## What you should now know about the 1st Law …John Boland

Two kinds of energy: kinetic and potential

Thermodynamic concepts of system and surroundings

The concept of the systems internal energy E (its energy supply)

Why the work of expansion/contraction done on the system is $-P\,\Delta V$

How E changes by heat transfer q and work w done on the system (1st Law)

q and w are the currency of energy exchange

Heat q and how it induces random thermal motion

In terms of molecules there is a fundamental difference between work (organized motion) and heat (random motion)

How heat added increases kinetic energy (translation/moving, rotating, vibrating molecules) while work causes a change in potential energy

What is a state function and why q and w are not state functions but E is (remember the battery example). So too are H, G and S

The concepts of heat capacity, specific heat capacity and molar heat capacity

Calculation of temperature change using specific heat

The enthalpy state function $H=E+PV$ and why it is the heat transferred to the system at constant P

Calculate change in E given H and your calculation of w ($-P\,\Delta V$)

Thermochemical calculations involving: standard enthalpy changes and Hess's Law

**HOMEWORK (Chapter 6)**
7, 13, 17, 23, 27, 29, 43, 45, 51, 53, 55, 59, 61, 63, 65, 67, 87