

Fold along the line and glue this side down in your Interactive Science Notebook.

Chapter 2: Biochemistry



Learning Objectives: There is a purpose of synthesis and breakdown of macromolecules in an organism. Energy is used in the maintenance, repair, growth, and production of tissues. Certain properties of water sustain life (for example: polarity, cohesion, solubility). Metabolic reactions are catalyzed by enzymes, whose shape and function are closely related.

Key Concepts:

Carbon Chemistry
pH

Elements in Living Things
Properties of Water
Enzyme structure

Molecules and Chemical Bonds
Macromolecule Structure & Functions
Factors that affect Enzyme activity

Essential Questions:

1. Why is carbon such a unique and important element that makes up life's molecules?
2. Why is water such a unique compound?
3. How is pH important to living things?
4. What are the functions of the four groups of macromolecules?
5. What are the general structures of the 4 groups of organic molecules?
6. What foods contain the 4 major groups of organic molecules?
7. How does one know that enzymes speed up chemical reactions?
8. How are rates of enzyme activity in cells affected by various factors such as pH or temperature?

CAN YOU SHOW
WHAT YOU
KNOW?

Vocabulary: (+) = Can explain it; (-) = Only heard it; 0 = No idea

Page	Term	Pre	Post	Memory Clue
	1. covalent bond			
	2. ionic bond			
	3. hydrogen bond			
	4. polar covalent bond			
	5. hydrophilic			
	6. hydrophobic			

Page	Term	Pre	Post	Memory Clue
	7. ion			
	8. cohesion			
	9. adhesion			
	10. capillary action			
	11. specific heat capacity			
	12. solute			
	13. solvent			
	14. solution			
	15. suspension			
	16. pH			
	17. organic compound			
	18. monomer "mono-"			
	19. polymer "poly-"			
	20. carbohydrate			
	21. monosaccharide "mono-"			
	22. disaccharide "di-"			
	23. polysaccharide "poly-"			
	24. glycogen			
	25. cellulose			
	26. protein			
	27. amino acid			
	28. polypeptide			
	29. nucleic acid			
	30. nucleotide			
	31. ATP			
	32. lipid			
	33. triglyceride			
	34. phospholipid			
	35. enzyme			
	36. substrate			
	37. active site			
	38. catalyst			
	39. denature			
	40. reactants			

What I Need to Know/Be able to do:

1. **Sequence** the following chemical bonds from strongest to weakest: *ionic, hydrogen, covalent*.
2. **Recognize** that biological organisms are composed primarily of very few elements-HONC.
3. Given a biologic scenario, **identify** the property of water that allows that to occur.
4. **Relate** the polarity of water to its other properties.
5. **Explain** the use pH indicators and the meaning of each result.
6. **Describe** the role of carbon in living organisms.
7. **Compare and contrast** polymers and monomers.
8. **Summarize** the four major families of biological macromolecules; including their structures and functions.
9. **Sketch** the 4 levels of protein structure and **describe** why the amino acids are held in those conformations.
10. **Identify** the parts of chemical formulae and reactions (coefficients, subscripts, products, reactants).
11. **Explain** the role of enzymes as catalysts that lower the activation energy of biochemical reactions.
12. **Identify** factors, such as pH and temperature that have an effect on enzyme.