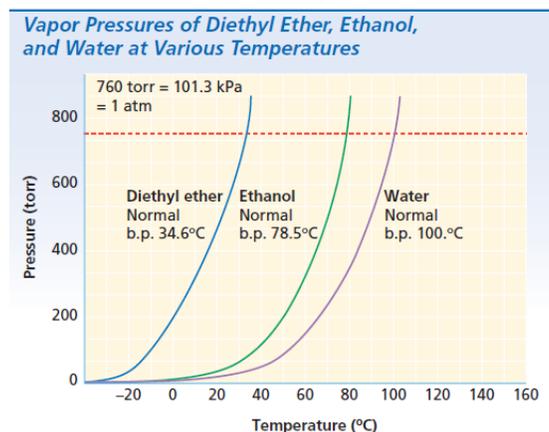


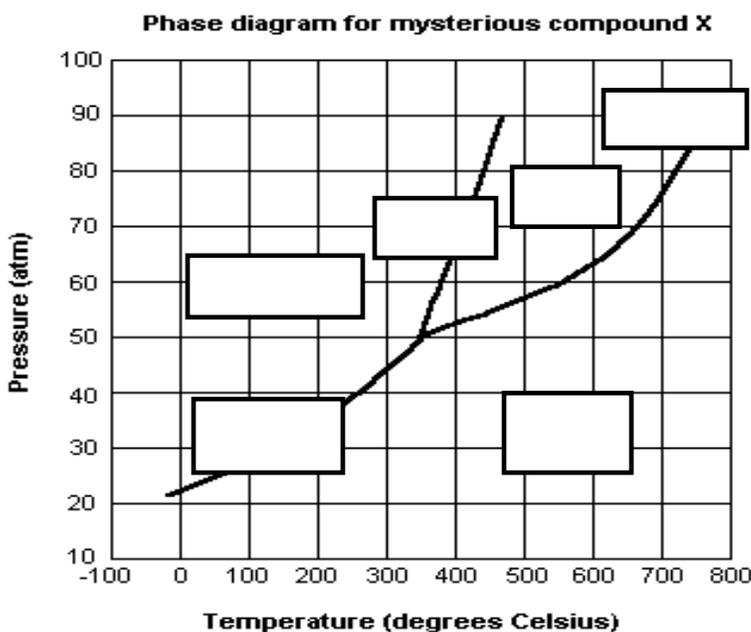
**States of Matter Application Questions.** Name: \_\_\_\_\_ Block: \_\_\_\_\_

Remember to ask your teacher when you need help.

1. Explain the relationship between absolute zero (0 K) and kinetic energy
2. Convert 25°C to the Kelvin scale (show work)
3. If the temperature is increased the kinetic energy (increases/decreases). This relationship is (directly/inversely) proportional.
4. Explain the difference between temperature and heat.
5. What is 385 mm Hg in: (show work)
  - a. kPa
  - b. atm
6. According to the assumptions of kinetic theory, how do the particles in a gas move?
7. In simplistic terms, describe elastic collisions.
8. Use kinetic theory to explain the differences between the particles in a gas and those in a liquid.
9. Use kinetic theory to explain what causes gas pressure.
10. Use the kinetic theory to explain how the pressure inside a car tire changes as a function of the air temperature outside the tire.
11. Explain why increasing the temperature of a liquid increases the rate of evaporation.
12. Why is dynamic equilibrium reached in a closed container and not in an open container?
13. Use kinetic theory to explain the difference between evaporation and boiling of a liquid.
14. A vacuum is where there are no gas particles, thus no external gas pressure. Why does water boil at room temperature in a vacuum? What affect will have on cooking times?
15. (Low/High) External Pressure = (Low/High) Boiling Point temperatures = ( Increase/Decrease) Cooking Times
16. Use the figure to the right:
  - a. Diethyl ether boils at what temperature when the pressure is 200 torr?
  - b. What pressure makes water boil at 70°C?
  - c. Which substance boils at 313K when the pressure is 150 torr?



17. Phase Diagram : Sea Level = 1 atm & Room Temp = 25°C



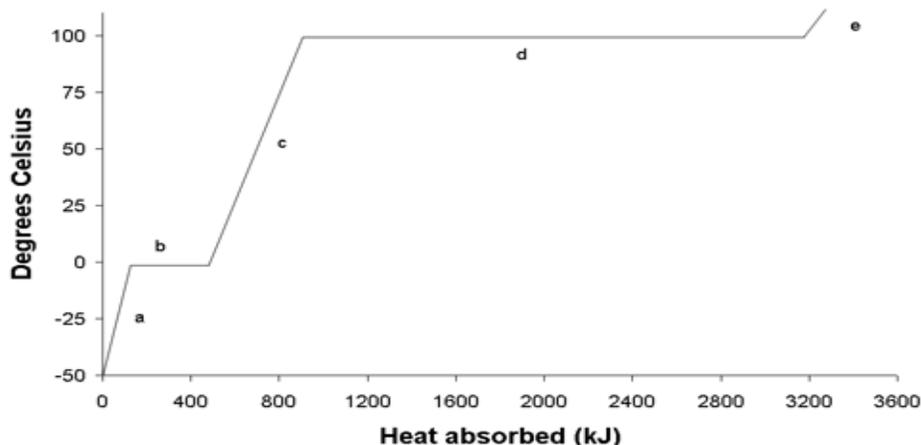
- a. Label in the appropriate boxes as “S”= solid, “L” = liquid, “G” = gas  
 “SL” = equilibrium between solid & liquid phase  
 “LV” = equilibrium between liquid & vapor phase  
 “SV” = equilibrium between solid & vapor phase
- b. Draw an arrow to show sublimation, vaporization, and solidification.
- c. Now, Label those arrows as “B” for sublimation, “V” for vaporization, & “M” for solidification.
- d. If a bottle containing compound X was in your closet, what phase would it most likely be in?
- e. At what temperature & pressure will all three phases coexist?
- f. A bottle of compound X is at a pressure of 45 atm & temperature of 100<sup>0</sup> C, what happens if the temperature is raised to 400<sup>0</sup> C?
- g. Why can't compound X be boiled at a temperature of 200<sup>0</sup> C?
- h. If you wanted to, could you drink compound X right now? Why or Why not?

18. A phase of matter is dependent on what two factors:

19. Explain how water can freeze at 0°C but it can also melt at 0°C, keeping pressure constant

20. Heating Curve

- a. During which segments is kinetic energy increasing?
- b. During which segments does kinetic energy remain the same?
- c. During which segment (s) do particles have the highest average kinetic energy?
- d. What is the freezing point of the substance?
- e. What is the boiling point of the substance?
- f. What is the melting point of the substance?
- g. During which segments is one phase only present?
- h. During which segments are two phases present?
- i. What letter represents the range where the solid is being warmed?
- j. What letter represents the range where the liquid is being warmed?
- k. What letter represents the range where the vapor is being warmed?
- l. What letter represents the melting?
- m. What letter represents vaporization?
- n. What letter represents crystallization?
- o. What letter represents condensation?
- p. Phase changes that are endothermic are
- q. During which segment could the heat of fusion be determined?
- r. During which segment could the heat of vaporization be determined?



On a separate piece of paper do the following book problems: pg 356 1 & 2 pg 354 28, 29, 30, & 31