# 12B – Boyle’s Law

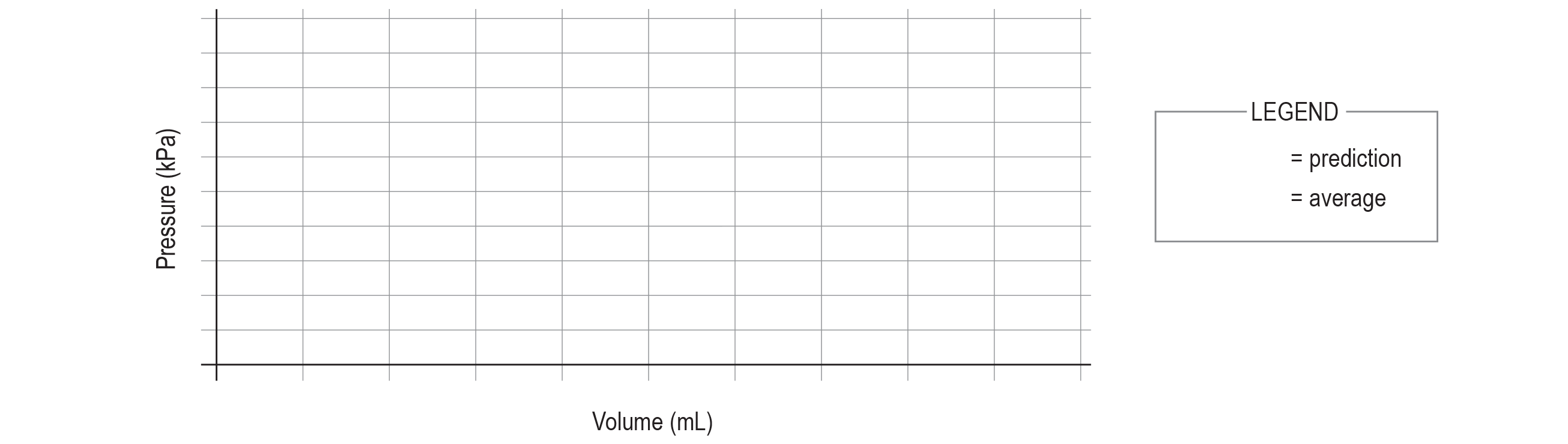
Analysis

* 1. Calculate and record the average pressure for each volume in Table 1.
* 2. Sketch the average pressure for each volume in Graph 1. Add numbers to the x- and y-axes at appropriate intervals and complete the legend to distinguish the prediction from the average.

Table 1 – Pressure and volume

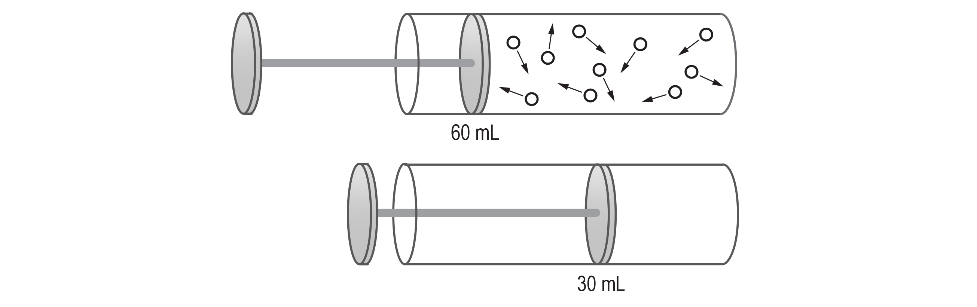
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Volume (mL) | Run 1 Pressure (kPa) | Run 2 Pressure (kPa) | Run 3 Pressure (kPa) | Average Pressure (kPa) |
| 60 |  |  |  |  |
| 55 |  |  |  |  |
| 50 |  |  |  |  |
| 45 |  |  |  |  |
| 40 |  |  |  |  |
| 35 |  |  |  |  |
| 30 |  |  |  |  |
| 25 |  |  |  |  |
| 20 |  |  |  |  |
| 15 |  |  |  |  |

Graph 1 – Pressure and volume



Questions

* 1. How do the pressure and volume data compare to your prediction?
* 2. What gas properties should be held constant to study the relationship between pressure and volume of a gas?
* 3. Which type of relationship exists between the pressure of a gas and its volume: direct or inverse? Explain your reasoning.
* 4. Boyle's Law is the relationship between the volume of a gas at constant temperature and the pressure upon it. Write a mathematic expression for Boyle's Law.
* 5. If the volume of a gas is cut in half, what would you expect to happen to the pressure? Assume other gas properties are constant.
* 6. The picture below represents gas particles in the syringe at 60 mL. Draw a picture of the gas particles in the syringe at 30 mL.



* 7. Use the two pictures to explain how the pressure of a gas will change when the volume decreases.