



Course Description
8th Grade Science
SSA Review

Table of Contents

GRADE 8 SCIENCE SSA REVIEW COURSE DESCRIPTION.....	4
BIG IDEAS 1, 2, 3, AND 4: NATURE OF SCIENCE	4
Topic 1: Scientific Investigations	4
BIG IDEA 5: EARTH IN SPACE AND TIME	5
Topic 1: The Universe - Stars and Galaxies	5
Topic 2: The Universe - Distances and Sizes	6
Topic 3: The Solar System	8
Topic 4: The Sun, Moon, and Earth	9
BIG IDEA 6: EARTH STRUCTURES.....	11
Topic 1: Earth's Layers and Plate Tectonics	11
Topic 2: The Rock Cycle.....	12
Topic 3: Evidence of Changes on Earth	14
Topic 4: Human Impact on Earth.....	15
Topic 5: Changes on the Earth's Surface	16
BIG IDEA 7: EARTH SYSTEMS AND PATTERNS	17
Topic 1: Climate and Weather.....	17
Topic 2: Earth Supports Life	19
BIG IDEA 8: PROPERTIES OF MATTER	19
Topic 1: Elements and Compounds.....	19
Topic 2: Metals and Nonmetals	22
Topic 3: The Periodic table.....	23
Topic 4: Structure of the Atom.....	24
Topic 5: Weight and Mass.....	25
BIG IDEA 9: CHANGES IN MATTER.....	25
Topic 1: Chemical Reactions and Equations	25
BIG IDEA 10: FORMS OF ENERGY.....	27
Topic 1: Light and Sound.....	27

BIG IDEA 11: ENERGY TRANSFER AND TRANSFORMATIONS.....	28
Topic 1: Heat Transfer.....	28
Topic 2: Transformation of Energy.....	30
Topic 3: Potential and Kinetic Energy.....	31
BIG IDEA 13: FORCES AND CHANGES IN MOTION	33
Topic 1: Forces Acting at a Distance.....	33
Topic 2: Motion - Speed, Distance, and Time	34
BIG IDEA 14: ORGANIZATION AND DEVELOPMENT OF LIVING ORGANISMS ...	35
Topic 1: Structural Hierarchy - Cell to Organisms.....	35
Topic 2: Cell - The Basic Unit of Life	36
Topic 3: Plant vs Animal Cell	36
Topic 4: Human Body Systems	37
BIG IDEA 15: DIVERSITY AND EVOLUTION OF LIVING ORGANISMS.....	39
Topic 1: Taxonomic Classification	39
Topic 2: Natural Selection and Variability	40
BIG IDEA 16: HEREDITY AND REPRODUCTION	42
Topic 1: Heredity and Genes.....	42
Topic 2: Types of Reproduction.....	42
BIG IDEA 17: INTERDEPENDENCE	44
Topic 1: Energy Flow in Ecosystems	44
Topic 2: Interrelationships between Organisms and Ecosystems	45
BIG IDEA 18: MATTER AND ENERGY TRANSFORMATIONS.....	47
Topic 1: Photosynthesis, Respiration, and Energy	47
Topic 2: Matter and Energy in Ecosystems.....	48

Grade 8 Science SSA Review 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 Quiz: [SC.8.N.1.1, 3, 4; SC.7.N.1.1, 3, 4; SC.6.N.1.1, 3] The Practice of Science
Quiz: [SC.8.N.1.2; SC.7.N.1.2; SC.6.N.1.2, 4] The Practice of Science
Quiz: [SC.8.N.1.5, SC.7.N.1.5; SC.7.N.3.2] The Practice of Science
Quiz: [SC.8.N.1.6; SC.7.N.1.6, 7, SC.7.N.2.1; SC.6.N.2.2] The Characteristics of Scientific Knowledge
Quiz: [SC.8.N.3.2; SC.7.N.3.1; SC.6.N.3.1] The Role of Theories, Laws, Hypotheses, and Models

Readers Rutherford's Big Surprise
Theories and Laws

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.

Student Review **Galaxies:** Students assess and review their understanding of the composition, shapes, and changing nature of galaxies.

Student Review **Stars and the H-R Diagram:** Students assess and review their understanding of the Hertzsprung-Russel Diagram that classifies stars based on their temperature and luminosity.

Student Review **Stars—Color and Luminosity:** Students assess and review their understanding of the components of the universe, such as stars, and that the Sun is the closest star to Earth.

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 Quiz: [SC.8.E.5.4] The Universe - Role of Gravity
Quiz: [SC.8.E.5.5] Properties of Stars
Quiz: [SC.8.E.5.3] Heirarchy - Planets to Universe
Quiz: [SC.8.E.5.2] Galaxies in the Universe

Readers Solar System, Galaxies, and the Universe

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.

Student Review **Distances in Light-years:** Students assess and review their understanding of the convenience of using light-years in the measurement of distances and sizes of astronomical bodies in the universe.

Student Review **Using Light to Study the Universe:** Students assess and review their understanding of how the different wavelengths of the electromagnetic spectrum, such as light and radio waves, are used to learn about distances and composition of objects in the universe.

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.



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.
Journals	Journal 2 - The Universe- Distances and Sizes
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
Quiz	Quiz: [SC.8.E.5.1] Distances in Space Quiz: [SC.8.E.5.11] Electromagnetic Spectrum - Use and Hazards
Readers	A Star for Mom's Birthday

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.

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.

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 spacecrafts that can provide oxygen, water, and other conditions necessary for life, and thus allow astronauts to live and work in space.

Student Review **The Solar System:** Students assess and review their understanding of the locations, the movements, and some of the physical properties of the planets and the Galilean moons in the solar system.

Student Review **The Sun:** Students assess and review their understanding of different layers that make up the Sun and the process of fusion within the Sun that produces heat and light.

Student Review **Asteroids, Meteors, and Comets:** Students assess and review their understanding of some of the physical properties of the objects in our solar system, such as the asteroid belt, meteors, and comets.

Student Review	History of Space Exploration: Students assess and review their understanding of some of the historical models of the solar system and how modern inventions have helped in space explorations.
Student Review	Life in our Solar System: Students assess and review their understanding of the characteristics of Earth, such as its distance from the Sun, the presence of water, and the composition of its atmosphere, that make it possible for life to exist.
Student Review	Living in Space: Students assess and review their understanding of the accommodations that allow astronauts to live and work in space.
Glossaries	<p>The Solar System Life in our Solar System</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>The Spotlight: In this Interactivity, students identify the planets with the help of some clues and determine their correct location in the solar system.</p> <p>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.</p>
Journals	<p>Journal - The Solar System (Comets)</p> <p>Journal 2 - The Solar System</p> <p>Journal 1 - Life In Our Solar System</p> <p>Journal 2 - Life In Our Solar System</p>
Activities	<p>The Solar System</p> <p>Describing Celestial Bodies</p>
Quiz	<p>Quiz: [SC.8.E.5.7] Solar System Objects - Properties</p> <p>Quiz: [SC.8.E.5.10] Access to Outer Space</p> <p>Quiz: [SC.8.E.5.6] Solar Properties</p> <p>Quiz: [SC.8.E.5.8] Solar System - Historical Models</p>
Readers	Interplanetary Real Estate

Topic 4: 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	<p>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.</p>
Instruction Module	<p>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.</p>
Instruction Module	<p>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.</p>
Student Review	<p>Earth's Rotation and Revolution: Students assess and review their understanding of how Earth's rotation and revolution on its tilted axis causes the day–night cycle and the seasons.</p>
Student Review	<p>The Lunar Cycle: Students assess and review their understanding of the sequence of events that occur during a lunar cycle.</p>
Student Review	<p>Tides: Students assess and review their understanding of how the positions of the Sun and Moon in relation to Earth affect ocean tides.</p>
Glossaries	<p>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.</p>
Interactivities	<p>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.</p>
Journals	<p>Journal 1 - The Sun, Moon, and Earth Journal 2 - The Sun, Moon, and Earth</p>
Activities	<p>Modeling What Causes Day and Night Modeling What Causes the Seasons Describing the Lunar Cycle</p>
Quiz	<p>Quiz: [SC.8.E.5.9] The Sun, Moon, and Earth</p>
Readers	<p>Our Necessary Moon</p>

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 as 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.

Student Review

Layers of the Earth: Students assess and review their understanding of the structural layers and sub-layers of Earth.

Student Review

Tectonic Plates: Students assess and review their understanding of Earth's tectonic plates and how they create major geological events, such as earthquakes and volcanoes.

Student Review

Theory of Plate Tectonics: Students assess and review their understanding of how the Continental Drift theory, sea floor spreading, and occurrence of volcanoes and earthquakes at specific areas, led scientists to develop the Theory of Plate Tectonics.

Student Review

Effects of Plate Tectonics: Students assess and review their understanding of the classification of plate boundaries based on their relative movement and the crustal features formed at each.

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	<p>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.</p> <p>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.</p>
Simulation	<p>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.</p>
Journals	<p>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</p>
Activities	<p>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</p>
Quiz	<p>Quiz: [SC.7.E.6.1] Layers of Earth Quiz: [SC.7.E.6.5] Theory of Plate Tectonics Quiz: [SC.7.E.6.7] Movement of Material within Earth</p>
Readers	<p>Earthquakes - Outward Expression of Earth's Dynamic Interior Mt. Pinatubo San Francisco Earthquakes</p>

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.

Student Review
Igneous and Metamorphic Rocks: Students assess and review their understanding of the formation of igneous and metamorphic rocks.

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	Quiz: [SC.7.E.6.2] The Rock Cycle
Readers	Mt. Pinatubo

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.

Student Review **Sedimentary Rocks:** Students assess and review their understanding of the formation of sedimentary rocks.

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 Quiz: [SC.7.E.6.4] Evidence of Earth's Evolution
Quiz: [SC.7.E.6.3] Measuring the Age of Earth

Readers The Grand Canyon A Window to Earth's History

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.

Student Review **Human Impacts on Ecosystems:** Students assess and review their understanding of how human activities, such as hunting, farming, and the construction of roadways, affect ecosystems.

Student Review **Human Impact on Ocean Ecosystems:** Students assess and review their understanding of human's dependence on ocean systems and how human activities affect the oceans' biodiversity.

Student Review **Watersheds:** Students assess and review their understanding of the impact of human activities on groundwater and surface water in a watershed.

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 1 - Human Impact on Ocean Ecosystems
Activities	Human Impacts on Ocean Ecosystems Human Activity in Watersheds pH Tolerance of Aquatic Organisms
Quiz	Quiz: [SC.7.E.6.6] Human Impact on Earth
Readers	Water Pollution

Topic 5: Changes on the Earth's Surface

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.

Student Review **Weathering:** Students assess and review their understanding of the process, types, and agents of weathering.

Student Review **Erosion:** Students assess and review their understanding of the process, types, and agents of erosion.

Student Review	Deposition: Students assess and review their understanding of the process, types, and agents of deposition.
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
Quiz	Quiz: [SC.6.E.6.1] Weathering, Erosion, and Deposition Quiz: [SC.6.E.6.2] Landforms on Earth
Readers	Glaciation and its Effects on Landscapes

Big Idea 7: Earth Systems and Patterns

Topic 1: Climate and Weather

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	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.
Student review	Weather and Weather Maps: Students assess and review their understanding of weather and how to interpret the symbols on a weather map.
Student Review	The Sun's Influence on Atmosphere and Oceans: Students assess and review their understanding of how the Sun's energy powers winds in the atmosphere and currents in the oceans.
Student Review	Influence of Oceans on Weather and Climate: Students assess and review their understanding of the influence of oceans on weather systems, such as creation of hurricanes and El Niño.
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	El Niño Convection Currents Using Weather Maps to Predict Weather How Accurate are Weather Reports? Constructing a Model of a Psychrometer Constructing a Model of an Anemometer
Quiz	Quiz: [SC.6.E.7.3] Global Patterns and Weather Quiz: [SC.6.E.7.4] Interaction between Earth's Spheres Quiz: [SC.6.E.7.6] Weather vs Climate Quiz: [SC.6.E.7.1] Types of Heat Transfer Quiz: [SC.6.E.7.5] Heat Energy from the Sun Quiz: [SC.6.E.7.2] Cycling of Water - Weather and Climate
Readers	Florida's Summer Thunderstorms Ocean Currents The Little Ice Age

Topic 2: 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 **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.

Student Review **Life in our Solar System:** Students assess and review their understanding of the characteristics of Earth, such as its distance from the Sun, the presence of water, and the composition of its atmosphere, that make it possible for life to exist.

Glossaries **Earth Supports 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 **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.

Journals
Journal 1 - Life In Our Solar System
Journal 2 - Life In Our Solar System

Quiz Quiz: [SC.6.E.7.9] Earth's Atmosphere

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.

<p>Instruction Module</p>	<p>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.</p>
<p>Instruction Module</p>	<p>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.</p>
<p>Instruction Module</p>	<p>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.</p>
<p>Student Review</p>	<p>Introducing Elements: Students assess and review their understanding of elements being pure substances and are represented by chemical symbols.</p>
<p>Student Review</p>	<p>Common Elements on Earth: Students assess and review their understanding of how only some elements, such as oxygen, hydrogen, nitrogen, and carbon, make up the largest part of solid Earth, the oceans, the atmosphere, and living matter.</p>
<p>Student Review</p>	<p>What are Compounds?: Students assess and review their understanding of how compounds are formed and represented by chemical formulas that are based on a molecule of the compound.</p>
<p>Student Review</p>	<p>Evidence of Chemical Changes: Students assess and review their understanding of the evidence that indicate the formation of a new substance, such as change in color, a change in temperature, the release of a gas, the formation of a precipitate, during a chemical reaction.</p>
<p>Glossaries</p>	<p>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.</p>
<p>Interactivities</p>	<p>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.</p>



Journals

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

Activities

Elements and Compounds

Quiz

Quiz: [SC.8.P.8.5] Elements and Compounds
Quiz: [SC.8.P.8.8] Properties of Compounds
Quiz: [SC.8.P.8.9] Mixtures and Pure Substances

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.

Student Review **Comparing Metals and Nonmetals:** Students assess and review their understanding of the physical properties of metals and nonmetals, such as luster, conductivity of heat and electrical energy, and malleability.

Student Review **Properties of Metalloids:** Students assess and review their understanding of the physical properties of metalloids, such as luster, conductivity of heat and electrical energy, and malleability, and where they appear on the periodic table.

Student Review **Calculating Density:** Students assess and review their understanding of how density is calculated and used to identify a substance.

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	Quiz: [SC.8.P.8.3] Density of Materials Quiz: [SC.8.P.8.4] Physical Properties of Substances
Readers	Acids and Bases

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.
Student Review	The Periodic Table: Students assess and review their understanding of the arrangement of the elements based on their properties into groups and periods in the Periodic Table.
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	Quiz: [SC.8.P.8.6] The Periodic Table
Readers	A Method to the Madness; 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.

Student Review **Atoms:** Students assess and review their understanding of the masses, electrical charges, and locations of protons, neutrons, and electrons in atoms.

Student Review **Valence Electrons and Reactivity:** Students assess and review their understanding of protons in determining an element's identity and of valence electrons in determining an element's reactivity and chemical properties.

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 2 - Structure of the Atom

Activities Structure of the Atom
Protons and Electrons

Quiz Quiz: [SC.8.P.8.7] Atoms and Sub-atomic Particles
Quiz: [SC.8.P.8.1] Theory of Atoms

Readers

Rutherford's Big Surprise
Welcome to the Nuclear Navy

Topic 5: Weight and Mass

Description: [SC.8.P.8.2] In this topic students will learn to differentiate between weight and mass recognize that weight is the amount of gravitational pull on an object.

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 learn that weight is a measure of the force of gravity and compare the weights of an object on Earth, the Moon, and Jupiter.

Student Review **Gravity and Weight:** Students assess and review their understanding of the gravitational force and it affects the weight of an object on Earth, on the Moon, and on Jupiter.

Quiz **Quiz: [SC.8.P.8.2] Weight and Mass**

Readers Mass, Weight, and Gravity
Basketball on the Moon

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.



Student Review	Evidence of Chemical Changes: Students assess and review their understanding of the evidence that indicate the formation of a new substance, such as change in color, a change in temperature, the release of a gas, the formation of a precipitate, during a chemical reaction.
Student Review	Chemical Symbols and Formulas: Students assess and review their understanding of how to determine the number of atoms of each element in a substance using the chemical formula.
Student Review	Chemical Reactions and Equations: Students assess and review their understanding of the evidence that indicate new substances formed in a chemical reaction and how to balance chemical equations that represent chemical reactions.
Glossaries	Chemical Reactions and Equations 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	Atoms and Elements: In this interactivity, students complete an element's data table and then identify the element using the periodic table.
Journals	Journal - Elements and Compounds Journal 1 - Chemical Reactions and Equations Journal 2 - Chemical Reactions and Equations
Activities	Is it a Chemical Reaction? Chemical Reactions and the Law of Conservation of Mass part 1 Chemical Reactions and the Law of Conservation of Mass part 2
Quiz	Quiz: [SC.8.P.9.1] Conservation of Mass Quiz: [SC.8.P.9.2] Physical and Chemical Changes Quiz: [SC.8.P.9.3] Effect of Temperature on Chemical Change
Readers	Common Chemical Reactions

Big Idea 10: Forms of Energy

Topic 1: Light and Sound

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

Instruction Module

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.

Student Review

Using Light to Study the Universe: Students assess and review their understanding of how the different wavelengths of the electromagnetic spectrum, such as light and radio waves, are used to learn about distances and composition of objects in the universe.

Student Review	Light and Matter: Students assess and review their understanding of the sources of light energy and that it travels through transparent and translucent materials.
Student Review	Reflection and Refraction of Light: Students assess and review their understanding of how light energy is reflected by shiny surface and refracted when it travels from one medium into another.
Student Review	Sound Energy: Students assess and review their understanding of the properties of sound energy.
Glossaries	<p>Light 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>
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 1 - The Universe - Distances and Sizes
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>
Quiz	<p>Quiz: [SC.7.P.10.2] Light-Reflection, Refraction, Absorption</p> <p>Quiz: [SC.7.P.10.1] Sun's Energy and the Electro-magnetic Spectrum</p> <p>Quiz: [SC.7.P.10.3] Light and Sound Waves</p>
Readers	Beyond Visible –The New Photovoltaic Technologies

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.



<p>Instruction Module</p>	<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>
<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>Student Review</p>	<p>Heat Transfer by Conduction: Students assess and review their understanding of the transfer of heat from an object at a higher temperature to an object at through conduction.</p>
<p>Student Review</p>	<p>Heat Transfer by Convection: Students assess and review their understanding of effects of heat on the movement of particles in a fluid through the process of convection.</p>
<p>Student Review</p>	<p>Heat Transfer by Radiation: Students assess and review their understanding of heat transfer as electromagnetic waves through the process of 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>

Simulations

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.

Journals	Journal – Heat Transfer
Activities	Heat Conduction Modeling Heat Transfer by Convection and Conduction
Quiz	Quiz: [SC.7.P.11.4] Ways in which Heat Flows Quiz: [SC.7.P.11.1] Adding and Removing Heat

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	<p>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.</p>
Student Review	<p>Energy Transformations: Students assess and review their understanding of energy transformations, such as chemical energy in a flashlight battery changing to electrical energy and then to light energy.</p>
Glossaries	<p>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.</p>
Interactivities	<p>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.</p> <p>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.</p>
Simulations	<p>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.</p>
Journals	<p>Journal - Energy Transformations Journal - Potential and Kinetic Energy</p>
Activities	<p>Energy Transformations Energy Transformations – STEM Potential and Kinetic Energy</p>
Quiz	<p>Quiz: [SC.7.P.11.2] Transformation of Energy Quiz: [SC.7.P.11.3] Energy Conservation</p>
Readers	<p>Pumped Storage Reservoirs</p>

Topic 3: 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	<p>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.</p>
Instruction Module	<p>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.</p>
Instruction Module	<p>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.</p>
Student Review	<p>Kinetic Energy: Students assess and review their understanding of what kinetic energy of a moving object is and what it depends on.</p>
Student Review	<p>Potential Energy: Students assess and review their understanding of potential energy and the factors that affect it, such as mass and the height to which an object is raised.</p>
Student Review	<p>Mechanical Energy Transformations: Students assess and review their understanding of the energy transformations between potential and kinetic energy through an oscillating pendulum.</p>
Glossaries	<p>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.</p>
Interactivities	<p>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.</p>
Simulations	<p>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.</p>
Journals	<p>Journal - Potential and Kinetic Energy</p>
Activities	<p>Potential and Kinetic Energy</p>
Quiz	<p>Quiz: [SC.6.P.11.1] Potential and Kinetic Energy</p>

Readers

Pumped Storage Reservoirs

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.

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.

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.

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.

Student Review

Electromagnetism: Students assess and review their understanding of what an electromagnetic field is, how it is different from magnetic and electric fields, its generation, and some of its uses.

Student Review

Gravity and Weight: Students assess and review their understanding of the gravitational force and it affects the weight of an object on Earth, on the Moon, and on Jupiter.

Student Review

Effect of Force on Motion: Students assess and review their understanding of how unbalanced forces change the position, direction, and speed of a moving object.

Glossaries	<p>Forces Acting at a Distance Force and Motion</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	<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>
Journals	<p>Journal 1 - Force and Motion Journal 1 - Effects of Force</p>
Activities	<p>Electrical Circuits – Electromagnets How the Direction of the Force Affects the Motion of an Object The Effect of Mass on the Motion of an Object</p>
Quiz	<p>Quiz: [SC.6.P.13.3] Effects of Unbalanced Forces Quiz: [SC.6.P.13.1] Types of Forces Quiz: [SC.6.P.13.2] Gravitational Force</p>
Readers	<p>What Goes Up Eddie the Eagle: A Battle with Forces</p>

Topic 2: 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	<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 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.</p>
Student Review	<p>Measuring Distance and Speed: Students assess and review their understanding of the calculation of average speed using distance and time, and how the motion of a moving object is depicted on a graph.</p>
Interactivity	<p>Graphing a Busy Day: In this interactivity, students interpret distance and time data from a graph and calculate speed.</p>
Glossaries	<p>Motion - Speed, Distance, and Time</p> <p>The interactive multimedia glossary provides both linguistic and non-linguistic representations of key terms related to science</p>

	concepts presented in the Instruction Modules, Interactivities, and Simulations.
Journals	Journal - Force and Motion
Activities	Representing Changes in Motion Graphically – STEM
Quiz	Quiz: [SC.6.P.12.1] Distance vs Time Graph

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.

Student Review **Structural Hierarchy - Cell to Organisms:** Students assess and review their understanding of structural hierarchy in plants and animals including cells, tissues, organs, organ systems, and organisms.

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.

Journals Journal - Cells to Organisms

Activities Levels of Organization of Living Things

Quiz Quiz: [SC.6.L.14.1]Cells 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.

Student Review **Cell: The Basic Unit of Life:** Students assess and review their understanding of cells and that organisms can be unicellular or multicellular.

Student Review **Eukaryotic and Prokaryotic Cells:** Students assess and review their understanding of the classification of cells as prokaryotic or eukaryotic depending on whether they have a nucleus or not.

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 Quiz: [SC.6.L.14.2] Cells - The Basic Unit of Life
Quiz: [SC.6.L.14.3] Cells - Processes to Maintain Homeostasis

Readers The Building Blocks of Life

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.
Student Review	Plant vs Animal Cell: Students assess and review their understanding of the differences between the organelles and their functions 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 - Plant vs. Animal Cell
Activities	Observing Paramecia Comparing Plant and Animal Cells Organelles
Quiz	Quiz: [SC.6.L.14.4] Plant and Animal Cells

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 region where two or more bones meet is called a joint and learn about the different types of joints in the human body.
Instruction Module	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>	<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>
<p>Instruction Module</p>	<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>
<p>Instruction Module</p>	<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>
<p>Student Review</p>	<p>Respiratory System: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the respiratory system.</p>
<p>Student Review</p>	<p>Circulatory System: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the circulatory system.</p>
<p>Student Review</p>	<p>Skeletal and Muscular Systems: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the skeletal and muscular system.</p>
<p>Student Review</p>	<p>Digestive and Excretory Systems: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the digestive and excretory system.</p>
<p>Student Review</p>	<p>Integumentary System: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the integumentary system.</p>
<p>Student Review</p>	<p>Nervous System: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the nervous system.</p>
<p>Student Review</p>	<p>Endocrine and Reproductive Systems: Students assess and review their understanding of the structural components, the way they operate, and primary functions of the endocrine and reproductive systems.</p>

Interactivities	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.
Glossaries	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.
Journals	Journal - Human Body Systems
Activities	Human Body Systems
Quiz	Quiz: [SC.6.L.14.5] Systems of the Human Body Quiz: [SC.6.L.14.6] Infectious Agents
Readers	True Foodies! Breathe in and Breathe out The Science Behind Skin Protection

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.
Student Review	Taxonomic Classification: Students assess and review their understanding of why the taxonomic classification was developed and how it classifies organisms in groups of decreasing sizes starting with Domains.

Student Review	Classification of Organisms: Students assess and review their understanding of the different characteristics used to classify organisms, such as prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic classifications, and mode of reproduction.
Student Review	Domain Eukarya: Students assess and review their understanding of the characteristics of the organisms of the domain Eukarya and its four kingdoms: Protista, Fungi, Planta, and Animalia.
Student Review	Domains Bacteria and Archaea: Students assess and review their understanding of the characteristics of the organisms of the domains Archaea and Bacteria.
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	Quiz: [SC.6.L.15.1] Classification of Organisms

Topic 2: Natural Selection and Variability

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.

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.
Student Review	Factors Influencing Natural Selection: Students assess and review their understanding of natural selection and factors that influence it, such as variations within a population and environmental factors.
Student Review	Variations in Organism: Students assess and review their understanding of physical, behavioral, and physiological adaptations that enhance survival in organisms.
Glossaries	Natural Selection and Selective Breeding 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.
Interactivity	Survivor: In this Interactivity, students analyze and select the traits that might be most suitable for survival based on the environment.
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.
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 - Natural Selection and Selective Breeding Journal - Variability And Survival
Activities	Geographic Speciation and Natural Selection
Quiz	Quiz: [SC.7.L.15.2] Natural Selection and Diversity Quiz: [SC.7.L.15.3] Theory of Evolution

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.

Student Review **Genes and Heredity:** Students assess and review their understanding of what genes are, where they are found, and how they are responsible for passing on traits from generation to generation.

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 the options in the correct order to represent the location of genes within a cell.

Journals Journal - Heredity and Genes

Activities Heredity and Genes

Quiz Quiz: [SC.7.L.16.1] Heredity and Genes
Quiz: [SC.7.L.16.2] Genotype and Phenotype Combinations

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.

<p>Student Review</p>	<p>Asexual Reproduction: Students assess and review their understanding of why offspring produced in asexual reproduction, which includes fragmentation, budding, binary fission and vegetative propagation, are genetically identical to each other and to their parent.</p>
<p>Student Review</p>	<p>Sexual Reproduction: Students assess and review their understanding of why sexual reproduction, which includes conjugation and fertilization, requires two parents and that the offspring produced by sexual reproduction are genetically diverse their parents and each other.</p>
<p>Glossaries</p>	<p>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.</p>
<p>Interactivities</p>	<p>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.</p>
<p>Journals</p>	<p>Journal - Types Of Reproduction</p>
<p>Activities</p>	<p>Types of Reproduction</p>
<p>Quiz</p>	<p>Quiz: [SC.7.L.16.3] Sexual and Asexual reproduction</p>

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.

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.

Student Review **The Food Chain:** Students assess and review their understanding of food chains that show the linear relationship of some organisms in an ecosystem that depend on each other for food and energy.

Student Review **Ecosystems–Energy Flow:** Students assess and review their understanding of food webs, which show how organisms are dependent on each other for food, and energy pyramids, which represent how much energy is transferred to each level of consumers beginning with producers at the base.

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.

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.

Journals Journal - Ecosystems–Energy Flow

Activities Flow of Energy in Ecosystems

Quiz

Quiz: [SC.7.L.17.1] Energy Transfer in Food Webs

Topic 2: Interrelationships between Organisms and Ecosystems

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.

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.

Student Review **Interrelationships between Organisms:** Students assess and review their understanding of producer/consumer, predator/prey, and parasite/host relationships in food webs within marine, freshwater, and terrestrial ecosystems.

Student Review **Abiotic Factors Influencing the Ecosystem:** Students assess and review their understanding of the abiotic factors, such as quantity of light, water, range of temperatures, or soil, influence ecosystems and the biotic factors within them.

Student Review **Biodiversity:** Students assess and review their understanding of how a higher variety of organisms in an ecosystem decreases the chances of an ecosystem collapsing when a food chain collapses.

<p>Student Review</p>	<p>Biomes-Deserts and Forests: Students assess and review their understanding of features of deserts and forests biomes around the world, and how the organisms found in each have adapted to survive in them.</p>
<p>Student Review</p>	<p>Biomes: Grasslands and Tundra: Students assess and review their understanding of features of grasslands and tundra biomes around the world, and how the organisms found in each have adapted to survive in them.</p>
<p>Student Review</p>	<p>Aquatic Biomes: Students assess and review their understanding of features of aquatic biomes around the world, and how aquatic organisms have adapted to survive in them.</p>
<p>Glossaries</p>	<p>Interrelationships Between Organisms 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.</p>
<p>Simulations</p>	<p>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.</p>
<p>Interactivities</p>	<p>Biomes and their Organisms: In this interactivity, students will identify and sort organisms that belong and do not belong to a biome.</p>
<p>Journals</p>	<p>Journal - Interrelationships between Organisms Journal - Diversity of Life</p>
<p>Activities</p>	<p>Activity 1: Interrelationships Between Organisms Activity 2: Interrelationships Between Organisms Interdependence in Living Systems Depending on and Competing for Resources Observing Biodiversity in a Schoolyard</p>
<p>Quiz</p>	<p>Quiz: [SC.7.L.17.2] Relationships Among Organisms Quiz: [SC.7.L.17.3] Limiting Factors in Ecosystems</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 **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.

Instruction Module **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.

Student Review **Photosynthesis:** Students assess and review their understanding of how plants transform the radiant energy of the Sun into chemical energy through photosynthesis.

Glossaries **Photosynthesis, Respiration, and 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.

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 Quiz: [SC.8.L.18.1] The Process of Photosynthesis
Quiz: [SC.8.L.18.2] Cellular Respiration

Readers Deforestation

Topic 2: Matter and Energy in Ecosystems

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.

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.

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.

Student Review **The Food Chain:** Students assess and review their understanding of food chains that show the linear relationship of some organisms in an ecosystem that depend on each other for food and energy.

Student Review **Ecosystems–Energy Flow:** Students assess and review their understanding of food webs, which show how organisms are dependent on each other for food, and energy pyramids, which represent how much energy is transferred to each level of consumers beginning with producers at the base.

Student Review **Nutrient Cycles:** Students assess and review their understanding of how the nutrients carbon, hydrogen, nitrogen, oxygen, and phosphorus are cycled in the environment.

Student Review	Decomposition: Students assess and review their understanding of cycling of matter in the process of decomposition within a compost bin.
Glossaries	Cycling of Matter 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.
Interactivities	Garbage to Garden! In this Interactivity, students “build” a compost pit choosing the correct materials for each layer in the compost pit.
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.
Journals	Journal - Cycling Of Matter Journal - Energy Flow In Ecosystems
Activities	Mini Compost in a Bottle Flow of Energy in Ecosystems
Quiz	Quiz: [SC.8.L.18.3] Transfer of Matter and Energy in Environments Quiz: [SC.8.L.18.4] Conservation of Mass and Energy in Living Systems
Readers	Deforestation