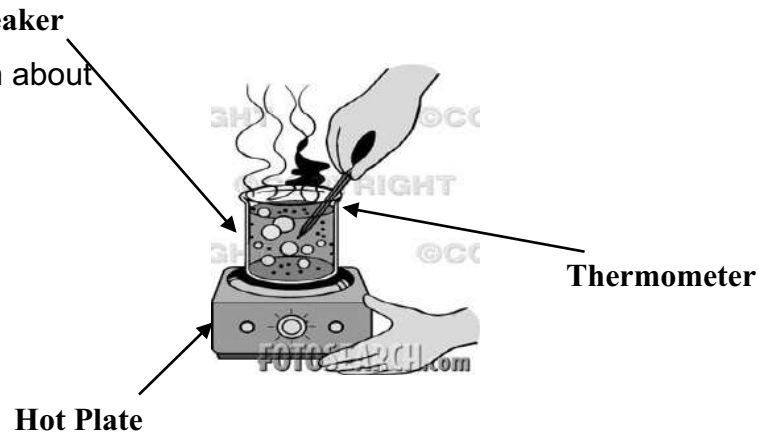
H2O Phase Change Lab



Purpose: Use data and graphs to learn about phase changes and kinetic energy

Materials:

- *Thermometer – 0 to 100°C*
- *Beaker – 250 or 400 mL*
- *Hot plate*
- *Ice*
- *Tap water*
- *Graph Paper*

Procedure:

- Prepare a data table like the example below that has Time on one side and Temperature on the other side:

Time (min)	Temperature (°C)
0.5	
1.0	

- Fill the beaker with ice, then add a small amount of water (about 25 mL)
- Place the beaker on the hot plate with the hot plate **TURNED OFF.**
- Take two temperature measurements of the ice/water slurry 30 seconds apart.
- **Do not let go of the thermometer.**
- **Do not let the thermometer touch the beaker sides or bottom.**
- Turn on the hot plate to about 6 (about half-way).
- Collect temperature measurements every 0.5 minutes (30 seconds).
- When the ice has completely melted, turn the hot plate to HIGH.
- Continue to collect temperature measurements every 0.5 minutes until the water has been boiling for about 3 minutes or you have collected 6 (six) temperature measurements that are within 0.5 degrees of each other.
- Do not let the beaker go dry. Stop the experiment, turn off the hot plate and notify the teacher if your beaker is close to going dry.
- Turn off the hot plate and pour the water down the sink.

Data and Calculations:

1. Data table with times and temperatures
2. Graph your data, x –axis as time and y-axis as temp. Use the whole piece of graph paper or use a computer graphing program.
3. Draw a best fit line through each section of the graph where the slope of the data is different.
4. Label your graph to indicate <u>where</u> the different phases of water are represented i.e. solid, liquid, gas

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Lab Questions:

1. What two phase changes are represented in this lab? Explain.
2. What is happening to the water during the "flat" areas in the graph?
3. What is happening to the water during the slanted areas in the graph?
4. In what areas of the graph is there more than one phase of water present?
5. What is the heat from the hot plate doing when the water is changing from ice to liquid?
6. Do these processes represent exothermic or endothermic reactions? Explain.
7. Does the kinetic energy (energy of movement) of the water particles increase in this lab or decrease? How do you know?

Conclusions and Final Summary:
Write at least a paragraph summary with conclusions and final thoughts. Do not repeat the procedure to me. Use your vocabulary words and discuss the concepts. Prove to me you know the main points of this lab!