**Unit 2: Biochemistry**

**Unit 2 References: Textbook Ch. 6**

**Test Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A: Basic Chemistry**

1. Read the information at <http://www.chem4kids.com/files/atom_intro.html> and define the following terms in your own words:
   1. Atom
   2. Proton
   3. Electron
   4. Neutron
   5. Element
   6. Matter
   7. Compound
   8. Ion
   9. Isotope
2. Create a concept map that illustrates the structure of matter. Include the following terms: atom, element, compound, molecule, ion, isotopes. Make sure to include “connecting words” to show the relationship between these terms.
3. Read the given information about atomic structure:

* The nucleus of an atom holds the protons and neutrons.
* # of protons = the atomic number from the periodic table.
* Protons + Neutrons = atomic mass (also from periodic table)
* In a neutral atom, positive protons are equal to negative electrons.
* The electron cloud holds electrons in energy levels as follows: 1st=2 electrons, 2nd=8 electrons, 3rd=18 electrons. Fill from the inside out!
* <http://www.livescience.com/37206-atom-definition.html>

Draw an atom of OXYGEN.

Draw an atom of CARBON.

* Atoms need a full outer shell (or at least 8 electrons) to be stable “happy”. Explain why these two atoms are not stable. How do you think atoms get the electrons they need to be stable?

**B: Organic Molecules**

1. Define the following terms in your own words:
   1. Lipid
   2. Nucleic Acid
   3. Carbohydrate
   4. Protein
   5. Catalyst
   6. Enzymes
2. Read the information found at <https://www.cliffsnotes.com/study-guides/anatomy-and-physiology/anatomy-and-chemistry-basics/organic-molecules>

Describe what makes a molecule ORGANIC.

1. Identify the following molecules as ORGANIC or INORGANIC:
   1. H 2 O
   2. C 6 H 12 O 6
   3. CH 4
   4. KOH

**C. Background on pH and Water**

1. In your own words compare & contrast acids and bases. Make sure to include what ions make a solution an acid and what ions make a solution a base.
2. Keeping that in mind, identify the following as acids or bases: HF, Mg(OH)2, HCl, H2SO4, KOH
3. Think about a water molecule. **H 2 O** Explain why water has a neutral pH.
4. Draw a one molecule of water. Label the positive and negative ends of the molecule.
5. Water can creep up thin tubes such as plant roots and pull more water molecules up the root. Using the diagram from #4 explain how water molecules might link together to accomplish this.

**D. Enzymes**

1. Refer to the figure on pg.162 in the online text book. Read the captions. Describe in your own words why shape is important to enzyme substrate interactions.
2. Use <http://www.chem4kids.com/files/bio_enzymes.html> to list factors that act as controls on enzyme activity? Define denature.
3. Read about specific enzymes on <http://sciencelearn.org.nz/Contexts/Digestion-Chemistry/Looking-Closer/Digestive-enzymes>. Use the table to list at least **three** enzymes used in our digestive system.