CHAPTER HIGHLIGHTS

Chemistry Is a Physical Science

Vocabulary
chemistry
chemical

- Chemistry is the study of the composition, structure, and properties of matter and the changes that matter undergoes.
- A chemical is any substance that has a definite composition or is used or produced in a chemical process.
- Basic research is carried out for the sake of increasing knowledge. Applied research is carried out to solve practical problems. Technological development involves the use of existing knowledge to make life easier or more convenient.

Matter and Its Properties

Vocabulary
mass
matter
atom
element
compound
extensive property
intensive property
physical property
physical change
change of state
solid
liquid
gas
plasma
chemical property
chemical change
chemical reaction
reactant

- All matter has mass and takes up space. Mass is one measure of the amount of matter.
- Chemical properties refer to a substance's ability to undergo changes that alter its composition and identity.
- An element is composed of one kind of atom. Compounds are made from two or more elements in fixed proportions.
- All substances have characteristic properties that enable chemists to tell the substances apart and to separate the substances.
- Physical changes do not involve changes in identity of a substance.
- The three major states of matter are solid, liquid, and gas. Changes of state, such as melting and boiling, are physical changes.
- In a chemical change—or a chemical reaction—the identity of the substance changes.
- Energy changes accompany physical and chemical changes. Energy may be released or absorbed, but it is neither created nor destroyed.
- Matter can be classified into mixtures and pure substances.

Elements

Vocabulary
group
family
period
metal
nonmetal
metalloid

- Each element has a unique symbol. The periodic table shows the elements organized by their chemical properties. Columns on the table represent groups or families of elements that have similar chemical properties. Properties vary across the rows, or periods.
- The elements can be classified as metals, nonmetals, metalloids, and noble gases. These classes occupy different areas of the periodic table. Metals tend to be shiny, malleable, and ductile and tend to be good conductors. Nonmetals tend to be brittle and tend to be poor conductors.
- Metalloids are intermediate in properties between metals and nonmetals, and they tend to be semiconductors of electricity. The noble gases are generally unreactive elements.