**Reading the Draft South Carolina Standards and Performance Expectations for Science (2013)**

The draft **Standards and Performance Expectations for Science** recommended by the **South Carolina** Science Standards Writing Team are based on the most recent research about learning science. This research is assimilated into a document called A Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, published by the National Research Council's Board on Science Education's Committee on a Conceptual Framework for New K–12 Science Education Standards. The standards are based on six assumptions about learning and the purpose of science learning.

The assumptions are as follows:

- Children are born investigators.
- The focus is on (a limited number of) Disciplinary Core Ideas and Science and Engineering Practices.
- Student understanding develops over time.
- Science and Engineering require both knowledge and practice.
- The standards should connect to student interests and experiences.
- Providing knowledge about science that all children should know promotes equity.

The new standards are multidimensional. The three dimensions are Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas. The three dimensions work together to unite science process (practices and crosscutting concepts) with content. There is no longer a split among the three.

**Dimension 1: Science and Engineering Practices (Framework, pp. 41–82)**

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

**Dimension 2: Crosscutting Concepts (Framework, pp. 83–102)**

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles and conservation
6. Structure and function
7. Stability and change

**Dimension 3: Disciplinary Core Ideas (Framework, pp. 103–216)**

1. Life Science
2. Physical Science
3. Earth and Space Science
4. Engineering Design
5. Links Among Engineering, Technology, Science, and Society

**How the Dimensions Work Together**

The draft **Standards and Performance Expectations for Science** are designed to ensure that the "processes" of science and the "content" of science are tightly linked. The Framework describes the relationship among the Framework elements and the student performance expectation:

> "Specification of 'performance expectations' is an essential component of the standards. This term refers to statements that describe activities and outcomes that students are expected to achieve in order to demonstrate their ability to understand and apply the knowledge described in the disciplinary core ideas. Following the model of the College Board's Science Standards for College Success…performance expectations specify what students should know and be able to do….They also illustrate how students engage in science practices to develop a better understanding of the essential knowledge. These expectations support targeted instruction and assessment by providing tasks that are measurable and observable." (Framework, p. 218)

"Content" is defined as a limited number of "Disciplinary Core Ideas (DCIs)." The DCIs represent the science content that all students should know for these subjects: Life Science; Physical Science; Earth and Space Science; Engineering Design; and Links Among Engineering, Technology, Science, and Society.

Here is an example DCI for Kindergarten structure and properties of matter:

> Different kinds of matter exist (e.g., wood, metal, water) and many of them can be either solid or liquid depending on temperature. Matter can be described and classified by its observable properties (e.g., visual, aural, textural), by its uses, and by whether it occurs naturally or is manufactured.

In writing the actual standard, the writers identified the Science and Engineering Practices most appropriate for Kindergarten students.

- Asking questions based on observations of the natural and/or designed world
- Planning and carrying out investigations

The resulting Performance Expectations therefore read as follows:

- Design and conduct an investigation of different kinds of materials to describe their observable properties and classify the materials based on the patterns observed.
- Design and conduct investigations to test the idea that some materials can be solid or liquid depending on temperature.
- Ask questions, based on observations, to classify different objects by their use and to identify whether they occur naturally or are human-made.

Note that the Performance Expectations include Crosscutting Concepts (Patterns, Cause and Effect) as well as the Connections to Engineering, Technology, and Applications of Science: the influence of technology on their investigations as well as human-made objects. For more information on the three dimensions refer to the Framework (*http://www.nap.edu/catalog.php?record_id=13165)* document.

Please keep in mind these standards are for ALL students. Specific course standards for high school courses have not been identified at this time.

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