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

### Science and Engineering Practices

<table>
<thead>
<tr>
<th>Science Concepts</th>
<th>Physical Science (PS1, PS2, PS3)</th>
<th>Engineering (ETS3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Earth &amp; Space Science (ESS1, ESS2, ESS3)</strong></td>
<td>• Using a model of matter to explain phase changes</td>
<td>• Using drawings to show the relationships between parts of a device</td>
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<td>• Constructing an argument about the sun’s appearance</td>
<td>• Measuring conservation of matter</td>
<td>• Communicating about changes to improve technologies and the development of new technologies that fulfill a want or need</td>
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<td>• Using models to explain Earth’s relationship to the sun, moon and stars</td>
<td>• Observing and measuring substances to describe characteristic properties</td>
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<tr>
<td>• Using a model to explain the cycling of water on Earth</td>
<td>• Experimenting to see if mixing substances creates a new substance</td>
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<td>• Graphing the locations and relative amounts of fresh and saltwater</td>
<td>• Supporting an argument that gravity is directed towards Earth’s center</td>
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<tr>
<td>• Obtaining information about human’s impact on the environment</td>
<td>• Describing that the food animals digest provides energy and nutrients for life processes</td>
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<td>• Testing, and proposing a change to, a water filter design</td>
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**Science Concepts**

<table>
<thead>
<tr>
<th>Earth Science (LS1, LS2)</th>
<th>Physical Science (PS1, PS2, PS3)</th>
</tr>
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<td>• Asking scientific questions about how plants obtain materials to live and grow</td>
<td>• Using a model of matter to explain phase changes</td>
</tr>
<tr>
<td>• Developing a model to describe movement of matter in the environment</td>
<td>• Measuring conservation of matter</td>
</tr>
<tr>
<td>• Comparing the effectiveness of composter designs</td>
<td>• Observing and measuring substances to describe characteristic properties</td>
</tr>
</tbody>
</table>

**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 ([www.doe.mass.edu/stem/review.html](http://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 CT Common Core of Teaching 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.

### Domain 1
**Classroom Environment, Student Engagement and Commitment to Learning**

**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

### Domain 2
**Planning for Active Learning**

**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

### Domain 3
**Instruction for Active Learning**

**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

*This document is based on the CT Core Standards Classroom ”Look Fours” and the MA Curriculum Observation Guide.*