Unit 10 Gas Laws **Team Names: _____**
Relay Race #1 **Block #____** **Date _____**

Instructions:

Player #1 will use Boyle's Law to solve for pressure. Next Player #2 will insert that pressure into Gay Lussac's Law to solve for temperature. Player #3 will then take that temperature and insert it into Charles Law to solve for volume. Finally Player #4 will take that volume and use it to solve for the number of moles. The first team to complete all our sections correctly wins the game.

Player #1: Boyle's Law

A piston chamber contains 325 ml of gas at a pressure of 687 mm Hg. The temperature remains constant at 25.0 ^{o}C, while the piston expands to increase the volume to 525 ml. Calculate the final pressure of the gas.

Player #2: Gay Lussac's Law

The piston chamber now has a pressure of _____ mm Hg and a temperature of 25.0 ^{o}C, as recorded above. What will the final temperature be *in Kelvin*, if the volume is held constant, and the pressure is increased to 1253 mm Hg?

Player #3: Charles' Law

The piston now has a temperature of _____ Kelvin and a volume of 525 ml, as recorded above. What will the final volume be, if the pressure is held constant, and the temperature is cooled to 37 ^{o}C?

Player #4: Avogadro's Law

Let's assume that the piston chamber contains 0.80 grams of methane gas at the current volume of _____, as recorded above. If the temperature and pressure are held constant, and the final volume of the chamber increases to 333 ml, how many moles of methane gas were added to the chamber?

Tie Breaker: How many grams of methane were added to the chamber?

Unit 10 Gas Laws **Team Names: _____**
Relay Race #2 **Block #____** **Date _____**

Instructions:

Player #1 will use Boyle's Law to solve for pressure. Next Player #2 will insert that pressure into Gay Lussac's Law to solve for temperature. Player #3 will then take that temperature and insert it into Charles Law to solve for volume. Finally Player #4 will take that volume and use it to solve for the number of moles. The first team to complete all our sections correctly wins the game.

Player #1: Boyle's Law

A piston chamber contains 2.50 L of gas at a pressure of 97.0 kPa. The temperature remains constant at 40.0 ^{o}C, while the piston compresses to decrease the volume to 1.25 L. Calculate the final pressure of the gas.

Player #2: Gay Lussac's Law

The piston chamber now has a pressure of _____ kPa and a temperature of 40.0 ^{o}C, as recorded above. What will the final temperature be *in Kelvin*, if the volume is held constant, and the pressure is increased to 339 kPa?

Player #3: Charles' Law

The piston now has a temperature of _____ Kelvin and a volume of 1.25 L, as recorded above. What will the final volume be, if the pressure is held constant, and the temperature is cooled to 25.0 ^{o}C?

Player #4: Avogadro's Law

Let's assume that the piston chamber contains 2.24 grams of oxygen gas at the current volume of _____, as recorded above. If the temperature and pressure are held constant, and the final volume of the chamber decreases to 0.227 L, how many moles of oxygen gas were removed from the chamber?

Tie Breaker: How many grams of oxygen were removed from the chamber?

Unit 10 Gas Laws **Team Names: _____**
Relay Race #1 **Block #____** **Date _____**

Instructions:

Player #1 will use Boyle's Law to solve for pressure. Next Player #2 will insert that pressure into Gay Lussac's Law to solve for temperature. Player #3 will then take that temperature and insert it into Charles Law to solve for volume. Finally Player #4 will take that volume and use it to solve for the number of moles. The first team to complete all our sections correctly wins the game.

Player #1: Boyle's Law

A piston chamber contains 325 ml of gas at a pressure of 687 mm Hg. The temperature remains constant at 25.0 ^{o}C, while the piston expands to increase the volume to 525 ml. Calculate the final pressure of the gas.

P=425 mm Hg

Player #2: Gay Lussac's Law

The piston chamber now has a pressure of _____ mm Hg and a temperature of 25.0 ^{o}C, as recorded above. What will the final temperature be *in Kelvin*, if the volume is held constant, and the pressure is increased to 1253 mm Hg?

T = 878 K

Player #3: Charles' Law

The piston now has a temperature of _____ Kelvin and a volume of 525 ml, as recorded above. What will the final volume be, if the pressure is held constant, and the temperature is cooled to 37 ^{o}C?

V = 185 ml

Player #4: Avogadro's Law

Let's assume that the piston chamber contains 0.80 grams of methane gas at the current volume of _____, as recorded above. If the temperature and pressure are held constant, and the final volume of the chamber increases to 333 ml, how many moles of methane gas were added to the chamber?

n = 0.04 moles were added

Tie Breaker: How many grams of methane were added to the chamber? 0.64 grams CH_4

Unit 10 Gas Laws **Team Names: _____**
Relay Race #2 **Block #____** **Date _____**

Instructions:

Player #1 will use Boyle's Law to solve for pressure. Next Player #2 will insert that pressure into Gay Lussac's Law to solve for temperature. Player #3 will then take that temperature and insert it into Charles Law to solve for volume. Finally Player #4 will take that volume and use it to solve for the number of moles. The first team to complete all our sections correctly wins the game.

Player #1: Boyle's Law

A piston chamber contains 2.50 L of gas at a pressure of 97.0 kPa. The temperature remains constant at 40.0 ^{o}C, while the piston compresses to decrease the volume to 1.25 L. Calculate the final pressure of the gas.

P = 194 kPa

Player #2: Gay Lussac's Law

The piston chamber now has a pressure of _____ kPa and a temperature of 40.0 ^{o}C, as recorded above. What will the final temperature be *in Kelvin*, if the volume is held constant, and the pressure is increased to 339 kPa?

T = 547 K

Player #3: Charles' Law

The piston now has a temperature of _____ Kelvin and a volume of 1.25 L, as recorded above. What will the final volume be, if the pressure is held constant, and the temperature is cooled to 25.0 ^{o}C?

V = 0.681 L

Player #4: Avogadro's Law

Let's assume that the piston chamber contains 2.24 grams of oxygen gas at the current volume of _____, as recorded above. If the temperature and pressure are held constant, and the final volume of the chamber decreases to 0.227 L, how many moles of oxygen gas were removed from the chamber?

n = 0.0467 moles were removed

Tie Breaker: How many grams of oxygen were removed from the chamber? 1.49 grams O_2