**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