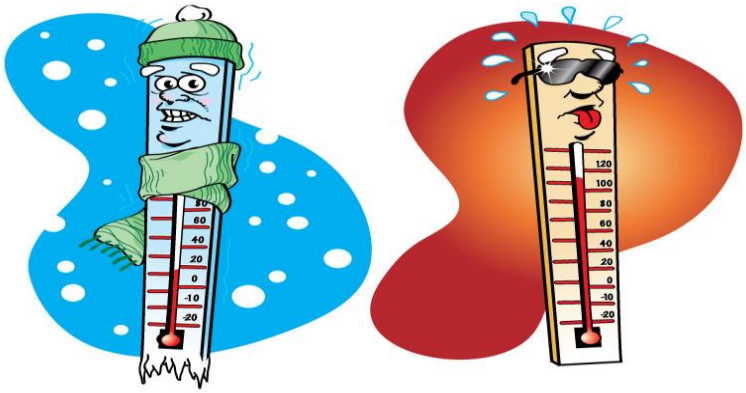
Thermal Energy: The Vibration of Molecules

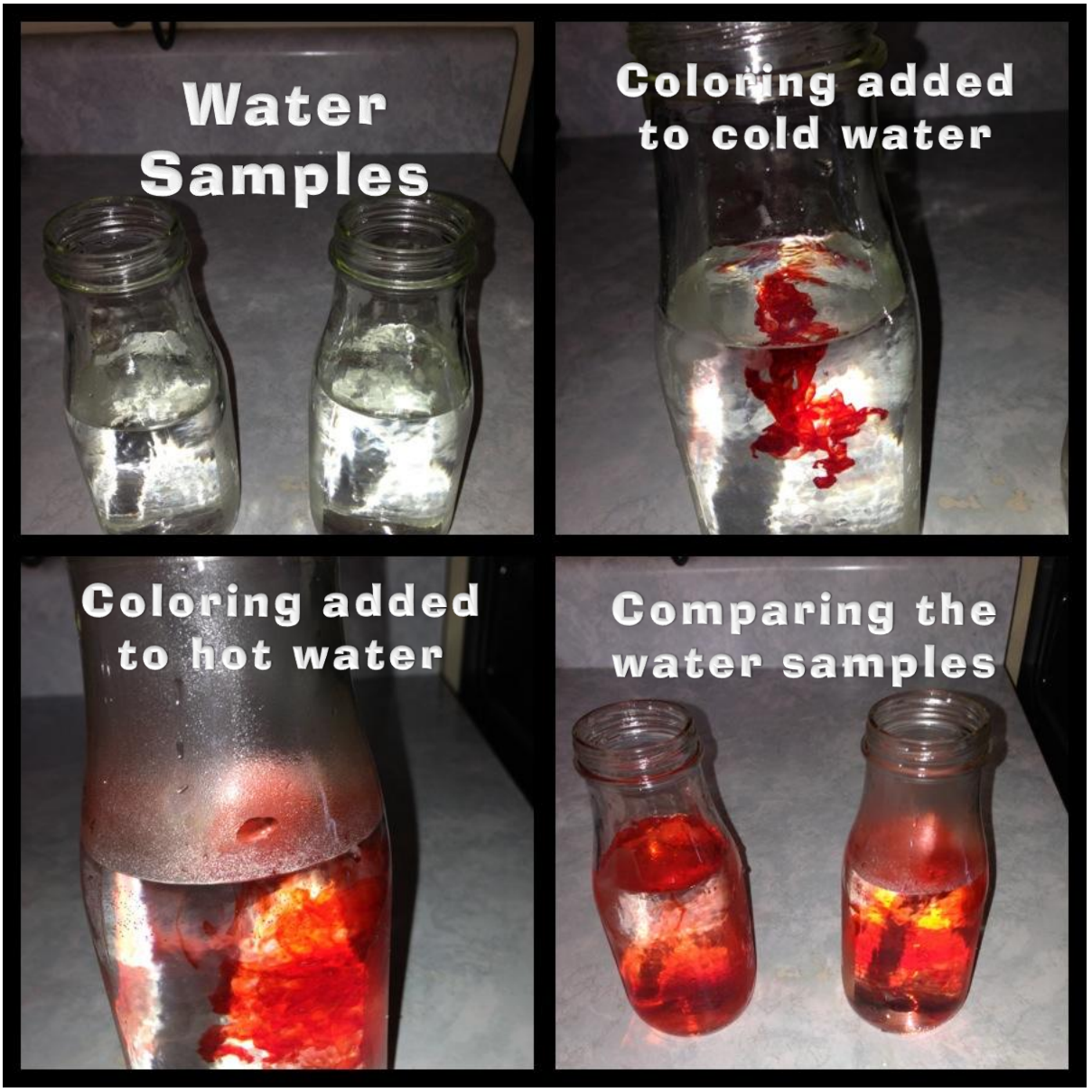
Begin with 2 glass containers. Place ice cold water in one and hot water in the other



First, add 1 drop of food coloring to the cold water and observe how the color disperses through the water. Does the color spread quickly or slowly? You may notice that the coloring looks a little bit like a jelly fish as streaks of color move through the water to the bottom of the glass.

Repeat the same process using the hot water. Do you notice the color dispersing differently? Does the color move quickly or slowly? Why do you think the food coloring reacted differently when dropped into the hot water?

Compare the 2 water samples. How are they the same? How are they different? What factors contributed to their differences?



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Thermal Energy: The Vibration of Molecules

Thermal Energy Lab 1: the vibration of molecules
In order to understand what heat energy is, it is important to remember that all things are made of tiny parts called atoms. These tiny parts join to form molecules. These molecules are so small that you cannot see them without a strong microscope. Other molecules cannot be seen at all. It is the smallest part of anything that still is that thing. A molecule of water is still water even though you may not be able to see it. A molecule of salt is still salt even though you may not be able to see it. A molecule of sugar is still sugar even though you probably could not taste it.

When something is heated by friction, fire, electricity, the sun, or your body, the molecules begin to vibrate. The faster the molecules vibrate, the more heat energy there is. You cannot see the vibrating molecules but you can see the affects. In this experiment we will see how the presence or lack of heat affects the way that the food coloring disperses (or moves through) the water samples.

Heat energy is the energy of vibrating molecules.

For this activity you will need:
~two clear glasses
~hot water
~cold water
~food coloring

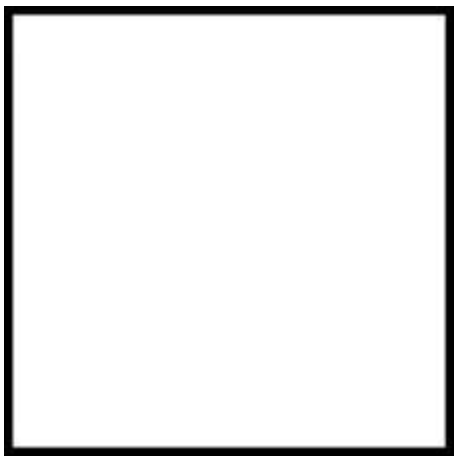
The Experiment:
1.Put hot water into one glass and cold water into the other
2.Let the glasses sit untouched for 2 minutes
3.With the dropper, very carefully put one drop of food coloring into each glass
4.Without touching or moving the glasses, observe what happens to the food coloring in the water. Watch for one minute

Name _____ Date _____Class period _____

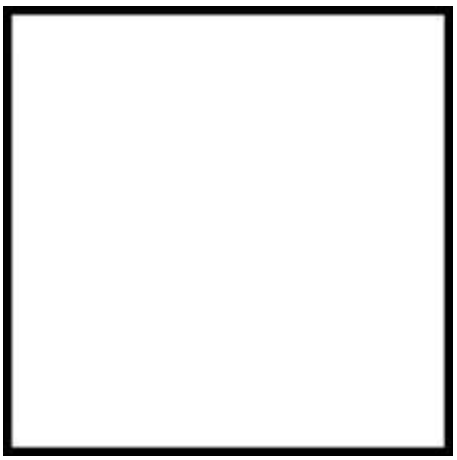
Thermal Energy: The Vibration of Molecules

Lab Reflections

•Draw two glasses and color showing what happened.
You can see how the molecules of hot water move faster than the molecules of cold water.



Glass with cold water



Glass with hot water

Finish the sentences with these words:

~ vibrate ~ ~ molecules ~ ~ heat energy ~ ~ hot~

2. The food coloring mixed more quickly with the _____ water.

3. Molecules _____ faster in hot water.

4. Energy of vibrating molecules is the same as _____.

5. The smallest parts of things are_____.

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