



**Course Description**  
**Grades 3-5**  
**National (NGSS)**  
**2016-17**



## Table of Contents

### **DISCIPLINARY CORE IDEA: PS1 MATTER AND ITS INTERACTIONS ..... 5**

<b>Matter and Its Interactions.....</b>	<b>5</b>
<b>Observing Physical Properties</b> (Suggested Grade Level: 3) .....	5
<b>Measuring Physical Properties</b> (Suggested Grade Level: 4) .....	6
<b>Physical Properties of Matter</b> (Suggested Grade Level: 5) .....	7
<b>States of Matter</b> (Suggested Grade Level: 3) .....	8
<b>Changing States of Matter</b> (Suggested Grade Level: 4) .....	8
<b>Mixtures</b> (Suggested Grade Level: 3).....	9
<b>Separating Mixtures</b> (Suggested Grade Level: 4).....	10
<b>Mixtures and Solutions</b> (Suggested Grade Level: 5) .....	10
<b>Physical and Chemical Changes</b> (Suggested Grade Level: 5) .....	11

### **DISCIPLINARY CORE IDEA: PS2 MOTION AND STABILITY: FORCES AND INTERACTIONS ..... 12**

<b>Forces, Motion, and Interactions.....</b>	<b>12</b>
<b>Force</b> (Suggested Grade Level: 3) .....	12
<b>Forces on an Object</b> (Suggested Grade Level: 4).....	13
<b>Effects of Force</b> (Suggested Grade Level: 5) .....	14
<b>Force and Motion</b> (Suggested Grade Level: 5) .....	15

### **DISCIPLINARY CORE IDEA: PS3 ENERGY ..... 16**

<b>Energy and Energy Transfer.....</b>	<b>16</b>
<b>Energy</b> (Suggested Grade Level: 3) .....	16
<b>Forms of Energy</b> (Suggested Grade Level: 3).....	17
<b>Energy Conversions</b> (Suggested Grade Level: 5) .....	18
<b>Light</b> (Suggested Grade Level: 5) .....	19
<b>Electrical Circuits</b> (Suggested Grade Level: 5) .....	20
<b>Electricity</b> (Suggested Grade Level: 5) .....	21

### **DISCIPLINARY CORE IDEA: PS4 WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER..... 22**

<b>Light.....</b>	<b>22</b>
<b>Light</b> (Suggested Grade Level: 5) .....	22



## **DISCIPLINARY CORE IDEA: LS1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES ..... 23**

<b>Structure, Growth, and Development of Organisms .....</b>	<b>23</b>
<b>Food and Nutrition</b> (Suggested Grade Level: 4) .....	23
<b>Muscular and Skeletal Systems</b> (Suggested Grade Level: 3) .....	24
<b>Growth and Change</b> (Suggested Grade Level: 3) .....	24
<b>Comparing Life Cycles</b> (Suggested Grade Level: 4) .....	25
<b>Life Cycles</b> (Suggested Grade Level: 5) .....	26

## **DISCIPLINARY CORE IDEA: LS2 ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS ..... 27**

<b>Interdependent Relationships in Ecosystems.....</b>	<b>27</b>
<b>Food Chains</b> (Suggested Grade Level: 3) .....	27
<b>Food Webs</b> (Suggested Grade Level: 4) .....	28
<b>Energy Flow through Food Webs</b> (Suggested Grade Level: 5).....	28
<b>Habitats and Organisms</b> (Suggested Grade Level: 3).....	29
<b>Producers and Consumers</b> (Suggested Grade Level: 4) .....	30
<b>Organisms and their Environment</b> (Suggested Grade Level: 5) .....	30
<b>Environmental Changes</b> (Suggested Grade Level: 3) .....	31
<b>Changes in Ecosystems</b> (Suggested Grade Level: 5) .....	32
<b>Carbon dioxide-Oxygen Cycle</b> (Suggested Grade Level: 5).....	33
<b>Cycling of Matter</b> (Suggested Grade Level: 5).....	33

## **DISCIPLINARY CORE IDEA: LS3 HEREDITY: INHERITANCE AND VARIATION OF TRAITS ..... 35**

<b>Inheritance and Variation of Traits .....</b>	<b>35</b>
<b>Inherited Traits</b> (Suggested Grade Level: 3) .....	35
<b>Traits and Characteristics</b> (Suggested Grade Level: 4).....	35
<b>Inherited Traits vs. Learned Characteristics</b> (Suggested Grade Level: 5).....	36

## **DISCIPLINARY CORE IDEA: LS4 BIOLOGICAL EVOLUTION: UNITY AND DIVERSITY 37**

<b>Organisms: Unity and Diversity .....</b>	<b>37</b>
<b>Adaptations</b> (Suggested Grade Level: 3) .....	37
<b>Environments and Adaptations</b> (Suggested Grade Level: 4) .....	37
<b>Adaptations and Survival</b> (Suggested Grade Level: 5).....	38
<b>Classifying Plants</b> (Suggested Grade Level: 5).....	39
<b>Classifying Animals</b> (Suggested Grade Level: 5).....	40

## **DISCIPLINARY CORE IDEA: ESS1 EARTH’S PLACE IN THE UNIVERSE ..... 41**



<b>Earth’s Place in the Universe</b> .....	<b>41</b>
The Solar System (Suggested Grade Level: 3) .....	41
Earth, Moon and Sun (Suggested Grade Level: 3) .....	41
Characteristics of the Sun, Moon, and Earth (Suggested Grade Level: 5) .....	42
Earth Cycles (Suggested Grade Level: 5) .....	43
<b>DISCIPLINARY CORE IDEA: ESS2 EARTH’S SYSTEMS</b> .....	<b>44</b>
<b>Earth's Systems</b> .....	<b>44</b>
Earth’s Ever Changing Surface (Suggested Grade Level: 3) .....	44
Landforms (Suggested Grade Level: 3) .....	45
Observing Change (Suggested Grade Level: 4) .....	45
Changes on Earth’s Surface (Suggested Grade Level: 5) .....	46
Learning from the Past (Suggested Grade Level: 5) .....	47
Weather (Suggested Grade Level: 3) .....	47
Energy from the Sun and Weather (Suggested Grade Level: 4) .....	48
Weather or climate? (Suggested Grade Level: 5) .....	49
Recognizing Patterns in Changes (Suggested Grade Level: 4) .....	49
The Water Cycle (Suggested Grade Level: 5) .....	50
<b>DISCIPLINARY CORE IDEA: ESS3 EARTH AND HUMAN ACTIVITY</b> .....	<b>51</b>
<b>Natural Resources and Human Activity</b> .....	<b>51</b>
Soil Formation (Suggested Grade Level: 3) .....	51
Soil Properties and Experiments (Suggested Grade Level: 4) .....	51
Earth’s Natural Resources (Suggested Grade Level: 3) .....	52
Conserving Resources (Suggested Grade Level: 4) .....	53
Energy Resources (Suggested Grade Level: 5) .....	53
<b>DISCIPLINARY CORE IDEA: SCIENCE AND ENGINEERING PRACTICES</b> .....	<b>54</b>
<b>Scientific Investigation and Reasoning</b> .....	<b>54</b>
Safety and Scientific Processes (Suggested Grade Level: 3, 4, 5) .....	54



## Disciplinary Core Idea: PS1 Matter and its Interactions

### Matter and Its Interactions

**Description:** Students will learn that matter has mass and occupies space; all matter is made of particles too small to be seen; particles of matter are arranged differently in solids, liquids, and gases; when two or more different substances are mixed, it may or may not result in the formation of a new substance.

### Unit 1

#### Observing Physical Properties (Suggested Grade Level: 3)

#### Instruction Module

In this module, students recognize that all objects are made of matter. They are introduced to the physical properties of matter such as temperature, mass, magnetism, and density. They learn that these properties can be observed and measured using tools and equipment. They are also introduced to the concept of buoyancy.

#### Interactivity/ Simulation

Physical Properties interactivity: In the interactive section of the module, students first identify the tools or measuring devices used to measure temperature and mass. Then, they read the temperature or compare masses.

Matter and Mass Simulation: In this simulation students will predict and measure the mass of objects that have the same volume but are made out of different materials.

#### Glossary

Observing Physical Properties

#### Assessed concepts/ topics

The questions in the assessment section test students' understanding of the following concepts: tools used to measure physical properties, materials that are attracted to magnets, hardness of materials, reading thermometers, and relative masses. The additional questions test students' understanding of density and buoyancy.

#### Activities

Observing Physical Properties: Sink or Float

Measuring Water Temperature (Experimental Investigation)

#### Journals

Journal #1  
Journal #2



<b>Unit 2</b>	<b>Measuring Physical Properties (Suggested Grade Level: 4)</b>
<b>Instruction Module</b>	In this module, students learn to measure, compare, and contrast physical properties of matter, including size, mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float. They learn that the physical state of matter depends on the energy and arrangement of the particles of matter. They learn about some of the tools that are used to measure the physical properties of matter such as thermometer, triple beam balance, and graduated cylinder.
<b>Interactivity/ Simulation</b>	Float or Sink interactivity: In the interactive section of the module, students “drop” various objects in water and observe them as they float or sink. Based on their observations, they decide whether or not the object is denser than water.
<b>Glossary</b>	Measuring Physical Properties
<b>Assessed concepts/ topics</b>	The questions in the assessment section test students’ understanding of the following concepts: floating and sinking, relative density, measurement of volume, and states of matter. The additional questions test students’ ability to identify the correct tools and units to measure mass, read temperatures, and identify the states of matter.
<b>Activities</b>	Measuring the Temperature of Pure Water and Salt Water
<b>Journals</b>	Journal #1 Journal #2
<b>Expository text passages/ activities</b>	Measurement: Measuring, Comparing and Contrasting Sizes



<b>Unit 3</b>	<b>Physical Properties of Matter (Suggested Grade Level: 5)</b>
<b>Instruction Module</b>	<p>In this module, students learn that matter can be classified based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy. They are presented with information about the properties of solids, liquids, and gases and recognize that the mass of an object is a constant property. They learn that the boiling and freezing/melting points of substances are constants and identify the boiling point and freezing point of water.</p>
<b>Interactivity/ Simulation</b>	<p>Physical Properties of Matter interactivity: In the interactive section of the module, students identify the boiling point, the melting point, and the freezing point of water on the Celsius scale.</p> <p>Thermal Energy—Conductor or Insulator simulation: In this simulation students will classify materials as thermal insulators or thermal conductors by conducting a simple investigation.</p>
<b>Glossary</b>	Physical Properties of Matter
<b>Assessed concepts/ topics</b>	<p>The questions in the assessment section test students' understanding of the following concepts: conductors and insulators, properties of solids, liquids, and gases, and attraction to magnets. The additional questions test students' ability to identify the boiling and freezing points of water, draw conclusions from information given in a chart, and recognize that liquids have a definite volume.</p>
<b>Activities</b>	<p>Classifying Matter (STEM Activity)</p> <p>Using Physical Properties to Classify Matter</p>
<b>Journals</b>	Journal 1 Journal 2



<b>Unit 4</b>	<b>States of Matter (Suggested Grade Level: 3)</b>
<b>Instruction Module</b>	In this module, students learn how to describe and classify samples of matter as solids, liquids, and gases. They differentiate between solids, liquids, and gases, and recognize that solids have a definite shape, and liquids and gases take the shape of their container. They learn that solids, liquids, and gases differ in their properties because of the difference in the arrangement of the particles of matter within them. They predict and observe changes in the state of matter caused by heating or cooling.
<b>Interactivity</b>	Matter Sorter interactivity: In the interactive section of the module, students identify and classify given materials as solids, liquids, or gases, based on their physical properties.
<b>Glossary</b>	States of Matter
<b>Assessed concepts/ topics</b>	The questions in the assessment section test students' understanding of the following concepts: properties of solids, liquids, and gases, and the arrangement of particles of matter in each of them. The additional questions test students' ability to recognize the properties of solids, liquids, and gases, the tools used to measure mass and volume, and the processes of melting, freezing, and evaporation.
<b>Activities</b>	States of Matter and Venn Diagram  Matter and Energy: Dissolving a Sugar Cube
<b>Journal entries</b>	Journal #1 Journal #2
<b>Unit 5</b>	<b>Changing States of Matter (Suggested Grade Level: 4)</b>

**Instruction Module**

In this module, students learn that matter can be grouped into solids, liquids, and gases based on their physical properties. They learn about the arrangement and the forces of attraction between the particles of matter. They predict and observe the changes caused by heating and cooling. They learn how heating and cooling causes the particles of matter to gain or lose energy.





<b>Interactivity</b>	Changing States of Matter interactivity: In the interactive section of the module, students identify the energy change (adding heat or removing heat) required to bring about specific changes in the states of matter.
<b>Glossary</b>	Changing States of Matter
<b>Assessed concepts/ topics</b>	The questions in the assessment section test students' understanding of the following concepts: changes in states of matter caused by heating or cooling, arrangement of particles of matter and forces between them in solids, liquids, and gases, sequence of changes in a materials caused by heating or cooling, and the processes of melting, freezing, boiling, and condensation. The additional questions test students' ability to interpret information from charts and graphs, and recognize the energy changes of the particles of matter during heating and cooling.
<b>Journal entries</b>	Journal #1 Journal #2
<b>Unit 6</b>	<b>Mixtures (Suggested Grade Level: 3)</b>
<b>Instruction Module</b>	In this module, students are introduced to mixtures. They learn that a mixture is created when two or more materials are physically combined. Through various examples, they learn that the ingredients in a mixture retain most of their physical properties. They learn about some of the techniques and tools used to separate the ingredients of mixtures.
<b>Interactivity</b>	In The Mix! interactivity: In the interactive section of the module, students identify mixtures and sort given materials into two groups - "mixture" and "not a mixture" (pure substances).
<b>Glossary</b>	Mixtures
<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: mixtures and pure substances, and tools and techniques used to separate mixtures based on the physical properties of the ingredients. The additional questions test students' ability to identify the properties of the ingredients in a mixture and suggest the most suitable tools and techniques to separate them.



<b>Journal entries</b>	Journal #1 Journal #2
<b>Unit 7</b>	<b>Separating Mixtures (Suggested Grade Level: 4)</b>
<b>Instruction Module</b>	In this module, students learn to differentiate between mixtures and pure substances. They are introduced to solutions, homogeneous mixtures, and heterogeneous mixtures. They learn that a mixture can be separated into its ingredients using various tools and techniques, including the use of magnets and sieves, and the basics of chromatography.
<b>Interactivity</b>	Mix Your Cake and Eat It Too! interactivity: This module includes a number of snippets of interesting information and does not include an interactive section.
<b>Glossary</b>	Separating Mixtures
<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: homogeneous and heterogeneous mixtures, solutions, and separation of mixtures using tools and techniques. The additional questions test students' ability to identify homogeneous and heterogeneous mixtures and identify tools used to separate mixtures based on the properties of the ingredients.
<b>Activities</b>	Comparing Mixtures and Solutions Identifying Mixtures and Solutions
<b>Journal entries</b>	Journal #1 Journal #2
<b>Unit 8</b>	<b>Mixtures and Solutions (Suggested Grade Level: 5)</b>
<b>Instruction Module</b>	In this module, students are presented with various examples of mixtures. They observe and learn that some mixtures maintain physical properties of their ingredients. They identify changes that can occur in the physical properties of the ingredients of solutions, such as dissolving salt in water. They differentiate between homogeneous and heterogeneous mixtures. They learn that the physical properties of the ingredients help to separate mixtures, and learn about the various tools and techniques used.



<b>Interactivity/ Simulation</b>	Properties of Mixtures simulation: In this simulation students will investigate to find out whether particles of different materials maintain their size, which is a physical property, or dissolve when mixed with water.
<b>Glossary</b>	Mixtures and Solutions
<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: mixtures, tools and techniques used to separate mixtures based on the physical properties of the ingredients, and solutions. The additional questions test students' ability to identify techniques to separate a mixture, recognize properties that change when a solution is formed, and recognize that the mass of the ingredients does not change when a mixture is created.
<b>Activity</b>	The ingredients of Solutions
<b>Journal entries</b>	Journal 1 Journal 2
<b>Unit 9</b>	<b>Physical and Chemical Changes</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this Instruction Module, students are presented with various examples of physical and chemical changes including separation of mixtures, cutting and folding of paper, changes in states of matter, and burning of paper. They understand that physical changes are changes in matter that do not result in the formation of a new substance and chemical changes are changes in matter that result in the formation of a new substance. They learn through examples that production of a gas, change in temperature, production of a precipitate, and color change are evidence or indications of a possible chemical change. They also understand the law of conservation of mass.
<b>Interactivity/ Simulation</b>	The Change Detector! interactivity: In this interactivity, students observe various changes and identify each as a physical change or a chemical change, based on whether or not a new substance is formed.



**Glossary**      Physical and Chemical Changes

<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: Changes in state caused by changes in temperature, physical changes, chemical changes, evidence of chemical changes, and separation of mixtures.
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**Journal**      Journal 1

## Disciplinary Core Idea: PS2 Motion and Stability: Forces and Interactions

### Forces, Motion, and Interactions

**Description:** Students will learn that there are different kinds of forces including, gravitational force, friction, and magnetism; forces have size and direction; forces on an object that do not sum to zero are unbalanced forces, and can cause changes in the object's speed or direction of motion.

#### Unit 1

**Force**  
(Suggested Grade Level: 3)

#### Instruction Module

In this module, students are introduced to force and the effects of force on an object. They differentiate between balanced and unbalanced forces. They learn how position and motion of an object can be changed by pushing and pulling, and that the effect of the force depends on the mass of the object. They are introduced to forces such as magnetism, friction, and gravity. They learn through examples that force is required to do work and that machines such as pulleys make work easier.



<b>Interactivity/ Simulation</b>	<p>Force interactivity: In the interactive section of the module, students observe the changes in motion of different objects and identify the force that caused the changes, such as friction and gravity. They also observe the motion of a toy car on different surfaces and recognize how the nature of the surface affects frictional forces.</p> <p>Force and Distance simulation: In this simulation students will observe and measure the distance moved by four carts filled with loads of different masses, when pushed with the same amount of force. Based on the results, they will infer which cart has the greatest mass.</p>
<b>Glossary</b>	Force
<b>Quiz</b>	<p>The questions in the assessment section test students' understanding of the following concepts: the effect of the nature of the surfaces on friction, balanced and unbalanced forces, direction of gravity and friction, and the effect of mass on the amount of force required to move an object. The additional questions test students' ability to identify the forces that caused changes in an objects position or motion, recognize the similarities between gravity and magnetism, and identify examples of work.</p>
<b>Activities</b>	<p>Force STEM Activity</p> <p>Force – Push or Pull?</p>
<b>Journal entries</b>	<p>Journal #1</p> <p>Journal #2</p>
<b>Unit 2</b>	<p><b>Forces on an Object</b> (Suggested Grade Level: 4)</p>
<b>Instruction Module</b>	<p>In this module, students are introduced to different kinds of forces including, gravity, friction, and magnetism. They learn the difference between balanced and unbalanced forces and recognize the effects of force on an object. They learn the difference between mass and weight and know that the weight of an object is a measure of the gravitational force on the object. They observe and learn that friction depends on nature of the surfaces.</p>



<b>Interactivity/ Simulation</b>	<p>Types of Forces interactivity: In the interactive section of the module, students observe the movement of an object and identify the force that causes the changes in motion.</p> <p>Temperature’s Effect on Magnetic Force simulation: In this simulation students will determine how temperature affects the force of a magnet by setting up a simple investigation.</p>
<b>Glossary</b>	Forces on an object
<b>Quiz</b>	<p>The questions in the assessment section test students’ understanding of the following concepts: balanced and imbalanced forces, direction of frictional forces, gravity and weight, and the units of measuring force. The additional questions test students’ ability to identify objects that are attracted to magnets, recognize surfaces on which friction is the least, recognize positions of magnets when they attract or repel each other, and identify the effects of force on an object.</p>
<b>Activities</b>	Testing the Effects of Force on an Object (Descriptive Investigation)
<b>Journal entries</b>	<p>Journal #1</p> <p>Journal #2</p>
<b>Unit 3</b>	<p><b>Effects of Force</b> (Suggested Grade Level: 5)</p>
<b>Instruction Module</b>	<p>In this module, students are introduced to forces and recognize the effects of force on an object. They learn about speed and acceleration. They learn that force is measured in newtons and a spring scale can be used to measure force. They observe how changes in motion of an object depend on the amount of force applied and the mass of the object. They learn that weight is a measure of the force of gravity on an object and depends on the mass of the object. They observe that friction depends on the nature of the surfaces.</p>
<b>Interactivity/ Simulation</b>	<p>Testing the Effects of Force- Friction simulation: In this simulation students will design an experiment and investigate the effect of friction on the speed of a car rolling down a ramp.</p>



## Glossary

## Effects of Force

### Quiz

The questions in the assessment section test students' understanding of the following concepts: gravity and weight, friction, and other forces that affect the motion of an object. The additional questions test students' ability to identify the relation between speed and acceleration, recognize the tools used to measure force, and recognize the effect of the surface on frictional forces.

### Activities

The Effect of Force on an Object (Experimental Investigation)

How the Direction of the Force Affects the Motion of an Object (Experimental Investigation)

The Effect of Mass on the Motion of an Object (Experimental Investigation)

### Journal entries

Journal #1  
Journal #2

## Unit 4

### Force and Motion (Suggested Grade Level: 5)

### Instruction Module

In this module, students are presented with various examples that show the effects of force on an object. They are introduced to a few familiar forces such as friction and gravity and learn that forces acting on an object can be balanced or unbalanced. They differentiate between distance and displacement. They learn the relation between speed, distance, and time and understand how to represent it on a graph.

### Interactivity/ simulation

The Mass-matcher! Interactivity: In this interactive section of the module, students recognize that weight is a force and figure out when forces are balanced and when they are unbalanced.

## Glossary

## Force and Motion



<b>Quiz</b>	The questions in the assessment section test the student’s understanding of the following concepts: Distance, displacement, average speed, balanced and unbalanced forces, magnitude and direction of forces, reading a time-displacement graph, effect of nature of surface on frictional forces.
<b>Activity</b>	Unbalanced Forces (Experimental Investigation)  Representing Changes in Motion Graphically (STEM Investigation)
<b>Journal entries</b>	Journal 1 Journal 2

## Disciplinary Core Idea: PS3 Energy

### Energy and Energy Transfer

**Description:** Students will learn that energy exists in various forms; energy can be transferred and transformed but cannot be created or destroyed; light and electricity are forms of energy; energy can be transferred by electric currents, which can then be used to produce motion, sound, heat, or light.

<b>Unit 1</b>	<b>Energy</b> (Suggested Grade Level: 3)
<b>Instruction Module</b>	In this module, students are introduced to the concept of energy. They learn that energy can exist in different forms, including mechanical, light, sound, and heat/thermal energy. They learn how each of the forms of energy is useful in everyday life.
<b>Interactivity/ Simulation</b>	Jamie In The Maze interactivity: In the interactive section of the module, students identify the correct form of energy that they need to use to perform a task, as they move through a maze.
<b>Glossary</b>	Energy





<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: the Sun as the main source of energy on Earth, and the different forms of energy used for different purposes. The additional questions test students' ability to identify the different forms of energy used for different purposes and recognize the importance of the energy from the Sun to life on Earth.
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**Activities**  
Energy: Observing Sound (Descriptive Investigation)  
Sound Energy: Make a Speaker Activity

<b>Journal entries</b>	Journal #1 Journal #2
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<b>Unit 2</b>	<b>Forms of Energy</b> (Suggested Grade Level: 3)
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**Instruction Module**  
In this module, students are introduced to the different forms of energy, including mechanical, sound, electrical, light, and heat/thermal. They learn that sound requires a material medium to travel through, unlike light and heat which can travel through vacuum. They are introduced to the processes of heat transfer including conduction, convection, and radiation. They learn about conductors and insulators of heat and electricity. They recognize why some materials make better sound insulators. They learn about transparent, translucent, and opaque materials.

<b>Interactivity/ Simulation</b>	Energy to Unpack interactivity: In the interactive section of the module, students are presented with various situations and are required to identify the different forms of energy.  Conductor or Insulator? simulation: In this simulation students will test different materials to find out whether they are electrical conductors or insulators.
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**Glossary**      Forms of Energy



<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: meaning of energy, sound waves, transparent, translucent, and opaque materials, and conductors and insulators. The additional questions test students' ability to recognize the units of measurement of energy, interpret information from charts, and recognize that sound travels fastest through solids.
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**Activities**

Forms of Energy (Descriptive Investigation)

Conductors and Insulators (Descriptive Investigation)

<b>Journal entries</b>	Journal #1 Journal #2
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<b>Unit 3</b>	<b>Energy Conversions</b> (Suggested Grade Level: 5)
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**Instruction Module**

In this module, students are introduced to the different forms of energy, including mechanical, light, thermal, chemical, electrical, and sound energy. They learn how each of the forms of energy is useful in everyday life. They learn that energy can be transformed from one form to another but it can neither be created nor destroyed.

<b>Interactivity/ Simulation</b>	Exploring The Uses Of Mechanical Energy Simulation: In this Simulation, students conduct an experimental investigation to explore how the energy in a twisted rubber band used in a spool racer is transformed into mechanical energy.
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**Glossary**

Energy Conversions

<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: sources of energy, different forms of energy, thermal energy as the energy of the moving particles of matter, and transformations of energy. The additional questions test students' ability to recognize the form of energy that plants need for photosynthesis, and identify energy transformations.
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**Activities**

Exploring Uses of Energy

Converting Thermal Energy to Motion (Descriptive Investigation)



<b>Journal entries</b>	Journal #1 Journal #2
<b>Unit 4</b>	<b>Light</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students are introduced to light and its characteristics. They learn that light travels in a straight line until it strikes an object or travels through one medium to another. They learn the differences between opaque, translucent, and transparent materials. They recognize that light can be reflected and refracted and learn about the construction and uses of lenses.
<b>Glossary</b>	Light
<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: reflection, refraction, refraction through lenses and its uses, and transparent, translucent, and opaque objects. The additional questions test students' ability to identify examples of refraction and reflection, and translucent objects.
<b>Activities</b>	The Properties of Light Light Reflection and Different Surfaces (Descriptive Investigation) Why Rainbows Form Exploring the Properties of Light
<b>Journal entries</b>	Journal #1 Journal #2



<b>Unit 5</b>	<b>Electrical Circuits</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students are introduced to static and current electricity. They learn that there are two types of charges, positive and negative. They learn that electricity travels in a closed path, creating an electrical circuit. They learn about electrical conductors and insulators. They are introduced to the electromagnetic field and learn how electricity is used to make electromagnets, and how magnets are used to produce electricity (generators).
<b>Interactivity/ Simulation</b>	<p>Send A Morse Code Interactivity: In the interactive section, students are “given” a set of items that include electrical conductors and insulators, a switch, a battery, and a light bulb. The students are required to select the correct items to construct an electric circuit. They also identify and select words that are related to current electricity from a list of words.</p> <p>Electromagnets Simulation: An Investigation simulation: In this simulation students will explore an electromagnetic field by setting up an experiment to investigate how the number of turns of wire in the coil wrapped around a nail affects the strength of an electromagnet.</p>
<b>Glossary</b>	Electrical Circuits
<b>Quiz</b>	The questions in the assessment section test students’ understanding of the following concepts: Electrical conductors and insulators, components of an electrical circuit, electric current, open and closed circuits, and electric and magnetic fields. The additional questions test students’ ability to recognize the most essential components of an electric circuit, identify insulators, recognize the effect of the number of turns in the coil and the current on the strength of an electromagnet.
<b>Activities</b>	Electrical Circuits – Electromagnets (STEM Activity)
<b>Journal entries</b>	Journal #1 Journal #2



<b>Unit 6</b>	<b>Electricity</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students are introduced to electricity and electrical circuits. They learn that the flow of electricity in circuits requires a complete path through which an electric current can pass. They learn about some of the uses of electricity such as to produce light, heat, and sound. They learn how electricity is used to make temporary magnets (electromagnets) that can be used in electric doorbells and junkyard cranes.
<b>Interactivity/ Simulation</b>	<p>Create a Circuit! interactivity: In the interactive section of the module, students use components such as wires and batteries to “build” electrical circuits that light up a bulb and make an electromagnet.</p> <p>Investigating Circuits simulation: In this simulation students will compare how electric current flows through a series and parallel circuit.</p>
<b>Glossary</b>	Electricity
<b>Quiz</b>	The questions in the assessment section test students’ understanding of the following concepts: essential components of an electrical circuit and an electromagnet, open and closed circuits, uses of electricity, and the role of switches in an electrical circuit. The additional questions test students’ ability to compare and contrast the energy transformations taking place in a light bulb and a radio, recognize energy conversions in an electric toaster, and recognize how an electromagnet works.
<b>Activities</b>	Design a Switch for an Electric Circuit (Experimental Investigation) Using an Electrical Circuit to Pop a Balloon (Observational Investigation)
<b>Journal entries</b>	Journal #1 Journal #2



## Disciplinary Core Idea: PS4 Waves and their Applications in Technologies for Information Transfer

### Light

**Description:** Students will learn that light is a form of energy that makes it possible for us to see; an object can be seen when light reflected from its surface enters the eyes; light is reflected, transmitted through, or absorbed by objects.

### Unit 1

**Light**  
(Suggested Grade Level: 5)

#### Instruction Module

In this module, students are introduced to light and its characteristics. They learn that light travels in a straight line until it strikes an object or travels through one medium to another. They learn the differences between opaque, translucent, and transparent materials. They recognize that light can be reflected and refracted and learn about the construction and uses of lenses.

#### Glossary

Light

#### Quiz

The questions in the assessment section test students' understanding of the following concepts: reflection, refraction, refraction through lenses and its uses, and transparent, translucent, and opaque objects. The additional questions test students' ability to identify examples of refraction and reflection, and translucent objects.

#### Activities

- The Properties of Light
- Light Reflection and Different Surfaces (Descriptive Investigation)
- Why Rainbows Form
- Exploring the Properties of Light

#### Journal entries

- Journal #1
- Journal #2



## Disciplinary Core Idea: LS1 From Molecules to Organisms: Structures and Processes

### Structure, Growth, and Development of Organisms

**Description:** Students will recognize the importance of food and nutrition for growth and development; plants and animals have structures that serve various functions in growth, survival, and reproduction, and have unique and diverse life cycles.

#### Unit 1

#### Food and Nutrition (Suggested Grade Level: 4)

#### Instruction Module

In this Instruction Module, students understand why and how organisms, including humans, require energy to live and grow. They recognize that food provides both energy and nutrients to organisms and that foods are made up of a variety of components including carbohydrates such as sugar and starch, proteins, and fats. They understand the importance of a balanced diet and learn that energy from food is measured in calories. They understand the importance of Nutrition Fact labels on packaged food items.

#### Interactivity

Healthy and Wise interactivity: In this interactivity, students read the Nutrition Fact labels on packaged food item and use the information to select items as instructed.

#### Glossary

Food and Nutrition

#### Quiz

The questions in the assessment section test students' understanding of the following concepts: Importance of a balanced diet, units used to measure energy from food, the different components of food, and information on Nutrition Facts labels.

#### Journal

Journal #1  
Journal #2



<b>Unit 2</b>	<b>Muscular and Skeletal Systems</b> (Suggested Grade Level: 3)
<b>Instruction Module</b>	In this Instruction Module, students learn how the muscular and skeletal systems work together to produce movement. They learn about the different types of joints found in the skeletal system and the types of movements that these joints facilitate. They also learn to compare the types of movements facilitated by different joints.
<b>Interactivity</b>	Where are your Joints? Interactivity: In this interactivity, students compare different types of joints with those found in common objects in order to identify the types of joints shown.
<b>Glossary</b>	Muscular and Skeletal Systems
<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: Components of the skeletal system, components of the muscular system, types of joints, and locations of some of the joints in the human body.
<b>Journal</b>	Journal #1 Journal #2
<b>Unit 3</b>	<b>Growth and Change</b> (Suggested Grade Level: 3)
<b>Instruction Module</b>	In this module, students learn about life cycles and what is meant by simple life cycle and metamorphosis. They learn to describe the simple life cycles of some animals such as the pigs and platypuses, and also of animals such as frogs and ladybugs, which undergo metamorphosis. They also learn about the life cycles of plants and understand that plants can be classified as annuals, biennials or perennials based on the number of growing seasons in their life cycles.
<b>Interactivity/ Simulation</b>	Try Cycles! Interactivity: In the interactive section of this module, students apply their understanding of plant and animal life cycles to identify the types of life cycles that different organisms undergo.  Comparing Life Cycles of Plants simulation: In this simulation students will compare the length of time it takes for different plants to complete one life cycle.





<b>Glossary</b>	Growth and Change
<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: simple life cycles in animals, metamorphosis in animals, plant life cycles and classification of plants into annuals, biennials and perennials, based on the number of growing seasons in their life cycles.
<b>Journal entries</b>	Journal #1 Journal #2
<b>Expository text passages/ activities</b>	Lifecycles: Fireflies
<b>Unit 4</b>	<b>Comparing Life Cycles</b> (Suggested Grade Level: 4)
<b>Instruction Module</b>	In this module, students learn about life cycles and understand that the life cycles of plants and animals can be either simple or complex. They learn about the different stages of development of organisms with complex life cycles such as frogs and butterflies. They also learn to compare organisms with simple and complex life cycles.
<b>Interactivity</b>	The Circle of Life! Interactivity: In this interactive section, students apply their understanding of complex life cycles to arrange the different stages in the life cycles of a butterfly, a beetle, and a radish plant, in the correct order.
<b>Glossary</b>	Comparing Life cycles
<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: simple and complex life cycles, metamorphosis in animals with complex life cycles such as frogs and butterflies, comparison of life cycles of different organisms.
<b>Activities</b>	Life Cycle of a Dandelion (Descriptive Field Investigation)



**Journal entries** Journal #1  
Journal #2

## Unit 5

### Life Cycles (Suggested Grade Level: 5)

#### Instruction Module

In this module, students learn that a life cycle is the sequence of stages of growth and development in an organism's life. They learn that most animals have simple life cycle but some animals undergo metamorphosis during their lives. They understand that metamorphosis can be either complete or incomplete, and learn to differentiate between the two.

#### Interactivity

Life Cycle interactivity: In the interactive section of this module, students apply their understanding of frog metamorphosis to correctly order the different stages in a frog's life cycle.

#### Glossary

Life Cycles

#### Quiz

The questions in the assessment and additional assessment sections test student understanding of the following concepts: life cycles of animals and plants, simple and complex life cycles, and incomplete and complete metamorphosis.

#### Activities

Insect Life Cycles: Comparing Complete and Incomplete Metamorphosis

#### Journal entries

Journal #1  
Journal #2

#### Expository text passages/ activities

Lifecycles: Fireflies



## Disciplinary Core Idea: LS2 Ecosystems: Interactions, Energy, and Dynamics

### Interdependent Relationships in Ecosystems

**Description:** Students will learn that organisms are related in food chains and food webs; matter cycles between the air and soil, and among producers, consumers, and decomposers as these organisms live and die; a healthy ecosystem is one in which organisms are able to meet their needs in a relatively stable web of life.

#### Unit 1

#### Food Chains

(Suggested Grade Level: 3)

#### Instruction Module

In this module, students learn that organisms depend on one another for energy and nutrients and that these relations between organisms can be represented as a flow diagram called a food chain. They understand that organisms can be classified as producers, consumers or decomposers based on how they get their energy. They also learn that consumers can be herbivores, carnivores or omnivores based on the type of food they eat. Students understand that many food chains can be interconnected to form food webs.

#### Interactivity

Build a Food Chain interactivity: In the interactive section of this module, students apply their understanding of food chains. They arrange organisms in the correct order of who eats what and also identify which organisms are producers, herbivores, carnivores, omnivores and decomposers.

#### Glossary

Food Chains

#### Quiz

The questions in the assessment and additional assessment sections test student understanding of the following concepts: components of food chains and food webs, impacts of adding to or removing organisms from ecosystems, and types of organisms in food chains and food webs.

#### Journal entries

Journal #1  
Journal #2



<b>Unit 2</b>	<b>Food Webs</b> (Suggested Grade Level: 4)
<b>Instruction Module</b>	In this module, students learn to describe the flow of energy through food chains and food webs and predict how changes in the ecosystem, such as forest fires, affect food webs. They understand that organisms in an ecosystem are linked to one another for energy and learn to describe the impacts of change in population of one organism on the other organisms in its ecosystem.
<b>Interactivity</b>	Go with the Energy Flow interactivity: In the interactive section of the module, students apply their understanding of food chains to identify the roles of organisms in a food chain and the correct order of energy flow.
<b>Glossary</b>	Food Webs
<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: flow of energy through food chains and food webs, role of producers, consumers, and decomposers in an ecosystem, and factors affecting populations of organisms in food chains and food webs.
<b>Journal entries</b>	Journal #1 Journal #2
<b>Expository text passage/ activities</b>	The Brown Tree Snake and Descriptive Investigation
<b>Unit 3</b>	<b>Energy Flow through Food Webs</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students learn to describe how energy obtained from the Sun flows through different food chains and food webs, from producers to consumers to decomposers. They learn about food chains and food webs.
<b>Interactivity</b>	Food Web Flow! interactivity: In the interactive section of the module, students arrange organisms of different food chains in the correct order of energy flow and form food webs by identifying the correct links between food chains.



**Glossary** Energy Flow through Food Webs

**Quiz** The questions in the assessment and additional assessment sections test student understanding of the following concepts: energy flow through food chains and food webs, different types of consumers based on food preferences, and energy pyramids.

**Activities** Energy Flow through Food Webs  
A Meadow Food Web

**Journal entries** Journal #1  
Journal #2  
Journal #3

## Unit 4

### Habitats and Organisms (Suggested Grade Level: 3)

**Instruction Module** In this module, students understand what is meant by an ecosystem and a habitat and learn to identify different types of ecosystems. They also learn to identify the different living and nonliving components of an ecosystem. Students understand how to differentiate between the terms ‘population’ and ‘community’ and learn to describe the kinds of interactions that exist between different organisms in a community. Students also learn to identify suitable habitats for organisms.

**Interactivity** Habitats and Organisms interactivity: In the interactive section of this module, students apply their understanding of the type of organisms that make up a pond community to identify which organisms belong to a pond ecosystem and which ones do not.

**Glossary** Habitats and Organisms



<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: organisms found in different ecosystems, basic needs of organisms, populations, and communities, components of an ecosystem, and interactions between organisms in an ecosystem.
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Habitats and Organisms

**Activities**

Observing Organisms in a Water Sample Using a Microscope

<b>Journal entries</b>	Journal #1 Journal #2
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**Expository text passage/ activities**

The Brown Tree Snake

<b>Unit 5</b>	<b>Producers and Consumers</b> (Suggested Grade Level: 4)
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**Instruction Module**

In this module, students understand what is meant by an ecosystem and that many organisms live in different ecosystems. They learn that organisms can either be producers, consumers, or decomposers and that each organism plays a unique role in its ecosystem.

<b>Interactivity</b>	Got the Munchies! Interactivity: In the interactive section of the module, students apply their understanding of consumers, and decomposers and sort organisms as herbivores, carnivores, omnivores, or decomposers, based on their food preferences.
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**Glossary**

Producers and Consumers

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: relationships between organisms in an environment, types of organisms in an environment, and classification of organisms based on the type of food consumed by them.
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**Journal entries**

Journal #1  
Journal #2

<b>Unit 6</b>	<b>Organisms and their Environment</b> (Suggested Grade Level: 5)
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**Instruction Module** In this module, students observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements. They learn that all organisms need certain resources such as food, water, and shelter, and that they compete for these limited resources. They also learn about food chains and food webs.

**Interactivity** Build an Ecosystem! Interactivity: In the interactive section of this module, students apply their understanding of the basic needs of organisms to construct artificial environments such as terrariums and aquariums. They select an organism and then select the components that the organism would need in order to survive.

**Glossary** Organisms and their Environment

**Quiz** The questions in the assessment and additional assessment sections test student understanding of the following concepts: the living and nonliving components of an ecosystem, food chains and food webs, and types of relationships between organisms in an ecosystem.

**Activities** Organisms' Interactions within their Ecosystem (Observational Investigations)

Predator vs. Prey (Observational Field Investigation)

**Journal entries** Journal #1  
Journal #2  
Journal #3

**Expository text passages/ activities** Animal Interactions: Sea Anemones and Clownfish

**Unit 7** **Environmental Changes**  
(Suggested Grade Level: 3)

**Instruction Module** In this module, students learn that environments are constantly changing and can be altered either naturally or by human activities. They learn to describe how organisms such as beavers act as eco-engineers to alter their environment. Students also learn to describe the environmental changes caused by floods, droughts and fires.



<b>Interactivity</b>	Pick the Change interactivity: In the interactive section of this module, students study visuals representing different environmental changes and identify the factors responsible for causing those changes.
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**Glossary** Environmental Changes

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: factors that cause changes in ecosystems, effects of droughts, floods, and fires on ecosystems, effects of human activities on ecosystems.
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**Journal entries** Journal #1  
Journal #2

<b>Unit 8</b>	<b>Changes in Ecosystems</b> (Suggested Grade Level: 5)
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**Instruction Module** In this module, students observe how organisms live and survive in their ecosystem by interacting with the living and non-living elements. They learn about the harmful impacts of human activities on different ecosystems and also the ways by which humans can minimize damage caused.

<b>Interactivity</b>	Ecosystem Harmony interactivity: In the interactive section of the module, students apply their understanding of factors affecting ecosystem stability to predict the impacts of different changes on an estuary ecosystem.
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**Glossary** Changes in Ecosystems

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: types of organisms that make up a food chain, namely producers, primary consumers, secondary consumers and decomposers, impacts of introducing exotic species in an ecosystem, impacts of altering the composition of organisms in an ecosystem, negative and positive impacts of human activities on ecosystems.
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**Activities** Predicting Effects of Changes to an Ant Farm Ecosystem





**Journal entries**      Journal #1  
                                  Journal #2  
                                  Journal #3

<b>Unit 9</b>	<b>Carbon dioxide-Oxygen Cycle</b> (Suggested Grade Level: 5)
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**Instruction Module**      In this module, students learn about the different biological processes such as photosynthesis, respiration, and decomposition, which are part of the carbon dioxide–oxygen cycle. They also learn to identify the significance of the carbon dioxide–oxygen cycle to the survival of plants and animals.

<b>Interactivity</b>	Balance the Cycle! interactivity: In the interactive section of this module, students identify processes and organisms that increase or decrease carbon dioxide and oxygen levels in the environment.
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**Glossary**      Carbon Dioxide-Oxygen Cycle

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: photosynthesis, respiration and decomposition, role of photosynthesis, respiration and decomposition in the carbon dioxide – oxygen cycle, factors leading to the disruption of the carbon dioxide – oxygen cycle.
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**Journal entries**      Journal #1  
                                  Journal #2

<b>Unit 10</b>	<b>Cycling of Matter</b> (Suggested Grade Level: 5)
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**Instruction Module**      In this module, students learn about the various ways in which nutrients such as carbon, nitrogen, phosphorus, oxygen and water are recycled between the environment and the organisms living in it. They also learn how composting helps to recycle nutrients in organic wastes. They recognize the role of decomposers in each of these cycles.

<b>Interactivity/simulation</b>	Garbage to Garden! Interactivity: In the interactive section of this module, students “build” a compost pit choosing the correct materials for each layer in the compost pit.
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**Glossary**

Cycling of matter

**Quiz**

The questions in the assessment section test the student's understanding of the following concepts:  
The importance of various nutrient cycles, role of decomposers associated with each cycle, and methods of composting.

**Activity**

Mini Compost in a Bottle – STEM

**Journal entries**

Journal #1



## Disciplinary Core Idea: LS3 Heredity: Inheritance and Variation of Traits

### Inheritance and Variation of Traits

**Description:** Students will learn that many traits and characteristics of organisms are inherited while others are learned from their interactions with the environment.

#### **Unit 1**      **Inherited Traits** (Suggested Grade Level: 3)

**Instruction Module**      In this module, students learn that characteristics which are passed on from parent to offspring are called inherited traits. Students identify some inherited traits of animals, plants and human beings.

**Interactivity**      Test Your 'Pair'enting Skills interactivity: In the interactive section of this module, students apply their knowledge of inherited traits of animals and plants to correctly identify the parent of given offspring based on inherited traits.

**Glossary**      Inherited Traits

**Quiz**      The questions in the assessment and additional assessment sections test student understanding of the following concepts: inherited traits in humans, plants, and animals, learned characteristics in humans and animals, differences between inherited traits and learned characteristics.

**Journal entries**      Journal #1  
Journal #2

#### **Unit 2**      **Traits and Characteristics** (Suggested Grade Level: 4)

**Instruction Module**      In this module, students learn that characteristics that are passed on from parents to offspring are called inherited traits. They also learn that some behavioral characteristics in humans and animals that are not inherited and are a result of experiences, are called learned characteristics.



<b>Interactivity</b>	Sort The Pictures interactivity: In this interactive section, students learn to distinguish between inherited traits and learned characteristics by identifying whether different pictures show inherited traits or learned characteristics of organisms.
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**Glossary** Traits and Characteristics

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: inherited traits of organisms and learned characteristics in humans and animals.
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**Journal entries** Journal #1  
Journal #2

<b>Unit 3</b>	<b>Inherited Traits vs. Learned Characteristics</b> (Suggested Grade Level: 5)
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**Instruction Module** In this module, students learn about the different inherited traits in plants, animals, and humans, and about learned characteristics. They also learn to differentiate between inherited traits and learned characteristics.

<b>Interactivity</b>	Inherited or Learned? interactivity: In the interactive section of this module, students identify whether the different pictures that are presented show an inherited trait or a learned characteristic.
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**Glossary** Inherited Traits vs Learned Characteristics

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: inherited traits in humans, plants and animals, learned characteristics in humans and animals, and differences between inherited traits and learned characteristics.
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**Activities** Inherited vs. Acquired Traits

<b>Journal entries</b>	Journal #1 Journal #2
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## Disciplinary Core Idea: LS4 Biological Evolution: Unity and Diversity

### Organisms: Unity and Diversity

**Description:** Students learn that the structural and behavioral adaptations of organisms allow them to survive in their natural environment; organisms vary in how they look and function because of inherited information and the environment; organism can be classified based on their similarities and differences.

<b>Unit 1</b>	<b>Adaptations</b> (Suggested Grade Level: 3)
<b>Instruction Module</b>	In this module, students learn how structures and behaviors of plants and animals allow them to survive in their environments.
<b>Interactivity</b>	Sonoran Desert Organisms interactivity: In the interactive section of this module, students select organisms that belong in the desert environment from a group of organisms, by studying their adaptations.
<b>Glossary</b>	Adaptations
<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: physical adaptations of plants and animals, behavioral adaptations of plants and animals, how adaptations help organisms survive in their environments.
<b>Journal entries</b>	Journal #1 Journal #2
<b>Expository text passages/ activities</b>	Organisms and Environments

### Unit 2

#### Environments and Adaptations (Suggested Grade Level: 4)

**Instruction Module** In this module, students learn about adaptations and the two kinds of adaptations that organisms have, namely structural and behavioral adaptations. They learn how an organism’s adaptations help it to survive in its natural environment and meet its basic needs.



<b>Interactivity</b>	Structural and Behavioral Adaptation interactivity: In this interactive section, students use their understanding of adaptations and the types of adaptations to identify whether an organism’s adaptation is structural or behavioral.
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**Glossary**                      Environments and Adaptations

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: structural adaptations of organisms in different environments including mimicry and camouflage, behavioral adaptations such as migration, and effects of changing environments on organisms.
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**Journal**                      Journal #1  
Journal #2

<b>Expository text passages/ activities</b>	Insect Adaptations (Descriptive Field Investigation)
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<b>Unit 3</b>	<b>Adaptations and Survival</b> (Suggested Grade Level: 5)
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**Instruction Module**                      In this module, students learn about the structural and behavioral adaptations of organisms in different environments. They also learn that the role an organism plays in its environment is called its niche, and that organisms are specially adapted to their niches.

<b>Interactivity</b>	Adaptations and Survival interactivity: In the interactive section of this module, students sort pictures showing adaptations of different organisms into two groups “structural adaptations” and “behavioral adaptations”.
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**Glossary**                      Adaptations and Survival

<b>Quiz</b>	The questions in the assessment and additional assessment sections test student understanding of the following concepts: structural and behavioral adaptation, how adaptations help an organism survive in its environment, how organisms are adapted only to their natural environment, and niche of organisms.
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**Activities**                      Adaptations

<b>Journal entries</b>	Journal #1 Journal #2
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Expository text passages/ activities

Insect Adaptations

## Unit 4

### Classifying Plants (Suggested Grade Level: 5)

#### Instruction Module

In this Instructional Module, students learn how plants are classified based on their physical characteristics into different groups. They learn that all plants can be classified as vascular and non-vascular plants. They learn that vascular plants can further be divided into the seedless and seed producing plants. They recognize that seed producing plants are classified into gymnosperms and angiosperms and those angiosperms are further divided into monocots and dicots. Students learn to compare plants from different group based on their external characteristics and also learn to distinguish between monocots and dicots based on some salient external characteristics.

#### Interactivity

Plant in Place interactivity: In this interactivity, students use a graphical organizer to sort five different types of plants into separate categories based on their external characteristics.

#### Glossary

Classifying Plants

#### Quiz

The questions in the assessment section test students' understanding of the following concepts: Classification of vascular seedless plants, vascular seed producing plants, differences between gymnosperms and angiosperms, and differences between monocots and dicots.

#### Journal

Journal #1



<b>Unit 5</b>	<b>Classifying Animals</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this Instruction Module, students learn that an animal can either be a vertebrate or an invertebrate based on the presence of a backbone. They learn that vertebrates can further be classified into five major groups namely fish, amphibians, reptiles, birds and mammals. They learn about the important characteristics of each of these groups and also learn to compare animals in these five groups.
<b>Interactivity</b>	Find 'n' Fit interactivity: In this interactivity students use descriptions of animals to sort them into invertebrate and vertebrate groups. They further classify the vertebrates into the five vertebrate groups based on their descriptions and external characteristics.
<b>Glossary</b>	Classifying Animals
<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: Difference between vertebrates and invertebrates, difference between the major vertebrate groups such as fish, amphibians, reptiles, birds, and mammals.
<b>Journal</b>	Journal #1





## Disciplinary Core Idea: ESS1 Earth’s Place in the Universe

### Earth’s Place in the Universe

**Description:** Students will learn about the objects in our Solar System and their positions relative to the Sun; the rotation and revolution of Earth cause observable patterns, including the day and night and seasonal cycles.

#### Unit 1

#### The Solar System

(Suggested Grade Level: 3)

#### Instruction Module

In this module students are introduced to the eight planets in the solar system. They learn about the characteristics of the planets and their position in relation to the Sun. They also learn about the characteristics of the Sun.

#### Interactivity

The Solar System interactivity: In this interactivity, students identify the planets in our solar system and match them with their names.

#### Glossary

The Solar System

#### Quiz

The questions in the assessment and additional assessment section test students' understanding of the following concepts: planets and their positions in relation to the Sun, and the characteristics of the Sun.

#### Activities

The Solar System: Order of the Planets

The Solar System – Planet Identification

#### Journal entries

Journal #1  
Journal #2

#### Unit 2

#### Earth, Moon and Sun

(Suggested Grade Level: 3)

#### Instruction Module

In this module, students learn about the Sun as a star composed of gases, that provides light and heat energy and recognize the importance of the energy from the Sun in the water cycle. They recognize the phases of the Moon. They observe models that illustrate the relationship of the Sun, Earth, and Moon, including orbits and positions.



<b>Interactivity</b>	Orbiting Spheres interactivity: In the interactive section of this module, students “place” the Sun, the Moon, and Earth in their correct orbital positions in the solar system. Then, they identify the correct object based on the characteristics of the Sun, the Moon, and Earth.
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**Glossary** Earth, Moon, and Sun

<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: the physical characteristics of the Sun, orbits and rotations of the Earth and the Moon, and characteristics features of the Moon.
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**Activities** The Sun, Earth and Moon as a System

<b>Journal entries</b>	Journal #1 Journal #2
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**Expository text passage/ activities** The Rainiest Place in the United States

<b>Unit 3</b>	<b>Characteristics of the Sun, Moon, and Earth</b> (Suggested Grade Level: 5)
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**Instruction Module** In this module, students learn about the characteristic features of the Earth, the Moon, and the Sun. They compare the Earth and the Moon on the basis of characteristics such as mass, size, density, gravity, atmosphere, temperature, and presence of water, impact craters, and the nature of the surface. They also compare the Sun with the Earth and the Moon. They learn about solar winds, sunspots, and solar flares and understand that reactions in the Sun’s core produce energy which we experience on Earth as light and heat.

<b>Interactivity</b>	This module does not include an interactive section.
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**Glossary** Characteristics of the Sun, Moon, and Earth



<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: characteristic features of the Sun, the Moon, and the Earth, comparisons of the three based on landforms, compositions of the atmosphere, and gravity. The additional questions also test students' ability to interpret information from a graph.
<b>Activities</b>	Characteristics of the Sun, Moon, and Earth
<b>Journal entries</b>	Journal #1 Journal #2

<b>Unit 4</b>	<b>Earth Cycles</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students understand that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky. They learn how Earth's tilted axis causes seasons as Earth orbits the Sun. They learn about the lunar cycle and recognize the phases of the Moon.
<b>Interactivity</b>	This module does not include an interactive section.
<b>Glossary</b>	Earth Cycles
<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: phases of the Moon, the lunar cycle, and the effects of rotation and revolution of Earth.
<b>Activities</b>	Day and Night and the Movement of the Sun Across the Sky
<b>Journal entries</b>	Journal #1 Journal #2 Journal #3



## Disciplinary Core Idea: ESS2 Earth's Systems

### Earth's Systems

**Description:** Students will learn that the surface of Earth changes over time due to the action of wind, water, and forces from within Earth; fossils found in rock layers provide clues to the environments and organisms that existed in the past; land surface, the oceans, the atmosphere, and energy from the Sun interact and influence weather and climate.

### Unit 1

#### Earth's Ever Changing Surface (Suggested Grade Level: 3)

#### Instruction Module

In this module students learn about the rapid changes in Earth's surface caused by volcanic eruptions, earthquakes, and landslides. They learn about tectonic plates and faults. They learn how plate movements can cause earthquakes. They learn how earthquakes can sometimes cause tsunamis and landslides. They observe and recognize the changes in Earth's surface cause by the movement of glaciers, such as U-shaped valleys and lakes.

#### Interactivity/ Simulation

Earth's Ever-Changing Surface interactivity: In the interactive section of this module, students are presented with "before" and "after" pictures of landforms changed by earthquakes, volcanoes, and glaciers. The students identify the natural forces that changed them.

How Volcanoes Change the Earth's Surface simulation: In this simulation students will observe how the thickness of the magma and the amount of dissolved gases it contains affects the type of eruption and the structure of the volcano.

#### Glossary

Earth's Ever-Changing Surface

#### Quiz

The questions in the assessment and additional assessment section test students' understanding of the following concepts: the various natural forces that change the surface of the Earth and the features that they form, including earthquakes, landslides, avalanches, and tsunamis.

#### Activities

Earth's Changing Surface: Changes that Occur Quickly

#### Journal entries

Journal #1  
Journal #2



<b>Unit 2</b>	<b>Landforms</b> (Suggested Grade Level: 3)
<b>Instruction Module</b>	In this module, students are introduced to the different landforms on Earth, including mountains, hills, valleys, and plains. They learn about the landforms formed by water such as beaches, bays, deltas, caves, lakes, islands, archipelagos, and peninsulas.
<b>Interactivity</b>	Jamie and the Jigsaw Puzzle interactivity: In the interactive section of this module, students complete a jigsaw puzzle by identifying landforms based on clues or descriptions.
<b>Glossary</b>	Landforms
<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: different landforms including mountains, rivers, plateaus, plains, islands, archipelagos, hills, deserts, continents, and the forces that created them.
<b>Journal entries</b>	Journal #1 Journal #2
<b>Expository text passage/ activities</b>	Landforms: Mount Everest
<b>Unit 3</b>	<b>Observing Change</b> (Suggested Grade Level: 4)
<b>Instruction Module</b>	In this module, students are introduced to the slow changes to Earth's surface caused by weathering, erosion, and deposition by water, wind, and ice. They recognize how fossils in sedimentary rock layers provide clues to the changes that may have occurred on Earth.
<b>Interactivity</b>	Observing Change interactivity: In the interactive section of the module, students observe fossils in layers of rock and order them from the oldest to the most recent, and use them as clues to infer about the environment of the region in the past.

**Glossary**

Observing Change

**Quiz**

The questions in the assessment and additional assessment section test students' understanding of the following concepts: changes to the Earth's surface, weathering, erosion, dissolving, deposition, rock layers, and fossils, use of data in charts and tables to identify and understand changes.

**Activities**

Changes on the Earth's Surface

**Journal entries**

Journal #1  
Journal #2

**Unit 4**

**Changes on Earth's Surface**  
(Suggested Grade Level: 5)

**Instruction Module**

In this module, students understand how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice. They recognize the processes of weathering, erosion, and deposition.

**Interactivity**

This module does not include an interactive section.

**Glossary**

Changes on Earth's Surface

**Quiz**

The questions in the assessment and additional assessment section test students' understanding of the following concepts: weathering, erosion, and deposition as processes that continually change the surface of the Earth and the landforms formed by these processes.

**Activities**

A Changing Earth

Observing Erosion and Deposition (Observational Investigation)

**Journal entries**

Journal #1  
Journal #2

**Expository text passages/ activities**

Our Earth's Changing Surface



<b>Unit 5</b>	<b>Learning from the Past</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students understand that evidence of changes can be gathered from photos taken before and after an event. They recognize the significance of using sedimentary rock sequences and fossils as evidence of past environments and living organisms. They learn how fossils are formed. They recognize that the shape of the continents and fossils found across continents can be used as evidence that the continents were once joined, as proposed by Wegener.
<b>Interactivity</b>	This module does not include an interactive section.
<b>Glossary</b>	Learning from the Past
<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: sequence of sedimentary rock layers, using fossils to understand past environmental conditions, types of fossils, and plate tectonics.
<b>Activities</b>	Fossils as Evidence of the Past
<b>Journal entries</b>	Journal #1 Journal #2 Journal #3
<b>Unit 6</b>	<b>Weather</b> (Suggested Grade Level: 3)
<b>Instruction Module</b>	In this module, students observe and learn how to measure, record, and compare day-to-day weather changes. They learn about the tools used to measure air temperature, wind direction, and precipitation. They learn how seasons are caused and recognize the importance of information gathered from satellite images.
<b>Interactivity</b>	Watch Out for the Weather! Interactivity: In the interactive section of this module, students observe and record weather conditions such as temperature, precipitation, and wind speeds for three different cities.
<b>Glossary</b>	Weather



<b>Quiz</b>	The questions in the assessment section and the additional questions test students' understanding of the following concepts: thermometers and temperature, precipitation, weather patterns, changes in weather, tools and equipment's used to measure weather conditions, weather information using charts and tables.
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**Activities** Measuring the Weather

<b>Journal entries</b>	Journal #1 Journal #2
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**Expository text passage/ activities** Weather: Measuring the Wind

<b>Unit 7</b>	<b>Energy from the Sun and Weather</b> (Suggested Grade Level: 4)
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**Instruction Module** In this module, students learn that the Sun is the main source of Energy for Earth. They learn how to measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key. They learn about the continuous movement of water above and on the surface of Earth through the water cycle and recognize the role of the Sun as a major source of energy that powers the water cycle.

<b>Interactivity</b>	The Vital Sun interactivity: In the interactive section of this module, students arrange pictures in the correct sequence to depict how the Sun's energy is responsible for the weather, formation of fossil fuels, and the food we eat.
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**Glossary** Energy from the Sun and Weather

<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: the Sun as the primary source of energy on Earth, responsible for the formation of fossil fuels and the food we eat. The additional questions also test students' understanding of symbols used on weather maps, cold and warm fronts, high and low pressures, and the forms of precipitation.
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**Activities** Energy from the Sun and Weather (Descriptive Investigation)  
Using Weather Maps to Predict Weather  
Creating a Weather Map





<b>Journal entries</b>	Journal #1 Journal #2
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<b>Unit 8</b>	<b>Weather or climate?</b> (Suggested Grade Level: 5)
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<b>Instruction Module</b>	In this module, students learn the difference between weather and climate. They learn that factors such as temperature, humidity, and air pressure affect the climate and weather conditions.
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<b>Interactivity</b>	Weather vs Climate interactivity: In the interactive section of this module, students observe pictures of and classify them as 'weather' or 'climate' based on whether it is a short term or a long term condition.
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<b>Glossary</b>	Weather or Climate?
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<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: weather and climate, temperature, humidity, wind, and air pressure. Some of the questions also test students' ability to interpret data represented as a graph or a table.
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<b>Activities</b>	Weather or Climate? (Field Investigation) Determining Wind Direction (Observational Field Investigation) Benjamin Franklin: Meteorologist
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<b>Journal entries</b>	Journal #1 Journal #2 Journal #3
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<b>Unit 9</b>	<b>Recognizing Patterns in Changes</b> (Suggested Grade Level: 4)
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<b>Instruction Module</b>	In this module, students are introduced to daily patterns, tides, seasonal patterns, and the different phases of the Moon. They understand how the Sun and the Moon are responsible for these patterns.
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<b>Interactivity/ Simulation</b>	<p>Recognizing Patterns in Changes interactivity: In the interactive section of this module, students arrange pictures in the correct sequence to depict patterns in the seasons, patterns in the apparent movement of the Sun based on the observation of shadows at different times of the day, and patterns in the lunar cycle.</p> <p>Shadows and Seasons simulation: In this simulation students will investigate and recognize that the length of a shadow follows a pattern throughout the year.</p>
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**Glossary** Recognizing Patterns in Changes

<b>Quiz</b>	The questions in the assessment section test students' understanding of the following concepts: patterns in weather, day and night, lunar cycle, and tides. The additional questions test students' ability to interpret and draw conclusions from data given in the form of graphs, tables, and chart.
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**Activities** Recognizing Patterns in Changes  
The Moon and Tides

<b>Journal entries</b>	Journal #1 Journal #2
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<b>Unit 10</b>	<b>The Water Cycle</b> (Suggested Grade Level: 5)
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**Instruction Module** In this module, students identify the significance of cycles and understand and recognize the various processes that govern the water cycle such as evaporation, condensation, precipitation and infiltration.

<b>Interactivity</b>	This module does not include an interactive/simulation section.
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**Glossary** The Water Cycle

<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding and ability to identifying the different processes of the water cycle.
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**Activities** The Water Cycle (Descriptive Investigation)

<b>Journal entries</b>	Journal #1 Journal #2
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**Expository text passages/ activities** The Rainiest Place in the United States



## Disciplinary Core Idea: ESS3 Earth and Human Activity

### Natural Resources and Human Activity

**Description:** Students will learn that that most materials and energy that humans use are derived from natural sources; some resources are renewable and some are not; human activities can affect these resources and the environment; humans can take measures to protect Earth’s resources and environments.

### Unit 1 **Soil Formation** (Suggested Grade Level: 3)

**Instruction Module** In this module, students are introduced to the various components of soil and learn to differentiate between sand, silt, and clay based on particle size and texture. Students learn how soils are formed by weathering of rock and the decomposition of plant and animal remains.

**Interactivity** What's in the Soil? interactivity: In the interactive section of this module, students identify the different components of soil in a soil sample.

**Glossary** Soil Formation

**Quiz** The questions in the assessment and additional assessment section test students' understanding of the following concepts: formation of soil, the different components of soil, and the physical properties of soil including color, texture, and particle size.

**Journal entries** Journal #1  
Journal #2

### Unit 2 **Soil Properties and Experiments** (Suggested Grade Level: 4)

**Instruction Module** In this module students learn to identify and describe the properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants. They learn that soil can be classified as sand, silt, or clay based on particle size and that soil contains humus.

**Interactivity/ Simulation** This module does not include an interactive section.  
  
Soil Properties-How Much Air Is In There simulation: In this simulation students will investigate the volume of air displaced by water in different soil samples and relate it to pore space, a physical property of soil.



## Glossary

Soil Properties and Experiments

### Quiz

The questions in the assessment and additional assessment section test students' understanding of the following concepts: properties of soil such as color, texture, water retention, amount of humus, sizes of soil particles, types of soils, organisms present in the soil, and experiments to demonstrate the different soil properties.

### Activities

Activity 1: Soil Properties and Experiments  
Activity 2: Soil Properties and Experiments (Descriptive Investigation)  
Activity 3: Observing the Properties of Sand Using a Microscope (Descriptive Investigation)

### Journal entries

Journal #1  
Journal #2

### Expository text passages/ activities

Tools Scientists Use: Microscopes

## Unit 3

### Earth's Natural Resources (Suggested Grade Level: 3)

### Instruction Module

In this module, students are introduced to the characteristics of natural resources that make them useful in products and materials. They learn the difference between renewable resources such as oxygen, freshwater, soil, plants and animals, and nonrenewable resources such as coal, oil, natural gas, and minerals. They recognize the different ways by which natural resources can be conserved.

### Interactivity

Identify the Resources interactivity: In the interactive section of this module, students identify the different natural resources that are used in order to make a boot.

## Glossary

Earth's Natural Resources

### Quiz

The questions in the assessment test students' understanding of the following concepts: renewable and nonrenewable resources, resources that can be recycled and reused, and different ways to conserve resources. The additional questions tests students ability to identify renewable and nonrenewable resources, and recognize ways of conserving resources,

### Journal entries

Journal #1  
Journal #2



<b>Unit 4</b>	<b>Conserving Resources</b> (Suggested Grade Level: 4)
<b>Instruction Module</b>	In this module, students are introduced to Earth's resources and they learn the difference between renewable and nonrenewable resources. They classify resources including air, plants, water, and animals as renewable resources and coal, oil, and natural gas as nonrenewable resources. They recognize the importance of conservation of resources.
<b>Interactivity</b>	Conserving Resources interactivity: In the interactive section of this module, students classify and group resources as renewable and non-renewable resources. Then, they identify which nonrenewable resource is used the most for a certain purpose that is mentioned.
<b>Glossary</b>	Conserving Resources
<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: renewable and nonrenewable resources, properties of renewable and nonrenewable resources, conservation and actions that help conserve natural resources. The additional questions also test students' ability to recognize the importance of replacing fossil fuels with renewable energy resources.
<b>Journal entries</b>	Journal #1 Journal #2
<b>Unit 5</b>	<b>Energy Resources</b> (Suggested Grade Level: 5)
<b>Instruction Module</b>	In this module, students are introduced to the processes that led to the formation of sedimentary rocks and fossil fuels. They learn about alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels.
<b>Interactivity</b>	Look at the Alternatives! interactivity: In the interactive section of this module, students identify an alternative source of energy that can be developed based on the different landscapes and available resources that are presented.
<b>Glossary</b>	Energy Resources



<b>Quiz</b>	The questions in the assessment and additional assessment section test students' understanding of the following concepts: formation of sedimentary rocks, formation of fossil fuels, alternate energy resources, and nonrenewable and renewable energy resources.
<b>Activities</b>	Processes that Lead to the Formation of Fossil Fuels and Sedimentary Rocks  Alternative Energy Sources at Home
<b>Journal entries</b>	Journal #1 Journal #2 Journal #3

## Disciplinary Core Idea: Science and Engineering Practices

### Scientific Investigation and Reasoning

**Description:** Students will learn how to describe, plan, and implement simple experimental investigations testing one variable. They learn about the steps of conducting scientific investigations including asking well-defined questions, developing testable hypotheses, planning investigations, and using appropriate equipment and technology.

<b>Unit 1</b>	<b>Safety and Scientific Processes</b> (Suggested Grade Level: 3, 4, 5)
<b>Instruction Module</b>	In this module, students learn how to describe, plan, and implement simple experimental investigations testing one variable. They learn about the steps of conducting scientific investigations including asking well-defined questions, developing testable hypotheses, planning investigations, and using appropriate equipment and technology. They learn how to collect information by observing and measuring, construct reasonable explanations based on analysis of observations and inferences, communicate valid conclusions, construct graphic data displays using technology to organize, examine and evaluate data, and learn how to record and analyze information using tools. They learn about safe practices and the use of safety equipment while conducting scientific investigations. They learn about the importance of making informed choices in conserving, disposing of, and recycling material.



<b>Interactivity</b>	Tess' Pulley Experiment interactivity: In the interactive section of this module, students choose suitable materials and equipment to “conduct” an experiment to test their hypothesis. They observe and “measure” the force required to lift different amounts of sand with and without a pulley system. They record their observations and compare the data. Based on the data collected, they arrive at a conclusion.
<b>Glossary</b>	Safety and Scientific Processes
<b>Quiz</b>	The questions in the assessment section test students’ understanding of the following concepts: steps used while conducting scientific investigations, safety equipment, tools used for measuring physical quantities, and data and conclusions. The additional questions test students’ ability to match quantitative data to graphical representations, identify dependent and independent variables, and identify patterns in data collected during experimentation.
<b>Activities</b>	Collecting, Recording and Analyzing Information Using Tools Evaluating the Accuracy of Advertisements for Products and Services
<b>Journal entries</b>	Journal #1 Journal #2
<b>Expository text passages/ activities</b>	Microscopes Evaluating Claims for Products and Services