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

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**Lesson 4: Specific Heat of Peanuts**

Peanuts are legumes in the bean family. How does the burning of peanuts 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 peanuts from the shelf to the balance to measure its mass.

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

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

10. Place the peanuts 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 Peanuts After Ignition” from “Mass of Peanuts 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 Peanuts Before Ignition** | **Mass of Peanuts 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 burning the peanuts.

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