Remember – heat flows from hot to cold.

Specific Heat Capacity – the amount of heat it takes to raise the temperature of 1 gram of the substance by 1°C

Water has a **very** large value --- 4.18 J/(g °C) --- compared to other chemicals. So – water takes a long time to heat up and a long time to cool down.

Spec. Heat for Al = 0.90 J/(g °C), glass = 0.24 J/(g °C), and wood = 1.80 J/(g °C).

Calorimetry – a laboratory method for determining the amount of energy given off or taken in by a chemical reaction. A **calorimeter** is used to make measurements (foam cups make good calorimeters).

We use the equation $q = m\,C\,\Delta T$ to find the change in energy.

If the system is at constant pressure we can say that $q = \Delta H$ and therefore $\Delta H = m\,C\,\Delta T$. ΔH is called the **enthalpy** of the system.

C will have different values depending on the substance. For example,

q = heat

m = mass

C_p = specific heat of H_2O

ΔT = change in temp (°C)

C_p of H_2O = 4.18 J/g °C

For *endothermic* reactions or processes ΔH is positive.

For *exothermic* reactions or processes ΔH is negative.

More on Enthalpy

Remember: Breaking bonds takes energy. Forming bonds gives off energy.

Exothermic - energy is released - products are lower in energy than reactants (**-ΔH**)

Endothermic -energy is absorbed - reactants are lower in energy than products (+ΔH)

Complete the graphs below showing the energy change between reactants and products.

$CaCO_3 + 176\ kJ \rightarrow CaO + CO_2$	$C + O_2 \rightarrow CO_2 + 395\ kJ$

We can measure the change in heat for chemical reactions, changes of state (freezing, melting, vaporization, etc.), and substances dissolving.