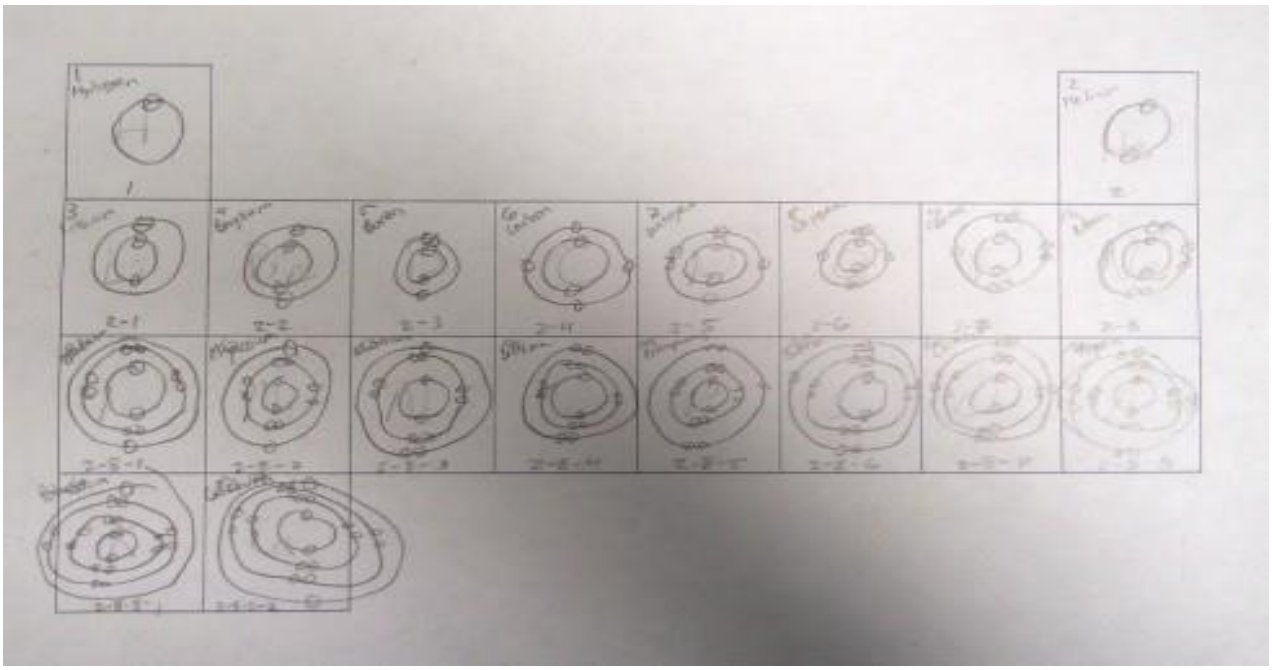
ELECTRON CONFIGURATIONS ON THE PERIODIC TABLE AND FLAME TESTS

Having demonstrated how to draw a few simple atoms, I had students fill out a periodic table template with drawings of the first twenty atoms. Actually, I only had them draw the electrons in their shells because it reduced the messiness of trying to fit in forty nuclear particles into a small tile, and the point I wanted to get at was the pattern of shells and valence electrons in the periodic table.

The end result looked something like this:



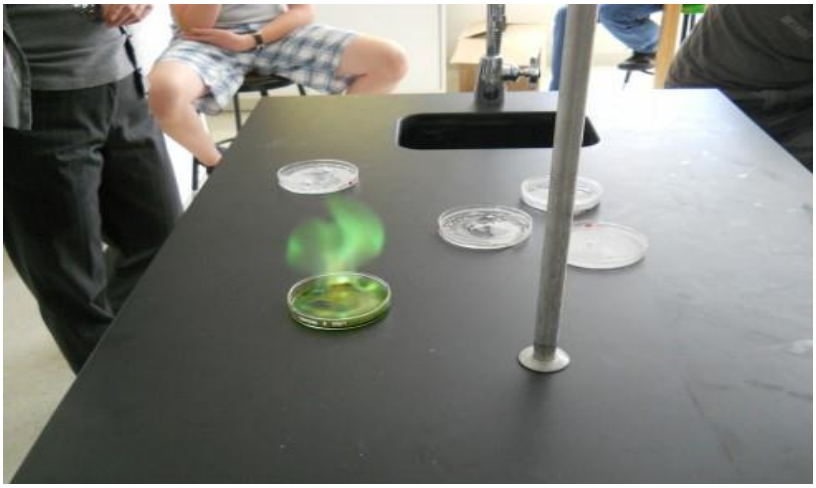
Students learn the relationship between electron configuration and position in the periodic table. Diagram by E.F..

All the drawing only took about 15 minutes, and once they'd figured out the first half dozen or so it started to get a little boring. But that freed up the cognitive resources so they could notice the two key patterns.

- First, each row in the periodic table has an additional electron shell.
- Second, as you go across a row you add one electron to the shell until it is filled.

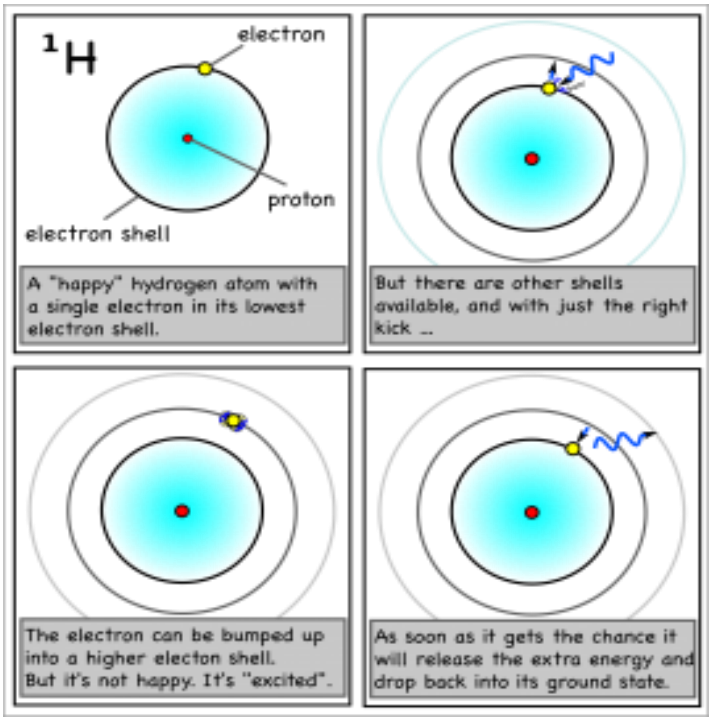
It's a first glimpse at the periodicity in the periodic table. And it sets us up nicely to be able to talk about chemical bonding.

Flame Tests



Copper burns green.

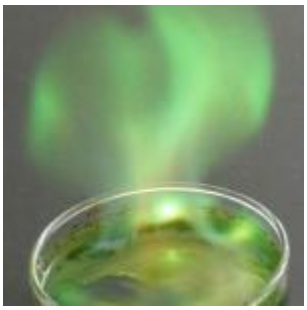
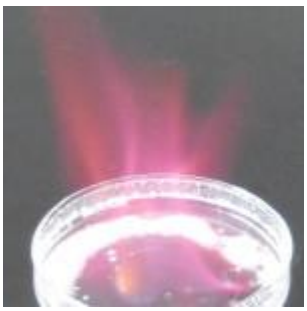
Elements can be identified from the color of light they give off when they're ionized: their emission spectra. Ms. Wilson's chemistry class today set fire to some metal salts to watch them burn.



A hydrogen atom's electron is bumped up an energy level/shell by ultraviolet light, but releases that light when the electron drops back down to its original shell.

She placed the salt crystals into petri dishes, submerged them in a shallow layer of alcohol, and ignited the alcohol. As traces of the salts were incorporated into the flames, the metal atoms became “excited” as they absorbed some of the energy from the flame by bumping up their electrons into higher electron shells. Since atoms don’t “like” to be excited, their excited electrons quickly dropped back to their stable, ground state, but, in doing so, released the excess energy as light of the characteristic wavelength.

Table 1: Emission colors of different metals.

Metal	Flame
Copper	
Strontium	
Sodium	
Lithium	

Source: http://montessorimuddle.org/2013/01/15/electron-configurations-on-the-periodic-table/