

Unit	Lesson	Lesson Objectives
Earth and Space Sciences		
Star Systems and Galaxies		
Describe star systems.		
Distinguish the major types of galaxies.		
Stars		
Explain how a star forms.		
Explain how stars are classified.		
Explain what happens as a star runs out of fuel.		
Identify the physical properties of stars.		
Planets		
Identify characteristics shared by the inner planets.		
Identify characteristics shared by the outer planets.		
Identify each planet in the solar system.		
Gravity and Motion		
Explain how Earth and the moon stay in orbit.		
Identify factors that influence the force of gravity between objects.		
The Earth-Sun-Moon System		
Describe solar and lunar eclipses.		
Explain how Earth moves in space.		
Explain what causes the phases of the moon.		
Explain what causes tides.		
Other Objects in the Solar System		
Describe the characteristics of dwarf planets.		
Distinguish between comets, asteroids, and meteoroids.		
Explain the difference between meteoroids, meteors, and meteorites.		
Science Practice: Examine how life may be affected when cosmic objects impact Earth.		
Relative Dating		
Describe the law of superposition.		
Explain how fossils are used to date rocks.		
Explain how geologists determine the relative age of rocks.		
Geologic Time		
Distinguish the units of the geologic time scale.		
Explain how Earth has evolved over geologic time.		
Explain why the geologic time scale is used to show Earth's history.		

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		<p>Cycles of Matter</p> <ul style="list-style-type: none">Analyze the importance of the nitrogen cycle.Examine how carbon cycles through an ecosystem.Identify the processes involved in the water cycle.
		<p>Continental Drift</p> <ul style="list-style-type: none">Describe evidence that supports continental drift.Explain continental drift.
		<p>Plate Tectonics</p> <ul style="list-style-type: none">Distinguish the three types of plate boundaries.Explain the theory of plate tectonics.Identify the major tectonic plates.Relate plate tectonics to the formation of landforms.
		<p>Characteristics of the Seafloor</p> <ul style="list-style-type: none">Describe evidence that supports seafloor spreading.Describe the process of seafloor spreading.Explain what occurs at deep-ocean trenches.
		<p>Lab: Plate Boundaries and Movement</p> <ul style="list-style-type: none">Compare and contrast the plate movements that cause earthquakes and volcanic eruptions.Describe the role of mantle convection in plate movement.Differentiate between the major types of plate boundaries.Examine how plate movements cause changes in Earth's surface.
		<p>Rocks and the Rock Cycle</p> <ul style="list-style-type: none">Describe the properties used to identify rocks.Identify the three main groups of rocks.Identify the ways in which rocks change as they move through the rock cycle.
		<p>Weathering and Soil</p> <ul style="list-style-type: none">Classify different types of soil.Describe the characteristics of soil.Distinguish between mechanical and chemical weathering.Explain how soil is formed.Identify factors that affect the rate of weathering.
		<p>Water and Wind Erosion</p> <ul style="list-style-type: none">Describe the effects of wind erosion and deposition.Explain how glaciers and waves cause erosion and deposition.Identify causes of groundwater erosion.Identify features that are formed by water erosion and deposition.

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		<p>Lab: Environmental Changes in a Watershed</p> <ul style="list-style-type: none"> Examine how environmental changes affect the health of a watershed. Predict the effect of human activity on the resources found in a watershed. <p>Atmospheric Moisture and Precipitation</p> <ul style="list-style-type: none"> Describe humidity and how it is measured. Distinguish the three main types of clouds. Explain how clouds form. Identify common types of precipitation. <p>Air Masses and Fronts</p> <ul style="list-style-type: none"> Differentiate the four main types of fronts. Explain how air masses move. Identify the major types of air masses. <p>Storms</p> <ul style="list-style-type: none"> Describe the effects of various storms on humans and the environment. Explain how various storms form. Identify measures that can be taken to stay safe in a storm. <p>Factors That Affect Climate</p> <ul style="list-style-type: none"> Explain how various factors affect weather and climate. Explain what causes seasons. <p>Climate Change</p> <ul style="list-style-type: none"> Explain how human, biologic, and geologic activities can influence climate. Identify events that can cause short-term and global climate change. <p>Energy on Earth</p> <ul style="list-style-type: none"> Distinguish between renewable and nonrenewable resources. Identify advantages and disadvantages of various energy sources. Identify renewable and nonrenewable resources. <p>Human Impact on Resources</p> <ul style="list-style-type: none"> Compare the costs and benefits of conservation policies. Identify the negative impacts that human activity has had on Earth's resources. Identify the positive impacts that human activity has had on Earth's resources. <p>Lab: Effects of Human Activity on Freshwater Resources</p> <ul style="list-style-type: none"> Identify sources of freshwater pollution. Model the effect of pollutants on the quality of freshwater resources. Predict the effect of human activity on the health of a freshwater ecosystem.

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Life Sciences**Cell Theory**

Analyze the contributions of different scientists to the development of the cell theory.

Identify the three components of the cell theory.

Cell Structure

Examine the functions of cell organelles.

Identify the organelles of a cell.

Photosynthesis

Explain the steps in the process of photosynthesis.

Identify the products and reactants of photosynthesis.

Cellular Respiration

Explain the steps in the process of cellular respiration.

Identify the products and reactants of cellular respiration.

Meiosis

Differentiate meiosis from mitosis.

Explain why meiosis is necessary for sexual reproduction.

Identify and describe the steps of meiosis.

Asexual and Sexual Reproduction

Analyze the process of sexual reproduction.

Compare and contrast asexual and sexual reproduction.

Examine the different types of asexual reproduction.

Identify the advantages and disadvantages of both asexual and sexual reproduction.

Introduction to Heredity

Differentiate between genotype and phenotype.

Distinguish dominant and recessive alleles.

Examine the contributions made by Gregor Mendel to the field of genetics.

Explain how traits are inherited.

DNA Mutations

Analyze the effects of DNA mutations on the traits of an organism.

Distinguish common types of DNA mutations.

Advances in Genetics

Compare the processes of selective breeding, cloning, and genetic engineering.

Describe the impact of genetic technologies on society and the environment.

Examine the use of gene therapy to treat disease.

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Natural Selection

- Describe factors that contribute to the extinction of a species.
- Examine how natural selection leads to evolution.
- Identify the conditions required for natural selection.
- Identify ways in which genetic variation and environmental factors contribute to natural selection.

Lab: Natural Selection

- Analyze data to determine phenotype changes through generations.
- Examine natural selection within a population.

The Fossil Record

- Examine how the fossil record indicates a long history of changing life-forms.
- Explain how scientists determine the age of a fossil.
- Identify how a fossil forms.

Evidence for Evolution

- Compare patterns of embryological development in different organisms.
- Determine how comparative anatomy supports the theory of evolution.

Evolutionary Relationships

- Analyze the relationships among organisms based on a variety of shared characteristics.
- Interpret evolutionary relationships among organisms on a cladogram.

Diversity of Life

- Compare and contrast the physical characteristics of different animals.
- Compare and contrast the physical characteristics of different plants.
- Identify why the life cycles of different organisms vary.

Body Organization and Homeostasis

- Analyze how organ systems function together to maintain homeostasis.
- Identify and order the levels of organization in the body.

The Digestive and Excretory Systems

- Analyze how the kidneys work.
- Examine how food is physically and chemically broken down by the digestive system.
- Identify the major structures and functions of the digestive system.
- Identify the major structures and functions of the excretory system.

The Nervous and Endocrine Systems

- Analyze how negative feedback works in the endocrine system.
- Analyze how sensory receptors communicate with the brain in response to stimuli.
- Examine the major structures and functions of the endocrine system.
- Identify the major structures and functions of the nervous system.

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Interactions among Living Things

- Differentiate competition, predation, and cooperation.
- Distinguish among the three types of symbiotic relationships.

Energy Flow in Ecosystems

- Analyze the transfer of energy through the trophic levels in an energy pyramid.
- Examine the movement of energy through an ecosystem in food chains and food webs.
- Explain the roles of producers, consumers, and decomposers in an ecosystem.
- Identify producers, consumers, and decomposers in food chains and food webs.

Populations

- Identify factors that affect population size.
- Identify limiting factors that affect a population in a given environment.

Biodiversity

- Examine ways to protect biodiversity.
- Identify how biodiversity contributes to the sustainability of an ecosystem.
- Identify some factors that can threaten biodiversity.
- Identify the factors that affect biodiversity.

Natural Environmental Change

- Assess the impact of natural environmental changes on organisms, populations, and species.
- Identify examples of natural long-term environmental changes.
- Identify examples of natural short-term environmental changes.

Human Impact on the Environment

- Assess the impact of human-induced environmental changes on organisms, populations, and species.
- Identify examples of long-term human-induced environmental changes.
- Identify examples of short-term human-induced environmental changes.

Physical Sciences

Atoms

- Describe the parts of an atom.
- Identify the masses, locations, and charges of protons, neutrons, and electrons.

Elements

- Describe what an isotope is and explain how isotopes of the same element are different.
- Examine the properties of an element.
- Explain how ions form.

Changes of State

- Describe what happens during the different changes of state.
- Explain how energy is related to changes of state.

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		<p>Physical Properties</p> <ul style="list-style-type: none">Describe and give examples of physical properties of matter.Explain how and why matter is conserved during a physical change.Explain what happens during a physical change.Identify examples of physical changes. <p>Chemical Properties</p> <ul style="list-style-type: none">Describe and give examples of chemical properties of matter.Differentiate between physical and chemical changes.Explain what happens during a chemical change.Identify examples of chemical changes. <p>Compounds</p> <ul style="list-style-type: none">Describe the defining characteristics of a compound.Determine the number of atoms of each element in a chemical formula.Explain how chemical formulas represent compounds.Use models to visualize the chemical structure of a compound. <p>Polymers</p> <ul style="list-style-type: none">Describe the uses of natural and synthetic polymers.Examine the benefits and limitations of using synthetic polymers.Explain the formation of polymers. <p>Describing Chemical Reactions</p> <ul style="list-style-type: none">Describe the law of conservation of mass.Explain how mass is conserved in chemical equations.Identify the parts of a chemical equation. <p>Types of Chemical Reactions</p> <ul style="list-style-type: none">Distinguish among the types of chemical reactions.Predict the product of each type of chemical reaction. <p>Introduction to Forces</p> <ul style="list-style-type: none">Describe the concept of force.Distinguish between balanced and unbalanced forces and their effect on motion.Explain how to determine the net force on an object. <p>Gravity</p> <ul style="list-style-type: none">Describe how gravity affects projectile motion.Describe Newton's law of universal gravitation.Explain the concept of free fall.Identify and describe the factors that affect the gravitational force between two objects.

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Newton's Laws of Motion

- Describe Newton's first law of motion and how it relates to inertia.
- Explain Newton's third law of motion and how it relates to action and reaction forces.
- Identify applications of Newton's three laws of motion.
- Use Newton's second law of motion to calculate force, mass, and acceleration.

Momentum

- Apply Newton's third law of motion to understand what happens to momentum when two objects collide.
- Define and calculate momentum.
- Explain how momentum is conserved.
- Use mathematical representations to show that the total momentum of a system of objects is conserved when there is no net force on the system.

Potential and Kinetic Energy

- Calculate the kinetic energy in a system.
- Calculate the potential energy in a system.
- Distinguish between potential and kinetic energy.
- Explain how energy is transferred in a moving system.

Lab: Kinetic Energy

- Calculate the kinetic energy of objects of different mass.
- Determine the kinetic energy of objects at different speeds.
- Graph data to illustrate changes in kinetic energy.

Energy Transformations

- Explain how energy changes form.
- Identify examples of energy transformations.
- Summarize the law of conservation of energy.

Temperature and Thermal Energy

- Describe how temperature is measured.
- Convert temperature readings between different temperature scales.
- Describe how thermal energy relates to temperature.
- Explain how temperature relates to kinetic energy.

Heat

- Distinguish between heat and thermal energy.
- Explain why some substances change temperature more easily than others.
- Predict how thermal energy flows between objects at different temperatures.

Lab: Thermal Energy Transfer

- Determine how mass affects the amount of thermal energy transferred.
- Investigate how different materials transfer thermal energy.
- Observe and compare the specific heat of water with the specific heat of other substances.

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Properties of Waves		
<p>Calculate the speed of a transverse wave.</p> <p>Describe how a wave's amplitude is related to the energy the wave carries.</p> <p>Describe the relationship between the frequency and wavelength of a wave.</p> <p>Explain why waves travel at different speeds.</p> <p>Use mathematical representations to show relationships among the frequency, wavelength, and speed of waves traveling in various media.</p>		
Wave Interactions		
<p>Describe how a wave's direction is changed by reflection, refraction, and diffraction.</p> <p>Differentiate between constructive and destructive interference.</p> <p>Explain what happens when waves interact.</p>		
Using Sound		
<p>Describe the uses of ultrasound technology.</p> <p>Explain how and why animals use echolocation.</p> <p>Summarize the ways in which sound waves are used for communication.</p>		
Electric Charge		
<p>Analyze the factors that affect the strength of an electric force.</p> <p>Describe the electric field due to a charge.</p> <p>Determine how electric charges interact.</p> <p>Explain how electrons cause objects to become electrically charged.</p>		
Magnets and Magnetism		
<p>Describe Earth's magnetic field.</p> <p>Describe the properties of magnets.</p> <p>Determine how magnetic poles interact with each other.</p> <p>Illustrate the magnetic field around a magnet.</p>		
Lab: Magnetic and Electric Fields		
<p>Demonstrate and describe electric fields.</p> <p>Demonstrate and describe magnetic fields.</p> <p>Show how magnetic and electric fields are related.</p>		
Engineering, Technology, and Application of Science		
Technological Design		
<p>Compare and contrast technological design and scientific investigation.</p> <p>Describe the four stages of technological design.</p> <p>Evaluate a technological design or product to determine if it meets designated criteria.</p>		