Massachusetts Curriculum Framework | SCIENCE | 1

WHAT TO LOOK FOR

A quick guide for observing classroom content and practice

In **grade 1**, instructional time should focus on five core ideas:

ESS
1. Earth's Place in the Universe

LS
1. From Molecules to Organisms: Structures and Processes
3. Heredity: Inheritance and Variation of Traits

PS
4. Waves and their Applications in Technologies for Information Transfer

ETS
1. Engineering Design

In a **1st 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)
- Observations of the sun, moon, and stars to describe apparent motion
- Analyzing data about seasonal patterns of change (sunrise, sunset, temperature, precipitation, environmental changes)

Physical Science (PS4)
- Demonstrating the relationship of vibrating materials and sound
- Experimenting with different materials and light
- Designing and building a device that uses light or sound to send a signal

Life Science (LS1, LS3)
- Using evidence to explain the function of animal senses and body parts and the function of plant parts
- Comparing different animals' behavior that helps offspring survive
- Using observations to compare individuals of the same kind

Technology/Engineering (ETS1)
- Defining a design problem that can be solved by developing or improving an object or tool
- Generating and sketching multiple solutions to a 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 1st-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.

What is the teacher doing?

- Creating culturally responsive lessons that engage and sustain student attention
- Supporting inquiry about what evidence is relevant to a scientific question
- Explaining the difference between a model and the object it represents

What are the students doing?

- Understanding what they will learn in a lesson
- Using information from observations to construct an evidence based account for natural phenomena
- Using scientific language precisely to convey meaning and understanding of concepts
- 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?

- Providing opportunities for students to communicate ideas, ask questions, and make their thinking visible in writing and speaking
- Designing lessons that support successful cooperation in culturally sensitive ways
- Asking students to describe patterns in observations

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
- Making observations based on prior experiences

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)
- Providing concrete strategies to respond to feedback (e.g., emphasizing importance of recorded observations)
- 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)
- With guidance, planning and conducting an investigation collaboratively with peers