**AP Biology Midterm Exam Study Guide**

**Chapters 2-6, 7 and 12**

*Exam Format: 35 Multiple choice questions (some with 4 choices, some with 5)*

*NOTE: All questions will come from previous assessments*

* Be able to determine the atomic mass and number of an atom. Also be able to calculate the number of protons, neutrons, and electrons.
* Be able to draw models of atoms if given the atomic mass and number.
* Understand the differences between the types of bonds {covalent (polar and nonpolar), ionic, hydrogen}
* Understand pH. (Including the scale, how acids and bases react in water/solution, etc.)
* Know what buffers are and how they react in solutions.
* Know how to classify functional groups based on structural formula. Also know the properties of each.
* Be able to differentiate between structural isomers, geometric isomers, and enantiomers.
* Understand condensation/dehydration reactions and when they occur.
* Be able to describe why water is necessary for life (properties).
* Know the role, structure, examples and be able to identify each of the classes of biomolecules, including examples that were provided (Hemoglobin, starch vs. cellulose, saturated vs. unsaturated, etc.)
* Also understand how the amino acids differ from one another
* Be able to differentiate between the 4 levels of protein structure and what types of bonds are involved in each
* Know what denaturation is and how it affects protein function
* Be able to describe the structure of DNA
* Be able to describe the function of cellular organelles (nucleus, cell membane, mitochondria, chloroplast, ribosomes, golgi apparatus, nuclear envelope, lysosomes, nucleolus, endoplasmic reticulum)
* Be able to describe the structure of the cell membrane
* Be able to describe the various types of movement across a membrane (diffusion, facilitated diffusion, active transport, phagocytosis, pinocytosis, endocytosis, osmosis, etc.) and to predict which way materials will flow.
* Be  able to differentiate between the structures found in prokaryotic cells and eukaryotic cells
* Know the phases of the cell cycle {G1, S, G2 (collectively Interphase) and M} and what happens in each.
* Know what mitosis is, including each phase and what happens generally in each.  Also know what is produced at the end of the process.
* Know the differences between the vocabulary associated with mitotic DNA (centromere, sister chromatids, chromatin, homologous chromosomes, etc.)