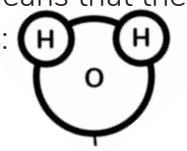
Date: _____ Name: _____

Heating Curve Experiment

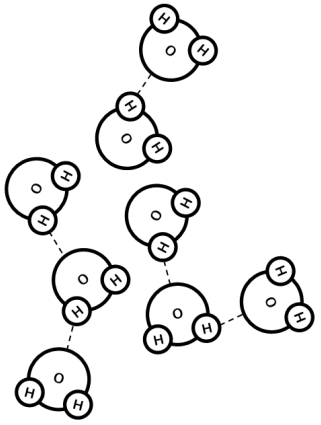
This activity was created by Amaris.

You've probably heard that water's chemical formula is H_2O, which means that there are two hydrogen molecules bonded to one oxygen molecule, like this:

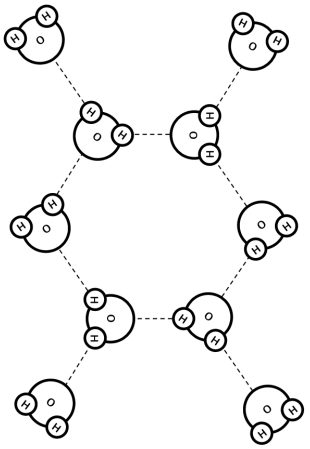


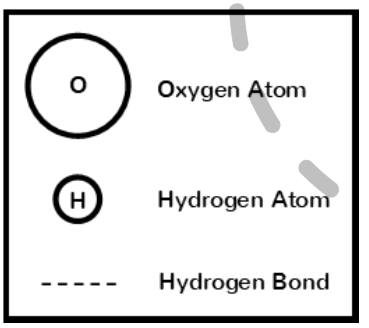
When water freezes, the hydrogens of the molecule bond to the oxygens of another molecule creating a solid. When bonded together, each molecule is further apart than in a liquid making ice less dense then water. When the ice is heated up, the heat breaks these hydrogen bonds forming liquid water.

Molecular Structure of Water

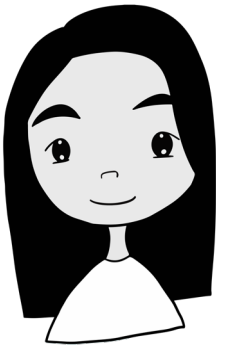


Molecular Structure of Ice





Did you know that water is the only substance whose solid floats? When any other substances, such as mercury or bromine, is in its solid state, it's more dense than its liquid, which makes it sink. It's really important that ice floats because in the winter when lakes and rivers freeze, the ice forms at the top of the water. This allows fish and other aquatic animals to live and survive in the water beneath the ice.



SLO : 7-2-01, 7-2-05, 7-2-07

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A heating curve is a graph that represents a substance's phase change as heat is applied to it over time. The plateau (where the graph looks horizontally flat) marks where a substance changes phase.

Create your own heating curve by observing the phase change of ice to water.

Materials

- Crushed ice*
- Container
- Thermometer

*If you don't have crushed ice, put some ice cubes in a tightly sealed bag and drop it on the ground a few times until the ice gets crushed. The larger the ice, the longer it takes to melt.

Directions

1. Put the crushed ice and thermometer in a container.
2. Stir the ice frequently and record the temperature every 5 minutes on the table below (you may not use all the spaces).
3. Stop recoding the temperature once the readings plateau around room temperature (around 22-24°C). Plot the data on the graph on the next page and label the type of phase change (solid to liquid, liquid to gas, etc.) at the plateau.

Time (m)	Temperature (°C)	Time (m)	Temperature (°C)
0		50	
5		55	
10		60	
15		65	
20		70	
25		75	
30		80	
35		85	
40		90	
45		95	

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Fill in the graph below with the data collected on the previous page.