

AP Biology
Student Learning Plan
Biochemistry Unit 3 - 14 Days
Math skill: Gibbs free energy

Day/Date	Topic/Objectives	Support
Day 1	Atoms and molecules <input type="checkbox"/> Explain the uses of carbon, hydrogen, oxygen, phosphorus and sulfur in biological systems. <input type="checkbox"/> Why is matter necessary for biological systems?	2.1 -2.3
Day 2	Water and Ph <input type="checkbox"/> Describe the structure of water and the unique properties that lead to hydrogen bonding. <input type="checkbox"/> Explain how the polarity of water and hydrogen bonding causes cohesion	2.5-2.6
Day 3	Carbon <input type="checkbox"/> Discuss the usefulness of carbon in building organic molecules <input type="checkbox"/> Describe how carbon is cycled through the ecosystem	3.1
Day 4	Polymers <input type="checkbox"/> What are the benefits of variability in polymer structure <input type="checkbox"/> What determines the structure and function of a particular polymer? <input type="checkbox"/> How do changes in the structure of polymers impact living organisms? <input type="checkbox"/> What polymers are important to living organisms?	
Day 5	Carbohydrates <input type="checkbox"/> Describe the chemical process that monomer units make carbohydrates <input type="checkbox"/> How do differences in chemical structure determine the function of cellulose, starch and glycogen?	3.2
Day 6	Lipids <input type="checkbox"/> How does the polar nature of lipids determine its function? <input type="checkbox"/> What is the role of phospholipids in the cell membrane and how is this determined by its structure? <input type="checkbox"/> What chemical differences distinguish saturated and unsaturated lipids?	3.5
Day 7	Nucleic Acids <input type="checkbox"/> How does the phosphorus cycle impact the formation of nucleic acids <input type="checkbox"/> Describe the structure of the monomer units that form nucleic acids	3.3

	<input type="checkbox"/> How is information encoded in nucleic acids <input type="checkbox"/> How does the structure of RNA differ from that of DNA? <input type="checkbox"/> What structural features of nucleic acids give them directionality? <input type="checkbox"/> How does diversity in genetic information lead to flexibility of function	
Day 8	RNA world <input type="checkbox"/> What unique features of RNA make it suitable as an early step in the evolution of cells? <input type="checkbox"/> How does complexity lead to “robustness” in living systems <input type="checkbox"/> What processes are “conserved” because they are fundamentally important for living organisms?	
Day 9	Proteins How does the nitrogen cycle make matter available for the formation of proteins How do the primary, secondary, tertiary and quaternary levels of organization determine the function of specific proteins? Describe the chemical structure of amino acids How are the R groups of amino acids classified How does the chemical nature of the R groups in amino acids determine the structure and function of proteins? Describe how the primary structure of proteins is formed What determines the primary structure of proteins?	3.4
Day 10	Enzymes Describe how the structure and function of enzymes allow them to catalyze chemical reactions Describe the interaction of enzyme and substrate at the active site. How do competition and cooperation affect the reaction of enzyme to substrate? How do coenzymes and cofactors impact the function of enzymes How do competitive and noncompetitive inhibitors impact the function of enzymes Describe how receptor-ligand interactions affect enzymes	
Day 11	Lab What variables impact the function of enzymes	
Day 12	Lab How can data be collected that represent the function of an enzyme over time	
Day 13	review	
Day 14	test	