Chapter 3   States of Matter

Section 3.2 The Gas Laws
(pages 75–81)

This section discusses gas pressure and the factors that affect it. It also explains the relationships between the temperature, volume, and pressure of a gas.

Reading Strategy (page 75)

Identifying Cause and Effect As you read, identify the variables that affect gas pressure, and write them in the diagram below. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.
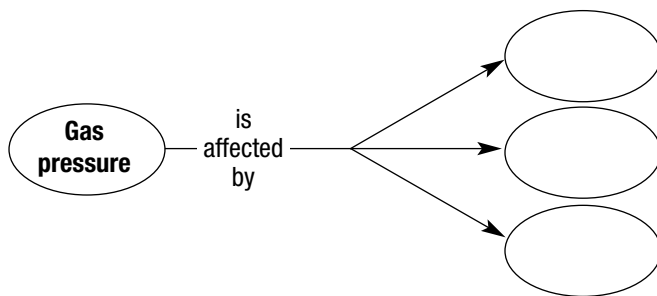

Pressure (pages 75–76)

1. What is pressure? _____

2. Circle the letter of each unit used to express amounts of pressure.

   a. newton   b. joule

   c. pascal   d. kilopascal

3. What causes the pressure in a closed container of gas? _____

_____

Factors that Affect Gas Pressure (pages 76–77)

4. Name the factors that affect the pressure of an enclosed gas.

   a. _____ b. _____ c. _____

5. Is the following sentence true or false? In a closed container, increasing the temperature of a gas will decrease the force with which particles hit the walls of the container. _____

6. What effect does raising the temperature of a gas have on its pressure, if the volume of the gas and the number of its particles are kept constant? _____

7. How does reducing the volume of a gas affect its pressure if the temperature of the gas and the number of particles are constant?

_____

_____

8. Increasing the number of particles of a gas will _____ its pressure if the temperature and the volume are constant.

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Charles's Law (page 78)
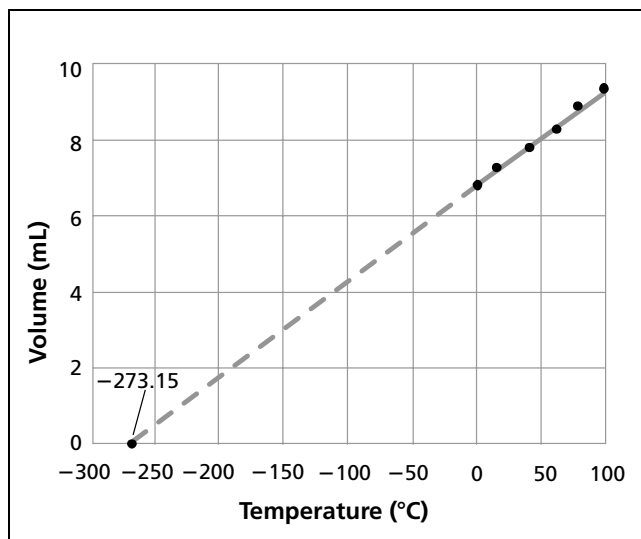
9. Jacques Charles recorded the behavior of gases on a graph like the one above. The data shows that the volume of a gas increases at the same rate as the _____ of the gas.

10. A temperature equal to 0 K on the Kelvin temperature scale is known as _____.

11. What does Charles's law state? _____

_____

Boyle's Law (page 79)

12. If the temperature and number of particles of gas in a cylinder do not change, and the volume of the cylinder is reduced by half, the pressure of the gas will be _____ as the original pressure.

13. Boyle's law states that there is an inverse relationship between the pressure and volume of a gas. Circle the letter of the correct expression of this relationship.

a. $P_1V_1 = P_2V_2$

b. $P_1V_2 = P_2V_1$

c. $\dfrac{P_1}{V_1} = \dfrac{P_2}{V_2}$

d. $P_1P_2 = V_1V_2$

The Combined Gas Law (pages 80–81)

14. Circle the letters of the factors that are included in the expression of the combined gas law.

a. temperature   b. number of particles

c. volume   d. pressure