Name: ________________________ Date: _________ Period: ______

Gas Laws Worksheet Part 1

Boyle's Law	Charles's Law	Guy-Lassac's Law	Combined Gas Law
For a given mass of gas at constant temperature, the volume of a gas varies inversely with pressure	The volume of a fixed mass of gas is directly proportional to its Kelvin temperature if the pressure is kept constant.	The pressure of a gas is directly proportional to the Kelvin temperature if the volume is kept constant.	Combines Boyle's, Charles', and the Temperature-Pressure relationship into one equation. Each of these laws can be derived from this law.
$P_1 \times V_1 = P_2 \times V_2$	$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ Or $V_1 \times T_2 = V_2 \times T_1$	$\frac{P_1}{T_1} = \frac{P_2}{T_2}$ Or $P_1 \times T_2 = P_2 \times T_1$	$\frac{P_1 \times V_1}{T_1} = \frac{P_2 \times V_2}{T_2}$ Or $P_1 \times V_1 \times T_2 = P_2 \times V_2 \times T_1$

Ideal Gas Law	Dalton's Law	Graham's Law
The Ideal Gas Law relates the pressure, temperature, volume, and mass of a gas through the gas constant "R".	At constant volume and temperature, the total pressure exerted by a mixture of gases is equal to the sum of the pressures exerted by each gas,	The rate of effusion/diffusion of two gases (A and B) are inversely proportional to the square roots of their formula masses.
$P \times V = n \times R \times T$ Or $PV = nRT$	$P_{total} = P_1 + P_2 + P_3 + \ldots.$	$\frac{Rate_A}{Rate_B} = \frac{\sqrt{molar\ mass_A}}{\sqrt{molar\ mass_B}}$

Abbreviation	Standard conditions
atm = atmosphere mm Hg = millimeters of mercury torr = another name for mm Hg Pa = Pascal kPa = kilopascal K = Kelvin °C = degrees Celsius	0°C = 273 K 1.00 atm = 760.0 mm Hg = 76 cm Hg = 101.3 kPa = 101, 300 Pa = 29.9 in Hg
Conversions	**Gas Law's Equation Symbols**
K = °C + 273 °F = 1.8°C + 32 $°C = \frac{°F - 32}{1.8}$ 1 cm^3 (cubic centimeter) = 1 mL (milliliter) 1 dm^3 (cubic decimeter) = 1 L (liter) = 1000 mL	Subscript (1) = old condition or initial condition Subscript (2) = new condition or final condition Temperature must be in Kelvins n = number of moles = grams/Molar mass $R = 8.31 \frac{L \cdot kPa}{K \cdot mol}$ or $0.0821 \frac{L \cdot atm}{K \cdot mol}$ You must have a common set of units in the problem