

Grade 4 Science Units:

Energy (FOSS)

The Foss **Energy** Module provides first-hand experiences in physical science dealing with energy and change. Students investigate electricity and magnetism as related effects and engage in engineering design while learning useful applications of electromagnetism in everyday life. They explore energy transfer through waves, repeating patterns of motion, that result in sound and motion.

The investigations focus on the concepts that energy is present whenever there is motion, electric current, sound, light, or heat, and that energy can transfer from one place to another. Students conduct controlled experiments by incrementally changing variables to determine how to make an electromagnet stronger and how the amount of energy transfer changes when balls of different masses hit a stationary object. Students interpret data from graphs to build explanations from evidence and make predictions of future events. They develop models to represent how energy moves from place to place in electric circuits and in waves. Students gain experiences that will contribute to the understanding of crosscutting concepts of patterns; cause and effect; systems and system models; and energy and matter.

- **4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.**
- **4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.**
- **4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. (Inv. 1, and 4).**
- **4.PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.**

Soil, Rock and Landforms (FOSS)

The Foss **Soils, Rocks, and Landforms** Module focuses on the concepts that weathering by water, ice, wind, living organisms, and gravity breaks rocks into smaller pieces, erosion (water, ice, and wind) transports earth materials to new locations, and deposition is the result of that transport process that builds new land.

Students conduct controlled experiments by incrementally changing specific environmental conditions to determine the impact of changing the variables of slope and amount of water in stream tables. Students interpret data from diagrams and visual representations to build explanations from evidence and make predictions of future events. They develop model mountains and represent the landforms from different perspectives to look for change. Students gain experiences that will contribute to the understanding of crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; systems and system models; structure and function; and stability and change.

- **4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.**
- **4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.**
- **4.ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.**
- **4.ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.**

Animal Studies (STC) (add internal structures w/frogs)

By caring for and observing unique animals during the STC **Animal Studies** unit - the dwarf African frog, the fiddler crab, and/or the millipede - students are able to focus on animal behavior, comparing and contrasting the needs, behaviors, and anatomical structures of each organism.

Each student creates and maintains a personal observation log in which he or she records notes about each animal throughout the unit. Students will learn that an object can be seen when light reflected from its surface enters the eyes. Plants and animals have both internal and external structures that serve various functions in behavior, growth and survival. Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.

- **4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support behavior, growth and survival.**
- **4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.**
- **4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.**