

God's Design for Science®

Chemistry & Ecology: Student Objectives

Properties of Atoms & Molecules

Atoms & Molecules

- Identify and describe the parts of an atom using diagrams.
- Use the periodic table to determine the characteristics of atoms.
- Describe the relationship between atoms and molecules.

Elements

- Describe how the periodic table can be used to classify elements.
- Distinguish between the properties of metals and nonmetals.
- Describe the importance of hydrogen, carbon, and oxygen.

Bonding

- Describe the differences between ionic and covalent bonds.
- Demonstrate different bonds using models.
- Describe the properties of crystals.

Chemical Reactions

- Use equations to describe chemical reactions.
- Identify factors that effect chemical reactions.
- Demonstrate the first law of thermodynamics using chemical reactions.
- Describe what happens to heat during chemical reactions.

Acids & Bases

- Distinguish between the properties of acids and bases.
- Describe the result of mixing acids and bases.
- Demonstrate how to test for acids and bases.

Biochemistry

- Describe the importance of water, proteins, fats, and carbohydrates to living things.
- Explain the connection between natural decomposers and fertilizers.
- Describe how medicines have impacted mankind.

Applications of Chemistry

- Describe ways in which chemistry can be used for the benefit of mankind.
- Demonstrate uses of chemistry in industry.

Properties of Matter

Experimental Science

- Describe how the scientific method is used to study the world.
- Distinguish between qualitative and quantitative observations.

Identify the proper tools and units used for measuring different properties of matter.

Measuring Matter

Distinguish between mass and weight.

Describe the relationship between mass, volume, and density.

Describe the relationship between density and buoyancy.

States of Matter

Distinguish between physical and chemical changes.

Describe how phase changes relate to solids, liquids, and gases.

Explain the relationship among temperature, pressure, and volume of gases.

Classifying Matter

Distinguish between elements, compounds, and mixtures using examples.

Identify unique characteristics of water and air and their importance for life.

Describe how pasteurization and homogenization are used to process milk.

Solutions

Distinguish between solutions and suspensions using examples.

Identify the most common solvent.

Describe the relationship between solubility and concentration.

Food Chemistry

Describe how chemistry is involved in the food we eat.

Identify the use of food additives.

Describe the importance of chemical reactions in making bread.

Properties of Ecosystems

Introduction to Ecosystems

Identify and describe ecosystems and niches.

Identify and describe food chains and food webs.

Identify roles of scavengers and decomposers.

Explain the various roles plants and animals play.

Grasslands & Forests

Describe what a biome is.

Explain the effects of climate on biomes.

Describe characteristics of grasslands.

Distinguish between deciduous and coniferous forests.

Aquatic Ecosystems

Describe the characteristics of the ocean, lakes, and rivers

Describe the characteristics of a coral reef.

Identify types of beaches.

Identify types of estuaries.

Extreme Ecosystems

Identify characteristics of the tundra, deserts, mountains, chaparral, oases, and caves.
Explain the importance of oases to people.
Understand the importance of fire to the chaparral.
Describe how some plants and animals were designed to survive with little water.

Animal Behaviors

Understand the characteristics of hibernation and estivation.
Describe how and why animals migrate.
Identify animal defenses and adaptations.
Describe methods of maintaining the balance of nature.

Ecology & Conservation

Describe man's impact on the environment.
Understand the truth about global warming.
Explain what people can do to be good stewards of the environment.