

Honors Biology Syllabus - Unit 1: Chemistry of Life

Essential Questions:

1. How do organisms obtain and use the matter and energy they need to live and grow?
2. How does the chemical makeup of an organism enable life's functions?
3. What molecules are essential for all life and how are these molecules assembled?

Required Reading:

- Chapter 1 (All)
- Chapter 2 (All)

Classwork:

- Class Lab Reviews

Homework:

- Unit 1 Vocabulary Checklist (Due on day of Unit 1 Exam)
- "What Science IS" Reading & Writing Prompt
- "Why Study Chemistry" Writing Prompt
- Peculiarities of Water Poster
- Organic Molecules Videos & Writing Prompts
- Identification of Unknown Carbohydrates Lab
- Enzyme Activity Inquiry Investigation

Labs:

- Identification of Unknown Carbohydrates
- Enzyme Activity Inquiry Investigation

Quizzes:

- Properties of Water Quiz (10 pts)
- Biological Macromolecules Quiz (20 pts)

Unit Exam (60 pts):

- 30 Multiple Choice Questions (30 pts - 1 pt per question)
- 6 Short Answer Questions (30 pts - 5 pts per question)

Schedule: (See "Weekly Outline" on course website for potential adjustments)

Date	Lesson Topics	Assignments
Thursday 08/15	-Introductions	
Friday 08/16	-Distribute Unit 1 Vocabulary Checklist -Explore Course Website & Online Textbook	-Unit 1 Vocabulary Checklist (Due Tuesday, 09/17)
Monday 08/19	-Introduce "Quotes of the Day" -Discuss Course Directives -Discuss Unit 1 Syllabus -Distribute and Discuss Safety Contracts	-Read Course Directives (Due Friday, 08/23) -Get Safety Contracts Signed (Due Monday, 08/26) -Read 1.1-1.2 & Define Key Terms on Vocab Checklist (Due Tuesday, 08/20)
Tuesday 08/20	-Video: Coevolution of Toxic Newts -Discuss "Scientific Method"	-Read 1.3-1.5 & Define Key Terms on Vocab Checklist (Due Block Day)
Block Day 08/22	-Notes: The Nature of Scientific Knowledge -Discuss Experimental Variables -Class Lab: Sample Experiments	-Read "What Science IS" -Respond to "What Science IS" Writing Prompt (Due Friday, 08/23)
Friday 08/23	-Discuss "What Science IS" -Review Atomic Structure & Periodic Table -Class Lab: Atomic Structure Practice Problems	-Read 2.1 & Define Key Terms on Vocab Checklist (Due Monday, 08/26) -"Why Study Chemistry?" Writing Prompt (Due Monday, 08/26)
Monday 08/26	-Discuss Current Event Summaries -Review Chemical Bonding -Class Lab: Chemical Bonding Review	-Begin Working on Current Event Summaries (Due Monday, 10/07) -Read 2.2 & Define Key Terms on Vocab Checklist (Due Tuesday, 08/27)
Tuesday 08/27	-Notes: Water - A Most Peculiar Substance -Peculiarity of Water Flyer	-Peculiarity of Water Flyer and Post Image to Blog (Due Friday, 08/30) -Read 2.3 & Define Key Terms on Vocab Checklist (Due Block Day)
Block Day 08/29	-Properties of Water Quiz -Nearpod: Carbon - The Element of Life	-Carbohydrates Video & Writing Prompt (Due Friday, 08/30)
Friday 08/30	-Study Carbohydrates -Class Lab: Organic Molecules & Carbs Review	-Lipids Video & Writing Prompt (Due Tuesday, 09/03)

Date	Lesson Topics	Assignments
Monday 09/02	-No School - Labor Day	
Tuesday 09/03	-Study Lipids -Class Lab: Lipids Review	-Read 2.4 & Define Key Terms on Vocab Checklist (Due Block Day) -Activation Energy Video & Writing Prompt (Due Block Day)
Block Day 09/05	-Discuss Chemical Reactions -Lab: ID of Unknown Carbohydrates	-Identification of Unknown Carbs Lab Handout (Due in class) -Proteins Video & Writing Prompt (Due Friday, 09/06)
Friday 09/06	-Study Proteins -Class Lab: Proteins Review	-Read 2.5 & Define Key Terms on Vocab Checklist (Due Monday, 09/09)
Monday 09/09	-Notes: Catalysts & Enzymes	-Study for Quiz Over Biological Macromolecules
Tuesday 09/10	-Biological Macromolecules Quiz -Introduce Enzyme Activity Lab	-Develop Group Hypothesis on Blog (Due Block Day)
Block Day 09/12	-Fill Out Unit 1 Test Preparation Checklist -Enzyme Activity Inquiry Investigation	-Enzyme Activity Inquiry Investigation Report (Due Friday, 09/13) -Nucleic Acids Video & Writing Prompt (Due Friday, 09/13)
Friday 09/13	-Distribute Unit 1 Take-Home Exam -Study Nucleic Acids -Class Lab: Nucleic Acids Review	-Work on Unit 1 Take-Home Exam (Due Tuesday, 09/17) -Finish Unit 1 Vocabulary Checklist (Due Tuesday, 09/17)
Monday 09/16	-Review for Unit 1 Exam	-Finish Unit 1 Take-Home Exam (Due Tuesday, 09/17) -Study for Unit 1 Exam
Tuesday 09/17	-Unit 1 Exam	
Block Day 09/19	-Unit 1 Exam Corrections	

Unit 1: Chemistry of Life Learning Targets

- Understand the requirements and expectations for Honors Biology.
- Identify the different elements of scientific inquiry.
 - Define how the terms fact, hypothesis, and theory are used in science.
 - Differentiate between theories and hypotheses.
 - Distinguish between observations and inferences.
 - Understand how to design and conduct a controlled experiment.
- Describe the structure of an atom.
- Identify the four primary elements essential for life that make up macromolecules.
- Describe how chemical bonds form.
 - Explain the role of electrons in determining the chemical reactivity of an element.
 - Compare ionic and covalent bonding.
- Describe the structure of a water molecule and how its unique properties contribute to the structure and function of organisms.
 - Recognize the importance of hydrogen bonding.
 - Explain why many compounds dissolve in water.
 - Describe the pH scale and categorize substances as acids or bases.
- Describe why carbon atoms form the basis of organic molecules and explain how their ability to bond is important in the formation of organic monomers and polymers.
 - Identify carbon skeletons and functional groups in organic molecules.
- Explain how organisms take in matter and rearrange the atoms in chemical reactions.
 - Describe how bonds break and reform during chemical reactions.
 - Describe the reactions used to synthesize and break apart polymers and monomers.
- Describe the basic structure and explain the function and importance of the four macromolecules of life: carbohydrates, lipids, nucleic acids, and proteins (including enzymes).
 - Describe the structure and functions of carbohydrates.
 - Describe the various structures and functions of lipids.
 - Describe the structure of amino acids and proteins.
 - Describe how a protein's shape is important to its function.
 - Explain how enzymes function as catalysts to affect activation energy.
 - Explain how factors such as pH and temperature can affect how an enzyme works.
 - Describe the functions of nucleic acids.