**CHEMISTRY**

**Proton**
- Charge = 1
- Mass = 1
- Nucleus

**Neutron**
- Charge = 0
- Mass = 1
- Nucleus

**Electron**
- Charge = -1
- Mass = 0
- Orbital Shells

2 in Shell 1
8 in Shell 2
8 in Shell 3
Then begin Shell 4 \[ \Rightarrow (2, 8, 8, 2) \]
10 in Shell 3

**Isotopes**
Atoms of the same element with different numbers of neutrons.

**Relative Atomic Mass**
The ratio of the average mass of one atom of an element to one-twelfth of the mass of one atom of carbon-12.

**Relative Molecular Mass**
The sum of relative atomic masses in a compound.

**Avogadro's constant**
\[ \text{Gx} \times 10^{23} \]

**Mole**
A unit of measurement for the amount of a specific substance.

**Periodic Table**
- Group 1 & 2 are most reactive
- Group 7 & 8 are most unreactive
- Group 1 - Alkali Metals
- Group 7 - Halogens
- Group 8 - Noble Gases

**Group 7 react with metals to form salts.**
Transition metals are all good conductors of electricity.
Group # = number of electrons in outermost shell (valence electrons)

**Ions**
- Formed by the loss/gain of electrons.

**Ionic Bonding**
Occurs when an atom gives or takes electrons from other atoms.
Occurs between metallic and non-metallic elements.

\[ \text{Na} \rightarrow \text{Na}^+ \] gives it away

1 electron in outer shell

8 electrons in outer shell

**Covalent Bonding**

- Occurs when atoms share electrons to fill outer shells and become unreactive.
- Occurs between non-metallic elements.
- More complex covalent structures also occur such as \( \text{N}_2 \), \( \text{C}_2\text{H}_4 \).
- These structures have more than 3 covalent bonds.

\[ \text{H} \quad \text{O} \quad \text{H} \]

\[ \text{H} \quad \text{H} \quad \text{O} \]

- **Double Bond**
- Both oxygen and hydrogen have full outer shells.