Name: _____ Block: _____

Specific Heat Capacity & Calorimetry

1. 375 kJ of heat is added to a 25.0 kg granite rock. How much does the temperature increase?

18.99°C

2. A 0.040 kg block of copper at 95°C is placed in 0.105 kg of water at an unknown temperature. After equilibrium is reached, the the final temperature is 24°C. What was the initial temperature of the water?

21.5°C

3. A sample of metal with a specific heat capacity of $0.50\ \frac{\text{kJ}}{\text{kg}\,^\circ\text{C}}$ is heated to 98°C and then placed in an 0.055 kg sample of water at 22°C. When equilibrium is reached, the final temperature is 35°C. What was the mass of the metal?

0.0948 kg

4. An 0.280 kg sample of a metal with a specific heat capacity of $0.43\ \frac{\text{kJ}}{\text{kg}\,^\circ\text{C}}$ is heated to 97.5°C then placed in an 0.0452 kg sample of water at 31.2°C. What is the final temperature of the metal and the water?

57°C

5. You want to do an experiment to measure the conversion of gravitational potential energy to kinetic energy to heat by dropping 2.0 kg of copper off the roof of LEHS, a height of 14 m. How much will the temperature of the copper increase?

   (*Hint: Remember that potential energy is measured in* J *but specific heat capacity problems usually use* kJ.)

0.356°C

6. Based on your answer to question #5 above, you decide to modify your experiment by dropping the 2.0 kg bag of copper from a height of 2.0 m to the floor multiple times. How many times would you need to drop the copper bag to get a temperature increase of 2°C?

   (*Hint: Remember that potential energy is measured in* J *but specific heat capacity problems usually use* kJ.)

39 times