Name _____

Date _____ Pd _____

Unit 2 Worksheet 3 – PVTn Problems

On each of the problems below, start with the given P, V, T, or n; then make a decision as to how a change in P, V, T, or n will affect the starting quantity, and then multiply by the appropriate factor. Draw particle diagrams of the initial and final conditions.

1. A sample of gas occupies 150 mL at 25 ˚C. What is its volume when the temperature is increased to 50˚C? (P and n = constant)

	P	T	V	n
Initial				
Final				
Effect				

2. The pressure in a bicycle tire is 105 psi at 25˚C here in Fresno. You take the bicycle up to Huntington, where the temperature is – 5˚C. What is the pressure in the tire? (V and n = constant)

	P	T	V	n
Initial				
Final				
Effect				

3. What would be the new pressure if 250 cm^3 of gas at standard pressure is compressed to a volume of 150 cm^3 ? (_____ = constant)

	P	T	V	n
Initial				
Final				
Effect				

4. What would be the new volume if 250 cm^3 of gas at 25˚C and 730 mm pressure were changed to standard conditions of temperature and pressure? (____= constant)

	P	T	V	n
Initial				
Final				
Effect				

5. Sam's bike tire contains 15 units of air particles and has a volume of 160mL. Under these conditions the pressure reads 13 psi. The tire develops a leak. Now it contains 10 units of air and has contracted to a volume of 150mL). What would the tire pressure be now?

	P	T	V	n
Initial				
Final				
Effect				

6. A closed flask of air (0.250L) contains 5.0 "bobs" of particles. The pressure probe on the flask reads 93 kPa. A student uses a syringe to add an additional 3.0 "bobs" of air through the stopper. Find the new pressure inside the flask.

	P	T	V	n
Initial				
Final				
Effect				

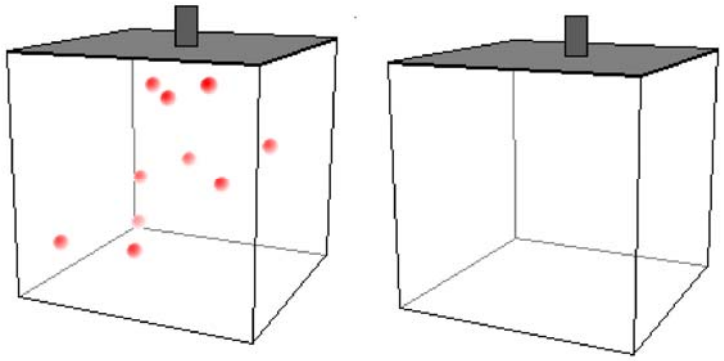
7. A 350 mL sample of gas has a temperature of 30˚C and a pressure of 1.20 atm. What temperature would needed for the same amount of gas to fit into a 250 mL flask at standard pressure?

	P	T	V	n
Initial				
Final				
Effect				

8. A 475 cm^3 sample of gas at standard temperature and pressure is allowed to expand until it occupies a volume of 600. cm^3. What temperature would be needed to return the gas to standard pressure?

	P	T	V	n
Initial				
Final				
Effect				

9. The diagram below left shows a box containing gas molecules at 25˚C and 1 atm pressure. The piston is free to move.



In the box at right, sketch the arrangement of molecules and the position of the piston at *standard* temperature and pressure. Does the volume decrease significantly? Why or why not?