**The Periodic Table**

In the late 1800’s, a Russian chemist named Dmitri Medeleev searched for a way to organize the elements. When he arranged all of the elements at that time in order of increasing atomic mass, he discovered there was a pattern. Chemical properties found in lighter elements could be shown to repeat in heavier elements. Because the pattern repeated, it was considered periodic. Today, we call this arrangement a periodic table of elements.

Mendeleev’s table had blank spaces. He looked at the properties and atomic masses of the elements surrounding these blank spaces. From this information, he predicted the properties and masses of elements not yet discovered. Three of Mendeleev’s missing elements were confirmed by 1885. He predicted six elements in all would be found, and eventually, all were discovered.

In 1913, Henry Moseley rearranged Mendeleev’s table so that it was organized by atomic number (the number of protons) instead of by atomic mass. This made sense because each successive element had one more proton than the next. This also showed more clearly which elements were missing. However, it did not indicate how many more there were left to be discovered.

Each row of elements is called a period. The properties of each period change gradually and predictably. There are 2 elements in the 1st period, 8 elements in the 2nd and 3rd periods, 18 elements in the 4th and 5th periods, 32 elements in the 6th period, and there are new ones being added to the 7th period.

The columns of elements in the table are called families or groups. Each family contains elements that have similar chemical or physical properties. The first family is known as the alkali metals. The second family is called the alkaline earth metals. The seventeenth column is known as the halogens, and the eighteenth is called the noble gases. The elements in families 3-12 are called the transition metals.

The elements are divided into three categories:

1. Metals: have luster (shiny), conduct heat, and are malleable (able to bend)
2. Nonmetals: tend to be gases or brittle solids, and are poor conductors
3. Metalloids: share properties of both metals and nonmetals. The metalloids are found along the stair-step line on the periodic table.

When you look at the periodic table, each element is in its own box, and looks something like this:

Element name

Hydrogen

1

H

1.008

Atomic number (number of protons)

Element symbol

Atomic mass (number of protons + neutrons)

The element symbols are one to two letter abbreviations used as “shorthand” in writing chemical equations and formulas. The symbols are based on the element name (Al = aluminum), sometimes based on a Greek or other foreign language name (Ag = argentum = silver). Elements are sometimes name for a person, and thus their abbreviations are also based on the name (Md = Mendelevium for Mendeleev), and sometimes based on a location (Po = Polonium, named for Poland by Marie Curie).