Chemistry – Unit 3 Work sheet

## Kinetic Molecular Theory

This theory describes all matter as being composed of tiny particles in endless random motion. In a solid, the particles vibrate, but are locked into an orderly array. In a liquid, the particles remain very close to each other because of attractions, but are free to move around past one another. In a gas, the particles are moving very rapidly, are widely separated, and have no attractions.

e



When energy is transferred to a sample of matter, *either* the particles speed up resulting in the temperature increasing and the thermal energy increasing *or* they get pulled apart resulting in the phase energy increasing

c

**d**

**-10**

a

b

and a phase change, **but *not* both at the same time.** This helps account for the shape of the heating curve.

**mp = melting point, bp = boiling point**

1. Label the x axis & the y axis of the graph.

2. Label which phases (solid, liquid, gas) are present in in section a, c, & e above.

3. Label the phase changes at sections b, & d (Example: solid 🡪 liquid).

4 Label the section where ice is melting.

5. Label the section where the water is evaporating.

6. To evaporate water, is heat added or removed from the water (the system)? To condense water, is heat added or removed from the water (the system)?

7. Where does the heat come from? If heat is released where does it go? (Hint: a physical system is made up of the system & the surroundings).

8. When water freezes, is heat absorbed from the surroundings or released to the surroundings

9. Draw the graph below. Use the following choices to describe what is happening on the following labeled sections of the graph as water heats up.

**D**



### increasing

### decreasing

### not changing

### zero

**& Energy**

a. During region A the thermal energy is .

b. During region B the thermal energy is .

c. During region A the phase energy is .

d. During region B the phase energy is .

e. During region C the thermal energy is .

f. During region C the phase energy is .

g. During region D the thermal energy is .

h. During region D the phase energy is .

10. Draw a particle diagram for what water looks like at A, B, and C.

