**Chapter 2 reader**

**Modern View of the atom-**

- The atom is composed of three basic parts, the proton, neutron, and the electron.

*List the function, location, mass in amu and grams, and charge of each*

* *Proton*
* *Neutron*
* *Electron*

*The atom is extremely small. Work through sample exercise 2.1 to gain a perspective of the size.*

*What is an Angstrom?*

**Atomic number, mass , and isotopes-**

The atomic number of an atom defines the atom. The atomic number is determined by the number of protons in the atom. Thus, if the number of protons in an atom changes, the identity of the atom changes. YOU CAN NOT CHANGE THE NUMBER OF PROTONS IN AN ATOM WITHOUT CHANGING THE ATOM YOU ARE TALKING ABOUT.

*Describe what would happen to an aluminum atom if it went through alpha decay  
 (Alpha Decay is when an atom loses 2 protons and 2 neutrons)-*

The atomic mass is determined by adding the number of protons to the number of neutrons. The atomic mass of an atom CAN change without changing the identity of the atom by adding or removing neutrons. CHANGING THE NUMBER OF NEUTRONS DOES NOT CHANGE THE IDENTITY OF THE ATOM WE ARE TALKING ABOUT. An atom that has the same number of protons but differing numbers of neutrons is called an ISOTOPE. An Isotope is identified when an element symbol is given with an accompanying mass. For example: If you were given the symbol C it would just be talking about the element carbon with its normal amount of neutrons, 6. If you were given the symbol C with an accompanying mass of 14 you would know it is the isotope of carbon with 8 neutrons. (calculated as mass= 14 minus the 6 protons)

*Work through practice exercise 2.2*

The atomic mass sale is the most convenient way to analyze the mass of atoms. In the atomic mass scale the mass of a proton is considered to be close to one gram instead of its real mass of 1.67 x 10^-24 g. In the amu system, the mass of carbon is considered to be exactly 12 grams . The mass of Hydrogen is 1.0078 amu.

The actual mass of listed on the periodic table and the mass that we most commonly use is called the average atomic mass. It is the sum of all the isotopes of an element multiplied by their percent abundance. If there is mostly carbon 12 in the world and little carbon 14 it should only make sense that the average atomic mass should be closer to 12 than 14.

*Work through sample exercise 2.4-*

**The periodic Table-**

The periodic table is an organized way to view the elements. It is based on the fact that the physical and chemical properties of elements seem to repeat every eight elements. This lead to there being eight main groups of elements. These eight groups of elements are considered the representative elements. Further investigation has lead to the transition metals, lanthanides, and actinides.

*List the names of the five named groups listed in table 2.3*

*Draw a rudimentary picture of the periodic table. Indicate the relative position of the metals, non-metals, and metalloids.*

**Molecules and molecular compounds-**

A molecule is two or more atoms tightly bound together. These two atoms will behave as though they are one entire package. Many elements in nature form a mutually beneficial bond to another atom of the same element. Example include hydrogen and oxygen. These types of atoms are considered DIATOMIC elements. Diatomic elements should always be considered diatomic when discussed if not explicitly listed as monatomic or s ions.

*List ALL the diatomic Elements-*

*THIS LIST SHOULD BE MEMORIZED!!!!!*

**Compound-** Two or more elements chemically combined.

**Empirical formula-** the simplest ratio of elements in a compound.

**Molecular formula-** the actual ratio of element represented in a molecular compound.

**Molecular Compound-** compounds that are composed of one or more molecules. Generally contain only non-metals.

**You should read section 2.6 to get a thorough explanation of the difference between molecular and empirical formulas.**

**Ions and ionic compounds-**

An ion is an atom that has become charged through the gaining or losing of an electron. If an atom loses an electron it is positively charged and called a cation. If an atom gains an electron it becomes negatively charged and is called an anion. An atom will lose or gain an electron to obtain an electron configuration of a noble gas.

*What would the following atoms do to obtain a noble gas configuration? Na, F, Be, N? Include whether they would form cations or anions.*

Two or more atoms that have formed oppositely charged ions can combine to form an ionic bond. AN IONIC BOND IS A BOND BETWEEN TWO OR MORE IONS. *An ionic bond always contains a metal and a non-metal. Why?*

*Describe the mechanism of the formation of a bond between Magnesium and Chlorine-*

*Work through sample exercise 2.10-*