WHAT TO LOOK FOR

A quick guide for observing classroom content and practice

In **grade 5**, instructional time should focus on nine core ideas:

ESS
1. Earth's Place in the Universe
2. Earth's Systems
3. Earth and Human Activity

LS
1. From Molecules to Organisms: Structures and Processes
2. Ecosystems: Interactions, Energy, and Dynamics

PS
1. Matter and Its Interactions
2. Motion and Stability: Forces and Interaction
3. Energy

ETS
3. Technological Systems

In a **5th 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, ESS3)

- Constructing an argument about the sun's appearance
- Using models to explain Earth's relationship to the sun, moon and stars
- Using a model to explain the cycling of water on Earth
- Graphing the locations and relative amounts of fresh and saltwater
- Obtaining information about human's impact on the environment
- Testing, and proposing a change to, a water filter design

Life Science (LS1, LS2)

- Asking scientific questions about how plants obtain materials to live and grow
- Developing a model to describe movement of matter in the environment
- Comparing the effectiveness of composter designs

Physical Science (PS1, PS2, PS3)

- Using a model of matter to explain phase changes
- Measuring conservation of matter
- Observing and measuring substances to describe characteristic properties
- Experimenting to see if mixing substances creates a new substance
- Supporting an argument that gravity is directed towards Earth's center
- Describing that the food animals digest provides energy and nutrients for life processes

Engineering (ETS3)

- Using drawings to show the relationships between parts of a device
- Communicating about changes to improve technologies and he development of new technologies that fulfill a want or need

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 5th 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?

- Asking students to apply scientific knowledge and ideas when engaging with real-world problems
- Focusing attention on scientific language (e.g., linguistic complexity, conventions, and vocabulary)
- Showing students how to use models to explain phenomena and generate evidence

What are the students doing?

- Persisting when engaging with meaningful scientific tasks
- Applying scientific knowledge when explaining natural phenomena or real world problems
- Identifying limitations of a model

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?

- Highlighting when students draw explicitly upon class content during discussions with peers
- Modeling ways of using computation and analysis to find patterns in observations
- Providing resources that support the comparison of students' results

What are the students doing?

- Asking questions that can be answered by investigations and predicting answers based on patterns
- Using computation and mathematical analysis to find patterns
- Comparing data collected by different groups to discuss similarities and differences in their findings

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?

- Providing concrete strategies to respond to feedback (e.g., emphasizing importance of recorded observations)
- 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?

- Demonstrating learning in multiple ways (e.g., classroom conversation, completion of investigation)
- Engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts)
- Using exemplars to inform their work