

OPTIONS FRMS Science 7 A		Scope and Sequence
Unit	Lesson	Objectives
Properties and Changes of Matter		
	Cellular Interactions with the Environment	<p>Examine the process of diffusion.</p> <p>Analyze the effects of osmosis on cells.</p> <p>Compare and contrast active and passive transport.</p>
	Cell Theory	<p>Examine the role of microscopes in discovering cells.</p> <p>Compare and contrast the functions of different types of microscopes.</p> <p>Describe the components of cell theory.</p> <p>Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.</p>
	Cell Structure	<p>Identify the organelles within a cell and describe their functions.</p> <p>Compare and contrast the structures of animal and plant cells.</p> <p>Science Practice: Label a diagram to illustrate the structure of a cell.</p>
	Cell Homeostasis	<p>Explain how cells maintain homeostasis.</p> <p>Differentiate between diffusion, osmosis, passive transport, and active transport.</p> <p>Describe the importance of homeostasis to living organisms.</p> <p>Science Practice: Generate procedures to utilize charts, graphs, and tables to show data.</p>
	Cell Differentiation and Specialization	<p>Explain the role of differentiation in the creation of specialized cells.</p>

Unit Lesson

Objectives

Describe specialized cells found within living organisms.

Analyze the effect of changing external conditions on specialized cells.

Science Practice: Examine how two different scientists could use different experimental designs and have the same outcome.

Animal and Plant Cells

Compare and contrast the structures of animal and plant cells.

Differentiate between the cell membrane and the cell wall.

Science Practice: Construct charts, graphs, and tables to organize data.

Prokaryotic and Eukaryotic Cells

Describe the basic structure of a cell.

Compare and contrast prokaryotic and eukaryotic cells.

Explain the endosymbiotic theory.

Science Practice: Evaluate past research from investigations similar in design and purpose.

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.

Physical Properties

Describe and give examples of physical properties of matter.

Explain what happens during a physical change.

Identify examples of physical changes.

Unit Lesson

Objectives

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

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

Ionic Bonds

Describe characteristics of ionic bonds.

Explain how ionic bonds form.

Identify the properties of ionic compounds.

Give examples of ionic compounds.

Covalent Bonds

Describe characteristics of covalent bonds.

Explain how covalent bonds form.

Identify the properties of covalent compounds.

Give examples of covalent compounds.

Compounds

Describe the defining characteristics of a compound.

Unit Lesson

Objectives

Explain how chemical formulas represent compounds.

Determine the number of atoms of each element in a chemical formula.

Use models to visualize the chemical structure of a compound.

Polymers

Explain the formation of polymers.

Describe the uses of natural and synthetic polymers.

Examine the benefits and limitations of using synthetic polymers.

Unit Test

Atoms and the Periodic Table

Atomic Theory

Describe the development of the modern model of the atom.

Compare the models of the atom put forth by Dalton, Thomson, Rutherford, and Bohr.

Atoms

Describe the parts of an atom.

Identify the masses, locations, and charges of protons, neutrons, and electrons.

Elements

Examine the properties of an element.

Describe what an isotope is and explain how isotopes of the same element are different.

Explain how ions form.

Periodic Table

Unit Lesson

Objectives

Examine the history of the periodic table.

Describe the organization of the periodic table.

Determine an element's symbol, atomic number, and mass number from the periodic table.

Metals

Describe the characteristic properties of metals.

Identify the location of metals in the periodic table.

Explain how and why the reactivity of metals changes in the periodic table.

Nonmetals

Describe the characteristic properties of nonmetals.

Identify the location of nonmetals in the periodic table.

Explain how and why the reactivity of nonmetals changes in the periodic table.

Metalloids

Describe the characteristic properties of metalloids.

Identify the location of metalloids in the periodic table.

Explain why most metalloids are used as semiconductors.

Chemical Reactions

Introduction to Chemical Reactions

Recognize that a chemical reaction is a chemical change.

Describe the evidence that shows that a chemical reaction has occurred.

Explain the difference between an endothermic and an exothermic reaction.

Types of Chemical Reactions

Distinguish among the types of chemical reactions.

Unit Lesson

Objectives

Predict the product of each type of chemical reaction.

Describing Chemical Reactions

Identify the parts of a chemical equation.

Describe the law of conservation of mass.

Explain how mass is conserved in chemical equations.

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.

The Digestive and Excretory Systems

Identify the major structures and functions of the digestive system.

Examine how food is physically and chemically broken down by the digestive system.

Identify the major structures and functions of the excretory system.

Analyze how the kidneys work.

Unit Test

energy

Changes of State

Describe what happens during the different changes of state.

Explain how energy is related to changes of state.

Conservation of Energy

Unit Lesson

Objectives

Explain the law of conservation of energy.

Apply the law of conservation of energy to solve problems.

Use energy transfer diagrams to illustrate that energy is conserved.

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.

Photosynthesis and Cellular Respiration

Illustrate and describe the energy conversions that occur during photosynthesis and respiration.

Compare and contrast the processes of photosynthesis and cellular respiration.

Science Practice: Evaluate data to formulate a conclusion.

Phase Changes

Describe phase changes in terms of kinetic-molecular theory.

Describe the energy changes that happen during changes of state.

Science Practice: Make and interpret graphs of temperature vs. time for changes of state.

Earth's Energy Budget

Describe what happens to incoming solar radiation when it reaches Earth.

Unit Lesson

Objectives

Identify factors that affect the absorption and reflection of incoming solar radiation.

Analyze and describe Earth's energy budget.

Explain the greenhouse effect.