In grade 4, instructional time should focus on seven 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

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

ETS
1. Engineering Design

In a 4th 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)
- Explaining that erosion and deposition over time result in rock and landscape formations
- Collecting data showing that Earth’s matter is broken down and moved
- Interpreting maps to describe patterns of land formations, volcanoes, and earthquakes
- Obtaining information about human use of renewable and nonrenewable energy resources
- Evaluating a design solution to reduce impact of natural disasters

Physical Science (PS3, PS4)
- Explaining the relationship of an object’s speed to its energy
- Observing energy transfer
- Predicting changes in energy when objects collide
- Testing and refining a device that converts motion into electrical, light, or sound energy
- Using a model to show wave patterns
- Describing how the reflection of light allows objects to be seen
- Comparing ways to send information through a coded pattern

Life Science (LS1)
- Constructing an argument that plants and animals have structures that support key life functions

Technology/Engineering (ETS1)
- Planning and carrying out tests to a model or prototype
- Evaluating design features when developing a model for a problem
- Recognizing that technology is any modification to fulfill a need or want

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/cteml/review.html).
- Practices are skills students are expected to learn and do; standards focus on some but not all skills associated with a practice.
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 4th grade science classroom.

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

**What is the teacher doing?**
- Communicating both the language and content objectives for students and why they are important
- Creating culturally responsive lessons that engage and sustain student attention
- Asking students to apply scientific knowledge and ideas when engaging with real-world problems

**What are the students doing?**
- Understanding what they will learn in a lesson and how it connects to prior learning
- Applying scientific knowledge when explaining natural phenomena or real world problems
- Comparing and refining arguments based on an evaluation of evidence
- Identifying limitations of a model

### Domain 2: Planning for Active Learning

**What is the teacher doing?**
- Providing opportunities for students to communicate ideas, ask questions, and make their thinking visible in writing and speaking
- 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 scientific (testable) questions that can be answered by investigation
- Drawing explicitly upon content they have learned in class in conversations with peers
- 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?**
- Using multiple formative approaches to assess student learning (e.g., classroom conversation, completion of investigation)
- Providing opportunities for students to conduct investigations with a controlled variable
- 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)
- Conducting investigations with a controlled variable

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