

NAME: _____ Period: ____ Date: _____ HR: _____

Ms. Young's Biology Unit 3 Study Guide: The Chemistry & Characteristics of Life. This review guide is just a bit different than the other biology teachers. One major difference is that I had to make the print larger so I could see it. I wanted to add in a bit more on enzymes. ☺

Let's Review...

1. Define **homeostasis**.

2. Give an example of how organisms maintain **homeostasis**.

3. Define **Metabolism**—

4. List the 8 characteristics of life

- | | |
|----------|----------|
| a. _____ | e. _____ |
| b. _____ | f. _____ |
| c. _____ | g. _____ |
| d. _____ | h. _____ |

5. Primary succession begins with what kind of environment? _____

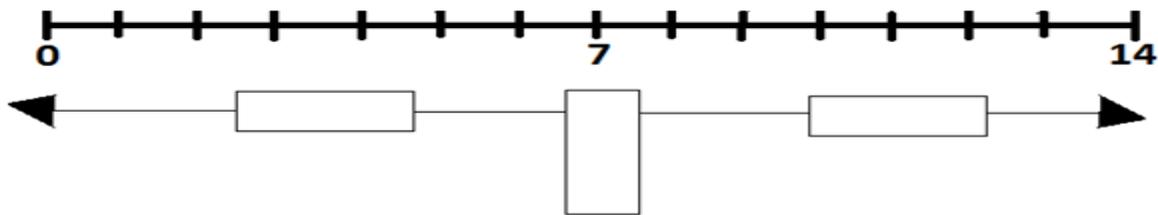
Secondary succession starts with _____.

If given enough time, both types of succession will end with what type of community?

6. When toxins move up a food chain, the process is called?

pH: Acids & Bases

7. Fill in the diagram of the **pH scale**. Label the basic, acidic, and neutral location on your scale.



8. What is our normal pH of our stomach? _____ Is that an acid or base? _____

9. Explain what a buffer is and how it can be used in the human body.

a. If you need to neutralize an acid, what type buffer do you need? _____

b. What about if you have a base? _____

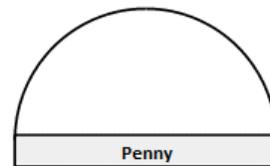
Water!

10. Water is made of _____ hydrogens and _____ oxygen

11. What property is it when water sticks to itself?

12. What property is it when water sticks to something else?

13. To the right is a picture of a penny with a large water droplet. Using your answers to #11 and #13, draw an arrow where both properties are being demonstrated.



14. You know you need to drink more water but you hate the taste! You decide to add a big squirt of fruit punch MiO (Gatorade flavoring). You mix them together and make: (circle one) solution or suspension

15. In that refreshing drink, what is the solvent? _____

Which one is the solute? _____

Macromolecules

16. What are the building blocks of macromolecules called? _____

17. When you join 2 or more of those building blocks, you form _____

18. List which macromolecules are found in each of the items below (there will be more than one in each item)

a. Cheese pizza (crust, tomato sauce, cheese): _____ ,
_____ , _____

b. Oatmeal with butter and cinnamon sugar: _____ ,

c. Freshly cooked French fries (think about the bag they come in, what will the bag look like?): _____ , _____

d. You bite your tongue and spit out blood. What's in the spit? _____ ,

19. Use your online notes we completed in class and your foldable to complete the macromolecule table.

Macromolecule Name	Monomers/Building Blocks	Functions	Example(s)
Proteins		1. Catalyze (enzymes) 2. Repairs muscles 3. Fight disease 4. Transport chemicals	1. 2. 3. 4.
Lipids	Fatty acids and glycerol	1. 2. 3.	1. 2. 3.
Nucleic Acids		1.	1. DNA 2.
Carbohydrates		1. 2.	1. 2. 3.

Chemical Reactions and Enzymes

20. What kind of energy is needed to start all chemical reactions in your body?

21. What do enzymes do to activation energy?

22. Explain what a catalyst does to chemical reactions.

23. If you just ate a cracker and the amylase in your spit is breaking it down, answer the following:

a. Substrate (reactant): _____

b. Enzyme: _____

c. Product: _____

24. What are 2 things that can change and then affect how well an enzyme works?

a. _____

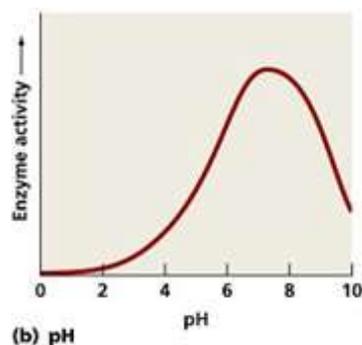
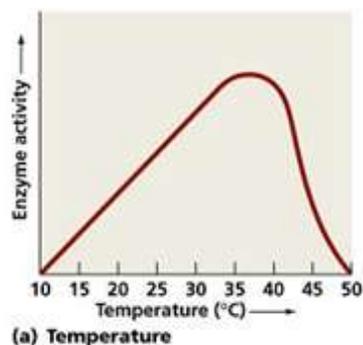
b. _____

25. Look at the graph below. These graphs are on ENZYMES!

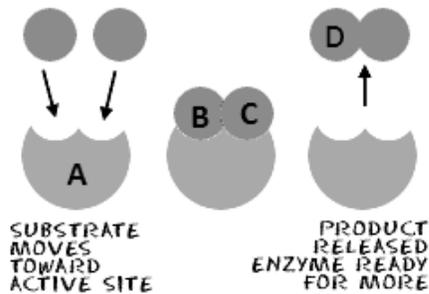
a. What is the best temperature for this enzyme? _____

b. What is the optimal pH (the highest point of the curve) for this enzyme? _____

c. THINK before you answer! What would happen if that same enzyme were placed in your stomach?



26. Look at the image below. Which labeled part is the enzyme?



27. Watch the video titled “Amoeba Sisters Enzymes” found on YouTube. I have it linked on our science website, but here is the actual address: <https://www.youtube.com/watch?v=qgVFkRn8f10>. Use the video to answer the questions below.

a. Illustrate an enzyme and substrate. Label the following key words in your illustration: enzyme, substrate, and active site.

b. Enzymes are typically which type of biomolecule?

c. Describe the effects that enzymes can have on substrates. In order to function efficiently, enzymes need to be at an ideal pH and temperature. Different enzymes have different ideal pH and temperature conditions. If the pH or temperature is extreme for a particular enzyme, it can even denature an enzyme, which can prevent it from binding and acting on its substrate. For the following two scenarios, name the variable (temperature or pH) that is affecting the function of the enzyme.

- ▶ ATP is produced by cellular respiration in your human body cells. There are a variety of enzymes that work to produce ATP, but one of those enzymes is called phosphofructokinase-1. This enzyme is sensitive to blood acidity. Blood can become more acidic if a patient is in respiratory distress.

What is the variable affecting enzyme function: _____.

- ▶ A popular lab that can be performed by students is to test the reaction rate of catalase enzyme when it acts on the substrate hydrogen peroxide. Catalase has the ability to break down hydrogen peroxide. Catalase can be found in beef liver from the grocery store! However, if the beef liver is boiled first, the catalase will not be able to break down hydrogen peroxide.

What is the variable affecting enzyme function: _____.