



Developed at:



THE LAWRENCE
HALL OF SCIENCE™
UNIVERSITY OF CALIFORNIA, BERKELEY

**A science education
is built one discovery
at a time.**

FOSS puts students first.

Every student deserves the larger benefits of science education, not just exposure to science words seen on the pages of a book or during a video. The developers at the Lawrence Hall of Science designed FOSS® to effectively engage students by inviting them to investigate, understand, and solve problems in the world around them. This philosophy is aligned with the Virginia Standards of Learning and the 5 C's of the Profile of a Virginia Graduate. It's a student-centered, hands-on approach that affords all students, regardless of background, culture, language, or ability, a full opportunity to become future-ready graduates.

Why FOSS?

- Student-first approach using hands-on activities and differentiated resources
- Aligned to the Standards of Learning with implementation tools for Virginia's teachers
- Student problem-solving through Engineering Design and Environmental Literacy
- Unmatched support and comprehensive resources for teachers and students
- FOSS passes the test with proven results for Virginia students





Comprehensive packages for complete learning.

FOSS® is more than just a science curriculum or science kit. Your investment in any FOSS module buys you all the student and teacher components to deliver world-class science education. No teachers scrambling or budgets strained to provide what's been left out—all the key components are included, with each element thoughtfully designed to conserve your money, space, and precious time.



“FOSS kits have provided a scaffolded path for a regular science teacher to improve her instruction and become a role model in science teaching and learning practices. From the excellent background knowledge it provides to math and language acquisition connections, FOSS curriculum and specific labs have turned around my teaching of Virginia science.”

Adriana F., Science Teacher
Alexandria, VA

Equipment Kit

Module and grade level kits contain permanent equipment, teacher materials, and consumables for three class uses. Durable, FOSS-exclusive equipment leads to successful investigations for all students, for class sizes up to 32 (8 groups) in repeated use.

Investigations Guide

Core Instructional Tool support the teacher with Overview, Alignment with Virginia SOLs, Materials, Investigations within the unit, and Assessments. Available in print and digital.

FOSS Science Resources

In-depth articles connect students' firsthand experiences to informational text, helping students integrate different methods of acquiring data. Available in print, eBook, and audiobook.

FOSS Technology

Interactive FOSSweb offers simulations and virtual investigations. Online activities provide differentiating instruction. Student ebooks and streaming video are also included. Comprehensive prep videos and slides support teachers.

Teacher Resources

Includes detailed alignments to Common Core ELA and Math Standards, AVAs (Activities for Virginia), taking FOSS outdoors, science notebook chapters, notebook masters, teacher masters, and assessment masters. Available in print and online.

Spanish Resources

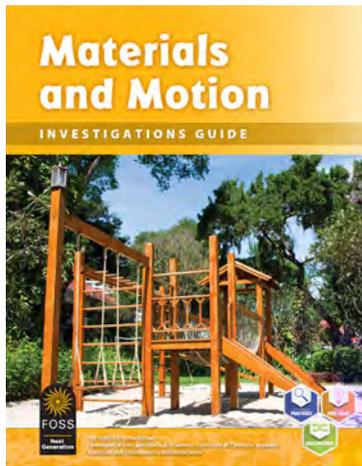
Spanish editions of *FOSS Science Resources* are offered both in print and eBook. FOSSweb provides audio files for *FOSS Science Resources*, as well as notebook, assessment, and teacher masters, module vocabulary and definitions, and Focus Questions.

Module Descriptions for Kindergarten

Materials and Motion

PHYSICAL SCIENCE

The Materials and Motion Module provides experiences that heighten students' understanding of the physical world as they perform tests to observe properties of materials such as wood, paper, and fabric. They learn about different materials to engineer a better shade structure. Students observe and compare pushes and pulls, the speed and motion of moving objects, and collisions.



Module Driving Questions:

- What is made of wood, paper, and fabric?
- How are the properties of those useful to us?
- How can we change the motion of an object?

Preview of Phenomena Investigated:

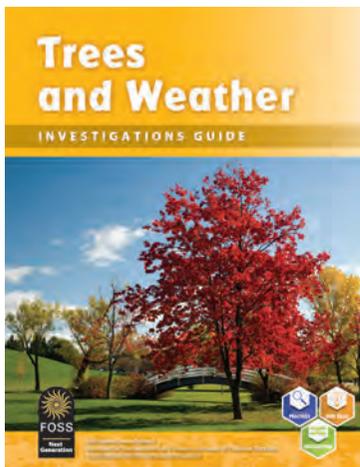
Students make sense of how common materials—wood, paper, and fabric—are defined by their properties. Students explore the motion of rolling objects and what changes their motion.

Virginia Science SOL & SEP: Force, Motion, and Energy K.2; Matter K.3, K.4; Living Systems and Processes K.5; Earth and Space Systems K.8, K.10; Earth Resources K.11; SEP K.1

Trees and Weather

EARTH SCIENCE

The Trees and Weather Module provides systematic investigations of trees and leaves over the seasons to bring students to a better understanding of trees' place at school and in the community. Students will observe day-to-day changes in weather over the year, as well as the impact weather has on living things.



Module Driving Questions:

- What do trees need to live and grow?
- How does weather affect trees?
- What changes do trees cause in their surroundings?

Preview of Phenomena Investigated:

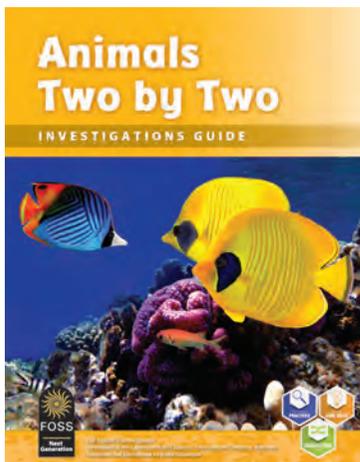
Students get to know the structures of neighborhood trees, their similarities and differences, and make sense of how trees live and grow through the seasons.

Virginia Science SOL & SEP: Matter K.4; Living Systems and Processes K.5, K.6, K.7; Earth and Space Systems K.8, K.9, K.10; Earth Resources K.1; SEP K.1

Animals Two by Two

LIFE SCIENCE

The Animals Two by Two Module provides young students with close and personal interaction with some common land and water animals. Students observe differences in structure and behavior and learn about basic needs of animals. Living materials are not included in the kits.



Module Driving Questions:

- How are animal structures similar and different?
- What do animals need to live and grow?

Preview of Phenomena Investigated:

Students investigate a few common animals to make sense of the animals' survival needs.

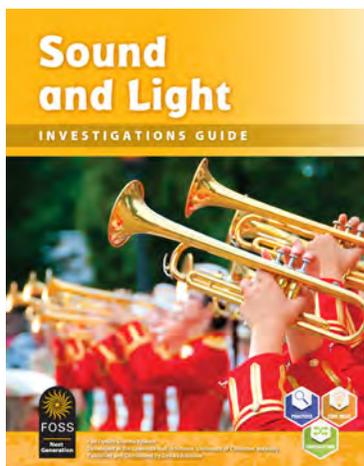
Virginia Science SOL & SEP: Matter K.4; Living Systems and Processes K.5, K.6, K.7; Earth and Space Systems K.10; SEP K.1

Module Descriptions for Grade 1

Sound and Light

PHYSICAL SCIENCE

The Sound and Light Module provides students with experiences to develop an understanding of how to observe and manipulate sound and light. Students learn that sound comes from vibrating objects and develop simple models for how sound travels. With light, students find out what happens when materials with different properties are placed in a beam of light.



Module Driving Question:

How do sound and light interact with objects?

Preview of Phenomena Investigated:

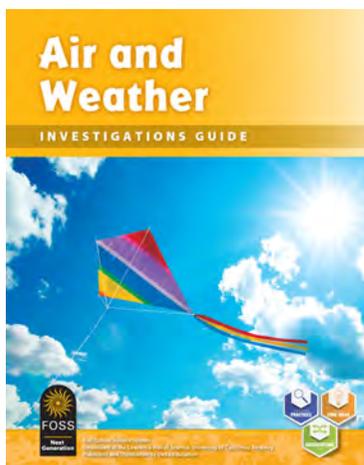
Students manipulate vibrating objects and sources of illumination to make sense of what they produce, and how humans and other animals use sound and light.

Virginia Science SOL & SEP: Life Systems and Processes 1.4, 1.5; SEP 1.1

Air and Weather

EARTH SCIENCE

In the Air and Weather Module, students turn their focus upward to explore that objects in the sky change position in predictable ways. They explore the natural using tools and methods to build on their understanding of the weather and to identify patterns. They monitor changes in hours of daylight over seasons and changing weather conditions. And they find the Moon in the day and night skies, and monitor its movement over the month.



Module Driving Questions:

- What is all around us?
- What do we observe in the sky above us?

Preview of Phenomena Investigated:

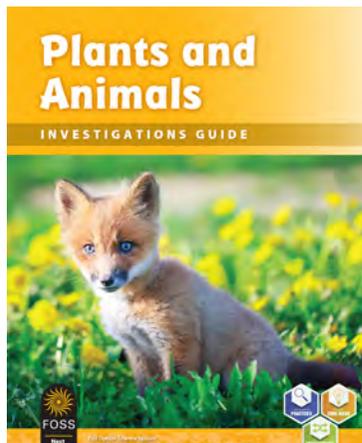
Students observe and describe patterns in weather and those made by natural objects in the sky to make sense of change in their surroundings.

Virginia Science SOL & SEP: Force, Motion, and Energy 1.2; Earth and Space Systems 1.6, 1.7; Earth Resources 1.8; SEP 1.1

Plants and Animals

LIFE SCIENCE

The Plants and Animals Module provides experiences with structures of plants, so that students discover ways to propagate new plants from mature plants. Students build a terrarium and provide for the needs of both plants and animals living together in a classroom habitat. They explore variation in the same kind of organism, including variation between young and adults, and find out about the behaviors of parents to help their offspring survive.



Module Driving Question:

How do young plants and animals survive in their habitat?

Preview of Phenomena Investigated:

Students find out about the structures and behaviors of young plants and animals (offspring) to make sense of how the young organisms grow and survive.

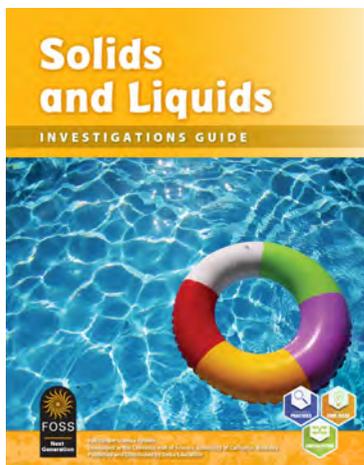
Virginia Science SOL & SEP: Life Systems and Processes 1.4, 1.5; SEP 1.1

Module Descriptions for Grade 2

Solids and Liquids

PHYSICAL SCIENCE

In the Solids and Liquids Module, students build on the science concepts of matter and its interactions developed in kindergarten, using new tools to enrich observations. Students observe, describe, and compare properties of solids and liquids. They conduct investigations to find out what happens when solids and water are mixed, and when liquids and water are mixed.



Module Driving Questions:

- How are solid and liquid materials similar and different?
- How do the properties of solid and liquid materials relate to how they can be used and how they can change?

Preview of Phenomena Investigated:

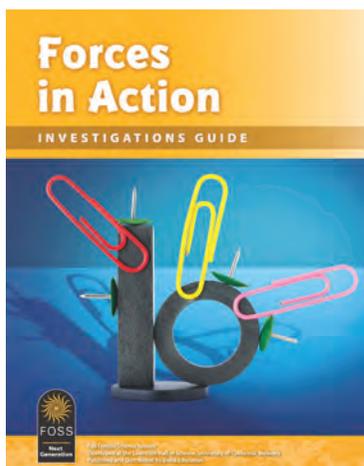
Students experience the properties of matter in two of its phases—solid and liquid—to make sense of how materials can change.

Virginia Science SOL & SEP: Matter 2.3; SEP 2.1

Forces in Action

PHYSICAL SCIENCE

In Forces in Action, students engage with phenomena related to forces—contact forces that make objects start to move or change their motion, and forces at a distance—gravity and magnetism. They investigate moving objects, and then apply their understanding to design ways to control or change the motion of those objects. They use the science and engineering practices to collect and interpret data to answer science questions, make predictions, and construct explanations for observed phenomena.



Module Driving Questions:

- What causes objects to spin in certain ways?
- What causes objects to roll in certain ways?
- What can the magnetic force do?
- How can we get objects to be balanced?

Preview of Phenomena Investigated:

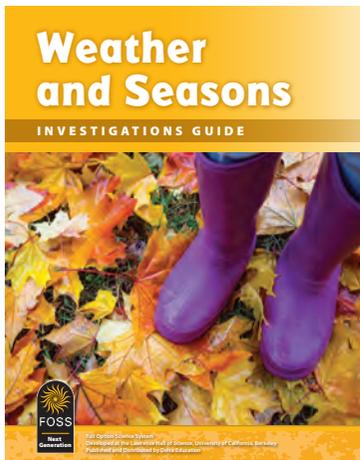
Students observe and work with systems that spin (tops) and roll (wheel and axles) to experience contact forces that make objects start to move or change their motion. They work with magnets and objects and balancing systems to experience forces at a distance—gravity and magnetism.

Virginia Science SOL & SEP: Force, Motion, and Energy 2.2; SEP 2.1

Weather and Seasons

EARTH SCIENCE

Students investigate weather and changes to Earth's surface. They use tools and methods to build on their understanding of the weather. They use calendars to record observations and monitor change over a day, weeks, and months. Students use simple tools to observe, describe, analyze, and sort solid earth materials. They observe the properties of rocks of various sizes and study the results of weathering and erosion, and locate natural sources of water. Students explore how wind and water change the shape of the land and compare ways to slow the process of erosion. Students learn about how the weather changes through the seasons and how those changes impact living things.



Module Driving Questions:

- How do we observe and describe the weather?
- How are small pieces of rock made and moved to change landforms?
- How does weather change through the seasons?

Preview of Phenomena Investigated:

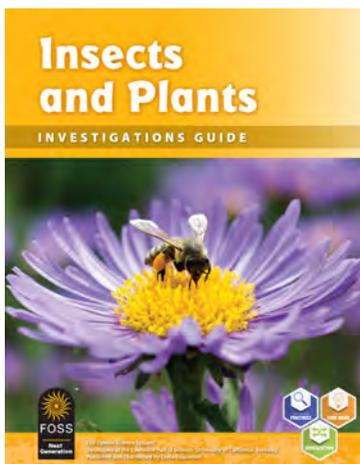
Students explore the phenomena of weather and changes to Earth's surface through weathering and erosion processes.

Virginia Science SOL & SEP: Matter 2.3; Earth and Space Systems 2.6, 2.7; Earth Resources 2.8; SEP 2.1

Insects and Plants

LIFE SCIENCE

The Insects and Plants Module builds understanding of growth and development of plants by observing new organisms over time. Students see the life cycles of insects unfold in real time and compare the structures and functions exhibited by each species to reveal patterns. At the same time, they grow a flowering plant in the classroom, and gain experience with the ways that plants and insects interact in feeding relationships, pollination, and seed dispersal.



Module Driving Question:

What is the natural history of some plants and animals in different habitats?

Preview of Phenomena Investigated:

Students observe patterns in the lives of insects and flowering plants as a way to make sense of the diversity of life in different habitats.

Virginia Science SOL & SEP: Living Systems and Processes 2.4, 2.5; Earth Resources 2.8; SEP 2.1



The background is a blurred photograph of a classroom. On the left, a person with long dark hair is partially visible. In the center, a person is wearing a white shirt with blue stripes on the sleeve. On the right, a person is wearing a blue and white plaid shirt. The overall scene is out of focus, emphasizing the text in the foreground.

“The FOSS lessons are student-led investigations that encompass many different learning styles and encourage a student’s natural curiosity and desire for learning. My students are excited for school and absolutely love science class.”

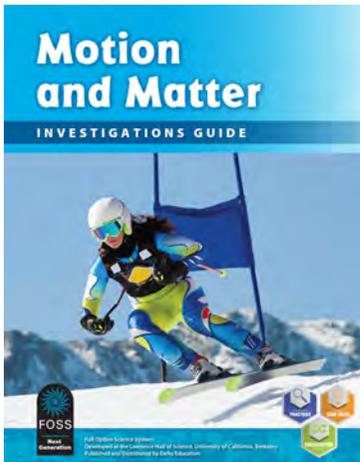
Donna R., Teacher
Giles County, VA

Module Descriptions for Grade 3

Motion and Matter

PHYSICAL SCIENCE

In the Motion and Matter Module, students explore forces and interactions, matter, and with engineering design. They work with magnets and paper clips, wheel-and-axle systems, paper air twirlers, and rotating tops. Students use their knowledge of science to experience the engineering design process. Finally, they build on the science concepts of matter and its interactions.



Module Driving Question:

What causes objects to move?

Preview of Phenomena Investigated:

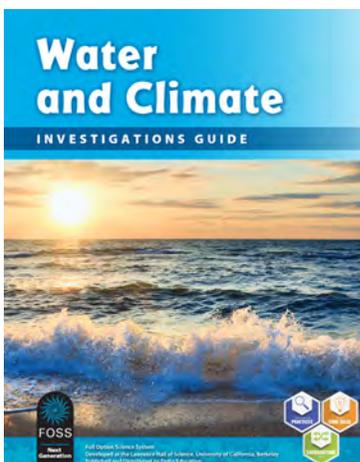
Students manipulate common objects to make sense of the patterns and causes of motion.

Virginia Science SOL & SEP: Force, Motion, and Energy 3.2; Matter 3.3; SEP 3.1

Water and Climate

EARTH SCIENCE

In the Water and Climate Module, students explore the properties of water, the water cycle and weather, interactions between water and other materials, and how we use water as a natural resource. They engage in science and engineering practices in the context of water, weather, and climate, and explore the crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; and systems and system models.



Module Driving Questions:

- How is water involved in weather?
- Are weather conditions the same around the world and through the year?

Preview of Phenomena Investigated:

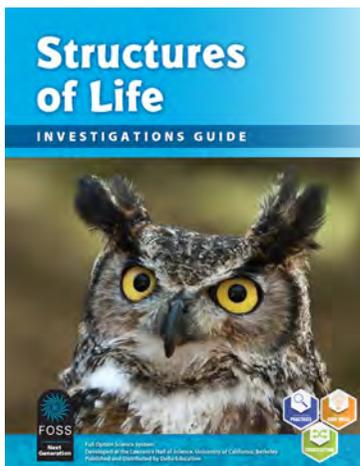
Students make sense of the properties of water and variations in weather to explain climate.

Virginia Science SOL & SEP: Earth and Space Systems 3.6, 3.7; Earth Resources 3.8; SEP 3.1

Structures of Life

LIFE SCIENCE

The Structures of Life Module consists of investigations dealing with the big ideas in life science: Plants and animals are organisms and exhibit a variety of strategies for life, organisms are complex and have a variety of observable structures and behaviors, organisms have varied but predictable life cycles and reproduce their own kind, and individual organisms have variations in their traits that may provide an advantage in surviving in the environment.



Module Driving Questions:

- Where do organisms come from and how do they survive?
- How are all the different kinds of plants and animals able to continue to exist on Earth?

Preview of Phenomena Investigated:

Students engage with the diversity of plants and animals they observe in our world to make sense of how organisms survive over time.

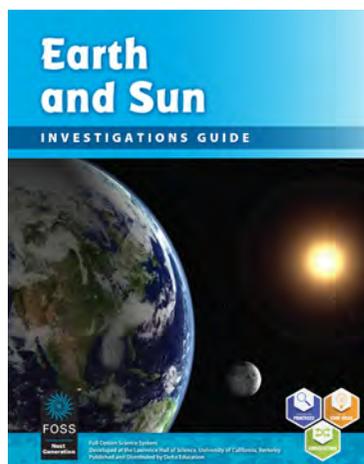
Virginia Science SOL & SEP: Life Systems and Processes 3.4, 3.5; Earth Resources 3.8; SEP 3.1

Module Descriptions for Grade 4

Earth and Sun

EARTH SCIENCE

The Earth and Sun Module focuses on Earth and the Sun as a system. Students collect and analyze shadow data. They observe the changes in the Moon's appearance over time. Then students explore the properties of the atmosphere, energy transfer from the Sun to Earth, and the dynamics of weather and water cycling in Earth's atmosphere.



Module Driving Question:

How do Earth's geosphere, hydrosphere, atmosphere, and biosphere interact to create a sustainable environment for all life?

Preview of Phenomena Investigated:

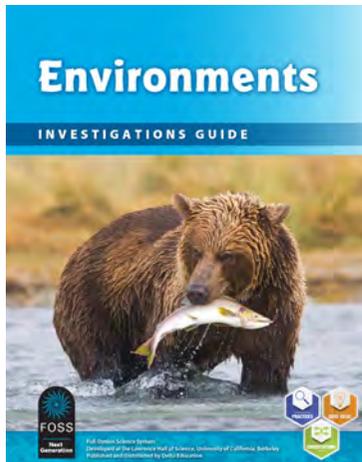
Students make sense of the patterns observed in the sky over a day, a month, a year, and their effect on different systems on Earth.

Virginia Science SOL & SEP: Earth and Space Systems 4.4, 4.5, 4.6; SEP 4.1

Environments

LIFE SCIENCE

The Environments Module focuses on the concepts that organisms need energy and matter to live and grow, and that living organisms depend on one another and on their environment. Students will determine an organism's preferences for various nonliving environmental factors; observe and record changes in organisms and their environment over time; identify and describe ecosystem feeding relationships; and conduct controlled experiments with organisms to discover their range of tolerance for environmental factors.



Module Driving Question:

How do the structures of terrestrial organisms function to support the survival of the organisms in that environment?

Preview of Phenomena Investigated:

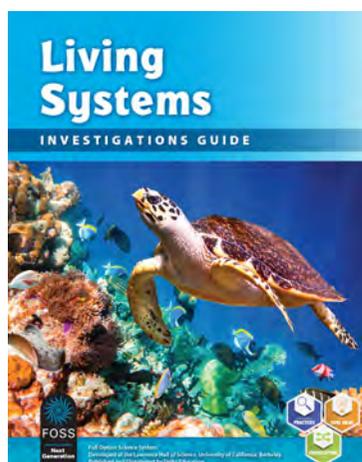
Students observe the structures and behaviors of organisms and the relationships between one organism and its environment to make sense of environmental conditions for survival.

Virginia Science SOL & SEP: Life Systems and Processes 4.2, 4.3; Earth and Space Systems 4.8; SEP 4.1

Living Systems

LIFE SCIENCE

The Living Systems Module looks at life at every level of organization—biosphere to individual organisms—to acknowledge that it is complex, involving multiple parts working together in systems to maintain the viability and vigor of the system. Students will observe and draw conclusions regarding the decomposition of organic matter; use models to explain how biological systems function; design and conduct investigations to discover how food is processed; and compare food webs on land and in marine ecosystems.



Module Driving Question:

How can we describe Earth's biosphere as a system of interacting parts?

Preview of Phenomena Investigated:

Students make sense of the biosphere in terms of its interacting organisms, environments, and ecosystems.

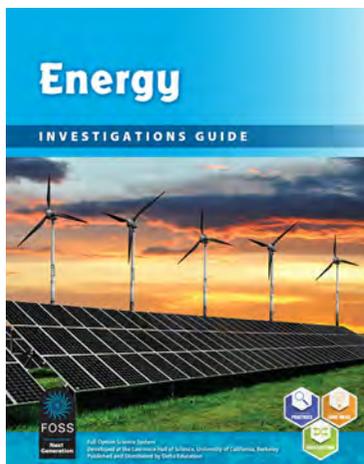
Virginia Science SOL & SEP: Life Systems and Processes 4.2, 4.3; Earth and Space Systems 4.7, 4.8; SEP 4.1

Module Descriptions for Grade 5

Energy

PHYSICAL SCIENCE

Students explore the concepts of energy and change, waves, and energy transfer in the Energy Module. Students experience electricity and magnetism as related effects and learn useful applications of electromagnetism in everyday life. They also consider energy transfer, force, and motion in different systems.



Module Driving Question:

How does energy transfer between systems?

Preview of Phenomena Investigated:

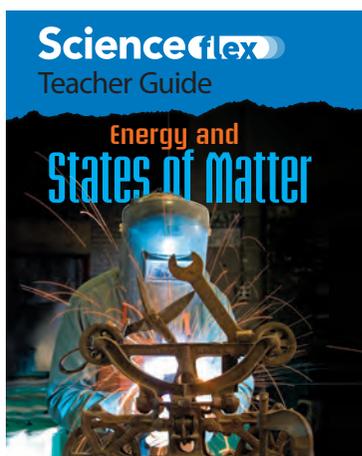
Students make sense of energy transferring from place to place by observing motion, electric current, sound, light, and heat.

Virginia Science SOL & SEP: Force, Motion and Energy 5.2, 5.3, 5.4, 5.5, 5.6, 5.9; SEP 5.1

ScienceFLEX Energy and States of Matter*

PHYSICAL SCIENCE

Students investigate with materials for physical and chemical properties and changes. Next, they explore the role of energy in changing matter from solids into liquids or gases and back again, and develop models to represent their thinking. Finally, they apply their new knowledge to the phenomena of icy, wet, humid weather on Earth and reinforce fourth grade SOLs.



Module Driving Question:

How are changes in the state of water involved in thunderstorms and other weather events?

Anchor Phenomenon:

Adding or taking away energy from water causes it to change from solid to liquid to gas and back again.

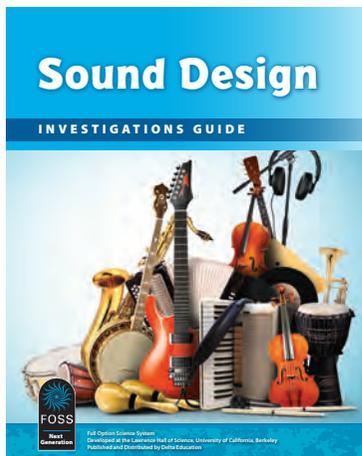
Virginia Science SOL & SEP: 5.1 and 5.7

*ScienceFLEX module provided by Delta Education®.

Sound Design

PHYSICAL SCIENCE

The Sound Design Module has three investigations that engage students with the phenomena of sound and the ways that humans and other animals use it in their lives. The driving question is: What is sound, and how can we produce and design sound? Through firsthand experiences students ask questions, plan and carry out investigations, interpret data, and construct explanations about sound. Students investigate sound sources to learn how energy is transferred to them, to cause vibrations, how the vibrations produce sound, and how those vibrations are detected by sound receivers.



Module Driving Questions:

- What causes the different sounds we hear?
- How does sound travel?
- How can we use vibrations to design musical instruments?

Preview of Phenomena Investigated:

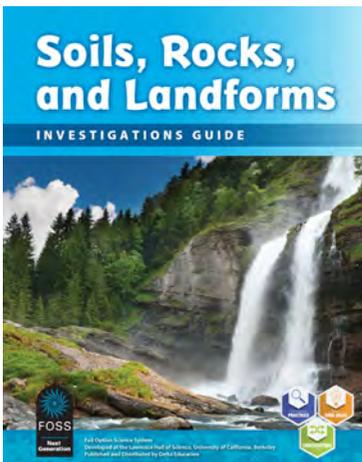
Sound energy can be generated, it can move from one place to another, it can do work, and it dissipates over time and distance.

Virginia Science SOL & SEP: Force, Motion and Energy 5.2, 5.5; SEP 5.1

Soils, Rocks, and Landforms

EARTH SCIENCE

The Soils, Rocks, and Landforms Module provides students with firsthand experiences with soils, rocks, and minerals, and modeling experiences to study changes to rocks and landforms at Earth's surface. Students will investigate the processes of physical and chemical weathering, soil composition, and how erosion and deposition alter landforms; analyze and interpret data from maps; identify minerals in common rocks; and observe how earth materials are used in the community around school.



Module Driving Questions:

- What are Earth's land surfaces made of?
- Why are landforms not the same everywhere?

Preview of Phenomena Investigated:

Students investigate various observable forms that make up Earth's surface to make sense of forces that change them.

Virginia Science SOL & SEP: Earth and Space Systems 5.8; SEP 5.1

FOSS® & Delta Education® K-5 Recommended Scope

Grade	Modules			
5	Energy and States of Matter*	Energy	Sound Design	Soils, Rocks & Landforms
4	Earth & Sun	Environments	Living Systems	
3	Motion & Matter	Water & Climate	Structures of Life	
2	Solids & Liquids	Forces in Action	Weather & Seasons	Insects & Plants
1	Sound & Light	Air & Weather	Plants & Animals	
K	Materials & Motion	Trees & Weather	Animals Two by Two	

*ScienceFLEX module provided by Delta Education®.

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At School Specialty, providing science curriculum is our specialty, every day of every year. We'll be right there with you, from purchase through implementation and ongoing annual professional development. Our team is supported by experienced FOSS consultants and by the program authors themselves at the Lawrence Hall of Science. We go beyond the ordinary to ensure that you have all you need to ignite your students' curiosity. With decades of combined FOSS experience, we stand ready to support your success.

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