**AP Biology Unit 1 – Study Guide**

**Chapters 2 – 5: Chemistry of Life and Biological Macromolecules**

 Describe the difference between ions and atoms and explain the important of ions in biological processes.

 Compare the types of bonding between atoms to form molecules.

* Identify subatomic particles and describe how they are arranged in atoms.
* Describe valence level electrons and their importance to bonding of elements.

 Define isotope and provide examples of how isotopes are used in medicine and other branches of science.

 Explain how the properties of water make water essential for life on Earth.

* polarity
* heat capacity
* heat of vaporization
* solvent (dissociation)
* cohesion / adhesion
* Explain the role of chemical bonds in water molecules and how they bond to other water molecules
* Compare an acid to a base, paying close attention to how hydrogen ions play a role in these types of compounds.
* Describe the effect of increasing Carbon Dioxide in the ocean.

 Explain the difference between organic and inorganic compounds.

 Define isomer and provide examples of structural isomers, enantiomers, cis-trans isomers (glucose & fructose)

 Describe the properties of the carbon atom that make the diversity of carbon compounds possible.

 Identify functional groups of organic compounds and provide examples.

* hydroxyl
* carbonyl (ketones & aldehydes)
* carboxyl
* amino

 Compare hydrolysis to dehydration synthesis with regard to how macromolecules are formed and broken down.

 Identify and/or describe the basic molecular structure of:

* carbohydrates
* lipids
* proteins
* nucleic acids

 Describe structure and provide examples of:

* monosaccharides, disaccharides, polysaccharides, pentose sugars
* fatty acids, triglycerides, saturated & unsaturated fats (know the differences of Saturated and Unsaturated)
* lipids and phospholipids
* steroids
* proteins and amino acids (polypeptides)
* nucleic acids (DNA, RNA)
* Identify the differences between Carbohydrates in plants and animals
* Explain how the folding of proteins into their different shapes affects their overall function