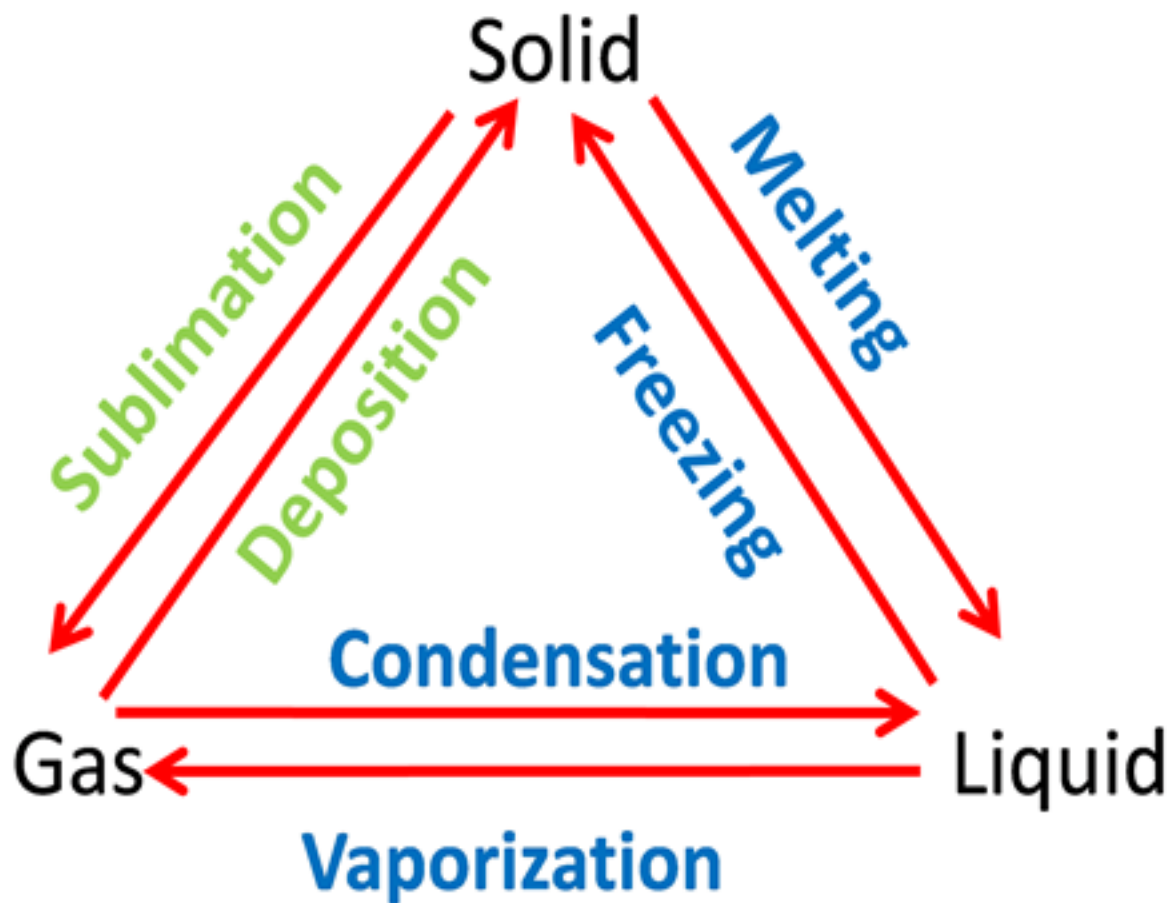


# Day 4—Temperature and Phase Change

Phases of Matter in terms of shape, volume and kinetic energy:

- \* Solids--definite shape and volume  
-Not much kinetic energy
- \* Liquids--definite volume, no definite shape  
-More kinetic energy
- \* Gases--No definite shape or volume.  
-Most kinetic energy

# Phase Change Triangle



## Phase Changes--Activity

1. Does the temperature increase during melting?

No, temperature does not change during phase change!!

2. Is energy required for each phase change?

Yes, It requires energy to change phase!!

3. Can both liquid water and steam exist at 100°C?

Yes, both steam and liquid water can exist at 100.

4. What must be changed, temperature or heat energy, during condensation?

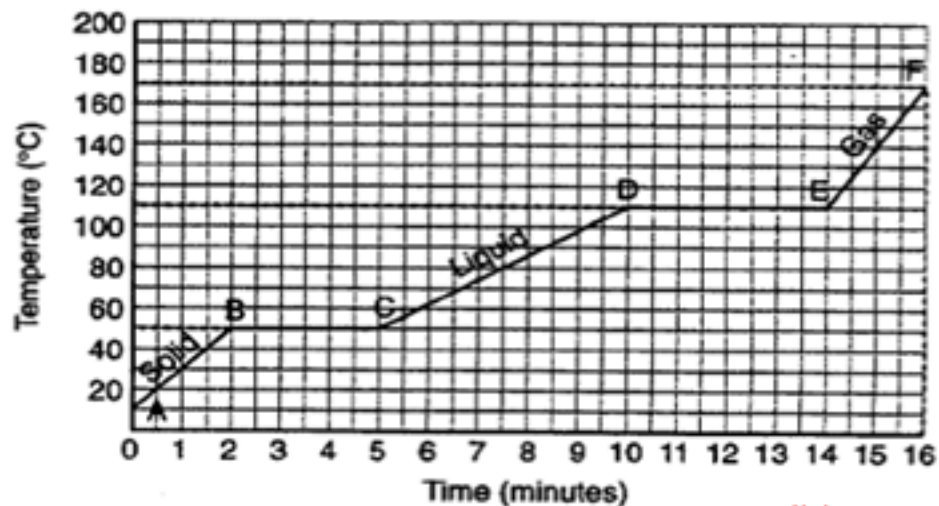
Heat energy--SEE #1

5. How would you describe the change in the arrangement of particles as heat energy and temperature increase?

Particles spread out more!!

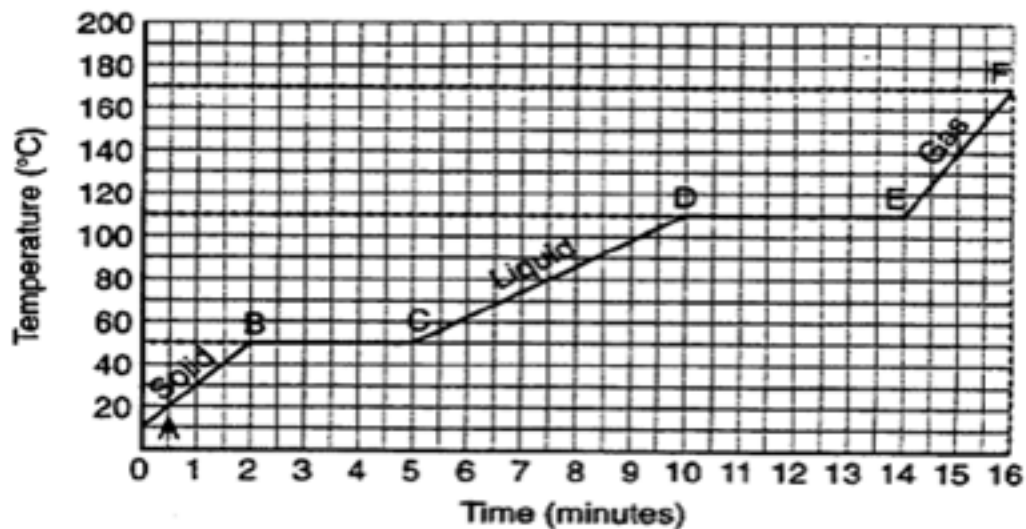
6. What rule can you state about the relationship between phase changes and temperature? Between phase changes and heat energy?

If you add heat to an object, one thing will happen, but never at the same time!!



solid

At the start of observations, Point A, the substance exists in the \_\_\_\_\_ state. The temperature at this point is 10 degrees C. As energy is added, the temperature of the substance rises at a constant rate for two minutes. At Point B, the temperature is 60 degrees C, and the solid begins to melt. The temperature remains constant until the change from solid to liquid is complete. It has taken three minutes to add enough energy to melt the solid completely. From Point C to Point D, the substance is in the liquid state. Its temperature rises at a constant rate to 110 degrees C. The temperature remains constant while the liquid changes to a gas. At Point E, the substance exists as a gas. Its temperature rises constantly as energy is added.



When the gaseous substance is allowed to cool, it loses energy. The cooling curve will be the reverse of the warming curve. Energy will be released as the substance changes from a gas to a liquid and also from a liquid to a solid. The amount of energy released during condensation will be the same as the amount gained during vaporization.