

1. Processes: isothermal, isobaric, isovolumetric, adiabatic, ...
2. Processes on the P-V diagram; a 'quasistatic' process
3. Work done by a gas : $\int_{V_{\text{start}}}^{V_{\text{finish}}} PdV$; Expands? gas does work; Contracts? work is done *on* it

[Work done *on* the gas] = negative of [Work done *by* the gas]
4. Work is the area under the curve on the $P - V$ diagram. Examples:
isobaric, isovolumetric, slanted straight line, isothermal
5. 'state variables.' internal energy change over a closed (quasistatic) cycle is zero.
work done during a closed cycle; heat in during a closed cycle;
6. Specific heat at constant pressure (c_P) is more than specific heat
at constant volume (c_V). Why? how much more, for an ideal gas?
7. The First Law, again; the equation of an adiabat on the $P - V$ diagram;
the work done during an adiabatic process
8. Molecules that are not points, but have structure. Internal degrees of freedom.
9. (again) Diatomic vs monoatomic gases- O_2 vs O , H_2 vs H , N_2 vs N etc.
10. Diatomic molecules: How many degrees of freedom?
How much internal energy? What then do we expect the heat capacity to be? Is it that?
11. Specific heat depends on temperature. Why aren't *all* the degrees of freedom participating?
How quantum mechanics explains that.