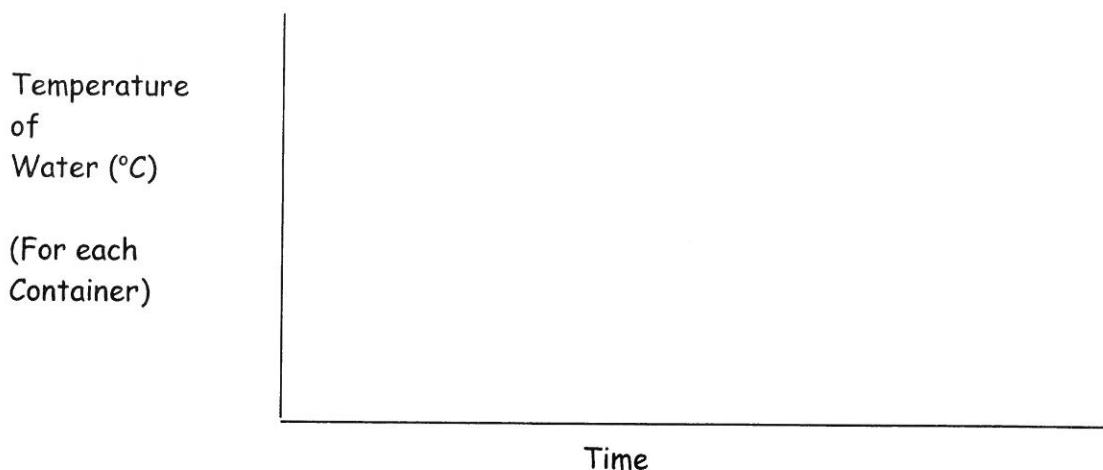


Problem: What happens to the temperature of ice water, room temperature water, and hot water when it sits for 30 minutes?

Background Information: Thermal energy is the internal energy contained by a substance because of the vibration and movement of the atoms and particles of the object. Heat is the transfer of thermal energy from one object to another object. Heat always moves from areas of high temperature to areas of lower temperature until it reaches thermal equilibrium and spreads out evenly.

Hypothesis: If I have 100 mL of hot water, 100 mL of ice water, and 100 mL of room temperature water that sit out for 30 minutes, then

Prediction: Based on your hypothesis, create a graph showing what you think the temperature of each container of water will do over the 30-minute period.



Materials:

- | | |
|---------------------|----------------------------------|
| 3 beakers | 100 mL of hot water |
| graduated cylinder | 100 mL of room temperature water |
| 100 mL of ice water | 3 different colored pencils |

Procedures:

1. Fill one beaker with 100 mL of Ice water. Put the temperature probe into the ice water beaker and record the initial temperature.
3. Fill one beaker with 100 mL of room temperature water. Put the temperature into the room temperature beaker and record the initial temperature
4. Fill one beaker with 100 mL of hot water. Put the temperature into the hot water beaker and record the initial temperature.
5. Record the temperature in each beaker every minute on your data table.
6. Using three different colored pencils, graph the temperatures from the data table onto one set of axes.

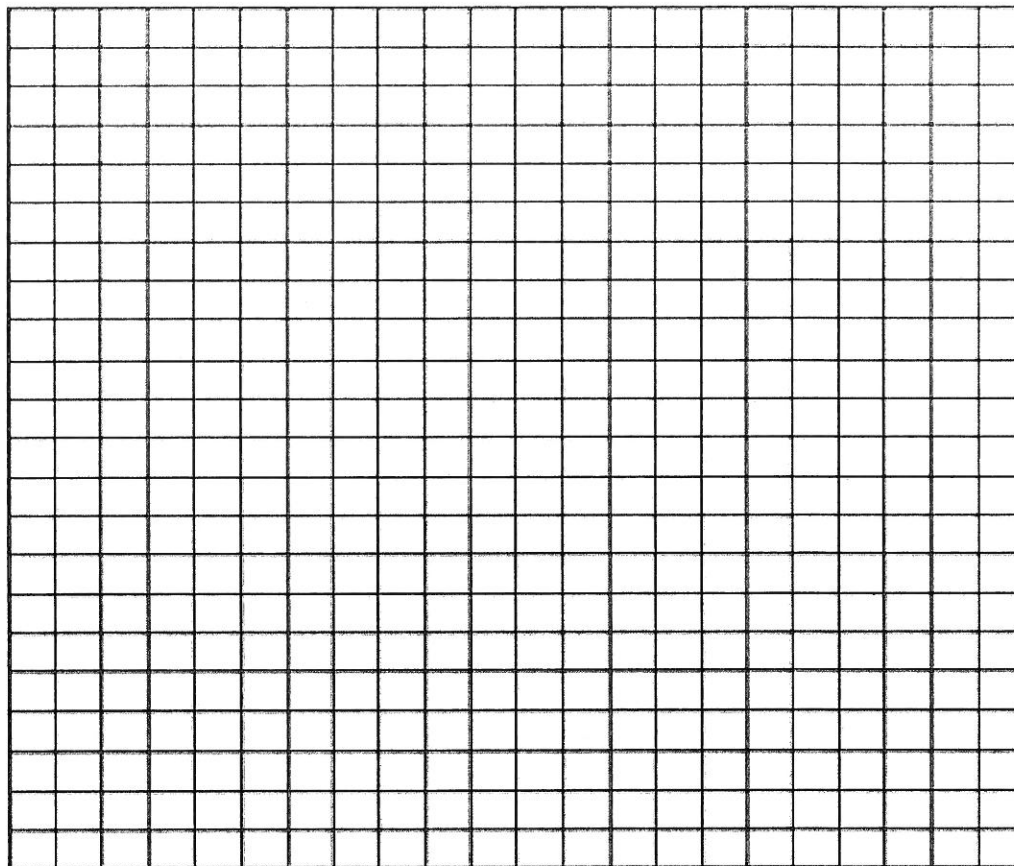
Thermal Equilibrium Lab

Data Table

Time (Minutes)	Temperature (Degrees C°)		
	Ice Water	Room Temperature Water	Hot Water
Initial Temperature			
5 min			
10 min			
15 min			
20 min			
25 min			
30 min			

Data Graph: Use three different colored pencils, draw a graph representing the data you collected above.

Temp of Water (degrees C°)



Time (min)

Thermal Equilibrium Lab

Analysis Questions:

1. Explain how the temperature of the ice water, room temperature water, and hot water changed during the 30-minute time frame. Be sure to use the actual numbers from your data table in your explanation.

2. What trends or patterns do you see in the graph you made? What happens to the three lines in the graph?

3. How did the heat transfer in the ice water? From where did the heat transfer? Did this heat transfer slow down or stop during the 30-minute time frame? Why?

4. How did the heat transfer in the room temperature water? From where did the heat transfer? Did this heat transfer slow down or stop during the 30-minute time frame? Why?

5. How did the heat transfer in the hot water? From where did the heat transfer? Did this heat transfer slow down or stop during the 30-minute time frame? Why?

6. Do you feel like you were able to collect accurate and precise data? Explain why or why not. Did you or your group members make any errors while collecting the data?

7. How does this lab demonstrate thermal equilibrium?
