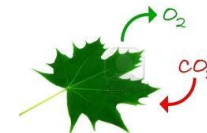


UNIT 4: Biochemistry



Biology Textbook: Chapters 2, 8 & 9

Standard 1: Students apply the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Standard 2: Students know and understand common properties, forms, and changes in matter and energy.

1. Elements can be organized by their physical and chemical properties (Periodic Table)
4. Word and chemical equations are used to relate observed changes in matter to its composition and structure

Standard 3: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.

1. There is a relationship between the processes of photosynthesis and cellular respiration
2. There is a purpose of synthesis and breakdown of macromolecules in an organism
3. Energy is used in the maintenance, repair, growth, and production of tissues
8. Certain properties of water sustain life (for example: polarity, cohesion, solubility)

Standard 5: Students understand that the nature of science involves a particular way of building knowledge and making meaning of the natural world.

Key Concepts:

Atomic Structure	Elements in Living Things	Molecules and Chemical Bonds
Carbon Chemistry	Properties of Water	Macromolecule Structure & Functions
Nutrients in Food	Enzyme structure	Factors that affect Enzyme activity
Chloroplast Structure	Photosynthesis Reactions	Mitochondrion Structure
Aerobic vs. Anaerobic Respiration		Photosynthesis & Cellular Respiration Relationship

Essential Questions:

1. What elements does carbon bond with to make up life's molecules?
2. Why is water such a unique compound?
3. What are the functions of the four groups of macromolecules?
4. How does one know that enzymes speed up chemical reactions?
5. How are rates of enzyme activity in cells affected by various factors such as pH or temperature?
6. How do plants and other organisms capture energy from the sun?
7. What variables can be manipulated to change the rate of photosynthesis?
8. What variables affect the rate of cell respiration?
9. How does body heat relate to cellular respiration?
10. How is ATP involved in many chemical reactions in the cell?
11. What is the relationship between photosynthesis and cellular respiration?

CAN YOU SHOW
WHAT YOU
KNOW?

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

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

Page	Term	Pre	Post	Memory Clue
	1. Atom			
	2. Element			
	3. Chemical bond			
	4. Molecule			
	5. Cohesion			
	6. Adhesion			
	7. Surface tension			
	8. Polarity			
	9. Capillary action			
	10. Polymer "poly-"			
	11. Macromolecule "macro-"			
	12. Monomer "mono-"			
	13. Protein			
	14. Polypeptide			
	15. Amino acid			
	16. Calorie			
	17. Carbohydrate			
	18. Monosaccharide (Simple sugar)			
	19. Disaccharide "di-"			
	20. Polysaccharide			
	21. Nucleic acid			
	22. Nucleotide			
	23. Lipid			
	24. Enzyme			
	25. Substrate			
	26. Active site			
	27. Activation Energy			
	28. Denature			
	29. ATP			
	30. Light reaction			
	31. Calvin cycle (Dark reaction)			
	32. Chlorophyll			
	33. Pigment			
	34. Thylakoid			
	35. Stroma			
	36. Cristae			
	37. Matrix			
	38. Glycolysis "glyco-" "-lysis"			
	39. Aerobic "aer"			
	40. Anaerobic (Fermentation)"an-"			

What I Need to Know/Be able to do:

- Diagram** the structure of an atom.
- Recognize** that biological organisms are composed primarily of very few elements-C,H,N,O,P,S.
- Describe** how chemical bonds form to make molecules.
- Given a biologic scenario, **identify** the property of water that allows that to occur.
- Relate** the polarity of water to its other properties.
- Describe** the role of carbon in living organisms.
- Summarize** the four major families of biological macromolecules; including their structure and function.
- Explain** the role of enzymes as catalysts that lower the activation energy of biochemical reactions.
- Identify** factors, such as pH and temperature that have an effect on enzymes.
- Describe** how ATP works in a cell.
- Identify** the role of electron carriers.
- Diagram** the structure of the chloroplast and mitochondrion.
- Identify** the reactants, products, and basic purposes of photosynthesis and cellular respiration.
- Describe** the reactions in photosynthesis and cellular respiration.
- Distinguish** between aerobic and anaerobic respiration.
- Compare** lactic acid and alcoholic fermentation.
- Explain** the interrelated nature of photosynthesis and cellular respiration in the cells of photosynthetic organisms.

