**Biology 101 Exam 1 Study Guide**

* Know the difference between a hypothesis & a scientific theory
* Know the parts of an experiment, be able to identify them in experiments, be able to graph and analyze data, be able to design an experiment
  + Independent variable
  + Dependent variable
  + Control group
  + Controlled variables/ constants
* Be able to describe the 3 major types of bonds
  + Covalent
    - Polar
    - Nonpolar
  + Ionic
  + Hydrogen
* Be able to identify the parts of an atom, their charges, their location, and use a periodic table to determine the numbers of each
  + Protons
  + Neutrons
  + Electrons
* Explain the significance of valence electrons, bonding properties of atoms, and the octet rule
* Identify why carbon is such an important atom for life and what organic compounds are
* Identify the correct monomers for each of the following organic polymers, properties/ uses of each
  + Carbohydrates
  + Lipids
  + Proteins
  + Nucleic acids
* Compare and contrast prokaryote and eukaryote cells
* Compare and contrast plant and animal cells
* Identify the pathway a newly synthesized protein takes to be excreted via the endomembrane system
* Identify the flow of genetic information in the Central Dogma of Biology
* Draw an label the parts of a phospholipid and explain how the properties contribute to the structure and function of the cells membrane
* What is the endosymbiont theory, what organelles does it involve, and what evidence supports it \*
* Identify how cells move items in and out across their membrane
  + Active transport
    - Pumps
    - Endocytosis
    - Exocytosis
  + Passive transport
    - Diffusion
    - Facilitated diffusion
    - Osmosis
  + Understand the role of concentration gradients
* Identify the structure and function of all cell parts both in words & diagrams
* For photosynthesis & Cellular Respiration be able to:
  + Identify what the steps are
  + Identify the location within the cell of each step
  + Identify the reactants
  + Identify the products
* Understand the importance of ATP cycling in metabolism
* Identify the properties of water and how life relies on them
  + Cohesion
  + Adhesion
  + High specific heat capacity
  + High heat of vaporization
  + Solvent properties
* Identify the levels of protein folding in determining their final structure & the bonds responsible for each
  + Understand sickle cell as an example of altered structure of a protein leading to disease
* Explain how enzymes work
  + Active site
  + Activation energy
  + Substrate
  + Understand the graph
    - Endothermic
    - Exothermic