**Big Idea 3- Description**

The terms that describe examples of scientific knowledge, for example: "theory," "law," "hypothesis," and "model" have very specific meanings and functions within science.

**Big Idea 3- Benchmarks**

- **SC.6.N.3.1:** Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life.
- **SC.6.N.3.2:** Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws.
- **SC.6.N.3.3:** Give several examples of scientific laws.
- **SC.6.N.3.4:** Identify the role of models in the context of the sixth grade science benchmarks.

**What Is a Law?**

A law is a description of a specific relationship under given conditions in the natural world. Laws are accepted to be true and universal, meaning that they always apply in every situation. An observation becomes a law after it has been proven, by use of evidence, in numerous, repeated investigations. One example of a law is Newton’s first law of motion. Newton’s first law of motion states that an object in motion will stay in motion, and an object at rest will stay at rest unless acted upon by an outside force. This law explains how things behave when they are in motion (and not moving) and provides the conditions for their movement. Other examples of scientific laws include Newton’s second and third laws of motion, the law of gravity and the law of conservation of energy.

**What Is a Theory?**

A theory is a well-supported and widely accepted explanation for what is observed in the natural world. It is not simply a claim that is made by an individual. In order for an observation (or several observations) to become a theory, it must be verified through the use of a systematic scientific process, with evidence, over and over through a series of numerous, repeated experiments. One example of a theory is the cell theory.
The cell theory states:

- All living organisms are composed of cells. They may be unicellular or multicellular.
- The cell is the basic unit of life.
- Cells arise from preexisting cells.

These statements explain observations that were made about living things and have been verified through investigations. Some other examples of theories include the big bang theory, the theory of plate tectonics, and the theory of electromagnetism.

**What Are Models?**

A model is based on observations that are made. Models are used in science to explain and predict observations. Models help scientists see things that are either too big or too small to be seen with the eye. A good model must be able to explain as many characteristics of these observations as possible yet be as simple as possible.

**Instructional Ideas**

1. Ask students to create a Venn diagram for the terms theory and law in their notebooks. Have students pair and explain the Venn diagram to a partner. Allow both partners the opportunity to explain their diagrams.
2. Present the terms theory and law and allow students the opportunity to refine their Venn diagrams.
3. Conduct a class discussion about the difference between the terms and create a classroom Venn diagram on the board.
4. Watch Theories and Laws. Have students refine their Venn diagrams even further.
5. Have students construct their own definitions of the terms.
6. Ask students to create a three-column chart in their notebooks. Have them label the columns Definition of a Model, Where Models Are Used, and Why Models Are Used.
7. Have students list information that they already know about models in the appropriate columns.
8. Present students the term model. Have students continue to add information to their charts.
9. Have students watch the video segment Using Evidence to Create a Viable Model. Have students continue to add information to their charts.
10. Have students use their charts to create their own definitions of the term model.
11. Use the reading passage Use Your School As a Tool to have students create their own scale models. (Note: The reading passage has the students create a scale model of their school, but this can be adapted to their classroom.)
12. After students have created their own models, have them partner with another student.
13. Have the student pairs critique each other’s models according to the charts and definitions that they constructed earlier.