Name: _____ Group: _____ Date: _____

STUDENT BOOK:	**Chapter 3, pp. 68, 75–79**
CONCEPTS:	COMPRESSIBLE FLUID RELATIONSHIP BETWEEN PRESSURE AND VOLUME
METHOD:	OBSERVATION

GAS UNDER PRESSURE

The relationship between gas pressure and volume has many possible applications, such as the use of weather balloons and compressed gas cylinders. Your setup for this activity will help you visualize what happens to the volume of a gas when the pressure increases or decreases.

IDENTIFYING THE OBSERVATION CRITERIA

Read pp. 68 and 75–79 in your student book for help in answering the following questions.

1. What do you call a fluid whose volume may decrease under pressure?

_____

2. Is air a compressible or incompressible fluid?

_____

3. What causes pressure in a gas?

_____

_____

_____

4. What happens with the pressure of a gas when its volume decreases? Explain your answer.

_____

_____

_____

_____

Name: _____ Group: _____ Date: _____

5. What happens with the pressure of a gas when its volume increases? Explain your answer.

_____

_____

_____

6. What happens with the volume of a gas when the pressure is increased? Explain your answer.

_____

_____

_____

7. What happens with a volume of a gas when the pressure is decreased? Explain your answer.

_____

_____

_____

8. Complete the following sentences summarizing the relationship between gas pressure and volume.

If the volume increases, the pressure _____

If the volume decreases, the pressure _____

If the pressure increases, the volume _____

If the pressure decreases, the volume _____

ESTABLISHING AN OBSERVATION PROTOCOL

9. Use the following materials to make your setup:

- clear plastic bottle (2 L *or* 1 L)
- inflatable balloon (30 cm *or* 22-cm)
- a straw
- transparent adhesive tape *or* adhesive putty

Name: _____ Group: _____ Date: _____

10. Make the setup by carrying out steps 1–5 of the following procedure.

Procedure

1. Insert the balloon into the bottle, leaving one end outside.
2. Inflate the balloon slightly and fasten it closed.
3. Insert the straw into the bottle alongside the balloon, leaving one end of the straw outside the bottle.
4. Fold the lip of the balloon down around the mouth of the bottle, carefully avoiding the straw.
5. Using the adhesive tape, hermetically seal the balloon to the bottle, being careful not to crush the straw.
6. Suck air from the bottle through the straw. Watch how the balloon changes, and record your observations.
7. Blow air into the bottle through the straw. Watch the balloon, and record your observations.
8. Repeat the experiment.

APPLYING THE OBSERVATION PROTOCOL

11. Perform steps 6–8 of the procedure, and record your results in the table on the next page.

Name: _____ Group: _____ Date: _____

Table of results

Procedure	Observation
First observation	
Suck air from the bottle.	
Blow air into the bottle.	
Second observation	
Suck air from the bottle.	
Blow air into the bottle.	

REFLECTING ON YOUR APPROACH

12. How does pressure inside the bottle change when air is removed?

13. How does the balloon volume change when air is sucked from the bottle through the straw.

14. How does the balloon volume change when air is blown into the bottle with the straw?

15. Based on your observations, what can you conclude about the relationship between the balloon volume and the air pressure around the balloon?

Name: _____ Group: _____ Date: _____

16. Do your observations improve your understanding of the process under study? Explain your answer.

17. What changes could you make to improve the suggested protocol?