

A quick guide for observing classroom content and practice

In **grade 2**, instructional time should focus on six core ideas:

ESS

2. Earth's Systems

LS

2. Ecosystems: Interactions, Energy, and Dynamics
4. Biological Evolution: Unity and Diversity

PS

1. Matter and Its Interactions
3. Energy

ETS

1. Engineering Design

In a **2nd grade science** class you should observe students engaged with at least one science concept and practice:

Science and Engineering Practices

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Science Concepts

Earth & Space Science (ESS2)

- Investigating and comparing multiple solutions to prevent changes in the land
- Mapping types and shapes of landforms and bodies of water
- Using information to explain where water is found on earth and that it may be liquid or solid
- Observing how wind and water can change the shape of a landform

Life Science (LS2, LS4)

- Developing models of what animals and plants need to meet their needs
- Using texts and media to compare living things in an area and in different types of geographic areas

Physical Science (PS1, PS3)

- Describing and classifying materials by observable properties
- Testing materials to determine which are best suited for a certain purpose
- Understanding that when a chunk of material is broken in to smaller pieces it is still the same material
- Constructing an argument that some changes to materials can be reversed and some cannot
- Experimenting to show the effects of friction on the temperature and speed of objects that rub against each other

Technology/Engineering (ETS1)

- Analyzing data to compare two designs for the same problem

NOTES

Comments on the Science and Engineering Practices:

- For a list of specific skills, see the *Science and Engineering Practices Progression Matrix* (www.doe.mass.edu/stem/review.html).
- Practices are skills **students** are expected to learn and do; standards focus on some but not all skills associated with a practice.

STE What to Look For The example below features three Indicators from the [Standards of Effective Practice](#). These Indicators are just a sampling from the full set of Standards and were chosen because they create a sequence: the educator plans a lesson that sets clear and high **expectations**, the educator then delivers high quality **instruction**, and finally the educator uses a variety of **assessments** to see if students understand the material or if re-teaching is necessary. This example highlights teacher and student behaviors aligned to the three Indicators that you can expect to see in a rigorous 2nd-grade science classroom.

Expectations
(Standard II, Indicator E) Plans and implements lessons that set clear and high expectations and also make knowledge accessible for all students.

What is the teacher doing?

- Communicating the learning objectives for the lesson orally and visually in student-friendly terms
- Focusing attention on newly learned scientific language (e.g. linguistic complexity, conventions, and vocabulary)
- Supporting inquiry about what evidence is relevant to a scientific question

What are the students doing?

- Persisting when engaging with meaningful scientific tasks.
- Using information from observations to construct an evidence based account for natural phenomena
- Identifying common features and differences between a model and the real object

Instruction
(Standard II, Indicator A) Uses instructional practices that reflect high expectations regarding content and quality of effort and work; engage all students; and are personalized to accommodate diverse learning styles, needs, interests, and levels of readiness.

What is the teacher doing?

- Designing lessons that support successful cooperation in culturally sensitive ways
- Providing opportunities for students to communicate their scientific ideas and thinking with each other
- Providing resources that support the collection and recording of results

What are the students doing?

- Asking questions that can be answered by observations
- Discussing scientific ideas with other students
- Using counting and numbers to identify and describe patterns

Assessment
(Standard I, Indicator B) Uses a variety of informal and formal methods of assessments to measure student learning, growth, and understanding to develop differentiated and enhanced learning experiences and improve future instruction.

What is the teacher doing?

- Using multiple formative approaches to assess student learning (e.g., classroom conversation, completion of investigation)
- Conducting frequent checks for student understanding and adjusting instruction accordingly
- Providing exemplars of work (e.g. historical examples, student work)

What are the students doing?

- Responding to teacher feedback to improve their work
- Engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts)
- With guidance, planning and conducting an investigation collaboratively with peers