

GAS LAWS: A Survey of Applications and Calculations name_____

Begin at <http://www.nisd.net/marshall> select Departments Science scroll to GasLaws
Read through the web sites and answer the following:

Boyle's Law Go to: <http://www.physlink.com/Education/AskExperts/ae518.cfm>

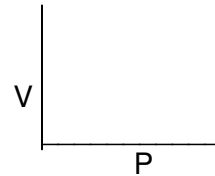
Boyle's Law describes the relationship between what two variables? _____ & _____

Write the formula for Boyle's Law: _____

How does a bicycle pump exemplify Boyle's Law?

Go to <http://www.grc.nasa.gov/WWW/K-12/airplane/aboyle.html>
Watch the animation and sketch the graph of Boyle's Law:

What factors remain constant? _____ & _____



Go to <http://www.1728.com/boyle.htm> scroll down and use the calculator.
Solve for volume (including units)

If a gas fills 22.40 Liters at 760.0 torr, how many Liters will the gas occupy at 800.0 torr? _____

Solve for pressure (including units)

What is the pressure of 20.0. mL of CO₂ if 100. mL has a pressure of 1.00 atm? _____



Charles Law Go to <http://dbhs.wvusd.k12.ca.us/webdocs/GasLaw/Gas-Charles.html>

What five gases did Jacques Charles study? _____, _____, _____, _____, _____

What did he discover about these gases?

When doing Charles Law calculations, what must be done to temperature?

What is the formula for Charles Law?

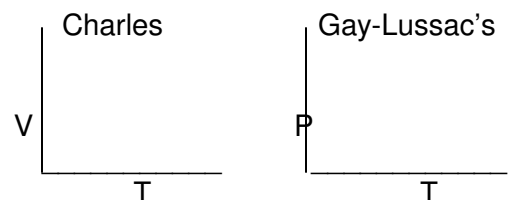
Go to <http://www.1728.com/charles.htm> scroll down and solve using the calculator.

If 150. mL of oxygen has a temperature of 25 °C, what will the volume be at -10 °C? _____

What is the temperature in Celsius if 500. mL of gas at 37°C cools and occupies a volume of 100. mL? _____ °C

Go to <http://www.grc.nasa.gov/WWW/K-12/airplane/aglussac.html>
Sketch graphs of Charles Law and Gay-Lussac's Laws:

What factors remain constant
in Charles Law? _____ & _____



Gay-Lussac's Law Go to <http://members.aol.com/profchm/gaylusac.html>

What is the relationship between the pressure of a gas and the Kelvin temperature? _____

What factors are held constant? _____ & _____

Write the formula for Gay-Lussac's Law:

Go to <http://www.1728.com/gaspres.htm> scroll down and calculate:

If a container of hydrogen at 300. K and 3.80×10^4 mm Hg pressure heats to 3010. K, what will be the new pressure in mm Hg? _____

If the container can only withstand a pressure of 3.80×10^5 mm, what do you think will happen to this container when heated to 3010. K?



Combined Law Go to <http://www.fordhamprep.org/gcurran/sho/sho/lessons/lesson76.htm>

Write the formula for the combined gas law:

Why is it appropriate to use the combined gas law?

Go to <http://www.1728.com/combined.htm> scroll down and calculate solving for volume.

Nitrogen occupies a volume of 250. mL at 25°C and 103 kPa.

What volume in mL would the gas occupy at 0°C and 96.0 kPa? _____



Dalton's Law Go to <http://dbhs.wvusd.k12.ca.us/webdocs/GasLaw/Gas-Dalton.html>

Write Dalton's Law of Partial Pressures for a mixture of Helium and Neon: _____

Write Dalton's Law of Partial Pressures for finding the total pressure of gases in a mixture:

$$P_{\text{total}} = \underline{\hspace{2cm}}$$

Where is Daltons' Law most commonly used?

In our calculations, how do we get rid of the pressure attributed to water?

Adjust the pressure then go back to <http://www.1728.com/combined.htm> and calculate:

If 45.0 mL of Hydrogen at 295 K and 763 mm Hg is collected over water, what would be the volume in mL of the dry gas at 273 K and 800. mm Hg. Pressure. (The vapor pressure of water at 22°C is 19.8 mm).

$$P_{\text{H}_2} + P_{\text{H}_2\text{O}} = P_{\text{total}} \quad P_{\text{H}_2} = P_{\text{total}} - P_{\text{H}_2\text{O}} \quad \text{The volume} = \underline{\hspace{2cm}} \text{ mL}$$



Congratulations on your review of gas laws!!!!!!