Changes of State:

1. Define the following:
   a. Heat of fusion: energy required to melt 1g of substance.

   b. Heat of vaporization: energy required to boil 1g of substance

   c. Specific Heat: amount of energy needed to raise 1g of a substance by 1°C

2. True or false: the heat of fusion and heat of vaporization depend on temperature.

   False

Specific Heat:

1. The equation for specific heat is: SH=heat/(mass*change in Temperature). Write the units for each variable in this equation:
   a. S.H.: $cal/g°C$
   b. Heat: cal or Joules
   c. Mass: grams
   d. Change in Temp: °C

2. How much heat must be absorbed by 375 grams of water to raise its temperature by 25° C?

   $Q = MC\Delta T$ M=375g   C=1.00 cal/g·c ΔT=25

   $Q = (375g)(1.00 \, cal/g·c)(25°c) = 9,375$ calories

3. What mass of silver can be heated from 25.0° C to 50.0° C by the addition of 2825 J? The specific heat of silver is 0.0562 cal/g C and 0.235 J/g C.

   $\Delta T = 50.0 - 25.0 = 25.0°c$

   $\dfrac{Q = MC\Delta T}{C\Delta T \quad C\Delta T}$ Q = 2825 J

   C = 0.235 J/g·c

   $M = \dfrac{Q}{C\Delta T} = \dfrac{2825 \, J}{0.235 \, J/g·c \times 25°c} = \boxed{480.85g}$

Calorimeter:

1. **What is the purpose of a calorimeter?**

   To determine calories in a food.

2. **A piece of chocolate changes the temperature of 1307 g of water from 28.5 degrees Celsius to 67.4 degrees Celsius. How many kcals does the piece of chocolate have?**

$$Q = MC\Delta T$$

$$M = 1307 \text{ g}$$
$$C = 1.00 \text{ cal}/g\cdot c$$
$$\Delta T = 67.4\,^{\circ}C - 28.5\,^{\circ}C = 38.9\,^{\circ}$$

$$(1307g)(1.00 \text{ cal}/g\cdot c)(38.9\,^{\circ}C) = 50,842.3 \text{ cal}/kg$$

$$50,842.3 \text{ cal} \left(\frac{1 \text{ kcal}}{1000 \text{ cal}} \right) = \boxed{50.8423 \text{ kcal}}$$