SPS5 – Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.

a. Compare and contrast the atomic/molecular motion of solids, liquids, gases, and plasmas.

Learning Target: I will be able to explain, demonstrate, and annotate the changes in molecular motion and structure of solids, liquids, gases, and plasmas once heat is added or taken away by completing a phase change lab and constructing phase change diagrams.

Phase Change Lab

Materials: Beaker, Ice, Water, Thermometer, Graph paper, hot plate

Task: Observe and record data on the phase change of ice to water to steam

Predictions:

1) What will happen to the molecular structure of the water as heat is added?

2) What happen to the physical properties of ice as heat is added?

3) Are you adding or subtracting energy during this experiment?

Procedure:

1) Pour about 75 ml of water into the beaker

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2) Place 5 ice cubes into the water and record the temperature of the water _____

3) Place the water on the hot plate.

4) Turn the hot plate up to highest level.

5) Record the temperature of the water every 30 seconds for 15 more minutes. KEEP THE THERMOMETER IN THE BEAKER OF WATER WHEN YOU ARE TAKING THE TEMPERATURE. DO NOT, I REPEAT DO NOT TAKE THE THERMOMETER OUT TO TAKE THE TEMPERATURE OF THE WATER. DOING THAT WILL INVALIDATE YOUR DATA RESULTS!!!

6) Use graph paper to prepare a line graph comparing time versus temperature. Time will go on the X-axis and temperature will go on the Y-axis.

Answer the following questions:

a) What was the initial temperature of the water? _____Celsius

b) What was the highest temperature that the water reached?_____ Celsius

c) What was the temperature of the water as the ice was melting? _____ Celsius

d) What were the phase changes that you were observing? (liquid to gas, liquid to solid, solid to liquid, gas to liquid, etc.)

e) Can you explain the temperature change (or lack of temperature change) as the ice was melting? As the water was heating up?

f) Describe the physical changes you observed and the energy associated with those changes.

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Time	Temperature of Water	Time	Temperature of Water
:30		8:00	
1:00		8:30	
1:30		9:00	
2:00		9:30	
2:30		10:00	
3:00		10:30	
3:30		11:00	
4:00		11:30	
4:30		12:00	
5:00		12:30	
5:30		13:00	
6:00		13:30	
6:30		14:00	
7:00		14:30	
7:30		15:00	

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