Massachusetts Curriculum Framework | SCIENCE | K

WHAT TO LOOK FOR

A quick guide for observing classroom content and practice

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

ESS
(2) Earth's Systems
(3) Earth and Human Activity

LS
(1) From Molecules to Organisms: Structures and Processes

PS
(1) Matter and its Interactions
(2) Motion and Stability
(3) Energy

In a **Kindergarten classroom** science content may be integrated in a variety of ways. Science and engineering practices may also be incorporated throughout a number of centers, themes, and experiences. When observing science in a Kindergarten classroom, you should see students engaged with at least one science concept and one 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 and Space Science (ESS2, ESS3)

- •Using and sharing quantitative observations of weather to describe patterns.
- •Constructing an argument supported by evidence for how plants and animals can change the environment.
- •Obtaining and using information about weather forecasting to prepare for, and respond to, different types of local weather.
- •Communicating solutions to reduce the amount of natural resources an individual uses.

Life Science (LS1)

- •Observing and communicating that animals and plants have needs to survive.
- •Recognizing that all plants and animals grow and change over time.

•Physical Science (PS1, PS2, PS3)

- •Investigating and communicating the idea that different kinds of materials can be a solid or liquid depending on temperature.
- •Comparing the effects of different strengths or directions of pushes and pulls on the motion of an object.
- •Making observations to determine that sunlight warms materials on the Earth's surface.
- •Using tools and materials to design and build a model of a structure that will reduce the warming effect of sunlight on an area.

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.

Science 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 kindergarten 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?

- Clearly communicating the learning objectives for the lesson orally and visually in student-friendly terms
- Creating culturally responsive lessons that engage and sustain student attention
- Focusing attention on newly learned scientific language (e.g. linguistic complexity, conventions, and vocabulary)

What are the students doing?

- Persisting when engaging with meaningful scientific tasks
- Using scientific language precisely to convey meaning and understanding of concepts
- Understanding what they will learn in a lesson and how it connects to prior learning

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 and ask questions to inform their thinking
- Designing lessons that support successful cooperation in culturally sensitive ways
- Eliciting student observations that build upon their prior knowledge

What are the students doing?

- Asking questions that can be answered by observations
- Identifying common features and differences between a model and the real object
- 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

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)
- Working cooperatively on a shared activity