

Chapter 2 Assessment - Answer Key

#1-29

ASSESSMENT

Lesson 2.1

UNDERSTAND KEY CONCEPTS

- 1. c 2. d 3. b
- 4. Elements are composed of atoms. Compounds are composed of atoms of two or more elements combined in definite proportions.
- 5. A radioactive isotope is an isotope with an unstable nucleus that breaks down at a constant rate over time. Scientific uses of radioactive isotopes include determining the age of rocks, treating cancer, killing bacteria in food, and tracing the movements of substances within organisms.
- 6. Atoms in a compound are held together by chemical bonds.
- 7. Two electrons are shared in a single covalent bond, four in a double bond, and six in a triple bond.

THINK CRITICALLY

- 8. The diagram should show that hydrogen and chlorine form a covalent bond. Students can use the chlorine atom in Figure 2-4 as a starting point and pair one of the seven electrons in its outer level with hydrogen's single electron.
- 9. 0.1 nm; If 100 million atoms lined up are 1 cm in length, then the diameter of one atom equals 1 cm divided by 100,000,000. This yields 1×10^{-8} cm, or 1×10^{-10} m, which equals 0.1 nm.

Lesson 2.2

UNDERSTAND KEY CONCEPTS

- 10. b 11. b 12. c
- 13. Cohesion is an attraction between molecules of the same substance. An example is water molecules drawing together, forming beads on a smooth surface. Adhesion is an attraction between molecules of different substances. An example is capillary action.
- 14. A solution is a mixture in which one substance is dissolved in another. The solute is the substance that is dissolved. The solvent is the substance in which the solute is dissolved.
- 15. An acid is a compound that forms hydrogen ions in solution. Acidic solutions have pH values less than 7. A base is a compound that forms hydroxide ions in solution. Basic solutions have pH values greater than 7.

THINK CRITICALLY

- 16. The mixture could be separated by adding water. The sodium chloride would dissolve in the water, but the silica would not. The salt could then be retrieved by filtering the silica out of the mixture and evaporating the water.
- 17. Students should infer that magnesium hydroxide is a base. The base reacts with the acid in the stomach and forms a less acidic product.

Lesson 2.3

UNDERSTAND KEY CONCEPTS

- 18. c 19. c
- 20. Polymers are large macromolecules made up of smaller molecules called monomers. For example, monomers called monosaccharides join together to form polymers called polysaccharides.
- 21. Proteins control the rate of chemical reactions, regulate cell processes, form important cellular structures, transport substances into or out of cells, and help fight disease.

Lesson 2.4

UNDERSTAND KEY CONCEPTS

- 25. a 26. d
- 27. A chemical reaction can either release or absorb energy.
- 28. An enzyme is a biological catalyst.
- 29. Factors that may influence enzyme activity include pH, temperature, and regulatory molecules that switch enzymes "on" or "off" as needed.

- 22. a 5-carbon sugar, a phosphate group, and a nitrogenous base
- 23. Sample answer: Students might suggest trying to dissolve the solid in water, because lipids are generally not water soluble. They also might suggest warming the solid to see if it would soften, because solid lipids tend to soften when heated.
- 24. "Carbo" indicates that carbon is present; "hydrate" suggests oxygen and hydrogen are present.

#9) $1 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ nm}}{10^{-9} \text{ m}} = 1 \times 10^8 \text{ atoms}$
 (100,000,000) 0.1 nm