

A quick guide for observing classroom content and practice

In **grade 6**, instructional time should focus on nine core ideas:

ESS

1. Earth's Place in the Universe
2. Earth's Systems

LS

1. From Molecules to Organisms: Structures and Processes
4. Biological Evolution: Unity and Diversity

PS

1. Matter and its Interactions
2. Motion and Stability: Forces and Interactions
4. Waves and their Applications in Technologies for Information Transfer

ETS

1. Engineering Design
2. Materials, Tools, and Manufacturing

In a **6th 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 (ESS1, ESS2)

- Developing and using a model to explain the causes of lunar phases
- Analyzing rock layers and fossils to determine relative ages
- Illustrating that the Earth and solar system are parts of the Milky Way
- Interpreting maps to provide evidence of Earth's plate movement

Life Science (LS1, LS4)

- Providing evidence that organisms are made of cells
- Developing a model to show how parts of cells contribute to functions
- Providing evidence to explain that body systems interact for life functioning
- Using fossils to infer patterns of environmental change
- Constructing an argument of evolutionary relationships among fossilized and modern organisms

Physical Science (PS1, PS2, PS4)

- Experimenting with chemical reactions and thermal energy
- Using a particulate model of matter to explain density
- Experimenting with mixtures
- Making claims about gravity
- Using diagrams to explain waves
- Showing that waves are reflected, absorbed, or transmitted
- Supporting the claim that digitized signals can transmit information

Technology/Engineering (ETS1, ETS2)

- Defining a problem with precision
- Visually representing solutions and applying scale and proportion
- Communicating a design solution
- Analyzing and comparing properties of different materials
- Selecting appropriate material for a design task
- Choosing and safely using appropriate tools for a prototype

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 6th grade science classroom.

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