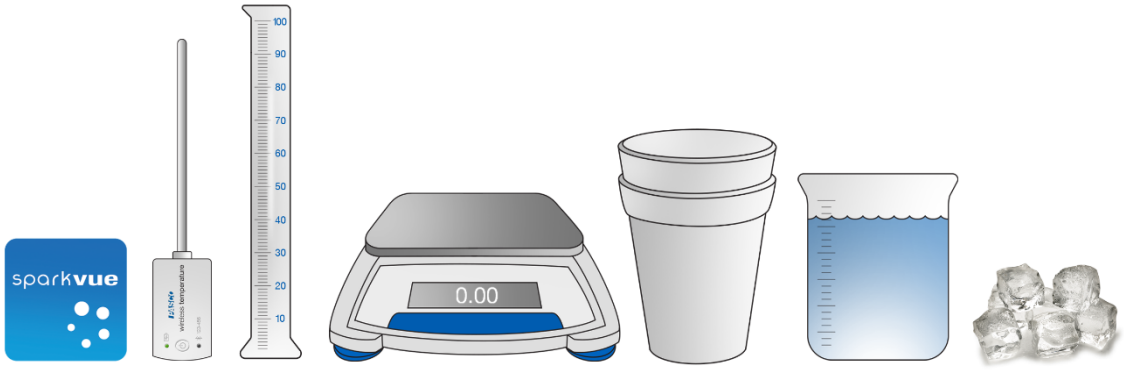
4D – HEAT OF FUSION

INQUIRY

Why does the temperature of an ice/water mix stay the same as the ice melts?

MATERIALS

- Device with SPARKvue software
- Temperature sensor
- Balance (readability: 0.01 g)
- Graduated cylinder, 100-mL
- Foam cups, 8-oz (2)
- Hot water
- Ice



BACKGROUND

A warm water sample mixed with a cooler sample will decrease in temperature as the temperature of the cooler sample rises. A different energy change takes place when a substance changes state.

SAFETY

Follow these important safety precautions in addition to your regular classroom procedures.

- Wear safety goggles at all times.

PROCEDURE

1. Open SPARKvue.
2. Open the 04D Heat of Fusion lab file in SPARKvue.
3. Use the Bluetooth icon to connect the Temperature sensor.
4. Measure about 50 grams of ice in a foam cup. Dry the ice with a paper towel before adding it to the cup. Record the exact mass in Table 1 on your answer sheet.
5. Assume the density of water is 1.0 g/mL. This allows you to use volume of water to measure its mass. Use the graduated cylinder to measure 70 - 75 grams of hot water. Record the exact mass in Table 1.
6. Start collecting data and measure the temperature of the hot water. Record the temperature in Table 1. Keep the temperature sensor in the hot water.

PROCEDURE

7. Add the ice to the hot water, stir gently and monitor the temperature of the mixture. Record the temperature immediately after all the ice has melted.

ANALYSIS

Complete the analysis on your answer sheet.

QUESTIONS

Answer the questions on your answer sheet.