

## Landforms

Students investigate the processes that shape the earth. Some changes of the earth surface are due to slow processes such as erosion and deposition while other changes are rapid like landslides, volcanic eruptions, and earthquakes. Students will also create and utilize various tools such as map projections and topographical maps to interpret features of Earth's surface.

**Unit Length:** 8 weeks

**Resources:** FOSS Landforms Module  
FOSS Landforms Science Stories

**Essential Questions:** How do slow processes such as erosion and deposition, shape and reshape the Earth's surface?  
How do rapid processes such as landslides, volcanic eruptions, and earthquakes shape and reshape the Earth's surface?  
How can two-dimensional maps be used to represent three-dimensional earth features?

**NJCCCS:**

<b>Science Content (Declarative Conceptual Knowledge)</b>	<b>NJCCCS</b>
<b>Students Will Know and Understand:</b>	
Models represent objects that are very large or processes that occur over long periods of time	5.4 B & C
Models and maps are ways of representing landforms and human structures	5.4 B & C
Maps can be made from models	5.4 B & C
Water is an important agent in shaping landforms	5.4 B & C
Some changes of the earth's surface are due to slow processes such as erosion and deposition. The wearing away of earth is erosion; the settling of eroded material is deposition	5.4 B & C
Landforms that result from running water include canyons, deltas, and alluvial fans	5.4 B & C
The slope of the land over which a river flows affects the processes of erosion and deposition	5.4 B & C
During flooding, the rate of erosion and deposition increases	5.4 B & C
Humans affect the processes of erosion and deposition	5.4 B & C
Some changes of the earth's surface are due to rapid processes such as landslides, volcanic eruptions, and earthquakes	5.4 B & C
Topographic maps are two-dimensional representations of three-dimensional surfaces	5.4 B & C
Topographic maps show contour lines, which represent points of equal elevation	5.4 B & C
Topographic maps use symbols and color to represent landforms	5.4 B & C
Cartographers use aerial photographs as one tool in constructing topographic maps	5.4 B & C
Landform maps can be generated from aerial photographs	5.4 B & C

<b>Thinking Processes (Procedural Knowledge)</b> <b>NJCCCS 5.1 A-D</b>	<b>NJCCCS</b>
<b>Students Will Be Able To:</b>	
Create a model of the schoolyard	5.4 B & C
Make a representation of the schoolyard using a grid system to transfer information to a smaller map	5.4 B & C
Compare the features on the models and the corresponding maps	5.4 B & C
Observe and measure the effects of flowing water in the stream table	5.4 B & C
Compare the features created in the stream tables	5.4 B & C
Relate the processes in the stream table to the processes of erosion and deposition	5.4 B & C
Experiment to find the effect of slope and floods on erosion and deposition	5.4 B & C
Relate the stream table results to natural processes	5.4 B & C
Simulate landslides, volcanic eruptions, and earthquakes and observe their effect on earth features	5.4 B & C
Observe features on a mount model and compare them to a two-dimensional topographic map	5.4 B & C
Create a topographic map from a model	5.4 B & C
Relate topographic features to symbolic representations on maps	5.4 B & C
Interpret aerial photographs	5.4 B & C
Relate information on maps and aerial photographs to the actual landforms	5.4 B & C

**Assessment:** Teacher observation, running records of skill attainment, hands-on activities, unit assessment

## Water

Water is the most important substance on Earth. It dominates the surface of our planet, changes the face of the land, and defines life. Students investigate these ideas by exploring properties of water, changes in water, interactions between water and other earth materials, and how humans use water.

**Unit Length:** 8 weeks

**Resources:** FOSS Water Module  
FOSS Water Science Stories

**Essential Questions:** What are the properties of water and how do these properties affect water’s interaction with other materials?  
How does heat affect water?  
How can water be used to do work?  
How do human requirements affect water quality?

**NJCCCS:**

<b>Science Content (Declarative Conceptual Knowledge)</b>	<b>NJCCCS</b>
<b>Students Will Know and Understand:</b>	
Water has several observable properties, including transparency, shapelessness, and movement or flow.	5.2 A &B 5.4 E & G
Water beads up on some materials and is absorbed by other materials	5.2 A &B 5.4 E & G
Surface tension is the skin-like surface of water that pulls it together into the smallest possible volume.	5.2 A &B 5.4 E & G
Water flows downhill.	5.2 A &B 5.4 E & G
Water expands when heat is added.	5.2 A &B 5.4 E & G
Water contracts when heat is taken away.	5.2 A &B 5.4 E & G
Cold water is denser than warm water .	5.2 A &B 5.4 E & G
Water is densest at 4°C.	5.2 A &B 5.4 E & G
Ice is less dense than liquid water.	5.2 A &B 5.4 E & G
A solid has definite volume and shape; a liquid has only definite volume.	5.2 A &B 5.4 E & G
Evaporation is the process by which liquid water changes into water vapor, a gas.	5.2 A &B 5.4 E & G
Temperature affects the rate of evaporation.	5.2 A &B 5.4 E & G

The surface area of a liquid affects the rate of evaporation.	5.2 A &B 5.4 E & G
Condensation occurs when water vapor touches a cool surface and changes into liquid.	5.2 A &B 5.4 E & G
Evaporation and condensation contribute to the movement of water through the water cycle.	5.2 A &B 5.4 E & G
Some earth materials absorb more water than other earth materials do.	5.2 A &B 5.4 E & G
Water flows more easily through some earth materials than through others.	5.2 A &B 5.4 E & G
Flowing water can be used to do work.	5.2 A &B 5.4 E & G
Water contains different materials that affect its quality.	5.2 A &B 5.4 E & G
Evaporation can be used to detect materials dissolved in water.	5.2 A &B 5.4 E & G

<b>Thinking Processes (Procedural Knowledge)</b> <b>NJCCCS 5.1 A-D</b>	<b>NJCCCS</b>
<b>Students Will Be Able To:</b>	
Observe and compare water on a variety of surfaces.	5.2 A &B 5.4 E & G
Observe and compare rates of water flow.	5.2 A &B 5.4 E & G
Observe and compare the interaction of water at different temperatures.	5.2 A &B 5.4 E & G
Observe and describe the properties of water in two states, solid and liquid.	5.2 A &B 5.4 E & G
Observe evaporation and condensation.	5.2 A &B 5.4 E & G
Compare rates of evaporation under different conditions.	5.2 A &B 5.4 E & G
Organize results from evaporation investigations.	5.2 A &B 5.4 E & G
Observe and compare movement of water through different materials.	5.2 A &B 5.4 E & G
Observe water power.	5.2 A &B 5.4 E & G
Organize results of investigation of water samples.	5.2 A &B 5.4 E & G
Describe and communicate observations.	5.2 A &B 5.4 E & G

**Assessment:** Teacher observation, running records of skill attainment, hands-on activities, unit assessment

# Magnetism and Electricity

**Unit Length:** 8 weeks

**Resources:** FOSS Magnetism and Electricity Module  
FOSS Magnetism and Electricity Science Stories

**Essential Questions:** What variables influence the force of attraction or repulsion between two magnets?  
How can the presence of a magnet be detected?  
How does electricity flow through a system?  
What materials permit the flow of electricity?  
How can electricity be used to produce heat, light, sound, and magnetic effects?

**NJCCCS:**

Science Content (Declarative Conceptual Knowledge)	NJCCCS
<b>Students Will Know and Understand:</b>	
Magnets stick to metal objects made of iron.	5.2 D & E
Magnetic interactions are caused by the magnetic force.	5.2 D & E
Magnets display forces of attraction and repulsion that decrease with distance.	5.2 D & E
Magnetism can be induced in a piece of steel that is close to or touching a magnet.	5.2 D & E
Electricity flows through pathways called circuits.	5.2 D & E
A switch is a device used to open and close circuits.	5.2 D & E
An open circuit is an incomplete electric pathway; a closed circuit is a complete pathway.	5.2 D & E
Materials that allow electricity to flow are conductors; those that do not are insulators.	5.2 D & E
A circuit with only one pathway for current flow is a series circuit. Components “share” the electric energy.	5.2 D & E
A circuit with two or more pathways for current flow is a parallel circuit. Components each have a direct pathway to the energy source.	5.2 D & E
A core of iron or steel becomes an electromagnet when electricity flows through a coil of insulated wire surrounding it.	5.2 D & E
There are a number of ways to change the strength of an electromagnet, including changing the number of winds of wire around the core.	5.2 D & E
An electromagnet placed in a complete circuit can be used to make a telegraph.	5.2 D & E
A switch can serve as a key in a telegraph system.	5.2 D & E
A code is a symbolic system used for communication.	5.2 D & E
Technology is the application of science.	5.2 D & E

<b>Thinking Processes (Procedural Knowledge)</b> <b>NJCCCS 5.1 A-D</b>	<b>NJCCCS</b>
<b>Students Will Be Able To:</b>	
Observe magnetic interactions and sort objects based on whether they are affected by a magnet.	5.2 D & E
Measure the force of attraction between magnets.	5.2 D & E
Record and Analyze results of investigations.	5.2 D & E
Build a test circuit and test objects for conductivity.	5.2 D & E
Predict conductivity of materials.	5.2 D & E
Sort materials based on whether they conduct electricity.	5.2 D & E
Observe the functioning of different kinds of circuits.	5.2 D & E
Compare the brightness of lamps in different kinds of circuits.	5.2 D & E
Determine the defining characteristics of series and parallel circuits.	5.2 D & E
Analyze and solve circuitry problems.	5.2 D & E
Observe the interaction between an electromagnet and objects.	5.2 D & E
Systematically investigate ways to strengthen electromagnets.	5.2 D & E
Compare the strength of electromagnets.	5.2 D & E
Organize data, conduct multiple trials, average results, and display results in a graph.	5.2 D & E
Explore the behavior of an electromagnet under different conditions.	5.2 D & E
Encode and decode clicks produced by a telegraph.	5.2 D & E

**Assessment:** Teacher observation, running records of skill attainment, hands-on activities, unit assessment

## Respiratory and Circulatory Systems

Students explore the structure and function of the respiratory and circulatory systems. They will develop an understanding of how the two systems are interdependent and how some illnesses and diseases affect the two systems. Students will research common illnesses and diseases and communicate their findings. They will analyze how healthy habits and diet can prevent some illnesses and diseases.

**Unit Length:** 2-3 Weeks

**Resources:** *Discovery Works* Grade 4 Textbook

**Essential Questions:** How do the respiratory and circulatory systems function interdependently?  
 What are the main organs and tissues involved in the circulatory and respiratory systems?  
 What illnesses and diseases are related to the respiratory and circulatory systems?

**NJCCCS:**

<b>Science Content (Declarative Conceptual Knowledge)</b>	<b>NJCCCS</b>	
<b>Students Will Know and Understand:</b>	<b>Science</b>	<b>Health</b>
The respiratory system brings oxygen into the body necessary for proper body functioning.	5.3A	
The circulatory system circulates blood carrying oxygen and nutrients to all of the parts of the body.	5.3A	
The respiratory system and circulatory systems are both made up of multiple organs that work together to complete a body function.	5.3A	
The respiratory and circulatory systems work interdependently.	5.3A	
Blood, muscle, and cartilage are examples of body tissues that make up the organs that make up the body systems.	5.3A	
There are many illnesses and diseases that are related to the respiratory and circulatory systems such as bronchitis, pneumonia, lung cancer, high blood pressure, heart disease, and strokes.		2.1 C
Through healthy habits and diet some illnesses and diseases related to the respiratory and circulatory systems can be prevented.		2.1 C 2.3 B

<b>Thinking Processes (Procedural Knowledge)</b> <b>NJCCCS 5.1 A-D</b>	<b>NJCCCS</b>	
<b>Students Will Be Able To:</b>	<b>Science</b>	<b>Health</b>
Identify organs and tissues involved in the respiratory and circulatory systems.	5.3A	
Demonstrate how the respiratory and circulatory systems work interdependently.	5.3A	
Research illnesses and diseases related to the respiratory and circulatory systems.		2.1 C
Discuss how healthy habits and diet can prevent some respiratory and circulatory illnesses and diseases.		2.1 C 2.3 B

**Assessment:** Teacher observation, running records of skill attainment, hands-on activities, unit assessment

## Space Science: The Sun, Earth, and Moon

Students investigate the relationships between the sun, Earth, and moon and how they interact as a system. Through simulation students will understand and demonstrate how the Earth moves during a day and throughout the year. They will communicate how this movement combined with the movement of the moon creates different moon phases and solar and lunar eclipses.

**Unit Length:** 3-4 weeks

**Resources:** *GEMS* Space Science Module Investigations 3 & 4  
*GEMS* Space Science Readers

**Essential Questions:** How does the Earth move throughout the day?  
How does the Earth move throughout the year?  
Why do we see different phases of the moon?  
What causes solar and lunar eclipses?

**NJCCCS:**

<b>Science Content (Declarative Conceptual Knowledge)</b>	<b>NJCCCS</b>
<b>Students Will Know and Understand:</b>	
The Earth rotates on an axis.	5.4 A
The Earth rotates on its axis approximately every 24 hours (23 ¼ hours) which equals one Earth day.	5.4 A
The Earth revolves around the sun in approximately 365 days which equals one Earth year.	5.4 A
The moon is a satellite of the Earth and rotates around the Earth. One rotation is approximately one month.	5.4 A
The phases of the moon are caused by the Earth's position and moon's position in relation to the sun.	5.4 A
There are eight moon phases.	5.4 A
Lunar eclipses occur when the Earth casts a shadow on the moon.	5.4 A
Solar eclipses occur when the sun, moon, and Earth line up and the moon casts a shadow on the Earth.	5.4 A

<b>Thinking Processes (Procedural Knowledge)</b>	<b>NJCCCS</b>
<b>NJCCCS 5.1 A-D</b>	
<b>Students Will Be Able To:</b>	
Simulate sun, Earth, and moon relationships; rotation, revolution, phases, and eclipses.	5.4 A
Observe and draw moon phases seen in the night sky over the period of a month.	5.4 A
Identify the moon phases using an identification key.	5.4 A
Communicate understanding of sun, Earth, and moon relationships.	5.4 A

**Assessment:** Teacher observation, running records of skill attainment, hands-on activities, unit assessment

