Name_____ Period _____ Date _____

Calorimetry

STEM Sims

Lesson 5: Specific Heat of Paraffin

Paraffin is a chemical that it used as fuel. How does the burning of paraffin affect the temperature increase of the water?

Doing the Science

1. Start the Calorimetry Simulation by clicking on the "Sim" tab.
2. Using the mouse, drag the paraffin from the shelf to the balance to measure its mass.
3. Record the mass into the "Mass of Paraffin Before Ignition" cell in Table 1 below.
4. Move the paraffin from the balance to the hot plate underneath the flask of water.
5. Record the temperature of the water in "Temperature of Water Before Ignition."
6. Click on "Ignite" to set the paraffin on fire.
7. Clicking on "10*X*" will speed up the timer.
8. Record the maximum temperature of the water in "Temperature of Water After Ignition".
9. Reweigh the paraffin on the balance and record the data in "Mass of Paraffin After Ignition".
10. Place the paraffin back onto the shelf.
11. Click on "Show Data" to compare the data you collected.
12. Click on "Hide Data" after analyzing your results.
13. Calculate the difference in mass by subtracting the "Mass of Paraffin After Ignition" from "Mass of Paraffin Before Ignition" and record the number in "Difference in Mass".
14. Calculate the difference in temperature by subtracting the "Temperature of Water After Ignition" from "Temperature of Water Before Ignition" and record the number in "Difference in Temperature".

Table 1.

Mass of Paraffin Before Ignition	Mass of Paraffin After Ignition	Difference in Mass	Temperature of Water Before Ignition	Temperature of Water After Ignition	Difference in Temperature

Do You Understand?

1. The amount of calories from the burning of the material can be calculated by multiplying the mass of water by the difference in temperature increase and by the specific heat of water. The specific heat for water is 1 calorie/(gram × °Celsius). Assume the flask of water contains 100 grams. Calculate the number of calories released by the paraffin when burned.

2. Determine the heat content of the paraffin. To do this, divide the number of calories released by burning the paraffin by the difference in the paraffin's mass.