

Options EHS Physical Science A-OR Scope and Sequence		
Unit	Lesson	Objectives
Science Skills		
	Tools, Technology, and Measurement	
		Select and use appropriate tools to perform tests and collect data.
		Select and use appropriate technology such as computers and graphing calculators to gather, analyze, interpret, and display data.
		Use the SI system of measurement to convert between standard and metric, and metric and metric, and to recognize approximate representations of measurement.
		Science Practice: Use technology to display data in tables and graphs, and use the graphical representations to interpret the data.
	Measurement	
		Identify basic units and prefixes used in the metric system.
		Perform metric system conversions.
		Measure length, mass, volume, and temperature.
	Scientific Measurement	
		Explain the purpose of utilizing the metric system in scientific measurement.
		Identify the basic SI units utilized in scientific measurement.
		Calculate values utilizing the metric conversion process.
		Describe the use of significant figures and rounding in scientific measurement.
	Scientific Inquiry	
		Examine the process of scientific inquiry using the three types of scientific investigations, including the benefits and limitations of each.
		Identify questions that can be answered through scientific investigation.
		Distinguish between variables and controls in a scientific investigation.

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Unit	Lesson	Objectives
	Test	
	Motion and Forces	
	Introduction to Motion	
		Describe the position of an object.
		Explain how an object's motion is relative to a reference point or frame.
		Distinguish between distance and displacement.
	Speed and Velocity	
		Differentiate between speed and velocity.
		Solve problems involving distance, time, speed, and/or velocity.
		Interpret graphs of distance versus time.
	Acceleration	
		Describe the concept of acceleration.
		Solve problems involving velocity, time, and acceleration.
		Interpret graphs of velocity versus time.
	Lab: Motion	
		Measure distance and time to determine speed.
		Graph changes in motion.
		Interpret data to determine acceleration.
	Introduction to Forces	
		Describe the concept of force.
		Explain how to determine the net force on an object.
		Distinguish between balanced and unbalanced forces and their effect on motion.

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Unit	Lesson	Objectives
	Friction	
		Describe friction and explain what causes it to occur.
		Identify and describe the different types of friction.
		Explain how friction can be reduced or increased depending on the application.
	Gravity	
		Describe Newton's law of universal gravitation.
		Identify and describe the factors that affect the gravitational force between two objects.
		Explain the concept of free fall.
		Describe how gravity affects projectile motion.
	Newton's Laws of Motion	
		Describe Newton's first law of motion and how it relates to inertia.
		Use Newton's second law of motion to calculate force, mass, and acceleration.
		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.
	Lab: Newton's Laws of Motion	
		Demonstrate Newton's first law.
		Verify Newton's second law by changing the variables F , m , or a .
	Momentum	
		Define and calculate momentum.
		Explain how momentum is conserved.
		Apply Newton's third law of motion to understand what happens to momentum when two objects collide.
		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.

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Unit	Lesson	Objectives
	Unit Test	
Work and Energy		
	Work and Power	
		Identify when work is done.
		Calculate the work done on an object.
		Explain how force, work, and power are related.
		Calculate power.
	Introduction to Machines	
		Define a machine and explain its purpose.
		Calculate the mechanical advantage of a machine.
		Calculate the efficiency of a machine.
	Simple Machines	
		Describe the six different types of simple machines.
		Calculate the mechanical advantage of each type of simple machine.
		Identify simple machines found in the human body.
		Distinguish compound machines from simple machines.
	Introduction to Energy	
		Define energy.
		Explain how energy and work are related.
		Identify and describe the different forms of energy.
	Potential and Kinetic Energy	
		Distinguish between potential and kinetic energy.

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Calculate the potential energy in a system.

Calculate the kinetic energy in a system.

Explain how energy is transferred in a moving system.

Energy Transformations

Explain how energy changes form.

Identify examples of energy transformations.

Summarize the law of conservation of energy.

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.

Unit Test

Matter

Introduction to Matter

Explain what makes up matter.

Describe how to measure mass and volume.

Differentiate between mass and weight.

Physical Properties

Describe and give examples of physical properties of matter.

Explain what happens during a physical change.

Identify examples of physical changes.

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Explain how and why matter is conserved during a physical change.

Density

Explain density and state the SI units used to measure it.

Calculate the mass, volume, or density of an object given the other two measurements.

Determine whether an object will sink or float relative to the density of the surrounding liquid.

Lab: Density of Solids

Measure the mass and volume of various solid objects.

Calculate the density of several solid objects.

Use density to identify an unknown substance.

States of Matter

Describe the arrangement and motion of atoms in the different states of matter.

Discriminate the characteristics of solids, liquids, and gases.

Changes of State

Describe what happens during the different changes of state.

Explain how energy is related to changes of state.

Chemical Properties

Describe and give examples of chemical properties of matter.

Explain what happens during a chemical change.

Identify examples of chemical changes.

Differentiate between physical and chemical changes

Unit Test

Temperature and Heat

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Unit	Lesson	Objectives
	Temperature and Thermal Energy	
		Explain how temperature relates to kinetic energy.
		Describe how temperature is measured.
		Convert temperature readings between different temperature scales.
		Describe how thermal energy relates to temperature.
	Heat	
		Distinguish between heat and thermal energy.
		Predict how thermal energy flows between objects at different temperatures.
		Explain why some substances change temperature more easily than others.
	Conduction	
		Explain how molecular movement transfers thermal energy by conduction.
		Distinguish between insulators and conductors.
		Identify situations in which conduction occurs.
	Convection	
		Explain how fluid movement transfers thermal energy by convection.
		Describe the motion of liquids and gases due to convection.
		Identify situations in which convection occurs.
	Radiation	
		Explain how electromagnetic waves transfer energy by radiation.
		Describe the role of color and texture in absorbers and reflectors.
		Identify situations in which radiation occurs.

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Lab: Thermal Energy Transfer

Investigate how different materials transfer thermal energy.

Determine how mass affects the amount of thermal energy transferred.

Observe and compare the specific heat of water with the specific heat of other substances.

Unit Test

earth science

The Cycles of Matter

Describe various cycles of matter that take place on Earth.

Evaluate the role played by cycles in sustaining life.

Explain the change in energy that occurs between each cycle in an ecosystem.

Spheres of Earth

Distinguish the four major parts of the Earth system.

Explain how Earth's four spheres interact.

Theory of Plate Tectonics

Summarize the theory of plate tectonics.

Describe the processes and features that occur at the three types of plate boundaries.

Explain how movement in the mantle is related to plate motion.

Science Practice: Examine a map to identify Earth's major tectonic plates.

Volcanoes

Identify the reasons why Earth's volcanic regions are located in certain areas.

Explain what happens when a volcano erupts.

Distinguish the two types of volcanic eruption.

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Describe the three stages of volcanic activity.

Explain how volcanoes create various landforms.

Water Resources

Describe the importance of water.

Explain how Earth's water is distributed and used.

Explain how water resources are managed.

Structure and Composition of the Atmosphere

Describe the composition of Earth's atmosphere.

Describe the importance of the atmosphere to living things.

Identify properties of air, including pressure and density.

Explain how altitude affects air pressure and density.

Distinguish the four main layers of the atmosphere.

Cumulative Exam

Cumulative Exam Review

Cumulative Exam