

SECTION SUMMARY

Reviewing the Concepts

- ◆ **Earth's atmosphere is composed of a mixture of gases—primarily nitrogen, oxygen, and water vapor.**
 1. List the percentage of each of the most plentiful gases in the atmosphere.
 2. Describe physical and chemical properties of the four most abundant gases that make up the atmosphere.
 3. Classify the mixture of gases in the atmosphere as a solution, a suspension, or a colloid. (*Hint:* See Unit 1, page 25.) Explain your answer.
 4. Compare the percent composition of gases in the atmosphere at sea level to the percent composition at high altitude.
 5. a. Has the percent composition of the atmosphere changed significantly throughout human history?
b. What evidence can you cite for your answer?

- ◆ **Pressure involves a force applied over a particular area. Air pressure is often measured in units of atmospheres (atm), kilopascals (kPa), or millimeters of mercury (mmHg).**
 6. It is much easier to slice a piece of cheese with the edge of a sharp knife than with the edge of a pencil. Explain this in terms of applied pressure.
 7. Vehicles that need to move easily over loose sand are often equipped with special tires. Would you expect these tires to be wide or thin? Explain your answer.
 8. U.S. weather reports on TV generally express air pressure in units of inches of mercury. Express a typical air pressure value in units of
 - a. atmospheres (atm).
 - b. kilopascals (kPa).
 - c. millimeters of mercury (mmHg).

- ◆ **The volume of a sample of gas in a flexible container will increase if external pressure is reduced, and decrease if external pressure is increased. Boyle's law describes this inverse relationship.**
 9. Explain why a sealed bag of potato chips "puffs out" (increases in volume) if taken from sea level to a high mountain pass.
 10. If the same bag of potato chips (see Question 9) were carried under water by a scuba diver, what would happen to the volume of the bag as it descended into deep water?
 11. A small quantity of the inert gas argon (Ar) is added to light bulbs to reduce the vaporization of tungsten (W) atoms from the solid filament. What volume of argon at a pressure of 760 mmHg is needed to fill a 0.21-L light bulb at a pressure of 1.30 mmHg? Assume the gas temperature remains constant.