PV = nRT

Ideal gasses are theoretical gasses that can be used to model the behavior of real gasses. In order for it to be considered ideal, individual gaseous particles must both not attract or repel one another, and also not have any volume.

The breakdown of the formula is as follows:

P - Pressure. Units typically consist of pascals, atmospheres, mmHg

V - Volume. Units typically consist of Liters or m^3

n - Number of moles of gas. Remember, a mol of a substance is a unitless amount of particles of the substance

R - Ideal gas constant. It can vary based on the units you use. Remember to use the correct units so that they match the units of the other components of the equation!

Units to use for $PV = nRT$

$R = 8.31 \dfrac{J}{K \cdot mol}$	$R = 0.082 \dfrac{L \cdot atm}{K \cdot mol}$
Pressure in pascals Pa	Pressure in atmospheres atm
Volume in m^3	volume in liters L
Temperature in kelvin K	Temperature in kelvin K

T - Temperature. Measured in Kelvin. If temperature is given in any other unit, remember to convert to Kelvin

Pressure Conversions likely used in class

1 atm = 1.01325 Bar = 101.325 Kilopascal = 760.000002 Torr = 759.99995 mmHg

If I have 4 moles of a gas at a pressure of 5.6 atm and a volume of 12 liters, what is the temperature?

If I contain 3 moles of gas in a container with a volume of 60 liters and at a temperature of 400 K, what is the pressure inside the container?

If I have an unknown quantity of gas held at a temperature of 1195 K in a container with a volume of 25 liters and a pressure of 560 atm, how many moles of gas do I have?

What is the volume of 23g of neon gas at 1C and a pressure of 2 atm?

Combined Gas Law

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

The combined gas law is effectively a restructuring of the ideal gas law, where both n (mols of gas) and R (already a constant) remain constant. It can be used to determine how changes in pressure, volume, or temperature can be used to calculate the conditions of the resulting system.

If four moles of a gas at a pressure of 5.4 atmospheres have a volume of 120 liters, what is the temperature?

If I initially have a gas with a pressure of 84 kPa and a temperature of 350 C and I heat it an additional 230 degrees, what will the new pressure be? Assume the volume of the container is constant.

A sample of 25L of NH3 gas at 10C is heated at constant pressure until it fills a volume of 50L. What is the new temperature in C?