

Calculating Specific Heat

[Here is a video](#) showing how to do this in a generic sense

[Here is a video](#) showing how to use a databot.

This meets Idaho Standard: HS-PSP-2.4 Students who demonstrate understanding can: Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).

Procedure:

1. Fill a beaker with water and heat to boiling on a hot plate.
2. Put 100 mL of water in a styrofoam cup.
3. Open Vizeey on your cell phone or chromebook.
4. Begin temperature collection
5. Record the temperature of the water in the styrofoam cup. _____
6. Collect a metal cube and record its mass. _____
7. Using tongs, put the cube into the boiling water.
8. Record the temperature of the boiling water. _____
9. Using tongs, transfer the cube from the boiling water to the styrofoam cup.
10. Record the highest temperature reached by the water in the cup. _____

Data Analysis:

1. Calculate the temperature change of the water. _____
2. Calculate the heat gained by the water. $Q = mc\Delta T$ The specific heat of water is $4.18 \text{ J/g}\cdot^\circ\text{C}$.

3. How much heat was released by the metal block? (Hint: where did the water get the heat?) _____
4. Calculate the temperature change of the metal. _____
5. Calculate the specific heat of the metal. _____

6. Look up the accepted value for the specific heat of the metal you are using. Long Text

7. Calculate the percent error. $\% \text{ error} = \frac{\text{Experimental} - \text{Accepted}}{\text{Accepted}} \times 100$

8. How might you change what you did to reduce the percent error? _____