Chem I Name _____

Date _____ Per ____

Worksheet #C51 The Combined Gas Law

When the pressure, volume, and temperature of a gas are changed, the combined gas law is used. If any of these three variables is unchanged, they cancel out.

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

Note: this only works when temperature is in degrees Kelvin. K = ºC + 273]

Pressure: 1.00 atm =760. torr
=760. mmHg
= 101.325 kPa
= 14.7 psi

1. Complete the following chart:

	P_1	V_1	T_1	P_2	V_2	T_2
a.	1.59 atm	3.76 L	24ºC	2.52 atm		33ºC
(set up)						
b.	603 mmHg	2.87 L	22ºC	1.45 atm	1.62 L	_____ ºC
(set up)						
c.	15.9 psi	125 mL	_____ ºC	730. torr	115 mL	198ºC
(set up)						

2. When temperature goes up, volume goes _____ (if the pressure stays the same).

3. If the volume goes down, pressure goes _____ (if the temperature stays the same).

over -->

4. An aerosol can contains 400. mL of compressed gas at 5.20 atm of pressure. When all of the gas is sprayed into a large plastic bag, the bag inflates to a volume of 3.52 L. What is the pressure of the gas inside the bag? (Assume constant temperature).

5. A 2.55 L balloon is at 1.15 atm of pressure at 25ºC. You take it down in a submarine, where the pressure is increased to 952 torr and the temperature is reduced to a chilly -15ºC. What will the volume of the balloon be down there?

6. The same lucky balloon from problem 5 is then taken up in an airplane, where the pressure is reduced to 10.6 psi and the temperature goes down even farther to -25.º C. What will it s volume be now?

7. Let's say you have a 6.89 mL sample of nitrous oxide at 15ºC and 730. mm Hg in another balloon. You take it to another room where the pressure is 119. kPa and notice that the volume of the balloon has changed to 7.50 mL. What must the temperature be in this new room? (answer in ºC)