

A quick guide for observing classroom content and practice

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

ESS

1. Earth’s Place in the Universe
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 Concepts

Earth & Space Science (ESS1, ESS2)

- 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 and that it may be liquid or solid
- Observing the influence of wind and water on landforms

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
- Determining which materials are best suited for a certain purpose
- Analyzing material properties when an object is cut into smaller chunks
- Constructing an argument that some changes to materials can be reversed and some cannot
- Experimenting to show the effects of friction on the temperature of objects rubbed together

Technology/Engineering (ETS1)

- Analyzing data to compare two designs for the same problem

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

NOTES

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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.



Science and Technology/Engineering What to Look For Guide

The practices below, which are aligned to the MA Model Teacher Rubric, should be evident in planning and instruction. Any particular lesson will demonstrate some of the practices, not all. For each lesson, artifacts or observables might include: lesson plan, tasks and assessments, teacher instruction, student discussion and behavior, or student work.

Standard I: Curriculum, Planning, and Assessment (I-A, I-B)

- The lesson focuses on grade-level standard(s).
- The lesson integrates science and engineering practice(s) with core idea(s) to support development of skills and conceptual understanding.
- The lesson engages students in making sense of relevant phenomena or solving relevant problems (through firsthand experiences or representations).
- The lesson intentionally relates new learning to students' prior skills and knowledge.
- The lesson provides grade-appropriate connection(s) to Literacy and/or Mathematics standards.
- The lesson includes opportunities to monitor learning throughout the lesson (such as through questioning or student performance assessments).

Standard II: Teaching all Students (II-A)

- The teacher actively engages students in authentic scenarios that provide opportunities to make sense of phenomena or design solutions.
- The teacher promotes use of evidence and provides time for students to communicate, clarify, justify, and represent their thinking about the lesson content.
- The teacher uses variation in students' ideas and strategies to strengthen other students' understanding.
- The teacher addresses student variability and diverse needs (including English language learners and students with disabilities) to ensure equitable access to the lesson and achievement of the standard(s).
- The teacher references student work and discussion to summarize the practices and core ideas learned.

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