Lesson 7: Just A Phase

Science Focus Question

Are **melting** and **boiling** points a characteristic property of a substance? Explain.

Getting Started

1. How could you make spaghetti cook faster? _____

   _____

   _____

2. Why does ice melt? _____

   _____

   _____

3. Why can you play in the snow when it is warm outside? _____

   _____

   _____

4. Why doesn't ice melt immediately when you add it to a soft drink?

   _____

   _____

   _____

5. Are things that are boiling always hot? Are things that are frozen always cold? Give an example of each to support your answer.

   _____

   _____

   _____

   _____

6. What are some of you own questions about what happens when ice melts and water boils?

   _____

   _____

   _____

   _____

Inquiry 7.1: Heating Ice Water

Predict what you think will happen to the temperature of the water after it is boiling and you continue to heat it. Will it **increase, decrease,** or **stay the same**. Be sure to provide a reason for your thinking. _____

_____

_____

_____

Table 1: Results of the Experiment

Time (min & s)	Temperature of Water (°C)	Observations	Time (min & s)	Temperature of Water (°C)	Observations
0					
30s					
1min					
1min, 30s					
2min					
2min, 30s					

Variables

Identify the manipulated, responding and controlled variables in this investigation.

Manipulated _____ Responding _____

Controlled _____

Graphical Analysis

Create a graph of the temperature of your water versus the time. Include the following:

- Title
- Labeled Axes
- Notes from observations (all ice melted, bubbles started forming, etc.)
- The melting and boiling points of water on your graph

Write a paragraph in your own words that explains the shape of the curve on your graph.

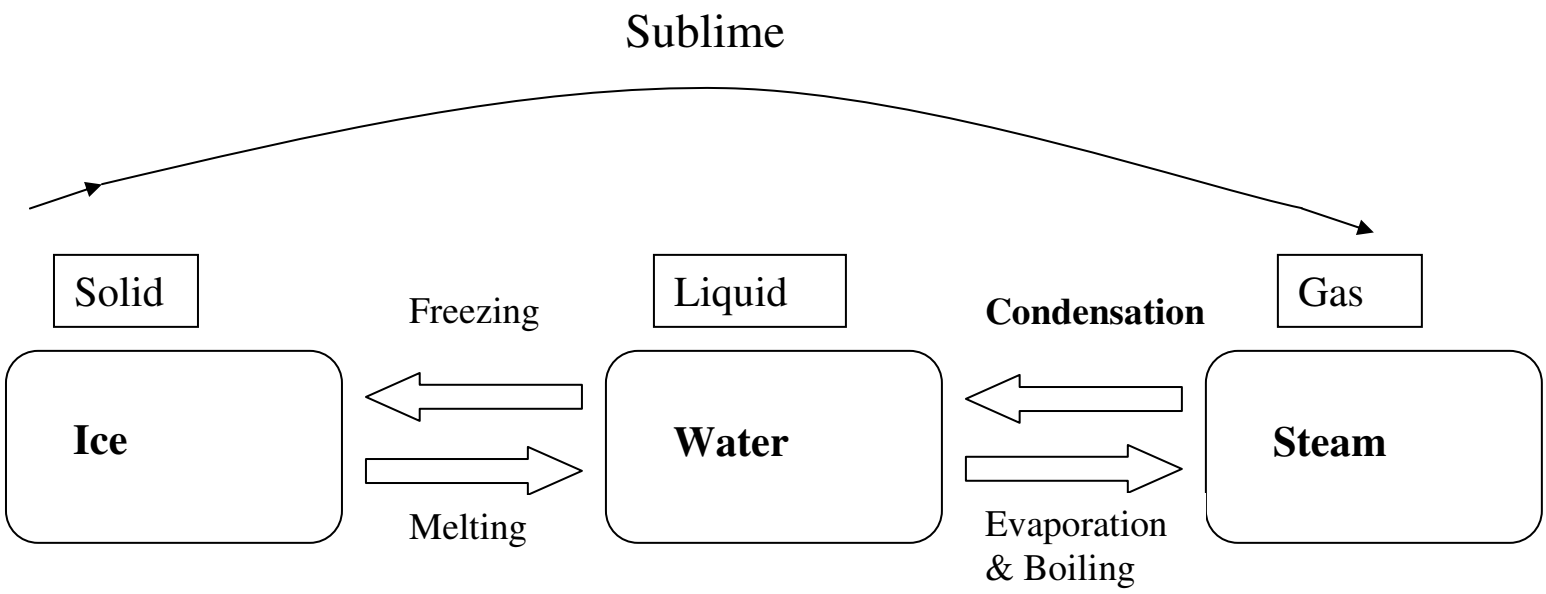
Laboratory Questions

1. How does the shape of your curve compare to the graphs produced by other groups? _____

2. Do any changes in the direction of your curve match the point at which the ice melted or the water boiled? Explain. _____

3. How can you use the curve on your graph to determine the temperature at which ice melted and water boiled? Are these temperatures what you expected?

Application



Boiling Water Demonstrations

Make the following predictions:

Demo #1:

What will be the temperature of the water in 2 beakers, one with 150ml of boiling water and the other with only 50ml of boiling water? Why? _____

_____

_____

_____

_____

Demo #2:

How will the temperature of boiling water heated with a propane torch compare to the temperature of boiling water heated with an alcohol burner? Why? _____

_____

_____

_____

_____

Results

Demo #1:

Temperature of beaker with 150ml of water _____

Temperature of beaker with 50ml of water _____

Demo #2:

Temperature of beaker heated with propane torch _____

Temperature of beaker heated with alcohol burner _____

Reading: Boiling Oil

1) Explain where crude oil comes from and how it is formed.

_____

_____

_____

_____

2) If you were to heat crude oil, what do you think would happen to the temperature as you reached the boiling point for the different parts (i.e. gasoline, kerosene, lubrication oils, etc.) that make up this mixture?_____

_____

_____

_____

_____

3) Draw a diagram of what you think the graph would look like if you were to heat crude oil from 0°C to 350°C.

Reading: Lost Wax Casting

1) How is knowledge of melting points important to the art of "lost wax casting?"

_____

_____

_____

_____