

## Specific Heat Worksheet

Name: \_\_\_\_\_

$$q = mc\Delta T, \text{ where } q = \text{heat energy, } m = \text{mass, and } \Delta T = (T_{\text{final}} - T_{\text{initial}}).$$

**Show all work and proper units.** Answers are provided at the end of the worksheet without units.

1. A 15.75-g piece of iron absorbs 1086.75 joules of heat energy, and its temperature changes from 25°C to 175°C. Calculate the specific heat capacity of iron.
2. How many joules of heat are needed to raise the temperature of 10.0 g of aluminum from 22°C to 55°C, if the specific heat of aluminum is 0.90 J/g°C?
3. To what temperature will a 50.0 g piece of glass raise if it absorbs 5275 joules of heat and its specific heat capacity is 0.50 J/g°C? The initial temperature of the glass is 20.0°C.
4. Calculate the heat capacity of a piece of wood if 1500.0 g of the wood absorbs  $6.75 \times 10^4$  joules of heat, and its temperature changes from 32°C to 57°C.
5. 100.0 mL of 4.0°C water is heated until its temperature is 37°C. If the specific heat of water is 4.18 J/g°C, calculate the amount of heat energy needed to cause this rise in temperature.
6. 25.0 g of mercury is heated from 25°C to 155°C, and absorbs 455 joules of heat in the process. Calculate the specific heat capacity of mercury.
7. What is the specific heat capacity of silver metal if 55.00 g of the metal absorbs 47.3 **calories** of heat and the temperature rises 15.0°C?
8. If a sample of chloroform is initially at 25°C, what is its final temperature if 150.0 g of chloroform absorbs 1.0 **kilojoules** of heat, and the specific heat of chloroform is 0.96 J/g°C?
9. BONUS!! If 50g of copper at 200°C is placed in 500ml of water at 20°C, what is the final temperature of the water? (copper = 0.2 J/g°C)

Answers in random order without units:

0.14; 1.8; 32;  $3.0 \times 10^2$ ; 0.46;  $1.4 \times 10^4$ ; 0.240; 231; 20.86