

**Gas Ws #1: Boyle's Law, Charles's law & Lussac's Law***Show all your work and provide answers in the correct number of sig figs.**Circle your final answer with units.***Boyle's Law**

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

At constant temperature

**Charles's Law**

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

At constant pressure

Temperature in Kelvin  
 $^{\circ}\text{C} + 273 = \text{K}$ **Lussac's Law**

$$\frac{P_1}{T_1} = \frac{P_2}{T_2}$$

At constant volume

Temperature in Kelvin

1. A sample of gas at 240.0 K and 670.0 torr occupies a 128 ml volume. What volume will the gas occupy at  $-75.0^{\circ}\text{C}$  if the pressure remains constant?
2. A sample of gas is in a steel container at  $-75.0^{\circ}\text{C}$  and 1.480 atm. What pressure will the sample have when the temperature is changed to  $1000.0^{\circ}\text{C}$ ?
3. In an airplane, a gas sample occurs at a volume of 1.5 L at 760.0 torr. Suppose, while flying, the airplane loses pressure and the volume of the gas increases to 11.40 L. What is the pressure in the airplane if the temperature is constant?
4. A balloon of air occupies 10.0 liters at  $25.0^{\circ}\text{C}$  and 1.00 atm. What volume will it occupy if it is placed in a freezer at  $-10.0^{\circ}\text{C}$  and the pressure is constant?
5. A 50.0 ml sample of a gas is contained in a syringe with a pressure gauge attached. Initially, the gauge indicates a pressure of 1.00 atm. The plunger is pushed so that the pressure reads 1.45 atm. What is the new volume of the gas?
6. A sample of gas at  $15.0^{\circ}\text{C}$  and 760.0 torr is heated to 375 K, and the volume is held constant. What is the new pressure of the gas?
7. A gas in a flexible container occupies 250.0 ml and 2.00 atm. If the temperature constant, what volume does the gas occupy when the pressure is 1.50 atm?