

## “Specific Heat Capacities” Answers

**Procedure:** You should have seen a temperature change for water of between 1 °C and 7 °C, and a temperature change for the metal of between 65 °C and 75 °C.

Sample Calculation of  $c_m$ :

$$m_m c_m \Delta T_m = m_w c_w \Delta T_w$$

$$c_m = \frac{m_w c_w \Delta T_w}{m_m \Delta T_m} = \frac{(64 \text{ grams})(4186 \text{ J/kg } ^\circ\text{C})(2 \text{ } ^\circ\text{C})}{(64 \text{ grams})(73 \text{ } ^\circ\text{C})} = \mathbf{114.7 \text{ J/kg } ^\circ\text{C}}$$

### **Questions:**

- 1) The specific heat capacities you calculated probably did not match those in the table due to error in the lab experiment.
- 2) Possible errors...
  1. Metal lost heat as it was transferred from the hot water to the cold water
  2. Metal/cold water system was not completely isolated
  3. Did not accurately read the thermometer
- 3) The metals showed the greatest temperature change because they have a much lower heat capacity than water. Water takes much more energy to change temperature than a metal.