

PROPERTIES OF GASSES WS

1) Match each gas law with its explanation below:

- a) IDEAL GAS LAW
- b) BOYLE'S LAW
- c) CHARLES'S LAW
- d) GAY-LUSSAC'S LAW
- e) AVOGADRO'S LAW

- A. b PRESSURE is inversely proportional to VOLUME ( $P \propto 1/V$ )
- B. d PRESSURE is directly proportional to TEMPERATURE ( $P \propto T$ )
- C. c VOLUME is directly proportional to TEMPERATURE ( $V \propto T$ )
- D. a A combination of the other gas laws to relate the PRESSURE, VOLUME, & Temperature
- E. e VOLUME is directly proportional to the AMOUNT of gas

2) Use Boyle's Law to predict what would happen if you increase the pressure on an ideal gas (keeping the temperature constant). INCREASING THE PRESSURE ON AN IDEAL GAS WILL DECREASE THE VOLUME OF THE GAS ( $P \propto \frac{1}{V}$ )

3) Use Charles's Law to predict what would happen if you increase the temperature of an ideal gas (keeping the pressure constant). INCREASING THE TEMPERATURE OF AN IDEAL GAS WILL INCREASE THE VOLUME OF THE GAS ( $V \propto T$ )

4) Use Gay-Lussac's Law to predict what would happen if you decrease the TEMP. of an ideal gas (keeping the volume constant). DECREASING THE TEMPERATURE OF AN IDEAL GAS WILL DECREASE THE PRESSURE OF THE GAS ( $P \propto T$ )

5) Explain the results of the gas pressure lab (when you balanced the books on the syringe) using either the ideal gas law or its component laws. THE VOLUME OF THE GAS IN THE SYRINGE CHANGED INVERSELY PROPORTIONAL TO THE PRESSURE APPLIED ACCORDING TO BOYLE'S LAW

6) Explain the results of the gas temperature lab (when you placed the syringes in different temperatures of water) using either the ideal gas law or its component laws. THE VOLUME OF THE GAS IN THE SYRINGE CHANGED PROPORTIONAL TO THE TEMPERATURE ACCORDING TO CHARLES'S LAW

7) Explain why you can use a flame syringe to ignite a cotton ball using either the ideal gas law or its component laws. APPLYING QUICK PRESSURE TO THE AIR IN THE SYRINGE WILL MOMENTARILY HEAT IT UP ABOVE THE COMBUSTION POINT OF COTTON (SIMILAR) TO GAY-LUSSAC'S LAW (NOT A CONST. VOL.)

8) Explain how Boyle's Law and Charles's Law relate to the concept of density. CHANGING THE VOLUME OF THE IDEAL GAS WILL AFFECT ITS DENSITY, SO YOU CAN MANIPULATE DENSITY WITH PRESSURE + TEMPERATURE.

9) Explain how the ideal gas law incorporates the four gas laws (Boyle's, Charles's, Gay-Lussac's, and Avogadro's Laws) into one gas law.  $PV = nRT$   
BOYLE'S LAW - P+V ARE ON THE SAME SIDE, SO THEY ARE INVERSELY PROPORTIONAL  
CHARLES'S LAW - V+T ARE ON OPPOSITE SIDES, SO THEY ARE PROPORTIONAL  
GAY-LUSSAC'S LAW - P+T ARE ON OPPOSITE SIDES, SO THEY ARE PROPORTIONAL  
AVAGADRO'S LAW - V+n ARE ON OPPOSITE SIDES, SO THEY ARE PROPORTIONAL

10) Draw a series of rough graphs below illustrating the relationships between the pressure, volume, and temperature of an ideal gas.

