26	20.97	1.63	0.62	1.00
	Title 1	462	26	21.29	1.33	0.62	0.82
	English Learner	176	26	21.08	1.54	0.60	0.98
	Former EL	18	26	21.06	1.63	0.81	0.71
	SWD	807	26	21.02	1.56	0.58	1.01
	Plan504	1					
	All Students	733	26	21.15	1.46	0.65	0.86
	EL/FEL	136	26	21.25	1.44	0.81	0.63
	Low Income	495	26	21.21	1.37	0.66	0.80
	African American/Black	117	26	21.20	1.33	0.55	0.89
	Asian	36	26	21.17	1.42	0.67	0.82
	Hispanic/Latino	207	26	21.22	1.37	0.66	0.80
	Native American	3					
	White	325	26	21.09	1.56	0.68	0.88
5	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	43	26	21.14	1.55	0.62	0.96
	Male	516	26	21.15	1.44	0.63	0.88
	Female	216	26	21.17	1.50	0.70	0.82
	Title 1	383	26	21.41	1.21	0.73	0.63
	English Learner	118	26	21.32	1.37	0.82	0.59
	Former EL	18	26	20.83	1.82	0.75	0.92
	SWD	728	26	21.16	1.46	0.65	0.86
	Plan504	5					
	All Students	702	26	20.97	1.61	0.63	0.99
	EL/FEL	132	26	21.14	1.68	0.73	0.88
6	Low Income	480	26	20.91	1.68	0.64	1.01
	African American/Black	104	26	20.97	1.63	0.60	1.03
	Asian	52	26	21.06	1.51	0.73	0.78

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
6	Hispanic/Latino	211	26	21.05	1.72	0.69	0.96
	Native American	2					
	White	305	26	20.87	1.59	0.58	1.03
	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	26	26	21.23	1.07	0.42	0.82
	Male	459	26	21.00	1.61	0.62	0.99
	Female	243	26	20.90	1.61	0.63	0.98
	Title 1	341	26	21.10	1.52	0.63	0.93
	English Learner	115	26	21.14	1.68	0.73	0.88
	Former EL	17	26	21.12	1.73	0.74	0.88
	SWD	697	26	20.97	1.61	0.63	0.98
	Plan504	2					
7	All Students	654	26	21.05	1.64	0.65	0.97
	EL/FEL	147	26	21.08	1.81	0.69	1.01
	Low Income	458	26	21.09	1.61	0.65	0.95
	African American/Black	106	26	20.93	1.90	0.58	1.23
	Asian	38	26	21.14	1.55	0.53	1.06
	Hispanic/Latino	200	26	21.19	1.56	0.74	0.79
	Native American	2					
	White	277	26	20.96	1.64	0.65	0.97
	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	28	26	21.32	1.25	0.34	1.01
	Male	447	26	21.10	1.61	0.68	0.91
	Female	207	26	20.96	1.70	0.58	1.10
	Title 1	322	26	21.26	1.48	0.65	0.87
	English Learner	126	26	21.24	1.58	0.55	1.06
	Former EL	21	26	20.10	2.64	0.83	1.08
	SWD	650	26	21.05	1.64	0.65	0.97
	Plan504	4					
8	All Students	636	26	21.03	1.58	0.59	1.01
	EL/FEL	117	26	21.03	1.58	0.59	1.02
	Low Income	442	26	21.05	1.54	0.59	0.98
	African American/Black	105	26	20.90	1.88	0.73	0.98
	Asian	50	26	21.12	1.57	0.52	1.09
	Hispanic/Latino	176	26	21.05	1.56	0.58	1.01
	Native American	1					
	White	271	26	21.02	1.49	0.55	1.00
	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	28	26	21.25	1.38	0.34	1.12
	Male	428	26	21.08	1.43	0.50	1.02
	Female	206	26	20.91	1.84	0.70	1.00
	Title 1	282	26	21.30	1.31	0.58	0.85
	English Learner	100	26	21.00	1.60	0.60	1.02
	Former EL	17	26	21.24	1.48	0.50	1.04
	SWD	628	26	21.05	1.54	0.58	1.00
	Plan504	3					
10	All Students	676	39	30.41	3.64	0.82	1.56
	EL/FEL	122	39	30.52	3.80	0.76	1.87
	Low Income	457	39	30.33	3.69	0.80	1.66
	African American/Black	108	39	30.49	3.67	0.80	1.64
	Asian	38	39	28.87	4.21	0.79	1.91
	Hispanic/Latino	195	39	30.91	3.61	0.80	1.60
	Native American	2					
	White	306	39	30.25	3.55	0.84	1.44
	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	26	39	30.54	3.65	0.78	1.71
	Male	447	39	30.31	3.81	0.82	1.61
	Female	229	39	30.62	3.29	0.81	1.45

continued

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	Title 1	240	39	30.64	3.64	0.86	1.37
	English Learner	118	39	30.50	3.85	0.76	1.88
10	Former EL	4					
	SWD	671	39	30.41	3.64	0.82	1.56
	Plan504	4					

No reliability or SEM values are reported for some subgroups, because in some cases there were some items for which only one student in the subgroup received a score, and in other cases, the sample size of the subgroup or the number of items is too small to produce meaningful calculations.

Table M-8. Subgroup Reliabilities—Alt/STE

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	All Students	758	39	30.31	3.17	0.72	1.68
	EL/FEL	142	39	30.81	3.00	0.71	1.61
	Low Income	515	39	30.37	3.14	0.73	1.65
	African American/Black	127	39	30.07	3.64	0.69	2.01
	Asian	43	39	30.40	3.03	0.76	1.48
	Hispanic/Latino	224	39	30.67	2.87	0.69	1.60
	Native American	3					
	White	317	39	30.20	3.20	0.70	1.75
5	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	42	39	29.79	3.15		
	Male	540	39	30.22	3.23	0.68	1.82
	Female	217	39	30.57	3.01	0.76	1.48
	Title 1	408	39	30.81	2.85	0.69	1.58
	English Learner	122	39	31.01	2.87	0.71	1.53
	Former EL	20	39	29.65	3.56		
	SWD	753	39	30.34	3.16	0.72	1.68
	Plan504	3					
	All Students	695	39	30.18	3.09	0.78	1.46
	EL/FEL	121	39	30.68	2.73	0.72	1.45
	Low Income	492	39	30.34	3.00	0.80	1.33
	African American/Black	115	39	30.36	3.24	0.85	1.24
	Asian	52	39	30.23	3.10	0.77	1.48
	Hispanic/Latino	196	39	30.31	2.85	0.77	1.36
	Native American	1					
	White	295	39	30.02	3.15	0.74	1.59
8	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	31	39	29.81	3.69		
	Male	480	39	30.26	2.93	0.72	1.54
	Female	213	39	29.95	3.43	0.84	1.37
	Title 1	308	39	30.65	2.88	0.82	1.21
	English Learner	104	39	30.55	2.86	0.74	1.45
	Former EL	17	39	31.41	1.62	0.60	1.03
	SWD	686	39	30.19	3.10	0.77	1.47
	Plan504	2					

Table M-9. Subgroup Reliabilities—Alt/Biology

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	All Students	417	39	30.61	3.22	0.67	1.84
	EL/FEL	75	39	31.64	2.28	0.64	1.37
	Low Income	266	39	30.56	3.21	0.66	1.88
	African American/Black	60	39	30.72	3.48	0.69	1.94
	Asian	28	39	30.89	2.79	0.65	1.65
	Hispanic/Latino	98	39	31.14	2.60	0.66	1.52
	Native American	3					
	White	210	39	30.34	3.38	0.68	1.91
HS	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	18	39	29.78	3.96	0.59	2.53
	Male	291	39	30.52	3.22	0.67	1.84
	Female	126	39	30.81	3.22	0.67	1.84
	Title 1	138	39	30.94	3.14	0.67	1.79
	English Learner	70	39	31.69	2.20	0.64	1.32
	Former EL	5					
	SWD	416	39	30.60	3.22	0.67	1.84
	Plan504	2					

Due to the small sample size of the subgroup and the small number of items, the calculation of coefficient alpha does not produce meaningful values.

Table M-10. Subgroup Reliabilities—Alt/Chemistry

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
	All Students	114	39	32.01	2.43	0.71	1.31
	EL/FEL	24	39	32.36	2.08	0.94	0.51
	Low Income	93	39	32.00	2.44	0.71	1.31
	African American/Black	18	39	31.94	2.62	0.75	1.30
	Asian	7					
	Hispanic/Latino	58	39	32.09	2.56	0.82	1.10
	Native American	2					
	White	24	39	31.83	2.22	0.62	1.36
HS	Pacific Islander/Hawaiian	1					
	Multi-Race; Non-Hispanic/Latino	4					
	Male	72	39	31.99	2.33	0.73	1.21
	Female	42	39	32.05	2.63	0.63	1.60
	Title 1	79	39	32.23	2.31	0.80	1.05
	English Learner	24	39	32.36	2.08	0.94	0.51
	Former EL	0					
	SWD	113	39	32.01	2.43	0.71	1.31
	Plan504	1					

Due to the small sample size of the subgroup and the small number of items, the calculation of coefficient alpha does not produce meaningful values.

Table M-11. Subgroup Reliabilities—Alt/Introductory Physics

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
HS	All Students	74	39	30.26	3.00	0.67	1.72
	EL/FEL	13	39	31.38	2.69	0.75	1.35
	Low Income	45	39	30.58	3.02	0.64	1.80
	African American/Black	14	39	31.29	2.49	0.62	1.53
	Asian	7					
	Hispanic/Latino	14	39	31.29	2.02	0.68	1.13
	Native American	0					
	White	34	39	29.71	3.19	0.64	1.90
	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	5					
	Male	52	39	30.27	3.07	0.66	1.79
	Female	22	39	30.23	2.91	0.73	1.52
	Title 1	21	39	32.19	1.57	0.73	0.81
	English Learner	13	39	31.38	2.69	0.75	1.35
	Former EL	0					
	SWD	74	39	30.26	3.00	0.67	1.72
	Plan504	1					

Table M-12. Subgroup Reliabilities—Alt/Technology/Engineering

Grade	Subgroup	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
HS	All Students	72	39	31.23	3.15	0.82	1.32
	EL/FEL	14	39	31.25	2.73	0.74	1.40
	Low Income	49	39	30.89	3.43	0.84	1.39
	African American/Black	21	39	31.75	2.81	0.93	0.72
	Asian	3					
	Hispanic/Latino	15	39	31.64	2.73	0.83	1.12
	Native American	0					
	White	27	39	30.59	3.70	0.83	1.52
	Pacific Islander/Hawaiian	0					
	Multi-Race; Non-Hispanic/Latino	6					
	Male	44	39	31.60	2.80	0.80	1.25
	Female	28	39	30.63	3.62	0.86	1.35
	Title 1	12	39	29.33	4.08	0.79	1.87
	English Learner	14	39	31.25	2.73	0.74	1.40
	Former EL	0					
	SWD	72	39	31.23	3.15	0.82	1.32
	Plan504	0					

Table M-13. Reliabilities by Reporting Category by Grade—ELA

Grade	Item Reporting Category	Number of Items	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	LA	8	12	6.76	2.96	0.73	1.54
	RE	24	28	17.13	6.37	0.88	2.23
	WR	1	4	1.12	0.88	NaN	NaN
4	LA	7	12	6.51	2.78	0.68	1.57
	RE	25	28	17.87	5.59	0.83	2.29
	WR	1	4	1.21	0.79	NaN	NaN
5	LA	9	14	7.95	3.16	0.73	1.64
	RE	22	26	17.99	5.54	0.84	2.19
	WR	2	8	2.82	1.63	0.72	0.86
6	LA	6	10	5.90	2.49	0.66	1.45
	RE	25	30	18.47	6.24	0.85	2.45
	WR	2	10	3.25	2.09	0.80	0.95
7	LA	7	12	7.30	3.22	0.74	1.65
	RE	24	28	16.92	5.99	0.84	2.42
	WR	2	10	3.29	2.49	0.70	1.36
8	LA	6	11	7.22	2.81	0.69	1.57
	RE	25	29	19.37	5.78	0.84	2.33
	WR	2	10	4.08	2.30	0.82	0.97
10	LA	7	11	8.52	2.55	0.72	1.36
	RE	23	30	20.92	6.28	0.85	2.43
	WR	2	10	5.32	2.22	0.85	0.86

Table M-14. Reliabilities by Reporting Category by Grade—Mathematics

Grade	Item Reporting Category	Number of Items	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	GE	4	4	2.26	1.22	0.49	0.87
	MD	10	12	7.04	3.08	0.77	1.47
	NF	7	9	5.68	2.54	0.74	1.29
	NT	6	8	4.71	2.24	0.74	1.15
	OA	13	15	9.69	3.94	0.81	1.72
4	GE	5	5	3.61	1.38	0.64	0.83
	MD	8	11	5.57	2.68	0.67	1.54
	NF	13	16	10.12	4.06	0.83	1.68
	NT	7	11	7.20	2.66	0.70	1.46
	OA	7	11	6.68	2.68	0.68	1.52
5	GE	4	5	3.08	1.35	0.50	0.96
	MD	7	11	5.96	2.73	0.69	1.52
	NF	11	14	7.80	3.44	0.74	1.75
	NT	13	16	9.64	4.19	0.83	1.75
	OA	5	8	4.04	1.99	0.50	1.41
6	EE	12	16	8.30	4.33	0.83	1.76
	GE	5	8	3.32	2.49	0.55	1.66
	RP	7	11	5.68	3.18	0.76	1.55
	SP	8	8	4.86	1.94	0.60	1.23
	NS	8	11	6.69	2.90	0.67	1.67
7	EE	12	13	6.80	3.58	0.83	1.46
	GE	5	8	3.07	2.24	0.58	1.45
	RP	7	11	5.61	2.96	0.68	1.67
	SP	8	11	5.00	2.94	0.74	1.49
	NS	8	11	4.94	3.31	0.71	1.77
8	FN	7	11	5.61	3.08	0.68	1.73
	GE	12	16	7.97	4.39	0.85	1.72
	SP	4	7	4.83	1.88	0.58	1.22
	NE	17	20	10.53	5.02	0.82	2.13
10	FN	17	21	10.84	5.63	0.87	2.01
	GE	15	21	11.11	5.30	0.83	2.20
	NE	5	9	5.34	2.77	0.67	1.60
	SP	5	9	4.45	2.23	0.66	1.29

Table M-15. Reliabilities by Reporting Category by Grade—STE

Grade	Item Reporting Category	Number of Items	Raw Score		Standard Deviation	Alpha	SEM
			Maximum	Mean			
5	ES	11	14	8.69	3.19	0.73	1.64
	LS	10	14	8.17	2.74	0.69	1.53
	PS	11	14	7.61	2.98	0.68	1.69
	TE	9	12	7.44	2.70	0.70	1.47
8	ES	11	14	7.06	3.14	0.68	1.79
	LS	11	14	7.10	3.20	0.70	1.75
	PS	9	13	7.38	2.92	0.69	1.62
	TE	10	13	7.55	3.15	0.71	1.68

Table M-16. Reliabilities by Reporting Category by Grade—Biology

Grade	Item Reporting Category	Number of Items	Raw Score		Standard Deviation	Alpha	SEM
			Maximum	Mean			
HS	EC	10	12	7.32	2.86	0.71	1.54
	EV	8	12	6.35	3.06	0.72	1.62
	HE	12	15	9.39	3.65	0.79	1.67
	MO	12	21	10.89	4.80	0.77	2.29

Table M-17. Reliabilities by Reporting Category by Grade—Introductory Physics

Grade	Item Reporting Category	Number of Items	Raw Score		Standard Deviation	Alpha	SEM
			Maximum	Mean			
HS	EN	13	18	9.88	4.24	0.79	1.96
	MF	21	30	17.48	6.26	0.85	2.43
	WA	8	12	6.54	2.82	0.69	1.56

Table M-18. SEM by Achievement Level by Grade—Alt/ELA

Grade	Achievement Level	Number of Students	Raw Score		Standard Deviation	SEM
			Maximum	Mean		
3	Awareness	31	39	19.68	2.90	4.83
	Emerging	455	39	26.27	3.04	2.42
	Progressing	370	39	30.85	1.08	0.93
4	Awareness	29	39	20.28	3.43	3.02
	Emerging	419	39	25.94	3.22	2.43
	Progressing	466	39	30.87	1.12	0.92
	Partially Meeting Expectations-Alt	1				
	Not Meeting Expectations-Alt	2				
5	Awareness	20	39	19.80	2.95	3.81
	Emerging	368	39	26.55	2.92	2.36
	Progressing	413	39	30.87	1.18	0.94
	Not Meeting Expectations-Alt	1				
6	Awareness	13	39	20.08	3.90	4.47
	Emerging	346	39	25.68	3.19	2.23
	Progressing	398	39	30.88	1.15	0.93
7	Awareness	31	39	19.67	2.62	2.37
	Emerging	321	39	26.03	3.04	2.45
	Progressing	366	39	30.89	1.19	0.93
	Not Meeting Expectations-Alt	1				
8	Awareness	22	39	20.55	3.78	3.49
	Emerging	289	39	26.12	2.96	2.29
	Progressing	410	39	30.89	1.17	0.92
	Not Meeting Expectations-Alt	1				
10	Awareness	16	39	20.13	2.45	3.63
	Emerging	290	39	25.11	3.03	2.54
	Progressing	380	39	30.97	1.19	0.97
	Partially Meeting Expectations-Alt	1				
	Not Meeting Expectations-Alt	7				

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

Table M-19. SEM by Achievement Level by Grade—Alt/Mathematics

Grade	Achievement Level	Number of Students	Raw Score		Standard Deviation	SEM
			Maximum	Mean		
3	Awareness	20	26	16.10	0.91	2.18
	Emerging	99	26	19.02	1.17	1.84
	Progressing	623	26	21.55	0.81	0.59
	Not Meeting Expectations-Alt	5				
4	Awareness	24	26	15.83	1.05	2.08
	Emerging	112	26	18.90	1.20	1.80
	Progressing	670	26	21.57	0.76	0.59
	Not Meeting Expectations-Alt	3				
5	Awareness	19	26	15.94	1.51	1.58
	Emerging	82	26	19.01	1.23	1.74
	Progressing	632	26	21.58	0.81	0.56
6	Awareness	19	26	15.53	1.17	2.07
	Emerging	115	26	18.80	1.18	1.77
	Progressing	568	26	21.59	0.74	0.57
7	Awareness	20	26	15.47	1.78	2.27
	Emerging	85	26	18.88	1.34	1.67
	Progressing	547	26	21.61	0.67	0.57
	Not Meeting Expectations-Alt	2				
8	Awareness	27	26	16.11	1.37	2.12
	Emerging	80	26	18.99	1.14	1.79
	Progressing	528	26	21.60	0.69	0.58
	Not Meeting Expectations-Alt	1				
10	Awareness	10	39	23.70	2.16	
	Emerging	167	39	25.17	2.29	1.10
	Progressing	491	39	32.32	1.14	0.65
	Partially Meeting Expectations-Alt	1				
	Not Meeting Expectations-Alt	7				

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

Table M-20. SEM by Achievement Level by Grade—Alt/STE

Grade	Achievement Level	Number of Students	Raw Score		Standard Deviation	SEM
			Maximum	Mean		
5	Awareness	33	39	23.47	2.30	3.27
	Emerging	149	39	26.12	2.38	2.24
	Progressing	575	39	31.78	1.47	1.01
	Not Meeting Expectations-Alt	1				
8	Awareness	28	39	23.39	2.30	
	Emerging	149	39	26.28	2.12	1.62
	Progressing	518	39	31.67	1.46	0.92

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

Table M-21. SEM by Performance Level by Grade—Alt/Biology

Grade	Performance Level	Number of Students	Raw Score			SEM
			Maximum	Mean	Standard Deviation	
HS	Awareness	15	39	23.00	3.23	3.55
	Emerging	75	39	26.25	2.37	2.73
	Progressing	321	39	31.84	1.39	1.01
	Meeting Expectations-Alt	5				
	Not Meeting Expectations-Alt	1				

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

Table M-22. SEM by Performance Level by Grade—Alt/Chemistry

Grade	Performance Level	Number of Students	Raw Score			SEM
			Maximum	Mean	Standard Deviation	
HS	Emerging	11	39	24.80	1.55	0.63
	Progressing	103	39	32.72	0.79	0.52

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

Table M-23. SEM by Performance Level by Grade— Alt/Introductory Physics

Grade	Performance Level	Number of Students	Raw Score			SEM
			Maximum	Mean	Standard Deviation	
HS	Awareness	5				
	Emerging	15	39	27.07	2.12	2.62
	Progressing	54	39	31.72	1.55	1.05

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

Table M-24. SEM by Performance Level by Grade— Alt/Technology/Engineering

Grade	Performance Level	Number of Students	Raw Score			SEM
			Maximum	Mean	Standard Deviation	
HS	Emerging	14	39	25.64	2.06	1.87
	Progressing	58	39	32.63	1.24	0.48

Due to the small sample size of the subgroup, the calculation of SEM does not produce meaningful values.

APPENDIX N
ACHIEVEMENT-LEVEL SCORE DISTRIBUTIONS

Table N-1. Achievement-Level Distributions by Grade—ELA[1]

Grade	Achievement Level	Number of Students[2]	Percent in Level 2023	2022	2021[3]	2019
3	Not Meeting Expectations	9,478	15	14	9	7
	Partially Meeting Expectations	25,627	41	42	40	37
	Meeting Expectations	23,662	37	38	42	47
	Exceeding Expectations	4,487	7	6	10	10
4	Not Meeting Expectations	10,379	16	15	12	8
	Partially Meeting Expectations	28,231	44	46	38	40
	Meeting Expectations	22,510	35	35	43	43
	Exceeding Expectations	3,521	5	4	6	9
5	Not Meeting Expectations	9,708	15	12	11	7
	Partially Meeting Expectations	26,351	41	47	42	40
	Meeting Expectations	25,350	39	36	39	46
	Exceeding Expectations	3,363	5	5	8	7
6	Not Meeting Expectations	14,845	23	21	21	12
	Partially Meeting Expectations	22,737	35	37	31	34
	Meeting Expectations	22,786	35	34	35	41
	Exceeding Expectations	5,370	8	8	12	13
7	Not Meeting Expectations	11,974	18	18	19	12
	Partially Meeting Expectations	26,875	41	40	38	39
	Meeting Expectations	21,768	33	36	37	41
	Exceeding Expectations	5,183	8	5	6	9
8	Not Meeting Expectations	14,432	21	17	17	12
	Partially Meeting Expectations	23,289	34	40	42	35
	Meeting Expectations	23,042	34	36	35	41
	Exceeding Expectations	6,796	10	7	7	11
10	Not Meeting Expectations	7,235	10	7	8	7
	Partially Meeting Expectations	21,466	31	35	27	32
	Meeting Expectations	30,265	43	50	46	48
	Exceeding Expectations	10,841	16	9	20	14

[1] This table presents distributions from the standard MCAS ELA tests. Distributions from the MCAS-Alt assessment are displayed in Table N-6.
[2] These results are based on the psychometric data sample used to conduct equating, not on the whole population of students.
[3] Testing was not conducted in 2020 due to Covid-19.

Table N-2. Achievement-Level Distributions by Grade—Mathematics[1]

Grade	Achievement Level	Number of Students[2]	Percent in Level			
			2023	2022	2021[3]	2019
3	Not Meeting Expectations	11,818	19	19	25	11
	Partially Meeting Expectations	25,556	40	40	41	39
	Meeting Expectations	21,416	34	35	28	41
	Exceeding Expectations	5,063	8	6	6	9
4	Not Meeting Expectations	10,621	16	16	23	11
	Partially Meeting Expectations	24,864	38	41	44	39
	Meeting Expectations	24,122	37	37	30	42
	Exceeding Expectations	5,514	8	6	4	8
5	Not Meeting Expectations	7,717	12	15	19	9
	Partially Meeting Expectations	30,782	47	49	48	42
	Meeting Expectations	23,496	36	33	30	43
	Exceeding Expectations	3,434	5	4	4	6
6	Not Meeting Expectations	10,812	16	14	22	9
	Partially Meeting Expectations	27,958	42	44	45	39
	Meeting Expectations	23,072	35	37	29	42
	Exceeding Expectations	4,369	7	5	5	11
7	Not Meeting Expectations	14,026	21	18	17	12
	Partially Meeting Expectations	26,619	40	45	48	40
	Meeting Expectations	20,385	31	31	29	38
	Exceeding Expectations	5,080	8	7	6	11
8	Not Meeting Expectations	13,030	19	16	21	11
	Partially Meeting Expectations	28,977	43	47	47	42
	Meeting Expectations	20,727	31	30	29	37
	Exceeding Expectations	5,122	8	7	4	10
10	Not Meeting Expectations	5,330	8	9	11	8
	Partially Meeting Expectations	29,867	43	41	35	33
	Meeting Expectations	27,933	40	39	42	45
	Exceeding Expectations	7,039	10	11	13	13

[1] This table presents distributions from the standard MCAS Mathematics tests. Distributions from the MCAS-Alt assessment are displayed in Table N-7.
[2] These results are based on the psychometric data sample used to conduct equating, not on the whole population of students.
[3] Testing was not conducted in 2020 due to Covid-19.

Table N-3. Achievement-Level Distributions by Grade—STE[1]

Grade	Achievement Level	Number of Students[2]	Percent in Level			
			2023	2022	2021[3]	2019
5	Not Meeting Expectations	11,398	18	17	18	11
	Partially Meeting Expectations	26,245	40	40	40	40
	Meeting Expectations	21,820	34	36	36	41
	Exceeding Expectations	5,474	8	7	7	9
8	Not Meeting Expectations	12,074	18	17	15	11
	Partially Meeting Expectations	27,565	41	41	44	42
	Meeting Expectations	23,866	35	37	34	39
	Exceeding Expectations	3,967	6	6	8	8

[1] This table presents distributions from the standard MCAS STE tests. Distributions from the MCAS-Alt assessment are displayed beginning with Table N-8.
[2] These results are based on the psychometric data sample used to conduct equating, not on the whole population of students.
[3] Testing was not conducted in 2020 due to Covid-19.

Table N-4. Achievement-Level Distributions by Grade—Biology

Grade	Achievement Level	Number of Students	Percent in Level 2023	2022	2021[1]	2019
HS	Not Meeting Expectations	8,410	15	15	--	--
	Partially Meeting Expectations	20,285	37	40	--	--
	Meeting Expectations	20,547	37	34	--	--
	Exceeding Expectations	5,796	11	11	--	--

[1] *2022 was the first year Biology was administered as a Next-Generation MCAS test.*

Table N-5. Achievement-Level Distributions by Grade—Introductory Physics

Grade	Achievement Level	Number of Students	Percent in Level 2023	2022	2021[1]	2019
HS	Not Meeting Expectations	1,684	12	10	--	--
	Partially Meeting Expectations	5,173	37	41	--	--
	Meeting Expectations	5,016	36	37	--	--
	Exceeding Expectations	2,217	16	12	--	--

[1] *2022 was the first year Introductory Physics was administered as a Next-Generation MCAS test.*

Table N-6. Achievement-Level Distributions by Grade—Alt/ELA

Grade	Achievement Level	Percent in Level 2023	2022	2021[1]	2019
3	Partially Meeting Expectations	0	0	0	0
	Progressing	41	40	41	53
	Emerging	50	48	46	39
	Awareness	3	4	3	2
	Incomplete	6	8	10	5
4	Partially Meeting Expectations	0	0	0	0
	Progressing	48	47	45	58
	Emerging	43	45	44	37
	Awareness	3	3	3	2
	Incomplete	5	5	9	4
5	Partially Meeting Expectations	0	0	0	0
	Progressing	49	46	46	57
	Emerging	44	42	42	36
	Awareness	2	2	2	2
	Incomplete	5	9	11	5
6	Partially Meeting Expectations	0	0	0	0
	Progressing	49	46	44	55
	Emerging	43	45	42	37
	Awareness	2	2	3	2
	Incomplete	7	8	12	6
7	Partially Meeting Expectations	0	0	0	0
	Progressing	46	48	42	56
	Emerging	41	41	41	34
	Awareness	4	3	2	2
	Incomplete	9	8	15	8
8	Partially Meeting Expectations	0	0	0	0
	Progressing	52	47	47	58
	Emerging	37	42	35	35
	Awareness	3	3	2	2
	Incomplete	8	8	16	5
10	Advanced	0	0	0	0
	Proficient	0	0	0	0
	Needs Improvement	0	0	0	0
	Progressing	48	48	45	55
	Emerging	38	38	40	36
	Awareness	3	2	2	1
	Incomplete	11	12	13	8

[1] *Testing was not conducted in 2020 due to Covid-19.*

Table N-7. Achievement-Level Distributions by Grade—Alt/Mathematics

Grade	Achievement Level	Percent in Level			
		2023	2022	2021[1]	2019
3	Partially Meeting Expectations	0	0	0	0
	Progressing	69	68	69	78
	Emerging	11	11	9	9
	Awareness	2	2	1	2
	Incomplete	18	19	20	11
4	Partially Meeting Expectations	0	0	0	0
	Progressing	69	72	71	79
	Emerging	12	10	12	8
	Awareness	2	1	2	2
	Incomplete	17	16	15	11
5	Partially Meeting Expectations	0	0	0	0
	Progressing	75	68	72	77
	Emerging	10	10	10	10
	Awareness	2	2	2	2
	Incomplete	13	20	17	12
6	Partially Meeting Expectations	0	0	0	0
	Progressing	70	71	70	81
	Emerging	14	12	10	7
	Awareness	2	2	3	2
	Incomplete	13	15	17	10
7	Partially Meeting Expectations	0	0	0	0
	Progressing	68	71	67	75
	Emerging	11	11	8	9
	Awareness	3	2	3	1
	Incomplete	19	16	23	15
8	Partially Meeting Expectations	0	0	0	0
	Progressing	68	68	67	76
	Emerging	10	13	7	9
	Awareness	3	3	2	1
	Incomplete	18	17	24	14
10	Advanced	0	0	0	0
	Proficient	0	0	0	0
	Needs Improvement	0	0	0	0
	Progressing	63	66	66	72
	Emerging	23	22	18	17
	Awareness	2	2	2	1
	Incomplete	13	11	15	10

[1] *Testing was not conducted in 2020 due to Covid-19.*

Table N-8. Achievement-Level Distributions by Grade—Alt/STE

Grade	Achievement Level	Percent in Level			
		2023	2022	2021[1]	2019
5	Needs Improvement	0	0	0	0
	Progressing	70	61	57	65
	Emerging	18	22	22	23
	Awareness	4	4	4	3
	Incomplete	7	12	18	10
8	Needs Improvement	0	0	0	0
	Progressing	67	65	57	70
	Emerging	19	19	16	16
	Awareness	4	5	3	2
	Incomplete	10	12	23	11

1 Testing was not conducted in 2020 due to Covid-19.

Table N-9 Achievement-Level Distributions—Alt/Biology

Grade	Achievement Level	Percent in Level			
		2023	2022	2021[1]	2019
HS	Advanced	0	0	0	0
	Proficient	0	0	0	0
	Needs Improvement	0	0	0	0
	Progressing	63	60	45	75
	Emerging	15	19	24	14
	Awareness	3	5	5	1
	Incomplete	19	16	26	11

[1] Testing was not conducted in 2020 due to Covid-19.

Table N-10. Achievement-Level Distributions—Alt/Chemistry

Grade	Achievement Level	Percent in Level			
		2023	2022	2021[1]	2019
HS	Advanced	0	0	0	0
	Proficient	0	0	0	0
	Needs Improvement	0	0	0	2
	Progressing	84	78	78	76
	Emerging	9	8	0	6
	Awareness	0	0	0	0
	Incomplete	7	14	22	16

1 Testing was not conducted in 2020 due to Covid-19.

Table N-11. Achievement-Level Distributions—Alt/Introductory Physics

Grade	Achievement Level	Percent in Level			
		2023	2022	2021[1]	2019
HS	Advanced	0	0	0	0
	Proficient	0	0	0	0
	Needs Improvement	0	0	0	3
	Progressing	70	53	40	73
	Emerging	19	26	0	14
	Awareness	6	11	0	3
	Incomplete	5	10	60	8

1 Testing was not conducted in 2020 due to Covid-19.

Table N-12. Achievement-Level Distributions—Alt/Technology/Engineering

Grade	Achievement Level	Percent in Level			
		2023	2022	2021[1]	2019
HS	Advanced	0	0	0	0
	Proficient	0	0	0	0
	Needs Improvement	0	0	0	0
	Progressing	72	79	64	74
	Emerging	16	11	17	15
	Awareness	1	1	2	0
	Incomplete	10	10	17	11

1 Testing was not conducted in 2020 due to Covid-19.

APPENDIX O
SAMPLE REPORTS—MCAS

MOVING FORWARD TOGETHER

At the Massachusetts Department of Elementary and Secondary Education, we know that every lesson, every teacher, every pathway, and every innovation helps each student reach their full potential. That's why we're working with schools across the state to reimagine what teaching and learning looks like moving forward. We're reaching toward a better future.

From the moment your child enters kindergarten to the day they graduate from high school, we're reimagining K-12 education in Massachusetts.

dese MASSACHUSETTS Department of Elementary and Secondary Education

DEEPER LEARNING:

In today's world, young people need to understand complex information and draw connections across contexts in the classroom and in the wider world. Deeper learning helps students engage in grade-level work that's interactive and relevant.

Scan the QR code for more →

INNOVATIVE ASSESSMENT:

Students learn science through experiments, problem-solving, and discovery. On the innovative science assessment we're piloting for grades 5 and 8, students use interactive simulations to show what they can do solving real-world problems.

EDUCATOR DIVERSITY:

Studies show that all students benefit from having racially and ethnically diverse teachers. That's why the state has launched comprehensive efforts to attract and retain talented professionals from diverse backgrounds.

Scan the QR code for more →

EARLY COLLEGE:

To help more students enroll in and succeed in college, designated Early College programs help students pursue a sequence of free college courses that also meet their high school requirements.

Scan the QR code for more →

Spring 2023 MCAS Tests Parent/Guardian Report

dese MASSACHUSETTS Department of Elementary and Secondary Education

Name:
SASID:
Date of Birth:
Local Student ID:

District:
School:
Grade: 10 (original graduating class: 2025)

This report provides your child's results from the spring 2023 Massachusetts Comprehensive Assessment System (MCAS) grade 10 test administration in English Language Arts (ELA) and Mathematics, and from one of the Science and Technology/Engineering (STE) subject tests in Biology, Introductory Physics, Chemistry, or Technology/Engineering that your child took in a previous test administration. Students are eligible to take the high school STE test in the 9th or 10th grade.

The following MCAS graduation requirements are determined by a student's original graduating class, which is assigned when they first enter a Massachusetts high school (grade 9 for most students).

Students in the classes of 2025 and earlier must meet the following requirements in ELA, Mathematics, and STE to be eligible for a high school diploma (in addition to meeting all local graduation requirements):

- earn a scaled score of 472 or higher on the ELA test or retest; **or** earn a scaled score of 455–471 on the ELA test or retest **and** fulfill the requirements of an Educational Proficiency Plan (EPP) in ELA.
- earn a scaled score of 486 or higher on the Mathematics test or retest; **or** earn a scaled score of 469–485 on the Mathematics test or retest **and** fulfill the requirements of an Educational Proficiency Plan (EPP) in Mathematics.
- earn a scaled score of 467 or higher on the Biology test; **or** earn a scaled score of 470 or higher on the Introductory Physics test; **or** earn a scaled score of 220 (*Needs Improvement*) or higher on the legacy Chemistry test or Technology/Engineering test.

Students may also participate in MCAS for scholarship purposes. Students' first attempt at taking a high school test in ELA, Mathematics, and STE will be used for the eligibility criteria for the John and Abigail Adams Scholarship. More information about scholarships is available at www.doe.mass.edu/scholarships.

The boxes below show your child's Competency Determination status for graduation in each subject. If your child requires an Educational Proficiency Plan in ELA or Mathematics, information on the requirements is available at www.doe.mass.edu/assessment/epp. Information about graduation requirements is available at www.doe.mass.edu/mcas/graduation.html. If you have questions about your child's performance, we encourage you to meet with your child's teacher(s) to discuss the results.

Your Child's Overall Results in Grade 10

English Language Arts	Mathematics	Science and Technology/Eng.
PASSED and met the MCAS graduation requirement in this subject	**PASSED** and met the MCAS graduation requirement in this subject	**PREVIOUSLY PASSED** and met the MCAS graduation requirement in this subject
Exceeding Expectations	**Meeting Expectations**	**Previously Passed**
Score **532** (Score Range: 440-560)	Score **516** (Score Range: 440-560)	Score **520** (Score Range: 440-560)
Growth Percentile **86**	Growth Percentile **93**	
Details on page 2	**Details on page 3**	

What is MCAS and how are test results used?
MCAS is the Commonwealth's standards-based assessment program. MCAS has the following primary purposes:

- To help families see whether their children are making expected academic progress
- To help educators identify areas of the curriculum where students are learning well and areas where students may need additional assistance to meet grade-level expectations
- To help the state direct resources to schools that need support
- At the high school level, to determine whether students have met the state requirements for the Competency Determination (that is, whether students are eligible for a high school diploma) and to determine whether students have met the state's scholarship eligibility requirements

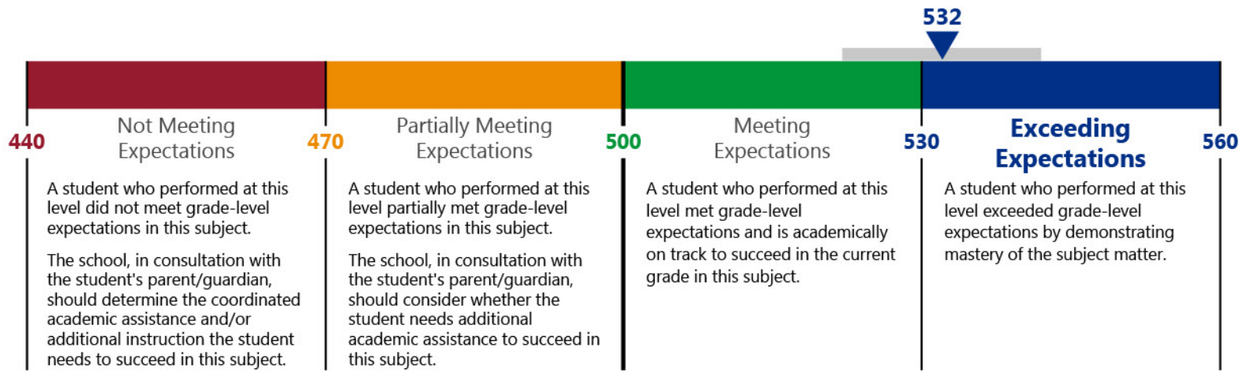
Where can you find more information?
www.doe.mass.edu/mcas/parents/

Name:
SASID:

Grade 10
Spring 2023
Computer-based test

English Language Arts

Your Child's Achievement Level: **Exceeding Expectations**
Your Child's Score: **532**



Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject.
The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject.
The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on track to succeed in the current grade in this subject.

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

The horizontal gray bars in the graphics above and below show the range of likely scores your child would receive if they took the test multiple times.

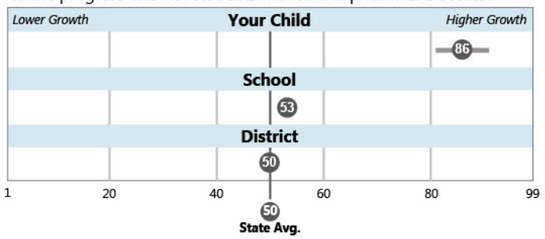
Achievement

This table shows how your child performed compared to students in their school, district, and state.

Your Child's Grade	Your Child's Score	Year	Average Score School	Average Score District	Average Score State
10	532	2023	502	497	504
8	505	2021			
6	501	2019			

2023 Student Growth Percentiles

The student growth percentile (1–99) compares your child's progress to the progress of other students with similar prior MCAS scores.



How your child performed in each reporting category and on each individual test question

Reporting Category	Points Earned by Your Child	Average Points in School	Average Points in District	Average Points in State	Total Possible Points	Average Points at Meeting Expectations*
Language (LA) †	11	8.5	8.0	8.5	11	8.9
Reading (RE)	27	20.8	19.5	20.8	30	20.9
Writing (WR) ‡	7	5.1	4.8	5.3	10	5.3

† The Language reporting category includes the standard English convention scores from essays.
‡ The Writing reporting category is based on the idea development scores from essays.

* Average number of points earned statewide by students at or near a score of 500, at the low end of the Meeting Expectations level.

Individual Test Questions

Go online to access released test questions at www.doe.mass.edu/mcas/testitems.html.

Question Number	1	2	3	4	5	6	7	8 CV	8 ID	9	10	11	12	13	14	15	16	17	18	19	20	21	22 CV	22 ID	23	24	25	26	27	28	29	30
Reporting Category	RE	LA	LA	RE	RE	RE	RE	LA	WR	RE	RE	RE	RE	RE	RE	RE	RE	RE	LA	RE	LA	RE	RE	LA	WR	RE	LA	RE	RE	RE	RE	RE	RE
Points Earned	1/1	1/1	1/1	1/1	1/1	1/1	2/2	3/3	3/5	1/1	1/1	1/1	2/2	2/2	1/1	1/1	0/1	1/1	1/1	1/1	0/2	2/2	3/3	4/5	1/1	1/1	1/1	1/1	1/1	1/1	2/2	2/2

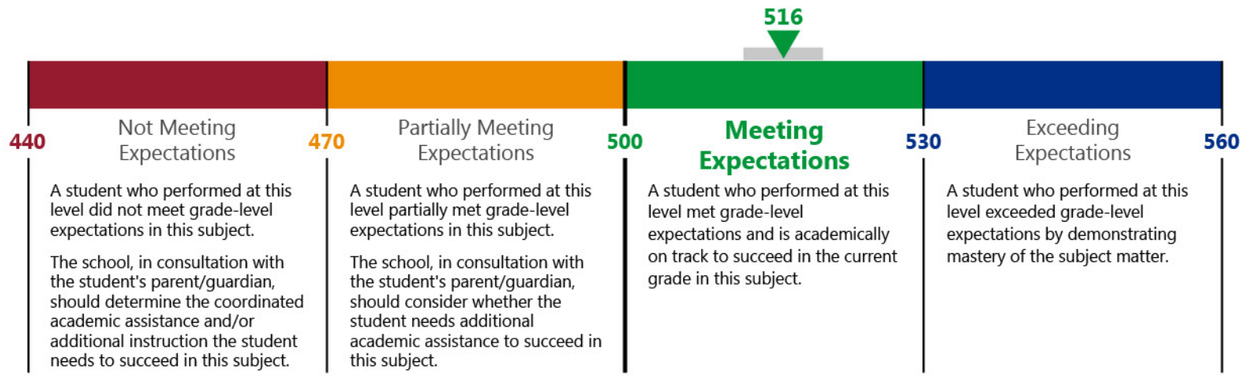
Key Points Earned: x/y = x points earned out of y possible points; Blank space = no answer; ID = Essay idea development score; CV = Essay conventions score

Name:
SASID:

Grade 10
Spring 2023
Computer-based test

Mathematics

Your Child's Achievement Level: **Meeting Expectations**
Your Child's Score: **516**



Not Meeting Expectations
A student who performed at this level did not meet grade-level expectations in this subject.
The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.

Partially Meeting Expectations
A student who performed at this level partially met grade-level expectations in this subject.
The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.

Meeting Expectations
A student who performed at this level met grade-level expectations and is academically on track to succeed in the current grade in this subject.

Exceeding Expectations
A student who performed at this level exceeded grade-level expectations by demonstrating mastery of the subject matter.

The horizontal gray bars in the graphics above and below show the range of likely scores your child would receive if they took the test multiple times.

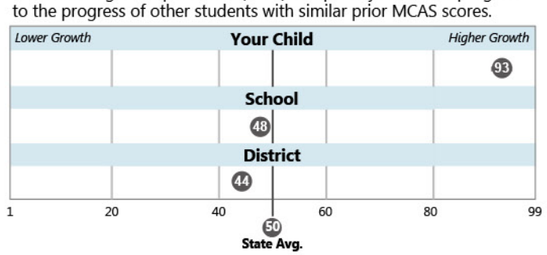
Achievement

This table shows how your child performed compared to students in their school, district, and state.

Your Child's Grade	Your Child's Score	Year	Average Score School	Average Score District	Average Score State
10	516	2023	496	491	500
8	489	2021			
6	506	2019			

2023 Student Growth Percentiles

The student growth percentile (1–99) compares your child's progress to the progress of other students with similar prior MCAS scores.



How your child performed in each reporting category and on each individual test question

Reporting Category	Points Earned by Your Child	Average Points in School	Average Points in District	Average Points in State	Total Possible Points	Average Points at Meeting Expectations*
Algebra and Functions (AF)	14	9.4	8.1	10.3	21	10.0
Geometry (GE)	14	9.6	8.3	10.6	21	10.5
Number and Quantity (NQ)	7	4.7	4.1	5.1	9	5.3
Statistics and Probability (SP)	9	4.1	3.7	4.3	9	4.2

* Average number of points earned statewide by students at or near a score of 500, at the low end of the Meeting Expectations level.

Individual Test Questions

Go online to access released test questions at www.doe.mass.edu/mcas/testitems.html.

Question Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Reporting Category	AF	GE	NQ	SP	AF	GE	AF	GE	AF	GE	NQ	AF	AF	AF	AF	NQ	AF	GE	AF	GE	AF	GE	AF	AF	AF	GE	SP	GE	AF	GE	AF	SP	GE	NQ	GE	NQ	SP	GE	GE	AF	GE	SP
Points Earned	1/1	1/1	1/1	1/1	1/1	2/4	1/1	1/1	1/1	1/1	1/2	1/1	1/4	1/2	1/1	1/1	1/1	1/2	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	4/4	1/1	1/1	0/1	0/1	2/2	0/1	3/4	2/2	1/1	1/1	1/1	1/2	0/1	0/1	1/1

Key Points Earned: x/y = x points earned out of y possible points; Blank space = no answer

APPENDIX P

SPRING 2023 MCAS & MCAS-ALT ANALYSIS AND REPORTING BUSINESS REQUIREMENTS

Table of Contents

MCAS Next-Gen

I. Overview (MCAS Next-Gen)

The Massachusetts Department of Elementary and Secondary Education (DESE) administers the MCAS tests in grades 3–8 and High School. ELA and Math are administered in grades 3–8 and 10 and Science and Technology/Engineering (STE) is administered in grades 5 and 8. High School sciences are administered starting in grade 9. In Spring 2023, Introductory Physics and Biology are administered as NextGen tests. Chemistry and Technology/Engineering are administered as legacy tests. The following tests are also administered:

1. In Spring 2023 an online-only administration of Grade 8 Civics Field Test. The test in 2023 only includes the End of Course Test. There is no Performance Task in 2023.
2. Grades 5 & 8 STE Short (mini) Form-Short form is being administered to students participating in the Innovative Science Pilot-both the short form and the pilot are being administered in Pearson TestNav. The mini form was created by using only a subset of the operational items in the grade/subject.
3. Operational Grades and subjects are:

NextGen					
Grade	Subject	Mode of test	**Grade**	Subject	Mode of Test
3–8	ELA	Online Paper	**9**	NextGen Introductory Physics NextGen Biology Legacy Technology/Engineering Legacy Chemistry	Online Paper Legacy is paper-only
3–8	Math	Online Paper			
5 and 8	Science and Technology/Engineering (STE)	Online Paper	**10**	NextGen Introductory Physics NextGen Biology Legacy Technology/Engineering Legacy Chemistry	Online Paper Legacy is paper-only
10	ELA	Online Paper			
10	Math	Online Paper			

A. Year to Year Changes

1. HS CD cuts are applied depending on the student's original_grad_class.
2. Original_grad_class is reported on the student report.
3. Original_grad_class is provided by DESE in the SIMS.
4. Original_grad_class is added as a viewable field in the Discrepancy Tool. Schools can request a change by DESE.
5. SCPI is no longer calculated.
6. Reporting categories are reported in alphabetical order on the student reports.
7. Local Student ID is added to the labels and student reports.
8. A new student report template is used in 2023. This template is to report High School students with ELA and Math results but are Previously Passed or Previously Failed with no current year science test attempted. The back page has the back page image instead of science results.

9. A new deliverable has been added for Civics Pilot 2023. A data file will be handed off to DESE containing student identifying information and item level results for the test. Data file layout provided by DESE.

II. General Information

A. Contract Code

163752

B. Reporting Deliverables

Preliminary Reporting		Final Reporting	
External	Internal	External	Internal
• Megafiles-All grades and subjects • Questionnaire Data files • Accommodations-by subject • Accommodations-by subject and item • Students with both Alt and General results	• Letter counts • Language counts • Discrepancy table	• Megafiles-All grades and subjects • 1 student report-print copy • Web student report-School and District level files • Student label-print copy • State File	• Printer data • iCore data

C. Delivery of Reports

- 1 copy of the Student Report is printed and shipped to districts.
- 1 Student Results Label is printed and shipped to districts, for each student.
- Online reports are available to the student's official school and district.
- Online reports are available in Pearson Access Next (PAN).
- Student Reports are shipped to their tested school.
- The student's report is in the web file for their official school and official district.

III. Pre-Test Administration

A. Test Design

Item Metadata data is stored in the ABBI item banking system. Pearson provides a test map which is an extract from ABBI that provides the item metadata for each operational and field test being administered.

Grade	Subject	Form(s)	Items included in Raw Score	Item Types
HS	Chemistry Technology/Engineering	Paper Accommodated Paper	Common	MC-Multiple Choice OR-Open Response
3–8	ELA	Online, paper, online accommodated, Paper accommodated	Common (OP)	SR-Selected Response CR-Constructed Response ES-Essay
3–8	Math	Online, paper, online accommodated, Paper accommodated	Common (OP)	SA=Short Answer SR-Selected Response CR-Constructed Response
5 and 8	Science	Online, paper, online accommodated, Paper Accommodated	Common (OP)	SR-Selected Response CR-Constructed Response

continued

Grade	Subject	Form(s)	Items included in Raw Score	Item Types
HS	Next Gen Bio and Phy	Online, paper, online accommodated, Spanish online Paper accommodated, Spanish Paper	Common (OP)	SR-Selected Response CR-Constructed Response
10	ELA	Online, paper, online accommodated, Paper accommodated	Common (OP)	SR-Selected Response ES-Extended Response
10	Math	Online, paper, online accommodated, Paper accommodated Online Spanish, Paper Spanish	Common (OP)	SA=Short Answer SR-Selected Response CR-Constructed Response

B. Forms

Form 01 is used for the accommodated forms.

Form conventions:

Form_Code=Year||subject||grade||Admin||Accommodation/Mode||Language||Form Number||Unit Number||Special

Where year=23;
Subject=EL, MA, SC, CV=Civics;
Grade=03, 04, 05, 06, 07, 08, 10, BI-Biology, PH-Introductory Physics, EC=Civics EOC

Spanish testers have Language=ES
Paper testers have accommodation/mode=PA

See *MCAS Scoring Form ID Key_11-2-22.xlsx* for more information.

Mini STE:

1. We will receive a separate lookup table for these students from Psychometrics.
2. The full scale should be used for reporting.
3. The short form consists of a subset of the OP items on the long form. It contains no FT, or matrix equating items.
4. There is 1 form per grade.

IV. Post Test Administration

A. Scoring

Machine scored items are scored according to the scoring rules and QTI in ABBI. The following table is applicable to hand scored items.

Raw Data Value	Reported Value	Description	Point Value	Response Attempted
0-max pts	Final score	Open Response / Short Answer	0-max	✓
N	0	Not Scorable	0	✓
BL		Blank response	0	
DC	0	Direct Copy	0	✓
UN	0	Unreadable\Unintelligible	0	✓
OT	0	Off Topic	0	✓
NE	0	Non-English	0	✓

B. Test Attemptedness

Grades 3–8 and HS, ELA, Mathematics, and STE: On the operational tests, a test meets attemptedness if there is at least one **operational** item that is attempted **per session**.

Grade 8 Civics Pilot: The test meets attemptedness if there is at least one item attempted per session.

If the student meets attemptedness then Attempt[sub]='F' (Fully Attempted). If the student has attempted operational items but not in each session, then Attempt[sub]='P' (Partially Attempted). If the student does not meet attemptedness Attempt[sub]='N' (Not Attempted).

C. Not Tested Reasons

The following not tested reasons apply to the Spring tests:

1. Medically Excused (MED)
2. Transfer (TRN)
3. First-year EL (LEP)
4. Void (VAB)
5. Previously Passed (High School STE only) (PAS)
6. Previously Failed (High School STE only) (PRF)
7. Multiple Answer Booklet (DUP)
8. Invalidated (INV)
9. Data Under Review (DUR)
10. Absent (ABS)
11. Student took the Alternate Assessment (ALT)

If a student has more than one Not Tested Reason, the following hierarchy is applied:

D. Participation Status Assignment Hierarchy (by subject)

a. Breach List (Amend Flag > '1') or Data Under Review list.
b. Void
c. Multiple Answer Booklets (Amend='1')
d. Summarize = '1' or TestGrade = '09':
   i. If the student is in the Alternate Assessment data, the student's participation status is taken from the Alternate Assessment data
   ii. If ELFirstyear='1' then: Not Tested LEP (PartStatus='F').

iii. **(Applicable for 3-8 and 10; HS STE without prior results)**:
   1. If the student meets attemptedness then: Tested (PartStatus = 'Z').
   2. If the student partially attempted or did not attempt:
      a. if Active_Test ≠ '1' then: Not Tested Transfer (PartStatus='D').
      b. Otherwise if MED then: Not Tested Medically Excused (PartStatus='G').
      c. Otherwise: Did Not Test (Partstatus='J') (**Not assigned in grades 3-8 unless specified in Breach list)**
      d. Otherwise: Not Tested Absent (PartStatus='E').

iv. (Applicable for HS with prior results): Previously Failed (High_sPerf from SIMS is not blank and sci_CD=0 or blank):
   1. If the student meets attemptedness then: Tested Accountable Retest (PartStatus='Y').
   2. If the student partially attempted or did not attempt then: Not Tested Accountable Retest (PartStatus='L').

v. (Applicable for HS with prior results Previously Passed (Sci_CD=1 and high_sperf2 is not blank)
   1. (**Pre-Discrepancy only; only grade 9 and Grade 10 students with summarize='1'**) If the student meets attemptedness or partially attempted then: Ineligible Accountable Retest, Previously Passed (PartStatus='P').
   2. If the student did not attempt (or during final processing: if the student did not attempt, partially attempted, or meets attemptedness) then: Previously Passed (PartStatus = 'K')

e. Summarize = '0' (regardless of any prior test results):
   i. Student is found in the Alternate Assessment data the student's participation status is taken from the Alternate Assessment data.
   ii. Otherwise, if the student meets attemptedness then: Tested Not Accountable (Retest) (PartStatus = 'R').
   iii. Otherwise, if the student partially attempted then: Partially Tested Not Accountable (Retest) (PartStatus = 'B').
   iv. Otherwise, if the student did not attempt then: Not Tested Not Accountable (Retest) (PartStatus = 'J').

Note:

1. Students with a blank High_sPerf and sciNTL ≠ '1' from SIMS are considered to not have prior results.
2. Students with SciNTL = '1' from SIMS are considered to have previously participated in science as a First Year EL student.
3. If sci_CD=0 or blank and SciNTL = '1', the student is considered Previously Failed.
4. Tests with participation status Void in preliminary reporting may be unvoided during the discrepancy period. Post-Discrepancy any remaining void tests will be suppressed. Students with no test may be built out according to Data Processing rules.

The table below describes the calculation of the applicable participation statuses.

Summarize	Prior Results	Description	Part Status	Test Stat*	Discrepancy Site	
					Code	Text
n/a	n/a	Breach	Breach Instructions are applied at the student level regardless of participation status and are identified by Amend > '1'			
		Void (Preliminary Only)	H	NTO	VAB	Void Answer Booklet
		Multiple Answer Documents (Security Breach)				
		Preliminary	I	NTO	DUP	Multiple Answer Booklets
		Final	N	NTO	n/a	n/a
		Invalidated (Only assigned via Breach List) Data Under Review (Only assigned via Breach List)	N Q	NTO NTO	INV DUR	Invalidated Data Under Review
1 (or Grade=09)	n/a	Tested Accountable Alternate Assessment	A	T	ALT	Tested Alternate Assessment
		Tested	Z	T	STD	Tested Standard
		Not Tested (/Partially Tested) – LEP (ELA Only)	F	NTL	LEP	Not Tested First Year EL
		Not Tested (/Partially Tested) - Transfer	D	NTO	TRN	Transferred
		Not Tested (/Partially Tested) – Medically Excused Absent	G	NTM	MED	Medically Excused
		Not Tested (/Partially Tested) - Absent	E	NTA	ABS	Absent
		Incomplete	B	NTO	INC	Incomplete
	Prev. Failed	Tested Alternate Assessment Accountable Retest	C	TR	ALR	Retested Alternate Assessment
	Prev. Failed	Tested Accountable Retest	Y	TR	RET	Retested
	Prev. Failed	Previously Failed (Not Tested /Partially Tested Accountable Retest)	L	NTO	PRF	Previously Failed
	Prev. Passed	Ineligible Accountable Retest – Previously Passed & Retested (Preliminary Only- final see K)	P	NTO	PPR	Previously Passed & Retested
	Prev. Passed	Previously Passed	K	NTO	PAS	Previously Passed
0	Any	Tested Not Accountable Alternate Assessment (Retest)	W	TR	ALN	Retested Alternate Assessment Not Aggregated
		Tested Not Accountable (Retest)	R	TR	REN	Retested Not Aggregated
		Partially Tested Not Accountable (Retest)	B	NTO	INC	Incomplete
		Not Tested Not Accountable (Retest)	J	NTO	DNT	Did Not Test

** Student results achieved while First-year EL, or students currently First-year EL (see rptLEPFirst calculation) are reported with TestStat = "NTL" in place of listed TestStat (all subjects). See Calculations by Participation Status Summary Table for more details.*

E. Inclusion/Exclusion Rules

The following applies to Item Analysis Student Inclusion/Exclusion (Ex[sub]) & Matrix Files

1. Only first-time accountable test takers that are not first-year LEP (Partstatus = 'Z' and rptLEP[sub] are included for item analysis and psychometric equating files (Ex[sub] = '0'). All other students are excluded (Ex[sub] = '1').
2. All analysis will be based on CBT tests only for Next Gen
3. For Next Gen tests due to the way some accommodations cannot be spiraled. The accommodations listed below will have the following special handling.
    a. Students with unique accommodations to be excluded include: paper-based testing, text-to-speech (TTS), Braille, Spanish, screen reader, ASL, and assistive technology;
    b. At DESE's discretion data will be provided to psychometrics to study mode effects.
    c. Students with these accommodations will be excluded from all matrix files.
    d. Students with these accommodations will be excluded from CTT and dif calculations for matrix items but will be included for scaling items.
4. The following applies to High School Science (STE's):
    a. First time test taker in HS STE is a student with stugrade='09' and no prior results (high_sperf2 is null in SIMS) **or** summarize='1' and no prior results (high_sper2 is null in SIMS)
    b. Only first-time test takers are included in analyses.

F. Rounding Rules

Calculation	Rounded (to the nearest)
Average scale score	Whole Number
Average reporting category points	Tenth
Mean Growth Percentile	Whole Number

G. Files from DESE

1. Breach List
    a. Students who are considered a security breach are provided by DESE in the Breach List. Instructions for processing and reporting each security breach case are provided.
    b. Data Analysis reviews the breach list and adds necessary Amend flag values (> '1') and instructions to the Amend Code Definition Lookup for each distinct scenario on the Breach List.
    c. Data Processing applies any necessary changes to the raw student record based on DESE's instructions and applies the corresponding Amend Flag value from the lookup to the student for Data Analysis processing.
2. Technology Failure List
    a. DESE will provide a list of students who could not complete the assessment based on a persistent technology issue with the testing platform. This file will be provided at the same time as the Breach List or pulled from PAN.
    b. These students are processed with an Amend code (AmendCode=13).
        i. If a student in grades 3–8 has a scale score>=470 or a HS student with CD>=1, the following information is reported:

1. a. Student's earned raw score, earned item scores, and earned mfScaledScore and earned perflevel. These students will be reported as NTO.

c. iii. If a student in grades 3–8 does not have a scaled score >=470 or a HS student with CD=0 and partially attempted then the student is reported as "INC" with their raw score, and item scores reported. The student's perf2, numin, and assess values will all be blank.

3. Students from DESE who are under investigation are reported as DUR with no item level data. Raw score is populated. Perflev='DUR' (Data Under Review) and other performance fields are blank in the megafile and on the student report.
4. SIMS
    a. Student data are provided by DESE for reporting use following the SIMS file layout (also provided by DESE.)
    b. SIMS contains various demographic, historical scores, and accountability data fields. The data populated depends on the time of year of the handoff.
    c. Multiple handoffs occur during the year.
5. Current Year Student Growth Data
    a. Current year student growth percentiles (and corresponding standard errors) are provided for ELA and Math at the student level from DESE based on preliminary results.
    b. If a score changes after Preliminary reporting, the growth score from DESE is suppressed and no growth is reported for the test.
    c. In 2023, the state growth mean will be fixed at 50.
6. Grade Span Lookup
    a. DESE provides a grade span lookup for all public official schools. It is used to assign "SchType" in the various megafile handoffs.
    b. Cognia will provide DESE with a list of any public schools that have students assigned to them that are not included in the lookup, resulting in blank grade span data based on the Preliminary data release.
    c. All public schools must have a grade span for final post-discrepancy reporting. For earlier releases grade spans may be blank for schools missing from the lookup.
7. Discrepancy Resolution
    a. Data from preliminary reporting is posted to the discrepancy site for clean up by the field and the department.
    b. See the Discrepancy Site Requirements for more details on which fields are available for editing at each user level.
    c. Data Processing re-processes data post-discrepancy to incorporate the updated information and discrepancy resolutions from DESE for DA for final reporting.
    d. During final processing all information from the discrepancy site is considered final and is maintained, however, changes to certain fields require additional data audits and/or recalculation of student participation status to ensure consistency. See the Data Reconciliation section for these details.
    e. DESE provides a spreadsheet with additional discrepancies reported by schools that were not able to be resolved in the tool or came later than the school window. Any late discrepancies reported well after the close of the window will be reported in the rerun.
8. Sprp_sch and Sprp_dis: Exceptions List
    a. DESE will provide this list to Cognia

   b. The lookup is used in the assignment of official student school and district (See Data Reconciliation Audits for details)
9. One School District List (daSingleSchDisLookup)
   a. DESE will provide this list to Cognia
   b. The lookup is used in the aggregate calculations (see Aggregate Calculations for details)

V. Scaling, Equating and Item Statistics

For the purposes of scaling and equating all high school students taking the High School Sciences are treated the same. They have taken the same sets of tests regardless of their student grade. Exclusions from analysis are described in the calculation section.

1. Legacy Scaling
   a. Scaling is done using a lookup table provided by psychometrics and the student's overall raw score (by subject).
   b. The scaled scores are even numbers from 200 to 280.
2. Next Gen Scaling
   a. Scaling is completed using a lookup table provided by Psychometrics. Scales are based on student's scaleform, and raw scores.
   b. The scaled scores are integers from 440 to 560.
3. Achievement Level Coding
   a. The MCAS Standard Assessment has four possible achievement levels, assigned to students using the raw to scaled score lookup provided by psychometrics.
   b. Alternate Assessment achievement levels are translated to their corresponding standard assessment achievement level prior to computing any aggregate calculations that include alternate assessment achievement level results as shown below.

MCAS Achievement Level	MCAS Description	MCAS-Alt Achievement Level	MCAS-Alt Description
1	N/A	7	Incomplete Portfolio (INP)
	N/A	8	Awareness (AWR)
	Legacy: Failing (F)	9	Emerging (EMG)
	NextGen: Not Meeting Expectations (NM)	10 17	Progressing (PRG) Not Meeting Expectations-Alt (NM_A)
2	Legacy: Needs Improvement (NI)	11	Needs Improvement-Alt (NIA)
	NextGen: Partially Meeting Expectations (PM)	14	Partially Meeting Expectations-Alt (PM_A)
3	Legacy: Proficient (P)	12	Proficient-Alt (P_A)
	NextGen: Meeting Expectations (M)	15	Meeting Expectations-Alt (M_A)
4	Legacy: Advanced (A)	13	Advanced-Alt (A_A)
	NextGen: Exceeding Expectations (E)	16	Exceeding Expectations-Alt (E_A)

VI. Student Level Calculations

A. Calculations by Participation Status Summary

Summarize	Prior Results		Part Stat	rptLEP[stub] [1]	Test Stat	Current Year Reporting Results					Aggregation and Accountability Results		
						('---'indicates data are blank)							
		Description				Raw Scores	Item Scores	rScaled Score (*Cognia Reports*)	Achievement Level (*rPerfLevel, mfPerfLev*)	mfScaledScore	Achievement Level (*Perf2/mfPerf2*)	Numin	Assess [2]
		Breach	*Breach Instructions are applied at the student level regardless of participation status and are identified by Amend > '1'*										
		Void *(Preliminary Only)*	H	*any*	NTO	earned	earned	---	VAB	---	---	---	0 [3]
		Multiple Answer Documents (Security Breach):											
		Preliminary	~~I~~	*any*	NTO	earned	earned	---	DUP	—	—	—	—
		Final	~~N~~	*any*	NTO	---	---	---	INV	—	—	—	—
1 (or Grade=09*)		Tested Alternate Assessment	A	0	T	---	---	---	earned (Alt)	---	earned (Alt)	✓	1
				1	NTL					---	---	---	1
		Tested	Z	0	T	earned	earned	earned	earned	earned	earned	✓	1
				1	NTL			*Pass:* earned *Else:* ---	*Pass:* earned *Else:* LEP	*Pass:* earned *Else:* ---	---	---	1
		Not Tested /Partially Tested – LEP (ELA Only)	F	1	NTL	Earned		*HS Pass:* earned *Else:* ---	*HS Pass:* earned *Else*: LEP	*HS Pass:* earned *Else:* ---	---	---	1
		Not Tested /Partially Tested - Transfer	D	0 (M/S 1)	NTO				*HS Pass:* earned *Else*: TRN		---	---	---
		Not Tested /Partially Tested – Medically Excused Absent	G	0 (M/S 1)	NTM				*HS Pass:* earned *Else*: MED		---	---	0
		Not Tested /Partially Tested - Absent	E	0 (M/S 1)	NTA				*HS Pass:* earned *Else*: ABS		---	---	0
	F	Tested Alternate Assessment Accountable Retest	C	0	TR	---	---	---	earned (Alt)	---	highest (Alt)	✓	1
				1	NTL					---	---	---	1
	F		Y	0	TR	earned	earned	earned	earned	earned	highest	✓	1

		Tested Accountable Retest		1	NTL			*Pass:* earned *Else:* ---	*Pass:* earned *Else*: LEP	*Pass:* earned *Else:* ---	---	---	1
	F	Previously Failed (Not Tested /Partially Tested Accountable Retest)	L	0	NTO	*Pass:* earned *Else:* ---	*Pass:* earned *Else:* ---	*Pass:* earned *Else:* ---	*Pass:* earned *Else:* PRF	earned	highest	✓	1
				1	NTL				*Pass:* earned *Else:* LEP	*Pass:* earned *Else:* ---	---	---	1
	P	Ineligible Accountable Retest – Previously Passed & Retested *(Preliminary Only)*	P	0	NTO	earned	earned	---	PPR**	prior	prior	✓	1
				1	NTL					prior	---	---	1
	P	Previously Passed	K	0	NTO	---	---	---	PAS**	prior	prior	✓	1
				1	NTL					prior	---	---	1
0		Tested Not Accountable Alternate Assessment (Retest)	W	0	TR	---	---	---	earned (Alt)	---	---	---	---
				1	NTL								
		Tested Not Accountable (Retest)	R	0	TR	earned	earned	earned	earned	earned	---	---	---
				1	NTL			*Pass:* earned *Else:* ---	*Pass:* earned *Else:* LEP	*Pass:* earned *Else:* ---			
		Partially Tested Not Accountable (Retest)	B	*any*	NTO	earned	earned	*Pass:* earned *Else:* ---	*Pass:* earned *Else:* INC	*Pass:* earned *Else:* ---	---	---	---
		Not Tested Not Accountable (Retest)	J	*any*	NTO	---	---	---	DNT	---	---	---	---

[1] rptLEP is LEPFirst for all grades/subjects/participation statuses that do not have prior results. It is a calculated combination of LEPFirst and prior LEP First status for Accountable partstatuses with prior results. See calculations section for details.

[2] Assess exceptions for ELA: there is an additional condition of participation on the Access test. See calculation specifics for details.

[3]If Summarize = 1 then Assess = 0. If Summarize = 0 then Assess is blank.

**Grade = 09 students are assigned participation statuses as if Summarize = '1'. Perf2, Numin, and Assess are populated for calculations but set to blank in the Megafile deliverable.*

***if (PPR or PAS) and (grade='09' or (grade='10' and summarize='1')) then invalidate current test and report prior results. (2023)*

Note: "(M/S 1)" indicates that rptLEP[sub] may also be '1' in Math and Science for the listed participation statuses.

Note: Pass is defined as CD>=1 for HS and scaled score is >=470 in grades 3–8.

B. Other Calculations

1. Official School and Official District Code
    a. Official District (sprp_dis)
        i. If the student's testing discode+schcode is on the Exceptions List (System+School) then the official district is the sprp_dis from the Exceptions List.
        ii. If the student's testing orgtype is 6, 13 or 22 then the official district is set to the discode concatenated with four zeroes.
        iii. Otherwise, the official district is the sending district from SIMS (senddiscode) if it exists, concatenated with four zeroes at the end. If senddiscode is blank the official district is set to '99999999'.
    b. Official School (sprp_sch)
        1. If the student's testing school (discode+schcode) is on the Exceptions List (System+School) then the official school is the sprp_sch from the Exceptions List.
        2. If a student is from a collaborative school (testing OrgType = 3 or 4) then the official school is = 05XX0000 where XX is the 3rd and 4th digit of the testing district code.
        3. If the student's testing orgtype is 25,31, or 50 then the official school is the official school code from SIMS (simsDiscode + SimsSchcode). If the simsDiscode and simsSchcode are blank the official school is set to the testing school code (discode+schcode). If the official school from SIMS is orgtype 22, then use the Exceptions list for official school. If the official school from SIMS is orgtype 3 or 4 apply formatting described in #2 above. If orgtype of the SIMS school is 4, set orgtype to 3.
        4. Otherwise, the official school is the testing school (discode+schcode).

2. StudentID
    a. StudentID = rptStudentID from DPRaw (verified SASID)
    b. For non-demonstration students, if StudentID does not begin with '10' it was generated by DP for linking purposes and will be set to blank for reporting.
3. Accommodations and Accommodation Footnotes
    a. If a student did not attempt any items in a subject, the corresponding raw accommodation indicators (from DPRaw) are ignored during the determination of accommodations and footnotes for reporting. Otherwise, if a student attempts at least one item in a subject, the corresponding raw accommodation indicators are evaluated:
        i. For ELA and Math accommodation all items (common, matrix, and field-test) are considered.
        ii. All underlying accommodation fields in DPRaw are maintained as provided, regardless of student attempt status.
    b. Standard Accommodations
        i. Accom_e = '1' if the student received any accommodations (except color contrast, answer masking and Alternative Mouse Cursor Pointer) in ELA, otherwise set it to blank.

ii. Accom_m = ‘1’ if the student received any accommodations in Math (except color contrast, answer masking and Alternative Mouse Cursor Pointer), otherwise set it to blank.
iii. Accom_s = ‘1’ if the student received any accommodations in science (except color contrast, answer masking and Alternative Mouse Cursor Pointer), otherwise set it to blank.

c. Special Access ELA Accommodations
   i. If Human Read-Aloud as a special access Accommodation is indicated, then Accom_ReadAloud=’H’
   ii. If Text to Speech accommodation is indicated, then Accom_ReadAloud=’T’
   iii. If Kurzweii special access Accommodation is indicated, then set Accom_Readaloud=’K’
   iv. If Human Scribe special access Accommodation is indicated, then Accom_Scribe=’H’
   v. If Speech to Text Non-Standard Accommodation is indicated, then Accom_Scribe=’S’
d. Special Access Math Accommodation
   i. If calculation Device Accommodation is indicated, then Accom_Calculator=’1’
e. For special access Accommodation Student Report text based on elaNSAFootnote and matNSAFootnote see table Special Access Accommodation Footnote Text (Student Report)

4. Reporting First Year EL Status

a. RptLEP is determined for each subject based on current year partstatus, test attemptedness, EL First-year status, and Prior EL First-year status (where applicable) to determine if a student’s results should be considered achieved while under EL First-year status or as currently First-year EL. This takes into consideration the prior status of the student when prior results are eligible for accountability (currently only allowed in science)
b. For all participation statuses that are considered Not Accountable rptLEP[sub] = ELfirstyear.
c. Otherwise, if the student is considered Accountable then:
   i. If the student has prior results:
      1. If the student meets attemptedness this year, then: rptLEP[sub] = ELFirstyear.
      2. If the student partially attempts or does not attempt this year, then:
         a. rptLEP[sub] = ‘1’ if either ELFirstyear = ‘1’ or [sub]NTL = ‘1
         b. Otherwise rptLEP[sub] = ‘0
   ii. If the student does not have prior results, then rptLEP[sub] = ELFirstyear

5. Alt

a. [e/m/s]Alt is set to ‘1’ if a student is considered Tested or Retested Alternate Assessment (accountable or not accountable; PartStatus in ‘A’,’C’,’W’). Otherwise, it is set to ‘0’.

6. SpecialEd

a. If a student is considered Tested or Retested Alternate Assessment (accountable or not accountable) in any subject (eAlt, mAlt, or sAlt = ‘1’) then SpecialEd = ‘1’. Otherwise, it is taken from IEP in SIMS. If it is blank, it is defaulted to ‘0’.

7. SIMS CD

a. The latest CD value from SIMS for Math, ELA, and Science is stored for each student as-is, without any additional formatting as SIMS_[sub]CD.

8. SSubject
    a. SSubject is set to the science subject that is used for reporting.
    b. Data Processing will provide the science subject for the current test as well as science subject for prior results.
    c. If a student took alt, then the alt science subject is reported.
    d. Report the current science subject, if the test meets attemptedness rules and is not invalidated due to student being in grade 9 or (10 and summarize='1') and previously passed. First time HS is defined as gradesims in ('10','11','12') and summarize='1'.
    e. If the student has prior results and being reported as Previously Passed or Previously Failed, use "Science and Technology/Engineering" on the student report and prior subject in the megafile.
    f. Otherwise, report the student as NextGen Biology (ssubject=5)
9. Raw Scores
    a. Overall Raw Score
        i. The student's overall raw score is the sum of scores for all scaling items.
        ii. If a student has a partstatus that does not receive reported raw scores or if the student did not attempt any items (Attempt[sub]='N') then the raw score is set to blank after all subsequent calculations are complete.
10. Points Earned
    a. MCpts are based on common, scaling multiple choice or selected response items with point values stored in item metadata tables.
    b. ORpts are based on non-MC or involving open response, constructed response and short answers (including essay scores). Item point totals are calculated based on item metadata tables.
    c. If a student does not receive reported raw scores these calculations are set to blank.
11. Reporting Category Points Earned
    a. The total points earned, and the percent of possible points earned by the student are calculated by reporting category.
    b. Calculations include all scaling items.
    c. If a student does not receive reported raw scores the number of points earned, and the percent of possible points earned are set to blank.
12. Legacy Item Responses
    a. If a student has a participation status that does not receive reported item scores, or does not receive item scores because of attempt status, pass requirements or rptLEP conditions, all item responses will be blanked out (NULL) after raw score calculations are complete.
    b. Otherwise, re-formatted and re-ordered responses to all common items are reported to support the student report and megafile deliverables (excluding the State File, which includes all items):
        i. OR items: the item score or not scorable code is reported. Responses of 'B' (blank) are set to NULL.
        ii. MC items: "+" indicates a correct response, and "- "indicates a masked incorrect response choice (multiple responses ("*") remain unmasked).
        iii. Legacy HS STE have no released items.
13. Next Gen Item Responses

Students with a participation status that does not receive reported item scores and those who do not receive item scores due to test attempt status, passing status, or rptLEP conditions will have scores blanked out (NULL) after raw scores have been calculated, if applicable.

a. All scaling items are reported and stored to support the student report and megafile deliverables (excluding the State File, which includes all items):
    i. OR and MS items: the item score or not scorable code is reported. Responses of 'B' (blank) are set to NULL.
    ii. Scores are formatted as x/y where x=earned score on the item; y=maximum score possible on the item.
b. The order of the items is the reporting sequence in the test map.
c. Items' release status is stored in the Objective 3 field in the test map. If an item has Objective 3=Release Pending the item is released.
d. RepCatCode is the 2-character reporting category code for each item:
    i. Assigned by Item Number for Math and ELA using daReportingCategoriesCrosswalk.
    ii. Assigned by daIref.Cat2 for Science using daSciRepCatCodes
    iii. Reporting Categories are stored in Objective 1 in the test maps.

14. Current-Year Reporting Results

a. Information stored in ScaledScore, Perflevel, rScaledScore, and rPerflevel are based on current year test results only. See the Calculations by Participation Status Summary table for details.
b. ScaledScore
    i. Current year scaled scores are used for aggregations. Conditions based on pass/fail, rptLEP or breach codes are not applied. This is an internal MP field that is not directly reported.
    ii. Blank for alternate assessment students and students not eligible to receive a scaled score based solely on participation status.
c. PerfLevel
    i. Earned current-year achievement level based on scaledscore (1-4).

Scaled Score Range	Achievement Level	Achievement Level Name	Achievement Level Abbreviation
440-469	1	Not Meeting Expectations	NM
470-499	2	Partially Meeting Expectations	PM
500-529	3	Meeting Expectations	M
530-560	4	Exceeding Expectations	E

    ii. Conditions based on pass/fail, rptLEP, or breach codes are not applied.
    iii. For Alternate Assessment students the un-translated PerfLevel from the Alternate Assessment data table StuPL is stored (7–17).
    iv. If the student does not receive an achievement level based solely on partstatus PerfLevel is blank.
    v. Valid Values: numeric achievement levels (1–4, 7–17) or blank. Internal Cognia field that is not directly reported.
d. rScaledScore
    i. rScaledScore is the current year earned scaled score for Cognia reporting purposes.

ii. rScaledScore = ScaledScore, with suppression based on pass/fail status, rptLEP, or breach codes applied from the participation status summary table.

e. rPerfLevel
   i. rPerfLevel is the current year achievement level or partstatus.
   ii. rPerfLevel = Perflevel, modified based on pass/fail status, rptLEP, or breach codes for reporting as follows:
      1. If perflevel = '1' or CD=0 or missing and rptLEP[sub] = '1' and the student has a partstatus that receives the text "LEP" in place of a non-passing achievement level, then set perflevel='LEP'. This is applied by subject for all subjects.
      2. Otherwise, if perflevel is blank then rPerflevel = partstatus.
      3. If a student has a breach code, then rPerfLevel is assigned per the breach instructions to override any other standard rules.
   iii. Valid values: numeric achievement levels (1–4, 7–17) and partstatus codes.

f. mfPerfLev (megafile: [e/m/s]PerfLev)
   i. Formatted rPerfLevel (current year reporting results) to contain either the student's achievement level abbreviated text (Standard or Alt), or 3-character participation status code for all students (e.g., 'P' or 'P_A' or 'LEP' or 'TRN').

g. For 3–8, all not tested statuses will get scaled score and perflev if it's >=470. The exception is blanking out SS/perflev per the breach list.

15. Aggregation/Accountability Results

a. Aggregation and Accountability Results combine prior and current results, where applicable. See the Calculations by Participation Status Summary table for details.
b. mfScaledScore (megafile: [e/m/s]scaleds)
   i. For Accountable or Grade 09 students mfScaledScore is populated with either the current year scaled score, or prior scaled score as applicable for accountability. For Not-Accountable students mfScaledScore is populated with current year results as applicable.
   ii. mfScaledScore is populated as follows for Accountable students (or Grade 09):
      1. mfScaledScore = rScaledScore for First Time Testers and First Time Testers that did not meet attemptedness (ABS, MED, TRN, LEP).
      2. mfScaledScore = Prior highest scaled score for Previously Passed (whose test has been invalidated) students ([sub]ScaledScore] from DPraw).
         a. Note: if [sub]ScaledScore is blank for the above scenario, the student passed via appeals and an accurate scaled score may not be available. mfScaledScore is left blank.
      3. Otherwise mfScaledScore is blank.
   iii. If rptLEP = '1' and the student's mfScaledScore (as determined above) is considered Failing, then mfScaledScore is set to blank.
   iv. mfScaledScore = rScaledScore for Not-Accountable students.
c. Perf2 (used in aggregate calculations;In 2023, not used for science aggregation for P/G reports)
   i. Populated with the achievement level for aggregate calculations and to support the megafile Perf2 using current year and prior results as applicable.
   ii. Perf2 is blank for all students with rptLep[sub] = '1'.
   iii. Otherwise Perf2 is populated as follows for Accountable or Grade 09 students:
      1. Perf2 = rPerfLevel for First Time Testers (1–4, '6' is translated to '1').

2. Perf2 is blank for First Time Testers that did not meet attemptedness (ABS, MED, TRN, LEP).
3. Perf2 = Highest achievement level between rPerfLevel and High_xPerf for Accountable Retesters (science only).
4. Perf2 = Highest prior achievement level (High_sPerf) for Previously Passed students.
5. Perf2 = Translated Alternate Assessment Perf2 for students Tested Alternate Assessment or Accountable Retested Alternate Assessment. Translation is done from Alternate Assessment Achievement Levels of 7-16 to Standard Achievement Levels 1-4

iv. Otherwise perf2 is blank. Perf2 is blank for all Not-Accountable students except for grade 09 (available for grade 09 specific Cognia aggregations).

d. mfPerf2 (megafile: [e/m/s]Perf2)
   i. Perf2 formatted to contain the student's achievement level abbreviated text (using Standard Assessment text only, e.g., 'P' or 'A'). Blank if Perf2 is blank.
   ii. mfPerf2 is set to blank for grade 09 students in the megafile export.

16. Competency: Updating ELA_CD, Mat_CD, and Sci_CD

a. These variables represent whether a student has met the testing graduation requirement for the subject, combining prior CD information from SIMS with the current test results. The higher CD value of the prior CD value and the CD value based on the current test is reported.

Subject	CD Value	Interpretation/Meaning
All subjects	0	Student has not yet met the graduation requirement in this subject
ELA/Math	1	Student has partially met the graduation requirement in this subject but may need an EPP
STE	1	Student has met the graduation requirement in this subject
ELA/Math	2	Student has met the graduation requirement in this subject

b. The updated mfCD fields begin with the prior CD value from SIMS (studemo SIMS_[sub]CD) for all students, regardless of participation status on this year's test. The prior value may be blank for students that have not previously tested in a subject.
c. The mfCD fields are then updated using current year scaled score results (rscaledscore) if and only if the CD value increases, otherwise the prior value is retained.
d. CD values assigned per the table below if SIMS CD=0 and original_grad_class=999, blank or <2026:

Subject	CD Value		
	0	1	2
ELA Scaled Score	<455	>=455 and <472	>=472
Math Scaled Score	<469	>=469 and <486	>=486

e. CD values assigned per the table below if SIMS CD=0 and original_grad_class= 2026 or above:

Subject	CD Value		
	0	1	2
ELA/Math Scaled Score	<470	>=470 and <486	>=486

f. For Legacy HS Science:
   i. If scaled score ≥ 220 then CD = '1'.
   ii. Otherwise, CD is '0'.
g. NextGen High School Sciences: CD values assigned per the tables below.
If SIMS CD=0 and original_grad_class=999, blank or <2026:

Science	CD Value	
	0	1
Biology	<467	>=467
Introductory Physics	<470	>=470

if SIMS CD=0 and original_grad_class=2026 or above:

Science	CD Value	
	0	1
Biology and Introductory Physics	<470	>=470

h. For students tested in the Alternate Assessment (Partstatus in 'A', 'C', or 'W') the CD field is taken from the current year updated CD field in the alternate assessment data (tblStuPL.mfCD) and is not re-calculated.

17. Graduation Requirement Footnote (CDFootnote) (tblScoredItem)

a. The graduation requirement footnote is for High School students and indicates if a student has met, previously met, or still needs to meet the testing requirements for graduation.
b. Using the previous CD value, student grade and summarize from SIMS (tblstudemo.SIMS_[sub]CD) and the updated CD value incorporating current test results (tblScoredItem.mfCD) for each subject determine the appropriate text for the student report. See table in *Student Report section* for more details.

18. NumIn

See the calculations by participation status summary for a list of statuses that receive numin = '1'. Otherwise, it is '0.'

19. Assess

a. The subject specific Assess field is populated to indicate whether Accountable students have met the participation requirement this year based on the Calculations by Participation Status Summary table.
b. Exception for ELA only, when Assess = '1': If EL = '1' and ACCESS_Part = '0' then Assess = '0'.
c. Fields are prefixed with e/m/s in the megafile.
d. Student was assessed: 1=student tested on MCAS or student is first year EL, 0=ABS or MED or EL student who did not take ACCESS for ELs test, blank=not included in participation reports. See the table on page 12 for more detailed information.

20. Student Growth Percentile (SGP)

a. Student growth percentiles (and standard error range) are reported for accountable first-time test takers that are not considered EL First Year (PartStatus = 'Z' and LEPFirst[sub] = '0') in year 2 (students must receive test scores in consecutive grades two years in a row or have test scores in grade 8 and grade 10 over three years).
b. For all other students, SGP is blank.
c. Growth is provided by DESE for students in Math and ELA, in grades 4–8 & 10.
d. After the discrepancy period, any student with changes to their preliminary raw score, perf2, partstatus, or StudentID will have growth data suppressed.

21. Complexity is populated with the student's alternate assessment composite complexity score for all students Tested or Retested (accountable or not-accountable) Alternate Assessment.

VII. Aggregate Calculations

1. Aggregation Summary

a. These rules are applied to all aggregate calculations. Any additional rules specific to a particular calculation will be listed under the rules for the calculation.
    i. All reporting levels (sch/dis/sta): Only students eligible for accountability (Summarize = '1') and test status ='T' are included in aggregate calculations, except for Grade 09 specific calculations.
    ii. For grade 9 and 10 HS Biology and Introductory Physics: aggregations include students with Teststatussci='T' (first time testers) for both grades together
    iii. Students are aggregated to their official school (sprp_sch) and official district (sprp_dis), unless their sprp_dis is in daSingleSchDisLookup , in which case they are aggregated to the school associated with their sprp_dis and inclusion rules are dictated by the district (school and district calculations must match).
    iv. Students with an SPRP Orgtype of 6 or 13 are used for school-level aggregations.
    v. For district aggregations, if sprp_dis = '99999999' then delete.
    vi. Exclusions based on OctEnrol are not applied to one-school district school or district level calculations.
    vii. Reporting category aggregations on the mini-MCAS student reports will only include tested students who took mini-MCAS.
    viii. Aggregations are suppressed for affected reporting categories where items were removed from their form of the test the student took.
b. Growth Aggregations
    i. All students with tblScoredItem.GP populated are eligible to be included in the calculations.
    ii. The following exclusions are applied to the pool of eligible students:
        1. Students with OctEnrol ≠ '1' are excluded at the school and district level, unless they are at a one-school district.
    iii. The state mean growth will be fixed at 50.
    iv. Minimum N-Requirement: if N < 20 for a school or district results are calculated but suppressed from reports.
    v.
    Minimum N-Requirement: if N < 20 for a school or district results are calculated but suppressed from reports.
c. Next Gen Reporting Category Calculations
    i. Paper and Online tests are aggregated together.

ii. Students near Meeting Expectations
    1. The average number of points earned (nPoints) and the percent of total possible points earned (pPoints) by students at the “low end of the Meeting Expectations level” is calculated for each reporting category at the state level, stacked by subject and reporting category order. The student group used must be greater or equal to 200; if not, the student pool will be expanded to include students with scale scores as follows 501, 499, 502, 498, etc.
    2. If any test/mode at a grade/content level does not reach the 200-student threshold within the scaled score range of 500-505, the student’s report will not include the average points for students scoring near Meeting Expectations for the reporting categories.
    3. Only students with Teststatus=’T’ are included in this calculation.

d. Next Gen Average Points Earned and Average Scale Score
    1. Calculate average for School, District and State
    2. Only students with Teststatus=’T’ are included in this calculation.
    3. Students with OctEnrol ≠ ’1’ are excluded at the school level unless they are at a one-school district.
    4. For HS Sciences, each science is aggregated by itself. Biology students are not combined with Introductory Physics students.

VIII. Data Deliverables Specifications

A. MegaFile(s)

1. Generic Details

b. Megafile deliverables are posted by grade to the FTP site for the state and contain data for all processed students.
c. All MegaFile deliverables follow the most recent layout: MCAS 2022-23 File Layout_Cognia.xlsx
d. Test-result based fields that are not applicable to particular deliveries are left blank. SIMS based fields are populated for all releases, where available.
e. Amend
    i. If a student receives an amend code for the General or Alternate Assessment, then the amend field will contain the first letter of that test (e.g., A value of “EM” indicates the student received an amend code in ELA and Math).
f. G3-8, first-year EL, full attempt, SS of 470+, get earned SS/perflev, teststat=NTL, perf2=blank.

Setting of Orgtype

1. Orgtype is based on the official school code.
2. Using the official school code link to the MCAS org data file (DA use: icore) and pull the org type (DA use: Reportcode2).
3. If an orgtype is not assigned, default orgtype to ‘X’. This is expected due to some SPRP schools not being in the Org data file.
4. If orgype of official school is 4, orgtype is set to 3.

a. The table below displays possible values for a school’s Orgtype

Orgtype Code	Description
2	Special Education School
3	Collaborative
4	Collaborative Program
6	Public School
10	MA State Agency
11	Private School
13	Charter School
22	Charter School Program
25	Alternative Ed Program
29	Out-of-State School
30	Adult Diploma Site
31	MCAS Test Site
34	SEIS Program
37	Adult Basic Education Program
50	Public School Program
95	Special Education Program

g. DataChanged
    i. DataChanged indicates if a student's record has changed since a prior release of the file. It is defaulted to '0' for all students.
    ii. Students whose record changes during the discrepancy period are flagged as datachanged = '1' (first full revision) in the post-discrepancy reporting file (release 4).
    iii. Only use the following fields when calculating datachanged:
        1. sprp_dis
        2. sprp_sch
        3. e/m/steststat
        4. e/m/srawsc
        5. e/m/sscaleds
        6. e/m/sperflev
        7. e/m/sperf2
        8. ~~e/m/scpi~~
        9. e/m/snumin
        10. e/m/sassess
h. Commas are suppressed from school and district names, and student names.
i. If [e/m/s]Alt. = '0' then set to blank.
j. If LEPFirst = '0' then set to blank.
k. For the following Accommodation variables, if the accommodation equals '0', then set to blank: Accom_readaloud, accom_scribe, accom_calculator.
l. [e/m/s]ScaledS is the combined current year and prior year official scaled score results for students included in aggregations and accountability.
m. [e/m/s]Perflev is the formatted current year achievement level or code.
n. [e/m/s]Perf2 is the formatted combined current and prior year achievement level results for accountability and aggregations. Set to blank for Grade = '09'.
o. [e/m/s]_CD is updated with current-year results.

p. [e/m/s]SGP is the reported current-year student growth percentile.
q. If Grade = '09' then the following accountability fields are set to blank:
    i. sPerf2
    ii. ~~sCPI~~
    iii. sNumin
    iv. sAssess

r. The following fields in the megafile will be blank in 2023:
    i. instruction_mode
    ii. eremote
    iii. mremote
    iv. sremote
    v. esession
    vi. msession

s. For students who took the mini-STE test:
    i. In the megafile the items that are not scored are presented with a "/".
    ii. In the megafile, ssession=1 to indicate regular test, and 3 to indicate mini form.

t.

2) Preliminary Release Specifics

a. File Name:MCASYYYY_XX.dat
   Where YYYY = 4-digit test year (e.g., 2023), XX = 2-digit test grade.
b. Files are produced for grades 03-08 and HS (includes test grade 09 and 10 data).
c. DataChanged is originally set to '0'. If a student record is new or was modified during the discrepancy period, datachanged is set to '1'. For any subsequent updates the datachanged flag will be maintained and incremented as necessary.
d. MCASRowID
   The mcasrowid is a 15-digit alpha-numeric field created in the following manner:
    i. 2 digits = administration year (ie: 23 for the 2023 test)
    ii. 2 digits = file grade (03-08 or HS)
    iii. 1 digit = test (1 = Standard)
    iv. 10 digits = bookletnumber (derived by DP from the student's SASID or submitted answer document)

B. Assigned Accommodations Data File(s)

1) File Name: [sub]Accom.csv

2) One file is produced by subject including all students in all grades and posted to the FTP.

3) The fields are described in the Accommodation File layout.

C. Accessed Accommodations Data File(s)

1) File Name: [sub]AccomByItem.csv

2) One file is produced by subject including all students in all grades and posted to the FTP.

3) For each test the file is stacked by item UIN and indicates which accommodations were accessed for that item.

4) Items with no accommodations accessed are not included in the file. If a student has not accessed any accommodations on the test this will result in that student not being included in the file.

D. Questionnaire (VOCAL) Data File(s)

1) File Name: Questionnaire Data GrXX.csv where XX = 2-digit grade

2) Layout: MCAS[4-digit year]Questionnairelayout.xlsx

3) Files are produced for Grades 04, 05, 08, and 10 and posted via FTP.

4) All students are included regardless of responses to questionnaire items, listed by SASID (StudentID)

5) Preliminary Questionnaire files will be delivered in June with final versions delivered in August. The Preliminary files will not have clean SASIDs. The MCASRowID in the final file will match the pre-discrepancy megafile.

E. Alt & Standard Participation File

A file is produced including students in all grades that took both the Alternate Assessment and Standard Assessment in the same subject. This file provides score and achievement level information for DESE to determine if any students should have their Standard Assessment results override their Alternate Assessment results. This file is posted to the FTP. The file naming convention is MCASyyyyTestedMCASandAlt.xlsx where yyyy=the academic year ex. 2122

F. State File

A state file is produced after all reruns have been done. The file contains information per the state file layout. An item list file accompanies the state file to indicate the item metadata for each item.

IX. Report Deliverables Specifications

A. General Rules for Report Generation

1. If a student does not receive a student report, then no label is printed for the student.
2. If all tested subjects for the student are under the Alternate Assessment, then the student will not receive a label or student report for the general assessment.
3. If all subjects are DNT the student does not receive a label or student report.
4. “Orphan” schools, defined by the district code field in iCore beginning with a letter, have generic district names such as Test Site or Out-of-State School. These generic names will be printed on the slip sheet of the printed reports but will be blanked out on the reports themselves. This applies to both labels and student reports.

B. Student Labels

1) Templates

a. There are three different label templates that differ depending on the number of subjects reported for the tested grade:
   i. One subject – grade 09 (9th grader with no ELA and no Math submitted)
   ii. Two subjects – grades 03, 04, 06, 07
   iii. Three subjects – grades 05, 08, 10 (also any 9th graders with ELA and/or Math submitted)

2) Label Displays

a. Student Name
   i. Presented as: FName MI. LName (with a period after the middle initial when the middle initial is not blank). Examples: JOHN T. SMITH or JENNY JONES
   ii. This section requires special formatting when one or more of the names are missing:
      1. If Lname is blank and Fname is blank, then section = “BLANK NAME”
      2. If Lname is blank and Fname is not blank, then section = “Fname BLANK”
      3. If Lname is not blank and Fname is blank, then section = “BLANK Lname”
b. Grade
   i. If grade=’10’ and summarize = 0 and StuGrade <> ‘SP’ then use StuGrade from SIMS.
   ii. If stugrade=’SP’ then blank for the labels and student reports.
   iii. Otherwise use the Test Grade and remove any leading zeroes.
c. SASID – Student ID from SIMS, no special formatting applied.
d. School Name, School Code, and District Name – School and District names and School Code from iCore based on testing school (discode,schcode). No special formatting applied.
e. Birth Date – DOB from SIMS, no special formatting applied. Stored in tblStudemo.DOB. Must be equal to 10 characters in length (MM/DD/YYYY).
f. Test Date: “Spring 20YY” where 20YY = test year, e.g., 2023.
g. Subject Title – Formatted with the following values:
   i. If subject = ‘ela’ then ‘English Language Arts’
   ii. If subject = ‘mat’ then ‘Mathematics’
   iii. If subject = ‘sci’ then and grade is 05 or 08 then ‘Science and Technology/Engineering’
   iv. Otherwise, if subject = ‘sci’ and grade is 09 or 10 (HS STE’s) then:
      1. If rptSciTry = ‘1’ then ‘Biology’
      2. If rptSciTry = ‘2’ then ‘Chemistry’
      3. If rptSciTry = ‘3’ then ‘Introductory Physics’
      4. If rptSciTry = ‘4’ then ‘Technology/Engineering’
      5. If rptSciTry= ’5’ then ‘Biology’
      6. If rptSciTry= ’6’ then ‘Introductory Physics’
h. Scaled Score – student earned scaled score stored as rScaledScore. If a student did not earn a scaled score for a tested subject (rScaledScore is NULL) the display is formatted as “---“.

i. Achievement level contains either the achievement level text or the not-tested statement stored in tblPerfLevelLookup. This is set using the student's rPerfLevel. This is always populated if the subject existed at the tested grade.

j. Local Student ID is displayed as is provided by DESE.

k. Original Grad Class is added to the labels. If Original_grad_class='999' then it is blanked out for reporting on the label and student report.

C. Student Reports

1. Templates

a. Local Student ID is added to the header of all student reports.
b. Original_grad_class is reported in header of all High School reports.
c. One subject – tested grade 09 legacy (9th grader with no ELA and no Math submitted)
d. One subject-tested grade 09 NextGen (9th grader with no ELA and no Math submitted)
e. Two subjects – tested grades 03, 04, 06, 07
f. Three subjects – tested grades 05, 08, 10 (also any 9th graders with ELA and/or Math submitted) -Science reported on the back page.
g. The grade 10 3-subject report has 3 different templates depending on the HS STE the student took. If the student took a legacy Science (Technology/Engineering or Chemistry) the back page will be in the legacy format. If the student took a Next Gen Science (Introductory Physics or Biology) the back page will be in the Next Gen format. If the student Previously Passed or Previously Failed Science, the back page will contain the back page image. The front page will have all 3 subjects and science will display the appropriate CD status for science. The subject will be "Science and Technology/Engineering" with the CD text and prior score.
h. If a student is Previously Passed (not invalidated and attempted) or Previously Failed (and attempted) in HS STE, the results will be on the Grade 10 template with the NextGen science page.
    i. The student's current earned score is reported.
    ii. The current subject is reported.
    iii. The achievement level is earned achievement level.
    iv. CD status will be reported according to the rules in the section B.16.d,e.
i. If the student has any other not tested participation status for HS STE, then the grade 10 template with the NextGen HS STE design will be used and the subject will be "Science and Technology/Engineering".
j. Students who took the mini-MCAS test will be treated as follows:
    i. They are aggregated only with other students who took the mini-MCAS who are classified as tested.
    ii. On their student report, the item grid will have · where the item was not presented on the mini-MCAS test.
    iii. A footnote will appear below the item grid that reads" ·=This question was not administered on the version of the test your child took and did not count toward their results."
k. On grade 10 reports a message is displayed on subject detail pages on the student reports for any subject where the student earns a passing score on the current year test but has not reached the Meeting Expectations performance level. There are two

notes depending on whether the student still needs to complete an Educational Proficiency Plan.
The notes read as follows:
"Note: Based on the passing standard in place during the transition to Next Generation MCAS tests, this score meets the high school graduation requirements." And "Note: Based on the passing standard in place during the transition to Next Generation MCAS tests, your child' score meets the high school graduation requirements. However, your child requires an Educational Proficiency Plan (EPP). Information on EPP requirements is available at www.doe.mass.edu/assessment/epp." For each subject the criteria are defined below for the notes to be printed on the subject page.

Subject	Original_Grad_Class	EPP/No EPP	Score Range
ELA	999 or <2026	*EPP*	*455–471*
		No EPP	*472–499*
	>=2026	*EPP*	*470–485*
		No EPP	*486–499*
Math	999 or <2026	*EPP*	*469–485*
		No EPP	*486–499*
	>=2026	*EPP*	*470–485*
		No EPP	*486–499*
Biology	999 or <2026	*N/A*	*467–499*
	>=2026		*470–499*
Physics	999 or <2026		*470–499*
	>=2026		470–499

2. Legacy HS (1 subject) Student Report Template (Chemistry or Technology/Engineering and tested grade=9 only)

The following sections discuss the formatting of the various displays presented on the legacy high school student report. All calculations and aggregation rules can be found in earlier sections of this document. Please note that all details mentioned below cover reporting of tested students as outlined in Test Administration Table.

a. Cover Page
   i. Title – "Spring 20YY MCAS Tests" where 20YY = test year, e.g., 2022.
   ii. Student Name – Presented as: LName, FName MI. (with a period after the middle initial when the middle initial is not blank). Examples: SMITH, JOHN T. or JONES, JENNY
   iii. This section requires special formatting when one or more of the names is missing:
   If Lname is blank and Fname is blank, then section = "BLANK NAME"
   If Lname is blank and Fname is not blank, then section = "BLANK, Fname"
   If Lname is not blank and Fname is blank then section = "Lname, BLANK"
   iv. SASID – Student ID from SIMS, no special formatting applied.
   v. Local Student ID from SIMS is added as is to the header section of the report.
   vi. School Name and District Name – School and District names from iCore based on testing school. No special formatting applied.
   vii. Grade-Test Grade and remove any leading zeroes.
   viii. DOB – DOB from SIMS, no special formatting. Must be equal to 10 characters in length (MM/DD/YYYY).

ix. Original_grad_class is added to the header section of the report. If the original_grad_class=999 then the original_grad_class is blanked for the reports.

b. Inner Pages

Reporting Category Display

i. Subject – Formatted with the following values:
ii. If rptSciTry = ‘2’ then ‘Chemistry’
iii. If rptSciTry = ‘4’ then ‘Technology/Engineering’
iv. Reporting category text and two-character codes for the approved text and codes.
v. Reporting category results are displayed only for students who are Tested.
vi. Points earned by your child is the points earned by the student in that reporting category.
vii. Possible Points – points possible for that reporting category.
viii. Percent of possible points earned by your child is points earned by child/points possible times 100. Rounded to the nearest whole number.
ix. Join to tblRepCatSummary based on the subject associated with the student’s rptSciTry.

Item Display

i. Subject Title – Formatted with the following values:
If rptSciTry = ‘2’ then ‘Chemistry’
If rptSciTry = ‘4’ then ‘Technology/Engineering’
ii. Order of rows within each grid
1st = “Question Number” – this is the released item order number.
2nd = “Reporting Category” – this is the two-character reporting category code.
3rd = “Your Child’s Score” - this is the response provided by the student.
iii. Formatting of Student Responses
If the student correctly responded for all MC items, this is translated to a ‘P’ in the reporting data so that a check mark is displayed. Incorrect responses are replaced with a ‘-‘ on the report as all items are unreleased.
iv. Otherwise for all other items the points earned by the student is presented along with the possible points for the item separated by a “/”. Examples: 2/4 or 7/12.
v. Item responses are blanked out in tblstuitem for students that should not receive reported item responses in the display.

Student Achievement Level and Scaled Score

i. Achievement level – contains either the achievement level text or the not-tested statement stored in tblPerfLevelLookup. This is set using the rPerfLevel
ii. Score is the earned scaled score or blank for not tested students
iii. For HS students where Test status not equal to ‘T’, scaledscores are displayed if earning a passing raw score (“Needs Improvement” or higher)
iv. For current year scaled scores use rScaledScore
v. For standard error bar use lowScaledScore and highScaledScore

vi. Graduation requirement notes:

Previous CD	current test	Text on P/G
0/blank	0/no attempt	HAS NOT MET the MCAS graduation requirement in this subject
0/blank	1	PASSED and met the MCAS graduation requirement in this subject
1	0/no attempt	Previously PASSED and met the MCAS graduation requirement in this subject
1	1	PASSED and met the MCAS graduation requirement in this subject

3. Next-Gen Student Report Template (note that this also includes legacy HS science for students taking Chemistry or Technology/Engineering)

The following sections discuss the formatting and displays presented on the Next-Gen P/G Student Report. All calculations and aggregation rules can be found in earlier sections of this document.

1) General Rules for Report Generation

a. If all tested subjects for the student are under the Alternate Assessment, then students will not receive a student report or label for the general assessment.
b. Test mode – Displayed is which mode of test the student used
    i. “Paper-based test” or “Computer-based test”
    ii. If a student has not attempted items ([x]attempt=’N’) then test mode will be blank on the student’s report.
c. Order of the Subject results
    i. The inner pages of the report display ELA on the left side of the page and Math on the right side of the page.
    ii. If grade is 05, 08 or HS, then Science results are displayed on the back page

2) Cover Page

a. If tested grade= 10: “Your Child’s Overall Results in Grade 10” is displayed.
b. If the tested grade is 5 or 8, then Family Guide text is displayed. Family Guide text is for the grade above the tested grade. Family Guide text for Grade 8 is the High School text.
c. Title – “Spring 20YY MCAS Tests” where 20YY = test year, e.g. 2023.
d. Student Name – Presented as proper case based on LName, FName MI. (with a period after the middle initial when the middle initial is not blank). Examples: Smith, John T. or Jones, Jenny
    i. This section requires special formatting when one or more of the names is missing:
        1. If Lname is blank and Fname is blank, then section = “Blank Name”
        2. If Lname is blank and Fname is not blank, then section = “Blank, Fname”
        3. If Lname is not blank and Fname is blank then section = “Lname, Blank”
e. SASID – Student ID from SIMS, no special formatting applied.
f. School Name and District Name – School and District names are truncated names from iCore based on testing school. No special formatting applied.
g. Grade –If tested grade is 5 or 8, student’s tested grade will be used.
h. For Grade 10, the student grade from SIMS is reported along with the original graduating class from SIMS (if available). If original graduating class is not available, the text “(original graduating class:)” is not printed. If Grade is “SP” then the student

grade is not reported. If original graduating class is '999' then the original graduating class would not be reported on the report.

i. DOB – DOB from SIMS, no special formatting. Must be equal to 10 characters in length (MM/DD/YYYY).
j. Local Student ID is reported as is provided in SIMS.
k. **High School:** Use the following tables, test attemptedness and earned CD to determine the appropriate note:

STE

Previous CD	current test	Text on P/G
0/blank	0/no attempt	HAS NOT MET the MCAS graduation requirement in this subject
0/blank	1	PASSED and met the MCAS graduation requirement in this subject
1	0/no attempt	Previously PASSED and met the MCAS graduation requirement in this subject
1	1	PASSED and met the MCAS graduation requirement in this subject

ELA/Math

Previous CD	current test	Text on P/G
0/blank	0/no attempt	HAS NOT MET the MCAS graduation requirement in this subject
0/blank	1	PASSED but requires an Educational Proficiency Plan in this subject
0/blank	2	PASSED and met the MCAS graduation requirement in this subject
1	0/no attempt	Previously PASSED but requires an Educational Proficiency Plan in this subject
1	1	PASSED but requires an Educational Proficiency Plan in this subject
1	2	PASSED and met the MCAS graduation requirement in this subject
2	0	Previously PASSED and met the MCAS graduation requirement in this subject
2	1	Previously PASSED and met the MCAS graduation requirement in this subject
2	2	PASSED and met the MCAS graduation requirement in this subject

l. **If tested grade=10**: print Not Tested reason below the text from the above table. If the student is tested this section is blank. The not-tested reason wording is stored in tblPerfLevelLookup. This is set using the rPerfLevel variable from tblStuTest
m. **If tested grade=10**: Print Student Growth Percentile under scaled score information
n. **If the student is being reported on the legacy science Grade 10 template, then** apply the following:

Graduation requirement footnotes

1. If student has cd='0' then print "Your child has not met the MCAS graduation requirement in this subject.
2. If student has PartStatus='K' then print "Your child has already met the MCAS graduation requirement in this subject."
3. If student has cd='1' then print "Your child has met the MCAS graduation requirement in this subject."

o. **Grade 9 reports will have Family Guide text from High School**. The same science text is displayed for science on the Grade 8 reports.

3) Inner pages

a. Reporting Category Display

i. Subject– Formatted with the following values:
If subject = 'ela' then 'English Language Arts'

If subject = ‘mat’ then ‘Mathematics’
If subject = ‘sci’ and grade is 05 or 08 then ‘Science and Technology/Engineering’
Otherwise, if subject = ‘sci’ and grade is 09 or 10 (HS STEs) then:
If rptSciTry = ‘1’ or ‘5’ then ‘Biology’
If rptSciTry = ‘3’ or ‘6’ then ‘Introductory Physics’
If rptSciTry = ‘2’ then ‘Chemistry’
If rptSciTry = ‘4’ then ‘Technology/Engineering’

b. **Next Gen**: Reporting category text, two-character codes, and report display ordering – refer to daRepCatTextLookup for the approved text and codes.
c. Reporting categories are sorted in alphabetical order.
d. Reporting category results and state comparisons are displayed only for students who are Tested. State results include only students who are Tested.
e. **Legacy Science only**: Percent of points earned by your child– pRawScore variables from tblStuRepCatPoints, no special formatting with RepCatID indicating the Reporting category RepOrder in daPointsPossible.
f. **For ELA, Math, 5 and 8 Science, and Next-Gen HS STE (Biology and Introductory Physics) the comparison “Average points earned” includes Meeting Expectation students who scored close to 500.”**
i. Prior to calculation, the pool of students used must be no less than 200. If there are less than 200 students at the 500 level, then expand the student pool to include students with scale scores equal to 501, 499, 502, 498, etc. until a minimum n of 200 students is reached, only considering students within the same scaleform.
ii. For any grade/content level that does not reach the 200-student threshold within the scaled score range of 495-505, the student’s report will not include the average points for the reporting categories.
iii. Data displaying averages in the scaled score table should include data from the full population, and not separated out by test mode.
iv. For students who are scored using a non-standard scaleform, the reporting category for which the reduced number of points is associated, display “N/A”.
g. **Item Display**
i. Subject Title and Subject Ordering follow the same rules as above.
ii. Order of rows within each grid
1 = “Question Number” – this is the released item order number.
2 = “Reporting Category” – this is the two-character reporting category code. This is displayed for HS Science students only.
If subject is ELA or Math, then: 3 = “Points Earned” - this is the score the student received for the item/total points possible for the item.
If subject is STE, then: 3=Practice Category-The single character abbreviation for the Practice Category assigned to the item. If there is no Practice Category assigned to the item, then “/”
If subject is STE, then: 4=” Points Earned”- this is the score the student received for the item/total points possible for the item.
iii. Order of items
a. Items are ordered in the order specified in the reporting sequence column in the test maps.
b. Item responses are ordered by the reportingsequence column in the test maps.

c. For essay points for each trait will be printed separately on the report in released item and trait order.

iv. Formatting of Student Responses

a. **Legacy HS Science** data will include the following:
   Check marks for correct answers.
   An asterisk if more than one answer provided.
   A dash if a student incorrectly answered the item.
   Open response items are displayed with the number of points earned out of the total possible points (Ex. 3/4 or 0/1).

b. ELA and Math and 5&8 Science, Biology and Introductory Physics data are displayed as the number of points earned out the total points possible (Ex. 1/1 or 0/3).

c. If a student did not answer an item, that cell will be blank.

h. Student Achievement Level and Scaled Score Statements

i. **Next Gen**: "Your Child's Achievement Level:" Achievement level earned by the student or the not tested reason for not tested students

ii. **Next Gen**: "Your Child's Score:" earned scaled score, the rScaledScore variable from tblStuTest.

iii. EL First-year students:

a. Students who are not Tested do not receive scaled scores

b. if TestStat = NTL:
   Scaled scores printed for ELA and Math and 5&8 Science if earned Achievement Level is PM or above.
   Scaled scores printed for HS Science students earning a CD status of 1 or above.

iv. State results will only include students who fully attempted.

i. Special Access Accommodation Student Report text based on table Special Access Accommodation Footnote Text (Student Report). See below for wording.

j. Next- Gen: Average Scaled Scores and Prior Scaled Scores

i. Display current year average scaled score based on official school and official district

ii. Prior grades and scaled scores will be pulled from the SIMS data

iii. Prior scores in grades 4-–8 to be reported are years 2021 and 2022 where available. Grade 10 will have results for 2021 and 2019 where available.

iv. Historical grades are populated from the SIMS fields Grade2019, Grade2021 and Grade2022. The fields are compared to the values in the below table:

Current Grade	Grade2022	Grade2021	Grade2019
04	03		
05	04	03	
06	05	04	03
07	06	05	04
08	07	06	05
10		08	06

If the grades from SIMS do not equal the above based on current grade, past scores, and sgp are not reported for the discrepant year.

k. Student Growth Percentile Display

i. Growth is provided by DESE.
ii. If a student's test status changes to Not Tested, then growth will be blanked out.
iii. Mean growth is based on official school and official district.
iv. Your Child – presents the student's growth percentile.
v. GP is used to mark the location of the circle with score.
vi. lowGP and highGP are used to draw a standard error bar behind the student score circle.
vii. School/District – Mean value from tblSummary for school/district based on official school and district (sprp_sch and sprp_dis).
viii. School/District Means are displayed regardless of whether the student has a growth percentile displayed.
ix. In 2023, State mean is fixed at 50.

l. Special access accommodation footnote

Special Access Accommodation	Student Report Text
Read aloud	Information provided by the school indicates this student received a special access accommodation (the ELA test was read aloud to this student) as required by their IEP or 504 plan.
Scribe	Information provided by the school indicates this student received a special access accommodation (this student used a scribe for the ELA test) as required by their IEP or 504 plan.
Calculator	Information provided by the school indicates this student received a special access accommodation (this student used a calculator for the non-calculator session of the mathematics test) as required by their IEP or 504 plan.
Read aloud and Scribe	Information provided by the school indicates this student received special access accommodations (the ELA test was read aloud to this student and the student used a scribe for the ELA test) as required by their IEP or 504 plan.

D. MCAS-Alt Feedback Form (MFF)

The Feedback Form is produced in June for the students who participate in the Alternate Assessment. This report is provided to educators as feedback to submitted student work. Alternate Assessment requirements are documented in the Reporting Business Requirements document for the Alternate Assessment.

X. Cognia Use Only:

a. Only tests with ex[sub]='0' will be loaded to ODS
b. Unique 4-character forms are created.
c. Testmode is added to studenttest.demographic (values to indication: online or paper)
d. Form definition for Psych Portal:
e. For Grade 10
    Paper Spanish form = 'PS00'
    Online Spanish without special indicator = 'ES01'
    Online Spanish with special indicator = 'ES' + first two characters of the special code

Online Form without special indicator = Accommodation/mode indicator + form #
Online Form with special indicator = special indicator + form #

f. For Grade 3–8
Mini test without Accommodation indicator = admin + form#
Mini test with Accommodation indicator = admin + Accommodation/mode indicator
Online Form without accommodation indicator = 'O' + form # + unit#
Online Form with accommodation indicator = accommodation/mode + unit#

g. Science Practice Categories are stored in Objective 5 in the test map as follows:

A. Investigations and Questioning
B. Mathematics and Data
C. Evidence, Reasoning, and Modeling

h. Reporting Products

Contract Code: [163752] Description MCAS Spring 2023 Admin ID 1	Report Type	Report For	Grade(s)	Report Subtype	Content Code	Qty
Student Report Parent Copy	07	1	03-10	02	00	1
Student Label	07	1	03-10	03	00	1

XI. Appendices

A. Reporting Category table

The last 3 rows in the table below are the science practice categories.

Grade	Subject	RepCatID	RepCatLabel	RepCatAbb	rptRepCatOrder
3	ela	1	Reading	RE	2
3	ela	2	Language	LA	1
3	ela	3	Writing	WR	3
3	mat	1	Operations and Algebraic Thinking	OA	5
3	mat	2	Number and Operations in Base Ten	NT	4
3	mat	3	Number and Operations-Fractions	NF	3
3	mat	4	Measurement and Data	MD	2
3	mat	5	Geometry	GE	1
4	ela	1	Reading	RE	2
4	ela	2	Language	LA	1
4	ela	3	Writing	WR	3
4	mat	1	Operations and Algebraic Thinking	OA	5
4	mat	2	Number and Operations in Base Ten	NT	4
4	mat	3	Number and Operations-Fractions	NF	3
4	mat	4	Measurement and Data	MD	2
4	mat	5	Geometry	GE	1
5	ela	1	Reading	RE	2
5	ela	2	Language	LA	1
5	ela	3	Writing	WR	3
5	mat	1	Operations and Algebraic Thinking	OA	5
5	mat	2	Number and Operations in Base Ten	NT	4
5	mat	3	Number and Operations-Fractions	NF	3
5	mat	4	Measurement and Data	MD	2
5	mat	5	Geometry	GE	1
5	sci	1	Earth and Space Science	ES	1
5	sci	2	Life Science	LS	2

continued

Grade	Subject	RepCatID	RepCatLabel	RepCatAbb	rptRepCatOrder
5	sci	3	Physical Science	PS	3
5	sci	4	Technology/Engineering	TE	4
6	ela	1	Reading	RE	2
6	ela	2	Language	LA	1
6	ela	3	Writing	WR	3
6	mat	1	Ratios and Proportional Relationships	RP	3
6	mat	2	The Number System	NS	5
6	mat	3	Expressions and Equations	EE	1
6	mat	4	Geometry	GE	2
6	mat	5	Statistics and Probability	SP	4
7	ela	1	Reading	RE	2
7	ela	2	Language	LA	1
7	ela	3	Writing	WR	3
7	mat	1	Ratios and Proportional Relationships	RP	3
7	mat	2	The Number System	NS	5
7	mat	3	Expressions and Equations	EE	1
7	mat	4	Geometry	GE	2
7	mat	5	Statistics and Probability	SP	4
8	ela	1	Reading	RE	2
8	ela	2	Language	LA	1
8	ela	3	Writing	WR	3
8	mat	1	Number System & Expressions/Equations	NE	3
8	mat	2	Functions	FN	1
8	mat	3	Geometry	GE	2
8	mat	4	Statistics and Probability	SP	4
8	sci	1	Earth and Space Science	ES	1
8	sci	2	Life Science	LS	2
8	sci	3	Physical Science	PS	3
8	sci	4	Technology/Engineering	TE	4
10	che	1	Properties of Matter and Thermochemistry	TH	3
10	che	2	Atomic Structure and Periodicity	AS	1
10	che	3	Bonding and Reactions	BR	2
10	che	4	Solutions, Equilibrium, and Acid-Base Theory	SO	4
10	ela	1	Reading	RE	2
10	ela	2	Language	LA	1
10	ela	3	Writing	WR	3
10	mat	1	Number and Quantity	NQ	3
10	mat	2	Algebra and Functions	AF	1
10	mat	3	Geometry	GE	2
10	mat	4	Statistics and Probability	SP	4
10	tec	1	Engineering Design	ED	3
10	tec	2	Construction and Manufacturing	CM	1
10	tec	3	Fluid and Thermal Systems	FL	4
10	tec	4	Electrical and Communication Systems	EL	2
10	bio	1	Molecules to Organisms	MO	4
10	bio	2	Heredity	HE	3
10	bio	3	Evolution	EV	2
10	bio	4	Ecology	EC	1
10	phy	1	Motion, Forces, and Interactions	MF	2
10	phy	2	Energy	EN	1
10	phy	3	Waves	WA	3
5,8, HS	sci	N/A	Investigations and Questioning	A	N/A
5,8, HS	sci	N/A	Mathematics and Data	B	N/A
5,8, HS	sci	N/A	Evidence, Reasoning, and Modeling	C	N/A

B. Report Translation top 15 Languages

Counts are based on SIMS firstlanguage field

Rank	First Language (abbrev.)	First Language Name	No. of enrolled students gr. 3-12 (Oct. 2022 SIMS)
1	spa	Spanish	81,375
2	por	Portuguese	25,044
3	chi	Chinese	9,781
4	hat	Creole (Haitian)	6,467
5	ara	Arabic	5,643
6	cpp	Crioulo	5,004
7	vie	Vietnamese	4,689
8	rus	Russian	2,986
9	khm	Khmer	2,470
10	fre	French	1,652
11	twi	Twi	1,433
12	hin	Hindi	1,315
13	tel	Telugu	1,201
14	alb	Albanian	1,120
15	guj	Gujarati	1,088

XII.Addenda:

There was an issue with 3 items on the screen reader form. The items are:

- Grade 3 Math Item 6 = MA001049099
- Grade 4 Math Item 31 = MA293812
- Grade 8 STE Item 24 = SC803872056

a. The solution requested by the client is for the students to have the item removed from their test. This will result in the students being on their own scaleform.
    i. On their student report, the item grid will have where the item was removed from their test record.
    ii. In the megafile the items that are not scored are presented with a "/".
    iii. A footnote will appear below the item grid that reads" ·=This question was not administered on the version of the test your child took and did not count toward their results."
    iv. ** is used to mask the following columns in the reporting category table for the affected Reporting Category in each case: Average Points in School, Average Points in District, Average Points in State, Average Points at Meeting Expectations
    v. The ** note reads "Average number of points for the school, district, state and at Meeting Expectations are not available for the version of the test your child took."
b. Students in Grade 9 who took a legacy STE will be reported as follows:
    i. The student will not receive a student report or label
    ii. The student will receive a memo from DESE
    iii. The student's test will be included in the megafile with the earned raw and scale score and CD.
    iv. Item level data will be blank in the megafile

MCAS-ALT

Reporting Business Requirements
Massachusetts Comprehensive Assessment System Alternate Assessment (MCAS-Alt)
Spring 2023

This document details requirements for analysis and reporting. The final student level data used for analysis and reporting is described in the "Data Processing Specifications." This document is considered a draft until the Massachusetts Department of Elementary and Secondary Education (DESE) signs off. If there are rules that need to be added or modified after said sign-off, DESE sign-off will be obtained for each such rule.

XIII. Contract Overview (MCAS-Alt)

A. New For This Year

- Will not apply in 2023: For Grade 10 STE, if a student does not have results instead of "Required, but not submitted" being printed on student report, the achievement level column on the report will be blank. These will be treated as students in grades 11,12, or 12+.
- Continuing into 2023: On the Student Report, students with participation status Previously Failed will have Achievement Level="Previously Tested" printed
- Continuing into 2023: Achievement Level "Incomplete Portfolio" is changed to "Incomplete"
- SCPI is no longer calculated.

B. Test Administration(s) Adminid=5

Subject	Required Grades	Permissible Grades	Test Type
ELA	03–08, 10	03–08, 10+	Portfolio
Mathematics	03–08, 10	03–08, 10+	Portfolio
Science & Technology/Engineering	05, 08	05, 08	Portfolio
One of either High School Biology, Chemistry, Introductory Physics, or Technology/Engineering	10	09,10+	Portfolio

C. General Information

ii. Client and internal deliverables for this contract are listed. Specifications for each deliverable are detailed in the Deliverable Specifications section provided.

Deliverable	Type	Delivery	Administration		
			June	Prelim	Post-Discrepancy
Student data Files	.xls	To PM	ü		ü
Alt Mega File	.dat	To PM	ü		
Comments Summary	.xls	To PM			ü
General Comments Summary	.xls	To PM			ü
State Performance Level Summary	.xls	To PM		ü	ü
State Participation Summary	.xls	To PM			ü
Teacher Survey	.xls	To PM		ü	
Participation by Disability	.xls	To PM			ü
Feedback Form (school level pdf)	.pdf	FTP for State	ü		
Feedback Form (by student pdf)	.pdf	Shipped with Portfolio	ü		
Parent/Guardian Report (school and district copy)	.pdf	Shipped to District			ü

XIV. Internal Data Sources

A. Scoring

iii. If score 1 does not match score 2 for any dimension, there must be a 3rd score for that dimension.

iv. If there is a 3rd score for a dimension, that score is the score of record. Otherwise, the 1st score is the score of record.

v. If scorer 3 bubbles Strand not Submitted, the strand will be considered not submitted and no scores will be reported.

vi. If Demonstration of Skills or Independence has a score of 'M' then both Demonstration of Skills and Independence must have a score of 'M'.

vii. A score of 'M' for scorer 1 and/or 2 will always have a 3rd score.

viii. A score of '1' for Level of Complexity from scorer 1 and/or 2 will always have a 3rd score.

ix. If Level of Complexity has a score of 1 then all other scores for that strand must be blank.

x. If 'At or Close to Grade Level Bubble' is 1 for a content area then at least one of the required strands for that content area must have a Complexity score of 3 or higher.

xi. A score of 'M' for Demonstration of Skill and Independence counts as a 1 for analysis.

xii. The performance level for each strand is determined by a lookup table (see section VI.B) using scores from Complexity, Demonstration of Skills, and Independence.

xiii. Bubbled comments that do not have text associated with them will be suppressed.

xiv. Strands with a Level of Complexity score of 1 will be treated as not submitted for analysis. If a required strand has a Level of Complexity score of 1, then the resulting performance level will be incomplete.

xv. For High School sciences DP sets the SciTry variable to indicate which science test was submitted for the current year, SciTry is calculated by reconciling the subject indicated by scorer 1 with scorer 3.

- '1' = Legacy Biology
- '2' = Chemistry
- '3' = Legacy Physics
- '4' = Technology/Engineering
- '5' = NextGen Biology
- '6' = NextGen Intoductory Physics
- For grades 10+ where science was not submitted, default sciTry to 1.
- SciTry is blank for grades 03-08.
- DA calculates the final reporting SciTry value as rptScitry.

B. Data Processing (DP)

xvi. ***Amend Flag***

- The Amend flag for each content area is set by DP based on test booklet reconciliation and the DESE Breach List on an individual student basis. The default Amend flag value for all students is '0'.
- See the Amend Flag Lookup (a Cognia internal Document) for valid Amend Flag values and their impact on reporting.

XV. External Data Sources

A. Breach List

xvii. Students who are considered a security breach are provided by the DESE in the Breach List. These students are identified as Security Breach: Cheating and instructions for processing and reporting the tests on an individual case basis are provided.

xviii. Data Analysis adds necessary Amend flag values (> '1') and instructions to the Amend Flag Lookup for each distinct scenario on the Breach List.

xix. Data Processing applies any necessary changes to the student record based on the DESE instructions and applies the corresponding Amend Flag value from the lookup to the student for Data Analysis processing.

B. SIMS

xx. Student demographic data is provided by the DESE for reporting use. Please see the Data Processing specifications for internal validations and requirements of the data.

xxi. ***Summarize***

- Summarize is populated in SIMS as either '1' or '0' or blank:
  a. Summarize = '1' indicates that the student is expected to test in the subjects specified for their grade and should be included in aggregations (where applicable). Their results are included in accountability determinations.
     - Students in Grades 03–08 are all expected to test.

- Students in Grade 10 (or students skipping grade 10 who have not yet been tested) are expected to test in Math and ELA and are expected to test or to have prior scores for science. They will have Summarize = '1'.

b. Summarize = blank in SIMS is only applicable to students from the student directory that do not link to SIMS.

c. Summarize = '0' indicates that the student is not expected or required to test at this time for accountability. These students are excluded from aggregations (except for grade 09 specific aggregations). Their results are not counted towards accountability determinations. This includes but is not limited to: student grade 09 students, students that are retesting to meet graduation requirements in a subject they previously failed or missed, students that are retesting to increase their scores for scholarship purposes, or students that are new to Massachusetts.

- See the Data Reconciliation section IV.A for Data Processing rules for determining the final Summarize source or default value in the views for DA based on Test Grade and SIMS data.

xxii. ***Banked Prior Achievement Level***

- Only applicable for science. All references are specific to science; if these determinations are needed for Math or ELA, the corresponding Math and ELA specific fields would be used.
- High_sPerf in SIMS contains the prior high achievement level to be considered during participation status assignment. ELA and Math fields are High_ePerf and High_mPerf respectively and are expected to be blank for HS students with Summarize = '1'.
- All other fields with historical score or performance information, including the CD fields, are ignored during the participation status determination for students.
- Data are stored in DPRaw for DA in [sub]PerfLevelHigh (for all subjects) and [sub]NTL fields (for science).

xxiii. ***SciNTL***

- If SciNTL = '1' a student is considered to have previously tested in science as a first year EL student and was reported with a sTestStat = 'NTL'.

C. Grade Span Lookup

- DESE provides a grade span lookup for all public official schools. These are joined to student data based on sprp_sch in tblStudemo.
- Cognia will provide DESE with a list of any public schools that have students assigned to them that are not included in the lookup, resulting in blank grade span data based on the Preliminary data release.
- All public schools must have a grade span for final post-discrepancy reporting. For earlier releases grade spans may be blank for schools missing from the lookup.

D. Discrepancy Site

xxiv. Data from preliminary reporting is posted to the discrepancy site for clean up by the field and the department.

xxv. See the Discrepancy Site Requirements for more details on which fields are available for editing at each user level.

xxvi. Data Processing re-processes data post-discrepancy to incorporate the updated information and discrepancy resolutions from the DESE for DA for final reporting.

xxvii. During final processing all information from the discrepancy site is considered final and is maintained, however, changes to certain fields require additional data audits and/or recalculation of student participation status to ensure consistency. See the Data Reconciliation section for these details.

E. Alternate Assessment Override

xxviii. Based on preliminary results from the Alt and Standard Results data file, the DESE may identify any students whose Standard Assessment results should be reported instead of their Alternate Assessment results during final reporting (subject specific).

xxix. The DESE will provide this list to Data Processing with the discrepancy resolutions.

xxx. DP will set the amend flag to appropriately identify these students for DA.

XVI. Data Reconciliation

The following cleanup will be performed on student level data prior to analysis once demographic data and reconciled test information are compiled to ensure consistency. Calculations are performed in the order listed below, and audited values are used in each subsequent check and for all analysis and reporting, as applicable:

A. *Summarize* (performed by DP)

xxxi. If test grade is in 03-08, summarize is defaulted to '1' for all students, regardless of SIMS value.

xxxii. If test grade is '09' summarize is defaulted to '0' for all students, regardless of SIMS value.

xxxiii. If test grade is '10':

- If student grade is ≤ '09':
  a. If the student submitted both Math and ELA (Alt or Standard), then summarize = '1'.
  b. Otherwise, summarize = '0'.
- If student grade = '10','11','12', or 'SP' then summarize is taken from SIMS. If summarize is missing, or if student grade is missing, it is defaulted to '0'.

xxxiv. The same rules are applied post-discrepancy, except summarize is taken from the updated Discrepancy data in place of SIMS. If summarize is updated during discrepancy reporting the participation status is set to blank to be reassigned.

B. ELfirstyear YrsInmass/ YrsInmass_num

xxxv. ELfirstyear is provided in SIMS and is not audited by Cognia

xxxvi. YrsInmass and YrsinMass_num are not audited by Cognia

C. EL

xxxvii. If ELfirstyear = '1' then update existing EL to '1'.

D. EL_FormerEL

xxxviii. If ELfirstyear = '1' or EL = '1' or FormerEL (DA Use: "flep_off" in dpraw) = '1' then update existing EL_FormerEL to '1'.

XVII. Official School and Official District Code

A. Terminology:

xxxix. Discode = Cognia Testing Discode from DPRaw (See DP Specifications)

xl. SchCode = Cognia Testing SchCode from DPRaw (See DP Specifications)

xli. SendDiscode = Sending District from SIMS

xlii. SimsDisCode = Official Discode from SIMS

xliii. SimsSchCode = Official SchCode from SIMS

xliv. Testing Orgtype = Testing school (discode+schcode) Org type

xlv. OrgType = SPRP school org type

xlvi. Exceptions List is provided to Cognia by the DESE.

xlvii. (DA Use): The exceptions list is stored in daTestSitelookup

B. Official District (sprp_dis)

xlviii. If the student's testing discode+schcode is on the *Exceptions List* (System+School) then the official district is the sprp_dis from the *Exceptions List*.

xlix. If the student's testing orgtype is 6, 13 or 22 then the official district is set to the discode concatenated with four zeroes.

l. Otherwise, the official district is the sending district from SIMS (senddiscode) if it exists, concatenated with four zeroes at the end. If senddiscode is blank the official district is set to '99999999'.

C. Official School (sprp_sch)

li. If the student's testing school (discode+schcode) is on the *Exceptions List* (System+School) then the official school is the sprp_sch from the *Exceptions List*.

lii. If a student is from a collaborative school (testing OrgType = 4) then the official school is = 05*XX*0000 where *XX* is the 3rd and 4th digit of the testing district code.

liii. If the student's testing orgtype is 25 or 31 then the official school is the official school code from SIMS (simsDiscode + SimsSchcode). If the simsDiscode and simsSchcode are blank the official school is set to the testing school code (discode+schcode). If the official school from SIMS turns out to be orgtype 22, then use the Exceptions list for official school.

liv. Otherwise, the official school is the testing school (discode+schcode).

D. Setting of Orgtype

lv. Orgtype is based on the official school code.

lvi. Using the official school code link to the MCAS org data file (DA use: icore) and pull the org type (DA use: Reportcode2).

- If an orgtype is not assigned, default orgtype to 'X'. This is expected due to some SPRP schools not being in the Org data file.

E. YrsInSch and YrsInDis

lvii. If sprp_sch or testing school (discode+schcode) = the official SIMS school code from June SIMS (simsDiscode + simsSchcode) then use YrsInSch value from SIMS. Otherwise set YrsInSch = '1'.

lviii. If sprp_dis = SendDiscode+0000 from June SIMS, then use the YrsInDis value from SIMS. Otherwise set YrsInDis = '1'.

F. Oct_Enrol (enrolled in same location since Oct)

lix. If sprp_sch or testing school (discode+schcode) = SIMS school code from June SIMS (simsDiscode+simsSchcode) then OctEnr = Oct_off from SIMS. Otherwise set Oct_Enr = '0'.

G. Con_Enrol (continuously enrolled for 2 years)

lx. Only populated for students in the grade 10 view, otherwise blank.

lxi. If sprp_sch or testing school (discode+schcode) = the official SIMS school code from June SIMS (simsDiscode + simsSchcode) then use con_enr_sch value from SIMS. Otherwise set con_enr_sch = blank.

lxii. If sprp_dis = SendDiscode+0000 from June SIMS, then use the con_enr_dis value from SIMS. Otherwise set con_enr_dis = blank.

lxiii. ConEnr_sta is taken from SIMS.

XVIII. Student Participation and Reporting Status

A. Basic Definitions

lxiv. ***Test Attemptedness*** *(by subject)*

- A strand was submitted if there is at least one scoring dimension with a valid score.
- Attempt: A student participated if at least one required strand was submitted
- Did not attempt: Students did not submit any required strands.

lxv. ***Not Tested Indicators*** *(by subject)*

The following Not Tested reasons may be bubbled on the student's answer booklet.

- Tested Standard MCAS
- Absent-Medically Documented (MED)

lxvi. ***Transfer***

- If Active_Test ≠ '1' and at least one required strand is missing the student is considered a transfer student.

lxvii. ***Void***

- Students whose only Student Information booklet (SIB) has been voided (Void = '1') are considered "Void".

lxviii. ***Prior Results*** *(by subject)*

Prior results currently only apply to HS Science. All references to High_sPerf and SciNTL should be considered subject specific if ELA and Math are updated to allow for prior result determinations.

- **No Prior Results**
  Students with a blank High_*x*Perf and sciNTL ≠ '1' from SIMS are considered to not have prior results.
- **Previously Passed**
  Students with a High_*x*Perf from SIMS in ('A', 'P', 'NI', 'A_A','P_A', 'NIA','M','E', or 'PM') are considered to have previously passed the subject.
- **Previously Failed**
  Students with a High_*x*Perf from SIMS in ('F', 'PRG', 'EMG', 'AWR', and 'INP','NM') are considered to have previously failed the subject.
- **Previously First Year EL**
  a. Students with SciNTL = '1' from SIMS are considered to have previously tested in science as a First Year EL student and were reported as TestStat = 'NTL'.
     - Applies to Science only, corresponding variables for ELA and Math do not currently exist in SIMS.

- If High_sPerf is not a Previously Passed status and SciNTL = '1', the student is considered Previously Failed.

B. Participation Status Assignment Hierarchy (by subject):

lxix. Breach List (Amend Flag > '1:' continue through assignment, breach instructions will trump all reporting instructions)

lxx. Summarize = '1' or Grade='09' without prior results:

- If the student **meets attemptedness** Tested *(PartStatus= 'A).*
- If the student did not attempt:
  a. If subject = 'ELA' and First Year LEP then: **Not Tested, LEP** *(PartStatus= 'F')*
  b. Otherwise, if MED then: **Not Tested Medically Documented** *(PartStatus= 'G')*
  c. Otherwise if Tested Standard MCAS is indicated then: **Tested MCAS Standard Assessment** (PartStatus='Z')
  d. Otherwise: **Not Tested Absent** *(PartStatus= 'E')*

lxxi. If (Summarize='1' or Grade='09') and Previously Failed:

- If the student *meets attemptedness* then: **Tested Accountable Retest** (PartStatus= 'C').
- If the student *partially attempted* or *did not attempt,* then: **Not Tested Accountable Retest** (PartStatus= 'L').

lxxii. If (Summarize='1' or Grade='09') and Previously Passed: **Previously Passed** (PartStatus='K')

lxxiii. Summarize = '0' and grade≠'09' (regardless of any prior test results):

- If the student meets attemptedness: **Not Accountable Retester** *(PartStatus= 'W').*
- If the student did not attempt: **Not Tested Not Accountable** (P*artStatus= 'J').*

C. Participation Status Summary

lxxiv. **Note there are some participation statuses in the chart that are not in the hierarchy above. These are not achievable in the alt and will only come out of the discrepancy site.**

Summarize	Prior Results	Description	Part Status	Test Stat*	Discrepancy Site Code	Discrepancy Site Text
		Breach	*Breach Instructions are applied at the student level regardless of participation status and are identified by Amend > '1'*			
		Void *(Preliminary Only)*	H	NTO	VAB	Void Answer Booklet
n/a	*n/a*	Multiple Answer Documents (Security Breach)				
		Preliminary	I	NTO	DUP	Multiple Answer Booklets
		Final	N	NTO	*n/a*	*n/a*
		Invalidated (Only assigned via Breach List)	N	NTO	INV	Invalidated
1 (or Grade=09)	*n/a*	Tested Accountable Alternate Assessment	A	T*	ALT	Tested Alternate Assessment
		Tested	Z	T*	STD	Tested Standard
		Not Tested (/Partially Tested) – LEP *(ELA Only)*	F	NTL	LEP	Not Tested First Year LEP
		Not Tested (/Partially Tested) - Transfer	D	NTO	TRN	Transferred
		Not Tested (/Partially Tested) – Medically Documented	G	NTM	MED	Absent-Medically Documented
		Not Tested (/Partially Tested) - Absent	E	NTA	ABS	Absent
	Prev. Failed	Tested Alternate Assessment Accountable Retest	C	TR*	ALR	Retested Alternate Assessment
	Prev. Failed	Tested Accountable Retest	Y	TR*	RET	Retested
	Prev. Failed	Previously Failed (Not Tested /Partially Tested Accountable Retest)	L	NTO*	PRF	Previously Failed
	Prev. Passed	Ineligible Accountable Retest – Previously Passed & Retested *(Preliminary Only- final see K)*	P	NTO*	PPR	Previously Passed & Retested
	Prev. Passed	Previously Passed	K	NTO*	PAS	Previously Passed
	Any	Tested Not Accountable Alternate Assessment (Retest)	W	TR*	ALN	Retested Alternate Assessment Not Aggregated
		Tested Not Accountable (Retest)	R	TR*	REN	Retested Not Aggregated
		Partially Tested Not Accountable (Retest)	B	NTO*	INC	Incomplete
		Not Tested Not Accountable (Retest)	J	NTO*	DNT	Did Not Test

** Student results achieved while First-year LEP, or students currently First-year LEP (see rptLEPFirst calculation) are reported with TestStat = "NTL" in place of listed TestStat (all subjects). See Calculations by Participation Status Summary Table for more details.*

D. Post-Discrepancy Assignment

lxxv. DA only "recalculates" participation statuses for students with a blank participation status during post-discrepancy processing. All other participation statuses are maintained as they are provided from the discrepancy data.

lxxvi. DP will reset participation statuses to blank prior to final processing for the following discrepancy events so DA will recalculate a new status:

- Student test grade is changed.

- Summarize is changed (not applicable in unchanged grades 03–08, 09).

		Breach	*Breach Instructions are applied at the student level regardless of participation status and are identified by Amend > '1'*										
		Void *(Preliminary Only)*	**H**	*any*	NTO	earned	earned	---	VAB	---	---	---	0 [3]
		Multiple Answer Documents (Security Breach) :											
		Preliminary	**I**	*any*	NTO	earned	earned	---	DUP	---	---	---	---
		Final	**N**	*any*	NTO	---	---	---	INV	---	---	---	---
1 (or Grade=09*)		Tested Alternate Assessment	**A**	0	T	---	---	---	earned (Alt)	---	earned (Alt)	ü	1
				1	NTL					---	---	---	1
		Tested	**Z**	0	T	earned	earned	earned	earned	earned	earned	ü	1
				1	NTL			*Pass:* earned *Else:* ---	*Pass:* earned *Else:* LEP	*Pass:* earned *Else:* ---	---	---	1
		Not Tested /Partially Tested – LEP (ELA Only)	**F**	1	NTL	earned		*HS Pass:* earned *Else:* ---	*HS Pass:* earned *Else*: LEP	*HS Pass:* earned *Else:* ---	---	---	1
		Not Tested /Partially Tested - Transfer	**D**	0 (M/S 1)	NTO				*HS Pass:* earned *Else*: TRN		---	---	---
		Not Tested /Partially Tested – Medically Documented Absent	**G**	0 (M/S 1)	NTM				*HS Pass:* earned *Else*: MED		---	---	0
		Not Tested /Partially Tested - Absent	**E**	0 (M/S 1)	NTA				*HS Pass:* earned *Else*: ABS		---	---	0
	F	Tested Alternate Assessment Accountable Retest	**C**	0	TR	---	---	---	earned (Alt)	---	highest (Alt)	ü	1
				1	NTL					---	---	---	1
	F	Tested Accountable Retest	**Y**	0	TR	earned	earned	earned	earned	highest	highest	ü	1
				1	NTL			*Pass:* earned *Else:* ---	*Pass:* earned *Else*: LEP	*Pass:* highest *Else:* ---	---	---	1
	F	Previously Failed	**L**	0	NTO	*Pass:* earned	*Pass:* earned	*Pass:* earned	*Pass:* earned *Else:* PRF	highest	highest	ü	1

Summarize	Prior Results		Part Stat	rptLEP[sub] [1]	Test Stat	Current Year Reporting Results							
		(Not Tested /Partially Tested Accountable Retest)		1	NTL	*Else:* --	*Else:* --	*Else:* --	*Pass:* earned *Else:* LEP	*Pass:* highest *Else:* --	---	---	1
	P	Ineligible Accountable Retest – Previously Passed & Retested *(Preliminary Only)*	**P**	0	NTO	earned	earned	---	INE	prior	prior	ü	1
				1	NTL					prior	---	---	1
	P	Previously Passed	**K**	0	NTO	---	---	---	PAS	prior	prior	ü	1
				1	NTL					prior	---	---	1
0		Tested Not Accountable Alternate Assessment (Retest)	**W**	0	TR	---	---	---	earned (Alt)	---	---	---	---
				1	NTL								
		Tested Not Accountable (Retest)	**R**	0	TR	earned	earned	earned	earned	earned	---	---	---
				1	NTL			*Pass:* earned *Else:* --	*Pass*: earned *Else:* LEP	*Pass:* earned *Else:* --			
		Partially Tested Not Accountable (Retest)	**B**	*any*	NTO	earned	earned	*Pass:* earned *Else:* --	*Pass:* earned *Else:* INC	*Pass:* earned *Else:* --	---	---	---
		Not Tested Not Accountable (Retest)	**J**	*any*	NTO	---	---	---	DNT	---	---	---	---

[1] rptLEP is LEPFirst for all grades/subjects/participation statuses that do not have prior results. It is a calculated combination of LEPFirst and prior LEP First status for Accountable partstatuses with prior results. See calculations section for details.
[2] Assess exceptions for ELA: there is an additional condition of participation on the Access test. See calculation specifics for details.
[3]If Summarize = 1 then Assess = 0. If Summarize = 0 then Assess is blank.
**Grade = 09 students are assigned participation statuses as if Summarize = '1'. Perf2, CPI, Numin, and Assess are populated for calculations but set to blank in the Megafile deliverable.*
Note: "(M/S 1)" indicates that rptLEP[sub] may also be '1' in Math and Science for the listed participation statuses.

- First year EL status is changed.
- Answer document is still void (entire book is suppressed).
- Answer document(s) are added or removed for a student.

- Prior results (high_xPerf, sciNTL) are changed for a student.

XIX. Calculations

i. ***Calculation Summary by Participation Status*** *(by subject)*

A. Student Level Calculations

lxxvii. ***StudentID*** *(**tblStudemo**)*

- StudentID = rptStudentID from DPRaw.
- If StudentID begins with '8' it will be set to blank.

lxxviii. ***Grade Span (tblStudemo)***

- Calculated using a lookup file provided by the DESE.

lxxix. ***Reporting First Year EL Status (rptLEP[sub])*** *(tblStudemo)*

- RptLEP is determined for each subject based on current year partstatus, test attemptedness, First Year LEP status, and Prior First Year LEP Status (where applicable) to determine if a student's results should be considered achieved while under First-Year LEP status or as currently First-year LEP. This takes into consideration the prior status of the student when prior results are eligible for accountability.
- For all participation statuses that are considered Not Accountable rptLEP*[sub]* = ELfirstyear.
- Otherwise, if the student is considered Accountable then:
  a. If the student has prior results:
     - If the student meets attemptedness this year, then: rptLEP*[sub]* = ELFirstyear.
     - If the student does not attempt this year, then:
       1. rptLEP*[sub]* = '1' if either ELFirstyear = '1' or SciNTL = '1'.
       2. Otherwise rptLEP*[sub]* = '0'.
  b. If the student does not have prior results, then rptLEP*[sub]* = ELFirstyear.

lxxx. ***SpecialEd*** (tblStudemo)

- If a student is considered Tested or Retested Alternate Assessment (accountable or not accountable) in any subject, then Sped_off = '1'. Otherwise, it is '0'.

lxxxi. ***ParentLetter (tblStudemo)***

- The Parent Letter flag is set to '0' to indicate that the student should not receive a Parent/Guardian Report in the following cases:
  a. If a student is classified as not tested or breach in all required subject, then ParentLetter = '0'.
- Class Pack Identifiers (Cognia) for printing the Parent version of the Parent/Guardian Report are produced for all students with ParentLetter = '1'.

lxxxii. ***General Portfolio Comments (tblStuDemo)***

- Scorers have the option of leaving comments for individual strands as well as for the whole portfolio.
- Comments will be sorted numerically.

- Only the first 4 general portfolio comments will be kept and reported on the portfolio feedback form.
- If a student did not receive a performance level of incomplete and the student has less than 4 general portfolio comment codes, then.
    a. Data Analysis will add comment code associated with Gen Comment 1 from the lookup provided by client services as a general portfolio comment. If the student still has less than 4 general portfolio comment codes, Data Analysis will add comment code associated with Gen Comment 2 from the lookup provided by client services as a general portfolio comment.

lxxxiii. ***Strand Specific Comments (tblStuScore)***

- Scorers have the option of leaving comments for individual strands as well as for the whole portfolio.
- Comments will be sorted numerically and then alphabetically.
- Data Analysis will set comment code associated with LOC=1 from the lookup provided by client services automatically when the Level of Complexity score is '1'.
- Only first 2 strand specific comments will be kept and reported on the portfolio feedback form.
- For Strand Specific comments, if the student's final score for a particular strand does not have an 'M' for Independence and Demonstration of Skill, then comments that refer to an 'M' in either of these dimensions will be suppressed.
- For strand specific comments, if a student's final score for a particular strand has an 'M' for Independence or Demonstration of Skills then the student will receive at least one comment that refers to an 'M.' (This is handled at scoring not programmatically)
- If the performance level for a particular subject is Student took the Standard MCAS then suppress all strand specific comments for that subject.
- For grades 11, 12, and 12+ suppress the comment "Strand required but not submitted" for all strands.

lxxxiv. ***Performance Level (tblStuPL)***

- A content area has a performance level of Incomplete when one of the following occurs:
    a. When not all of the required strands are submitted for a content area, the content performance level is Incomplete.
    b. If Demonstration of Skills and Independence = M:
        - For contents requiring 3 strands, if there are 2 strands or more M's in either Independence or Demonstration of Skills, the content performance level is Incomplete.
        - For contents requiring 2 strands, if there is 1 strand or more M's in either Independence or Demonstration of Skills, the content performance level is Incomplete.
- For content areas that are not incomplete, the performance level is found using the overall strand performance level and the lookup table.
    a. The overall strand performance level for a content requiring 3 strands is found by averaging the performance levels of the 3 final strands of record. If the average is between 3 and 3.9 round down, otherwise, round to the nearest whole number.
    b. When more than 3 strands are submitted for a content area that requires the choice of 3, use the 3 strands that yield the highest overall strand performance level. If more than 3 strands have the same performance level, sort the strands

by self-evaluation, complexity, and generalized performance, and select the top 3 based on those criteria.

c. The overall strand performance level for a content requiring 2 strands is determined by averaging the performance levels of the 2 strands and rounding down.

d. If the calculations for strand score average yield a performance level of 11 (Needs Improvement) or 14 (Partially Meeting Expectations), then check that the student meets other requirements to earn Needs Improvement or Partially Meeting Expectations before assigning the final performance level.

- Needs Improvement (Legacy STE only) or Partially Meeting Expectations (NextGen only):

a. Grades 03-08 only

- For grades 03-08, to earn an overall performance level of *Partially Meeting Expectations the student must meet the following criteria:*
  1. For ELA, a student must complete the 3 required strands and earn a performance level of 4 for each of the strands.
  2. For Mathematics, complete all 5 strands and earn a performance level of 4 for each of the strands.
  3. For Science, a student must complete strands in three different STE disciplines and earn a performance level of 4 for each of the strands.
- If the student is marked “at or close to grade level” and submits fewer than 3 strands with a performance level of 4, the student will be reported as Not Meeting Expectations.
- If a student submits 3 or more strands when 2 are required, the 2 required strands and the highest scoring additional strand will be used to determine Partially Meeting Expectations.

b. Competency: Grades 09-12+ only

- The Competency List is provided by DESE and lists students in grades 09-12+ who were judged by a panel of competency experts to be at a performance level of *Needs Improvement* or *Partially Meeting Expectations* or above. Only students on the Competency list are eligible for a performance level of *Needs Improvement*/*Partially Meeting Expectations* or above. The students must also meet the following criteria:
  1. For ELA, a student must complete the 3 required strands and earn a performance level of 4 for each of the strands.
  2. For Mathematics, complete all 5 strands and earn a performance level of 4 for each of the strands.
  3. For Science, a student must complete all 4 strands in one discipline and earn a performance level of 4 for each of the strands.
- If a student is on the Competency List and the requirements are met, the earned scores are reported but the performance level is taken from the list.
- If a student is on the Competency List and the requirements are not met a list is sent to Program Management for resolution.
- If any HS student attempting competency (at or close to grade level is marked) and does not meet the requirements above for any reason, the test is reported as Failing/Not Meeting Expectations.
- If resubmitted appeal / competency determination portfolio, Math students will be tested against the 13-14 Math strands. Otherwise, students will be aligned with the 18-19 Math strands.

lxxxv. ***Aggregation/Accountability Results*** *(tblStuPL)*

Aggregation and Accountability Results combine prior and current results, where applicable.

- **Perf2** *(*Cognia *aggregate calculations)*
  a. Populated with the achievement level for aggregate calculations and the megafile.
  b. Perf2 is blank for all students with rptLep[sub] = '1'.
  c. Perf2 = rPerfLevel for Tested Alternate Assessment that are not first-year LEP (PartStatus = 'A' and rptLEP = '0'). It is translated to standard assessment achievement levels (1-4).
  d. Perf2 = the highest achievement level between PerfLevel and [sub]PerfLevelHigh for Accountable Retest Alternate Assessment students that are not first-year LEP (PartStatus = 'C' and rptLEP = '0'). It is translated to standard assessment achievement levels (1-4).
  e. Otherwise, Perf2 is calculated in general MCAS.

lxxxvi. ***NumIn*** (***tblStuPL*** for Megafile)

- For HS students and 5 and 8 Science, the subject specific numin field is set to '1' if the student is assigned CPI Points for the subject. Otherwise, it is '0'. Fields are prefixed with *e/m/s* in the megafile.
- For 03-08 ela and math, See the calculations by participation status summary for a list of statuses that result in numin = '1'. Because this calculation is only be done at grade 03-08, if Teststat is 'T' then numin='1'. Otherwise, it is '0'.

lxxxvii. ***Assess*** (***tblStuPL*** for Megafile):

- Blank since alt mega file is only produced in June

lxxxviii. ***Composite Level of Complexity (tblStuPL)***

- All students who receive an alt performance level will have a Composite Level of Complexity (CLC) computed.
- Composite Level of Complexity is calculated using the Complexity scores from the final strands used to calculate the content performance level, the 'At or Close to Grade Level' bubble (if it exists), and a lookup table, which is based on the number of strands.
- Students attempting Partially Meeting Expectations Grade 03-08
  a. When a two-strand portfolio contains the required strands plus at least one additional strand apply the rules for a three strand portfolio.
  b. If there is more than one additional strand submitted use the strand with the higher complexity score to compute the CLC.
- Incomplete
  a. For portfolios with not all required strands submitted, only the required strands that were submitted will be used to compute the CLC.
  b. When a three-strand portfolio has a strand missing, apply the rules for a two-strand portfolio.
  c. When a two or three strand portfolio has only one of the required strands, apply the rules for a one strand portfolio.

lxxxix. ***Competency: Updating ELA_CD, Mat_CD, and Sci_CD (tblStuPL)***

- *Applicable to High School only*

- These variables represent whether or not a student has met the testing graduation requirement for the subject, combining prior CD information from SIMS with the current test results.
- The updated CD fields begin with the prior CD value from SIMS (studemo SIMS_*[sub]*CD) for all students, regardless of participation status on this year's test. The prior value may be blank for students that have not previously tested in a subject.
- The CD Status from SIMS is then updated using the current test results if and only if it increases, otherwise the prior value is retained:
- For Math and ELA:
  a. If rPerflevel ='11' or '14' then CD = '1'.
  b. Otherwise, if rPerflevel in ('12','13','15','16') then CD = '2'.
  c. Otherwise, CD is '0'.
- For Science:
  a. If rPerflevel in ('11','12','13','14','15','16') then CD = '1'.
  b. Otherwise, CD is '0'.

xc. ***Composite Performance Index Points (daStuCPI)-Not applicable to 2023 and beyond***

For HS science, DESE provides Cognia with the number for students tested in MCAS and MCAS-Alt. These counts are provided at the subject level. DA use: These counts are stored in tblstuCPILookup.

- CPI will be calculated for only legacy high school science and technology/engineering (STE)
- CPI Points are assigned based on results used for Aggregations and Accountability.
- Students with Test Status='T' or (PartStatus="C" and rptLEP=0) will receive CPI points.
- Otherwise, CPI points will not be assigned.
- Breach cases will not receive CPI points.
- Assign cpi points for students with Test Status=" T" as follows
  a. Assign cpi points based on performance level as follows for performance levels other than PRG.
     - CPI=100 for PerfLevel=A_A or P_A.
     - CPI=75 for PerfLevel=EMG or NIA.
     - CPI=50 for PerfLevel=AWR
     - CPI=25 for PerfLevel=INP.
  b. Assign cpi points based on performance level as follows for PRG.
     - Step 1
       1. CPI=100 for PerfLevel=PRG and NatureofDis=01, 09, 10, 11, or 13 and LevelOfNeed=04.
       2. CPI=75 for PerfLevel= PRG and NatureofDis not equal to 01, 09, 10, 11, or 13 or LevelOfNeed not equal to 04
       3. If Step 1 results in the number of students with 100 CPI points being less than 1.0499 percent of the total tested students in both the alt and standard MCAS then proceed to Step 2:
     - Step 2
       1. CPI=100 for PerfLevel=PRG and NatureofDis=01, 09, 10, 11, or 13 and LevelOfNeed=03 or 04.

2. CPI=75 for PerfLevel= PRG and NatureofDis not equal to 01, 09, 10, 11, or 13 or LevelOfNeed not equal to 03 or 04
3. If Step 2 results in the number of students with 100 CPI points being less than 1.0499 percent of the total tested students in both the alt and standard MCAS then proceed to Step 3:

- Step 3
  1. CPI=100 for PerfLevel=PRG and NatureofDis=01, 09, 10, 11, or 13 and LevelOfNeed=01, 02, 03, or 04.
  2. CPI=75 for PerfLevel= PRG and NatureofDis not equal to 01, 09, 10, 11, or 13 or LevelOfNeed not equal to 01, 02, 03, or 04.
  3. If Step 3 results in the number of students with 100 CPI points being greater than 1.0499 percent of the total tested students in both the alt and standard MCAS then proceed to Step 4:
- Step 4
  1. CPI=100 for PerfLevel=PRG and NatureofDis=01, 09, 10, 11, or 13 and LevelOfNeed=03 or 04.
  2. Also, CPI=100 for PerfLevel=PRG and NatureofDis=01 and LevelOfNeed=01 or 02.
  3. CPI=75 for PerfLevel= PRG and NatureOfDis and LevelOfNeed do not satisfy I or II.
  4. If Step 4 results in the number of students with 100 CPI points being greater than 1.0499 percent of the total tested students in both the alt and standard MCAS then proceed to Step 5:
- Step 5
  1. CPI=100 for PerfLevel=PRG and NatureofDis=01, 09, 10, 11, or 13 and LevelOfNeed=04.
  2. Also, CPI=100 for PerfLevel=PRG and NatureofDis=01 and LevelOfNeed=03.
  3. CPI=75 for PerfLevel= PRG and NatureOfDis and LevelOfNeed do not satisfy I or II.

c. If Step 4 or 5 results in the number of students with 100 CPI points being less than 1.0499 percent of the total tested students in both the alt and standard MCAS then stop.

d. If Step 5 results in the number of students with 100 CPI points being greater than 1.0499 percent of the total tested students in both the alt and standard MCAS then proceed to Step 1 and then stop.

- Assign student's with (PartStatus="C" and rptLEP=0) CPI points as follows
  - CPI points will be based on either current year Alternate assessment Achievement level or Prior year test results which may be from the Alternate Assessment or MCAS. The results from the assessment that produces the highest CPI points will be used.
    1. Calculate the current year CPI points using the Alternate Assessment translation below on the tblstuPL.rPerfLevel
    2. If ScaledScoreHigh is populated, calculate the prior year CPI points using the MCAS lookup table below. Otherwise, use the Alternate Assessment lookup table on PerfLevelHigh.

Composite Performance Index (CPI) – Legacy MCAS Tests *(High School Science and Technology/Engineering only)*		
Test	**ScaledScore Range**	**CPI Points**
Standard MCAS	240-280	100
	230-238	75
	220-228	50
	210-218	25
	200-208	0

CPI – MCAS-Alt *(High School Science and Technology/Engineering only)*		
Test	**Alt Performance Level:**	**CPI Points**
Alternate Assessment (Only when re-assigning based on prior-year Alt Results for Accountability)	A_A P_A PRG	100
	EMG NIA	75
	AWR	50
	INP	25

xci. ***Achievement Level Coding***

- The MCAS Standard Assessment has four possible achievement levels, assigned to students using the raw to scale score lookup provided by psychometrics.
- Alternate Assessment achievement levels are translated to their corresponding standard assessment achievement level prior to computing any aggregate calculations that include alternate assessment achievement level results as shown below:

MCAS and MCAS-Alt Achievement Levels			
MCAS Achievement Level	**MCAS Description**	**MCAS-Alt Achievement Level**	**MCAS-Alt Description**
1	*03-08, 10 (Next Gen):* Not Meeting Expectations (NM) *Legacy HS Science:* Failing (F)	7	Incomplete (INC)
		8	Awareness (AWR)
		9	Emerging (EMG)
		10	Progressing (PRG)
		17	Not Meeting Expectations-Alt (NM_A)
2		11	Needs Improvement (NIA)

MCAS and MCAS-Alt Achievement Levels			
MCAS Achievement Level	**MCAS Description**	**MCAS-Alt Achievement Level**	**MCAS-Alt Description**
	Legacy HS Science: Needs Improvement (NI) NextGen: Partially Meeting Expectations (PM)	14*	Partially Meeting Expectations-Alt (PM_A)
3	Legacy HS Science: Proficient (P) NextGen: Meeting Expectations (M)	12	Proficient (P_A)
		15*	Meeting Expectations-Alt (M_A)
4	Legacy HS Science:Advanced (A) NextGen: Exceeding Expectations (E)	13	Advanced (A_A)
		16*	Exceeding Expectations-Alt (E_A)

**Used for grades 03-08, 10 ela and math and 05 and 08 Science and NextGen HS Science.*

B. Aggregate Level Calculations

xcii. ***Aggregation Rules***

- These rules are applied to all aggregate calculations. Any additional rules specific to a particular calculation will be listed under the rules for the calculation.
- Tested Students (PartStatus = 'A) are included in aggregations.

C. Lookup Tables

xciii. ***Required Strands by Content Area and Grade***

Grade	Content Area	Number of Strands Required	Strands Required
3	ELA	3	Language, Reading & Writing*
3	Math	2	Operations and Algebraic Thinking, Measurement and Data
4	ELA	3	Language, Reading & Writing*
4	Math	2	Operations and Algebraic Thinking, Numbers and Operations – Fractions
5	ELA	3	Language, Reading & Writing*
5	Math	2	Number and Operations in Base Ten, Numbers and Operations – Fractions
5	Sci	3	Choice of 3***
6	ELA	3	Language, Reading & Writing*
6	Math	2	Statistics and Probability, The Number System
7	ELA	3	Language, Reading & Writing*
7	Math	2	Ratios and Proportional Relationships, Geometry
8	ELA	3	Language, Reading & Writing*
8	Math	2	Expressions and Equations, Geometry
8	Sci	3	Choice of 3***
10+	ELA	3	Language, Reading, Writing
10+	Math	3	Choice of 3**
09, 10+	Sci	3	Any three learning standards from one discipline: Biology, Chemistry, Physics, or Technology/Engineering

**ELA 03-08: Students that test at or near grade level will take strands: Reading, Reading II & Writing.*
*** Math 10+: The strands titles are: 'Functions', 'Geometry', 'Statistics and Probability', 'Number and Quantity', and 'Algebra'.*
**** Science 05 and 08: Choice of 3 of the following: 'Earth and Space Science', 'Life Science', 'Physical Sciences', and 'Technology/Engineering'*

xciv. ***Strand Performance Level***

Level of complexity	Demonstration of skills	Independence	Performance Level
2	1	1	1
2	1	2	1
2	1	3	1
2	1	4	1
2	2	1	1
2	2	2	1
2	2	3	1
2	2	4	1
2	3	1	1
2	3	2	1
2	3	3	2
2	3	4	2
2	4	1	1
2	4	2	1
2	4	3	2
2	4	4	2
3	1	1	1
3	1	2	1
3	1	3	1
3	1	4	1
3	2	1	1
3	2	2	1
3	2	3	2
3	2	4	2
3	3	1	1
3	3	2	2
3	3	3	3
3	3	4	3
3	4	1	1
3	4	2	2
3	4	3	3
3	4	4	3
4	1	1	1
4	1	2	1
4	1	3	1
4	1	4	1
4	2	1	1
4	2	2	1
4	2	3	2
4	2	4	2
4	3	1	1
4	3	2	2
4	3	3	3
4	3	4	3
4	4	1	1
4	4	2	2
4	4	3	3
4	4	4	3
5	1	1	1

Level of complexity	Demonstration of skills	Independence	Performance Level
5	1	2	1
5	1	3	2
5	1	4	2
5	2	1	1
5	2	2	2
5	2	3	3
5	2	4	3
5	3	1	1
5	3	2	2
5	3	3	3
5	3	4	4
5	4	1	1
5	4	2	2
5	4	3	3
5	4	4	4

xcv. ***Content Area Performance Lookup***

Strand Performance Levels	Content Achievement Level	Description
1	8	Awareness
2	9	Emerging
3	10	Progressing
4	11	Needs Improvement
	14	Partially Meeting Expectations
5	12	Proficient
	15	Meeting Expectations
6	13	Advanced
	16	Exceeding Expectations
NA	7	Incomplete
	17	Not Meeting Expectation

xcvi. ***Composite Level of Complexity***

Composite Level of Complexity Look up for a 3 strand Portfolio

At or Near Grade Level Bubble	Strand 1: Level of Complexity Score	Strand 2: Level of Complexity Score	Strand 3: Level of Complexity Score	Composite Level of Complexity
0	2, or 1	2, or 1	2, or 1	ACC
0	3, 2, or 1	3, 2, or 1	3	EP
1	3, 2, or 1	3, 2, or 1	3, 2, or 1	GL
0,1	3, 2, or 1	3, 2, or 1	4, or 5	GL
0,1	3, 2, or 1	4	4	GL
0,1	3, 2, or 1	4	5	GL
0,1	3, 2, or 1	5	5	GL
0,1	4	4	4	GL
0,1	4	4	5	GL
0,1	4	5	5	GL
0,1	5	5	5	GL

Composite Level of Complexity Look up for a 2 strand Portfolio

At or Near Grade Level Bubble	Strand 1: Level of Complexity Score	Strand 2: Level of Complexity Score	Composite Level of Complexity
0	2, or 1	2, or 1	ACC
0	3, 2, or 1	3	EP
1	3, 2, or 1	3	GL
0,1	3, 2, or 1	4	GL
0,1	3, 2, or 1	5	GL
0,1	4	4	GL
0,1	4	5	GL
0,1	5	5	GL

Composite Level of Complexity Look up for a 1 strand Portfolio

At or Near Grade Level Bubble	Strand 1: Level of Complexity Score	Composite Level of Complexity
0	2, or 1	ACC
0	3	EP
1	3	GL
0,1	4, or 5	GL

Key:
ACC = Access Skill
EP=Entry Point
GL = Grade Level Achievement Standards

Data Deliverables Specifications

XX. Student Data Files

A. Student Demographics

B. Student Scores

C. Student Performance Levels

i. Use Roster code for the Performance Levels

XXI. MegaFile

A. Generic Details

ii. Megafile deliverables are posted to the FTP site for the state and contain data for all processed students.

iii. All MegaFile deliverables follow the layout: MCASAlt2223AllStudentFileLayout.xlsx.

iv. Fields that are not applicable to particular deliveries are left blank.

v. Students with Amend > '1' are reported as Amend = '1'.

vi. Subject specific fields are prefixed by '*x*' such that: m=math, e=ela, s=science.

vii. *x*Alt = '1' if the student Tested or Retested Alternate Assessment, otherwise blank.

viii. Sped_Off = tblStudemo.SpecialEd.

ix. *x*Perflev = tblStuPL.rPerfLevel reformatted to DESE code or achievement level code based on rPerfLevelLookup. DESE Code (See Appendix D).

x. *x*Perf2 = tblStuPL.Perf2.

xi. The mcasrowid is a 15-digit number created in the following manner.

- 2 digits=year (23)
- 2 digits=grade
- 1 digit=x
  a. x=1 if at least one strand was submitted for all required content area.
  b. x=2 if at least one strand was submitted for ELA and no strands were submitted for other required content areas.
  c. x=3 if at least one strand was submitted for Math and no strands were submitted for other required content areas.
  d. x=4 if at least one strand was submitted for science and no strands were submitted for other required content areas.
  e. x=5 if at least one strand was submitted for any 2 required content areas, but nothing was submitted for the third required content area.
  f. X=6 if a student did not submit any content areas.
- 10 digits=bookletnumber

B. Summary Files

C. Comments Summary

xii. Contains Counts of each strand specific comment by grade, subject, and strand

xiii. One tab includes all students.

xiv. One tab includes student with Performance Level Incomplete

D. General Comments Summary

xv. Contains counts of each General Comment by grade

xvi. Includes all students.

E. State Performance Level Summary

xvii. Layout is MCASAlt2223PerfSummaryLayout.xlsx

xviii. Include counts and percents.

xix. Only include students who earned an achievement level.

xx. One tab will contain achievement levels aggregated by grade and subject.

xxi. One tab will contain achievement levels aggregated across grades and subjects.

xxii. One tab will contain achievement level aggregations for grades 09 and 10 by subject.

- Will include the alt students who earned a competency in either May or July Competency determination.

xxiii. One tab will contain achievement levels aggregations for grades 11, 12, and 12+ by subject.

- This data will include the alt students who earned competency in either the May or July Competency determination.

F. State Participation Summary Files

xxiv. Layout is MCASAlt2223PartSummaryLayout.xlsx

xxv. “Assessed Student" = partstatus in ('A','Z') and TestStatus = 'T' based on data in MCAS tblStudemo (therefore NTL or first-year EL students are excluded).

xxvi. Retest Students (TestStatust = 'TR' or Alt students in grades, 11, 12, or 13) were excluded from all counts.

xxvii. Sort first tab by subject, then grade and the PartByCLC tab by grade then subject.

xxviii. One tab will contain counts and percents by grade and subject.

xxix. Percent is based on number of students assessed in standard MCAS or MCAS-Alt

xxx. One tab will contain count and percent of students taking alt across all grade and subjects.

xxxi. Percent is based on number of students assessed in standard MCAS or alt.

xxxii. One tab will contain counts and percents by grade and subject for the tested in Standard MCAS, Tested in MCAS Alt with a composite level of complexity of Grade Level, and Tested in MCAS Alt with a composite level of complexity of Access Skills or Entry Point.

G. Teacher Survey Summary

xxxiii. This file is created every other year and will not be produced for the 2223 reporting year.

xxxiv. Only include records with a first and last name and at least one response.

xxxv. Calculate total number of surveys.

xxxvi. Compute counts and percentages of responses for each question. Also compute number of non-responses for each question.

H. Participation by Disability

xxxvii. Counts of tested students by disability type

Report Deliverables Specifications

XXII. Specifications

A. Feedback Form

xxxviii. The files will be named MCASAltFeedbackForms2223_[DisCode][SchCode].pdf

xxxix. A grade 09 or higher report lists the science discipline strands instead of the science strands that appear for grades 03-08.

xl. For grades 03-08 math and ela the titles of the strands that were not submitted and not required will not print.

1. Indicated in tblStuScore where RepAction='0'
2. For these cases the strands below will move up to display with all blank rows at the bottom.
3. In grade five where there are six possible strands, if a student turns in all six only the first five will print based on the strand sort order. The strand "Measurement and Data" will not print in this case.

xli. An asterisk (*) is displayed in place of missing strand scores for required strands that were not submitted.

xlii. For grades 11, 12, and 12+ do not display asterisks in any strands.

xliii. If the performance level for a particular subject is Student took the Standard MCAS then do not display asterisks in any strands.

xliv. Missing scores are left blank for non-required strands.

xlv. All strands submitted will be reported.

xlvi. At most 4 general portfolio comments (see section III for description of choosing general portfolio comments).

xlvii. At most 2 strand specific comments (see section III for description of choosing strand specific comments).

B. Parent Report

*xlviii.*Cover Page Header

1. For student name print Last Name, First Name, MI. in all caps.
2. Print the two-digit grade print for grades 03-12 and 12+ will print for grade 13.
3. Print the school name associated with the student's testing school.
4. Print the district name associated with the student's sending district if it exists. Otherwise print the district name associated with the student's testing district.

xlix. Achievement Display

1. For tested students, place a check and shade the achievement level box corresponding to the student's achievement level.
2. For not tested students, print the not tested reason in the achievement display for that content area. Based on tblPerfLevelLookup
3. If a content area is not tested at a given grade, then do not shade or check any achievement level boxes or that content area. Print 'NOT ASSESSED FOR STUDENTS IN THIS GRADE'.

l. Score Display

1. If the student did not submit the required number of strands print an asterisk (*) after the subject text.
    a. Print ‘REQUIRED BUT NOT SUBMITTED’ in the grid for required strands that were not submitted.
    b. If the achievement level for a particular subject is Student took a Standard MCAS then do not display the asterisk or print ‘REQUIRED BUT NOT SUBMITTED’ in the grid for any strand.
2. A grade 09 or higher report lists the High School STE discipline strands instead of the STE strands that appear for grades 03-08.
3. Score Grid
    a. All strands submitted will be reported.
    b. For strands that were submitted, gray shade the box associated with the dimension score for level of complexity, demonstration of skills, independence, self-evaluation, and generalized performance.

li. Data Page Header

1. For student name print Last Name, First Name, MI in proper case.
2. Print SASID.

XXIII. Appendix

I. Assigning Sprp_sch and Sprp_dis: Exceptions List (daTestSiteLookup)

This information is collected and stored with the Operational General Assessment program. Please refer to the Operational General Assessment rules for the list of exceptions.

a. One-School District List

This information is collected and stored with the Operational General Assessment program. Please refer to the Operational General Assessment rules for the list of one-school districts.

b. rPerfLevel Lookup for MegaFile Codes

Achievement Level or Part Flag	MegaFile Code	Description
1	F	Failing
2	NI	Needs Improvement
3	P	Proficient
4	A	Advanced
6	W	Warning
7	INP	Incomplete
8	AWR	Awareness
9	EMG	Emerging
10	PRG	Progressing
11	NIA	Needs Improvement-Alt
12	P_A	Proficient-Alt
13	A_A	Advanced-Alt
14	PM_A	Partially Meeting Expectations-Alt
15	M_A	Meeting Expectations-Alt
16	E_A	Exceeding Expectations-Alt
17	NM_A	Not Meeting Expectation
B	INC	Incomplete
D	TRN	Transferred
E	ABS	Absent
F	LEP	First-year LEP
G	MED	Absent - Medically Documented
H	VAB	Void
I	DUP	Invalidated
J	DNT	Did Not Test
K	PAS	Previously Passed
P	PPR	Previously Passed & Retested
L	PRF	Previously Failed
N	INV	Invalidated

c. **Historical PerfLevel Translations**

If the following achievement levels are provided in SIMS for a student they are translated to currently-reported achievement levels.

SIMS PerfLevel	Description	Code	PerfLevel	PerfLevel Description
A_M	Advanced Mastery	A	4	Advanced
P_M	Proficient Mastery	P	3	Proficient
NIM	Needs Improvement Mastery	NI	2	Needs Improvement
F_M	Failing Mastery	F	1	Failing
P+	Above Proficient	A	4	Advanced

APPENDIX Q
MCAS-ALT SKILLS SURVEY

MCAS-Alt SKILLS SURVEY

Introduction

The MCAS-Alt Skills Survey is a standardized component of the statewide alternate assessment (MCAS-Alt) that must be administered by the teacher to each student **BEFORE** selecting an entry point or access skill in the subject required for assessment. The survey will help determine a student's current level of knowledge, skills, and abilities so that challenging entry points can be selected in each strand. The survey will also familiarize teachers with the range of entry points in a strand/domain that may be selected for the assessment.

The results of the Skills Survey should be used as the basis for selecting an entry point or access skill listed in the *Resource Guide to the Massachusetts Curriculum Framework for Students with Disabilities*. A follow-up skills survey will not be required after teaching the skill, although it may be helpful to conduct the survey after the skill has been taught, especially if the student will attend a different classroom the following year.

Instructions for Completing the Skills Survey:

Conduct a brief assessment of each skill in the required strand/domain for a student in that grade. Check one box (A–E) for each skill in the required strand/domain(s). Teachers may use any combination of the following methods to conduct a brief assessment of each skill:

a) observations, informal assessments, progress reports, or classroom work; OR
b) 2–4 tasks, based on the **examples** provided in the survey form; or **tasks designed by the teacher** that are accommodated for each student's instructional level and needs.

If using specific tasks or activities to assess the student, please use the following protocol for each skill:

1) Present the first task to the student.
2) If the student does not respond on the first attempt, repeat the task with a verbal reminder or other prompt (if needed), but do not give the answer. (Note: If a prompt is given, the response may be accurate, but is not independent.)
3) If the student responds to the first task, give a second, more complex task. Repeat with a prompt if needed. Make notes on the survey form to remind you of the student's performance of each task.
4) If the student does not respond to the second task, even with a prompt, do not introduce a third task. Simply mark an "X" in the column (A, B, C, D, or E) that most closely describes his or her performance of the skill.
5) Introduce the next task in the survey. Repeat steps 2 through 4 until all skills in the required strand/domain are assessed.

Once the survey has been completed for each required strand/domain, review the results and proceed as follows:

- **Select a related or higher-level-of-complexity entry point from the Resource Guide based on any skill that has been checked in columns A, B, or C**.
- **Do not select an entry point for any skills checked in columns D or E**.
- **If column A ("unable to perform the skill") is checked for all skills in the strand/domain**, consider assessing an access skill (i.e., a motor or communication skill).
- **If columns D and/or E are checked for most of the skills in the strand/domain**, then the IEP team should consider whether the standard MCAS test (paper or online) or grade-level/competency portfolio would be more appropriate for the student in that subject.

Submit a completed MCAS-Alt Skills Survey for each assessed strand in the student's portfolio, just after the Strand Cover Sheet. A strand without a Skills Survey will be considered incomplete.

Descriptors for each column listed on the following pages:

A	B	C	D	E
Student is **unable** to perform this skill. ---------OR-------- Teacher is unable to assess student on this skill.	Student is just starting to learn this skill and demonstrates the skill only **rarely** without support. --- Student performs this skill accurately with **0-25% independence**. ---------OR-------- Student performs this skill independently with **0-25% accuracy**.	Student demonstrates this skill **intermittently** and only **occasionally** without support. --- Student performs this skill accurately with **26-50% independence**. ---------OR-------- Student performs this skill independently with **26-50% accuracy**.	Student demonstrates this skill **more often than not** without support. --- Student performs this skill accurately with **51-75% independence**. ---------OR-------- Student performs this skill independently with **51-75% accuracy**.	Student demonstrates this skill **almost all the time** without support. --- Student performs this skill accurately with **76-100% independence**. --------OR--------- Student performs this skill independently with **76-100% accuracy**.

** % Independence refers to the average percent of unprompted responses by the student.*

Student's Name_____ Grade_____ Date of Survey_____

ELA—All Grades

Language (Vocabulary Acquisition and Use)

	Based on exposure to vocabulary during academic activities, student can:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Communicate answers to simple questions about familiar objects.					
2.	Identify familiar objects/actions by name.					
3.	Match given words or symbols to pictures that mean the same or similar thing.					
4.	Answer questions about the meaning of words found in stories, poems, or during other academic activities.					
5.	Identify words/symbols/pictures that are opposite in meaning.					
6.	Identify words/symbols/pictures that are similar in meaning.					
7.	Use phrases to express a need, request, idea, or response during an academic activity.					
8.	Describe key attributes of different objects (e.g., the flower is colorful).					
9.	Communicate using common temporal words (e.g., before, after, now, later, first, next).					
10.	Identify examples of figurative language (e.g., idiom, metaphor, simile, hyperbole, or personification) used in a text.					

Student's Name_____ Grade_____ Date of Survey_____

ELA—All Grades

Reading (Informational or Literary Text)

	Based on a literary or informational text read by or to the student, student can:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Identify the main character(s) in the text.					
2.	Identify the setting of the text.					
3.	State key details from the text.					
4.	Identify events (or ideas) presented in the text.					
5.	Identify the central (main) idea of the text.					
6.	Explain *why* or *how* something occurred in the text.					
7.	Identify and define unknown words in the text; or match words or phrases from the text to their meaning.					
8.	Differentiate between a fact and the author's opinion.					
9.	Describe the author's point of view.					

Student's Name_____ Grade_____ Date of Survey_____

ELA—All Grades

Writing (Text Type and Purposes)

Does the student use a communication system* to express ideas, requests, and responses? ϒ YES ϒ NO If YES, student can use their communication system to:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Initiate expressive communication using a single word or symbol.					
2.	Respond to questions or writing prompts with single words.					
3.	Respond to questions or writing prompts with sentence fragments (i.e., phrases).					
4.	Respond to questions or writing prompts with one complete sentence.					
5.	Respond to questions or writing prompts with at least one paragraph (three or more sentences).					
6.	Retell at least three events in chronological order.					
7.	Express an opinion on a topic and gives at least one reason.					
8.	Express at least two relevant facts or details based on a given topic or text.					
9.	Respond to questions or writing prompts using descriptive language and connecting words or phrases.					

** Communication systems may include verbal/gestural/symbolic/or iconic expression using a keyboard, handwriting, dictation, symbol-based system, assistive technology, ASL or other sign system, Braille, etc.*

Student's Name_____ Grade_____ Date of Survey_____

Grade 3 Mathematics

Operations and Algebraic Thinking (OA)

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Count up to 5 objects to answer questions about "how many all together."					
2.	Match numerals (up to 10) with the number of objects/pictures displayed.					
3.	Add two or more objects, or take away two or more objects, from a set of up to 5 objects and express "how many are left?"					
4.	Create two sets with an equal number of objects in each set.					
5.	Compare two groups of objects and indicate which has "more" and which has "less."					
Using standard numerals, symbols, and notation, student can:						
6.	Plot three single-digit numbers on a number line relative to each other.					
7.	Solve addition problems involving one-digit numbers up to a total of 10 (e.g., 1+3; 2+5; 4+6)					
8.	Solve one-step word problems using addition within 100.					
9.	Solve one-step word problems using subtraction within 100.					
10.	Identify the missing number in a problem involving addition and subtraction (up to 15), with an unknown quantity (e.g., 12 -? = 5).					
11.	Show equalities in number sentence (e.g., 2 + 4 = 4 + 2; 3 + 1 = 2 + 2).					
12.	Count by 2's to 20.					
13.	Count by 5's to 25.					
14.	Identify the missing number in a problem involving multiplication and division (within 25), with an unknown quantity (e.g., 2 X? = 20; 20 ÷? = 5).					
15.	Use estimation to approximate the solution to a one-step word problem (e.g., if I have 12 marbles and I add 9 more, about how many marbles will I have in all?).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 3 Mathematics

Measurement and Data

	Using objects, manipulatives, technology, or paper-pencil, student can:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Given two objects, identify the object that is bigger.					
2.	Count the number of objects with a similar characteristic (e.g., count the number of red objects; count the objects with straight edges).					
3.	Compare up to three objects based on length, width, or height (longer, shorter, tallest, shortest).					
4.	Tell time to the nearest hour using analog clocks.					
5.	Identify up to three U.S. coins either by name or value.					
6.	Express the value of a combination of at least two coins up to 99 cents.					
7.	Measure the length of objects using a pre-selected standard tool (e.g., ruler).					
8.	Express time on an analog clock to the nearest minute.					
9.	Find the area of a rectangle by multiplying side lengths.					
10.	Calculate the perimeter of straight-edged polygons.					
11.	Solve word problems involving the addition or subtraction of distances (e.g., miles, yards) and/or money (e.g., dollars, cents).					
12.	Represent a set of data graphically (e.g., on a list, table, bar graph, or circle graph, etc.).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 4 Mathematics

Operations and Algebraic Thinking (OA)

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Add ("put together") or subtract ("take away") one object from a set of objects and express the resulting quantity.					
2.	Add two or more objects, or take away two or more objects, from a set of 5 objects and express the resulting quantity.					
3.	Create sets with an equal number of objects in each set.					
4.	Compare two groups of objects and indicate which has "more" and which has "less."					
5.	Answer questions about "how many altogether" (up to 10 objects).					
6.	Sort or group objects by multiples of two.					
7.	Match numerals (up to 10) with the number of objects/pictures displayed.					
Using standard numerals, symbols, or notations, student can:						
8.	Plot at least three single-digit numbers on a number line.					
9.	Solve addition problems involving one-digit numbers up to a total of 10.					
10.	Identify the missing number in a problem involving subtraction (up to 15) (e.g., 12 -? = 5).					
11.	Show equalities in number sentences (e.g., 2 + 4 = 4 + 2; 3 + 1 = 2 + 2).					
12.	Count by 2's to 20.					
13.	Count by 5's to 25.					
14.	Determine the unknown quantity in a multiplication problem (within 20) (e.g., how many groups of 5 objects is equal to 15?).					
15.	Solve multiplication problems with multipliers of 1–10.					
16.	Solve division problems within 100 with divisors of 1–10.					
17.	Identify the missing number in a word problem involving multiplication and division (within 25), with unknowns in all positions (e.g., 20 ÷? = 5).					
18.	Create or extend a numerical pattern based on a given rule (e.g., "begin with 7, then the rule is to add 4").					

Student's Name_____ Grade_____ Date of Survey_____

Grade 4 Mathematics

Number and Operations—Fractions

	Identify/recognize fractions:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Identify ½ and whole using manipulatives and/or familiar objects.					
2.	Partition a whole into 1/2, 1/3, and 1/4 equal parts.					
3.	Compare parts of the same whole (quarter, third, half) to determine the relative size of each.					
4.	Compare fractions of the same whole with like denominators to determine which is greater (e.g., ¼ or ¾).					
5.	Label points on a number line with simple fractions with like denominators (e.g., label 1/6, 3/6, 5/6 on the same number line).					
6.	Demonstrate one or more fractions that are equivalent to ½ using models or manipulatives (e.g., 2/4, 3/6, 4/8).					
7.	Compare two fractions with unlike denominators and indicate which is greater or less (1/3 or 3/5).					
Operations with fractions:						
8.	Add and subtract "unit fractions" with like denominators (e.g., ¼ + ¼ = ?).					
9.	Add and subtract fractions with like denominators (e.g., 1/8 + 3/8 =? and 5/8 – 3/8 = ?).					
10.	Multiply simple fractions by a whole number (e.g., 3/5 X 5 = 15/5 = 3).					
11.	Multiply fractions by fractions (e.g., 2/4 X 4/5 = 8/20).					
12.	Convert simple decimals to simple fractions and vice versa (e.g., .25 = ¼; ½ = .50).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 5 Mathematics

Number and Operations in Base Ten (NBT)

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Count by ones to 10.					
2.	Represent up to 5 objects with numerals, including 0.					
3.	Compose numbers from 1 to 9 to create 10, using objects.					
4.	Count by tens to 100.					
5.	Count forward beginning from a given number up to 100 (e.g., count on from 23).					
6.	Identify "ten more" (or "ten less") than a given two-digit number.					
7.	Add and subtract single-digit numbers.					
8.	Add and subtract two-digit numbers.					
9	Round a given amount of money to the nearest dollar (e.g., $2.57 rounds to $3.00).					
10.	Round whole three-digit numbers to the nearest 100.					
11.	Multiply a one-digit number by a two-digit number.					
12.	Divide a three-digit number by a one-digit number (without remainders).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 5 Mathematics

Number and Operations—Fractions

	Identify/recognize fractions:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Identify ½ and whole using manipulatives and/or familiar objects.					
2.	Partition a whole into ½, ⅓, and ¼ equal parts.					
3	Compare parts of the same whole (½, ⅓, and ¼) to determine the relative size of each.					
4.	Compare fractions of the same whole with like denominators to determine which is greater (e.g., ¼ or ¾).					
5.	Label points on a number line with simple fractions with like denominators (e.g., label 1/6, 3/6, 5/6 on the same number line).					
6.	Demonstrate one or more fractions that are equivalent to ½ using models or manipulatives (e.g., 2/4, 3/6, 4/8).					
7.	Compare two fractions with unlike denominators and indicate which is greater or less (1/3 or 3/5).					
	Operations with fractions:					
8.	Add and subtract "unit fractions" with like denominators (e.g., ¼ + ¼ = ?).					
9.	Add and subtract fractions with like denominators (e.g., 1/8 + 3/8 =? and 5/8 – 3/8 = ?).					
10.	Multiply simple fractions by a whole number (e.g., 3/5 x 5 = 15/5 = 3).					
11.	Multiply fractions by fractions (e.g., 2/4 x 4/5 = 8/20).					
12.	Convert simple decimals to simple fractions and vice versa (e.g., .25 = ¼; ½ = .50).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 6 Mathematics

Statistics and Probability

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Record responses to a survey.					
2.	Represent a simple set of data graphically, either from a survey or based on observations (e.g., on a table, chart, tally, bar graph, or circle graph).					
3.	Describe what is being shown in a simple data display (e.g., in a table or on a bar, line, or circle graph).					
4.	Answer questions related to the data shown in a data display (e.g., do more students have brown eyes or blue eyes?).					
5.	Order a set of numerical data.					
6.	Find the median in an ordered set of numerical data.					
7.	Calculate the range (spread) of a given set of data (e.g., by finding the difference of the greatest and least values).					
8.	Given two sets of numerical data, decide which has the greatest mean.					
9.	Calculate the mean of a given set of data.					

Student's Name_____ Grade_____ Date of Survey_____

Grade 6 Mathematics

The Number System

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Match visual representation of a simple fraction to the fraction itself (e.g., match one-third of a pie to "$\frac{1}{3}$").					
2	Distinguish ¼ from ½ of the same object.					
3.	Locate positive whole numbers on a number line.					
4.	Add and subtract one-digit whole numbers.					
5.	Multiply and divide one-digit whole numbers					
6.	Add and subtract two-digit whole numbers.					
7.	Add and subtract fractions with like denominators.					
8.	Multiply two-digit whole numbers by one-digit whole numbers.					
9.	Multiply two- and three-digit whole numbers by two-digit whole numbers.					
10.	Divide two-digit numbers by one-digit whole numbers.					
11.	Multiply fractions by whole numbers (e.g., $4 \times \frac{2}{3}$).					
12.	Multiply fractions by fractions (e.g., ¼ x ⅜).					
13.	Solve word problems involving fractions (e.g., I have 2/3 cup of water. Paul has half as much as me. How much water does Paul have?).					
14.	Identify numbers that are multiples of 2 or 3 from a list of numbers.					
15.	Add and subtract numbers including decimals to tenths (e.g., 3.6 + 4.7).					
16.	Multiply and divide decimals by whole numbers to tenths (e.g., 7.4 X 4; 4.8 ÷ 6).					
17.	Locate and plot points in the first quadrant of a coordinate plane (e.g., plot and/or locate the points (4, 5), (8, 12), (6,3) on a graph).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 7 Mathematics

Ratios and Proportional Relationships

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Create a part-to-part ratio among objects already pre-sorted into sets or categories (e.g., the ratio of red to blue objects is 5:3).					
2.	Express a part-to-whole ratio (e.g., If 5 of 9 students are boys, then the part-to-whole ratio is 5:9).					
3.	Identify two or more equivalent fractions ($\frac{1}{2} = \frac{3}{6}$).					
4	Convert quantities from one measurement unit to another (e.g., 6 feet = 2 yards; 18 inches = 1½ feet).					
5.	Calculate a percentage of a given quantity (e.g., What is 25 percent of 48?).					
6.	Calculate a unit rate using real-world examples (e.g., If 5 apples cost $2.00, the unit rate is $0.40 per apple).					
7.	Determine the percentage given the quantities (e.g., 10 is what percent of 50; 9 is what percent of 45?).					
8.	Solve one-step equations using multiplication (e.g., $3x = 45$ or $4x = 36$).					
9.	Create a table given a ratio (e.g., given the ratio 1:3, make a table with 2:?; 3:?; and 4:?).					
10.	Express a percent as a fraction equivalent. (e.g., 75% = $\frac{75}{100}$ or $\frac{3}{4}$).					
11.	Solve proportions where one quantity is represented by a variable (e.g., $\frac{3}{5} = \frac{x}{15}$).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 7 Mathematics

Geometry

	Using objects, manipulatives, technology, or paper-pencil, student can:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Find a shape that is round.					
2.	Partition a shape into two equal parts.					
3.	Match identical two-dimensional shapes (e.g., drawings of squares, triangles).					
4.	Match identical three-dimensional shapes (e.g., ball/sphere; box/cube).					
5.	Demonstrate the relative positions of objects. (e.g., besides, inside, next to, above, below).					
6.	Sort two-dimensional shapes (e.g., squares, circles, and triangles).					
7.	Identify simple shapes by name (circle, square, triangle, box/cube, ball/sphere).					
8.	Sort two- and three-dimensional shapes by attribute, such as color, shape, and size.					
9	Identify and label a line and an angle.					
10.	Identify angles as either acute, obtuse, or right.					
11.	Plot a given number on a horizontal number line.					
12.	Plot a given ordered pair in the first quadrant of a coordinate plane (e.g., (4, 5); (8, 12); (8, 3)).					
13.	Calculate the area of a square or rectangle.					

Student's Name_____ Grade_____ Date of Survey_____

Grade 8 Mathematics

Expressions and Equations

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Express the meaning of "equal to, "greater than," or "less than" by comparing groups of objects.					
2.	Compare number quantities using the symbols <, =, or >.					
3.	Represent repeated addition using groups of objects with equal amounts (e.g., given 12 objects, create 2 groups of 6; 3 groups of 4; etc.).					
4.	Create equivalent expressions using commutative property (e.g., 4 + 2 = 2 + 4; 5 X 3 = 3 X 5).					
5.	Solve addition and subtraction equations where the sum or difference is represented by a variable. (e.g., $5 + 7 = r$).					
6.	Identify the missing number in an equation involving addition or subtraction (e.g., $8 + ? = 13$).					
7.	Solve multiplication and division equations where the product or quotient is represented by a variable (e.g., $6 \times 7 = t;\ 32 \div 8 = n$).					
8.	Identify the missing factor in an equation involving multiplication (e.g., $4\ \times ? = 28$).					
9.	Identify equivalent numerical expressions. (e.g., $8 + 8 + 8$ can be written as 3×8 or 8 $\times 3$).					
10.	Evaluate expressions with numbers and letters involving addition and subtraction, given the value of an unknown number. (e.g., What is 7-*p*, if *p*=2; *p*=3; *p*=5?).					
11.	Generate a number pattern given an initial value and an addition rule (e.g., initial value is 6, rule is "add 4," determine the next 5 numbers in the pattern).					
12.	Solve a one-step equation involving multiplication and/or division, with no remainder (e.g., $14 \div n = 7$).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 8 Mathematics

Geometry

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Find a shape that is round.					
2.	Match identical two-dimensional shapes (e.g., drawings of squares, triangles).					
3.	Match identical three-dimensional shapes e.g., ball/sphere; box/cube).					
4.	Match similar shapes of different sizes.					
5.	Distinguish squares, circles, and triangles.					
6.	Communicate the names of simple shapes.					
7.	Describe the relative positions of objects (e.g., besides, inside, next to, above, below).					
8.	Sort two- and three-dimensional shapes by attribute, such as color, shape, and size.					
9.	Partition a shape into two equal parts.					
10.	Identify and label a line and an angle.					
11.	Identify angles as either acute, obtuse, or right.					
12.	Plot numbers on a horizontal number line.					
13.	Plot ordered pairs in the first quadrant of a coordinate plane (e.g., (4, 5); (8, 12); (8, 3)).					
14.	Calculate the area of a square or rectangle.					

Student's Name_____ Grade_____ Date of Survey_____

Grade 10 Mathematics

(Conduct the skills survey only in the three Conceptual Categories selected for the grade 10 MCAS-Alt.)

Number and Quantity

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Locate positive whole numbers on a number line.					
2.	Match visual representation of a simple fraction to the fraction itself (e.g., match one-third of a pie to "$\frac{1}{3}$").					
3.	Compare two fractions and communicate whether one is "less than," equal to," or "greater than" the other.					
4.	Add and subtract one-digit whole numbers.					
5.	Multiply and divide one-digit whole numbers.					
6.	Add and subtract two-digit whole numbers.					
7.	Add and subtract fractions with like or unlike denominators.					
8.	Multiply two-digit whole numbers by one- and two-digit whole numbers.					
9.	Identify perfect squares and their square roots up to 10. (e.g., $6^2 = 36$; $\sqrt{36} = 6$).					
10.	Divide two-digit numbers by one-digit whole numbers.					
11.	Multiply fractions by whole numbers (e.g., $4 \times \frac{2}{3}$).					
12.	Multiply fractions by fractions (e.g., ¼ x ⅜)					
13.	Divide fractions by fractions (e.g., $\frac{1}{3} \cdot \frac{3}{5} = \frac{3}{15}$; $\frac{1}{3} \div \frac{3}{5} = \frac{5}{9}$)					
14.	Solve word problems involving fractions (e.g., I have 2/3 cup of water. Paul has half as much as me. How much water does Paul have?)					
15.	Identify numbers that are multiples of 2 or 3 from a list of numbers.					
16.	Add and subtract numbers including decimals to tenths (e.g., 3.6 + 4.7).					
17.	Multiply and divide decimals by whole numbers to tenths (e.g., 7.4 X 4; 4.8 ÷ 6).					
18.	Plot and locate points on a coordinate grid (e.g., plot and/or locate the points (3, -2), (-4, 6), (-7, -3) on a graph).					
19.	Round a five-digit number (e.g., 25, 331) to the nearest hundred (e.g., 25, 300) and nearest thousand (e.g., 25,000).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 10 Mathematics

(Conduct the skills survey only in the three Conceptual Categories selected for the grade 10 MCAS-Alt.)

Algebra

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Compare number quantities using the symbols <, =, or >.					
2.	Create groups of objects with equal amounts in multiple ways (e.g., given 12 objects, create 2 groups of 6; 3 groups of 4 etc.).					
3.	Create equivalent expressions using the commutative property (e.g., 4 + 2 = 2 + 4; 5 X 3 = 3 X 5).					
4.	Solve addition and subtraction equations where the sum or difference is represented by a variable (e.g., $5 + 7 = r$).					
5.	Solve multiplication and division equations where the product or quotient is represented by a variable (e.g., $6 \times 7 = t$; 54 , $7 = n$).					
6.	Identify the missing number in an equation involving addition or subtraction (e.g., $? + 8 = 13$).					
7.	Identify equivalent numerical expressions. (e.g., $8 + 8 + 8$ can be written as 3×8).					
8.	Solve one- and two-step equations with one variable (e.g., solve for *x*, if 3*x*=15; 5*x* + 7 = 42).					
9.	Multiply a two-digit number by a one-digit number.					
10.	Evaluate expressions with numbers and letters involving addition and subtraction, given the value of an unknown number (e.g., 7-*p*, if *p*=2; *p*=3; *p*=5).					
11.	Extend a simple arithmetic sequence. (e.g., 7, 10, 13,?,?).					
12.	Determine the point of intersection of two lines graphed on a coordinate plane by observation (e.g., the point of intersection of two lines is $(5, -1)$).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 10 Mathematics

(Conduct the skills survey only in the three Conceptual Categories selected for the grade 10 MCAS-Alt.)

Functions

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Create a part-to-part ratio among objects already pre-sorted into sets or categories (e.g., the ratio of red to blue objects is 5:3).					
2.	Express a part-to-whole ratio (e.g., If 5 of 9 students are boys, then 5/9 of the students are boys; or part-to-whole ratio is 5:9).					
3.	Identify two or more equivalent fractions ($\frac{1}{2} = \frac{3}{6}$).					
4.	Calculate a percentage of a given quantity (e.g., What is 25 percent of 48?).					
5.	Calculate a unit rate using real-world examples (e.g., If 5 apples cost $2.00, the unit rate is $0.40 per apple).					
6.	Determine the percentage given the quantity (e.g., 9 is what percent of 45? what is 40 percent of 300?).					
7.	Express a percent as a fraction equivalent (e.g., 75% = $\frac{75}{100}$).					
8.	Solve proportions where one quantity is represented by a variable (e.g., $\frac{3}{5} = \frac{x}{15}$).					
9.	Complete missing values on an input-output table (or use manipulatives) when given the function rule and input values (e.g., Rule: ribbon costs $1.25 per yard; what is cost for 3 yards? 12 yards; etc.).					
10.	Create a table of ordered pairs (or generate a number pattern) representing a real-life relationship (e.g., based on $.95 cost of one donut, create a table of ordered pairs when multiple donuts are bought; or miles traveled over different periods of time at 60 mph).					
11.	Complete a table (or extend a number pattern) based on an initial value and an addition or subtraction rule.					
12.	Determine the addition or subtraction rule of an input/output table, given the ordered pairs.					

Student's Name_____ Grade_____ Date of Survey_____

Grade 10 Mathematics

(Conduct the skills survey only in the three Conceptual Categories selected for the grade 10 MCAS-Alt.)

Geometry

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Find a shape that is round.					
2.	Match identical two-dimensional shapes (e.g., drawings of squares, triangles).					
3.	Match identical three-dimensional shapes (e.g., ball/sphere; box/cube).					
4.	Match similar shapes of different sizes.					
5.	Distinguish squares, circles, and triangles.					
6.	Communicate the names of simple shapes.					
7.	Describe the relative positions of objects (e.g., besides, inside, next to, above, below).					
8.	Sort two- and three-dimensional shapes by attribute, such as color, shape, and size.					
9.	Partition a shape into two equal parts.					
10.	Identify and label a line and an angle.					
11.	Identify angles as either acute, obtuse, or right.					
12.	Plot numbers on a horizontal number line.					
13.	Graph ordered pairs in the first quadrant of a coordinate plane (e.g., (4, 5); (8, 12); (8, 3)).					
14.	Calculate the area of a square or rectangle.					
15.	Identify lines of symmetry within a two-dimensional figure.					
16.	Use the Pythagorean Theorem to find the length of the hypotenuse of a right triangle, given the length of the two other sides.					
17.	Calculate the area of a circle (πr^2), given its diameter or radius (e.g., find the area of a circle with a radius of 3; find the area of a circle with a diameter of 8).					

Student's Name_____ Grade_____ Date of Survey_____

Grade 10 Mathematics

(Conduct the skills survey only in the three Conceptual Categories selected for the grade 10 MCAS-Alt.)

Statistics and Probability

Using objects, manipulatives, technology, or paper-pencil, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Order a set of numerical data from least to greatest.					
2.	Identify the minimum and maximum values in a set of numbers.					
3.	Identify the range of numerical data in a set of numbers arranged from least to greatest.					
4.	Identify the median (i.e., the middle value) for a set of numerical data.					
5.	Answer simple questions related to data represented on a data display (e.g., numbers on a pie chart showing the number of sunny days to rainy days in a given month).					
6.	Calculate the mean of a set of numerical data.					

Student's Name_____ Grade_____ Date of Survey_____

Next Generation (Next-Gen) Science and Technology/Engineering (STE):
Grade 5 and 8 – All Strands
High School – Biology and Introductory Physics ONLY

Complete the skills survey **once** for each student in all eight science practices listed below.
Note: The Science Practices are the same across all next-gen STE strands and grade spans.

Before selecting entry points for the student, teachers should assess each student's skills and abilities in each Science Practice, checking the box if the student can perform the skill independently, at least some of the time.

The STE Skills Survey is based on the student's ability to independently perform a science skill (for example ask a question, follow directions, describe something), rather than on specific science content.

Teachers should select entry points at the highest grade span in which the checked boxes appear.
Teachers may select entry points from different grade spans, depending on the results of the skills survey. For example, a student in grade 8 may be able to perform one science practice listed in grade span 6-8, while performing another science practice in grade span 3-5.

NOTE: High School Chemistry and Technology/Engineering are legacy, rather than next-gen, assessments that will be conducted as they have been in previous years (i.e., by submitting a data chart with at least eight dates; plus at least two pieces of evidence in each strand). This is the last year legacy science will be offered.

(revised 6/2/20)

SCIENCE and TECHNOLOGY/ENGINEERING (STE) SKILLS SURVEY

Instructions: For grades 5 and 8 STE and high school Biology and Introductory Physics, check the boxes below in each of the eight numbered Science Practices that the student can perform independently, at least some of the time. Select an entry point from each science practice in the highest grade span in which the checked boxes appear.

1. Asking Questions and Defining Problems		
Less Complex ↑ More Complex	PreK–Grade 2	☐Ask clarifying questions about a topic or idea. ☐Use observations to ask relevant questions. ☐Define a simple problem related to a topic.
	Grades 3–5	☐Use observations and/or data (for example, multiple-word descriptors, descriptions or drawings of observations, counted observations, measurements) to ask a question about a topic or idea. ☐Identify questions on a topic that can be answered by an investigation. ☐Define a simple problem that can be solved related to a topic.
	Grades 6–8	☐Identify scientific (testable) and non-scientific (non-testable) questions. ☐Generate scientific questions about a topic based on research and/or observations.
	Grades 9–12	☐Evaluate a scientific question to determine if it is testable and/or relevant to a topic. ☐Generate a scientific question about a topic that is testable using available resources.
		☐My student cannot perform any of the skills in this science practice

2. Planning and Carrying Out Investigations		
Less Complex ↑ More Complex	PreK–Grade 2	☐Choose how to collect data and/or observations (for example, using one-word descriptors, yes/no observations) on a topic. ☐Follow the steps of an investigation to collect data and/or observations (for example, using one-word descriptors, yes/no observations) on a topic. ☐Record observations (for example, based on first-hand experiences or through the media) on a topic. ☐Use pictures and/or drawings to collect observations related to a topic.
	Grades 3–5	☐Choose how to collect data and/or observations (for example, using multiple-word descriptors, descriptions or drawings of observations, counted observations, measurements) on a topic. ☐Follow the steps of an investigation to collect data and/or observations (for example, multiple-word descriptors, descriptions or drawings of observations, counted observations, measurements) on a topic. ☐From multiple options, select the best method to collect data and/or observations on a topic. ☐Record observations (for example, based on first-hand experiences, or through the media) to collect data on a topic.
	Grades 6–8	☐Choose how to collect data to serve as evidence (for example, descriptions or drawings of observations over time, measurements that may show a pattern). ☐Follow the steps of an investigation on a topic to produce data to serve as evidence (for example, descriptions or drawings of observations over time, measurements that may show a pattern). ☐Select and use appropriate methods and/or tools (for example, ruler, graduated cylinder, thermometer, carbon dioxide sensor) for collecting data in an investigation. ☐Record observations and/or measurements to produce data to serve as evidence for an investigation. ☐Test two different models of the same proposed design solution to determine which better meets the criteria for success.

	Grades 9–12	☐Choose how to collect data to serve as evidence (for example, measurements, or descriptions of observations comparing an experimental and control group over time). ☐Follow the steps of an investigation to produce data to serve as evidence (for example, measurements, or descriptions of observations comparing an experimental and control group over time). ☐Select appropriate tools (for example, ruler, graduated cylinder, thermometer, carbon dioxide sensor) to conduct an investigation on a topic. ☐Select and/or create the appropriate organizer (for example, table, chart, graphic organizer) to collect data from an investigation.
		☐My student cannot perform any of the skills in this science practice
3. Analyzing and Interpreting Data		
Less Complex	PreK–Grade2	☐Display data (for example, one-word descriptors, number/tally of yes/no observations) visually using a simple graph, table, or picture to show information on a topic. ☐Identify patterns by grouping information/data by similar observable properties. ☐Make predictions on a topic prior to collecting data/observations.
	Grades 3–5	☐Represent data (for example, counted observations, measurements) on a data display. ☐Answer questions based on a representation (for example, data display) of a data set. ☐Make predictions about an outcome in order to compare predictions to actual data and/or observations. ☐Compare predictions to actual data and/or observations from an investigation. ☐Use data and/or observations (for example, multiple-word descriptors, descriptions or drawings of observations, counted observations, measurements) to identify patterns about a topic. ☐Use data and/or observations to identify relationships between topics, ideas, or concepts. ☐From tests of an object or tool, evaluate data and/or observations (for example, multiple-word descriptors, descriptions or drawings of observations, counted observations, measurements) to determine if it works as intended. ☐Construct a conclusion based on evidence or observations (for example, from an investigation).
More Complex	Grades 6–8	☐Use data and/or observations (for example, descriptions or drawings of observations over time, measurements that may show a pattern) from an investigation to interpret features of the data or develop conclusions. ☐Describe one or more patterns (for example, using multiple-word descriptors) in a data set. ☐Analyze/interpret data (for example, descriptions or drawings of observations over time, measurements that may show a pattern) to make sense of a topic. ☐Compare and contrast two data sets. ☐Use observations and/or data (for example, descriptions or drawings of observations over time, measurements that may show a pattern) to evaluate and/or refine a design solution.
	Grades 9–12	☐Analyze/interpret data from a table or graph, citing details and/or evidence from the data display. ☐Create two or more appropriate visual representations of the same data set (for example, line graph, bar graph, circle graph, table, etc.).
		☐My student cannot perform any of the skills in this science practice.

4. Using Mathematics and Computational Thinking		
Less Complex	PreK–Grade2	☐Use counting and numbers to show data on a topic (for example, count/tally the number of yes/no observations or responses from the class). ☐Identify qualitative (i.e., using words) information about objects or data. ☐Identify quantitative (i.e., using numbers) information about objects or data.
	Grades 3–5	☐Use counting and numbers to show data on a topic (for example, measurements). ☐Describe, measure, and/or compare quantitative (i.e., numerical) attributes of objects or data. ☐Identify patterns in quantitative (i.e., numerical) data about a topic.
	Grades 6–8	☐Organize simple data sets (for example, data table, chart, graph) to reveal patterns. ☐Evaluate whether qualitative (i.e., descriptive) or quantitative (i.e., numerical) data is best to collect as evidence in an investigation about a topic. ☐Use computations (for example, addition, subtraction, division, multiplication) to analyze data (for example, averages, totals, differences).
	Grades 9–12	☐Use given formulas to solve for relevant quantities (for example, speed, density). ☐Apply mathematical concepts and/or processes (for example, ratios, rates, percentages, proportions, and/or basic operations) to answer questions or solve problems.
More Complex		☐My student cannot perform any of the skills in this science practice.

5. Developing and Using Models		
Less Complex	PreK–Grade2	☐Label a model that shows or explains a topic. ☐Illustrate a model to show or explain a topic. ☐Compare a model of an object with the actual object and identify similarities and differences.
	Grades 3–5	☐Given directions, construct a model to show or explain a topic. ☐Develop or create a model to show/explain a topic. ☐Distinguish between a model and the actual object, process, or event. ☐Compare two (or more) models of the same topic (for example, compare models of human body systems to identify common features and differences).
	Grades 6–8	☐Revise a model to more clearly show or explain a topic. ☐Show or explain a topic using a model.
More Complex	Grades 9–12	☐Refine an existing model by suggesting revisions. ☐Evaluate a model citing details about clarity and accuracy of the model.
		☐My student cannot perform any of the skills in this science practice.

6. Constructing Explanations and Designing Solutions		
Less Complex	PreK–Grade2	☐Show/express one or more observations or characteristics of a familiar topic or object. ☐Show/express the relationship between two objects or topics.
	Grades 3–5	☐Describe one or more characteristics of a topic or object based on observations. ☐Identify a design problem and a potential solution using words, pictures, or drawings. ☐Draw and/or explain a design solution for a content-related problem.
	Grades 6–8	☐Explain how a familiar object, device, or machine works. ☐Construct conclusions based on evidence from an investigation of a topic. ☐Generate a solution to a design problem using pictures or drawings. ☐Use tools (for example, ruler/tape measure, scissors, hammer) and/or materials to build a prototype that solves a specific problem. ☐Use observations and data from investigations (for example, descriptions or drawings of observations over time, measurements that may show a pattern) to design a solution to a problem.
More Complex	Grades 9–12	☐Construct an explanation of how an object, prototype, or machine works based on information from a variety of sources (for example, model, research, investigation, simulation) ☐Generate multiple solutions to a design problem. ☐Compare multiple solutions to a design problem.
		☐My student cannot perform any of the skills in this science practice.

7. Engaging in Argument from Evidence		
Less Complex	PreK–Grade2	☐Use scientific evidence (for example, data, observations from an investigation) to support an argument about a topic from the grades PreK-2 STE standards (see core ideas at each grade).
	Grades 3–5	☐Use scientific evidence to support a claim about a topic from the grades 3-5 STE standards (see core ideas at each grade). ☐Use scientific evidence to support a claim for or against a design solution.
	Grades 6–8	☐Use scientific evidence to support an argument about a topic from the grades 6-8 STE standards (see core ideas at each grade). ☐Compare and critique two arguments about a scientific topic or idea. ☐Defend a claim about the merits of a particular design solution, citing relevant evidence.
	Grades 9–12	☐Use scientific evidence and observations to construct an argument about a topic from the high school STE standards (see core ideas at each grade). ☐Make and defend a claim based on scientific evidence about a topic or idea. ☐Evaluate competing design solutions for a problem using evidence related to the criteria for success and the constraints of the resources.
More Complex		☐My student cannot perform any of the skills in this science practice.

8. Obtaining, Evaluating, and Communicating Information		
Less Complex  More Complex	PreK–Grade2	☐Research (for example, using media or informational text) and present information (for example, show or express) on a topic from the grades preK-2 STE standards (see core ideas at each grade). ☐Communicate information or ideas (orally, graphically, textually, and/or mathematically) on a topic from grades preK-2 STE standards (see core ideas at each grade). ☐Compare fictional and non-fictional resources on a topic. ☐Recall (retell) important information from a text or from observations.
	Grades 3–5	☐Research (for example, using media or informational text) and present information on a topic from the grades 3-5 STE standards (see core ideas at each grade). ☐Communicate information or ideas (for example, orally, graphically, textually, and/or mathematically) on a topic from grades 3-5 STE standards (see core ideas at each grade). ☐Compare two informational sources (for example, using media, informational text, data display) to determine similarities and differences in how information was presented.
	Grades 6–8	☐Research and present information on a topic from grades 6-8 STE standards (see core ideas at each grade). ☐Communicate information or ideas (for example, orally, graphically, textually, and/or mathematically) on a topic from grades 6-8 STE standards (see core ideas at each grade). ☐Combine scientific information from multiple sources (for example, media, informational text, data display, observations from an investigation) to explain scientific information or phenomena.
	Grades 9–12	☐Research and present information on a topic from grades 9-12 STE standards (see core ideas at each grade). ☐Communicate information or ideas (orally, graphically, textually, and/or mathematically) on a topic from grades 9-12 STE standards (see core ideas at each grade span). ☐Evaluate the validity and reliability of information provided in multiple texts/media on the same topic.
		☐My student cannot perform any of the skills in this science practice.

Student's Name_____ Grade_____ Date of Survey_____

High School Science and Technology/Engineering (STE)

Chemistry (Legacy standards)

(Note: For this high school STE discipline, conduct the Skills Survey below.)

	Illustrate, demonstrate, or respond verbally to:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Group objects by one similar observable property (e.g., size, shape, color, weight, or texture)					
2.	Identify three properties of three different objects/materials (e.g., the ball is round, smooth, and blue; water is cold, wet, and clear)					
3.	Identify up to 3 given materials/objects as either solid, liquid, or gas					
4.	Give examples of a physical versus chemical change (i.e., a physical change doesn't change the substance (melting an ice cube, tearing paper, mixing flour and an egg); in a chemical change (e.g., combustion), a new substance is formed and energy is either given off or absorbed) (e.g., rusting iron, baking a cake, burning wood)					
5.	Give examples of each basic form of energy (i.e., light, sound, heat, electrical, and/or magnetic)					
6.	Classify up to three substances as either a mixture (e.g., soil, sand, coffee with milk, sugar and water) or a pure substance (e.g., air, water, diamonds, table salt, sugar)					

Student's Name_____ Grade_____ Date of Survey_____

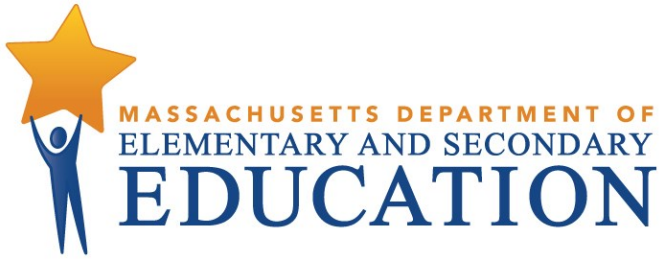
High School Science and Technology/Engineering (STE)

Technology/Engineering (Legacy standards)

(Note: For this high school STE discipline, conduct the Skills Survey below.)

	Illustrate, demonstrate, or respond verbally to:	A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Name three tools and what they were designed to do.					
2.	Identify parts of the human body that act as tools (e.g., teeth for cutting, fingers for grasping).					
3.	Match various tools to their intended purpose.					
4.	Determine whether given objects are natural or human-made.					
5.	Identify different means of transportation.					
6.	Draw or describe a picture/diagram of a specific object you would like to construct.					
7.	Describe the materials you would use to build the object you would like to construct and why you chose those materials.					
8.	Name or describe at least one tool you would use to construct the object you chose and describe why you chose the tool.					
9.	Match a symbol (without text) used to communicate an idea to its message or meaning (e.g., symbols used for wheelchair access, danger, bicycle lane).					
10.	Calculate the actual length of an object from a scaled drawing.					

APPENDIX R
GUIDELINES FOR SCORING
2023 MCAS-ALT



Guidelines for Scoring 2023 MCAS-Alt

MCAS Alternate Assessment

Massachusetts Comprehensive Assessment System

This document was prepared by the
Massachusetts Department of Elementary and Secondary Education

Jeffrey C. Riley
Commissioner

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Purpose of the Scoring Guidelines

The purpose of the *Guidelines for Scoring 2023 MCAS-Alt* is to train scorers to evaluate the 2023 MCAS Alternate Assessment (MCAS-Alt). These guidelines provide important information so that scorers can give valid scores on statewide MCAS-Alt assessments and maintain consistency in applying the scoring rules during the scoring process. Massachusetts educators are also encouraged to use these guidelines to familiarize themselves with the process used to evaluate the MCAS-Alt assessments for their students.

MCAS-Alt is the state's alternate assessment for students with the most significant cognitive disabilities who cannot be assessed on standard MCAS tests, even with accommodations, due to the severity of their disabilities. It is important to assess the academic performance of all students concerning learning standards and to include students with disabilities in MCAS reporting, so results provided to their schools can be used to improve instruction. The MCAS-Alt ensures that students with the most significant cognitive disabilities have an opportunity to show what they know academically and to receive instruction at a level that is challenging and attainable.

By participating in alternate assessments and including their scores in the results of their school and district, students have a greater chance of being considered when decisions are made to allocate staff and resources. Requirements for conducting the MCAS-Alt are provided in the *2023 Educator's Manual for MCAS-Alt*, available at www.doe.mass.edu/mcas/alt/resources.html.

Table of Contents

Introduction and Background

The MCAS Alternate Assessment (MCAS-Alt) has been administered annually in Massachusetts since 2001. According to state and federal laws, all students with disabilities are required to participate in statewide assessments, either by taking standard MCAS tests with or without accommodations or by taking the MCAS-Alt. Decisions regarding how each student will participate in MCAS must be made by the student's IEP team and documented in the student's IEP or listed in the student's 504 plan.

Contents and Structure of the MCAS-Alt

The MCAS-Alt consists of 1) the MCAS-Alt Skills Survey, which is a standardized, measurable, and scorable component that must be completed before selecting "entry points" for subsequent, deeper assessment in the required strand and subject; 2) a collection of "primary evidence" consisting of data charts, work samples, and photographs/video based on the selected entry points or access skills in the specific areas identified for submission in the required subject; and 3) optional "supporting documentation" that describes or shows the context of the assessment activities, including materials, setting, format, and student reflections. The collection of evidence is organized into "strands" according to the standards specified for assessment in each grade and content area**.** Each strand includes the following products and information related to the specific topics and domains being assessed:

- **MCAS-Alt Skills Survey** (see sample in Appendix D)
- **one data chart** showing the student's performance on at least eight different dates, based on a skill listed in the state's Resource Guide for Students with Disabilities in the learning standard and subject required for assessment
- at least **two pieces of evidence**, including work samples, video clips, and/or photographs, showing the student's performance based on the skill listed on the data chart, with a brief description of how the student demonstrated the skill
- examples of **supporting documentation**, including materials and tools used by the student, reflection sheets, and other supporting documentation at the discretion of the teacher

Exceptions to the above assessment requirements are described on pages 21–23 for ELA-Writing (all grades) and on page 24 for Science and Technology/Engineering (grades 5 and 8 and "Next Generation" high school Biology and Introductory Physics).

Detailed instructions for conducting the MCAS-Alt are available in the Department's publication entitled the Educator's Manual for MCAS-Alt, which is updated annually. The Educator's Manual is posted on the Department's website at www.doe.mass.edu/mcas/alt/resources.html.

Scoring the MCAS-Alt

After the skills surveys and evidence collections are submitted to the Department on March 31, 2023, they are reviewed and scored at a scoring institute sponsored by the Department and Cognia, the state's alternate assessment contractor. The *Guidelines for Scoring 2023 MCAS-Alt* (this publication) provides detailed information on the process that will be used by scorers to review and rate each student's alternate assessment. This publication is available at www.doe.mass.edu/mcas/alt/results.html.

General Guidelines for Scorers

Carefully review the following guidelines and review each step of the scoring process included in this booklet, including all scoring rules and onscreen displays in the AltScore program.

Scorers must:

- **Score objectively and impartially.**
  Put aside opinions about the appropriateness of the student's placement, program, or services; opinions on why the student is participating in the alternate assessment; and personal feelings about statewide assessment in general.
- **Review all evidence in a strand before scoring the strand.**
- **Score only what is provided in each strand.**
  Do not make inferences or assumptions about what the student or teacher may have intended or should have included. Use *actual evidence*, rather than the description of the evidence provided by the teacher, as the basis for determining the score.
- **Avoid biases in reviewing the assessment based on overall presentation, neatness, and/or organization of the contents.**
- **Score each rubric area separately for each strand.**
- **Respect student and teacher confidentiality.**
  In accordance with the Family Educational Rights and Privacy Act (FERPA), do not discuss confidential student information with anyone. Do not use the names of teachers or students when discussing the contents of any assessment. Do not score any assessment if you are familiar with the student or teacher who submitted it.
- **Respect the contents of the assessments.**
  Student assessments must be returned in the same condition in which they were submitted. Maintain the order of all contents in the three-ring binder. Remove notes, flags, and placeholders you may have used during scoring.
- **Keep food and drinks away from the binders.** Store uncovered, sticky, or greasy edibles underneath the scoring table at all times.
- **Score at a reasonable pace, without rushing.**
  Read each question and answer it based on the evidence in front of you. Be methodical without taking too long. Each strand should take no more than about fifteen minutes to score. Ask for assistance only if you get stuck.

Content Areas Assessed by MCAS-Alt: Grades 3, 4, and 5

A student in this grade	Must be assessed in the following	
	Content areas	**Strands/Domains**
3	• English Language Arts	• One portfolio strand each in: ○ Reading (Literature or Informational Text) ○ Language (*Vocabulary Acquisition and Use*) ○ Writing (*Text Types and Purposes*)
	• Mathematics	• One portfolio strand each in: ○ Operations and Algebraic Thinking ○ Measurement and Data
4	• English Language Arts	• One portfolio strand each in: ○ Reading (Literature **or** Informational Text) ○ Language (*Vocabulary Acquisition and Use*) ○ Writing (*Text Types and Purposes*)
	• Mathematics	• One portfolio strand each in: ○ Operations and Algebraic Thinking ○ Number and Operations–Fractions
5	• English Language Arts	• One portfolio strand each in: ○ Reading (Literature **or** Informational Text) ○ Language (*Vocabulary Acquisition and Use*) ○ Writing (*Text Types and Purposes*)
	• Mathematics	• One portfolio strand each in: ○ Number and Operations in Base Ten ○ Number and Operations–Fractions
	• Science and Technology/Engineering (STE)*	• Three different STE disciplines, one core idea for each discipline

* STE assessments may include evidence collected during the current and one immediately preceding school year.

Content Areas Assessed by MCAS-Alt: Grades 6, 7, and 8

A student in this grade	Must be assessed in the following	
	Content areas	**Content areas**
6	• English Language Arts	• One portfolio strand each in: ○ Reading (Literature **or** Informational Text) ○ Language (*Vocabulary Acquisition and Use*) ○ Writing (*Text Types and Purposes)*
	• Mathematics	• One portfolio strand each in: ○ The Number System ○ Statistics and Probability
7	• English Language Arts	• One portfolio strand each in: ○ Reading (Literature **or** Informational Text) ○ Language (*Vocabulary Acquisition and Use*) ○ Writing (*Text Types and Purposes*)
	• Mathematics	• One portfolio strand each in: ○ Ratios and Proportional Relationships ○ Geometry
8	• English Language Arts	• One portfolio strand each in: ○ Reading (Literature **or** Informational Text) Language (*Vocabulary Acquisition and Use*) ○ Writing (*Text Types and Purposes*)
	• Mathematics	• One portfolio strand each in: ○ Expressions and Equations ○ Geometry
	• Science and Technology/Engineering *	• Three different STE disciplines, one core idea for each discipline

* STE assessments may include evidence collected during the current and one immediately preceding school year.

Content Areas Assessed by MCAS-Alt: High School

A student in this grade	Must be assessed in the following	
	Content areas	**Content areas**
9	• Science and Technology/Engineering*	• Three core ideas in **one** "next generation"[1] STE discipline: o Biology or o Introductory Physics
10	• Science and Technology/Engineering*	• Three core ideas in **one** "next generation"[1] STE discipline: o Biology or o Introductory Physics **OR** • Three standards in **one** "legacy"[2] STE discipline: o Chemistry **or** o Technology/Engineering
10	• English Language Arts	• One strand each in: o Reading (Literature **or** Informational Text) o Language (*Vocabulary Acquisition and Use*) o Writing (*Text Types and Purposes*)
	• Mathematics	• One strand each in **any three** of the following strands: o Number and Quantity (The Number System) o Statistics and Probability o Algebra/Expressions and Equations o Geometry o Functions/Ratios and Proportional Relationships

***** STE assessments may include evidence collected during the current and one immediately preceding school year. Review the STE assessment format on page 24.

[1] "Next generation" refers to standards in the 2016 Science and Technology/Engineering Curriculum Framework (for Biology and Intro Physics).

[2] "Legacy" refers to standards in 2001/2006 Science and Technology/Engineering Curriculum Framework (for Chemistry and Tech/Eng).

Required Assessment Contents

Assessment Overview

The MCAS-Alt consists of 1) a completed MCAS-Alt Skills Survey for each assessed strand; and 2) either two or three assessed strands in each content area, depending on the subject and student's grade (see tables on pages 3–5) organized in a three-ring binder for each student. Guidelines for assembling the MCAS-Alt are provided in the 2023 Educator's Manual for MCAS-Alt, available at www.doe.mass.edu/mcas/alt/resources.

Required Forms

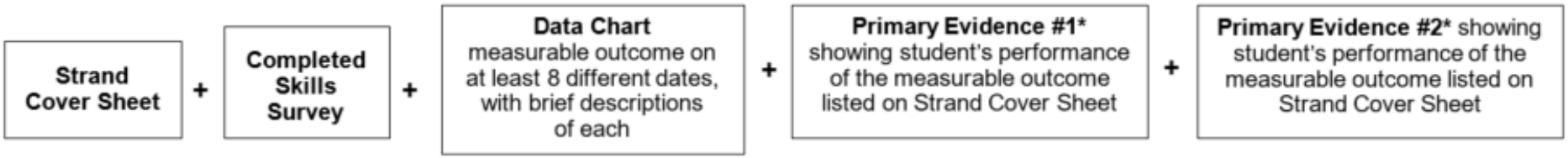
- MCAS-Alt Cover Sheet
- Student's Weekly Schedule
- Student's Introduction
- Verification Form
- School Year Calendar

The overall score will not be affected if a required form is missing, but the scorer should provide comment 54 or 55 from the Comment Key (Appendix A), as appropriate.

Contents of Each Strand:

The "evidence" shown below must be included, at minimum, in each required strand (except ELA–Writing and Next Generation STE which have different formats and requirements). Additional supporting documentation may be submitted at the teacher's discretion (see below). The measurable outcome being assessed must **remain the same** throughout each strand.

A complete strand includes the following components:



* Primary evidence may be a **work sample**, **video sample**, **photograph,** or **series of photos** clearly showing a final product. Video samples may be up to 3 minutes in duration. Evidence must be labeled with name, date, percent accuracy, and percent independence, and must include a brief description of the activity (either written directly on the evidence or a Work Sample Description form).

Supporting Documentation (Optional):

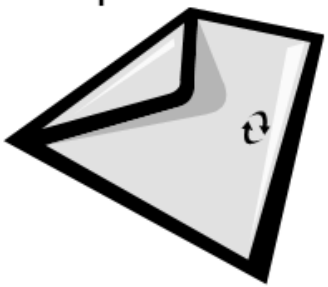
- Work Sample Description form(s)
- Tools, templates, organizers, reference sheets, computer screenshots, description, or sample screen of an Augmentative and Alternative Communication (AAC) or other technology-based device used by the student
- Reflection sheets or other examples of self-evaluation

Summary of Scoring Process: Scorers

The Scorer:

1

- Receives a three-ring binder from the Table Leader
- Removes it from unsealed white envelope
- Stores the envelope under or near the binder



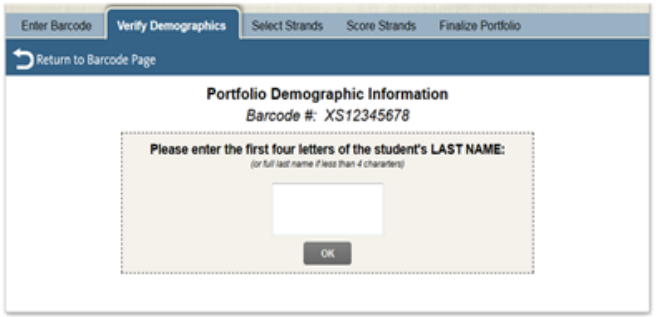
2

Enters the 10-digit barcode found on the white envelope (beneath the student's name label) into the AltScore program

The barcode will always begin with 7499

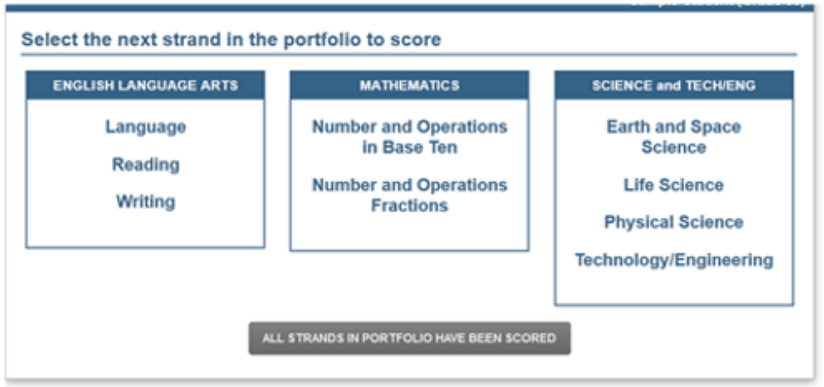
3

Confirms that demographic information in the AltScore program matches the MCAS-Alt Cover Sheet of the assessment to be scored



4

Selects a strand to score



Summary of Scoring Process: Scorers (Continued)

The Scorer:

5

- Scores each strand individually
- Answers each question in the AltScore program for each strand, in order to determine scores for:
  - Level of Complexity
  - Completeness
  - Demonstration of Skills and Concepts
  - Independence
  - Self-Evaluation
  - Generalized Performance

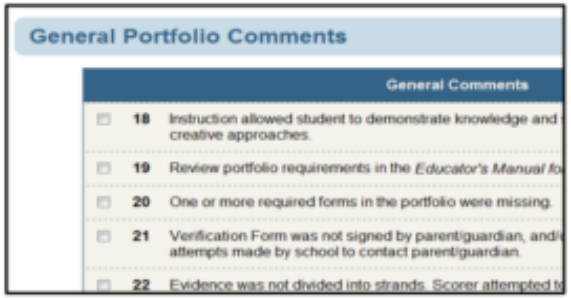
6

- Adds Strand Comments, as appropriate, for each strand
- Informs Table Leader of any scores of "M" or Level of Complexity (LOC)=1

(Note: A score of "M" means that strand evidence was either missing or insufficient to score. "M" comments will be generated automatically, as needed, according to scorers' responses to the AltScore "Completeness" questions.)

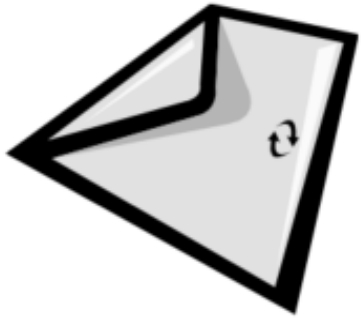
7

- Scores the remaining strands in each content area until all have been scored
- Adds General Portfolio Comment(s), as appropriate, for each content area



8

Places binder back in white envelope and returns it to the Table Leader



Summary of Scoring Process: Table Leaders

The Table Leader:

1

- Distributes binders to scorers at their table
- Answers questions from scorers at their table
- Uses AltScore "Arbitration" screen to complete steps 2, 3, and 4

2

- Double-scores each scorer every fifth binder (or at least once each morning and each afternoon), and as needed, at the Table Leader's discretion
- Determines whether a double or resolution score is needed
- Ensures that double scores are conducted by a scorer at another table.

3

- Tracks and maintains the flow of binders into and out of the double-score box.
- Follows procedure for "M" resolution and discrepancy resolution scores.

(Note: A score of "M" means that strand evidence was either missing or insufficient to score)

4

- Discusses any inaccurate scores with the scorer, based on resolution score
- Checks percent of inter-rater reliability (IRR) in AltScore for scorers based on their double-scored binders

5

- Returns binders to their original box when completely scored
- Confirms that all strands have been scored

6

- Returns completed boxes to the Quality Control room
- Retrieves a new box of binders from storage room

Scoring: *Complexity*

The following numbered questions appear in AltScore, the online program that guides scorers through the scoring process. Many of the AltScore questions will be different for **ELA–Writing** and **Science and Technology/Engineering**.

1. DOES THE MEASURABLE OUTCOME CONTAIN AN ACCEPTABLE ENTRY POINT OR ACCESS SKILL FOUND IN RESOURCE GUIDE FOR THIS STRAND/DOMAIN?

Scorer must confirm that:

- The strand includes a measurable outcome (listed on line 5 on the Strand Cover Sheet).
- The entry point or access skill is listed in the Resource Guide. Line 4 of the Strand Cover Sheet lists the **page number** in the Resource Guide on which the entry point or access skill is listed (If the page number is not listed, use **CTRL+F** and type in a keyword to search.)
- The wording of the entry point or access skill has not been **excessively modified** in the measurable outcome (i.e., the original meaning and intent of the entry point or access skill have been maintained).
- If the measurable outcome is not based on an entry point or access skill found in the Resource Guide, the scorer reports to the table leader who will request the **floor manager's approval** before answering NO.

***Examples* of entry points that were modified in the measurable outcome:**

1. Entry point (Mathematics–The Number System): Represent a real-life negative quantity using a vertical or horizontal number line.

   Acceptable modification of the measurable outcome:
   - *Student will represent a real-life negative quantity using a number line with 80% accuracy and 100% independence*. (**Note**: "…vertical or horizontal" was deleted.)
   - Entry point (Mathematics–Number and Operations–Fractions): *Solve a multiplication word problem involving fractions using manipulatives.*

   An unacceptable modification of the measurable outcome:
   - *Student will solve a multiplication word problem using manipulatives with 80% accuracy and 100% independence.* (**Note:** Measurable outcome from the *Number and Operations–Fractions* domain must include "fractions.")

If the answer to question 1 is YES, the scorer answers this follow-up question:

- **DOES THE MEASURABLE OUTCOME INCLUDE MULTIPLE SKILLS** (e.g., "addition and subtraction")?

Scoring: Complexity (Continued)

2. IS THE SKILL ADDRESSED DURING A STANDARDS-BASED ACTIVITY? (ONLY WHEN LOC=2)

Scorers must confirm that:

- The student has addressed the skill in the context of an academic (i.e., standard-based) activity.
- If Level of Complexity =2 (i.e., "access skills"), the student addressed the skill in the context of an academic (i.e., standard-based) activity (see line 4, Strand Cover Sheet).

Examples:

Academic activities expose the student to the tools, concepts, and materials of the **content area** required for assessment, for example:

- Student will *turn her device on/off* to participate in a counting sequence activity within 10 seconds of a directive.
- Student will *visually track materials* representing informational text within a specified amount of time.
- Student will *orient or manipulate materials* used to create a possible solution(s) to a simple design problem model.

Non-academic activities might include:

- Carrying a jug of water
- Engaging in personal hygiene (e.g., bathroom routines)
- Choosing a motivational reward

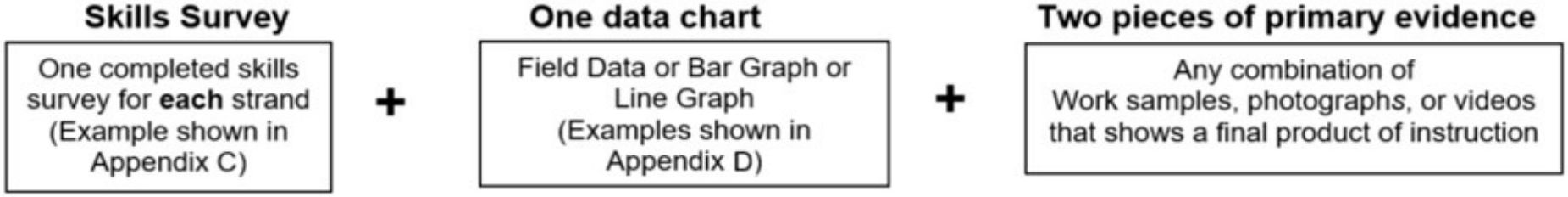
The scoring rubric below is the basis for the score in Level of Complexity. The AltScore program will score this area automatically, based on scorers' responses to the AltScore "Complexity" questions.

SCORING RUBRIC: Level of Complexity (LOC)				
1	**2**	**3**	**4**	**5**
Assessment reflects **little or no basis** in, or is **unmatched** to, *Curriculum Framework* learning standards required for assessment. **("NO" to *Complexity* questions 1 or 2)**	Student addresses social, motor, and communication **"access skills"** during instruction based on *Curriculum Framework* learning standards in this strand.	Student addresses *Curriculum Framework* learning standards that have been modified below grade-level expectations (i.e., **"entry points"**) in this strand.	Student addresses a narrow sample of *Curriculum Framework* learning standards **(1 or 2) at grade-level** expectations in this strand. **(Assessment must be reviewed by Content Experts)**	Student addresses a broad range of *Curriculum Framework* learning standards **(3 or more) at grade-level** expectations in this strand. **(Assessment must be reviewed by Content Experts)**

Scoring: *Completeness*

1. DOES THE STRAND INCLUDE A COMPLETED SKILLS SURVEY, A DATA CHART, AND AT LEAST TWO PIECES OF PRIMARY EVIDENCE?

For all strands (*except* ELA–Writing and "Next Generation" STE), scorers must confirm that the strand includes at least:



If the answer to question 1 is YES, then the scorer will review primary evidence and determine which, if any, of the following are included:

__ Photographs and/or videos __ Teacher-Documented work sample (see p.18) __ None of these

(If photographs and/or videos, or teacher-Documented work samples are checked above, **Questions 11 and 12** will be activated in AltScore.)

If a completed skills survey, plus one data chart and two pieces of evidence are **not** included in the strand, the scorer answers NO. Scorer will be directed to **Scoring: Self-Evaluation**

2. IS THE STUDENT'S NAME, % ACCURACY, AND % INDEPENDENCE LISTED ON THE DATA CHART?

Scorers must confirm that the following information is listed:

- Student's correct name
- Percent (%) accuracy and percent (%) independence for at least 8 data points

3. IS THE FIRST DATA POINT ON THE DATA CHART BELOW 80 PERCENT FOR ACCURACY AND/OR INDEPENDENCE? Scorer must confirm that: The earliest data point on the data chart is below 80% for either Accuracy or Independence, or both.

Scoring: *Completeness (Data Chart)*

4. DOES THE DATA CHART INCLUDE AT LEAST 8 DIFFERENT VALID DATES?

Scorer must confirm that:

- All dates for **English Language Arts** (**ELA)** and **Mathematics** occur in the current school year (i.e., between 7/1/22 and 3/31/23).
- All dates for **Science and Technology/Engineering (STE)** include the current and up to one previous school year (i.e., between 7/1/21 and 3/31/23)
- No data points are included that indicate 0% accuracy and 0% independence – those are not valid data points.

5A. DO AT LEAST 8 BRIEF DESCRIPTIONS ADDRESS ONLY THE SKILL IDENTIFIED IN THE MEASURABLE OUTCOME?

Scorer must confirm that:

- On at least 8 dates, the student was assessed on the same skill listed in the measurable outcome, as documented in the brief descriptions for each activity included at the bottom portion of the data chart.
- Scorer should not score any data point that assesses a skill that is different from the skill listed in the measurable outcome.

For example, in ELA–Literature, if the measurable outcome is:

Student will compare and contrast characters in a story with 80% accuracy and 100% independence.

- **An acceptable brief description might be**: *After reading Cinderella, the student used a Venn diagram to compare and contrast the character traits of Cinderella and her stepsisters.*
- **An unacceptable brief description might be:** *Student answered questions about Cinderella and her stepsisters after reading two chapters and recorded her answers on a worksheet.* ("Answering questions" is **not** the same skill as "comparing and contrasting.")

5B. DO AT LEAST 8 BRIEF DESCRIPTIONS ADDRESS ALL OF THE SKILLS FOUND IN THE MEASURABLE OUTCOME? (ONLY APPEARS IF SCORER ANSWERS **YES** TO "MULTIPLE SKILLS" QUESTION)

Scorer must confirm that:

- If multiple skills are listed in the measurable outcome (e.g., addition and subtraction), then **all** the skills must be addressed on at least 8 different dates (e.g., were both addition *and* subtraction included in the descriptions of at least 8 data points?)

  This question only appears if the scorer indicated that the measurable outcome included multiple skills (See bottom of page 10).

For example, in ELA–Reading, the measurable outcome is: Student will *identify the main idea **and** key details in an informational text* with 80% accuracy and 100% independence.

Acceptable Brief Description: The student read *Martin Luther King, Jr., and wrote the main idea from the first two paragraphs,* **and** *listed the key details*. (NOTE: The brief descriptions on the data chart must show that both skills were addressed on at least 8 dates.)

Unacceptable Brief Description: The student read Martin Luther King, Jr., and found the main idea for each paragraph. (Note: Student did not perform both skills listed in the measurable outcome, since the teacher said the student would *identify the main idea **and** key details*

If the answer to Question 5A or 5B is NO, question 6 will not appear.

Scoring: *Completeness (Data Chart)* (Continued)

6. DO AT LEAST 8 BRIEF DESCRIPTIONS ON THE DATA CHART SHOW HOW THE STUDENT ADDRESSED THE SKILL (I.E., WHAT ACTIVITY, INSTRUCTIONAL APPROACH, AND/OR MATERIALS WERE USED)?

Scorer must confirm that:

A minimum of 8 brief descriptions were provided that indicate what the student did (skill) and how the student demonstrated the skill (e.g., activity, instructional approach, materials used).

It should be clear to the scorer how the activity was conducted. If not, the scorer should click NO.

- The skill listed in the measurable outcome **and** the method(s) or approach(es) used by the student to demonstrate the skill or respond to questions should BOTH be included in the brief description.

For example, the following brief descriptions indicate **what** the student did and **how** they performed the activity:

In ELA–Reading, the measurable outcome is: Student will *answer simple comprehension questions about informational text.*

Acceptable brief descriptions:

- After reading *All about Penguins*, the student **answered 5 questions** about penguins' habits (**SKILL** being assessed in the measurable outcome) on a **worksheet** (**HOW** the student demonstrated the skill).
- Student ***orally*** **answered 8 questions** about the possible reasons for extinction (**SKILL** being assessed in the measurable outcome), based on the class assignment to read *Gone but Not Forgotten* (**HOW** the activity was conducted).
- Student read *National Geographic for Kids* online and **answered 8 comprehension questions** (**SKILL** being assessed in the measurable outcome) on his ***computer*** (**HOW** the activity was conducted).

In ELA–Reading, the measurable outcome is: Student will *identify the main idea* about a literary text.

Unacceptable brief description:

- Student identified the main idea in *Silly Penguins* (i.e., **HOW** was not addressed).

Scoring: *Completeness (Data Chart)* (Continued)

Note to Scorers:

A scorer's response of "NO" to any of the preceding questions will result in a score of "M" in both Demonstration of Skills and Concepts (i.e., accuracy) and Independence, which will result in an overall score of *Incomplete* in the content area.

A score of "M" means that the required information in the strand was either missing or insufficient to provide a score. "M" comments will be generated automatically, based on the scorer's "NO" response(s).

All scores of "M" will be double scored.

Scoring: *Completeness (Data Chart)* (Continued)

For ELA–Reading: Informational or Literary Text

R1. DO AT LEAST 8 BRIEF DESCRIPTIONS INCLUDE TEXT TITLES? IF NOT, ARE COPIES OF THE ACTUAL TEXT INCLUDED ELSEWHERE IN THE STRAND?

Scorers must confirm that:

- At least 8 brief descriptions for ELA–Reading include the **title of the text**, a reference to the topic of the text (e.g., a text about ghosts) used during each activity, or a **photocopy** of the text (e.g. if it was teacher-created or taken from a website). If titles of texts are not listed on the data chart, look for a list elsewhere in the strand.

R2. DO ALL ACTIVITIES ON THE DATA CHART ASSESS EITHER INFORMATIONAL TEXT OR LITERARY TEXT?

After reviewing *Literature and Informational Text* hyperlink in AltScore (see Appendix H), scorers must confirm that:

- The activities listed on the data chart assessed **either *informational* or *literary* text**, but not both.

ELA–Reading: A definition of "Text"

For the ELA–Reading strand, "text" is at least one complete sentence (not phrases or isolated words). Isolated words or phrases may be assessed, but only if these have been extracted from the text listed on the data chart, and/or in brief descriptions, and/or from the photocopied text submitted in the strand.

The student may demonstrate **comprehension** of text either in writing (including scribed by the teacher), verbally, or through use of actions (e.g., pointing to one picture from an array that represents the text), symbols (e.g., selection of pictures, illustrations, or text), or technology (e.g., a computer or electronic communication system).

Scoring: Completeness (Primary Evidence)

8. Is the student's name, valid date, % accuracy, and % independence listed on at least two pieces of primary evidence, or listed on Work Sample Description labels?

Primary evidence includes any combination of work samples, videos, or photographs.

Scorers must confirm that:

- At least **two** pieces of evidence include the student's correct name, valid date, percent (%) accuracy, and percent (%) independence, listed either directly on the piece or on a Work Sample Description form attached (or adjacent) to the evidence.

9. Do at least two pieces of primary evidence directly address the skill identified in the measurable outcome?

Scorers must confirm that:

- At least two pieces of primary evidence address the skill listed in the measurable outcome.

10. Do at least two pieces of evidence address ALL of the skills found in the measurable outcome (e.g., "addition and subtraction")?

Scorers must confirm that:

- If multiple skills are listed in the measurable outcome, then all skills listed are addressed in at least two pieces of primary evidence (work samples, videos, or photographs).

  This question only appears if the scorer indicated that the measurable outcome included multiple skills (See bottom of page 10).

Scoring: Completeness (Primary Evidence) (Continued)

11. DO THE PHOTOGRAPH(S) OR VIDEO(S) SHOW A FINAL PRODUCT AND IS EACH ONE CLEARLY LABELED?

If photographs or videos are **not** included, then scorers will not see this question. After reviewing the photographs or videos, scorers must confirm that:

- The photo or video documents the skill listed in the measurable outcome.
- A final product from the activity is visible.
- Products are clearly labeled with name, valid date, % accuracy, and % independence.
- Video samples are no more than 3 minutes in length (i.e., scorers should view only the first 3 minutes of the video)

12. DOES THE "TEACHER-DOCUMENTED WORK SAMPLE" INCLUDED AS PRIMARY EVIDENCE PROVIDE SUFFICIENT INFORMATION TO DETERMINE WHAT THE STUDENT DID FOR EACH TASK AND HOW THE STUDENT ADDRESSED THE MEASURABLE OUTCOME?

A "**teacher-documented work sample"** is a piece of primary evidence produced by the teacher on behalf of a student who is unable to generate his or her written work samples. In the teacher-documented work sample, a teacher may document one or more student responses on a single date that addresses the same measurable outcome.

- If teacher-documented work samples are **not** included, then scorers will not see this question.
- See a sample "teacher-documented work sample" in Appendix G.

Scorers must confirm that:

- The teacher-documented work sample provides documentation of a series of trials conducted on the same date.
- The student's responses are recorded for each trial, task, or question, together with the % accuracy and % independence.
- The teacher-documented work sample must include detailed information describing the context of each activity and how it was conducted. (Note: click the hyperlink in the AltScore program for further information and an example.)
  :

Scoring: *Completeness (Primary Evidence)* (Continued)

For ELA—Reading

R3. DO AT LEAST TWO PIECES OF PRIMARY EVIDENCE INCLUDE TITLES OR PHOTOCOPIES OF TEXTS?

Scorers must confirm that:

- At least two pieces of primary evidence include the **title** of the text used during the activity or a **photocopy** of the text if it was teacher-created or taken from a website.

Note: In AltScore, refer to the list of informational texts that require only the title and do **not** require a photocopy of the text (see Appendix H or use the hyperlink located in AltScore to view).

R4. DO AT LEAST TWO PIECES OF PRIMARY EVIDENCE DOCUMENT ACTIVITIES BASED SOLELY ON INFORMATIONAL OR LITERARY TEXT?

After reviewing the *Literature and Informational Text* handout (Appendix H), scorers must confirm that:

- At least two pieces of primary evidence document the same text type (i.e., either Literary **or** Informational text, but not both) listed in the measurable outcome. Copies of the text should be provided when the text is teacher-created or internet-based, unless it is included on the supplementary list of well-known informational text in Appendix H.

Scoring: Demonstration of Skills & Concepts (DSC) and Independence (IND)

For all strands **except ELA**–**Writing** and **STE (**grades 5, 8, and High School Biology and Introductory Physics**)**, the scorer must determine the dates of the **final 1/3-time frame** of the data points on the data chart (or at least the last 3 dates on the data chart).

Scorer performs the following steps in AltScore:

1. Enters the **date, % accuracy, and % independence for each acceptable piece of primary evidence**.
2. Enters the **date, % accuracy, and % independence** in the final 1/3-time frame on the data chart (or last 3 data points).
3. AltScore will automatically calculate an average of all scores in the final 1/3-time frame (including primary evidence, when applicable) for DSC and IND, based on the scoring rubric shown below.
4. Scorer reviews the averages calculated by AltScore and confirms that the scores "appear to be correct," based on the scoring rubrics shown below.

Demonstration of Skills and Concepts (Accuracy)				
M	**1**	**2**	**3**	**4**
The strand contains insufficient information to determine a score.	Primarily inaccurate and demonstrates minimal understanding in this strand (**0–25% accurate).**	Limited and inconsistent with regard to accuracy, and demonstrates limited understanding in this strand (**26–50% accurate**).	Mostly accurate and demonstrates some understanding in this strand **(51–75% accurate)**.	Demonstrates consistent accuracy and understanding in this strand (**76–100% accurate**).
Independence				
M	**1**	**2**	**3**	**4**
The strand contains insufficient information to determine a score.	Student requires extensive verbal, visual, and physical assistance to demonstrate skills in this strand **(0–25% independent**).	Student requires frequent verbal, visual, and physical assistance to demonstrate skills in this strand (**26–50% independent**).	Student requires some verbal, visual, and physical assistance to demonstrate skills in this strand (**51–75% independent**).	Student requires minimal verbal, visual, and physical assistance to demonstrate skills in this strand (**76–100% independent**).

For ELA–Writing

W1. IS THERE A COMPLETED SKILLS SURVEY AND 3 DIFFERENT WRITING SAMPLES WITH CORRESPONDING PRE-SCORED WRITING RUBRICS?

Scorers must confirm that:

- A completed ELA Writing Skills Survey is included.
- A minimum of **three different final writing samples** were submitted together with **three completed Writing scoring rubrics** attached or adjacent to each sample. If any are missing, the scorer clicks NO and follows prompts.
- If a student's writing sample contains personal bathroom-related activities, do not count the writing sample as one of the three required samples. Check with your table leader if you are uncertain.

Writing samples may be created using the student's primary mode of communication, including samples that are:

- handwritten or word-processed by the student
- dictated or signed to a scribe with the student's own words transcribed verbatim (scribes may assume correct capitalization and punctuation.)
- created using a symbol-based communication system or icons

Writing samples may be submitted in any combination of the following **text types**:

1. **Opinion / Argument:** stating a claim, opinion, preference, or analysis based on a text or topic, citing reasons and evidence from a text, where possible.
2. **Informative / Explanatory text:** conveying or explaining facts, information, or ideas on a topic, including descriptions taken and/or adapted from a text.
3. **Narrative (including poetry):** telling a story based on real or imagined events from a text or from personal experience, including fiction, drama (script), a personal reflection, or an event sequence; using figurative language (e.g., similes, metaphors), imagery, sounds of words (e.g., rhyme), meter, and/or repetition to express emotion or tell a story.

Teachers are required to pre-score their students' final writing samples (not the baseline sample) by completing a separate **writing scoring rubric** for each final writing sample.

W2. IS THE STUDENT'S NAME, VALID DATE, AND % INDEPENDENCE INCLUDED ON EACH OF THE THREE FINAL WRITING SAMPLES (EITHER ON THE SAMPLE OR THE WORK SAMPLE DESCRIPTION)?

Scorers must confirm that:

- Each final writing sample includes the student's name, a valid date, and % independence, listed either on the piece or on a Writing Work Sample Description either attached or adjacent to the evidence.

W3. IS THERE A BASELINE SAMPLE SUBMITTED?

Scorers must confirm that:

- A **baseline writing sample** was submitted that consists of either a draft, outline, notes, completed graphic organizer, or partially completed writing sample. Check the Work Sample Description to determine whether the sample was considered "final" or "baseline."
- If a baseline sample was NOT submitted, then the scorer clicks NO. (NOTE: This will not affect the final score in this strand)
- **Note:** Completed writing scoring rubrics are **not** required for baseline samples because these will not be included in the score.

W4. IS THE LEVEL OF COMPLEXITY ON THE SUBMITTED RUBRICS ACCESS SKILLS (2) or ENTRY POINTS (3)?

- Scorers review the pre-scored writing rubric to determine if Level of Complexity = 2 or 3.
- Scores will see questions 5 and 5A for entry points (Level of Complexity= 3).
- Scorers will see question 5B for access skills (Level of Complexity = 2).

W5. DOES THE WRITING SAMPLE INCLUDE ONLY…?

- Single words/pictures/symbols,
- list of single words,
- fill-in-the-blank, matching, true/false, circling correct responses, selecting multiple-choice response(s), **or**
- text provided by the teacher, with **no** evidence of original text expressed by the student.

If yes to W5, then the scorer clicks YES and proceeds to question W5A.
If not, Scorer clicks NO and enters the writing rubric scores provided by the teacher. Scorers do NOT change any scores.

W5A. IF THE WRITING SAMPLE DOES INCLUDE ONE OR MORE OF THE EXAMPLES LISTED IN W5, DOES THE PRE-SCORED WRITING RUBRIC CONTAIN SCORES OF 3 OR 4 IN *EXPRESSION OF IDEAS AND CONTENT*, *KNOWLEDGE OF CONVENTIONS*, *TEXT STRUCTURE*, OR *USE OF VOCABULARY*?

Scorer must confirm that:

- A writing sample includes one or more of the examples listed in W5 above, **and** that
    - **scores of 3 or 4** are provided by the teacher for the *Expression of Ideas and Content, Knowledge of Conventions, Text Structure,* or *Use of Vocabulary.*
        - If so, the scorer clicks YES. **Scorer must change the scores of 3 or 4 in the areas available on the rubric, to scores of 1 or 2** (according to the writing rubric descriptions for each area) and must enter the revised scores onscreen, rather than the scores provided by the teacher.
    - **scores of 1 or 2** are provided by the teacher for the *Expression of Ideas and Content, Knowledge of Conventions, Text Structure,* or *Use of Vocabulary.*
        - If so, the scorer clicks NO to this question and enters the writing rubric scores provided by the teacher.

    NOTE: The scores in the four areas of the writing rubric listed above will be used to determine the score for the Demonstration of Skills and Concepts.

W5B. DOES THE WRITING SAMPLE DOCUMENT THE STUDENT'S PARTICIPATION IN THE CREATION OF A WRITTEN PRODUCT (FOR THE LEVEL OF COMPLEXITY = 2 ONLY)?

Scorer confirms that a written product is provided for a student who is working on "access skills" with a description of the student's participation.

FOR SCIENCE AND TECHNOLOGY/ENGINEERING (STE) IN GRADES 5, 8 AND HIGH SCHOOL BIOLOGY AND INTRODUCTORY PHYSICS

S1. IS THERE ONE COMPLETED STE SKILLS SURVEY FOR THE ENTIRE STE DISCIPLINE, AND AT LEAST 3 STE SUMMARY SHEETS?

Scorers must confirm that:

- **One completed STE Skills Survey is included for the entire STE discipline** (i.e., all science practices have been surveyed with at least one checked box beneath each practice).
- At least **three** STE Summary Sheets per strand were submitted.
- If the scorer answers NO, the scorer will be redirected to **Scoring: Self-Evaluation**

S2. DO AT LEAST THREE STE SUMMARY SHEETS PER STRAND HAVE PRIMARY EVIDENCE ATTACHED WITH VALID NAME, DATE, AND % ACCURACY AND INDEPENDENCE?

Scorers must confirm that:

- At least **three** STE summary sheets have primary evidence (e.g., work samples) attached.
- Each summary sheet includes the student's name, valid date, and % accuracy and independence.
- If the scorer answers NO, the scorer will be redirected to Scoring: Self-Evaluation

S3. ARE THREE DIFFERENT SCIENCE PRACTICES REFLECTED ON EACH STE STRAND COVER SHEET?

Scorers must confirm that:

- The **three** summary sheets reflect **three** different science practice numbers. (See Sample STE Summary Sheet in Appendix F.)
- If the scorer answers NO, the scorer will be redirected to **Scoring: Self-Evaluation**

S4. DO ACTIVITIES ON THREE STE SUMMARY SHEETS ASSESS THE SAME CORE IDEA?

Core Idea is found on the Strand Cover Sheet (Line 4) (See Sample Strand Cover Sheet in Appendix F)

Scorers must:

- In AltScore, select from the dropdown menu the **Core Idea** listed on the Strand Cover Sheet.

- Review the list of related topics within the selected Core Idea.
- Confirm that the activities relate to *any* of the listed topics.

S5. DOES EACH PIECE OF EVIDENCE DOCUMENT THE ENTRY POINT/ACCESS SKILL LISTED ON THE STE SUMMARY SHEET?

Scorers must confirm that:

- The evidence documents the entry point/access skill listed on the STE Summary Sheet (e.g., the entry point states, *Illustrate, construct, and/or label a model to show/explain the parts of a plant.* The evidence shows a picture of a plant with parts labeled.)
- **Note:** If STE Summary Sheets were completed last year and this year, please alert your table leader.

STE Summary Sheet — Data Entry

In AltScore, scorers will enter the Science Practice numbers (1–8) and the overall percentages of accuracy and independence for the first three complete STE Summary Sheets in the strand.

Note: If three different science practices are not indicated on the STE Summary Sheet, click BACK to return to question #3 and answer NO.

Scoring: Self-Evaluation (S-E)

Instructions to Scorers

The scorer should review the evidence in the strand for examples of self-evaluation. The following examples should each be counted as one example of self-evaluation, if it is **performed by the student** (as indicated on the evidence, in an attached note, or on a Work Sample Description label):

- selecting student's own work for the assessment
- choosing materials/activities
- reflecting on performance
- goal setting
- graphing or monitoring own performance
- completing a K-W-L chart (i.e., "What I know? What I want to know? What did I learn?")
- checking off or listing tasks as they are accomplished
- self-correcting errors in the work sample

The scorer indicates whether none, one, or multiple example(s) of self-evaluation were found in the strand.

Scoring Rules

1. If the same self-evaluation activity was used on multiple pieces of primary evidence, count each as an example of self-evaluation.
2. Do not count a stamp, sticker, or teacher expressing praise as examples of self-evaluation.
3. If a teacher scribes a student's responses to a self-evaluation question, that should count as an example.
4. Count any example that uses pictures and/or symbols, rather than words, to self-evaluate, as shown below.

The score for *Self-Evaluation* will be determined by AltScore based on the scoring rubric below:

	SCORING RUBRIC: Self-Evaluation	
M	**1**	**2**
Evidence of self-correction, monitoring, goal setting, and reflection was **not found** in this strand.	Student self-corrects monitors, sets goals, and reflects on only **one piece of evidence** in this strand.	Student self-corrects monitors, sets goals, and reflects on **two or more pieces of evidence** in this strand.

Scoring: *Generalized Performance (GP)*

Instructions to Scorers

The scorer should review all evidence and brief descriptions for examples of "generalized performance." Generalized Performance reflects the number of **instructional approaches** and **activity formats** used by the student to acquire and demonstrate knowledge and skills, including any of the following variations:

- *Media and materials* (e.g., uses a variety of materials, such as printed text, manipulatives, art materials, computer, etc.)
- *Activity formats* (e.g., classroom projects, research, experiments, worksheets, open/constructed responses)
- *Presentation formats* (e.g., oral, written, multimedia)
- *Response formats* (e.g., handwritten, word-processed, oral presentation, or visual display)
- Application of skills and/or knowledge in a setting outside the school

The scorer should indicate in AltScore whether <u>one</u> or <u>multiple</u> example(s) of generalized performance were found in the strand.

Scoring Rules

a) Activities in **community settings** (i.e., outside the school, including homework) always count as one example of GP when this is indicated in the evidence or in the brief description.

b) **Use of age-inappropriate instructional materials** (e.g., dolls, nursery rhymes, etc.) by a student in grades 6–10 will result in a score of GP = 1, regardless of other factors contributing to the GP score. In this case, add Comment G from the Comment Key. Check with your Table Leader if you are uncertain.

For ELA–Writing and STE ONLY

The scorer does not need to indicate a score for Generalized Performance for strands in ELA–Writing and STE. When the minimum requirements are met, a score of GP=2 will be generated automatically for these strands.

The score for *Generalized Performance* will either be "**1" or "2**," based on the rubric below:

SCORING RUBRIC FOR EACH STRAND: Generalized Performance (GP)	
1	**2**
Student demonstrates knowledge and skills in this strand using a **single** context or **one** instructional approach.	Student demonstrates knowledge and skills in this strand using **two or more** contexts or instructional approaches.

Scoring Rules in Special Cases

1) Can pieces of primary evidence also be included as points on the data chart? If so, is the strand complete?

Yes. At the teacher's discretion, the work samples, videos, and other primary evidence may be included as data points on a data chart, but it is *not* required. Regardless of whether primary evidence is also included as data points on the chart, scorers will count the evidence for determining completeness, provided the work reflects the skill listed in the measurable outcome. If a work sample is also included on the data chart, the percent accuracy and independence will only be counted once by AltScore.

2) What if a required strand is not submitted?

The scorer must indicate that the strand was not submitted by checking the box "strand required but not submitted" on the final AltScore screen.

3) What if a strand was submitted that was not required for a student in that grade?

If a strand was submitted in a discipline or domain that was **not** required, scorers should not score the strand.

4) Can primary evidence be submitted from previous school years?

The requirement is that submitted evidence should have been created during the current school year. Only Next Gen **Science and Technology/Engineering (STE)** assessments in grades 5, 8, and high school may contain evidence accumulated over two consecutive school years, the current and one previous year (i.e., beginning July 1, 2021).

5) What is a "legacy" alternate assessment?

The term legacy refers to the high school STE disciplines of Chemistry and Technology/Engineering which are based on earlier (2001/2006) STE curriculum frameworks. For these STE disciplines, three different entry points/access skills are selected based on three different standards, with one data chart and two pieces of primary evidence submitted for each entry point. **Only Grade 10** may assess legacy strands for 2023.

6) Can photographs (or a series of photographs) and video samples be submitted as primary evidence?

Products submitted in a strand will be counted and scored as primary evidence if the final product of instruction is visible and photo(s) or video(s) clearly describes how the student demonstrated the measurable outcome. Each product must be labeled with all required information. Video samples must be intelligible (or transcribed in writing), clear enough for a scorer to see the final product, and not longer than three (3) minutes in duration.

Maintaining Validity and Reliability

Training and Qualification of Scorers

Before the first day of actual scoring, prospective scorers receive intensive training supervised by Department staff. After training is completed, each prospective scorer, Table Leader, scoring specialist, and Floor Manager must pass a qualifying test before scoring any student assessments.

Qualifying Test

To qualify, prospective scorers must individually score several pre-calibrated, simulated MCAS-Alt strands using the AltScore onscreen scoring program. These "qualification strands" cover a range of scenarios scorers are likely to encounter in the actual scoring of student assessments. Prospective scorers are permitted to refer to the following publications while taking the qualifying test:

- *Guidelines for Scoring 2023 MCAS-Alt* (this publication)
- *Resource Guide to the Massachusetts Curriculum Frameworks for Students with Disabilities* (Fall 2022 edition) (digital version)
- *Training for MCAS-Alt Scorers* – PowerPoint presentation handout
- Sample strands used during scorer training

The passing scores for the qualifying test are as follows:

- Scorers must achieve a score of at least **85 percent** correct
- Table Leaders, Floor Managers, and MCAS-Alt scoring specialists must achieve a score of at least **90 percent** correct.

Prospective scorers, Table Leaders, scoring specialists, and Floor Managers who do *not* qualify on the first attempt are allowed to review their tests and receive additional training, after which a second qualifying test is administered. Those who do not qualify on the second attempt will be excused from scoring. Table Leaders and scoring specialists who score 85–89 percent will be invited to participate as scorers, but not as Table Leaders or scoring specialists.

Maintaining the Accuracy and Consistency of Scores

All scoring discrepancies and scores of "M" for DSC and IND are resolved by a scoring specialist and Floor Managers.

Table Leaders and Department staff will track each scorer's inter-rater reliability (IRR). For assessments in grades 3–10, this is accomplished by double-scoring at least one student's entire assessment (i.e., skills surveys and strands) each morning and afternoon for each scorer, or at least one entire assessment out of every five scored. Table Leaders and scoring specialists will be double-scored on at least two complete assessments each week, with discrepancies resolved by a Floor Manager. Each scorer's rate of agreement with an expert scorer (i.e., inter-rater reliability) must be maintained at a level of 80 percent or higher for all rubric areas in the double-scored assessments. When the rate of agreement falls below 80 percent, scorers are retrained and subsequently double-scored for the remainder of that day and may be released from scoring at the discretion of the Department if their rate of agreement falls below 80 percent two or more subsequent times.

Appendix A: Scorer Comment Key

2023 MCAS-Alt

COMMENT KEY

STRAND COMMENTS	
A	Level of Complexity indicated on the Strand Cover Sheet (access skills, entry points, or grade level) was changed to match the evidence submitted.
B	Some brief descriptions or evidence contained additional skills not listed in the measurable outcome and were not included in the calculation of the final score.
C	Some data points or evidence were listed with 0% accuracy and 0% independence are not valid and were not included in the final score.
D	Some date(s) listed on primary evidence occurred on a non-school day and were not included in the final score.
E	Some date(s) listed on data chart occurred when school was not is session and were not included in the final score.
F	Some evidence was impossible to read and/or interpret and was not included in the final score.
G	The percent of accuracy and/or independence on at least one piece of primary evidence was recalculated to reflect the work submitted.
H	Some photograph(s) could not be scored because the final product was not evident or the percent of acc. and/or ind. could not be verified.
I	Consult with a content specialist to ensure that evidence aligns with the strand or domain.
J	Strand showed evidence of open-ended, creative approaches that allowed the student to demonstrate knowledge and skills.
K	Evidence submitted as self-evaluation did not demonstrate choices or reflection by the student.
L	Audio/video sample could not be scored due to poor quality or inability to open one or more recorded segments.
M	Review the differences between Literature and Informational text for the ELA–Reading strand at www.mcas-alt.org/materials.
N	Two different data charts are not acceptable as a core set of evidence in the same strand.
O	At least 8 brief descriptions on the data chart did not clearly explain how the student addressed the measurable outcome.
P	Strand was well-organized.
Q [Scr 3 only]	Strand contained the required elements.

STRAND COMMENTS — NEXT-GEN SCIENCE	
SM	Consult with a science content specialist to ensure that evidence represents the selected entry point or access skill.
SN	Unclear how the percent of accuracy and/or independence were determined on one or more STE Summary Sheets.
SO	STE Summary Sheet description(s) lacked clarity and/or specificity.
SP	STE Summary Sheet(s) documented varied instructional approaches.
SQ	Supporting documentation described how the learning occurred and was helpful in determining the score.
SR	Evidence demonstrated creative application of science practices.

STRAND COMMENTS — WRITING	
WJ	Unclear whether the text in the sample was generated by the student or the teacher.
WK	Use of the student's primary mode of communication allowed the student to effectively express his or her knowledge and ideas.
WL	Consider other methods to document the student's expressive communication.
WM	One or more Writing rubric scores were changed to reflect the evidence submitted.
WN	A required baseline writing sample was not submitted.
WO	Supporting documentation described how learning occurred and was helpful in determining the score.
WP	Unclear how the percent of independence was calculated on one or more writing samples.
WQ	Writing samples showed evidence of open-ended and/or creative approaches.

LEVEL OF COMPLEXITY = 1 COMMENTS	
WI WRT only	Motor skills did not reflect communication and/or expression by the student and could not be scored (e.g., trace letters or scribble).
X	Skill was not addressed in the context of a standards-based activity or aligned to the required strand/domain.
Y	Entry point was not found in the Resource Guide and was either not pre-approved by DESE or was excessively modified.
Z	Standard and/or entry point was not selected from the Vocabulary Acquisition and Use cluster, as required for the ELA–Language strand.

GENERAL COMMENTS	
50	Assessment showed evidence of a range of open-ended, creative approaches that allowed the student to demonstrate knowledge and skills.
51	Supporting documentation was helpful to the scorer in understanding the instructional strategies and/or context.
52	Please review requirements in the Educator's Manual for MCAS-Alt and consider attending additional Department-sponsored training sessions.
53	Review guidelines for selecting a measurable outcome in the Educator's Manual for MCAS-Alt.
54	One or more required forms were missing, but this did not affect the overall score.
55	Verification Form was not signed by parent/guardian and no information was provided documenting attempts by the school to contact parent/guardian.
56	Evidence was not included for three learning standards in a single discipline of High School Science and Technology/ Engineering.
57	Consider showing evidence of varied instructional approaches used with the student (Generalized Performance).
58	Confidential information about the student should not be included in the assessment.
59	3 different Mathematics conceptual categories were required in grade 10 but were not submitted.
60	3 different core ideas were not submitted for one discipline in High School Science and Technology/Engineering.
61	Binder was well-organized.

Appendix B: MCAS-Alt Glossary

The following terms are used to describe and score the MCAS-Alt:

Access Skills: Student outcomes that address a social or motor skill during a standards-based (i.e., academic) activity in the required strand

Conceptual Category: The high school Mathematics standards are clustered in "conceptual categories:" Number and Quantity (N), Algebra (A), Functions (F), Modeling, Geometry, and Statistics and Probability (S) which together present a coherent view of high school mathematics.

Content Area: The subject assessed by the MCAS-Alt, including English Language Arts and Literacy (ELA), Mathematics, and Science and Technology/Engineering (STE)

A core set of evidence: The minimum amount of evidence required for a strand to receive a score. For most subjects, except ELA–Writing and Next Generation STE, this includes

- **One data chart** showing a student's progress over time in learning the measurable outcome; **PLUS**
- **Two additional pieces of primary evidence** (e.g., work samples) showing the student's performance of the same measurable outcome shown on the data chart

Domain: A topic or cluster of related Mathematics standards in grades PreK–8, according to the Massachusetts Curriculum Framework.

Entry Point: An academic outcome based on a learning standard that has been modified below grade-level expectations. Entry points are listed at progressively lower levels of complexity in the Fall 2021 *Resource Guide to the Massachusetts Curriculum Frameworks for Students with Disabilities (the "Resource Guide").*

Learning Standard: Specific statement of what *all* students should know and be able to do by the end of each grade.

Measurable Outcome: A specific goal for a student taking the MCAS-Alt that serves as the basis of his or her data charts and/or primary evidence. Measurable outcomes are based on entry points and access skills listed in the Resource Guide that identifies the specific skill to be assessed in the strand/domain required for the assessment of a student in that grade. Measurable outcomes have been individualized with percentages of accuracy and independence (e.g., "[Student] will add 3-digit numbers with 80 percent accuracy and 100 percent independence")

Primary evidence: A work sample, photograph, video sample, or teacher-documented work sample that documents the student's knowledge or demonstration of a skill.

***Resource Guide to the Massachusetts Curriculum Frameworks for Students with Disabilities*:** The Resource Guides list the Massachusetts learning standards in each subject and grade and identify student outcomes (i.e., entry points and access skills) based on each standard at successively lower levels of complexity (i.e., from more-to-less complex).

Strand: A unit of scorable evidence in the alternate assessment; a cluster of related standards in the Massachusetts Curriculum Framework.

Supporting documentation: Products that show the context and/or format of an instructional activity, but not the final product or performance of the activity, i.e., how did the instruction occur? Examples of supporting documentation might include a blank graphic organizer, a computer screenshot of a program or application used by the student, a reflection sheet, or a work description.

Appendix C: Sample MCAS-Alt Skills Survey

Student's Name: **Sample Student** Grade: **08** Date of Survey: **10/21/22**

ELA - All Grades

Language (Vocabulary Acquisition and Use)

Based on exposure to vocabulary during academic activities, student can:		A 0% (unable)	B Up to 25% (rarely)	C Up to 50% (occasionally)	D Up to 75% (more often than not)	E Up to 100% (almost always)
1.	Communicate answers to simple questions about familiar objects.	○	○	○	◉	○
2.	Identify familiar objects/actions by name.	○	○	○	◉	○
3.	Match given words or symbols to pictures that mean the same or similar thing.	○	○	○	◉	○
4.	Answer questions about the meaning of words found in stories, poems, or during other academic activities.	○	○	◉	○	○
5.	Identify words/symbols/pictures that are opposite in meaning.	○	○	◉	○	○
6.	Identify words/symbols/pictures that are similar in meaning.	○	○	○	◉	○
7.	Use phrases to express a need, request, idea, or response during an academic activity.	○	○	◉	○	○
8.	Describe key attributes of different objects (e.g., the flower is colorful).	○	◉	○	○	○
9.	Communicate using common temporal words (e.g., before, after, now, later, first, next).	○	◉	○	○	○
10.	Identify examples of figurative language (e.g., idiom, metaphor, simile, hyperbole, or personification) used in a text.	◉	○	○	○	○

MCAS-Alt SKILLS SURVEY

Appendix D: Data Chart–Sample Field Data Chart

DATA METHOD 1: FIELD DATA CHART

COMPLETE ALL INFORMATION BELOW.

Student Name: Rosie Riverter

Content Area/Strand: English Language Arts - Language

Learning Standard: L.8.4a Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.

Measurable Outcome: Student will attend visually, aurally, or tactilely to materials related to vocabulary acquisition within 15 seconds with 80% accuracy and 60% independence.

KEY (Accurate (+ or -) / (I or P) Independence)	
+	Accurate
-	Incorrect
I	Independent
P	Prompt Used

At least eight (8) different dates are required.

Date (mo/day/yr):	10/7/22	11/12/22	11/19/22	11/22/22	11/23/22	12/1/22	12/2/22	12/3/22	12/4/22	12/9/22
Accuracy and Independence for each trial (see KEY):	+ / P	+ / P	+ / I	- / P	- / P	- / P	+ / P	- / P	+ / P	- / P
	- / P	- / P	+ / I	- / P	+ / P	+ / P	+ / I	+ / P	+ / I	+ / P
	+ / I	+ / P	+ / I	- / P	- / P	+ / I	+ / I	+ / I	- / P	+ / I
	+ / I	- / P	+ / I	- / P	- / P	+ / I	- / P	+ / I	+ / I	+ / I
	- / P	+ / I	+ / P	- / P	+ / P	+ / I		+ / P	+ / P	+ / I
	- / P	- / P	- / P	- / P	+ / P	- / P		+ / P	+ / I	- / P
	+ / I	+ / I	- / P	- / P	+ / P	- / P		+ / P	+ / I	- / P
	- / P	+ / I	+ / I	- / P	- / P	- / P		+ / P	+ / I	+ / I
		- / P	- / P	+ / I	+ / P			+ / I	+ / I	- / P
		+ / P	+ / P	+ / I	- / P			+ / I	+ / P	+ / I
% Accuracy: SUMMARY for this date	50	60	70	20	50	50	75	90	90	60
% Independence: SUMMARY for this date	38	30	50	20	0	38	50	40	60	50
Brief Description (What was student asked to do and how did he/she do it?)	During a literacy group, was read chapter 8 (Margalo) in Stuart Little. A story box of objects was used to represent vocabulary from the text.	During a literacy group, was read chapter 10 (Springtime) in Stuart Little. A story box of objects was used to represent vocabulary from the text.	During a literacy group, was read chapter 11 (The Automobile) in Stuart Little. A story box of objects was used to represent vocabulary from the text.	During a literacy group, was read chapter 13 (Ames' Crossing) in Stuart Little. A story box of objects was used to represent vocabulary from the text.	During a literacy group, was read chapter 15 (Heading North) in Stuart Little. A story box of objects was used to represent vocabulary from the text.	During literacy group, was read a poem about snow. During the reading, a story box of objects was used to represent vocabulary from the poem.	During morning meeting, the class discussed the topics of attendance, the calendar (month and day of the week), and the weather. Tactile objects and images were used to represent the vocabulary	During literacy group, was read chapter 1 (Peter Breaks Through) in Peter Pan. A story box of objects was used to represent vocabulary from the text.	During a literacy group, was read chapter 2 (The Shadow) in Peter Pan. A story box of objects was used to represent vocabulary from the text.	During a literacy group, was read chapter 3 (Come Away, Come Away) in Peter Pan. A story box of objects was used to represent vocabulary from the text.

Data was taken on whether the student attended within 15 seconds of being shown the object.

Appendix D: Data Chart–Sample Bar Graph

DATA METHOD 2: BAR GRAPH *(instructional data summarizing the student's performance on each date)*

Accuracy: **Independence:**

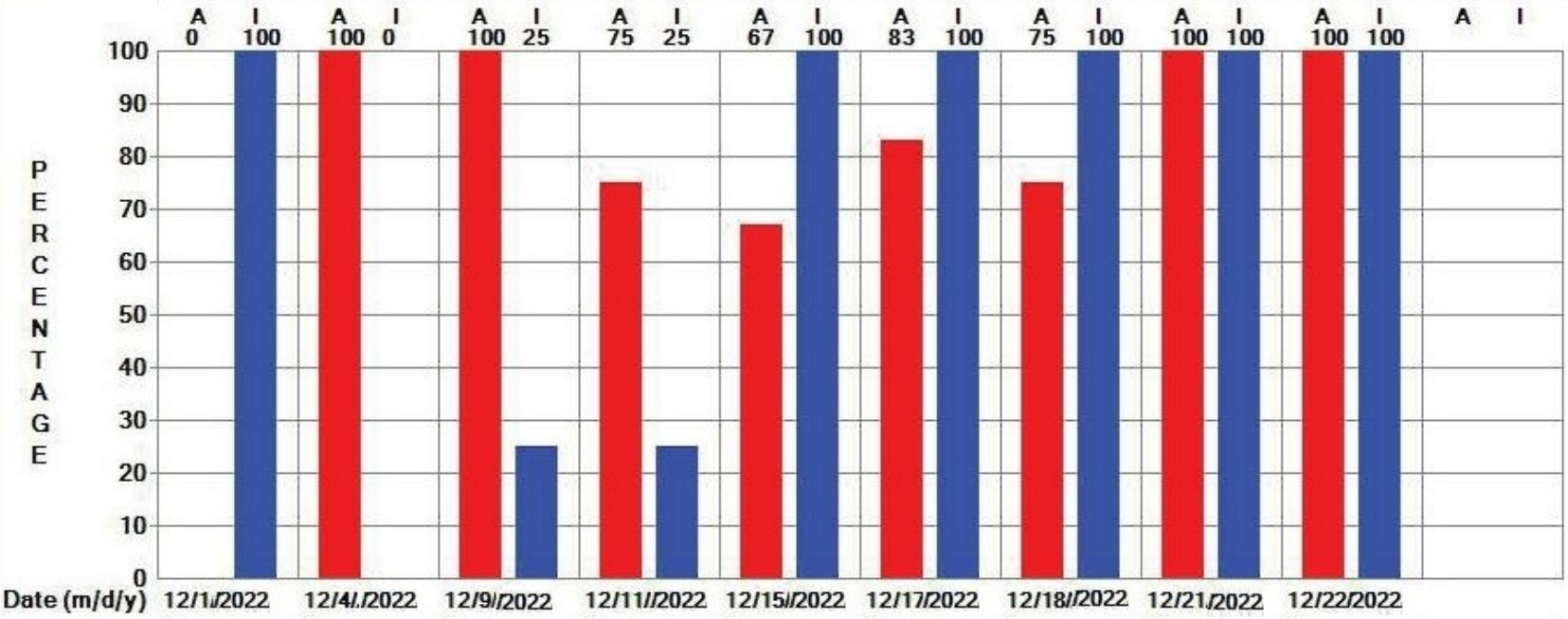
COMPLETE ALL INFORMATION BELOW. AT LEAST EIGHT (8) DIFFERENT DATES ARE REQUIRED.

Student Name: Stevie Budd

Content Area/Strand: Mathematics/Number and Operations - Fractions

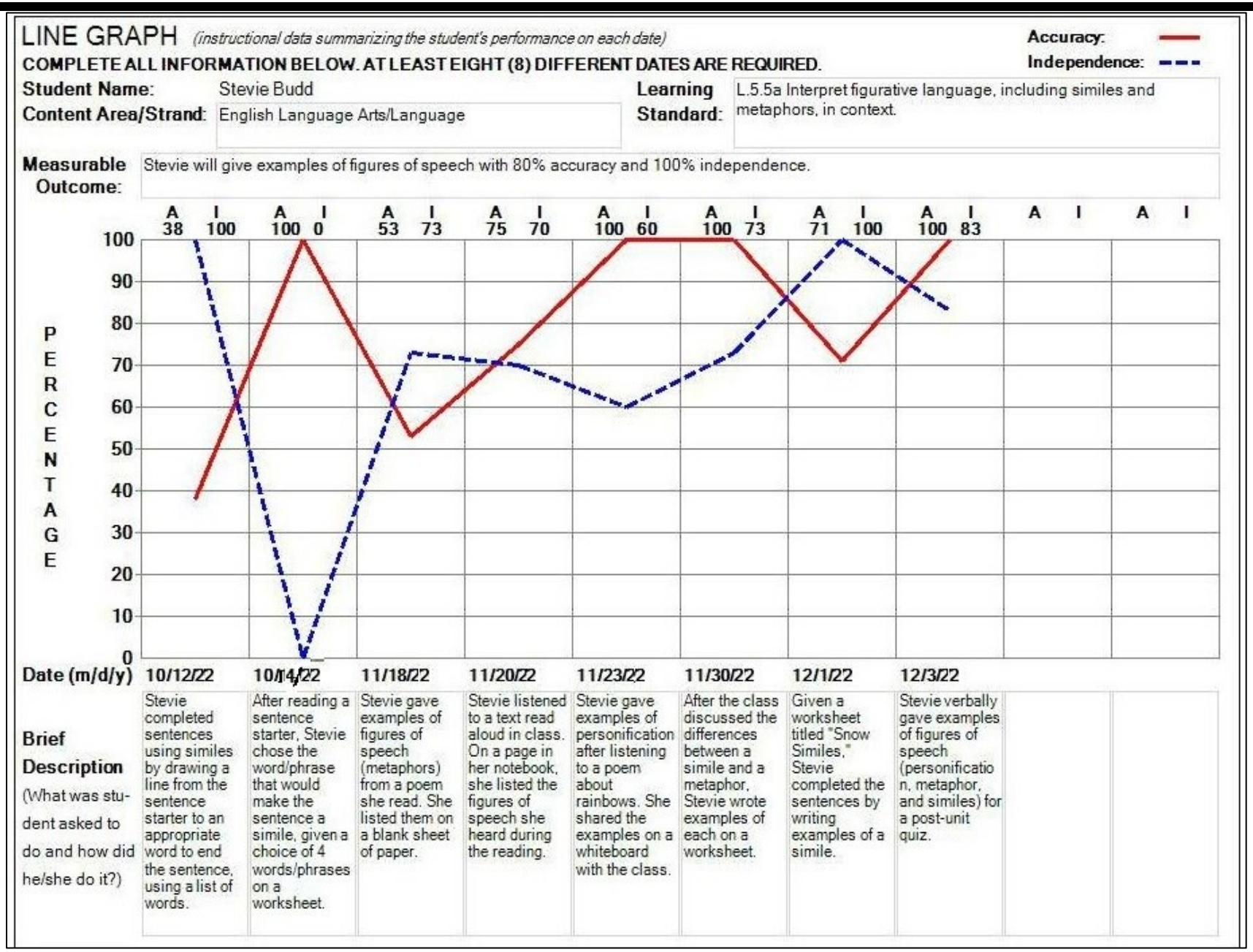
Learning Standard: 5.NF.B.5a Interpret multiplication as scaling (resizing), by: comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

Measurable Outcome: Stevie will multiply fractions by fractions using manipulatives, visual models, and/or technology with 80% accuracy and 100% independence.



Date (m/d/y)	Brief Description (What was student asked to do and how did he/she do it?)
12/1/2022	On a whiteboard, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/4/2022	On a worksheet, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/9/2022	On a whiteboard, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/11/2022	On a worksheet, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/15/2022	On a whiteboard, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/17/2022	On a worksheet, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/18/2022	On a worksheet, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/21/2022	Given a worksheet, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.
12/22/2022	On a whiteboard, Stevie multiplied a fraction by a fraction and created a visual model to show her understanding of the problem. Accuracy was based only on her solution.

Appendix D: Data Chart–Sample Line Graph



LINE GRAPH *(instructional data summarizing the student's performance on each date)*

Accuracy: ——— Independence: - - -

COMPLETE ALL INFORMATION BELOW. AT LEAST EIGHT (8) DIFFERENT DATES ARE REQUIRED.

Student Name: Stevie Budd

Content Area/Strand: English Language Arts/Language

Learning Standard: L.5.5a Interpret figurative language, including similes and metaphors, in context.

Measurable Outcome: Stevie will give examples of figures of speech with 80% accuracy and 100% independence.

	10/12/22	10/14/22	11/18/22	11/20/22	11/23/22	11/30/22	12/1/22	12/3/22		
A	38	100	53	75	100	100	71	100	A	A
I	100	0	73	70	60	73	100	83	I	I
Brief Description (What was student asked to do and how did he/she do it?)	Stevie completed sentences using similes by drawing a line from the sentence starter to an appropriate word to end the sentence, using a list of words.	After reading a sentence starter, Stevie chose the word/phrase that would make the sentence a simile, given a choice of 4 words/phrases on a worksheet.	Stevie gave examples of figures of speech (metaphors) from a poem she read. She listed them on a blank sheet of paper.	Stevie listened to a text read aloud in class. On a page in her notebook, she listed the figures of speech she heard during the reading.	Stevie gave examples of personification after listening to a poem about rainbows. She shared the examples on a whiteboard with the class.	After the class discussed the differences between a simile and a metaphor, Stevie wrote examples of each on a worksheet.	Given a worksheet titled "Snow Similes," Stevie completed the sentences by writing examples of a simile.	Stevie verbally gave examples of figures of speech (personification, metaphor, and similes) for a post-unit quiz.		

Appendix E: MCAS-Alt Rubric for Scoring Strands

	1	2	3	4	5
Level of Complexity	Strand reflects little or no basis in, or is unmatched to, curriculum framework learning standard(s) required for assessment.	Student primarily addresses motor and communication "access skills" during instruction based on curriculum framework standards in this strand.	Student addresses curriculum framework standards that have been modified below grade-level expectations in this strand.	Student addresses a narrow sample of curriculum framework standards (1 or 2) at grade-level expectations in this strand.	Student addresses a broad range of curriculum framework standards (3 or more) at grade-level expectations in this strand.

	M	1	2	3	4
Demonstration of Skills and Concepts (Accuracy)	The strand contains insufficient information to determine a score.	Student's performance is primarily inaccurate and demonstrates minimal understanding in this strand (0–25% accurate).	Student's performance is limited and inconsistent with regard to accuracy and demonstrates limited understanding in this strand (26–50% accurate).	Student's performance is mostly accurate and demonstrates some understanding in this strand (51–75% accurate).	Student's performance is accurate and is of consistently high quality in this strand (76–100% accurate).
Independence	The strand contains insufficient information to determine a score.	Student requires extensive verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (0–25% independent).	Student requires frequent verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (26–50% independent).	Student requires some verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (51–75% independent).	Student requires minimal verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (76–100% independent).
Self-Evaluation	Evidence of planning, self-correction, task-monitoring, goal-setting, and reflection was not found in this content area.	Student infrequently plans, self-corrects monitors, sets goals, and reflects in this content area — only one example of self-evaluation was found in this strand.	Student plans, self-corrects monitors, sets goals, and reflects in this content area — multiple examples of self-evaluation were found in this strand.		
Generalized Performance		Student demonstrates knowledge and skills in one context or uses one approach and/or method of response and participation in this strand.	Student demonstrates knowledge and skills in multiple contexts or uses multiple approaches and/or methods of response and participation in this strand.		

Appendix E: Rubric for Scoring ELA–Writing

		M	1	2	3	4
Level of Complexity			Writing sample not submitted or unmatched to requirement.	Student addressed Writing through "access skills."	Student addressed Writing through "entry points."	Student addressed Writing at "grade-level."
Demonstration of Skills and Concepts	**Expression of Ideas and Content**	Writing sample not submitted; or contained insufficient information to determine a score; or written in a language other than English; or could not be read or understood	No main idea (informative), point of view (opinion), event sequence (narrative), or focus (poetry); or was unclear or off-topic; or used single word, picture, or symbol to express ideas; or all text provided by teacher	Writing sample related to assignment only minimally; included no or only one detail or description; or used picture sequence to express ideas; or used no figurative language or poetry form (poetry)	Main idea (informative), point of view (opinion), or event sequence (narrative) was evident; limited use of facts, details, and/or descriptions; sometimes repetitive and/or off-topic; limited use of figurative language (poetry);	Main idea (informative), point of view (opinion), or event sequence (narrative) was clearly expressed; three or more accurate and relevant facts, details, or descriptions included; used vivid imagery and figurative language appropriately (poetry)
	Knowledge of Conventions		Little or no original text; or used pictures or isolated words; or could not be understood due to errors in grammar and/or usage	General meaning could be understood, though use of grammar was limited and/or contained errors or run-on sentences; or lacked poetry form (poetry)	Complete sentences with some errors; grammar was effective; correct noun-verb agreement; some evidence of poetry form (poetry)	Meaning was clear, with rare or no errors in grammar and overall usage; poetry form used appropriately (poetry)
	Text Structure		Used single words, pictures, symbols without text; or all text provided by teacher	Sentence fragments (phrases) or one complete sentence used to express ideas; produced two related lines (poetry)	At least two complete sentences were used to express ideas; produced up to four related lines (poetry)	A paragraph of at least three related, well-constructed sentences was used to express ideas; more than four related lines (poetry)
	Use of Vocabulary		Vocabulary was unrelated to assignment; or all text was provided by teacher	Vocabulary was related to assignment, but word choice was limited and/or sometimes inappropriate	Vocabulary was functional and relevant; used basic common words, with some descriptive language	Vocabulary was clear and precise; used descriptive language, modifiers, connecting words and/or phrases

Appendix F: STE Strand Cover Sheet for Grades 5 and 8 STE, and High School Biology and Introductory Physics

2023 MCAS-Alt

Science and Technology/Engineering
STRAND COVER SHEET

(A completed STE Strand Cover Sheet must be included at the beginning of each STE discipline)

(1) Student's Name: **Archie Mark**

(2) Student's grade as reported in the Student Information Management System (SIMS): **08**

(3) STE Discipline: **EARTH AND SPACE SCIENCES**

(4) Core Idea: **Earth's Place in the Universe**

Below, list each STE Summary Sheet included in the assessment (<u>three</u> are required):

Practice # (1-8)	Date	STE Summary Sheet Description	Self-Evaluation
1	2/3/23	Asking questions	Yes
2	12/16/22	Investigation	No
3	1/23/23	Impact of the positions of the EMS	No

Appendix F: STE Summary Sheet for Grades 5 and 8 STE, and High School Biology and Introductory Physics

Science and Technology/Engineering (STE)
STE SUMMARY SHEET

Directions: Complete and submit **one summary sheet for each selected entry point or access skill** in the core idea (total of 3 summary sheets for each core idea). Document at least **three different science practices** among the three summary sheets. Attach **three pieces of primary evidence**, each to its corresponding STE Summary Sheet.

Student's Name: **New Student** Date (m/d/y):

Grade: **08** Discipline (Strand): **Earth and Space Science**

Core Idea: **Earth's Place in the Universe**

Science Practice (#1-8):

☐ Entry Point

☐ Access Skill

Resource Guide Page:

Grade Span:

Brief Description of activity (including materials, instructional approach, and how the student addressed the entry point or access skill):

Self-Evaluation:

SUMMARY for this activity: Accuracy: Independence:

☐ **EVIDENCE IS ATTACHED (Check if YES)**

Three pieces of evidence must be attached to its corresponding STE Summary Sheet.

A clearly labeled photograph with a detailed description may be substituted for evidence that may be difficult or impossible to attach to a STE Summary Sheet, including large, fragile, or temporary products, such as a model or a large display.

Grade Level: 7th Grade
Content Area (Subject): Math
Strand: Ratios and Proportional Relationships
Learning Standards: 7.RP.A.2 Recognize and represent proportional relationships between quantities.
Measureable Outcome: will turn on technology used to demonstrate ratios and proportional relationships by pressing an access switch to turn the page of a teacher made story on the computer about ratios and proportions with 80% accuracy and 100%independence. will turn on the technology within 15 seconds of a directive.

Brief Description: During a math work session, turned on technology by pressing an access switch to turn the page of a teacher made book on the computer within 15 seconds of a directive. The book taught about ratios and proportional relationships by showing her a series of farm animals using the phrase "for every" to talk about how many of each appendage each animal had. (ex: for every cow there are 4 legs)

Trial Number	Page Number	Did she turn on technology by pressing her switch to activate the reading?	Latency In seconds	What was the ratio on the page?	+/-	I/P
1	1	No	15+ seconds	For every pig there is one tail	-	I
2	1	Yes	4 seconds	For every pig there is one tail	+	I
3	2	Yes	14 seconds	For every sheep there are 2 ears	+	I
4	3	No	15+ seconds	For every cow there are 4 legs	-	I
5	3	No	15+ seconds	For every cow there are 4 legs	-	I
6	3	Yes	10 seconds	For every cow there are 4 legs	+	P
7	4	Yes	3 seconds	For every duck there is 1 beak	+	I
8	5	Yes	1 second	For every goat there are 2 horns	+	I
9	6	Yes	11 seconds	For every horse there are 4 legs	+	I
10						

Accuracy	Independence
67%	89%

Appendix H: Informational Text – Supplemental List

Teachers are directed to include a photocopy of any Internet-based or teacher-created texts being submitted in the student's ELA-Reading assessment. **The following *informational* texts do not require a photocopy for the ELA–Reading–Informational Text strand because they are widely used and well-known:**

- ***News-2-You*** (symbol and text-based)
- ***Scholastic for Kids***
  - ***Science Spin***
- ***Weekly Reader***
- ***Time for Kids***
- ***Newsweek for Kids***
- ***National Geographic for Kids***
- ***Newsela*** (daily online news articles at five different reading levels from grades 3–12)
- ***Unique Learning Systems*** (symbol and text-based)
- ***Wonderopolis*** or ***Camp Wonderopolis***
- **Digital Textbooks (provide the name of the textbook)**

Teachers may simply list the title and topic of articles, plus the name of the publication, from the sources listed above either in the brief description or directly on the evidence. For example:

"(Student) read an article about goats from National Geographic for Kids and answered five comprehension questions on a worksheet."

Appendix H: Literature and Informational Text Types

READING: LITERATURE VS. INFORMATIONAL TEXT

(Adapted from engageny.org)

- Examples of literary text:
  - A. adventure stories
  - B. nursery rhymes
  - C. poems
  - D. fables and folktales
  - E. legends
  - F. myths
  - G. fantasy
  - H. plays
  - I. historical fiction
  - J. mysteries
  - K. science fiction
  - L. realistic fiction
  - M. allegories
  - N. parodies
  - O. satire
  - P. graphic novels

- Examples of Informational text:
  - A. literary nonfiction
  - B. biographies and autobiographies
  - C. exposition, argument, and functional text, including:
    - personal essays and speeches
    - opinion pieces
    - essays about art or literature
    - biographies and memoirs
    - journalism (articles)
    - historical, scientific, technical, or economic accounts
  - D. historical, scientific, and technical texts, including:
    - texts about history, social studies, science, and the arts
    - directions, forms, and digital sources on a range of topics
    - historical, scientific, technical, or economic accounts

APPENDIX S
SCORING RUBRIC FOR MCAS-ALT
ELA—WRITING

SCORING RUBRIC for ELA–Writing

Student's Name: **Date:**

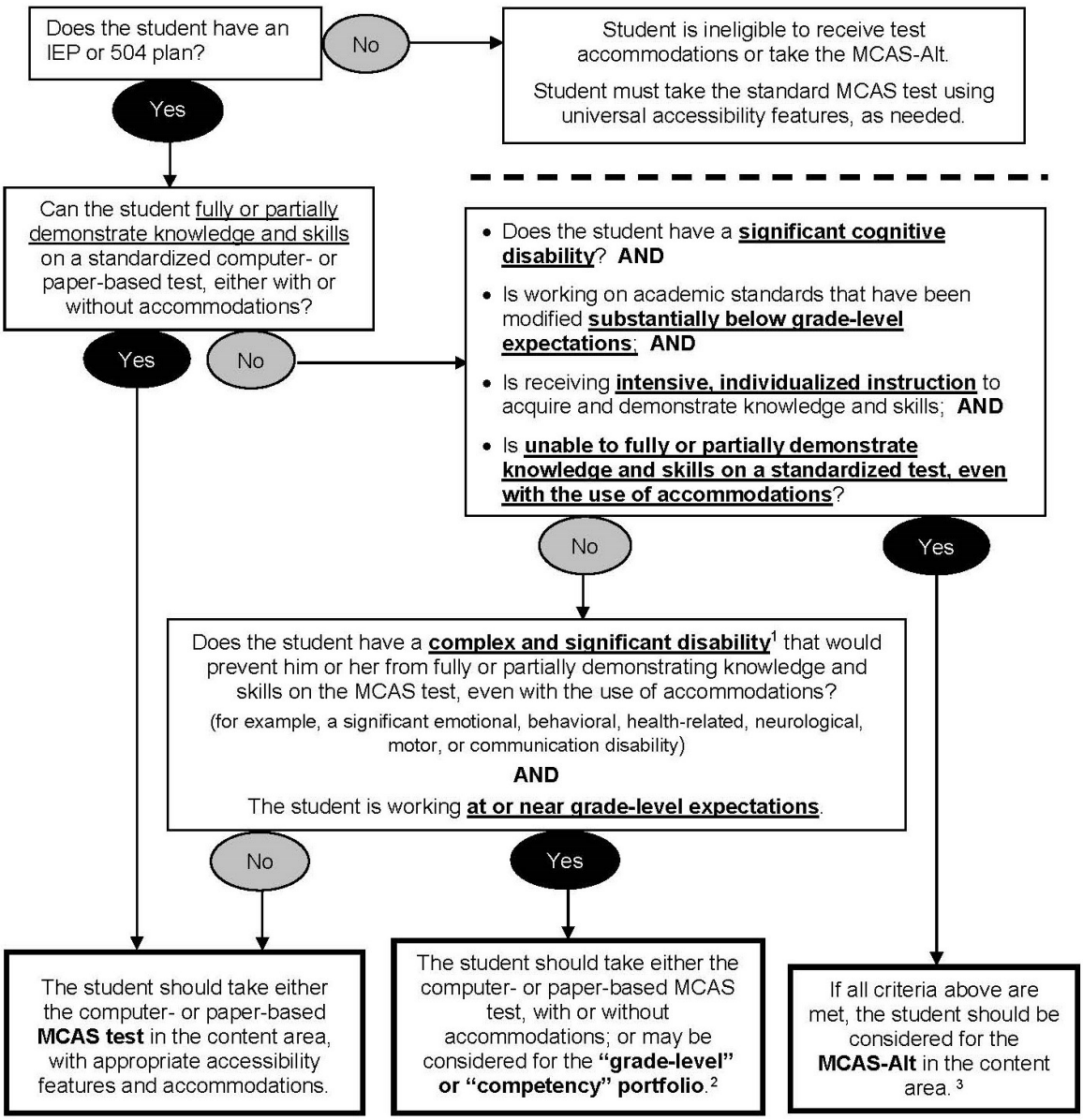
(Check one) ____**Narrative** ____**Opinion/Argument** ____**Informative/Explanatory**

		M	1	2	3	4
Level of Complexity			Writing sample not submitted or unmatched to requirement.	Student addressed Writing through "access skills."	Student addressed Writing through "entry points."	Student addressed Writing at "grade-level."
Demonstration of Skills and Concepts	**Expression of Ideas and Content**	Writing sample not submitted; or contained insufficient information to determine a score; or written in a language other than English; or could not be read or understood	No main idea (informative), point of view (opinion), event sequence (narrative), or focus (poetry); or was unclear or off-topic; or used single word, picture, or symbol to express ideas; or all text provided by teacher	Writing sample related to assignment only minimally; included no or only one detail or description; or used picture sequence to express ideas; or used no figurative language or poetry form (poetry)	Main idea (informative), point of view (opinion), or event sequence (narrative) was evident; limited use of facts, details, and/or descriptions; sometimes repetitive and/or off-topic; limited use of figurative language (poetry);	Main idea (informative), point of view (opinion), or event sequence (narrative) was clearly expressed; three or more accurate and relevant facts, details, or descriptions included; used vivid imagery and figurative language appropriately (poetry)
	Knowledge of Conventions		Little or no original text; or used pictures or isolated words; or could not be understood due to errors in grammar and/or usage	General meaning could be understood, though use of grammar was limited and/or contained errors or run-on sentences; or lacked poetry form (poetry)	Complete sentences with some errors; grammar was effective; correct noun-verb agreement; some evidence of poetry form (poetry)	Meaning was clear, with rare or no errors in grammar and overall usage; poetry form used appropriately (poetry)
	Text Structure		Used single words, pictures, symbols without text; or all text provided by teacher	Sentence fragments (phrases) or one complete sentence used to express ideas; produced two related lines (poetry)	At least two complete sentences were used to express ideas; produced up to four related lines (poetry)	A paragraph of at least three related, well-constructed sentences was used to express ideas; more than four related lines (poetry)
	Use of Vocabulary		Vocabulary was unrelated to assignment; or all text was provided by teacher	Vocabulary was related to assignment, but word choice was limited and/or sometimes inappropriate	Vocabulary was functional and relevant; used basic common words, with some descriptive language	Vocabulary was clear and precise; used descriptive language, modifiers, connecting words and/or phrases
Independence		Writing sample not submitted; or contained insufficient information to determine a score; or written in a language other than English; or could not be read or understood	Student required extensive, almost continuous prompts to complete writing sample (0-25% independent) _____%	Student required frequent prompts to complete writing assignment (26-50% independent) _____%	Student required some prompts to complete writing assignment (51-75% independent) _____%	Student required no, or very few, prompts to complete writing assignment (76-100% independent) _____%

APPENDIX T
DECISION-MAKING TOOL FOR
MCAS-ALT PARTICIPATION

Decision-Making Tool for MCAS Participation by Students with Disabilities

The decision flowchart shown below may be useful to IEP teams and individuals responsible for developing 504 plans to make *annual* decisions regarding appropriate student participation in MCAS. Separate decisions must be made in each content area being assessed: ELA, mathematics, and science and technology/engineering.



[1] See the *Educator's Manual for MCAS-Alt* for additional details on and examples of "complex and significant disabilities."

[2] See the *MCAS Grade-level and Competency Portfolio Manual* for details on submission of "grade-level" and "competency" portfolios.

[3] Students who take the MCAS-Alt in high school will not earn a Competency Determination in the assessed subject and therefore will not be eligible to earn a high school diploma.

APPENDIX U
CRITERIA FOR PARTICIPATION—MCAS-ALT

Guidance on Designating Students for the MCAS-Alt

Decisions regarding participation in statewide assessments by students with disabilities must be discussed at the student's annual IEP team meeting and be documented in the IEP.

IEP team members should familiarize themselves with the criteria used to designate students for alternate assessments. The criteria listed below together with the Decision-Making Tool for MCAS-Alt Participation should be used by teams as the basis for making ***annual*** **assessment decisions for *each* student in *each* subject required for academic assessment.**

Criteria for Designating a Student for an Alternate Assessment

A student with the *most significant cognitive disability* should take the **MCAS-Alt** if he or she

- is working on *learning standards* in the content area that have been *substantially modified* due to the severity of the disability; **and**
- is receiving *intensive, individualized instruction* in order to acquire, generalize, and demonstrate knowledge and skills; **and**
- is *unable to demonstrate knowledge and skills on a standardized paper or online test*, even with accommodations.

Teams should **not** assume that a student should take an alternate assessment based on the fact that he or she

- has not been provided instruction in the general curriculum;
- has a specific disability (e.g., all students with intellectual disabilities should not automatically be designated for the MCAS-Alt);
- is placed in a program or classroom where it is expected that students will take the MCAS-Alt;
- has taken an alternate assessment previously (since this is an annual decision);
- has previously failed the MCAS test;
- is an English learner;
- is from a low-income family or is a child in foster care;

- requires the use of assistive technology or an alternative augmentative communication system; or
- attends a school in which the IEP team may have been influenced to designate the student for an alternate assessment in order for the school to receive disproportionate credit toward the school's accountability rating.

Other Considerations

When an IEP team (or 504 plan coordinator) is *undecided* as to which assessment format is most appropriate for a particular student, the Department recommends that the ***standard test*, either with or without accommodations, be assigned as the default assessment format for the student**.

When assigning the standard test, teams should also deliberate as to whether it would be more appropriate for a student to take the computer-based Next-Generation MCAS test (for which universally designed accessibility features, tools, and accommodations are available) or a paper-based MCAS test (offered as an accommodation instead of the computer-based test).

When the decision is made to administer a standard MCAS test, with or without accommodations, the IEP team should evaluate after administration whether useful information was provided by the test results. If so, it may be preferable to have the student continue taking the standard MCAS test in that subject because of the broad range of standards that are assessed and reported on MCAS tests compared to the limited standards assessed in an MCAS-Alt portfolio. Students who take the MCAS-Alt will not be eligible to earn a Competency Determination and receive a high school diploma.

Questions on alternate assessment may be addressed to mcas@mass.gov. Thank you for your attention to this important information.

APPENDIX V
SUMMARY OF ALT-SCORE FREQUENCIES

Table V-1. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/ELA

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
		Complexity	0	42	868	0	0
	1	Independence	10	30	99	701	0
		Skills	0	9	89	742	0
		Complexity	0	61	851	0	0
3	2	Independence	10	33	127	606	0
		Skills	4	11	106	655	0
		Complexity	1	109	800	0	0
	3	Independence	33	109	231	482	0
		Skills	353	311	174	17	0
		Complexity	0	43	919	0	1
	1	Independence	14	24	113	752	0
		Skills	3	16	86	798	0
		Complexity	0	54	910	0	1
4	2	Independence	18	23	121	666	0
		Skills	1	20	122	685	0
		Complexity	5	76	880	0	1
	3	Independence	22	113	253	516	0
		Skills	305	327	256	16	0
		Complexity	0	38	799	0	0
	1	Independence	6	18	105	665	0
		Skills	1	8	69	716	0
		Complexity	0	36	805	0	0
5	2	Independence	11	20	132	579	0
		Skills	1	11	83	647	0
		Complexity	0	72	763	0	1
	3	Independence	14	75	227	483	0
		Skills	293	256	232	18	0
		Complexity	0	42	763	0	0
	1	Independence	6	26	114	608	0
		Skills	0	10	70	674	0
		Complexity	0	49	759	0	0
6	2	Independence	4	27	112	540	0
		Skills	1	14	73	595	0
		Complexity	1	83	724	0	0
	3	Independence	20	80	222	429	0
		Skills	254	250	232	15	0
		Complexity	2	41	740	0	0
	1	Independence	8	34	123	551	0
		Skills	0	13	77	626	0
		Complexity	0	51	737	0	0
7	2	Independence	7	26	122	501	0
		Skills	1	12	64	579	0
		Complexity	2	84	695	0	0
	3	Independence	14	78	191	437	0
		Skills	253	226	228	13	0
		Complexity	0	39	743	0	0
	1	Independence	4	25	102	591	0
		Skills	3	14	74	631	0
		Complexity	0	40	741	0	0
8	2	Independence	14	34	95	529	0
		Skills	0	13	95	564	0
		Complexity	0	77	700	0	0
	3	Independence	17	64	190	444	0
		Skills	217	240	240	18	0
		Complexity	1	40	772	1	6
	1	Independence	12	21	94	573	0
		Skills	2	13	79	606	0
		Complexity	0	37	782	3	6
HS	2	Independence	7	24	102	532	0
		Skills	4	17	75	569	0
		Complexity	1	59	759	3	4
	3	Independence	16	62	208	445	0
		Skills	186	220	287	38	0

Table V-2. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/Mathematics

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
3	1	Complexity	0	59	844	5	0
		Independence	20	29	136	626	0
		Skills	2	5	84	720	0
	2	Complexity	0	0	0	0	5
		Independence	0	0	0	5	0
		Skills	0	0	0	5	0
	3	Complexity	0	0	0	5	0
		Independence	0	0	0	5	0
		Skills	0	0	0	5	0
	4	Complexity	0	0	0	0	5
		Independence	0	0	0	5	0
		Skills	0	0	0	5	0
	5	Complexity	0	52	848	5	0
		Independence	9	32	111	645	0
		Skills	3	12	71	711	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
4	1	Complexity	0	53	912	1	0
		Independence	20	40	129	683	0
		Skills	1	20	88	763	0
	2	Complexity	0	0	2	1	0
		Independence	0	0	1	2	0
		Skills	0	1	1	1	0
	3	Complexity	0	68	895	3	0
		Independence	14	36	129	690	0
		Skills	0	11	94	764	0
	4	Complexity	0	0	0	0	3
		Independence	0	0	0	3	0
		Skills	0	0	0	3	0
	5	Complexity	0	0	3	0	0
		Independence	0	1	1	1	0
		Skills	0	1	1	1	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
5	1	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	2	Complexity	0	55	789	0	0
		Independence	9	28	118	612	0
		Skills	3	10	55	699	0
	3	Complexity	0	49	794	0	0
		Independence	7	26	120	622	0
		Skills	1	9	81	684	0
	4	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	5	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
6	1	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	2	Complexity	0	84	720	0	0
		Independence	7	33	128	570	0
		Skills	0	17	75	646	0
	3	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	4	Complexity	0	0	0	0	0

continued

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
6	4	Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	5	Complexity	0	72	729	0	0
		Independence	15	32	135	563	0
		Skills	3	10	66	666	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
7	1	Complexity	2	69	723	2	0
		Independence	14	29	124	531	0
		Skills	0	12	74	612	0
	2	Complexity	0	0	1	1	0
		Independence	0	0	1	1	0
		Skills	0	1	1	0	0
	3	Complexity	0	0	0	2	0
		Independence	0	1	0	1	0
		Skills	0	2	0	0	0
	4	Complexity	0	45	752	0	1
		Independence	4	29	92	584	0
		Skills	0	14	69	626	0
	5	Complexity	0	0	0	0	2
		Independence	0	1	0	1	0
		Skills	0	0	2	0	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
8	1	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
	2	Complexity	1	74	699	0	0
		Independence	17	42	91	536	0
		Skills	2	8	69	607	0
	3	Complexity	0	0	0	0	1
		Independence	0	0	0	1	0
		Skills	0	1	0	0	0
	4	Complexity	0	41	737	1	0
		Independence	7	28	79	577	0
		Skills	2	12	73	604	0
	5	Complexity	0	0	1	0	0
		Independence	0	1	0	0	0
		Skills	0	1	0	0	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0
HS	1	Complexity	0	8	225	9	6
		Independence	1	15	24	172	0
		Skills	0	7	25	180	0
	2	Complexity	0	31	614	11	5
		Independence	5	24	60	475	0
		Skills	0	10	62	492	0
	3	Complexity	0	42	479	10	3
		Independence	7	20	66	390	0
		Skills	2	15	50	416	0
	4	Complexity	1	50	580	10	10
		Independence	8	19	71	459	0
		Skills	3	7	68	479	0
	5	Complexity	0	20	390	18	3
		Independence	5	14	46	293	0
		Skills	0	4	46	308	0
	6	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0

Table V-3. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/Science Grade 5

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
5	1	Complexity	0	63	739	1	0
		Independence	26	81	168	475	0
		Skills	1	15	70	664	0
	2	Complexity	0	58	744	1	0
		Independence	31	68	179	466	0
		Skills	1	11	63	669	0
	3	Complexity	0	58	727	1	0
		Independence	27	66	175	451	0
		Skills	0	15	72	632	0
	4	Complexity	0	11	38	0	0
		Independence	1	9	8	28	0
		Skills	0	0	0	46	0

Table V-4. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/Science Grade 8

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
8	1	Complexity	0	58	653	0	0
		Independence	17	62	182	382	0
		Skills	1	11	68	563	0
	2	Complexity	0	50	684	0	0
		Independence	34	60	181	387	0
		Skills	2	8	61	591	0
	3	Complexity	0	43	655	0	0
		Independence	25	66	155	383	0
		Skills	1	14	47	567	0
	4	Complexity	0	21	111	0	0
		Independence	0	13	30	74	0
		Skills	1	1	15	100	0

Table V-5. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/Biology

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
HS	1	Complexity	0	33	510	1	5
		Independence	20	46	110	296	0
		Skills	1	20	45	406	0
	2	Complexity	0	34	479	1	5
		Independence	15	38	100	289	0
		Skills	0	7	50	385	0
	3	Complexity	0	39	468	1	5
		Independence	19	38	94	290	0
		Skills	1	4	41	395	0
	4	Complexity	0	0	0	0	5
		Independence	0	0	0	5	0
		Skills	0	0	0	5	0

Table V-6. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/Chemistry

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
HS	1	Complexity	0	2	126	0	0
		Independence	0	0	2	117	0
		Skills	0	2	4	113	0
	2	Complexity	0	2	124	0	0
		Independence	0	1	2	115	0
		Skills	0	1	10	107	0
	3	Complexity	0	2	124	0	0
		Independence	0	1	4	112	0
		Skills	1	0	10	106	0
	4	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0

Table V-7. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/ Introductory Physics

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
HS	1	Complexity	0	8	76	1	0
		Independence	4	10	28	40	0
		Skills	0	1	7	74	0
	2	Complexity	0	7	76	0	0
		Independence	2	8	22	48	0
		Skills	0	3	9	68	0
	3	Complexity	0	8	74	0	0
		Independence	3	6	15	56	0
		Skills	0	3	5	72	0
	4	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0

Table V-8. Frequency of Scores by Grade, by Strand, by Rubric Area—Alt/Technology/Engineering

Grade	Strand	Rubric Area	Score				
			1	2	3	4	5
HS	1	Complexity	0	6	81	2	0
		Independence	2	1	10	66	0
		Skills	0	0	8	71	0
	2	Complexity	0	6	80	0	0
		Independence	0	2	11	67	0
		Skills	0	3	8	69	0
	3	Complexity	0	5	78	0	0
		Independence	0	6	9	64	0
		Skills	1	4	11	63	0
	4	Complexity	0	0	0	0	0
		Independence	0	0	0	0	0
		Skills	0	0	0	0	0

APPENDIX W
MCAS-ALT ACHIEVEMENT STANDARDS AND DESCRIPTORS

Grade-Level and Alternate Academic Achievement Standards and Descriptors

Grade-Level Achievement Standards and Descriptors

For each student who takes the standard MCAS tests, one of the following *grade-level academic achievement standards (levels)* will be reported in each content area.

Grades 3-10 (MCAS "Next-Generation" Grade-Level Academic Achievement Standards for ELA, Mathematics, and High School Biology and Introductory Physics):

- ***Not Meeting Expectations*—**Students performing at this level did not meet grade-level expectations in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.
- ***Partially Meets Expectations***—Students performing at this level partially meet grade-level expectations for knowledge, skills, and understanding. These students may need coordinated assistance and/or additional instruction to succeed at the next grade level.
- ***Meeting Expectations***—Students performing at this level meet grade-level expectations for knowledge, skills, and understanding, and are academically prepared to succeed at the next grade level.
- ***Exceeding Expectations***—Students performing at this level exceed grade-level expectations for knowledge, skills, and understanding, and are academically well prepared to succeed at the next grade level.

High School Chemistry and Technology/Engineering (MCAS "Legacy" Grade-Level Academic Achievement Standards):

- ***Needs Improvement***—Students demonstrate a **partial understanding of grade-level subject matter** and solve some simple problems.
- *Proficient*—Students demonstrate a solid understanding of challenging grade-level subject matter and solve a wide variety of problems.
- ***Advanced***—Students demonstrate a **comprehensive understanding of challenging grade-level subject matter** and provide sophisticated solutions to complex problems.

Alternate Academic Achievement Standards and Descriptors

For each student who takes the MCAS-Alt, one of the following *alternate academic achievement standards (levels)* will be reported in each content area.

Grades 3-10 (Alternate Assessments Based on Alternate Achievement Standards):

- ***Awareness***—Students demonstrate **very little understanding** of standards and core knowledge topics contained in the Massachusetts curriculum framework for the content area. Students require extensive prompting and assistance, and their performance is mostly inaccurate.

- ***Emerging***—Students demonstrate a **simple understanding that is below grade-level expectations** of a limited number of standards and core knowledge topics contained in the Massachusetts curriculum framework for the content area. Students require frequent prompting and assistance, and their performance is limited and inconsistent.
- ***Progressing***—Students demonstrate a **partial understanding that is below grade-level expectations** of selected standards and core knowledge topics contained in the Massachusetts curriculum framework for the content area. Students are steadily learning new knowledge, skills, and concepts. Students require minimal prompting and assistance, and their performance is basically accurate.
- While not technically an achievement level, a score of ***Incomplete*** will be given if **insufficient evidence and information was included** to allow an achievement level to be determined.

The state's alternate academic achievement standards (*Awareness, Emerging, Progressing*) and their descriptors reflect the collaboration, input, and professional judgment of numerous stakeholders who have affirmed that these achievement levels represent the highest possible standards achievable by students taking the MCAS-Alt; and that these standards are appropriate and aligned to ensure that a student who meets those standards is on track to pursue productive post-secondary education, vocational training, and/or competitive integrated employment.

APPENDIX X
SAMPLE REPORTS—MCAS-ALT

Who must take MCAS?

All students in grades 3-8 and 10 who attend publicly funded school programs are required to participate in MCAS statewide assessments. A relatively small number of students with disabilities take the MCAS-Alt if they are unable to take regular MCAS tests, even with accommodations.

The decision to participate in an alternate assessment is made each year in each subject by the student's IEP team, which includes parents/guardians. Most students who take the alternate assessment receive individualized instruction that has been substantially modified from the instruction other students receive. Please be aware that participation in the MCAS-Alt may eventually delay, or otherwise affect, your child's ability to earn a high school diploma.

Why include students with disabilities in the MCAS and MCAS-Alt?

It's the law.
State and federal laws require the participation of all students in statewide assessments. The alternate assessment allows students with the most significant cognitive disabilities who cannot take regular MCAS tests to "show what they know" and to receive instruction at a level that is challenging and attainable for them.

MCAS helps to determine how much a student is learning.
An MCAS-Alt shows what the student has learned during the school year. Scores provide feedback that can be used to identify challenging goals and instruction for the future.

Including all students in a school's or district's test results ensures that all students will be taught.
Counting the results of students who take the MCAS-Alt means that those students are more likely to be considered when resource decisions are made.

As learning improves, expectations are raised.
Evidence indicates that students learn more when they are engaged in instruction based on the state's learning standards and when they participate in assessments based on those learning standards.

How are the MCAS-Alt results used?

MCAS-Alt results should be used by the school and the IEP team to:

- identify challenging academic goals and plan instruction for the student
- measure the student's progress in achieving the academic standards in the Massachusetts curriculum frameworks
- allocate sufficient school resources for the student's education
- establish whether schools and districts are making progress in educating students with disabilities

Can students meet the state's graduation requirement and earn a diploma if they participate in the MCAS-Alt?

We want you to be aware that participation in an alternate assessment may eventually delay or affect your child's ability to complete the state's requirements to receive a high school diploma because the MCAS-Alt assesses learning standards that are **below** the expectations needed to meet the state's graduation requirement. Therefore, students who participate in the MCAS-Alt will not be able to meet the state's graduation requirement.

The purpose of the state's graduation requirement is to ensure that a student earning a Massachusetts diploma can demonstrate basic competencies in English language arts, mathematics, and science and technology/ engineering before entering post-secondary education or the workplace. This requirement has been in place for all students beginning with the graduating class of 2003. You can learn more about graduation requirements on the Internet at www.doe.mass.edu/mcas/graduation.html.

To meet the state's graduation requirement, a student must do one of the following:

- take and pass the required MCAS tests;
- submit a competency portfolio that demonstrates the student's knowledge and skills at a grade 10 level of achievement; or
- be granted an MCAS Performance Appeal that documents his or her grade point average compared with other students who take grade-level courses. Information on MCAS appeals is available at https://www.doe.mass.edu/mcasappeals/.

For more information

Massachusetts Comprehensive Assessment System (MCAS)	www.doe.mass.edu/mcas
MCAS Alternate Assessment (MCAS-Alt)	www.doe.mass.edu/mcas/alt
MCAS participation requirements for students with disabilities	www.doe.mass.edu/mcas/accessibility
Graduation requirements and MCAS performance appeals	www.doe.mass.edu/mcas/graduation.html
If you have questions	Email: mcas@doe.mass.edu

Spring 2023 MCAS Alternate Assessment (MCAS-Alt) Parent/Guardian Report

MASSACHUSETTS Department of Elementary and Secondary Education

Name:	**SASID:**
School:	**Grade:** 05
District:	**Date of Birth:**

Enclosed are your child's results from the 2023 MCAS Alternate Assessment (MCAS-Alt). All students are required to participate in MCAS, either by taking the standard MCAS tests or by participating in the MCAS Alternate Assessment (MCAS-Alt) for students with disabilities who meet certain requirements. Your child's school submitted his or her MCAS-Alt last spring, as indicated in his or her IEP or 504 plan. The MCAS-Alt is a record of your child's level of achievement, including a collection of his or her academic work. Before it was submitted, your child's school was required to invite you to review your child's assessment.

Please meet with your child's teacher(s) to discuss the meaning of these results and talk about your child's goals for the coming school year. Your support is extremely important. The Department of Elementary and Secondary Education would like to acknowledge the hard work of your child's teachers in compiling the MCAS-Alt and contributing to this important and worthwhile effort.

Your Child's Overall Results

English Language Arts	Mathematics	Science and Technology/Engineering
Achievement Level	Achievement Level	Achievement Level
Progressing	**Progressing**	**Progressing**

Purposes of the MCAS-Alt

The MCAS-Alt is an assessment designed to measure the achievement of students with the most significant cognitive disabilities in selected areas of English Language Arts, Mathematics, and Science and Technology/Engineering. Your child is expected to demonstrate knowledge of the state's learning standards at a level that is challenging and appropriate.

The purpose of the MCAS-Alt is to make sure schools are teaching the standards to all students, regardless of their disability and even when they cannot show what they know on a standard test.

What is the MCAS-Alt?

Your child's MCAS-Alt includes samples of his or her schoolwork and a record of his or her progress in the subject(s) being assessed. Each assessment includes work samples and charts of progress in the same subjects that are assessed on the standard MCAS tests for a student in that grade. Students taking the MCAS-Alt are working on knowledge and skills at lower levels of difficulty than their peers who take the MCAS tests and their results reflect this. More details about the MCAS-Alt are provided in the *Educator's Manual for MCAS-Alt*, which is available at http://www.doe.mass.edu/mcas/alt/edmanual.docx.

Name:
SASID:

Grade: 05
Spring 2023

Achievement Level Descriptors

		Your Child's Achievement Level (✓)		
		English Language Arts	Mathematics	Science and Technology/ Engineering
Exceeding Expectations	A student who performed at this level **exceeded grade-level expectations** by demonstrating mastery of the subject matter.			
Meeting Expectations	A student who performed at this level **met grade-level expectations** and is academically on track to succeed in the current grade in this subject.			
Partially Meeting Expectations	A student who performed at this level **partially met grade-level expectations** in this subject. The school, in consultation with the student's parent/guardian, should consider whether the student needs additional academic assistance to succeed in this subject.			
Not Meeting Expectations	A student who performed at this level **did not meet grade-level expectations** in this subject. The school, in consultation with the student's parent/guardian, should determine the coordinated academic assistance and/or additional instruction the student needs to succeed in this subject.			
Progressing	A student at this level demonstrated a **partial understanding below grade-level expectations** of selected learning standards and core knowledge topics contained in the Massachusetts curriculum framework for the subject. Students at this level are steadily learning new knowledge, skills, and concepts. Students require minimal prompting and assistance, and their performance is basically accurate.	✓	✓	✓
Emerging	A student at this level demonstrated a **simple understanding below grade-level expectations** of a limited number of learning standards and core knowledge topics contained in the Massachusetts curriculum framework for the subject. Students at this level require frequent prompting and assistance, and their performance is limited and inconsistent.			
Awareness	A student at this level demonstrated **very little understanding** of learning standards and core knowledge topics contained in the Massachusetts curriculum framework for the subject. Students at this level require extensive prompting and assistance, and their performance is mostly inaccurate.			
Incomplete	**Sufficient evidence and information** was not included to allow an achievement level to be determined in the subject.			

The section above shows your child's overall achievement level in each subject of the alternate assessment.
The MCAS-Alt was scored in each area shown below. Scores for *Level of Complexity*, *Demonstration of Skills and Concepts (accuracy)*, and *Independence* were combined to give the overall achievement level.

MCAS-Alt Scoring Areas and Your Child's Scores

ENGLISH LANGUAGE ARTS

	Level of Complexity	Demonstration of Skills and Concepts	Independence	Self-Evaluation	Generalized Performance
	1 2 3 4 5	M 1 2 3 4	M 1 2 3 4	M 1 2	1 2
Language	☐☐■☐☐	☐☐☐■☐	☐☐☐☐■	☐☐■	■☐
Reading	☐☐■☐☐	☐☐☐■☐	☐☐☐☐■	☐☐■	■☐
Writing	☐☐■☐☐	☐☐■☐☐	☐☐☐■☐	☐☐■	☐■

MATHEMATICS

	Level of Complexity	Demonstration of Skills and Concepts	Independence	Self-Evaluation	Generalized Performance
	1 2 3 4 5	M 1 2 3 4	M 1 2 3 4	M 1 2	1 2
Number and Operations in Base Ten	☐☐■☐☐	☐☐☐☐■	☐☐☐■☐	☐☐■	■☐
Number and Operations - Fractions	☐☐■☐☐	☐☐☐■☐	☐☐☐☐■	☐☐■	■☐
Operations and Algebraic Thinking	*Not required for assessment in this grade*				
Geometry	*Not required for assessment in this grade*				
Measurement and Data	*Not required for assessment in this grade*				

SCIENCE and TECHNOLOGY/ENGINEERING

	Level of Complexity	Demonstration of Skills and Concepts	Independence	Self-Evaluation	Generalized Performance
	1 2 3 4 5	M 1 2 3 4	M 1 2 3 4	M 1 2	1 2
Earth and Space Sciences	☐☐■☐☐	☐☐☐☐■	☐☐■☐☐	☐☐■	☐■
Life Science	☐☐■☐☐	☐☐☐☐■	☐☐☐■☐	☐☐■	☐■
Physical Sciences	☐☐■☐☐	☐☐☐☐■	☐☐☐■☐	☐☐■	☐■
Technology/ Engineering	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐	☐☐

Your child's MCAS-Alt was scored in the following Scoring Areas:

Level of Complexity — How your child addressed the learning standards in each subject (strand)
5 - Student addresses a broad range of curriculum framework learning standards (three or more) at grade-level expectations in this strand.
4 - Student addresses a narrow sample of curriculum framework learning standards (one or two) at grade-level expectations in this strand.
3 - Student addresses curriculum framework learning standards that have been modified below grade-level expectations in this strand.
2 - Student primarily addresses social, motor, and communication "access skills" during instruction based on curriculum framework learning standards in this strand.
1 - Strand reflects little or no basis in, or is unmatched to, curriculum framework learning standard(s) required for assessment.

Demonstration of Skills and Concepts — The percentage of accurate (correct) responses
4 - Student's performance is accurate and is of consistently high quality in this strand (76-100% accurate).
3 - Student's performance is mostly accurate and demonstrates some understanding in this strand (51-75% accurate).
2 - Student's performance is limited and inconsistent with regard to accuracy and demonstrates limited understanding in this strand (26-50% accurate).
1 - Student's performance is primarily inaccurate and demonstrates minimal understanding in this strand (0-25% accurate).
M - Strand contains insufficient information to determine a score.

Independence — The amount of assistance your child received
4 - Student requires minimal verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (76-100% independent).
3 - Student requires some verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (51-75% independent).
2 - Student requires frequent verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (26-50% independent).
1 - Student requires extensive verbal, visual, and physical assistance to demonstrate skills and concepts in this strand (0-25% independent).
M - Strand contains insufficient information to determine a score.

Self-Evaluation — Your child's awareness of his or her performance
2 - Student frequently plans, self-corrects, monitors, sets goals, and reflects in this subject; multiple examples of self-evaluation were found in this strand.
1 - Student infrequently plans, self-corrects, monitors, sets goals, and reflects in this subject; only one example of self-evaluation was found in this strand.
M - Evidence of planning, self-correction, task-monitoring, goal-setting, and reflection was not found in this strand.

Generalized Performance — The number of approaches used by your child to demonstrate knowledge and skills
2 - Student demonstrates knowledge and skills in multiple contexts, or uses multiple approaches and/or methods of response and participation in this strand.
1 - Student demonstrates knowledge and skills in one context, or uses one approach and/or method of response and participation in this strand.

MASSACHUSETTS
Department of Elementary and Secondary Education

Spring 2023
MCAS Alternate Assessment

Feedback Form

Student Name:
Grade Level: 05
Student ID:
School:
District:
Student's Home District:

This is a preliminary score report with comments and is intended for review by the teacher who prepared the assessment. Printed *Parent/Guardian Reports* will be sent to districts in Fall 2023. The publication entitled *Guidelines for Scoring MCAS–Alt* is available at www.doe.mass.edu/mcas/alt/results.html.

Content areas assessed at this grade level: English Language Arts, Mathematics, Science and Technology/Engineering

ENGLISH LANGUAGE ARTS

	Strand	Level of Complexity	Demonstration of Skills	Independence	Self-Evaluation	Generalized Performance
Achievement Level Progressing	**Language**	3	3	4	2	1
	Comments					
	Reading	3	3	4	2	1
	Comments					
	Writing	3	2	3	2	2
	Comments					

MATHEMATICS

	Domain	Level of Complexity	Demonstration of Skills	Independence	Self-Evaluation	Generalized Performance
Achievement Level Progressing	**Number and Operations in Base Ten**	3	4	3	2	2
	Comments					
	Number and Operations - Fractions	3	3	4	2	2
	Comments					
	Comments					
	Comments					
	Comments					

MASSACHUSETTS
Department of Elementary and Secondary Education

Spring 2023
MCAS Alternate Assessment

Feedback Form

Student Name:
Grade Level: 05
Student ID:
School:
District: Abington
Student's Home District:

SCIENCE AND TECHNOLOGY/ENGINEERING

	Strand	Level of Complexity	Demonstration of Skills	Independence	Self-Evaluation	Generalized Performance
Achievement Level Progressing	**Earth and Space Sciences**	3	4	2	2	2
	Comments					
	Life Science	3	4	3	2	2
	Comments					
	Physical Sciences	3	4	3	2	2
	Comments					
	Technology/ Engineering					
	Comments					

GENERAL COMMENTS

Assessment contained the required strands for this grade.

* Indicates this strand was required but not submitted.

M Indicates that evidence was missing or was insufficient to determine a score in this rubric area.

† Indicates the non-submission of a required MCAS-Alt content area OR may reflect that the student took standard MCAS for this content area.

‡ Achievement level will be determined prior to final reporting.