

# HEAT AND ITS MEASUREMENT

Name \_\_\_\_\_

Heat (or energy) can be measured in units of calories or joules. When there is a temperature change ( $\Delta T$ ), heat ( $Q$ ) can be calculated using this formula:

$$Q = \text{mass} \times \Delta T \times \text{specific heat capacity}$$
$$(\Delta T = \text{Final Temp} - \text{Initial Temp})$$

During a phase change, we use this formula:

$$Q = \text{mass} \times \text{heat of fusion (or heat of vaporization)}$$

Solve the following problems.

- |   |       |
|---|-------|
| 1. How many joules of heat are given off when 5.0 g of water cool from 75° C to 25° C? (Specific heat of water = 4.18 J/g° C) | _____ |
| 2. How many calories are given off by the water in Problem 1? (Specific heat of water = 1.0 cal/g° C)                         | _____ |
| 3. How many joules does it take to melt 35 g of ice at 0° C? (heat of fusion = 333 J/g)                                       | _____ |
| 4. How many calories are given off when 85 g of steam condense to liquid water? (heat of vaporization = 539.4 cal/g)          | _____ |
| 5. How many joules of heat are necessary to raise the temperature of 25 g of water from 10° C to 60° C?                       | _____ |
| 6. How many calories are given off when 50 g of water at 0° freezes? (heat of fusion = 79.72 cal/g)                           | _____ |