

Solids, Liquids, and Gases ▪ *Reading/Notetaking Guide***The Behavior of Gases** (pp. 103–111)

This section explains how the volume, temperature, and pressure of a gas are related.

Use Target Reading Skills

As you read, complete the outline about the behavior of gases. Use the red headings for the main ideas and the blue headings for subtopics. Add supporting ideas to the subtopics.

The Behavior of Gases
I. Measuring Gases
A. Volume
B. Temperature
C. Pressure
II. Temperature and Volume
A.
B.
III.

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Measuring Gases (pp. 104–105)

1. List the three measurements that are helpful to know when working with a gas.

2. The volume of a gas is the same as the volume of its _____.

3. What is temperature? _____

4. Is the following sentence true or false? The faster gas particles are moving, the greater their energy and the lower the temperature.

5. The force pushing on a surface divided by the area of that surface is called _____.

6. A pressure of 101.3 kPa is equal to _____ Pa.

7. Does the air inside a fully pumped basketball have a lower or higher pressure than the air outside? Explain.

Temperature and Volume (pp. 106–107)

8. What is the principle known as Charles's law?

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9. If the temperature of a gas is decreased at constant pressure, what happens to its volume?

10. Why does a hot air balloon rise when the air inside it is heated?

Pressure and Volume (pp. 108–109)

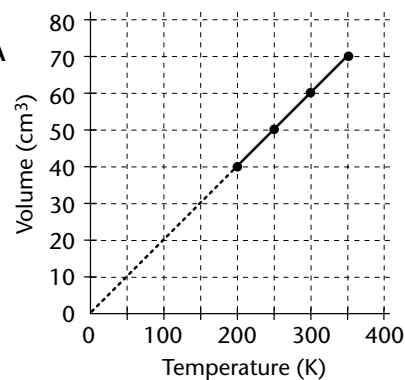
11. What does Boyle's law say about the relationship between the pressure and volume of a gas?

12. Complete the table about the relationship between the pressure and volume of a gas, assuming temperature is held constant.

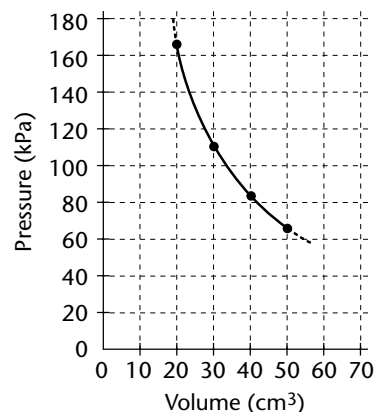
Pressure and Volume of a Gas	
Change	Increases or Decreases?
Pressure decreases	a. Volume
Pressure increases	b. Volume
Volume increases	c. Pressure
Volume decreases	d. Pressure

Solids, Liquids, and Gases ▪ *Reading/Notetaking Guide***The Behavior of Gases** *(continued)***Table A**

Relationship of Temperature and Volume of an Amount of Gas at Constant Pressure	
Temperature (K)	Volume (cm ³)
200	40
250	50
300	60
350	70

Graph A**Table B**

Relationship of Volume and Pressure of an Amount of Gas at Constant Temperature	
Volume (cm ³)	Pressure (kPa)
20	166.5
30	111.0
40	83.3
50	66.6

Graph B

Use the graphs and tables above to answer the following questions.

13. Which law is represented in each graph above?

Graph A: _____

Graph B: _____

14. Are the variables in the graphs directly proportional or inversely proportional? How can you tell?

Graph A: _____

Graph B: _____

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The Behavior of Gases *(continued)*

15. Use the graphs to predict the following:

- a. volume of the gas when the temperature is 400 K _____
- b. pressure of the gas when the volume is 60 cm³ _____

Pressure and Temperature (p.110)

16. Suppose a gas is kept in a closed, rigid container. If the temperature of the gas is increased, what happens to its pressure on the container?

17. If the temperature of that gas in the container is decreased, what happens to its pressure?

18. What can cause tires to burst on long trips in warm weather?
