



# Calorimetry

## STEM Sims

### Lesson 1: Specific Heat of Wood

Wood is a common fuel for fires. How much wood needs to burn in order to raise the temperature of water?

#### Doing the Science

1. Start the Calorimetry Simulation by clicking on the “Sim” tab.
2. Using the mouse, drag the wood from the shelf to the balance to measure its mass.
3. Record the mass into the “Mass of Wood Before Ignition” cell in Table 1 below.
4. Move the wood from the balance to the hot plate underneath the flask of water.
5. Record the temperature of the water in “Temperature of the Water Before Ignition.”
6. Click on “Ignite” to set the wood on fire.
7. Clicking on “10X” will speed up the timer.
8. Record the maximum temperature of the water in “Temperature of Water After Ignition”.
9. Reweigh the wood on the balance and record the data in “Mass of Wood After Ignition”.
10. Place the wood 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 Wood After Ignition” from “Mass of Wood 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 Wood Before Ignition	Mass of Wood 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  $\times$   $^{\circ}$ Celsius). Assume the flask of water contains 100 grams. Calculate the number of calories released by the wood when burned.
2. Determine the heat content of the wood. To do this, divide the number of calories released by burning the wood by the difference in the wood’s mass.