

# FIFTH GRADE

## FOSS: Earth and Sun

**Anchor phenomenon:** Patterns observed in the sky over a day, a month, a year, and more, and their effects on Earth

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

The constant renewal of water on Earth's land surfaces by the activities in the atmosphere is one of the defining characteristics of Earth, the water planet. Students investigate the properties of the atmosphere, energy transfer from the Sun to Earth, and the dynamics of weather and water cycling in Earth's atmosphere. Other experiences help students to develop and use models to understand Earth's place in the solar system, and the interactions of Earth, the Sun, and the Moon to reveal predictable patterns—daily length and direction of shadows, day and night, and the seasonal appearance of stars in the night sky.

### **New York State Science Learning Standards:**

Earth Sciences: 5-ESS1-1, 5-ESS1-2, 5-ESS2-1, 5-ESS2-2, 5-ESS3-1

Physical Sciences: 5-PS1-1, 5-PS2-1

Engineering Design: 3-5 ETS1-2, 3-5 ETS1-3

### **Practices:**

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

### **Crosscutting Concepts:**

- Patterns
- Cause and effect
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter

## FOSS: Living Systems

**Anchor phenomenon:** Ecosystems and organisms and their interacting parts

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

Students start by looking at Earth as the interaction of four Earth systems or subsystems—the geosphere, the atmosphere, the hydrosphere, and the biosphere. They focus on the biosphere and investigate systems on different scales—nutrient and transport systems within an organism that moves matter and provides energy to the individual organism, and feeding relationships in ecosystems that move matter among plants, animals, decomposers, and the environment. They come to understand that plants get the materials they need for growth primarily from water and air, and that energy in animals' food was once energy from the Sun. Students explore how human activities in agriculture, industry, and everyday life can have major effects on these systems

### **New York State Science Learning Standards:**

Life Sciences: 5-LS1-1, 5-LS2-1, 4-LS1-2\*

Physical Sciences: 5-PS3-1

Earth Sciences: 5-ESS2-1, 5-ESS3-1

### **Practices:**

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

### **Crosscutting Concepts:**

- Patterns
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change

## Amplify: Modeling Matter

**Anchor phenomenon:** Chromatography is a process for separating mixtures. Some solids dissolve in a salad dressing while others do not. Oil and vinegar appear to separate when mixed in a salad dressing.

What happens when two substances are mixed together?

In the role of food scientists working for fictional company Good Food Production, Inc., students are introduced to the idea that all matter is made of particles too small to see, and that each different substance is made of particles (molecules) that are unique. They are then challenged to solve two problems: One problem requires them to separate a mixture, and the other requires them to make unmixable substances mix. Students are challenged to use the particulate model of matter to explain their work to the CEO of the company. In doing so, students figure out that the properties of materials are related to the properties of the nano-particles that make up those materials.

### **New York State Science Learning Standards:**

Physical Science: 5-PS1-1, 5-PS1-2, 5-PS1-3, 5-PS1-4

Engineering Design: 3-5-ETS1-2

### **Practices:**

- Developing and using models
- Obtaining, evaluating, and communicating information
- Planning and carrying out investigations
- Engaging in argument from evidence

### **Crosscutting Concepts:**

- Scale, proportion, and quantity
- Energy and matter
- Stability and change