**Phase Changes: Heat and Temperature**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_

* **Heat:**
* **Temperature:**

**Compare and Contrast the terms in each pair of terms:**

1. melting point & freezing point
2. evaporation & vaporization
3. evaporation & boiling
4. vaporization & sublimation
5. melting point & boiling point
6. freezing & condensation

**Imagine you are a water molecule who is going through a series of phase changes. Describe your experience as you change from the following. Write two – three sentences.**

1. A molecule of ice to a molecule of liquid water.
2. A molecule of gas to a molecule of liquid water.

**Study the graph an answer the questions that follow.**

Temp

Heat Energy

SOLID

LIQUID

GAS

Freezes

Melts

Condenses

Boils

1. Does the temperature increase during melting? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Is energy required for each phase change? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Can both liquid water and steam exist at 100o C? Why or why not?
4. What must be changed, temperature or heat energy, during condensation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. How would you describe the change in the arrangement of particles as heat energy and temperature increase?
6. What rule can you state about the relationship between phase changes and temperature?
7. What rule can you state about the relationship between phase changes and heat energy?

**Use the graph below to answer the following questions about an unknown substance:**

20

0

40

60

80

100

1200

1400

Celsius

1. What is the boiling point of the substance?
2. What is the melting point of the substance?
3. Which state is present at 30o C?
4. Which state is present at 60o C?
5. Which state is present at 130o C?
6. How will the substance change if energy is added to the liquid at 40o C?

**Critical Thinking Question**

After taking a shower, you notice that small droplets of water cover the mirror. Explain how this happens. Be sure to describe where the water comes from and the changes it goes through.