**Science and Engineering Practices**

**Developing and Using Models**
- Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
  - Develop and use a model to describe phenomena. (MS-ESS2-1)
  - Develop a model to describe unobservable mechanisms. (MS-ESS2-4)

**Constructing Explanations and Designing Solutions**
- Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.
  - Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students’ own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-ESS3-1)

**Disciplinary Core Ideas**

**ESS2.A: Earth’s Materials and Systems**
- All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms. (MS-ESS2-1)

**ESS2.C: The Roles of Water in Earth’s Surface Processes**
- Water continually cycles among land, ocean, and atmosphere by transpiration, evaporation, condensation, and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4)

**ESS3.A: Natural Resources**
- Humans depend on Earth’s land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)

**Common Core State Standards Connections**

- ELA/Literacy – RST.6–8.1: Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS3-1)
  - RST.6–8.2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-ESS3-1)
  - RST.6–8.9: Draw evidence from informational texts to support analysis, reflection, and research. (MS-ESS3-1)

- SL.8.5: Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-ESS2-1)

- Mathematics – 6.EE.B.6: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS3-1)

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*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The section entitled "Disciplinary Core Ideas" is reproduced verbatim from A Framework for K–12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas. Integrated and reprinted with permission from the National Academy of Sciences.