

Name: _____

Block: _____

Reading Assignment No. 1

Characteristics of Water and its Role in Biological Systems • Acids and Bases • Organic Molecules

Read Section 2.3 and 2.4 on pages 27-31 in your textbook and answer the following questions:

1. For each of the following characteristics of water, explain how it relates to water's role in biological systems. Please be specific and mindful that your answer is in your OWN WORDS.

a. Water has a high heat capacity.

b. Water has a high heat of vaporization.

c. Water is a solvent.

d. Water molecules are cohesive and adhesive.

e. Water has a high surface tension.

f. Ice is less dense than liquid water.

2. What is an acid?

3. Explain and provide a general reaction that demonstrates how acids behave when they dissociate in water.

4. What is a base?

5. Explain and provide a general reaction that demonstrates how bases behave when they dissociate in water.

6. What is the pH scale and how does it relate to $[H^+]$ and $[OH^-]$?

7. How does $[H^+]$ change as you move down and up the pH scale by 1 unit?

8. How does a buffer resist changes in pH?

9. Explain in detail how buffers in your blood help to maintain stable blood pH levels. Use chemical equations to support your written response.

10. What is an organic molecule?

11. How does carbon's electron configuration enable it to bond to other atoms?

12. Draw a hydrocarbon chain.

13. For each of the following macromolecules, list its monomer:

- a. Carbohydrate: _____
- b. Protein: _____
- c. Nucleic acid: _____
- d. Lipids: _____

14. Describe a dehydration reaction and draw a diagram that supports your written response.



15. Describe a hydrolysis reaction and draw a diagram that supports your written response.


