Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Lesson 3: Specific Heat of SternoTM**

Sterno is a gel that can be ignited and is used to keep foods warm. An 8 oz. container of Sterno can burn for up to 2.5 hours! How does the burning of Sterno 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 Sterno from the shelf to the balance to measure its mass.

3. Record the mass in the “Mass of Sterno Before Ignition” cell in Table 1 below.

4. Move the Sterno 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 Sterno 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 Sterno on the balance and record the data in “Mass of Sterno After Ignition”.

10. Place the Sterno 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 Sterno After Ignition” from “Mass of Sterno 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 Sterno Before Ignition** | **Mass of Sterno 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 Sterno when burned.

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