

Name: **KEY**

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Boyle's Law states that the volume of a gas varies inversely with its pressure if temperature is held constant.
(If one goes up, the other goes down.) We use the formula:

$$P_1 \times V_1 = P_2 \times V_2$$

Solve the following problems (assuming constant temperature). Assume all number are 3 significant figures.

A sample of oxygen gas occupies a volume of 250. mL at 740. torr pressure. What volume will it occupy at 800. torr pressure? **231 mL**

$$(740 \text{ torr})(250. \text{ mL}) = (800. \text{ torr})(V_2); = 231 \text{ mL}$$

A sample of carbon dioxide occupies a volume of 3.50 Liters at 125 kPa pressure. What pressure would the gas exert if the volume was decreased to 2.00 liters? **219 kPa**

$$(125 \text{ kPa})(3.50 \text{ L}) = (P_2)(2.00 \text{ L}); = 219 \text{ kPa}$$

A 2.00-Liter container of nitrogen had a pressure of 3.20 atm. What volume would be necessary to decrease the pressure to 1.00 atm? **6.40 L**

$$(3.20 \text{ atm})(2.00 \text{ L}) = (1.00 \text{ atm})(V_2); = 6.40 \text{ L}$$

Ammonia gas occupies a volume of 450.0 mL as a pressure of 720. mmHg. What volume will it occupy at standard pressure (760 mmHg)? **426 mL**

$$(720 \text{ mmHg})(450.0 \text{ mL}) = (760 \text{ mmHg})(V_2); = 426 \text{ mL}$$

A 175 mL sample of neon had its pressure changed from 75.0 kPa to 150.0 kPa. What is its new volume? **87.5 mL**

$$(75.0 \text{ kPa})(175 \text{ mL}) = (150.0 \text{ kPa})(V_2); = 87.5 \text{ mL}$$