



Course Description
Grades 3-5
National (NGSS)



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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

Identifying Matter: In this Instruction Module, students understand that matter is anything that has mass and occupies space. They recognize that the characteristics, or properties of matter can be used to identify matter.

Understanding Mass: In this Instruction Module, students are introduced to the concept of mass. Using objects of different sizes, it demonstrates how objects that are of different sizes may have the same mass. Students understand that mass can be compared and measured using a pan balance or a triple beam balance.

Hot or Cold: In this Instruction Module, students are introduced to the concept of temperature. Students learn how a thermometer is used to measure and compare temperatures.

Magnets: In this Instruction Module, students are introduced to the concept of magnetism. Students observe and recognize that magnets attract and exert a force on some objects while they have no effect on other objects.

Hardness of Matter: In this Instruction Module, students are introduced to the term “hardness”. Students learn how to use the scratch test to test and compare hardness of objects made of different kinds of matter.

Float or Sink – Density: In this Instruction Module, students are introduced to the concepts of density. Students learn to explain why an object floats or sinks in water, using the concept of density.

Float or Sink – Buoyancy: In this Instruction Module students are introduced to buoyancy. Students observe an experiment and understand Archimedes' Principle. They recognize the relation between the weight of the water displaced and the buoyant force, and learn that an object floats in water if its weight is less than the weight of the water it displaces.



Interactivity/ Simulation	<p>Physical Properties: 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.</p> <p>Matter and Mass: In this simulation students will predict and measure the mass of objects that have the same volume but are made out of different materials.</p>
Glossary	Observing Physical Properties
Quiz	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	<p>Observing Physical Properties: Sink or Float</p> <p>Measuring Water Temperature (Experimental Investigation)</p>
Journals	Journal #1 Journal #2
Teacher Resources	Observing Physical Properties

Unit 2

Measuring Physical Properties (Suggested Grade Level: 4)

Instruction Module

What is Matter?: In this Instruction Module, students are introduced to the term "Matter". Students learn that matter can be classified into solids, liquids, and gases. They observe and compare the physical properties of the three states of water. They observe the example of water and recognize that matter can change from one state to another.

Adding and Removing Heat: In this Instruction Module, students are introduced to the processes that lead to changes in the state of matter. Students learn that adding or removing heat from matter causes the molecules in matter to gain or lose energy. They learn that temperature is a measure of how fast the molecules in matter are moving and is measured with a thermometer.

Measuring Mass: In this Instruction Module, students learn



that mass refers to the amount of matter in an object and can be measured with a triple beam balance.

Volume: In this Instruction Module, students learn that the volume of an object is the amount of space occupied by it. They observe and infer that two objects cannot occupy the same space at the same time and learn how this property is used to measure the volume of irregular solids using a graduated cylinder. They also learn to use formulas to find the volume of a rectangular prism.

Density: In this Instruction Module, students observe and understand the meaning of density. They learn that density is a measure of the mass of an object compared to its volume. They also learn that an object sinks or floats in water depending on whether its density is greater than or less than the density of water.

Magnetic Properties: In this Instruction Module, students are introduced to the magnetic properties of matter. They learn that magnets attract objects made of certain metals like iron. They observe and understand that like poles of magnets repel while unlike poles attract each other.

Interactivity/ Simulation	Float or Sink : 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.
Glossary	Measuring Physical Properties
Quiz	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.
Activities	Measuring the Temperature of Pure Water and Salt Water
Journals	Journal #1 Journal #2
Expository text passages/ activities	Measurement: Measuring, Comparing and Contrasting Sizes
Teacher Resources	Measuring Physical Properties



Unit 3	Physical Properties of Matter (Suggested Grade Level: 5)
Instruction Module	<p>Classification of Matter: In this Instruction Module, students observe and learn that matter has physical properties that can help to classify matter. They learn that matter can be classified based on its physical state and recognize the properties of solids, liquids, and gases.</p> <p>Mass: In this Instruction Module, students learn that the mass of an object is the amount of matter in it and can be measured with a triple beam balance. They observe and measure the mass of substances before and after a physical change and recognize that mass is conserved.</p> <p>Density, Solubility, and Magnetism: In this Instruction Module, students learn about relative density, by examining why some objects sink in water while some others float. They learn about solubility in water as well as magnetism.</p> <p>Heat Conductors and Insulators: In this Instruction Module, students learn about conductors and insulators of heat. They observe various examples of conductors and insulators of heat, and recognize their uses.</p> <p>Conductors and Insulators of Electricity: In this Instruction Module, students learn that conductors of electricity allow electricity to flow through them while insulators do not allow electricity to flow through them. They observe examples of conductors and insulators and identify their uses.</p> <p>Melting, Freezing, and Boiling Points: In this Instruction Module, students observe and learn that adding or removing heat results in an increase or decrease in temperature. They learn that water changes state from solid to liquid at 0 oC (melting point) and from liquid to gas at 100 oC (boiling point). They also learn that the freezing point of water is the same as its melting point.</p>
Interactivity/ Simulation	<p>Physical Properties of Matter: 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: In this simulation students will classify materials as thermal insulators or thermal conductors by conducting a simple investigation.</p>
Glossary	Physical Properties of Matter



Quiz	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.
Activities	Classifying Matter (STEM Activity) Using Physical Properties to Classify Matter
Journals	Journal 1 Journal 2
Teacher Resources	Physical Properties Of Matter

Unit 4	States of Matter (Suggested Grade Level: 3)
Instruction Module	<p>Matter: In this Instruction Module, students learn that matter is anything that has mass and occupies space. They learn how a pan balance can be used to compare and measure mass. They also learn how to use graduated cylinder to find the volume of an irregular shaped object.</p> <p>Solids, Liquids, and Gases: In this Instruction Module, students are presented with examples of solids, liquids, and gases. Students observe and compare their physical properties including shape and volume, and arrive at a generalization of their physical properties. They also learn that the differences in state are a result of the differences in the arrangement of particles of matter in them.</p> <p>Changing States of Water: In this Instruction Module, students observe the changes in states of water when heat is added to it or removed from it. They learn how adding or removing heat affects the particles of matter in water, and results in change of state.</p>
Interactivity	Matter Sorter: In the interactive section of the module, students identify and classify given materials as solids, liquids, or gases, based on their physical properties.



Glossary

States of Matter

Quiz

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.

Activities

States of Matter and Venn Diagram

Matter and Energy: Dissolving a Sugar Cube

Journal entries

Journal #1
Journal #2

Teacher Resources

States of Matter

Unit 5

Changing States of Matter (Suggested Grade Level: 4)

Instruction Module

Particles of Matter in Solids: In this Instruction Module, students are introduced to the arrangement of particles of matter in solids and the forces of attraction between them. Students understand the process of change of state from solid to liquid by heating (melting) and from liquid to solid (freezing) at the molecular level.

Particles of Matter in Liquids: In this Instruction Module, students are introduced to the arrangement of, and force of attraction between, the particles of matter in liquids. Students learn how this affects the volume and shape of liquids. They understand the processes of boiling (change of state to gas on heating a liquid) and condensation (the change to liquid on cooling a gas).

Gases: Shape and Volume: In this Instruction Module, students are introduced to the strength of the forces between particles of matter in gases. Students understand why gases have neither a fixed shape nor a fixed volume.

Nature and States of Water: In this Instruction Module, students learn that water naturally exists in all three states. They observe and recognize how water changes states as it



moves from land to air and back to land during the process of the water cycle.

Interactivity	Changing States of Matter: 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.
Glossary	Changing States of Matter
Quiz	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.
Journal entries	Journal #1 Journal #2
Teacher Resources	Changing States Of Matter

Unit 6	Mixtures (Suggested Grade Level: 3)
Instruction Module	<p>What is a Mixture?: In this Instruction Module, students are introduced to mixtures. Students observe various examples of mixtures and recognize that a mixture is made of two or more substances that are physically combined. They learn that the components of a mixture retain most of their physical properties and no new substance is formed.</p> <p>Separating Mixtures: In this Instruction Module, students observe examples of mixtures and recognize that the substances that make up the mixture retain most of their physical properties. They recognize some of the tools used to separate mixtures.</p>
Interactivity	In The Mix: In the interactive section of the module, students identify mixtures and sort given materials into two groups - "mixture" and "not a mixture" (pure substances).



Glossary	Mixtures
Quiz	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.
Journal entries	Journal #1 Journal #2
Teacher Resources	Mixture

Unit 7	Separating Mixtures (Suggested Grade Level: 4)
Instruction Module	<p>The Mixed and the Pure: In this Instruction Module, students observe various examples of mixtures and identify the substances that make up each mixture. They understand the difference between mixtures and pure substances. They recognize that mixture can be physical combinations of solids, liquids, and gases.</p> <p>Heterogeneous and Homogeneous Mixtures: In this Instruction Module, students observe examples of heterogeneous and homogeneous mixtures and understand the difference. They learn that solutions are homogeneous mixtures.</p> <p>Separate the Mixtures: In this Instruction Module, students learn that most of the properties of the substances that make up a mixture do not change. They identify the different tools that can be used to separate mixtures based on the physical properties of the ingredients. They are introduced to the process of chromatography.</p>
Interactivity	<p>Mix Your Cake and Eat It Too!: In this interactivity students observe how different ingredients are mixed together to make the batter for a cake, and identify whether the mixture is heterogeneous or homogeneous at each stage during the process.</p>
Glossary	Separating Mixtures



Quiz	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.
Activities	Comparing Mixtures and Solutions Identifying Mixtures and Solutions
Journal entries	Journal #1 Journal #2
Teacher Resources	Separating Mixtures
Unit 8	Mixtures and Solutions (Suggested Grade Level: 5)
Instruction Module	<p>Heterogeneous Mixtures: In this Instruction Module, students learn about heterogeneous mixtures and recognize that the ingredients maintain their physical properties.</p> <p>Solutions: In this Instruction Module, students learn that solutions are homogeneous mixtures. They observe examples of solutions and understand that the size of the ingredients, a physical property, changes. They learn that alloys are solutions of two or more metals.</p> <p>Using Properties to Separate Mixtures: In this Instruction Module, students observe examples of mixtures and understand that the components retain most of their physical properties. They learn that mixtures can be separated using tools based on the physical properties of the components.</p>
Interactivity/ Simulation	<p>Properties of Mixtures: In this Simulation, students conduct an experimental investigation to determine if different materials, when mixed with water, will maintain their size (which is a physical property) or dissolve.</p>
Glossary	Mixtures and Solutions



Quiz	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.
Activity	The ingredients of Solutions
Journal entries	Journal 1 Journal 2
Teacher Resources	Mixtures And Solutions
Unit 9	Physical and Chemical Changes (Suggested Grade Level: 5)
Instruction Module	Physical and Chemical Changes: 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.
Interactivity/ Simulation	The Change Detector!: 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
Quiz	The questions in the assessment section test students' understanding of the following concepts: Changes is state caused by changes in temperature, physical changes, chemical changes, evidence of chemical changes, and separation of mixtures.



Journal

Journal

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

Force: In this Instruction Module, students are introduced to force as a push or pull. Students observe examples and understand that forces can make an object at rest to move, bring a moving object to rest, and change the direction of motion. They also learn that two equal and opposite forces cancel each other and are called balanced forces.

What Is Work?: In this Instruction Module, students are introduced to the concept of work and machines. Students learn that in science, work is done when a force moves an object. They also learn that simple machines like pulleys help to make work easier.

Force and Mass: In this Instruction Module, students observe an experiment with a toy and learn that an object of greater mass requires a greater force to move it from rest.

What is Friction?: In this Instruction Module, students are introduced to friction. They learn that friction is a force that opposes motion. They observe and infer that the amount of friction depends on the nature of the surfaces in contact with each other.

Gravity and Magnetic Force: In this Instruction Module, student learn that both gravity and magnetic forces are similar because they are invisible forces that can pull objects. They also learn the differences between the two forces. They understand that while gravity pulls all objects, magnetic forces pull magnetic materials, and that magnets can also push other magnets depending on the direction in which they point.



Interactivity/ Simulation	<p>Force: 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: In this Simulation, students conduct an experiment to investigate the motion and position of four carts filled with different loads and then infer which cart has the greatest mass.</p>
Glossary	Force
Quiz	<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>
Activities	Force STEM Activity Force – Push or Pull?
Journal entries	Journal #1 Journal #2
Teacher Resources	Force



Unit 2	Forces on an Object (Suggested Grade Level: 4)
Instruction Module	<p>What Can Force Do?: In this Instruction Module, students are introduced to force and its effects on objects. Students learn that pushes and pulls are called forces. They recognize that forces can move an object, stop a moving object, and change the direction and speed of a moving object. They learn that forces are represented by arrows.</p> <p>Balanced and Unbalanced Forces: In this Instruction Module, students learn that forces have a magnitude and direction. They observe examples of balanced and unbalanced forces and infer about their effects on an object. They learn that an object at rest will move only when the forces acting on it are not balanced.</p> <p>Mass, Weight, and Gravity: In this Instruction Module, students learn the difference between mass and weight, and the units used to measure them. They learn that the weight of an object is a measure of gravitational force experienced by the object and can be measured with a spring scale. They understand that the mass of an object remains the same wherever it is measured, but the weight of an object depends on the gravitational force experienced by it.</p> <p>Friction: In this Instruction Module, students learn that friction is a force that opposes motion. They observe an experiment and recognize friction is greater when the surfaces in contact are rough than when the surfaces are smooth.</p> <p>A Magnet's Force: In this Instruction Module, students observe examples and understand that magnets exert a force of attraction on certain materials such as iron. They also learn that like of poles of two magnets repel each other while unlike poles attract each other.</p>
Interactivity/ Simulation	<p>Types of Forces: 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: In this simulation students will determine how temperature affects the force of a magnet.</p>
Glossary	Forces on an object



Quiz	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.
Activities	Testing the Effects of Force on an Object (Descriptive Investigation)
Journal entries	Journal #1 Journal #2
Teacher Resources	Forces On An Object

Unit 3	Effects of Force (Suggested Grade Level: 5)
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Instruction Module	<p>Force and Motion: In this Instruction Module, students observe and identify the various forces that can act on a ball during a baseball game. They recognize the effects of these forces.</p> <p>Speed and Acceleration: In this Instruction Module, students are introduced to speed and acceleration. Students learn that speed is the distance traveled by an object in a unit of time. They understand that acceleration refers to a change in speed and/or direction of motion and is caused by a force acting on the object.</p> <p>Effects of Force and Mass on Motion: In this Instruction Module, students observe examples and understand that an object at rest travels a greater distance when a greater force is used to move it. They also learn that an object of greater mass requires a greater force to move it through a certain distance as compared to an object that has less mass.</p> <p>Gravity and Weight: In this Instruction Module, students learn that the gravitational force between two objects depends on the mass of the objects. They compare the weights of an object on Earth, on the Moon, and on Jupiter, and infer that weight depends on the gravitational force experienced by the object.</p> <p>Friction – An Opposing Force: In this Instruction Module, students learn that friction is a force that opposes the motion of an object. They observe an experiment and understand that friction depends on the nature of surfaces in contact.</p>
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Interactivity/ Simulation	Testing the Effects of Force- Friction : In this Simulation, students conduct an experiment that investigates the effect of friction on the speed of a car rolling down a ramp.
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	<p>The Effect of Force on an Object (Experimental Investigation)</p> <p>How the Direction of the Force Affects the Motion of an Object (Experimental Investigation)</p> <p>The Effect of Mass on the Motion of an Object (Experimental Investigation)</p>
Journal entries	Journal #1 Journal #2
Teacher Resources	Effects Of Force
Unit 4	Force and Motion (Suggested Grade Level: 5)
Instruction Module	<p>Effects of Force on Motion: In this Instruction Module, students learn the pushes and pulls are called forces. They observe examples and changes caused by friction and gravity, and recognize that unbalanced forces can move an object at rest and change the speed and direction of a moving object.</p> <p>Measuring Distance and Speed: In this Instruction Module, students observe and recognize that motion is relative. They learn to calculate the average speed of an object by dividing the total distance traveled by the total time taken to travel that distance and express it using the correct units of measurement. They also learn that the motion of an object can be depicted on a distance - time graph.</p>



Interactivity/simulation	The Mass-matcher! : In this Interactivity, students observe the effects of a pair of forces on an object and decide if the forces are balanced or unbalanced.
Glossary	Force and Motion
Quiz	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.
Activity	Unbalanced Forces (Experimental Investigation) Representing Changes in Motion Graphically (STEM Investigation)
Journal entries	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.

Unit 1	Energy (Suggested Grade Level: 3)
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Instruction Module

What Is Energy?: In this Instruction Module, students observe examples of situations where energy is used and understand the meaning of energy. They learn that energy exists in different forms.

Energy Forms – Light and Heat: In this Instruction Module, students are introduced to heat and light as forms of energy. They learn that light energy helps us to see and plants use light energy during photosynthesis. They understand that light bends as it passes through transparent objects, and is blocked by opaque objects. They also learn that heat or thermal energy is the energy of the moving particles of matter.



Energy of Moving Objects: In this Instruction Module, students are introduced to examples of mechanical energy. Students observe various examples and infer that moving objects have mechanical energy. They also recognize that objects can have stored mechanical energy because of their position.

What Is Sound?: In this Instruction Module, students are introduced to sound. Students learn how sound is produced, how it travels, and how our ear helps us to hear sound. They also learn that sound can travel through solids, liquids, and gases but cannot travel in space.

Interactivity/ Simulation	Jamie In The Maze: 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.
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Glossary	Energy
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Quiz	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
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Journal entries	Journal #1 Journal #2
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Teacher Resources	Energy
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Unit 2	Forms of Energy (Suggested Grade Level: 3)
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Instruction Module	<p>Mechanical Energy: In this Instruction Module, students are introduced to kinetic energy and potential energy and recognize the mechanical energy transformations from one form to another.</p> <p>Sound Energy: In this Instruction Module, students observe and infer that sound is produced by mechanical vibrations and travels as sound waves. They learn that sound needs matter to travel through and travels fastest through solids. They also learn that echoes are a result of the bouncing of sound waves.</p> <p>Electrical Energy: In this Instruction Module, students are introduced to kinetic energy and potential energy and recognize</p>
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the mechanical energy transformations from one form to another.
Light Energy: In this Instruction Module, students learn about light energy and know that it travels in straight lines. They learn about transparent, translucent, and opaque objects.

Thermal Energy: In this Instruction Module, students learn that that the energy of the moving particles of matter is called thermal energy, and that temperature is a measure of how fast the particles of matter are moving. They learn about the process of heat transfer including conduction, convection, and radiation. They also learn that heat conductors are materials that allow heat to pass through them while heat insulators are materials that do not allow heat to pass through them easily.

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

Quiz	<p>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.</p>
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Activities

Forms of Energy (Descriptive Investigation)

Conductors and Insulators (Descriptive Investigation)

Journal entries	<p>Journal #1</p> <p>Journal #2</p>
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Teacher Resources Forms Of Energy

Unit 3	<p>Energy Conversions (Suggested Grade Level: 5)</p>
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Instruction Module	<p>Heat, Light, and Electrical Energy: In this Instruction Module, students observe and recognize that the Sun provides us with heat and light energy. They identify other sources of light energy and heat energy. They learn that light energy helps us to see, and heat energy helps us to cook food and keep ourselves warm. They also learn that electricity is the most useful form of energy.</p> <p>Mechanical Energy and Sound: In this Instruction Module, students observe examples and recognize that objects have energy due to their motion or their position. They learn that this energy is called mechanical energy. They also learn that sound is a form of mechanical energy and is produced by vibrations of matter and travels through particles of matter.</p> <p>Energy Transformations: In this Instruction Module, students observe various examples of energy transformations and learn that energy is neither created nor destroyed but can change from one form to another.</p>
Interactivity/ Simulation	<p>Exploring The Uses Of Mechanical Energy : 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.</p>
Glossary	Energy Conversions
Quiz	<p>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.</p>
Activities	<p>Exploring Uses of Energy</p> <p>Converting Thermal Energy to Motion (Descriptive Investigation)</p>
Journal entries	<p>Journal #1</p> <p>Journal #2</p>
Teacher Resources	Energy Conversions
Unit 4	<p>Light (Suggested Grade Level: 5)</p>



Instruction Module

Light and Matter: In this Instruction Module students learn about light as a form of energy, its sources, and how it travels. They observe various examples and identify transparent, translucent, and opaque materials.

Reflection and Refraction of Light: In this Instruction Module, students learn that light rays reflect off surfaces. They learn the difference between regular reflection and diffuse reflection. They also understand that light rays refract when they travel from one medium into another, and recognize instances of refraction.

Lenses and Their Uses: In this Instruction Modules, students learn how light rays refract when they travel through concave and convex lenses. They understand how a telescopes make distant objects appear closer by using a combination of lenses to magnify the image. They also understand the role of the lens in the human eye and a camera.

Glossary	Light
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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	<p>The Properties of Light</p> <p>Light Reflection and Different Surfaces (Descriptive Investigation)</p> <p>Why Rainbows Form</p> <p>Exploring the Properties of Light</p>
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Journal entries

Journal #1
Journal #2

Teacher Resources	Light
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Unit 5	Electrical Circuits (Suggested Grade Level: 5)
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Instruction Module

Electricity: In this Instruction Module, students are introduced to static electricity. Students learn that charges are of two type - positive and negative; like charges repel each other while unlike



charges attract each other. They also learn that almost all electrical appliances use current electricity, which is charges in motion.

Electrical Circuits: In this Instruction Module, students are introduced to electrical circuits. Students learn that the flow of electricity requires a closed path and a source of energy such as a battery. They understand how a switch helps to make or break a circuit and learn the difference between conductors and insulators of electricity.

Electricity and Magnetism: In this Instruction Module, students are introduced to magnetic fields, electrical fields, and electromagnetic fields. Students learn how to create an electromagnet and understand how electromagnets differ from permanent magnets. Students also learn how magnets are used to produce electricity.

Interactivity/ Simulation	<p>Send A Morse Code: 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- An Investigation: In this Simulation, students conduct an experiment to investigate how the number of turns in the coil wrapped around a nail affects the strength of an electromagnet.</p>
Glossary	Electrical Circuits
Quiz	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.
Activities	Electrical Circuits – Electromagnets (STEM Activity)
Journal entries	Journal #1 Journal #2
Teacher Resources	Electrical Circuits



Unit 6	Electricity (Suggested Grade Level: 5)
Instruction Module	<p>What is Electricity?: In this Instruction Module, students learn that electrical devices work on electric current, which is a flow of electric charges. They understand that the flow of electric current requires a source of energy and a closed continuous path called an electric circuit. They recognize instances where electrical energy is converted to other useful forms of energy such as light, heat, and sound.</p> <p>Electromagnets: In this Instruction Module, students learn that electro magnets are temporary magnets. They observe and learn to make an electromagnet. They recognize the use of an electromagnet in a junkyard crane.</p>
Interactivity/ Simulation	<p>Create a Circuit!: 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: In this simulation students will compare how electric current flows through a series and parallel circuit.</p>
Glossary	Electricity
Quiz	<p>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.</p>
Activities	<p>Design a Switch for an Electric Circuit (Experimental Investigation)</p> <p>Using an Electrical Circuit to Pop a Balloon (Observational Investigation)</p>
Journal entries	Journal #1 Journal #2
Teacher Resources	Electricity



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

Light and Matter: In this Instruction Module students learn about light as a form of energy, its sources, and how it travels. They observe various examples and identify transparent, translucent, and opaque materials.

Reflection and Refraction of Light: In this Instruction Module, students learn that light rays reflect off surfaces. They learn the difference between regular reflection and diffuse reflection. They also understand that light rays refract when they travel from one medium into another, and recognize instances of refraction.

Lenses and Their Uses: In this Instruction Modules, students learn how light rays refract when they travel through concave and convex lenses. They understand how a telescopes make distant objects appear closer by using a combination of lenses to magnify the image. They also understand the role of the lens in the human eye and a camera.

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
Teacher Resources	Light

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

Food and Nutrition: 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: 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.
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Journal Journal #1
Journal #2

Unit 2 Muscular and Skeletal Systems (Suggested Grade Level: 3)

Instruction Module **Muscular and Skeletal Systems:** 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.

Interactivity **Where are your Joints?:** In this interactivity, students compare different types of joints with those found in common objects in order to identify the types of joints shown.

Glossary Muscular and Skeletal Systems

Quiz 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.

Journal Journal #1
Journal #2

Unit 3 Growth and Change (Suggested Grade Level: 3)

Instruction Module **Simple Life Cycles:** In this Instruction Module, students learn how the life cycle of an organism includes its birth, growth, and reproduction. They understand what is meant by a simple life cycle, and give examples of organisms that have a simple life cycle.
Metamorphosis: In this Instruction Module, students observe and learn about the different stages in the life cycle of a ladybug, an insect that undergoes metamorphosis. They also learn about the different stages in the life cycle of a frog. They recognize the important structural differences between the juvenile and adult



stages.

Plant Growth Cycles: In this Instruction Module, students learn that different plants take different amounts of time to complete their growth and life cycle. They learn that plants can be classified as annuals, biennials, or perennials depending on whether they complete their life cycle in one, two, or many growing seasons respectively.

Interactivity/ Simulation	<p>Try Cycles!: 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.</p> <p>Comparing Life Cycles of Plants : In this simulation students will compare the length of time it takes for different plants to complete one life cycle.</p>
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Glossary	Growth and Change
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Quiz	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.
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Journal entries	Journal #1 Journal #2
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Expository text passages/ activities	Lifecycles: Fireflies
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Teacher Resources	Growth and Change
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Unit 4	Comparing Life Cycles (Suggested Grade Level: 4)
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Instruction Module	<p>Life Cycles of Animals: In this Instruction Module, student observe examples of organisms that have simple life cycles and complex life cycles. They learn which types of organisms have simple life cycles and which ones have complex life cycles.</p> <p>Life Cycle of a Butterfly: In this Instruction Module, students observe and understand that a butterfly undergoes a complete change in form or complete metamorphosis during its life. Students will be able to identify and describe the main features of the four stages in a butterfly life cycle.</p>
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Plant Life Cycles: In this Instruction Module students observe example of plant life cycles and recognize that plants have a complex life cycle. They learn about the different stages in the life cycle of a bean plant and an oak tree.

Interactivity	The Circle of Life! : 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.
Glossary	Comparing Life cycles
Quiz	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.
Activities	Life Cycle of a Dandelion (Descriptive Field Investigation)
Journal entries	Journal #1 Journal #2
Teacher Resources	Comparing Life Cycles

Unit 5	Life Cycles (Suggested Grade Level: 5)
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What are Life Cycles?: In this Instruction Module, students understand that a life cycle has no beginning or an end and that it is continuous. They also learn to explain the important events that are part of every life cycle such as birth, growth, and reproduction.

The Life Cycle of Mammals: In this Instruction Module, students learn that all mammals have a simple life cycle, with the young closely resembling the adults. They also identify the different stages in the life cycle of humans and outline important changes that occur in each of these stages.

Life Cycle of a Frog: In this Instruction Module, students learn that metamorphosis is a complete change in form that some animals such as frogs undergo during their lives. They learn to describe the different stages in the life cycle of a frog and identify the important changes that take place as a tadpole metamorphoses into an adult frog. They also learn to identify structural differences between a tadpole and an adult frog.



Incomplete Metamorphosis: In this Instruction Module, students learn that some insects such as grasshoppers go through incomplete metamorphosis, where the larval stage resembles the adult. They learn to identify and describes the various stages in the incomplete metamorphosis of a grasshopper. They will also learn to compare incomplete metamorphosis with complete metamorphosis.

Complete Metamorphosis: In this Instruction Module, students learn that some insects such as butterflies go through complete metamorphosis, where the larval stage looks completely different from the adult. They learn to identify and describe the various stages in the complete metamorphosis of a butterfly.

Life Cycle of a Bean Plant: In this Instruction Module, students learn to identify and describe the different stages of plant growth, using the example of a bean plant.

Life Cycle of an Apple Tree: In this Instruction Module, students learn to identify and describe the different stages in the life cycle of an apple tree ,and identify the correct sequence in which these events occur.

Interactivity	Life Cycle: 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 Life Cycle of a Dandelion
Journal entries	Journal #1 Journal #2
Expository text passages/ activities	Lifecycles: Fireflies
Teacher Resources	Life Cycles



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

Food Chains and Food Webs: In this Instruction Module students learn that organisms on Earth ultimately get their energy from the Sun. They learn that plants can directly convert sunlight into chemical energy and are called producers. They also learn that animals are consumers because they cannot make their own food. They understand that the flow of energy in an ecosystem can be represented schematically using food chains and food webs. They learn to explain why producers come first in every food chain. They also learn to identify factors that can disrupt energy flow in an ecosystem and to evaluate the impacts of these disruptions.

Types of Consumers: In this Instruction Module students understand that consumers are organisms that cannot make their own food and depend on other organisms for their energy. They understand that consumers can be classified based on what they eat and how they obtain their food. They learn to describe and give examples of different types of consumers such as herbivores, carnivores, omnivores, scavengers and decomposers.

Interactivity

Build a Food Chain: 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
Teacher Resources	Food Chains

Unit 2	Food Webs (Suggested Grade Level: 4)
Instruction Module	<p>Food Chains: In this Instruction Module, students understand how energy from the Sun is converted to chemical energy by the producers. They learn how this chemical energy is passed on from the producers to the consumers, and understand that this flow of energy can be represented using a food chain.</p> <p>Food Webs: In this Instruction Module, students understand how food chains can be interconnected to form food webs. They learn how to use a food web to recognize the relationship between different organisms in an ecosystem.</p> <p>Factors Affecting Populations: In this Instruction Module, students learn to describe the effects of a forest fire on the different populations of organisms living in it. They also learn to explain how a change in the number of producers or consumers can affect the entire food web.</p>
Interactivity	Go with the Energy Flow: 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.
Glossary	Food Webs
Quiz	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.



Journal entries Journal #1
Journal #2

Expository text passage/ activities The Brown Tree Snake and Descriptive Investigation

Teacher Resources Food Webs

Unit 3

Energy Flow through Food Webs (Suggested Grade Level: 5)

Instruction Module

Energy from the Sun: In this Instruction Module, students learn that energy from the Sun powers the water cycle. They also understand that plants convert sunlight to chemical energy during photosynthesis and animals depend on plants directly or indirectly for this chemical energy.

Energy Flow in an Ecosystem: In this Instruction Module, students learn that the flow of energy from one organism to another in an ecosystem can be represented diagrammatically using a food chain. They understand that food chains in an ecosystem interlink to form food webs. They also learn that more energy is available to the producers than to the consumers and that this decrease in energy can be represented using an energy pyramid.

Interactivity

Food Web Flow!: 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



Expository text
passage/ activities

The Brown Tree Snake and Descriptive Investigation

Teacher Resources

Energy Flow through Food Webs

Unit 4

Habitats and Organisms (Suggested Grade Level: 3)

Instruction Module

Components of an Ecosystem: In this Instruction Module students learn what an ecosystem is and recognize that it is made up of living and nonliving components. They observe examples of ecosystems and identify the living and nonliving components of an ecosystem.

Population and Habitat: In this Instruction Module students examine a pond environment to understand what a population and habitat are.

Basic Needs of Organisms: In this Instruction Module students learn that all organisms have some basic needs without which they cannot survive and that all their basic needs are best met in their natural habitat. They learn to identify the basic needs of plants and animals. They also understand why the natural habitat for one organism may be unsuitable for another organism, belonging to a different habitat.

Competing for Habitat Resources: In this Instruction Module students study a pond habitat to understand that organisms in a habitat must compete with each other to fulfill their basic needs. They also evaluate the impacts of overpopulation of some organisms in the pond habitat, on resources and populations of other organisms in the pond.

Interactivity

Pond Dwellers: 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

Quiz

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.



Habitats and Organisms

Activities

Observing Organisms in a Water Sample Using a Microscope

Journal entries

Journal #1
Journal #2

Expository text passage/ activities

The Brown Tree Snake

Teacher Resources

Habitats and Organisms

Unit 5

Producers and Consumers (Suggested Grade Level: 4)

Instruction Module

Ecosystems: In this Instruction Module, students learn to describe ecosystems and explain why they are important. They also use examples to identify suitable ecosystems for different animals.

Role of Producers: In this Instruction Module, students understand that plants are called producers because they can directly convert sunlight to chemical energy through photosynthesis. They also learn how plants make the Sun's energy available to all other organisms in an ecosystem.

Consumers: In this Instruction Module, students will learn that all animals are consumers because they depend on other organisms for their energy. They learn to identify, describe, and give examples of the different types of consumers such as herbivores, carnivore, omnivores, predators, prey, and scavengers.

Decomposers: In this Instruction Module, students learn to explain the role of decomposers in an ecosystem and give examples of some common decomposers. They also learn to evaluate the significance of decomposers in the recycling of nutrients in an ecosystem.

Interactivity

Got the Munchies!: 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.

Glossary

Producers and Consumers



Quiz	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.
Journal entries	Journal #1 Journal #2
Teacher Resources	Producers And Consumers
Unit 6	Organisms and their Environment (Suggested Grade Level: 5)
Instruction Module	<p>Competition for Resources: In this Instruction Module, students learn that organisms require some resources from their ecosystem without which they cannot survive. They understand that organisms compete with each other for resources that are limited.</p> <p>Relationships Among Organisms: In this Instruction Module, students learn that organisms require some resources from their ecosystem without which they cannot survive. They understand that organisms compete with each other for resources that are limited.</p>
Interactivity	<p>Build an Ecosystem!: 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.</p>
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
Teacher Resources	Organisms And Their Environments
Unit 7	Environmental Changes (Suggested Grade Level: 3)
Instruction Module	<p>Organisms Changing their Environment: In this Instruction Module, students observe and understand how organisms like beavers change their environment, and how these changes affects other organisms living in the same environment.</p> <p>Factors Affecting an Environment: In this Instruction Module, students examine how natural hazards such as forest fires, affect food webs in an ecosystem. They observe examples and evaluate how a change in prey population affects the corresponding predator population.</p>
Interactivity	<p>Pick the Change: In the interactive section of this module, students study visuals representing different environmental changes and identify the factors responsible for causing those changes.</p>
Glossary	Environmental Changes
Quiz	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.
Journal entries	Journal #1 Journal #2
Teacher Resources	Environmental Changes
Unit 8	Changes in Ecosystems (Suggested Grade Level: 5)



Instruction Module

How Organisms Change Their Ecosystems: In this Instruction Module, students learn how an organism can make important changes to its ecosystem using the example of the prairie dog in the Blackland Prairie Ecosystem. They also understand how these changes benefit other organisms in the same ecosystem.

Human Impacts on Ecosystems: In this Instruction Module, students understand how humans have drastically altered ecosystems by activities such as hunting, agriculture, and the construction of roadways, using the example of a Blackland Prairie ecosystem. They also learn about the different steps that humans can take to minimize damage to an ecosystem and to restore an ecosystem.

Interactivity

Ecosystem Harmony: 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.

Glossary Changes in Ecosystems

Quiz

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.

Activities Predicting Effects of Changes to an Ant Farm Ecosystem

Journal entries

Journal #1
Journal #2
Journal #3

Teacher Resources Changes in Ecosystems

Unit 9 Carbon dioxide-Oxygen Cycle
(Suggested Grade Level: 5)



Instruction Module

Photosynthesis: In this Instruction Module, students learn that plants use carbon dioxide and water along with energy from sunlight to make their own food. They also understand that oxygen is released as a by-product of photosynthesis. They evaluate the significance of photosynthesis in sustaining life on Earth.

Respiration: In this Instruction Module, students learn that oxygen is essential for organisms to survive. They understand how organisms such as human, breathe in oxygen and explain how this oxygen eventually reaches the cells to break down food and release chemical energy.

Decomposition: In this Instruction Module , students understand the process of decomposition as the breakdown of dead organic matter by organisms called decomposers. They recognize the importance of decomposition in recycling nutrients within an environment and in the carbon dioxide - oxygen cycle.

Interactivity	Balance the Cycle! : 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
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Quiz	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
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Teacher Resources	Carbon dioxide-Oxygen Cycle
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Unit 10	Cycling of Matter (Suggested Grade Level: 5)
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Instruction Module

Cycling of Matter: In this Instruction Module, students learn to describe how nutrients such as carbon, hydrogen, nitrogen, oxygen and phosphorus are cycled in the environment through the carbon, nitrogen, phosphorus and water cycles.

Decomposition: In this Instruction Module, students learn to describe the process of decomposition and to identify its importance in cycling nutrients in an ecosystem. They also learn to describe how decomposition can be employed to make compost.



Interactivity/ Simulation	Garbage to Garden! : In the interactive section of this module, students “build” a compost pit choosing the correct materials for each layer in the compost pit.
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	Inherited Traits of Plants and Animals: In this Instruction Module, students learn that offspring resemble their parents and grandparents because of inherited traits. Students learn that inherited traits are passed on from parents to their offspring. They observe and recognize examples of inherited traits in animals, plants, and humans.
Interactivity	Test Your 'Pair'enting Skills: 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
Teacher Resources	Inherited Traits
Unit 2	Traits and Characteristics (Suggested Grade Level: 4)
Instruction Module	<p>Inherited Traits and Survival: In this Instruction Module, students learn that inherited traits are characteristics that are passed on from parents to offspring. They are presented with different examples of inherited traits. They also understand how the inherited traits of some organisms help them adapt to their environment.</p> <p>What is Learned Behavior?: In this Instruction Module, students will understand what learned behavior is and explain how learned behavior is different from inherited traits. They will also understand how some types of learned behavior helps some organisms survive in their environment.</p>
Interactivity	Sort The Pictures: 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.
Glossary	Traits and Characteristics
Quiz	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.
Journal entries	Journal #1 Journal #2
Teacher Resources	Traits And Characteristics



Unit 3	Inherited Traits vs. Learned Characteristics (Suggested Grade Level: 5)
Instruction Module	<p>Inherited Traits: In this Instruction Module, students learn to define inherited traits and give examples of inherited traits in plants and animals. They also understand how some inherited traits are adaptations in organisms that help them survive in their environment.</p> <p>Learned Characteristics: In this Instruction Module, students understand what learned characteristics are. They learn to distinguish between learned characteristics and inherited traits. They observe and identify examples of learned characteristics in animals and humans.</p>
Interactivity	Inherited or Learned?: In the interactive section of this module, students identify whether the different pictures that are presented show an inherited trait or a learned characteristic.
Glossary	Inherited Traits vs Learned Characteristics
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, and differences between inherited traits and learned characteristics.
Activities	Inherited vs. Acquired Traits
Journal entries	Journal #1 Journal #2
Teacher Resources	Inherited Traits VS Learned Characteristics



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.

Unit 1	Adaptations (Suggested Grade Level: 3)
Instruction Module	What is an Adaptation?: In this Instruction Module, students observe a variety of examples of adaptations. They identify the adaptations and differentiate between structural and behavioral adaptations.
Interactivity	Sonoran Desert Organisms : 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.
Glossary	Adaptations
Quiz	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.
Journal entries	Journal #1 Journal #2
Expository text passages/ activities	Organisms and Environments
Teacher Resources	Adaptations
Unit 2	Environments and Adaptations (Suggested Grade Level: 4)



Instruction Module	<p>Types of Adaptations: In this Instruction Module, students learn to define and explain what is meant by an adaptation. They learn that adaptations can be either structural or behavioral and recognize examples of each kind.</p> <p>Structural Adaptations: In this Instruction Module, students learn to recognize and describe structural adaptations. They also learn about adaptations such as mimicry and camouflage.</p>
Interactivity	<p>Structural and Behavioral Adaptation: 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.</p>
Glossary	Environments and Adaptations
Quiz	<p>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.</p>
Journal	Journal #1 Journal #2
Expository text passages/ activities	Insect Adaptations (Descriptive Field Investigation)
Teacher Resources	Environments And Adaptations
Unit 3	<p>Adaptations and Survival (Suggested Grade Level: 5)</p>
Instruction Module	<p>Comparing Adaptations of Similar Organisms: In this Instruction Module, students observe and compare the structural adaptations of similar organisms that inhabit different environments. They learn how adaptations help an organism survive in its natural environment.</p> <p>Behavioral Adaptations: In this Instruction Module, students observe and identify examples of instinctive and learned behavioral adaptations. They learn how behavioral adaptations help organisms survive in their environment.</p>



Interactivity	Adaptations and Survival: In the interactive section of this module, students sort pictures showing adaptations of different organisms into two groups “structural adaptations” and “behavioral adaptations”.
Glossary	Adaptations and Survival
Quiz	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.
Activities	Adaptations
Journal entries	Journal #1 Journal #2
Expository text passages/ activities	Insect Adaptations
Teacher Resources	Adaptations And Survival

Unit 4	Classifying Plants (Suggested Grade Level: 5)
Instruction Module	Classifying Plants: 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 that 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: 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.
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Journal	Journal #1
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Unit 5	Classifying Animals (Suggested Grade Level: 5)
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Instruction Module	Classifying Animals: 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.
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Interactivity	Find 'n' Fit: 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.
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Glossary	Classifying Animals
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Quiz	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.
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Journal	Journal #1
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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
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	(Suggested Grade Level: 3)
Instruction Module	<p>The Planets: In this Instruction Module, students are introduced to the eight planets of our solar system—Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Students are encouraged to use mnemonics to help recall all the names of the planets.</p> <p>Inner Planets: In this Instruction Module, students are presented with the descriptions of each of the inner planets (Mercury, Venus, Earth, and Mars) and their distinctive features, such as nature of surface, atmosphere, comparative sizes, and position in relation to the Sun. Students observe, and draw comparisons and contrasts among the inner planets.</p> <p>Outer Planets: In this Instruction Module, students are presented with the descriptions of each of the outer planets (Jupiter, Saturn, Uranus, and Neptune) and their distinctive features, such as, comparative sizes, atmosphere, rings, and position in relation to the Sun. Students observe, and draw comparisons and contrasts among the outer planets. They learn that the asteroid belt separates the inner planets from the outer planets and understand why Pluto is no longer considered a planet.</p> <p>The Sun: In this Instruction Module, students are introduced to the Sun as the object in the center of our solar system. Students learn about the composition of the Sun, its different layers, and the process of fusion that makes the Sun the main source of energy on Earth. Students are also introduced to Sunspots.</p>
Interactivity	The Solar System: 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	<p>The Solar System: Order of the Planets</p> <p>The Solar System – Planet Identification</p>
Journal entries	<p>Journal #1</p> <p>Journal #2</p>
Teacher Resources	The Solar System



Unit 2	Earth, Moon and Sun (Suggested Grade Level: 3)
Instruction Module	<p>The Sun—Our Star: In this Instruction Module, students are introduced to the Sun as the largest object in our solar system. Students learn that the Sun is a star and is mostly made up of hydrogen and helium. They compare the relative sizes of the Sun, Earth, and the Moon and understand that the Sun appears to be the same size as the Moon because it is much farther away from Earth than the Moon.</p> <p>The Physical Sun: In this Instruction Module, students are introduced to some of the regions of the Sun such as the Sun’s corona, the photosphere, and sunspots. Students understand that the Sun is the main source of energy on Earth, providing energy for photosynthesis and driving the water cycle.</p> <p>Orbits and Rotation: In this Instruction Module, students learn that Earth rotates on its axis, causing the day and night cycle. They also understand that the Sun's gravitational pull holds Earth and the other planets in their orbits around the Sun.</p> <p>The Moon: In this Instruction Module, students learn that the Moon rotates on its axis and orbits the Earth. They understand that the Moon appears to change shape because only parts of the surface of the Moon which is lit up is visible from Earth.</p>
Interactivity	<p>Orbiting Spheres: 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.</p>
Glossary	Earth, Moon, and Sun
Quiz	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.
Activities	The Sun, Earth and Moon as a System
Journal entries	Journal #1 Journal #2



Expository text passage/ activities

The Rainiest Place in the United States

Teacher Resources

Earth, Moon, and Sun

Unit 3

Characteristics of the Sun, Moon, and Earth
(Suggested Grade Level: 5)

Instruction Module

Characteristics of Earth: In this Instruction Module, students are introduced to the characteristics of Earth such as its core, its crust, the gases in its atmosphere, its gravitational pull, and the existence of water in all three states. Students recognize the various characteristics that make life on Earth possible.

Comparing the Moon to Earth: In this Instruction Module, students compare the size, mass, gravitational pull, and atmosphere of the Earth and the Moon. They compare and contrast the lunar surface to Earth's surface and understand that the forces that cause weathering and erosion on Earth do not exist on the Moon.

Characteristics of the Sun: In this Instruction Module, students are introduced to the characteristics of the Sun such as its temperature and composition. Students observe and compare the Sun's mass and size with that of Earth. They learn about sunspots, solar winds, and solar flares.

Glossary

Characteristics of the Sun, Moon, and Earth

Quiz

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.

Activities

Characteristics of the Sun, Moon, and Earth

Journal entries

Journal #1
Journal #2

Teacher Resources

Characteristics of the Sun, Moon, and Earth

Unit 4

Earth Cycles
(Suggested Grade Level: 5)



Instruction Module

The Day and Night Cycle: In this Instruction Module, students learn that changes that repeat and form a pattern are called cycles. They understand that the day-and-night cycle is caused by the rotation of Earth on its axis.

Cycle of the Seasons: In this Instruction Module, students learn that the cycle of seasons is a result of Earth revolving around the Sun on its tilted axis. They observe and understand that when the Northern hemisphere is tilted toward the Sun, it experiences summer and when it is tilted away from the Sun, it experiences winter.

Phases of the Moon: In this Instruction Module, students learn that as the Moon revolves around Earth, only parts of its lit up surface are visible from Earth resulting in the different phases of the Moon. They also learn that waxing and waning are terms used to describe the apparent growing and shrinking of the Moon.

Glossary

Earth Cycles

Quiz

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.

Activities

Day and Night and the Movement of the Sun Across the Sky

Journal entries

Journal #1
Journal #2
Journal #3

Teacher Resources

Earth Cycles

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

Tectonic Plates and Earthquakes: In this Instruction Module, students learn about the different types of earthquakes and the types of changes these earthquakes cause on Earth's surface. Students understand that earthquakes can occur both on land and underwater.

Volcanic Eruptions: In this Instruction Module students understand that during a volcanic eruption, molten magma escapes from under Earth's crust to its surface. They also learn about some of the positive and negative effects of a volcanic eruption.

Glaciers – A Natural Force: In this Instruction Module, students learn what a glacier is and recognize the effects of glacial erosion on Earth's surface.

Interactivity/ Simulation

Earth's Ever-Changing Surface: 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: In this Simulation, students conduct an experiment to investigate how the type of magma affects what kind of volcano will form.

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

Teacher Resources Earth's Ever-changing Surface

Unit 2 **Landforms**
(Suggested Grade Level: 3)

Instruction Module

Continents and Oceans: In this Instruction Module, students are introduced to the continents and oceans on Earth. They learn the names of the seven continents and five oceans and their locations.

Landforms on Land: In this Instruction Module, students are introduced to the various landforms on land, such as hills,



mountains, plateaus, valleys, plains, canyons, and deserts. Students observe and compare the different landforms.

Landforms Shaped by Water: In this Instruction 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.

Interactivity	Jamie and the Jigsaw Puzzle: In the interactive section of this module, students complete a jigsaw puzzle by identifying landforms based on clues or descriptions.
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Glossary	Landforms
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Quiz	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.
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Journal entries	Journal #1 Journal #2
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Expository text passage/ activities	Landforms: Mount Everest
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Teacher Resources	Landforms
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Unit 3	Observing Change (Suggested Grade Level: 4)
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Instruction Module	<p>Changes on the Earth's Surface: In this Instruction Module, students learn that Earth's surface is constantly being changed by natural forces such as wind, water, and glaciers. They understand how these forces cause weathering, erosion, deposition, and dissolving which change landforms and create new landforms.</p> <p>Rock Layers and Fossils: In this Instruction Module, students learn that the lowest layer in sedimentary rock is usually the oldest and that scientists study these layers to understand events that occurred in the past. They also learn that fossils found in rock layers provide evidence of organisms that lived in the past and their environments.</p> <p>Using Tables and Charts: In this Instruction Module, students are introduced to charts and tables. Students observe examples and understand how the information represented in tables and charts can help us understand changes such as the erosion of a cliff by waves, or changes in the population of bald eagles.</p>
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Interactivity	Observing Change: 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
Teacher Resources	Observing Change
Unit 4	Changes on Earth's Surface (Suggested Grade Level: 5)
Instruction Module	<p>Erosion by Water: In this Instruction Module, students will learn about water erosion and the landforms created by such erosion. They will also understand how erosion by water can be measured quantitatively in the laboratory.</p> <p>Water as a Force: In this Instruction Module, students learn how water can change Earth's surface. They learn that water is a destructive force when it causes weathering and erosion and that it is a constructive force when it causes deposition.</p> <p>Changes on Earth's Surface: In this Instruction Module, students learn that Earth's surface is constantly being changed by natural forces such as wind, water, and glaciers. They understand how these forces cause weathering, erosion, deposition, and dissolving which change landforms and create new landforms.</p>
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

Teacher Resources Changes On Earth’s Surface

Unit 5

Learning from the Past (Suggested Grade Level: 5)

Instruction Module

Understanding Past Events: In this Instruction Module, students learn to examine photographs to make conclusions about certain events that have occurred in the past. They understand how photographs can serve as valuable records that can be used for evaluating past events.

How are Fossils Formed?: In this Instruction Module, students learn that sedimentary rocks are formed over millions of years and plant and animal remains are buried in these rocks as fossils.

Clues About Past Environments: In this Instruction Modules, students observe examples of trace fossils and make inferences about environmental conditions that existed in the past. They learn how such fossils provide important clues about environmental conditions in the past.

Evidence of Pangaea: In this Instruction Module, students are introduced to various evidence that suggest that in the past, all present-day continents were joined to form one giant landmass called Pangaea. Students learn to evaluate the evidence.

Glossary Learning from the Past

Quiz 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.

Activities Fossils as Evidence of the Past

Journal entries Journal #1
Journal #2
Journal #3

Teacher Resources Learning from the Past



Unit 6	Weather (Suggested Grade Level: 3)
Instruction Module	<p>What Is Weather?: In this Instruction Module, students are introduced to the concept of weather. Students learn that the Sun warms the surface of Earth and the air above it, causing the weather changes on Earth. They recognize how weather affects our daily activities.</p> <p>Air Temperature: In this Instruction Module, students are introduced to air temperature. Students learn how a thermometer is used to measure air temperature. They recognize that the Sun does not heat Earth's surface evenly, resulting in variations in temperatures across Earth.</p> <p>Wind: In this Instruction Module, students are introduced to the direction and speeds of winds. They learn how a wind sock is used to find out the direction in which the wind blows. They understand how wind speeds can be described a calm, light, moderate, or strong.</p> <p>Precipitation: In this Instruction Module, students learn about the different forms of precipitation such as rain, sleet, and snow. They learn that tools such as the rain gauge and the snow gauge help to measure the amount of precipitation in an area. They recognize the effects of an excess or of a shortage of precipitation.</p> <p>Patterns in Weather: In this Instruction Module, students learn that meteorologists use information from satellite maps to study weather patterns and predict weather conditions. They also learn how data collected and represented in charts and tables help to identify weather patterns.</p>
Interactivity	Watch Out for the Weather! : In the interactive section of this module, students observe and record weather conditions such as temperature, precipitation, and wind speeds for three different cities.
Glossary	Weather
Quiz	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.
Activities	Measuring the Weather
Journal entries	Journal #1 Journal #2



Expository text passage/ activities Weather: Measuring the Wind

Teacher Resources Weather

Unit 7

Energy from the Sun and Weather (Suggested Grade Level: 4)

Instruction Module

Sun’s Energy In Food: This Instruction Module explains how the Sun’s energy is present in our food. It traces the path of the Sun’s energy through plants and animals, and into our food.
Sun's Energy and the Water Cycle: In this Instruction module, students learn how to describe and illustrate the water cycle, and recognize that the Sun is the major source of energy in this process.
Weather Maps: In this Instruction Module, students learn about the symbols on a weather map that represent high and low pressures, and cold, warm, and stationary fronts. They also learn how each of these conditions affects the weather of a place.

Interactivity

The Vital Sun: 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.

Glossary

Energy from the Sun and Weather

Quiz

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.

Activities

Energy from the Sun and Weather (Descriptive Investigation)
Using Weather Maps to Predict Weather
Creating a Weather Map

Journal entries

Journal #1
Journal #2

Teacher Resources

Energy From The Sun And Weather

Unit 8

Weather or climate?



(Suggested Grade Level: 5)

Instruction Module

The Sun and Weather: In this Instruction Module, students learn how uneven heating of the Earth’s surface results in variation of temperatures in the different parts of Earth. They learn that the Earth's tilted axis is the cause of the uneven heating.

Humidity: In this Instruction Module, students are introduced to humidity. They learn that humidity refers to the amount of water vapor in the air. They understand that humidity depends on the climate of a place and on temperature.

Air Pressure and Weather: In this Instruction Module, students are introduced to air pressure. Students learn about the effects of temperature on air pressure and learn to identify regions of high and low pressures on a weather map. They understand that air moves from a region of high pressure to a region of low pressure and recognize the effects of air pressure on weather.

Climate: In this Instruction Module, student learn the difference between climate and weather. They learn how meteorologists collect weather data over several years to determine the climate of a place. They also learn about global warming and some of the possible consequences.

Interactivity

Weather vs Climate: 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.

Glossary

Weather or Climate?

Quiz

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.

Activities

Weather or Climate? (Field Investigation)
Determining Wind Direction (Observational Field Investigation)
Benjamin Franklin: Meteorologist

Journal entries

Journal #1
Journal #2
Journal #3

Teacher Resources

Weather or Climate?

Unit 9 Recognizing Patterns in Changes



	(Suggested Grade Level: 4)
Instruction Module	<p>What are Patterns?: In this Instruction Module, students learn that a pattern is a set of events or design that repeat. They recognize examples of patterns that occur in nature such as the day and night pattern, weather patterns, and patterns in the arrangement of petals or butterfly wings.</p> <p>Seasonal Patterns, Weather, and Climate: In this Instruction Module, students observe and recognize seasonal patterns. They recognize that seasons are accompanied by changes in weather, and that a pattern of weather of a place over several years is the climate of the place.</p> <p>Patterns of the Sun: In this Instruction Module students learn about the daily patterns of Sun including sunrise and sunset, and its apparent movement across the sky during a day that causes patterns in shadows. They also understand that the position of the Sun in the sky changes through different seasons and affects the duration of the day and night.</p> <p>Patterns Caused by the Moon: In this Instruction Module, students learn about the lunar cycle and understand what causes the different phases of the Moon. They also learn that the pattern of high tides and low tides are caused by the gravitational pull of the Moon.</p>
Interactivity/ Simulation	<p>Recognizing Patterns in Changes: 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: In this simulation students will investigate and recognize that the length of a shadow follows a pattern throughout the year.</p>
Glossary	Recognizing Patterns in Changes
Quiz	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.
Activities	Recognizing Patterns in Changes The Moon and Tides
Journal entries	Journal #1 Journal #2



Teacher Resources Recognizing Patterns Of Change

Unit 10	The Water Cycle (Suggested Grade Level: 5)
Instruction Module	The Water Cycle: In this Instruction Module, students are introduced to the water cycle. Students learn to identify and describe the different processes that are part of the water cycle such as evaporation, condensation, precipitation, infiltration, and transpiration.
Glossary	The Water Cycle
Quiz	The questions in the assessment and additional assessment section test students' understanding and ability to identifying the different processes of the water cycle.
Activities	The Water Cycle (Descriptive Investigation)
Journal entries	Journal #1 Journal #2
Expository text passages/ activities	The Rainiest Place in the United States
Teacher Resources	The Water Cycle

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	What is soil made of?: In this Instruction Module, students learn that soil is formed by the weathering of rock and is made up of sand, silt, clay and humus. They also understand that different soil types contain varying amounts of sand, silt, and clay. How is Soil Formed?: In this Instruction Module, students are introduced to the processes that result in the formation of soil. Students learn that soil is formed as a result of weathering of rock.



They observe and recognize how differences in temperature and the forces of air, water, and ice can cause weathering.

Interactivity	What's in the Soil?: 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
Teacher Resources	Soil Formation
Unit 2	Soil Properties and Experiments (Suggested Grade Level: 4)
Instruction Module	Properties of Soil: In this Instruction Module, students will learn to describe the different components of soil. They will also learn to use soil properties such as color, texture, and composition to identify soil types. They will also investigate and determine the soil best suited for plant growth. Soil Water Retention: In this Instruction Module, students observe an experiment and compare the water retention capacities of different soil types such as sand, silt, clay, and loam. They learn about the steps of the scientific method used when performing an experiment.
Interactivity/ Simulation	Soil Properties-How Much Air Is In There? : In this Simulation, students conduct an experiment that investigates the volume of air bubbles displaced by different soil samples.
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
Teacher Resources	Soil Properties And Experiments
Unit 3	Earth's Natural Resources (Suggested Grade Level: 3)
Instruction Module	Conserving Earth's Resources: In this Instruction Module, students recognize the importance of conserving Earth's natural resources. They learn how renewable and nonrenewable resources can be conserved by reducing the usage of their products, reusing some of the products, and also recycling some of these products whenever possible.
Interactivity	Identify the Resources: 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



Teacher Resources	Earth's Natural Resources
Unit 4	Conserving Resources (Suggested Grade Level: 4)
Instruction Module	<p>Renewable Resources: In this Instruction Module, students learn that renewable resources are natural resources that are plentiful in nature. They also learn to identify and give examples of renewable resources.</p> <p>Nonrenewable Resources: In this Instruction Module, students learn that nonrenewable resources are natural resources that exist in limited quantities in nature. They also learn to identify and give examples of nonrenewable resources.</p> <p>Conservation of Natural Resources: In this Instruction Module, students learn about the consequences of depletion of natural resources and recognize the importance of conservation of resources. They also learn about different ways to conserve these resources.</p>
Interactivity	<p>Conserving Resources: 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.</p>
Glossary	Conserving Resources
Quiz	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.
Journal entries	Journal #1 Journal #2
Teacher Resources	Conserving Resources
Unit 5	Energy Resources (Suggested Grade Level: 5)



Instruction Module	<p>Formation of Fossil Fuels: In this Instruction Module, students learn about fossil fuels and the processes that led to the formation of fossil fuels.</p> <p>Alternative Energy Resources: In this Instruction Module, students learn about alternative energy resources including wind, solar, hydroelectric, geothermal, and biofuels.</p> <p>Sedimentary Rocks: In this Instruction Module, students learn about the processes that lead to the formation of sedimentary rocks and the various types of sedimentary rock.</p>
Interactivity	Look at the Alternatives!: 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.
Glossary	Energy Resources
Quiz	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.
Activities	<p>Processes that Lead to the Formation of Fossil Fuels and Sedimentary Rocks</p> <p>Alternative Energy Sources at Home</p>
Journal entries	<p>Journal #1</p> <p>Journal #2</p> <p>Journal #3</p>
Teacher Resources	Energy Resources

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.

Unit 1

Safety and Scientific Processes



	(Suggested Grade Level: 3, 4, 5)
Instruction Module	Safety and Scientific Processes: In this Instruction Module, students learn how to successfully conduct safe, appropriate science investigations using scientific processes and that it is as important as the science content knowledge gained from the experience.
Interactivity	Tess' Pulley Experiment: In this interactivity, students conduct a virtual experimental investigation to test a hypothesis that a pulley system with two pulleys will decrease the force required to lift a mass by half.
Glossary	Safety and Scientific Processes
Quiz	<p>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.</p> <p>Collecting, Recording and Analyzing Information Using Tools</p>
Activities	Evaluating the Accuracy of Advertisements for Products and Services
Journal entries	Journal #1 Journal #2
Expository text passages/ activities	Microscopes Evaluating Claims for Products and Services