EUREKA MATH²

GREAT MINDS, 2021

PUBLICATION DATE: OCTOBER 2024

Eureka Math² is an online mathematics program for Grades K-8. Please see the Great Minds website and the publisher-provided information later in this report for product specifications. Grades reviewed: K-5

"I love how the lessons build on one another. I love how they show multiple ways to solve the same problem. It helps me scaffold...and gives the students choice."

Massachusetts Educator

Eureka Math²

Great Minds, 2021

Mathematics, Grades K-5

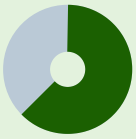
Publication Date: October 2024

Content Standards and Organization

Grade-Appropriate Practices

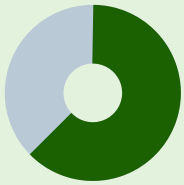
Standards Alignment

Accessibility for Students



Usability for Teachers

Impact on Learning



Classroom Application

Overall

Meets Expectations - Most or all evidence indicates high quality; little to none indicates low quality. Materials may not be perfect, but Massachusetts teachers and students would be well served and strongly supported by them.

Partially Meets Expectations - Some evidence indicates high quality, while some indicates low quality. Teachers in Massachusetts would benefit from having these materials but need to supplement or adapt them substantively to serve their students well.

Does Not Meet Expectations - Little to no evidence indicates high quality; most or all evidence indicates low quality. Materials would not substantively help Massachusetts teachers and students meet the state's expectations for teaching and learning.

Not Applicable (N/A) - Materials were not designed to address the criterion, and the publisher explicitly named the omission in legal submissions. This rating applies only to the Foundational Skills criterion in the K-5 ELA/Literacy rubric. It signals that the core curricular materials is without foundational skills and will need to be paired with a strong foundational skills resource to address all components of the core literacy block.

No Rating - Evidence is insufficient to generate rating.

Overall

The Bottom Line

Eureka Math² materials are well-aligned with Massachusetts standards and provide students with opportunities to build procedural fluency in a grade-appropriate manner. Materials also encourage students to use multiple representations to solve problems and include instructional routines that provide opportunities for students to explain their thinking and participate in some peer collaboration. Although English learner supports could be more robust, materials affirm and value diverse cultures and perspectives. However, explicit guidance toward next steps based on assessment data and how to set clear expectations for students is lacking. Recommendations on how to build teachers' knowledge while challenging pedagogical biases would likewise be beneficial.

Standards Alignment

Content Standards and Organization

Strengths

- Materials are well-aligned with Massachusetts standards and progress in a coherent manner. Each module includes an Overview section outlining prerequisite skills and the grade and module in which students learned prerequisite content. In addition, the Overview section describes the progression of lessons within the module and ways that students will apply the content in future grades.

- Materials intentionally build students' conceptual understanding, while providing opportunities to build procedural fluency and apply learning to real-world problems. Each lesson includes four sections: Fluency, Launch, Learn, and Land. In the Fluency section, students practice previously learned material to activate prior knowledge they will need to learn new material (EdReports, 1B). When introducing new material, the materials place a strong focus on developing conceptual understanding. For example, in Grade K, Module 1, Topic B, Lesson 9, students count objects arranged in different ways, building conceptual understanding that the arrangement of objects does not impact the number objects counted.

Challenges

-

The Bottom Line

Materials are well-aligned with college- and career-ready Massachusetts standards. Content progresses coherently; materials emphasize prerequisite knowledge and conceptual understanding when introducing new content.

Grade Appropriate Practices

Strengths

- Materials encourage students to use multiple representations to solve problems and help students make connections between different methods of solving problems. For example, in Grade 4, Module 1, Lesson 1, students learn to count collections of objects using drawings, numbers, expressions, equations, and written explanations. Teachers are encouraged to support students to reflect on the strengths and challenges of using different representations. Teachers ask students questions such as, "How can you organize your collection to make it easier to count?" and "How does the way you organized your collection make it easier to count?"

- Materials provide opportunities for students to justify solutions to problems using oral and written communication. Prompts across lessons and grade levels ask students how they know their answer is correct and to share their thinking in writing. In addition, students have many opportunities to justify their thinking in conversations with peers. For example, in Grade 4, Module 2, Lesson 4, materials present a fictional character named Robin, and they share her strategy using a place value chart to multiply. After reviewing Robin's work, students turn and talk with their peers to share similarities and differences between Robin's work and their own work. An area for growth includes more robust language and vocabulary support to ensure students, particularly English learners (ELs), have the mathematical language they need to justify their solutions.

- In most lessons, materials expose students to a range of tools that they can use to solve problems, and they provide opportunities for students to reflect upon which tool is best to solve a particular problem. For example, in Grade 4, Module 2, Lesson 9, students use the Read-Draw-Write process to solve the multiplication problem 4 x 75. Notes direct teachers to "Encourage students to self-select their methods for representing the problem." Teachers observe the methods that students use and select three students to share the tools they used to solve the problem with their peers. However, some lessons miss opportunities to expose students to an appropriate range of tools. For example, in Grade 3, Module 1, Lesson 1, slides introduce students to the Rekenrek manipulative tool, but they do not provide a digital version of the tool for students to use.

- Materials include instructional routines that provide opportunities for students to explain their thinking to others and evaluate others' thinking. For example, the "Five Framing Questions" routine "supports students in analyzing a work sample or solution strategy by guiding them through states of discovery." In addition, students participate in routines such as "Take a Stand" and "Stronger and Clearer Each Time." Lessons feature many opportunities for students to critique the work of fictional characters. For example, in Grade 5, Module 2, Lesson 14, students

analyze the work of a fictional character named Riley by discerning where he made a mistake in his problem-solving process.

- Materials provide regular opportunities for students to collaborate with peers focused on lesson content. Turn and Talk or Think-Pair-Share routines are included in almost every lesson. Teachers could modify some activities to de-center their roles and further encourage small-group partnership, such as in Grade 1, Module 6, Lesson 3, when students work independently to make a classroom floor plan.

Challenges

-

Bottom Line

Materials encourage students to make connections between multiple representations of problem solving. While opportunities are provided to justify solutions to problems using oral and written communication, materials are limited in the robust language and vocabulary supports for ELs to do so. In most lessons, materials expose students to a range of tools to solve problems as well as opportunities to reflect on which tools should be used when. Instructional routines allow for regular peer collaboration and for students to explain their thinking and evaluate that of others.

Classroom Application

Accessibility for Students

Strengths

- Materials provide for varied means of accessing content, helping teachers meet the diverse needs of students. Materials in Grade 5, Module 1, Lesson 1, include teacher notes, differentiation supports, Universal Design for Learning suggestions, and language supports. In Grade 5, Module 1, Lesson 1, the "Differentiation: Support" call-out box instructs teachers to help students understand that 10 times as much as 1,000 is one 10,000 by showing and bundling physical place value disks on the place value chart until their understanding of the pictorial representation is firm. For students who need additional support, teachers are advised to offer calculators for them to confirm the relationship of 10 times as much and 10 times as small.

- Materials provide varied opportunities to demonstrate learning and help teachers meet the diverse needs of students. Each lesson includes four sections: Fluency, Launch, Learn, and Land. Each of these sections provides a variety of different opportunities for students to solve problems. For example, in the Fluency section, students practice previously learned material to activate prior knowledge they will need to learn new material. The Land section allows students to synthesize the day's learning (EdReports, 3O). Across activities, students solve problems individually, through discussion with peers, and in varying formats. Specific recommendations are routinely provided for implementing Universal Design for Learning.

- Materials help teachers ensure that students at various levels of English proficiency have access to grade level content, with several modules per lesson including high-quality videos to help set the context. They exclude voiceovers or verbal instructions as a way to help English learners make sense of the math problem at hand using only visuals.

- Materials include questions and tasks that affirm diverse identities and perspectives. In Grade 4, Module 1, Lesson 7, students learn to write mixed numbers in special form with hundredths and are provided information about the history of other number systems. Teachers have access to a script that details how Babylonians did not use a decimal point to indicate place value, but rather relied on context to interpret numbers correctly. This historical illustration aids in disrupting the Eurocentric narrative of math's origin. A missed opportunity, however, relates to data collection in various activities and the underlying tone that math is neutral, when in fact, the power of math knowledge can be used to either oppress or uplift people.

Challenges

- Materials lack consistent supports to enable students learning English to access grade-appropriate content. While some supports for English learners (ELs) to develop academic language in English are embedded throughout materials, there is a missed opportunity for in-depth directions to ensure students are able to fully leverage these supports. For example, although sentence frames are present to help students develop academic language in English, the frames may not be accessible for ELs. In Grade 4, Module 3, Lesson 8, teachers are provided the following sentence frame to aid students in sharing their justification during Take a Stand: "I would use ___ to solve the problem because ___." This support could be more accessible for ELs by providing a list of possible strategies to help fill in the sentence, as well as math-specific vocabulary words.

The Bottom Line

There are varied means for accessing content and demonstrating learning available throughout the materials to help teachers meet the diverse needs of students. However, while there are supports available for students at various levels of English proficiency to access grade level content and develop academic language in English, these supports could be more robust. Materials elevate diverse backgrounds and include some examples of factual, historical attributions for the development of concepts and applications related to the content.

Usability for Teachers

Strengths

- Lessons and tasks advance student learning with clear purpose. Each unit includes an overview that details what will be covered in the lesson, key questions that will be answered, and the achievement descriptors that will be met. In addition, individual lessons advance student learning in a logical manner. For example, in Grade 2, Module 4, Lesson 3, students practice solving multi-step word problems and reasoning about equal expression. They begin by determining which collection of shells in a sketched diagram has fewer shells. Then, they complete a number sequence to build fluency with mentally adding or subtracting 10. This is followed by students solving an equation by using the arrow way (a strategy that involves parsing a number into more manageable pieces in order to add or subtract) to develop subtraction fluency within 200.

- Materials support teachers with suggested classroom routines and structures, including instructional discourse and problem-solving routines. In Grade 4, Module 2, Lesson 8, the Numbered Heads Routine as well as the Think-Pair-Share routine are used within Part of the Learn section. However, to improve teacher usability in the digital version of the curriculum, routines in lessons should be linked to their descriptions.

- Materials include guidance and resources designed specifically to build teachers' knowledge. In Grade 5, Module 4, Lesson 17, to increase student engagement, teachers are prompted to "Consider providing students with mastery-oriented feedback as they apply their self-selected method. For example, recognize students' efforts in applying the methods based on reasoning that demonstrates students' attentiveness to the units." Additional guidance for teachers on how to recognize pedagogical biases and enhance lessons to be responsive to the diverse identities of students would be beneficial.

Challenges

- Pacing is flexible with the number of instructional days being reasonable for a 180-day school year. Implementation guidelines for 60-minute classes are included, as are optional lessons and 30 assessment days that can be adjusted based on need. However, materials lack the flexibility in pacing necessary to adequately support English learners and students with diverse learning needs, potentially making it challenging for teachers to adjust the pacing to meet all students' needs.

- While materials include informal and formal assessments that help teachers measure learning, further support could be provided to adjust instruction. Suggestions to teachers for following up with students are general and minimal,

stating generically that teachers should look back at lessons to select guidance and practice problems that best meet students' needs if they are working below grade level (EdReports, 3J). Furthermore, the achievement descriptors and proficiency indicators provided at the end of modules assist teachers with student proficiency levels but are not directly tied to a specific assessment.

- While materials work towards helping teachers set clear expectations for students, such as by providing detailed lessons and including sample solutions to problems, there are limited recommendations on how to carry out student support and address student misconceptions. For example, the assessments include only the proficiency levels and correct answers to problems rather than multi-level exemplars and rubrics for specific student responses. Checklists for students, self-assessments, and peer assessment are also not included.

The Bottom Line

Materials include tasks, routines, and structures to advance student learning. While time estimates for lessons and units are reasonable, additional flexibility in pacing is missing to support English learners or students with diverse needs. Materials include informal and formal assessments that help teachers measure learning and adjust instruction. Further instruction on how teachers can use assessment results to inform decisions of reteaching, reassessing, or continued practice to adapt to student learning is missing. Finally, materials could incorporate additional guidance on how to set clear expectations for students and build teachers' knowledge while challenging pedagogical biases.

Impact on Learning

The Bottom Line

A DESE-commissioned policy brief found in 2018 that "research has yet to catch up to recent developments in curriculum materials." As with many comprehensive curriculum products currently in use, high-quality studies of student learning impacts are not yet available for *Eureka Math²* Grades K-5. This is a promising and important area for further study.

Looking for more information? Read the full EdReports review or find a Massachusetts district using this product.

GREAT MINDS

What the Publisher Says....

We asked publishers for information on product specifications and technological requirements, professional learning opportunities for Massachusetts educators, and diversity of representation in their materials. See what Great Minds had to say about *Eureka Math²*.

Diversity Representation

Describe how you ensure that students of diverse races, ethnicities, nationalities, socioeconomic classes, family experiences, linguistic backgrounds, abilities, cultures, religions, genders, gender identities, sexual orientations, and other identities see themselves fully reflected and respected in your curriculum. For example, describe any bias or inclusivity review procedures you have in place and provide evidence of their efficacy.

Eureka Math² acknowledges that deep learning happens when all students can leverage their diverse life experiences while learning mathematics. The curriculum provides students with mirrors in which to see their own identities reflected, as well as windows through which to view others' cultural perspectives. Specific instructional prompts, engaging word problems, accessible and engaging tasks, Math Past connections, fine art connections, and context videos throughout *Eureka Math²* work together to create a powerful curriculum that welcomes all students and encourages them to become doers of mathematics.

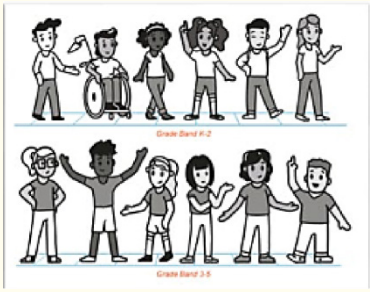
Eureka Math² invites students into mathematics and celebrates diversity by highlighting specific lesson moments that can be tailored to bring students' experiences from their homes and communities into the classroom. For example, a strategically placed UDL margin box encourages the teacher to adjust the existing two-step area word problem context by utilizing familiar items in the school or community. Additionally, *Eureka Math²* lessons include wordless context-building videos to highlight how we use math to solve everyday problems and make sense of the world around us. The highly engaging videos found in the GK–5 curriculum are either character animation or live action. Through these videos, students realize more readily that math surrounds them and they too can engage in mathematical pursuits.

Eureka Math² leverages the power of student relationships and interdependence through frequent partner and group work. Teachers can use strategic, flexible groupings that build off students' strengths. A Language Support margin box in the first lesson of every module serves to remind teachers to leverage students' cultural perspectives when strategically grouping students.

Students' experiences in the classroom also connect to their homes and communities through Family Math. Each Family Math letter describes major

concepts in the topic by using words and phrases that should be familiar to students. The letter contains key terms and visual supports students can use to explain the concepts or strategies to their families or that can help adults at home understand a concept. Family Math includes simple and practical at-home activities to extend learning and help students see mathematics in their world. concept. Family Math includes simple and practical at-home activities to extend learning and help students see mathematics in their world.

The pictures of people and other images in *Eureka Math²* represent diversity and these representations affirm student identities while rejecting the stereotypes and biases that have excluded many students from mathematical learning in favor of a more robust and inclusive perspective. Care was taken to include a variety of body types and skin tones in images throughout the curriculum, such as in images that involve counting on hands. The names used in word problems and for sample students in the lesson vignettes are intentionally diverse to represent the wide variety of students who use the curriculum.



Nearly every module in *Eureka Math²* includes a feature called Math Past. Each Math Past tells the history of big ideas in the module, recounting the story of the mathematics through artifacts, discoveries, and other contributions from cultures around the world. This resource counters the traditional Eurocentric perspective and celebrates the many contributions of Black, Indigenous, and People of Color communities to the history of mathematics. Math Past provides ideas about how to engage students in the history of mathematics. For example, students explore large numbers in expanded form by first engaging with Egyptian hieroglyphics. The module's Math Past Teacher Resource highlights the specific hieroglyphic numerals and their connection to familiar objects for Egyptians 4,000 years ago.

In a similar vein, *Eureka Math²* connects works of fine art to the standards of each grade level. Each Teach book opens with a stunning work of fine art that has a connection to the math learned in the grade. There are also a wide variety of additional pieces of art embedded in each grade's lessons. For example, students count the objects in a painting by a French artist, study the shapes in a Navajo blanket and find the difference in the lengths of two Pala'wan carved wood masks.

Eureka Math² is an inclusive mathematics curriculum that represents diverse doers of math. The curriculum's images, fine art, and pictures of people represent diversity through problems and activities related to real-life experiences, perspectives, and contributions of people from various cultures, ethnicities, and identities. Thus, the curriculum inspires all students to think of themselves as mathematicians.

Professional Learning

Describe any professional learning opportunities (materials or experiences, publisher-provided or otherwise) available for Massachusetts educators that are designed to support high-quality implementation of your curriculum.

Effective implementation of high-quality instructional materials can provide all learners with access to rigorous, on-grade-level learning that considers the unique needs and cultures of all classrooms. Great Minds professional development and curated coaching sessions engage teachers experientially in deepening their content knowledge, understanding how the design of the *Eureka Math²* curriculum fosters accessibility for all students, and preparing to leverage the curriculum resources to support students' confidence and success. Each session is designed to build on teachers' expertise and experience to foster teacher efficacy and give them tangible action steps to immediately put in place in their classrooms.

Professional development sessions can be sequenced in a custom plan to best meet the needs of Massachusetts educators. Sessions are available in both virtual and on-site formats, and foundational sessions are also available in on-demand formats. Virtual professional development sessions have a 35-participant maximum, while on-site sessions have a maximum of 50 participants.

Eureka Math² Projected Foundational Professional Development Sessions (Recommended for Year 1 Implementation)	
Lead: Facilitating Successful Implementation GK-5 G6-Algebra 1	School and district leaders are introduced to the *Eureka Math²* curriculum and are provided with guidance on how leaders can best support their teachers during implementation.
Launch: Bringing Curriculum to Life GK-5 G6-Algebra 1	Teachers who are new to math curriculum from Great Minds investigate the structure, design, and components of *Eureka Math²* while engaging with the curriculum's print and digital resources. Participants explore the instructional role of all the curriculum resources (including *Eureka Math²* Equip for those who also adopt the premium assessment tool) and are prepared to facilitate lessons with students.
Teach: Effective Instruction with Eureka Math2 GK-2, G3-5 G6-Algebra 1	Participants study the content of a common module, topic, and lesson by using the recommended process of previewing the learning, investigating the development of learning, and exploring the assessment. They use the knowledge they gain from their study to prepare a lesson for instruction. Participants explain how studying supports them in thinking about connections between content while planning, so they can make those connections visible when teaching, helping students to access grade-level content by relating new learning to prior knowledge. They apply the process to study a module, topic, and lesson at their own grade level. Participants leave this session having prepared and practiced a lesson they will teach.

Eureka Math² Sustaining Professional Development Sessions (Foundational sessions are pre-requisites)	
Assess: Embedded Opportunities to Inform Instruction GK–2, G3–5, G6–Algebra I	This session extends the learning from Teach: Effective Instruction with *Eureka Math²* to explore more deeply assessment opportunities that are an integral part of instruction rather than as separate, isolated events. Participants explore the suite of assessments provided with *Eureka Math²* and understand each component's role in making inferences about next-step instructional decisions, reflecting on instructional practice, and accurately communicating students' proficiency with mathematical content. They analyze sample student work and relate the design of the assessment system to consider the recommended practices for scoring and grading. Participants leave this session feeling more comfortable and confident navigating the assessment system of *Eureka Math²*.
Inspire: Discourse, Engagement and Identity GK–Algebra I	In this one-day session, teachers experience the ways in which they shape their students' identities and the learning community through language and instructional decisions, as well as by fostering discourse and engagement. Participants leave prepared to optimize discourse and engagement, inspiring all students to see themselves as doers and thinkers of mathematics.
Adapt: Optimizing Instruction GK–2, G3–5, G6–Algebra I	This one-day session is designed for teachers and instructional leaders as a sustaining session after they have participated in Launch, Teach, and Assess. Participants build on the framework from Teach: Effective Instruction with *Eureka Math²* by using curriculum materials and student data to plan for and facilitate instruction that supports all learners in accessing grade-level content. During this session, participants analyze student work and use the data to engage in a process to plan for responsive instruction.

Learn more about *Eureka Math²* professional development here.

Product Specifications

Describe what a school or district needs to implement your curriculum successfully, including instructional hours and technological infrastructure. Provide basic information about what products are associated with the curriculum (e.g., what texts a typical purchase includes, what tools are openly available online).

To ensure a successful implementation of *Eureka Math²*, we strongly recommend Massachusetts schools/districts provide:

- The Teach books for educators (all grades) along with the Learn (all grades) and Apply (grades 1–5) student workbooks
- Great Minds Digital Platform access for teachers and students with the Eureka Math2 premium assessment bundle that features summative Benchmark Assessments as well as the Eureka Math2 Equip digital diagnostic assessment tool
- Math manipulative kits (all grades)
- Great Minds professional learning options, including foundational and sustaining professional development sessions as well as professional coaching sessions
- While not required, we recommend teachers have access to a desktop computer, laptop, or tablet device with broadband internet access and connectivity to a projector or an interactive whiteboard device to maximize the online resources. For students, computer, laptop, or tablet access is recommended for completing certain online activities and lessons, especially digital assessments.

Response to Report

At Great Minds, we believe every child is capable of greatness. We appreciate the commitment of CURATE and Massachusetts educators to identify and utilize high-quality instructional materials that facilitate all children achieving greatness.

Coherence drives every aspect of *Eureka Math²*. Our writers have drawn from their classroom experience to intentionally organize lessons, topics, and modules to follow a logical progression and build knowledge within and across grade levels. Leveraging clear connections between concepts deepens students' conceptual understanding of big mathematical ideas.

Eureka Math² sits in the Dynamic Middle of three key aspects of rigor—conceptual understanding, procedural fluency, and application. Individual *Eureka Math²* lessons are designed to emphasize each key aspect differently. By balancing this emphasis across modules and grade levels, our unique approach produces confident students who can choose the correct problem-solving strategies, apply them successfully, and explain why they work.

Eureka Math² advances equity and empowers teachers and students, honoring every individual as a valuable contributor to the mathematics classroom. We've applied the latest research on supporting multilingual learners, leveraging Universal Design for Learning principles, and promoting social-emotional learning. Strategies for addressing learner variance and supporting students with understanding, speaking, and writing English in mathematical contexts are embedded in lesson facilitation, instructional routines, and marginalia, with special attention to Tier 1, 2, and 3 terms. *Eureka Math²* resources allow teachers to spend their time engaged in the valuable work of delivering high-quality instruction that moves their students toward greatness.