Biochemistry Basics!!!

Name: _____

Per: _____ Date:_____

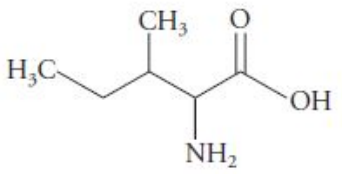
Bonding and Chemical Structures

1. What is the difference between a covalent bond and an ionic bond?

2. How many bonds are typically formed by each of the following atoms:
   Carbon: _____ Hydrogen: _____ Oxygen: _____ Nitrogen: _____

3. Locate all the atoms in the line drawing of isoleucine shown to the right, and write its chemical formula!

   Formula for isoleucine: _____



Isoleucine

4. On Schoology (or here: https://www.youtube.com/watch?v=ASLUY2U1M-8&t=49s) , find the TedEd video "How Polarity Makes Water Behave Strangely". Use this resource as well as your own knowledge of chemistry to answer the following questions:

   a. What makes a molecule polar?

   b. Draw a diagram of a water molecule and label its polar regions. Then, draw and label a second water molecule forming a hydrogen bond with the first. (you can make a sketch using the Kami tools or you can make a sketch on paper and insert a photo of your sketch here):

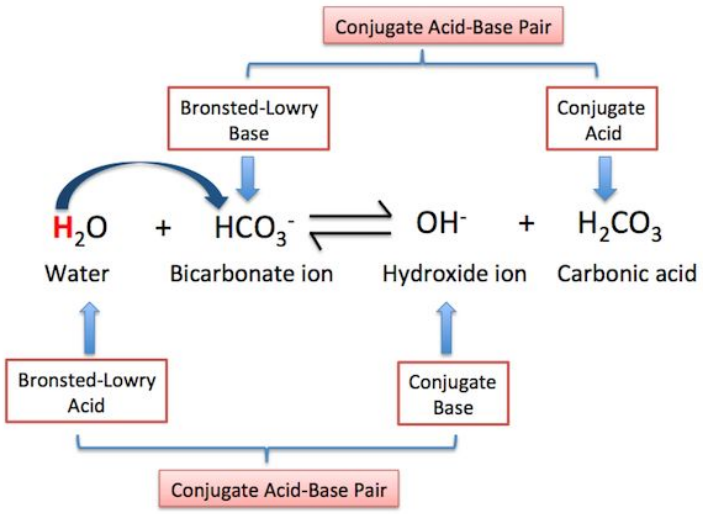
   c. Why does ice float on liquid water?

   d. Another term for polar molecules is (circle one) **hydrophobic / hydrophilic** which literally means _____ , and nonpolar molecules are (circle one) **hydrophobic / hydrophilic** which literally means _____.

e. Compounds will mix with or dissolve into each other best when their polarities are similar. Provide two specific examples of compounds that will dissolve in water, and two that will dissolve in oil, and explain why they interact in this way.

Acids and Bases

Examine the diagram showing an acid-base interaction. What's happening??



4. Based on what you see in the diagram, come up with a simple definition of an **acid**:

5. Based on what you see in the diagram, come up with a simple definition of a **base**:

6. What is pH? Based on the definitions you wrote above, how do acids and bases affect the pH of a solution?

Making and Breaking Macromolecules:

On Schoology (or at https://www.youtube.com/watch?v=ZMTeqZLXBSo) watch the video titled "Dehydration Synthesis and Hydrolysis"

a. What is **dehydration synthesis**? What are the reactants, and what is the result? Sketch a simplified reaction, using shapes for the components. (you can make a sketch using the Kami tools or you can make a sketch on paper and insert a photo of your sketch here):

b. What is hydrolysis? What are the reactants, and what is the result? Sketch a simplified reaction, using shapes for the components. (you can make a sketch using the Kami tools or you can make a sketch on paper and insert a photo of your sketch here):

c. Sketch this reaction: If you make sucrose from glucose & fructose monomers, _____ water molecule(s) will be *(circle one)* released/used. (you can make a sketch using the Kami tools or you can make a sketch on paper and insert a photo of your sketch here):

d. Sketch this reaction: If you digest a protein made of 10 amino acids, _____ water molecule(s) will be *(circle one)* released/used. (you can make a sketch using the Kami tools or you can make a sketch on paper and insert a photo of your sketch here):