

Lesson 3

ANSWER KEYS

Figures & Reading Checks



Pressure in a Basketball

Figure 2 When a basketball leaks air, the pressure inside decreases. It loses its bounciness and becomes "flat."

CCC Cause and Effect

On each image, write a physical property that changes due to low gas pressure in the object.



The mattress becomes less supportive.



The lawn ornaments are less rigid and cannot stand upright.



The tire loses its round shape.

Figures & Reading Checks

Cooling and Warming a Balloon

Figure 3 ✎ The volume of a gas-filled balloon changes as the temperature changes. Below each image, shade the arrows to indicate whether temperature and volume increase or decrease at each step.

A gas-filled balloon is at room temperature, 20°C.

The balloon is submerged in the liquid nitrogen at -196°C.

The balloon is removed from the liquid nitrogen.

The balloon is again at room temperature.

	Step 1 to 2	Step 2 to 3	Step 3 to 4
Temperature	↑ (white) ↓ (pink)	↑ (pink) ↓ (white)	↑ (pink) ↓ (white)
Volume	↑ (white) ↓ (pink)	↑ (pink) ↓ (white)	↑ (pink) ↓ (white)

Figures & Reading Checks

Model It!

SEP Develop Models ✎ Draw two diagrams to show the air particles in a bike pump before and after the handle is pushed down.



Air in pump before
handle is pushed

Diagram should show gas
particles loosely packed in a
space.

Air in pump after
handle is pushed

Diagram should show gas
particles more tightly packed
in a smaller space.

Figures & Reading Checks

How Pistons Work

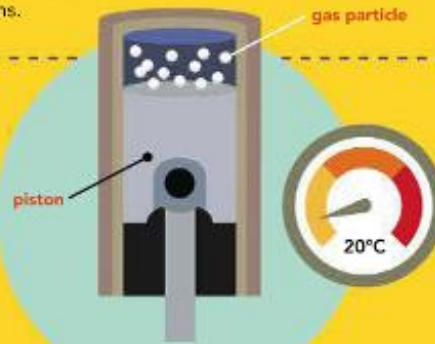
Figure 6 Use what you have learned about gas behavior to understand how temperature, pressure, and volume affect pistons.

Temperature and Pressure

The image shows gas particles above a piston in a rigid container. The piston is held fixed.

Relate Change ✎ Finish this sentence by circling the correct answer: If the temperature of the gas increases, the pressure on the piston will

(increase) decrease).



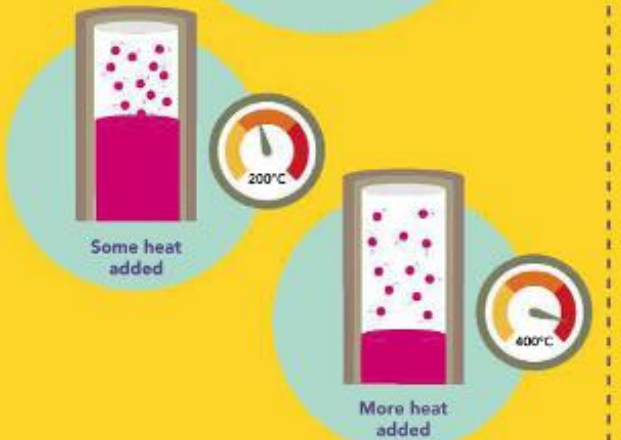
Temperature and Volume

Now, the piston is free to move up or down. Heat is applied to the gas in the cylinder.

Apply Scientific Reasoning ✎ Finish this sentence by circling the correct answer: As temperature increases, the volume of the gas will

(increase) decrease).

SEP Develop Models ✎ In each cylinder, draw the piston and the gas particles based on the temperature shown.




Figures & Reading Checks

Pressure and Volume
This time, the gas is kept at a fixed temperature. The piston is pushed by an outside force, so the pressure on the gas increases.

Integrate With Visuals What happens to the volume of the gas as the pressure increases?

The volume of the gas decreases.

SEP Develop Models ✎ Under the cylinders, rank the pressure from lowest to highest with 1 being lowest and 3 being highest. Rank the volume from lowest to highest as well.




Pressure	1	2	3
Volume	3	2	1

Figures & Reading Checks

 **READING CHECK** **Summarize** How does particle motion affect pressure?

As the particles move faster, the pressure on the walls of the container increases.

 **READING CHECK** **Read and Comprehend** If the temperature of a gas were to decrease, what would happen to the volume of a gas? It would also decrease.