Specific Heat Problems Name_____ Block_____ Date___

$$Q = mc\Delta T \qquad c = \frac{Q}{m\Delta T} \qquad m = \frac{Q}{c\,\Delta T} \qquad \Delta T = \frac{Q}{c\,m}$$

q = heat energy, m = mass in grams, and T = temperature in °C Remember, $\Delta T = (T_{final} - T_{initial})$.

Show all work and proper 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 new temperature will a 50.0 g piece of glass be raised to if it absorbs 5275 joules of heat and its specific heat capacity is 0.83 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 6.75×10^4 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 4.186 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 1000.0 **joules** of heat, and the specific heat of chloroform is 0.96 J/g°C?