1. What is the equation for heat of fusion?
   \[ q = m \Delta H_f \]

2. What is the equation for heat of vaporization?
   \[ q = m \Delta H_v \]

3. What are the units for heat of fusion?
   \( \text{J/} \text{g} \)

4. What are the units for heat of vaporization?
   \( \text{J/} \text{g} \)

5. If 2083 Joules are used to melt 5.26 grams of aluminum, what is the heat of fusion of aluminum?
   \[ q = m \Delta H_f \]
   \[ 2083 \text{J} = 5.26 \text{g} \cdot \Delta H_f \]
   \[ \Delta H_f = \frac{3.96 \text{J}}{\text{g}} \]

6. If the same amount (5.26 g) of zinc is melted, it takes 579 Joules to completely melt the sample. What is the heat of fusion of zinc?
   \[ q = m \Delta H_f \]
   \[ 579 \text{J} = 5.26 \text{g} \cdot (\Delta H_f) \]
   \[ \Delta H_f = \frac{110 \text{J}}{\text{g}} \]

7. How much energy is needed to heat a 125 g sample of water from 20 °C to 100 °C? (Note that this is a specific heat problem)
   \[ q = mc \Delta T \]
   \[ q = (125 \text{g}) \cdot (4.184 \text{J/} \text{g} \cdot \text{°C}) \cdot (100 \text{°C} - 20 \text{°C}) \]
   \[ q = 41,870 \text{J} \]

8. How much energy does it take to boil a 125 g sample of water? (\( \Delta H_{\text{vap}} \) for water = -2257 J/g)
   \[ q = m \Delta H \]
   \[ q = (125 \text{g}) \cdot (-2257 \text{J/g}) \]
   \[ q = -281,875 \text{J} \]

9. How much energy does it take to heat 125 g of steam from 100 °C to 110 °C? (Specific heat of steam= 2.01 J/g °C)
   \[ q = mc \Delta T \]
   \[ q = (125 \text{g}) \cdot (2.01 \text{J/} \text{g} \cdot \text{°C}) \cdot (110 \text{°C} - 100 \text{°C}) \]
   \[ q = 2510 \text{J} \]

10. What is the mass of a sample of Nickel, which completely melts after 3120 J of heat? (\( \Delta H_{\text{fus}} \) of nickel is 298 J/g)
    \[ q = m \Delta H \]
    \[ 3120 \text{J} = m \cdot (298 \text{J/g}) \]
    \[ m = 10.5 \text{g} \]