

# Specific Heat

## Chem Worksheet 16-1

Name \_\_\_\_\_

Use the data in the table to answer the following questions.

Substance	Specific Heat Capacity (J/g °C)
water	4.184 J/g °C
aluminum	0.89 J/g °C
silicon	0.703 J/g °C
iron	0.45 J/g °C
copper	0.387 J/g °C
silver	0.24 J/g °C
gold	0.129 J/g °C
lead	0.128 J/g °C

### Useful Equations

$$q = mc\Delta T$$
$$\Delta T = T_{\text{final}} - T_{\text{initial}}$$
$$1 \text{ kg} = 1000 \text{ g}$$
$$1 \text{ cal} = 4.184 \text{ J}$$
$$T_c = 5/9(T_f - 32)$$
$$T_K = T_c + 273$$
$$1 \text{ kcal} = 1000 \text{ cal}$$

1. Calculate the energy required to heat a beaker of water at 18 °C to boiling. The mass of the water is 70.0 g.
2. A water heater warms 35-L (35 kg) of water from a temperature of 22.7 °C to a temperature of 83.7°C. Determine the amount of energy (in joules) required.
3. Determine the temperature change that will occur when 250-J of energy is applied to 20. g of gold.
4. When 895-J of heat is applied to a sample of iron metal the temperature increases by 55.0 °C. Determine the mass of the metal sample.
5. A silver ring has a mass of 138.45 g. How many calories of heat are required to increase the temperature from 11.8 °C to 162.5 °C?
6. A heat energy of 645 J is applied to a sample of glass with a mass of 28.4 g. Its temperature increases from -11.6 °C to 15.5 °C. Calculate the specific heat of glass.
7. What is the mass of copper that increases its temperature by 285 °C when 186,000 J of energy is applied?
8. How much energy (in kJ) is lost by a 348-kg iron statue that goes from a temperature of 299 K to a temperature of 280 K?
9. When 5800 joules of energy are applied to a 15.2-kg piece of lead metal, how much does the temperature change by?
10. A 9.84 oz ingot of unknown metal is heated from 73.2 °F to 191.2 °F. This requires 3.91 kcal of energy. Calculate the specific heat of the metal and determine its identity.