Reading Assignment for November 18
Sections 12.2 and 12.3

Please notice that this file is two pages long.

12.2 - The Atomic Model of an Ideal gas

- This time, you should concentrate on the "Pressure" subsection.
- Pressure = "average" force on a container due to a gas. (Note: liquids also exert a pressure on their container. The definition and behavior is mostly the same as that of a gas.)
- Containers have pressure on "both" sides - the difference between the two is what determine the magnitude and direction of the net force.
- Unit of Pressure - Pascal ($Pa = N/m^2$). There are other units, mostly in chemistry or in the U.S. These are atmosphere (atm), millimeters of mercury ($mm\, Hg$) also called the torr, and pounds per square inch (psi). See textbook for conversions.
- Gauge pressure is a useful quantity that we will be using. (I'll use it more in Chapter 13.)
- The ideal gas law (in its Physics form) $PV = Nk_BT$.

12.3 - Ideal-Gas Processes

- Here we are always talking about a gas that cannot escape its container, so the number of molecules must remain constant.
- Making a plot of pressure versus volume (a pV diagram) allows use to find the work done by the gas.
- A constant-volume process is a vertical line on a pV diagram and corresponds to the gas doing no work.
- A constant-pressure process is called isobaric. Isobaric processes are horizontal lines on a pV diagram. The gas does work $W_{gas} = p\Delta V$ during an isobaric process.

- A constant-temperature process is called isothermal. Isothermal processes are hyperbolas on a pV diagram. The gas does work during an isothermal process, but finding the area requires calculus, so we won't deal with that aspect.

- The first law for ideal gases: $Q - W_{gas} = 3/2Nk_B\Delta T$

- An adiabatic process is one for which there is not heat, *i.e.*, $Q = 0$. Adiabatic expansions lower the temperature of gas, while an adiabatic compression raises the temperature.

The rest of chapter 12

- We won't have time to cover the rest of this chapter's material. I'm relying on the fact that you've probably seen most of it in chemistry. If not, you should read it over. It's fairly well written.