$Q = mH_f$                                    $Q = mH_v$                                    $Q = mC_p\Delta T$

WATER VALUES

$H_f = 334$ J/g                                $H_v = 2260$ J/g                                $C_p = 4.18$ J/gC

The Heat Quiz

1. The specific heat of aluminum is 0.90 J/g·°C. How much energy is required to raise the temperature of 10 grams of aluminum from 10°C to 25°C? **ANS: 135 J**

2. A 100 gram sample of a metal undergoes a temperature change from 10°C to 50° after absorbing 1500 J of heat. What is the specific heat of the metal? **ANS:.375 J/gC**

3. How many joules of heat energy are required to raise the temperature of 30 grams of water by 50°C? **ANS: 6270 J**

4. What energy change has occurred when 400 grams of water cools from 35°C to 25°C **ANS: 16720 J**

5. How many joules are required to vaporize 10 grams of water at its boiling point? **ANS: 22,600 J**

6. How much energy must be removed from 25 grams of water at 0°C to convert the water to ice?
**ANS: 8350 J**

7. What mass of ice at 0°C can be melted by the addition of 1670 joules of heat ?
**ANS: 5 grams**

8. How many grams of water at 100°C can be converted to steam by the addition of 565 joules of heat?
**ANS: .25 g**

9. Circle all of the following phase changes that will **release** energy. **ANS: c and d......molecules slowing**

   a. melting            b. boiling            c. condensation            d. freezing

10. If you were asked to calculate the energy needed to change 14 grams at -10 C to steam at 125 C, how many steps would be in the calculation? **ANS: 5 (raise to 0, melt, raise to 100, boil, raise to 125)**

11. When a piece of gold (specific heat 0.13 J/g·°C) and a piece of iron (specific heat 0.46 J/g·°C) each absorb an equal amount of heat **ANS: A (since not as much heat is required to raise the temperature by 1 degree, the final temperature can be higher, given the same quantity of heat)**

        A.      the gold will end up with the higher final temperature.

        B.      they will end up at the same final temperature.

        C.      the iron will end up with the higher final.