Analyze Your Data

1) Begin your analysis by making a **line graph** of the temperatures you measured in the two beakers:
   a. Label your graph as "Experiment 1" or "Experiment 2"
   b. Label the horizontal axis "Time (in minutes)"—the time increments have already been done for you.
   c. Label the vertical axis "Temperature"
   d. Use 10° C increments from 0° C to 50°C
   e. Use a colored pencil or marker for graphing the data from Beaker A (or C) and another color for Beaker B (or D)—label and color in the key.
   f. For each beaker and its corresponding color, plot the four data points and draw a line to connect the points.

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2) Setting up your **bar graph** showing the volume of water recovered (melted ice) from the three bags of ice.
   a. Label the graph as "Experiment 1" or "Experiment 2"
   b. Label each bag either Bag A (or C) and B (or D) on the horizontal axis.
   c. Create reasonable intervals to use for the vertical axis (Volume of water recovered; melted ice).
   d. Using the same colors you used in your line graph for the beakers, color in the key accordingly for the bags of ice (Bag A, B, C, or D).
   e. Use a regular pencil for the controlled bag.
   f. Create a bar graph using your data from your chart.

REFLECT QUESTIONS

1) a. What do you think caused the temperature in each beaker to change?
b. Why do you think the temperatures did not all change by the same amount?

2) Which ice bag had the largest volume of melted ice? Why? Explain your reasoning.

3) Which ice bag had the least volume of melted ice? Why? Explain your reasoning.

4) *Only answer the question that pertains to YOUR experiment. Also, remember how thermal energy is described—look at LS1 vocab to help!*

a) In Experiment #1: Beakers A and B had the same volume of water. However, the starting temperature of the water was different. 4a) How did this affect the volume of melted ice in each bag? 4b) Which do you think had more thermal energy before ice was added: water in Beaker A or water in Beaker B? Why do you think this?

b) In Experiment #2: Beakers C and D had the same temperature of water the amount of the water was different. 4a) How did this affect the volume of melted ice in each bag? 4b) Which do you think had more thermal energy before ice was added: water in Beaker C or water in Beaker D? Why do you think this?

5) In both experiments, one bag was placed in 400mL of warm water, and another was not in any water at all. a) Which bag had more melted ice in it? b) What does this tell you about the thermal energy of the warm water?

6) EXPERIMENT #1 ONLY** (experiment #2 will need to answer when we go over) Did the cold water in Beaker A have thermal energy? Why or why not?

7) At the end of your experiment, which beaker had water with more thermal energy? Explain, using evidence.

8) There was less thermal energy in the water in each beaker at the end of the experiment than at the start. Where did the thermal energy go? Explain.

9) In your experiment, a) what factor affected the rate of ice melting in each beaker? b) How does this factor help determine the amount of thermal energy?