

Uplift Education Summer Assignment
Science, Grade 10

Solids, liquids and gases have different properties that describe their state. When enough heat is applied to a substance to change its state, the properties of substance will change, as well. It is difficult to see the small particles that make up a solid, liquid or gas. However, we can use our observations of a substance's volume and how it looks to infer how the particles are behaving.

Procedure:

1. Heat 80.0 g of ice in a 200 mL beaker.
2. Record the temperature inside the beaker every minute for 20 minutes.
3. Create a graph to describe the data collected.

Data:

Time (min)	Temperature (°C)		Time (min)	Temperature (°C)
0	-12		11	60
1	-8		12	70
2	-4		13	80
3	0		14	90
4	0		15	100
5	0		16	100
6	10		17	100
7	20		18	105
8	30		19	110
9	40		20	115
10	50			

- 1 Construct a temperature versus time graph below



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- 2 Label the melting point (mp) and boiling point (bp) of water on your graph.
- 3 One gram of liquid water will occupy a volume of 1 mL; how much volume will the substance in the beaker occupy at 10 minutes?
- 4 At the 19 minute mark, scholars measured 72 mL of water in the beaker. This was less than they measured at the 10 minute mark. Explain what happened to the missing water.
- 5 Olive oil is commonly used in cooking. Olive oil has a melting point of $-6.0\text{ }^{\circ}\text{C}$ and a boiling point of $299\text{ }^{\circ}\text{C}$. Use the graph below to sketch an approximation of the temperature of olive oil as you heated it from $-20\text{ }^{\circ}\text{C}$ to $320\text{ }^{\circ}\text{C}$ over the course of 30 minutes.



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6 Over the summer, one scholar discovered six unmarked plastic bottles filled with oils in their pantry. The scholar labeled the bottles A, B, C, D, E and F. Design an experiment to determine if any of the bottles have the same oil. Be sure to indicate what data you would collect, how you would collect that data, and any graphs or charts you would create to display the data.