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

<table>
<thead>
<tr>
<th>ESS</th>
<th>Earth’s Place in the Universe</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS</td>
<td>From Molecules to Organisms: Structures and Processes</td>
</tr>
<tr>
<td>PS</td>
<td>Waves and their Applications in Technologies for Information Transfer</td>
</tr>
<tr>
<td>ETS</td>
<td>Engineering Design</td>
</tr>
</tbody>
</table>

### What to Look For

In a 1st grade science class you should observe students engaged with at least one science concept and practice:

#### 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)**
- Gathering information and asking questions that can be solved by developing or improving an object or tool
- Generating and sketching multiple solutions to a 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**

Comments on the Science and Engineering Practices:
- For a list of specific skills, see the Science and Engineering Practices Progression Matrix [here](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.

<table>
<thead>
<tr>
<th>Expectations (Standard II, Indicator E)</th>
<th>What is the teacher doing?</th>
<th>What are the students doing?</th>
</tr>
</thead>
</table>
| Plans and implements lessons that set clear and high expectations and also make knowledge accessible for all students. | • 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 | • 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 |

<table>
<thead>
<tr>
<th>Instruction (Standard II, Indicator A)</th>
<th>What is the teacher doing?</th>
<th>What are the students doing?</th>
</tr>
</thead>
</table>
| 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. | • 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 | • 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 |

<table>
<thead>
<tr>
<th>Assessment (Standard I, Indicator B)</th>
<th>What is the teacher doing?</th>
<th>What are the students doing?</th>
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</table>
| 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. | • 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) | • 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 |