



Course Description
Grades 6–8
Florida
2016-2017



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Grade 6 Course Description

Big Ideas 1, 2, and 3: Nature of Science

Topic 1: Scientific Investigations

Description: [SC.6.N.1.1] In this topic students will learn to describe, plan, and carry out scientific investigations of various types including descriptive, comparative, and experimental investigations, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and communicate conclusions.

Instruction Module

Safety and Scientific Investigations: In this Instruction Module, students learn how to plan and implement descriptive, comparative, and experimental investigations. They learn to ask well-defined questions, formulate testable hypotheses, collect, record, and analyze data, construct tables and graphs, communicate valid conclusions and predict trends.

Glossary

Scientific Investigations

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Simulations

Dissolve and Resolve: In this simulation students understand the effect of acid rain on different types of rocks. They test how acid affects marble, limestone, quartz, and granite by submerging them in acid that has a pH level similar to that of acid rain. They measure and record how much mass, if any, the rocks lost after 24 hours. They analyze the data collected and arrive at a conclusion.

Design the Ride: In this simulation section, students change the height of the hills of a roller coaster and observe the effect on the movement of the roller coaster car. They record their observations, analyze the data, and arrive at a conclusion. This helps them to understand the energy conversions that take place in a roller coaster ride.

Journals

Journal - Safe Practices and Safety Equipment

Activities

Move it! Move it! - Molecules in Motion
Potential and Kinetic Energy
Lab Safety Symbols



Quiz

Scientific Investigations

Big Idea 6: Earth Structures

Topic 1: Weathering, Erosion, and Deposition

Description: [SC.6.E.6.1] In this topic students recognize that Earth's surface is continuously altered by forces, and recognize the processes of weathering, erosion, and deposition.

Instruction Module

Weathering: In this Instruction Module, students learn about the process of weathering and understand how mechanical weathering differs from chemical weathering. They learn about the agents of weathering including water, wind, ice, temperature changes, and organisms, and understand how weathering changes the surface of Earth.

Instruction Module

Erosion: In this Instruction Module, students will learn about the process of erosion and understand how wind, water, and ice act as agents of erosion. They learn how erosion changes the surface of Earth.

Instruction Module

Deposition: In this Instruction Module, students learn about the process of deposition and understand how landforms such as deltas, alluvial fans, sand dunes, and moraines are a result of deposition by water, wind, and glaciers.

Glossaries

Weathering, Erosion, and Deposition

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Simulations

Dissolve and Resolve: In this simulation students understand the effect of acid rain on different types of rocks. They test how acid affects marble, limestone, quartz, and granite by submerging them in acid that has a pH level similar to that of acid rain. They measure and record how much mass, if any, the rocks lost after 24 hours. They analyze the data collected and arrive at a conclusion.

Journals

Journal - Slow Changes In Ecoregions



Big Idea 7: Earth Systems and Patterns

Topic 1: Climate and Weather

Description: [SC.6.E.7.1; SC.6.E.7.2; SC.6.E.7.3; SC.6.E.7.5; SC.6.E.7.6] In this topic students will learn to explain how energy provided by the Sun influences global patterns of atmospheric movement, and describe the interactions between the atmosphere, land, and oceans that affect weather patterns and climate.

Instruction Module

Weather and Weather Maps: In this Instruction Module, students understand the difference between weather and climate. They learn about the role of the Sun in creating high pressure and low pressure regions, thus affecting the weather of a place. They also learn about the symbols on a weather map used to represent high and low pressures, and warm and cold fronts.

Instruction Module

The Sun’s Influence on Atmosphere and Oceans: In this Instruction Module, students learn that the energy from the Sun causes convection currents in the atmosphere. They also understand that unequal heating of the oceans and differences in salinity cause surface currents and deep ocean currents. They recognize how these ocean currents affect the climate and weather in all parts of the world.

Instruction Module

Influence of Oceans on Weather and Climate: In this Instruction Module, students recognize the role of the oceans in the water cycle and in the creation of hurricanes. They understand the influence of ocean currents on the weather and climate of a place. They also learn what causes El Niño and how it affects the weather globally.

Glossaries

Climate and Weather

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities

Predict the Weather: In this Interactivity, students recognize the types of weather associated with high/low pressure and warm/cold fronts.

Journals

Journal 1 - Climate and Weather
Journal 2 - Climate and Weather



Activities	<p>El Niño</p> <p>Convection Currents</p> <p>Using Weather Maps to Predict Weather</p> <p>How Accurate are Weather Reports?</p> <p>Constructing a Model of a Psychrometer</p> <p>Constructing a Model of an Anemometer</p>
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Quiz	Climate and Weather
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Topic 2: Catastrophic Events and Ecosystems

Description: [SC.6.E.7.7] In this topic students learn to recognize and describe the effects of natural disasters on ecosystems.

Instruction Module	<p>Catastrophic Events and Ecosystems: In this Instruction Module, students learn how natural disasters such as hurricanes, tornadoes, forest fires, floods, and even asteroid crashes are catastrophic events that affect the various components of an ecosystem.</p>
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Glossaries	<p>Catastrophic Events and Ecosystems</p> <p>The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>
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Interactivities	<p>Alex’s Soil Lab: In this Interactivity, students predict the type of catastrophic event that has occurred in a region by examining the components of soil in that area.</p>
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Journals	Journal - Catastrophic Events and Ecosystems
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Quiz	Catastrophic Events and Ecosystems
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Topic 3: Earth Supports Life

Description: [SC.6.E.7.9] Students will be able to identify and describe the characteristics of Earth such as the presence of water and the composition of the atmosphere, that allow life (as we know it) to exist.

Instruction Module	<p>Life in our Solar System: In this Instruction Module, students learn that Earth is the only object in our solar system that can support life. They recognize the characteristics of Earth such as its distance from the Sun, the presence of water, the composition of its atmosphere, and its mass that make it possible for life to exist.</p>
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Glossaries	<p>Earth Supports Life</p> <p>The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>
Interactivities	<p>Will It increase or decrease?: In this Interactivity, students use a model to change the location of the Earth and predict how it would affect the amount of sunlight and temperature if Earth was closer to or further away from the Sun. Then, they change the mass of the Earth and predict its effect on the gravitational force.</p>
Journals	<p>Journal 1 - Life In Our Solar System</p> <p>Journal 2 - Life In Our Solar System</p>
Quiz	<p>Earth Supports Life</p>

Big Idea 11: Energy Transfer and Transformations

Topic 1: Potential and Kinetic Energy

Description: [SC.6.P.11.1] In this topic students will learn to differentiate between kinetic energy and potential energy, and identify situations where energy is transformed.

Instruction Module **Kinetic Energy:** In this Instruction Module, students observe and learn that kinetic energy is the energy possessed by moving objects. They learn that the kinetic energy of an object depends on the mass and speed of the object.

Instruction Module **Potential Energy:** In this Instruction Module, students observe examples and learn that potential energy is the energy stored in objects because of their position or condition. They recognize that the potential energy of an object raised above the ground depends on its mass and the height to which it is raised.

Instruction Module **Mechanical Energy Transformations:** In this Instruction Module, students observe an oscillating pendulum and learn that mechanical energy continuously changes from potential to kinetic and back to potential energy. They learn the pendulum eventually stops oscillating because energy is lost as heat due to friction. Students apply this understanding to explain the energy transformations in roller coaster rides.



Glossaries	Potential and Kinetic energy The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Is it Potential or Kinetic?: In this Interactivity, students observe the movement of objects and identify the correct amounts of potential and kinetic energy at different positions of the objects.
Simulations	Design the Ride: In this simulation section, students change the height of the hills of a roller coaster and observe the effect on the movement of the roller coaster car. They record their observations, analyze the data, and arrive at a conclusion. This helps them to understand the energy conversions that take place in a roller coaster ride.
Journals	Journal - Potential and Kinetic Energy
Activities	Potential and Kinetic Energy
Quiz	Potential and Kinetic Energy

Big Idea 12: Motion of Objects

Topic 1: Motion - Speed, Distance, and Time

Description: [SC.6.P.12.1] In this topic, students will learn the relation between the speed of a moving object, the distance it travels, and the time it takes, and represent this as a graph for an object moving at constant speed.

Instruction Module	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 travelled 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.
Glossaries	Motion - Speed, Distance, and Time The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Journals	Journal - Force and Motion



Activities	Representing Changes in Motion Graphically – STEM
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Quiz	Motion - Speed, Distance, and Time
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Big Idea 13: Forces and Changes in Motion

Topic 1: Forces Acting at a Distance

Description: [SC.6.P.13.1; SC.6.P.13.2] In this topic students will learn about forces acting at a distance such as electrical, magnetic, and gravitational.

Instruction Module	Electricity: In this Instruction Module, students are introduced to static electricity. Students learn that charges are of two types - 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.
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Instruction Module	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.
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Instruction Module	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 it.
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Glossaries	Forces Acting at a Distance The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
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Simulations	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.
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Journals	Journal - Effects of Force
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Activities	Electrical Circuits – Electromagnets
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Quiz	Forces Acting at a Distance
Topic 2: Force and Motion	
Description: [SC.6.P.13.1; SC.6.P.13.2; SC.6.P.13.3] In this topic students will learn to differentiate between balanced and unbalanced forces, and identify the effects of unbalanced forces on the motion of an object.	
Instruction Module	Effect 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.
Glossaries	Force and Motion The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	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.
Journals	Journal - Force and Motion
Activities	How the Direction of the Force Affects the Motion of an Object The Effect of Mass on the Motion of an Object
Quiz	Force and Motion

Big Idea 14: Organization and Development of Living Organisms

Topic 1: Structural Hierarchy - Cell to Organisms

Description: [SC.6.L.14.1] In this topic, students will learn to identify the patterns in the hierarchical organization of organisms from cells to tissues to organs to organ systems to organisms.

Instruction Module
Structural Hierarchy - Cell to Organisms: In this Instruction Module, students learn that multicellular organisms can either be simple or complex based on whether or not they exhibit structural hierarchy. They learn that the structural hierarchy exhibited by complex multicellular organisms from the smallest to the largest unit is cells to tissues to organs to organ systems to organism.



Glossaries	Structural Hierarchy - Cell to Organisms The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
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Journals Journal - Cells to Organisms

Activities	Levels of Organization of Living Things
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Quiz Structural Hierarchy - Cell to Organisms

Topic 2: Cell - The Basic Unit of Life

Description: [SC.6.L.14.2; SC.6.L.14.3] In this topic students will learn to recognize and explain that the cells is the basic unit of life and is capable of performing all life functions; they learn to compare and contrast eukaryotic cells and prokaryotic cells.

Instruction Module **Cell: The Basic Unit of Life:** In this Instruction Module, students learn that all living organisms are composed of cells and that the cell is the basic unit of life. They learn that organisms can be unicellular or multicellular. They understand that a single cell is capable of performing all life functions and that every cell has a cell membrane, cytoplasm and DNA.

Instruction Module **Eukaryotic and Prokaryotic Cells:** In this Instruction Module, students learn about the structures of a prokaryotic and eukaryotic cell. They also learn to compare and contrast a typical prokaryotic and eukaryotic cell.

Glossaries **Cell - The Basic Unit of Life**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities **Sorting Cells:** In this Interactivity, students identify the components of cells that are common to both kinds of cells and the components which are present either in eukaryotic cells or in prokaryotic cells.

Journals Journal 2 - Cell – The Basic Unit of Life

Quiz	Cell - The Basic Unit of Life
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Topic 3: Plant vs Animal Cell

Description: [SC.6.L.14.4] In this topic students will learn to differentiate between plant and animal cells, and compare and contrast the structure and functions of major organelles of plant and animal cells.

Instruction Module **Plant vs Animal Cell:** In this Instruction Module, students recognize that plant and animal cells are both eukaryotic cells. They learn about the structural components of both these types of cells, and compare and contrast the structure and functions of major organelles of plant and animal cells.

Glossaries **Plant vs Animal Cell**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities **Cell! Cell! Organelle!** In this Interactivity, students “build” a plant cell and an animal cell by dragging and dropping the correct organelles to the appropriate cell.

Journals Journal 2 - Plant vs. Animal Cell

Activities Observing Paramecia
Comparing Plant and Animal Cells Organelles

Quiz Plant vs Animal Cell

Topic 4: Human Body Systems

Description: [SC.6.L.14.5] In this topic students will learn to identify and describe the structure and functions of the major systems of the human body.

Instruction Module **Respiratory and Circulatory Systems:** In this Instruction Module, students learn about the structural components of the respiratory and the circulatory systems. They understand that these systems are interconnected for the transport of gases in the human body. They understand how the respiratory system helps in the exchange of gases and the circulatory system helps in the transport of gases within the body.

Instruction Module **Skeletal and Muscular Systems:** In this Instruction Module, students learn how bones and muscles work together to facilitate movement. They learn that muscles are of two main types, namely voluntary and involuntary muscles. They learn that the



	<p>region where two or more bones meet is called a joint and learn about the different types of joints in the human body.</p>
Instruction Module	<p>Digestive and Excretory Systems: In this Instruction Module, students learn about the different components of the digestive system and how they aid in digestion. They also learn about the kidneys in the excretory system and how they work to eliminate wastes in the bloodstream.</p>
Instruction Module	<p>Integumentary System: In this Instruction Module, students learn that the integumentary system is made of the skin, hair and nails. They learn about the different structural components of the skin and the functions of these components.</p>
Instruction Module	<p>Nervous System: In this Instruction Module, students Learn about the components of the nervous system and their functions. They also understand how nerves carry electrical messages or impulses to and from the brain.</p>
Instruction Module	<p>Endocrine and Reproductive Systems: In this Instruction Module, students learn that the endocrine system is made of structures called glands that release hormones to regulate some important functions in the body. They learn about the functions of some important endocrine glands. They also learn about the structural components of the male and female reproductive systems and their functions.</p>
Interactivities	<p>Dr.Fix-it!: In this Interactivity, students identify organs that are missing from an organ system and drag and drop the right organ to its right location in the organ system.</p>
Glossaries	<p>Human Body Systems The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>
Journals	Journal - Human Body Systems
Activities	Human Body Systems
Quiz	Human Body Systems



Big Idea 15: Diversity and Evolution of Living Organisms

Topic 1: Taxonomic Classification

Description: [SC.6.L.15.1] In this topic students will learn how and why organisms are classified according to shared characteristics.

Instruction Module

Taxonomic Classification: In this Instruction Module, students learn that taxonomic classification groups living organisms into smaller and smaller groups based on their similarities. They also understand the significance of using a standardized taxonomic classification system.

Instruction Module

Three Domain Classification: In this Instruction Module, students learn that all organisms are grouped into three domains - Archaea, Bacteria and Eukarya, and recognize the main characteristics of organisms belonging to each domain. They also learn that organisms in Domain Eukarya are further divided into four kingdoms - Protista, Fungi, Plantae, and Animalia, and understand the features of organisms belonging to each of these kingdoms.

Glossaries

Taxonomic Classification

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities

Sort the Lot!: In this Interactivity, students classify organisms into kingdoms based on their characteristics.

Journals

Journal 1 - Taxonomic Classification
Journal 2 - Taxonomic Classification

Activities

The Basic Characteristics of Kingdoms

Quiz

Taxonomic Classification



Grade 7 Course Description

Big Ideas 1, 2 and 3: Nature of Science

Topic 1: Scientific Investigations

Description: [SC.7.N.1.1; SC.7.N.1.3; SC.7.N.1.4; SC.7.N.1.5] In this topic students will learn to describe, plan, and carry out scientific investigations of various types including descriptive, comparative, and experimental investigations, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and communicate conclusions.

Instruction Module **Safety and Scientific Investigations:** In this Instruction Module, students learn how to plan and implement descriptive, comparative, and experimental investigations. They learn to ask well-defined questions, formulate testable hypotheses, collect, record, and analyze data, construct tables and graphs, communicate valid conclusions and predict trends.

Glossary **Scientific Investigations**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Simulations **Nitrogen Levels in Water:** In this Simulation, students collect water samples from different regions in a watershed and conduct water quality tests to discover the source of nitrogen that is entering the ocean.

Journals Journal - Safe Practices and Safety Equipment

Activities Lab Safety Symbols
Move it! Move it! - Molecules in Motion

Quiz Scientific Investigations

Topic 2: Origin of Universe—Theories

Description: [SC.7.N.2.1] In this topic students will learn how new evidence and observations led scientists to develop the Big Bang theory to explain the origin of the universe.



Instruction Module	Origin of Universe—Theories: In this Instruction Module, students understand how observations such as Hubble's discovery of red shifted stars and galaxies leading to the theory of the expanding universe, the discovery of cosmic microwave background radiation, and the abundance of light elements in the universe led scientist to develop the Big Bang theory to explain the origin of the universe.
Glossary	Origin of Universe—Theories The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivity	Origin Of The Universe - Theories: In this Interactivity students observe “light waves” from an object in space and decide whether the object is stationary, moving away from, or moving toward the observer. They also recognize if the light is red shifted, blue shifted, or if there is no shift.
Journals	Journal - Origin of the Universe – Theories
Activities	Theories That Attempt to Explain the Origin of the Universe Using Scientific Data as Evidence
Quiz	Origin of Universe—Theories

Topic 3: History of Space Exploration

Description: [SC.7.N.2.1] In this topic, students will learn about the role of inventions and the development of equipment, such as the telescope and space transportation, that assist in acquiring scientific knowledge about objects in space.

Instruction Module	History of Space Exploration: In this Instruction Module, students learn about the geocentric and heliocentric models of the solar system. They learn how inventions and development of equipment such as telescopes and space transportation have helped in space explorations.
Glossary	History of Space Exploration The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Quiz	History of Space Exploration



Big Idea 6: Earth Structures

Topic 1: Earth's Layers and Plate Tectonics

Description: [SC.7.E.6.1; SC.7.E.6.4; SC.7.E.6.5; SC.7.E.6.7] In this topic students will learn to identify and describe the layers of Earth, and recognize the effects of plate tectonics on the crustal features on Earth.

Instruction Module **Layers of Earth:** In this Instruction Module, students learn that Earth is divided into the crust, mantle, and core.

Instruction Module **Tectonic Plates:** In this Instruction Module, students learn that Earth's crust is broken in pieces called tectonic plates that float atop the molten mantle and that the movements of these tectonic plates can alter Earth's surface and create earthquakes, ocean basins, volcanoes and mountains.

Instruction Module **Theory of Plate Tectonics:** In this Instruction Module, students learn how the Continental Drift theory, the discovery of sea floor spreading, and observations that volcanoes and earthquakes occurred most frequently at specific areas around the world led scientists to develop the Theory of Plate Tectonics.

Instruction Module **Effects of Plate Tectonics:** In this Instruction Module, students learn that plate boundaries are classified as convergent, divergent, or transform boundaries based on their relative movement. They learn that divergent boundaries lead to the formation of crustal features such mid-ocean ridges, rift valleys, and fault block mountains; convergent boundaries lead to the formation of features such as trenches, volcanoes, and folded mountains; transform boundaries result in strike-slip faults and cause earthquakes.

Glossaries **Earth's Layers and Plate Tectonics**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities **Building Earth and Matching Plates:** In this Interactivity, students recognize the different layers of the Earth and what it is made up of, by "building" a model Earth. They also recognize the different tectonic plates and their location on the world map.
Tectonic Trouble: In this Interactivity, students identify divergent, convergent, and transform boundaries based on their description and then identify the crustal features associated with each of them.



Simulation	Flow of Lava: In this simulation, students investigate to find out if the thickness of the lava affects its flow rate and the type of volcanic structure that is formed. They compare liquids of different thicknesses. They observe and record the time taken by each liquid to flow down a funnel. Based on the data, they arrive at a conclusion.
Journals	Journal 1 - Plate Tectonics Journal 2 - Plate Tectonics Journal 1 - Effects of Plate Tectonics Journal 2 - Effects of Plate Tectonics Journal 3 - Effects of Plate Tectonics
Activities	Modeling the Structural Layers of the Earth Major Tectonic Plates Evidence that Supports Plate Tectonics Theory Crustal Features and Plate Tectonics 3-D Mind-mapping
Quiz	Earths Layers and Plate Tectonics

Topic 2: The Rock Cycle

Description: [SC.7.E.6.2] In this topic students will learn to identify the patterns within the rock cycle and relate them to the processes of weathering, erosion, sedimentation, compaction, cementation, metamorphosis, and melting.

Instruction Module	Rocks: In this Instruction Module, students learn that rocks are of three basic types, namely igneous, sedimentary, and metamorphic. They learn about the processes involved in the formation of these rocks. They also understand the rock cycle in which rocks can be converted from one form to another.
Glossaries	The Rock Cycle The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Rock Transformer: In this Interactivity, students identify the process that formed a given rock sample and then “transform” it into another rock type by choosing the right process.
Journals	Journal - Rock Cycle
Activities	Modeling the Rock Cycle Descriptive Investigation



Quiz

The Rock Cycle

Topic 3: Evidence of Changes on Earth

Description: [SC.7.E.6.3; SC.7.E.6.4] In this topic students will learn how fossils are formed and recognize the significance of using sedimentary rock sequences and fossils as evidence of past environments and living organisms. From the shape of the continents and the fossils found across continents, they understand that the continents were once joined, as proposed by Wegener.

Instruction Module

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.

Instruction Module

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.

Instruction Module

Evidence of Pangaea: In this Instruction Module, students are introduced to various evidences 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.

Glossaries

Evidence of Changes on Earth

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Journals

Journal 1 - Learning from the Past
Journal 2 - Learning from the Past
Journal 3 - Learning from the Past

Activities

Fossils as Evidence of the Past

Quiz

Evidence of Changes on Earth

Topic 4: Human Impact on Earth

Description: [SC.7.E.6.6] In this topic, students will learn to recognize the impact that humans have had on Earth's ecosystems and watersheds.



Instruction Module	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.
Instruction Module	Human Impact on Ocean Ecosystems: In this Instruction Module, students learn about the different ways in which oceans are important, and recognize the impacts of human activities such as over-fishing and pollution on oceans ecosystems. They learn about different steps that human can take to preserve marine ecosystems.
Instruction Module	Watersheds: In this Instruction Module, students learn to define and describe a watershed. They understand the significance of watersheds and understand how watersheds are affected by natural and human activities.
Glossaries	Human Impact on Earth The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Trace the Waste: In this Interactivity, students observe various human activities that could affect ocean ecosystems. They recognize the modes by which the pollution finally ends up in the ocean.
Simulation	Nitrogen Levels in Water: In this Simulation, students collect water samples from different regions in a watershed and conduct water quality tests to discover the source of nitrogen that is entering the ocean.
Journals	Journal 1 - Changes in Ecosystems Journal 2 - Changes in Ecosystems Journal 3 - Changes in Ecosystems Journal - Human Impact on Ocean Ecosystems
Activities	Human Impacts on Ocean Ecosystems Human Activity in Watersheds pH Tolerance of Aquatic Organisms
Quiz	Human Impact on Earth



Big Idea 10: Forms of Energy

Topic 1: Light

Description: [SC.7.P.10.1; SC.7.P.10.2; SC.7.P.10.3] In this topic students will learn to explain that light can be reflected, refracted, and absorbed, that white light is made up of a spectrum of different colors, and that light waves move at different speeds in different materials.

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.

Instruction Module **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.

Instruction Module **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 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.

Instruction Module **Using Light to Study the Universe:** In this Instruction Module, students learn how scientists study the different wavelengths of light from distance stars and other objects in space and use it to gain information about the composition of the objects. They understand how scientists compare the absorption spectrums of stars to the emission spectrums of elements to understand the composition of stars.

Glossaries **Light**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities **Star Light Star Bright:** In this Interactivity, students compare the absorption spectrum of stars and compare it with the emission spectrum of elements to analyze which element is present in the star.



Journals	Journal - The Universe - Distances and Sizes
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Activities	<p>Why Rainbows Form</p> <p>Exploring the Properties of Light</p> <p>Light Reflection and Different Surfaces</p> <p>Radio Astronomy</p> <p>Constructing a Model Hand-held Spectroscope</p>
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Quiz	Light
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Topic 2: Sound

Description: [SC.7.P.10.3] In this topic students will learn that sound waves needs matter to travel through and sound travels the fastest through solids.

Instruction Module	<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>
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Glossaries	<p>Sound</p> <p>The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>
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Quiz	Sound
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Big Idea 11: Energy Transfer and Transformations

Topic 1: Heat Transfer

Description: [SC.7.P.11.1; SC.7.P.11.4] In this topic students will learn that adding or removing heat results in a temperature change, and describe the processes of heat transfer including conduction, convection, and radiation.

Instruction Module	<p>Temperature: In this Instruction Module, students learn that temperature is a measure of the average kinetic energy of the moving particles of matter. They recognize the need of tools such as thermometers and learn about the three scales of measuring temperature.</p>
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<p>Instruction Module</p>	<p>What is Thermal Energy?: In this Instruction Module, students learn that thermal energy of a substance refers to the total kinetic energy of the moving particles of matter in the substance. They recognize that the thermal energy of two substances can be different even when their temperatures are the same.</p>
<p>Instruction Module</p>	<p>Heat Transfer by Conduction: In this Instruction Module, students learn that heat is transferred from an object at a higher temperature to an object at a lower temperature until both objects are at the same temperature. They also learn that conduction is the process in which heat is transferred through a substance from one particle to another and mostly occurs in solids.</p>
<p>Instruction Module</p>	<p>Heat Transfer by Convection: In this Instruction Module, students learn that convection is a process of heat transfer in which the particles of matter move from the hot end to the cooler end, carrying the energy with them, and mostly occurs in liquids and gases. They learn that wind is a result of convection currents in the atmosphere, and earthquakes are a result of convection currents in Earth's mantle.</p>
<p>Instruction Module</p>	<p>Heat Transfer by Radiation: In this Instruction Module, students learn that radiation is the process by which heat is transferred as electromagnetic waves and does not require a material medium. They learn that energy from the Sun is transferred to Earth by radiation.</p>
<p>Glossaries</p>	<p>Heat Transfer The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>
<p>Simulations</p>	<p>Heat and Heat Transfer: In this simulation, students set the temperatures of two materials whose containers are in contact with each other, observe the changes in temperature of both after an interval of time, and arrive at a conclusion about the direction in which thermal energy moves. Heat Transfer by Conduction: In this simulation, students observe the time taken for heat to flow through different materials and, based on their observations, categorize the materials as thermal conductors and insulators.</p>
<p>Journals</p>	<p>Journal – Heat Transfer</p>
<p>Activities</p>	<p>Heat Conduction Modeling Heat Transfer by Convection and Conduction</p>



Quiz

Heat Transfer

Topic 2: Transformation of Energy

Description: [SC.7.P.11.2; SC.7.P.11.3] In this topic students will learn that that energy cannot be created nor destroyed, but can be changed from one form to another.

Instruction Module

Energy Transformations: In this Instruction Module, students observe and recognize examples of energy transformations such as chemical energy in a flashlight battery changing to electrical energy and then to light energy, and kinetic energy changing to thermal energy. They learn about the Law of Conservation of Energy.

Instruction Module

Generating Electrical Energy: In this Instruction Module, students learn how electricity is generated by transforming other forms of energy including chemical energy, thermal energy, solar energy, nuclear energy, and potential energy. They learn how thermal, nuclear, and hydropower plants, and solar cells use various energy resources to produce electricity.

Instruction Module

Transformation of Chemical Energy: In this Instruction Module, students learn that chemical energy is the energy stored in the bonds that hold together the atoms and molecules of a substance. They observe examples of transformation of chemical energy to other forms of energy, such as transformations of chemical energy in food to kinetic and potential energy, in batteries to electrical and light energy, in fuels to thermal, kinetic, and electrical energy.

Instruction Module

Mechanical Energy Transformations: In this Instruction Module, students observe an oscillating pendulum and learn that mechanical energy continuously changes from potential to kinetic and back to potential energy. They learn the pendulum eventually stops oscillating because energy is lost as heat due to friction. Students apply this understanding to explain the energy transformations in roller coaster rides.

Glossaries

Transformation of Energy

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities

Identify My Change: In this interactive section of the module, students are presented with various examples of energy transformations and they identify the correct sequence of energy transformations taking place.

Is it Potential or Kinetic?: In this Interactivity, students observe the movement of objects and identify the correct amounts of



	potential and kinetic energy at different positions of the objects.
Simulations	Design the Ride: In this simulation section, students change the height of the hills of a roller coaster and observe the effect on the movement of the roller coaster car. They record their observations, analyze the data, and arrive at a conclusion. This helps them to understand the energy conversions that take place in a roller coaster ride.
Journals	Journal - Energy Transformations Journal - Potential and Kinetic Energy
Activities	Energy Transformations Energy Transformations – STEM Potential and Kinetic Energy
Quiz	Transformation of Energy

Big Idea 15: Diversity and Evolution of Living Organisms

Topic 1: Natural Selection and Selective Breeding

Description: [SC.7.L.15.2; SC.7.L.15.3] In this topic, students will learn that variations and environmental factors influence natural selection, leading to diversity of organisms.

Instruction Module	Factors Influencing Natural Selection: In this Instruction Module, students understand that populations are constantly changing over time and this is due to natural selection. They learn about different factors influencing natural selection such as variations within a population and environmental factors such as predators and the availability of food.
Glossaries	Natural Selection and Selective Breeding The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Simulations	Feed the Finch!: In the simulation, students investigate and find out if the shape of the beaks of finches is an adaptation to the kind of food available. They use different kinds of pliers to represent beaks and observe the type of food particles that can be picked up by each.
Journals	Journal - Natural Selection and Selective Breeding



Activities

Geographic Speciation and Natural Selection

Quiz

Natural Selection and Selective Breeding

Topic 2: Variability and Survival

Description: [SC.7.L.15.2; SC.7.L.15.3] In this topic, students will learn to explain the variation within a population or species by comparing external features or behaviors of organisms that enhance their survival.

Instruction Module

Variations and Natural Selection: In this Instruction Module, students learn that favorable variations in a population develop into adaptations over time. They understand how natural selection acts on variations.

Instruction Module

Types of Adaptations: In this Instruction Module, students learn that adaptations are of three basic types, namely physical, behavioral and physiological. They learn to identify these adaptations in different organisms and understand the significance of these adaptations in helping the organisms survive.

Glossaries

Variability and Survival

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities

Survivor: In this Interactivity, students analyze and select the traits that might be most suitable for survival based on the environment provided.

Simulations

Mass Matters?: In the simulation, students “conduct” an investigation to determine if the mass of seeds (chestnut) affects the rate of germination. They group the seeds based on their mass and observe and compare the number of seeds that grow into plants in each group. They arrive at a conclusion based on their observations.

Journals

Journal - Variability And Survival

Quiz

Variability and Survival



Big Idea 16: Heredity and Reproduction

Topic 1: Heredity and Genes

Description: [SC.7.L.16.1] In this topic students will learn that heredity is the passage of genetic information from one generation to the next, and that DNA contains genes located in the chromosomes of each cell.

Instruction Module **Genes and Heredity:** In this Instruction Module students understand that genes are segments of DNA that code for a single trait. They learn that in eukaryotic cells, DNA is found in the nucleus in structures called chromosomes.

Glossaries **Heredity and Genes**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities **Packaging Fun:** In this Interactivity, students place labeled boxes one inside the other in the correct order to represent the location of genes within a cell.

Journals Journal - Heredity and Genes

Activities Heredity and Genes

Quiz Heredity and Genes

Topic 2: Types of Reproduction

Description: [SC.7.L.16.3] In this topic students will learn to compare and contrast asexual and sexual reproduction.

Instruction Module **Asexual Reproduction:** In this Instruction Module, students learn that asexual reproduction involves only one parent and that the offspring produced are genetically identical to each other and to their parent. They will also learn to describe some methods of asexual reproduction such as fragmentation, budding, binary fission and vegetative propagation.

Instruction Module **Sexual Reproduction:** In this Instruction Module, students learn that sexual reproduction requires two parents and that the offspring produced by sexual reproduction are genetically distinct from their parents and each other. They will also learn to describe some methods of sexual reproduction such as conjugation and fertilization.



Glossaries **Types of Reproduction**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities **Whose Parent is that Anyway?:** In this Interactivity, students differentiate between sexual and asexual reproduction, classify asexual reproduction as binary fission, budding, fragmentation, regeneration, spore formation and vegetative reproduction. They recognize the advantages and disadvantages of sexual and asexual reproduction.

Journals Journal - Types Of Reproduction

Activities Types of Reproduction

Quiz Types of Reproduction

Topic 3: Selective Breeding

Description: [SC.7.L.16.4] In this topic students will learn how humans can create new species by selective breeding.

Instruction Module **Selective Breeding:** In this Instruction Module, students learn that humans can create new species by selective breeding. They learn about common selective breeding such as inbreeding and hybridization that result in new breeds of animals and varieties of plants.

Glossaries **Selective Breeding**
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Journals Journal - Natural Selection and Selective Breeding

Activities Selective Breeding



Big Idea 17: Interdependence

Topic 1: Energy Flow in Ecosystems

Description: [SC.7.L.17.1] In this topic students will learn to explain and illustrate the relationships among producers, consumers, and decomposers in the process of energy flow in ecosystems through food chains and food webs.

Instruction Module	The Food Chain: In this Instruction Module, students learn that some organisms in an interconnected to each other based on who eats what and that this can be represented using a food chain. They learn that a food chain starts with a producer that is consumed by an herbivore, which in turn is consumed by a carnivore. They understand that herbivores and carnivores are both consumers and that in a food chain the flow of energy is unidirectional, always from the producers to the carnivores.
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Instruction Module	Ecosystems–Energy Flow: In this Instruction Module, students learn that energy flow in an ecosystem can be represented using food chains. They understand that food chains interconnect to form food webs that are more complex compared to food chains. They also learn that energy flow can be represented using an ecological pyramid with the producers at the base of the pyramid and the top carnivores at the apex.
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Glossaries	Energy Flow in Ecosystems The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
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Interactivities	Build the Food Chain: In this Interactivity students create a viable food chain in order for energy to flow to the top predator, and predict the amount of energy available at a particular trophic level.
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Journals	Journal - Ecosystems–Energy Flow
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Activities	Flow of Energy in Ecosystems
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Quiz

Energy Flow in Ecosystems

Topic 2: Interrelationships between Organisms

Description: [SC.7.L.17.2; SC.7.L.17.3] In this topic students will learn to compare and contrast interrelationships between organisms, and recognize the impact of abiotic factors on an ecosystem.

Instruction Module

Interrelationships between Organisms: In this Instruction Module, students learn that organisms in an ecosystem interact with one another. They understand that these interactions are of different types, namely producer - consumer, predator - prey, and Host - parasite interactions.

Instruction Module

Abiotic Factors Influencing the Ecosystem: In this Instruction Module, students learn about the different abiotic factors in an ecosystem. They examine how these abiotic factors influence the biotic factors in the ecosystem.

Glossaries

Interrelationships Between Organisms

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Simulations

Rhize n Grow!: In this simulation students investigate the interrelationship between Rhizobium bacteria and red clover plants. They observe the growth of two sets of red clover plants, one that is inoculated with Rhizobium bacteria and the other which is untreated, at intervals of two weeks and record their observations.

Journals

Journal - Interrelationships between Organisms

Activities

Activity 1: Interrelationships Between Organisms
Activity 2: Interrelationships Between Organisms
Interdependence in Living Systems
Depending on and Competing for Resources

Quiz

Interrelationships Between Organisms



Topic 3: Ecosystems and Environments

Description: [SC.7.L.17.2; SC.7.L.17.3] In this topic students will learn about the interactions between the biotic and abiotic components of ecosystem, and recognize how changes in any one of these factors affect the ecosystem.

Instruction Module

Factors Affecting Ecosystems: In this Instruction Module, students learn that an ecosystem is made of abiotic and biotic components that are constantly interacting with one another. They understand how changes to any of these factors affect the ecosystem.

Instruction Module

Biomes and their Environments: In this Instruction Module, students learn to define a biome. They learn about the different types of biomes on Earth and to describe the characteristics of each of these biomes.

Glossaries

Ecosystems and Environments

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities

Biomes and their Organisms: In this interactivity, students will identify and sort organisms that belong and do not belong to a biome.

Journals

Journal - Diversity of Life

Activities

Observing Biodiversity in a Schoolyard

Quiz

Ecosystems and Environments

Grade 8 Course Description

Big Ideas 1, 2, 3, and 4: Nature of Science

Topic 1: Scientific Investigations

Description: [SC.8.N.1.1; SC.8.N.1.3; SC.8.N.1.6] In this topic students learn to describe, plan, and implement descriptive, comparative, and experimental investigations, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.



Instruction Module	Safety and Scientific Investigations: In this Instruction Module, students learn how to plan and implement descriptive, comparative, and experimental investigations. They learn to ask well-defined questions, formulate testable hypotheses, collect, record, and analyze data, construct tables and graphs, communicate valid conclusions and predict trends.
Glossary	Scientific Investigations The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Simulations	Colors and Heat Absorption: In this simulation, students recognize that the addax antelope changes color in response to the seasons. Students investigate to determine how the change in coat color is an adaptation that aids the addax's survival. Flow of Lava: In this simulation, students investigate to find out if the thickness of the lava affects its flow rate and the type of volcanic structure that is formed. They compare liquids of different thicknesses. They observe and record the time taken by each liquid to flow down a funnel. Based on the data, they arrive at a conclusion.
Journals	Safe Practices and Safety Equipment
Activities	Lab Safety Symbols Move it! Move it! - Molecules in Motion
Quiz	Scientific Investigations

Big Idea 5: Earth in Space and Time

Topic 1: The Universe - Stars and Galaxies

Description: [SC.8.E.5.2; SC.8.E.5.3; SC.8.E.5.4; SC.8.E.5.5] In this topic students will learn that stars are classified based on their brightness, temperature, size, and luminosity, and that the universe contains many billions of galaxies, each containing billions of stars.

Instruction Module **Stars—Color and Luminosity:** In this Instruction Module, students learn that the temperature of a star can be determined by its color. They learn that the temperatures of blue colored stars are higher than that of red colored stars. They also learn that a star's luminosity depends on its distance from Earth, its size, and the



amount of energy it emits.

Instruction Module	Stars and the H-R Diagram: In this Instruction Module, students learn about the different stages in the life cycle of stars such as the formation, the main sequence, red giants, supergiants, supernovae, white dwarfs, and black holes. They learn how stars are classified on the Hertzsprung-Russel Diagram based on their temperature and luminosity.
Instruction Module	Galaxies: In this Instruction Module, students learn that galaxies are made of gas, dust, and stars. They learn about the characteristics of spiral, elliptical, and irregular galaxies and understand that galaxies are constantly changing or evolving. They recognize that our solar system is part of the Milky Way galaxy.
Glossaries	The Universe - Stars and Galaxies The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Home for the Stars: In this Interactivity students predict the temperature of a star based on its location on the H-R Diagram. Then, they classify the star based on its luminosity and temperature.
Journals	Journal 1 - The Universe Journal 2 - The Universe
Activities	Plotting Stars
Quiz	The Universe - Stars and Galaxies

Topic 2: The Universe - Distances and Sizes

Description: [SC.8.E.5.1; SC.8.E.5.11] In this topic students will learn that the enormous distances between objects in space are measured in units called light years; they also learn how scientists use different wavelengths of the electromagnetic spectrum to gain information about distances and properties of components in the universe.

Instruction Module **Distances in Light Years:** In this Instruction Module, students learn that a light year is the distance traveled by light in one year. They understand why a light year is a convenient unit to measure large distances and sizes in the universe.



Instruction Module	Using Light to Study the Universe: In this Instruction Module, students learn how scientists study the different wavelengths of light from distance stars and other objects in space and use it to gain information about the composition of the objects. They understand how scientists compare the absorption spectrums of stars to the emission spectrums of elements to understand the composition of stars.
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Glossaries	The Universe - Distances and Sizes The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
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Interactivities	Star Light Star Bright: In this Interactivity students compare the absorption spectrum of stars with the emission spectrum of elements to analyze which element is present in the star.
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Journals	Journal - The Universe- Distances and Sizes
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Activities	Modeling Distances Using Light Years: Part 1 Modeling Distances Using Light Years: Part 2 Modeling Sizes Using Light Years: Part 1 Modeling Sizes Using Light Years: Part 2 Radio Astronomy Absorption and Emission Spectra Simple Spectroscope
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Quiz	The Universe - Distances and Sizes
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Topic 3: The Solar System

Description: [SC.8.E.5.6; SC.8.E.5.7; SC.8.E.5.8; SC.8.E.5.10] In this topic students will learn to describe the properties of the objects in the Solar System, compare various historical models of the Solar System, and recognize how technology is essential to explore outer space, including manned explorations.

Instruction Module	The Sun: In this Instruction Module, students learn how the process of fusion that occurs within the core of the Sun produces vast amounts of energy. They learn how this energy is transferred through the different layers of the Sun including the radiative zone, the convective zone, and the photosphere, from where it is released into space as heat and light.
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Instruction Module	The Solar System: In this Instruction Module, students learn about the location, the movements, and some of the physical properties of the objects in our solar system such as the planets, the Galilean moons, the asteroid belt, meteors, and comets.
Instruction Module	History of Space Exploration: In this Instruction Module, students learn about the geocentric and heliocentric models of the solar system. They learn how inventions and development of equipment such as telescopes and space transportation have helped in space explorations.
Glossaries	The Solar System The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	The Spotlight: In this Interactivity, students identify the planets with the help of some clues and determine their correct location in the solar system.
Journals	Journal 1 - The Solar System (Comets) Journal 2 - The Solar System
Activities	The Solar System Describing Celestial Bodies
Quiz	The Solar System

Topic 4: Life in our Solar System

Description: [SC.8.E.5.7; SC.8.E.5.10] In this topic students will learn to compare the properties of objects in the Solar System such as gravitational force, distance from the Sun, temperature, and atmospheric conditions with those of Earth and recognize that Earth is the only object in the Solar System that supports life, and recognize how technology has made manned explorations of space possible.

Instruction Module	Life in our Solar System: In this Instruction Module, students learn that Earth is the only object in our solar system that can support life. They recognize the characteristics of Earth such as its distance from the Sun, the presence of water, the composition of its atmosphere, and its mass that make it possible for life to exist.
Instruction Module	Living in Space: In this Instruction Module, students learn that conditions in space do not support life. They recognize the need for specially designed spacecraft that can provide oxygen, water, and other conditions necessary for life, and thus allow astronauts to live and work in space.



Glossaries	Life in our Solar System The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Will It Increase or Decrease?: In this Interactivity, students change the location of the Earth in a model of the Solar System and predict how it would affect the amount of sunlight and temperature on Earth. Then, they change the mass of the Earth and predict its effect on the gravitational force.
Journals	Journal 1 - Life In Our Solar System Journal 2 - Life In Our Solar System
Quiz	Life in our Solar System

Topic 5: The Sun, Moon, and Earth

Description: [SC.8.E.5.9] In this topic students will learn about the impact of the Sun on Earth including seasons, and the impact of the Moon on Earth, including phases and tides, and the relative positions of each.

Instruction Module	Earth's Rotation and Revolution: In this Instruction Module, students learn that Earth rotates on its tilted axis from west to east causing the day and night cycle and the apparent movement of the Sun across the sky. They also learn that Earth revolves around the Sun, and the tilt of its axis in relation to the Sun causes the changes in seasons.
Instruction Module	The Lunar Cycle: In this Instruction Module, students learn that the phases of the Moon are a result of the relative positions of the Sun, Moon, and Earth. They understand that only parts of the Moon's lit up surface are visible from Earth, resulting in the apparent waxing and waning of the Moon.
Instruction Module	Tides: In this Instruction Module, students learn that the Moon's gravitational pull on Earth's waters results in tides. They learn that every point on Earth experiences two high tides and two low tides during a day, and the combined effect of the gravitational pull of the Sun and the Moon result in spring tides and neap tides.



Glossaries	The Sun, Moon, and Earth The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Phases and Tides: In this Interactivity students identify the phases of the Moon based on its position relative to the Sun and Earth, and predict at what points during Earth's rotation, places on Earth would experience high and low tides.
Journals	Journal 1 - The Sun, Moon, and Earth Journal 2 - The Sun, Moon, and Earth
Activities	Modeling What Causes Day and Night Modeling What Causes the Seasons Describing the Lunar Cycle
Quiz	The Sun, Moon, and Earth

Big Idea 8: Properties of Matter

Topic 1: Elements and Compounds

Description: [SC.8.P.8.5; SC.8.P.8.8] In this topic students will learn that there are a finite number of elements and that two or more elements combine to form compounds, differentiate between elements and compounds, and identify the formation of a new substance by using the evidence of a possible chemical change.

Instruction Module
What are Elements?: In this Instruction Module, students learn that elements are the simplest form of matter and that about 117 elements have been discovered so far. They learn the names of some elements such as oxygen, hydrogen, nitrogen, and, carbon that make up the solid part of Earth, the ocean, the atmosphere, and living matter.

Instruction Module
Identifying Elements: In this Instruction Module, students learn that an element can be identified by its properties. They learn that the atoms of each element have a unique structure that determines its properties. They also learn that each element is represented by a chemical symbol.



Instruction Module

What are Compounds?: In this Instruction Module, students learn that two or more elements combine to form a compound and that the smallest unit of a compound is a molecule. They learn that compounds are represented by chemical formulas and can only be separated by chemical process such as electrolysis.

Instruction Module

Evidence of Chemical Changes: In this Instruction Module, students understand that a chemical change results in the formation of new substances. They learn that a change in color, a change in temperature, the release of a gas, the formation of a precipitate, and a change in color are evidence of chemical changes.

Glossaries

Elements and Compounds

The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.

Interactivities

The Substance Detector: In this Interactivity students classify a given substance as an element or a compound based on its symbol/chemical formula. They observe the substance undergoing a change and recognize it as a physical or a chemical change.

Journals

Journal 1 - Elements and Compounds
Journal 2 - Elements and Compounds
Journal 3 - Elements and Compounds

Activities

Elements and Compounds

Quiz

Elements and Compounds

Topic 2: Metals and Nonmetals

Description: [SC.8.P.8.3; SC.8.P.8.4] In this topic student will learn that elements are classified into metals, nonmetals, and metalloids, compare their physical properties such as thermal or electrical conductivity, luster, malleability, and ductility, and calculate the densities of some materials.

Instruction Module

Properties of Metals: In this Instruction Module, students observe the properties of some metals and learn that metals have a shiny luster, are malleable and ductile, and are mostly good conductors of heat and electricity.



Instruction Module	Comparing Metals and Nonmetals: In this Instruction Module, students observe and compare some physical properties of metals and nonmetals including ability to conduct heat and electricity, luster, malleability, and ductility and learn to tabulate the differences.
Instruction Module	Properties of Metalloids: In this Instruction Module, students observe the properties of metalloids and recognize that they have some properties of metals and some of nonmetals. They learn that metalloids occupy the space between the metals and nonmetals on the periodic table.
Instruction Module	Calculating Density: In this Instruction Module, students learn that the density of a substance is unique and can be used to identify a substance by using standard density charts. They learn that density can be calculated by dividing the mass of a substance by its volume. They understand that mass can be measured with a triple beam balance and the volume of an irregular shaped object can be measured using a graduated cylinder.
Glossaries	Metals and Nonmetals The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Test Your Metal: In this Interactivity students observe the physical properties of elements and classify them as metal, nonmetal, or metalloid. Then, given the mass and volume of the sample, they identify it by calculating its density and comparing the value with a density chart.
Journals	Journal - Metals and Nonmetals
Activities	Calculating the Density of Metals
Quiz	Metals and Nonmetals

Topic 3: The Periodic table

Description: [SC.8.P.8.6] In this topic students will learn that elements are grouped in the periodic table according to similarities of their properties

Instruction Module

The Periodic Table: In this Instruction Module, students learn that all known elements are represented on the periodic table based on their atomic numbers. They understand that elements in a group have common properties and that properties change across a period.



Glossaries	The Periodic Table The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Lost and Found: In this Interactivity students identify the position of an element on the Periodic Table based on its atomic structure, and then recognize whether the element is a metal, a nonmetal, or a metalloid based on its properties.
Journals	Journal - The Periodic Table
Activities	The Periodic Table
Quiz	The Periodic Table

Topic 4: Structure of the Atom

Description: [SC.8.P.8.1; SC.8.P.8.5; SC.8.P.8.7] In this topic students will learn about the scientific theory of atoms by recognizing that atoms are the smallest unit of an element and are composed of sub-atomic particles, and the number of protons determine an element's identity and valence electrons determine its chemical properties, including reactivity.

Instruction Module
Atoms: In this Instruction Module, students are introduced to the structure of the atom. They learn about protons, neutrons, and electrons, their location in the atoms and their electrical charges. They learn about atomic number and mass number.

Instruction Module
Valence Electrons and Reactivity: In this Instruction Module, students learn about electron shells and valence shells, and understand what is meant by a full electron shell. They learn that an element does not react easily with other elements when the valence shells of its atoms are full.

Instruction Module
Ionic and Covalent Bonds: In this Instruction Module, students learn that ionic bonds form when atoms lose or gain electrons resulting in the formation of positive and negative ions which attract each other. They learn that covalent bonds form when atoms of elements share their electrons.

Glossaries
Structure of the Atom
The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.



Interactivities **Form a Bond:** In this Interactivity students will be able to infer which atoms would most likely form ionic bonds based on the number of electrons in their valence shell.

Journals Journal - Structure of the Atom

Activities Structure of the Atom
Protons and Electrons

Quiz Structure of the Atom

Big Idea 9: Changes in Matter

Topic 1: Chemical Reactions and Equations

Description: [SC.8.P.9.1; SC.8.P.9.2] In this topic students will learn to differentiate between physical and chemical changes and recognize evidence of a chemical change, learn that chemical reactions can be represented by chemical equations, and recognize that mass is conserved when substances undergo chemical changes.

Instruction Module **Evidence of Chemical Changes:** In this Instruction Module, students understand that a chemical change results in the formation of new substances. They learn that a change in color, a change in temperature, the release of a gas, the formation of a precipitate, and a change in color are evidence of chemical changes.

Instruction Module **Chemical Symbols and Formulas:** In this Instruction Module, students are introduced to chemical symbols and formulas. They learn that a chemical formula conveys information about the number of atoms of each element that combine to make a molecule of the compound.

Instruction Module **Chemical Reactions and Equations:** In this Instruction Module, students learn that chemical reactions result in the formation of new substances. They learn how to write chemical equations to represent chemical reactions. They understand that chemical equations need to be balanced so that the Law of Conservation of Mass holds true.



Glossaries	<p>Chemical Reactions and Equations</p> <p>The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>
Interactivities	<p>Balance the Chemical Equation: In this Interactivity, students use the law of conservation of mass to balance chemical equations. They add/remove atoms and molecules in the reactants as well as products to balance the equation.</p>
Journals	<p>Journal - Elements and Compounds</p> <p>Journal 1 - Chemical Reactions and Equations</p> <p>Journal 2 - Chemical Reactions and Equations</p>
Activities	<p>Is it a Chemical Reaction?</p> <p>Chemical Reactions and the Law of Conservation of Mass part 1</p> <p>Chemical Reactions and the Law of Conservation of Mass part 2</p>
Quiz	<p>Chemical Reactions and Equations</p>

Big Idea 18: Matter and Energy Transformations

Topic 1: Photosynthesis, Respiration, and Energy

Description: [SC.8.L.18.1; SC.8.L.18.2] In this topic students will learn to describe the processes of photosynthesis and cellular respiration.

Instruction Module	<p>Photosynthesis: In this Instruction Module, students understand that green plants are capable of producing their own food through photosynthesis. They learn about the different structures of a leaf that aid photosynthesis.</p>
Instruction Module	<p>Respiration: In this Instruction Module, students learn that oxygen is essential for organisms to survive. They understand how organisms such as humans breathe in oxygen and explain how this oxygen eventually reaches the cells to break down food and release chemical energy.</p>
Glossaries	<p>Photosynthesis, Respiration, and Energy</p> <p>The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.</p>



Simulations	The Green Machine! : In this simulation, students measure the rate of photosynthesis in underwater plants exposed to varying amounts of sunlight. They make a hypothesis, record their observations and arrive at conclusions after analyzing their data.
Journals	Journal - Photosynthesis And Energy Conversion Journal - Carbon Dioxide–Oxygen Cycle
Activities	Extracting Chlorophyll from Plant Leaves

Quiz Photosynthesis, Respiration, and Energy

Topic 2: Cycling of Matter

Description: [SC.8.L.18.3; SC.8.L.18.4] In this topic students will learn that matter is continuously transferred within and between organisms and their environment, and describe the carbon, nitrogen, phosphorus, and water cycles.

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.
Instruction Module	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 used to make compost.
Glossaries	Cycling of Matter The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
Interactivities	Garbage to Garden!: In this Interactivity, students “build” a compost pit choosing the correct materials for each layer in the compost pit.
Journals	Journal - Cycling Of Matter
Activities	Mini Compost in a Bottle

Quiz Cycling of Matter



Topic 3: Energy Flow in Ecosystems

Description: [SC.8.L.18.3; SC.8.L.18.4] In this topic students will learn that the flow of energy in an ecosystem is unidirectional, and can be represented using food chains, food webs, and energy pyramids.

Instruction Module	The Food Chain: In this Instruction Module, students learn that some organisms in an interconnected to each other based on who eats what and that this can be represented using a food chain. They learn that a food chain starts with a producer that is consumed by an herbivore, which in turn is consumed by a carnivore. They understand that herbivores and carnivores are both consumers and that in a food chain the flow of energy is unidirectional, always from the producers to the carnivores.
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Instruction Module	Ecosystems–Energy Flow: In this Instruction Module, students learn that energy flow in an ecosystem can be represented using food chains. They understand that food chains interconnect to form food webs that are more complex compared to food chains. They also learn that energy flow can be represented using an energy pyramid with the producers at the base of the pyramid and the top carnivores at the apex.
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Glossaries	Energy Flow in Ecosystems The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science concepts presented in the Instruction Modules, Interactivities, and Simulations.
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Interactivities	Build the Food Chain: In this interactivity, students are required to make a viable food chain in order for energy to flow to the top predator and predict the amount of energy available at a particular trophic level.
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Journals	Journal - Energy Flow In Ecosystems
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Activities	Flow of Energy in Ecosystems
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Quiz	Energy Flow in Ecosystems
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