

## Honors Biology Syllabus - Unit 3: Matter and Energy in Organisms and Ecosystems

### Essential Questions:

1. How does energy get converted from one form to another?
2. How is the energy stored in food obtained and used by organisms?
3. How can energy from the sun be converted into food or structural molecules?

### Required Reading:

- Chapter 13
- Chapter 4

### Classwork:

- Constructing a Model of ATP
- Food Chains and Webs Modeling Activity
- Study Sheet for Photosynthesis
- Photosynthesis Writing Task
- Study Sheet for Cellular Respiration
- Cellular Respiration Writing Task

### Homework:

- Unit 3 Vocabulary Checklist
- "Hydrothermal Vents" Video & Online Writing Prompt
- "Fall Colors & Photosynthesis" Online Writing Prompt

### Labs:

- Cell Energy Inquiry Investigation

### 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
<b>Tuesday</b> 10/22	-New Seating Arrangement -Distribute Unit 3 Syllabus & Vocab Checklist -Joseph Priestley's Experiments	-Unit 3 Vocabulary Checklist (Due Thursday, 11/14) <b>Homework</b> -"Hydrothermal Vents" Video & Writing Prompt (Due Thursday, 10/24)
<b>Block Day</b> 10/24	-Discuss Hydrothermal Vents Video -Discuss Lecture Review -Video: The Guide	<b>Homework</b> -Explore Options for Lecture Review (Due Monday, 12/02) -Read Concepts 13.1-13.3 (Due Friday, 10/25)
<b>Friday</b> 10/25	-Food Chains and Webs Modeling Activity	-Food Chains and Webs Modeling Activity Worksheet (Due Monday, 10/28) <b>Homework</b> -Read Concepts 13.4-13.6 (Due Monday, 10/28)
<b>Monday</b> 10/28	-Constructing a Model of ATP	-Constructing a Model of ATP Worksheet (Due in class) <b>Homework</b> -Read 4.1-4.2 & Define Key Terms on Vocab Checklist (Due Tuesday, 10/29)
<b>Tuesday</b> 10/29	-Photosynthesis Animation & Tutorial	-Study Sheet for Photosynthesis (Due in class) <b>Homework</b> -"Fall Colors & Photosynthesis" Online Writing Prompt (Due Thursday, 10/31) -Read 4.3 & Define Key Terms on Vocab Checklist (Due Thursday, 10/31)
<b>Block Day</b> 10/31	-Discuss "Fall Colors & Photosynthesis" -Notes: Photosynthesis in Detail -Overview of Photosynthesis Writing Task	-Photosynthesis Writing Task (Due Friday, 11/01) <b>Homework</b> -Read 4.4 & Define Key Terms on Vocab Checklist (Due Friday, 11/01)
<b>Friday</b> 11/01	-Cellular Respiration Animation & Tutorial	-Study Sheet for Cellular Respiration (Due in class) <b>Homework</b> -Read 4.5 & Define Key Terms on Vocab Checklist (Due Tuesday, 11/05)

Date	Lesson Topics	Assignments
<b>Monday 11/04</b>	-Counseling Presentation	
<b>Tuesday 11/05</b>	-Notes: Cellular Respiration in Detail -Overview of Cellular Respiration Writing Task	<b>Homework</b> -Cellular Respiration Writing Task (Due Thursday, 11/07) -Read 4.6 & Define Key Terms on Vocab Checklist (Due Thursday, 11/07)
<b>Block Day 11/07</b>	-Fill Out Unit 3 Test Preparation Checklist -Notes: Fermentation -Introduce Cell Energy Inquiry Investigation	<b>Homework</b> -Plan Cell Energy Inquiry Investigation Online (Due Friday, 11/08)
<b>Friday 11/08</b>	-Cell Energy Inquiry Investigation	-Cell Energy Inquiry Lab Report (Due Monday, 11/11)
<b>Monday 11/11</b>	-Unit 3 Exam Review Game	<b>Homework</b> -Finish Unit 3 Vocabulary Checklist (Due Thursday, 11/14)
<b>Tuesday 11/12</b>	-Socratic: Matter & Energy in Ecosystems Review	<b>Homework</b> -Study for Unit 3 Exam
<b>Block Day 11/14</b>	-Unit 3 Exam	
<b>Friday 11/15</b>	-Unit 3 Exam Corrections	

### Unit 3: Exploring Matter and Energy in Organisms and Ecosystems Learning Targets

- Explain the importance of ATP as an energy source for cellular work.
  - o Explain what chemical energy is and how cells release it from food.
  - o Give examples of work that cells perform.
  - o Describe the structure of ATP and how it stores energy.
  - o Summarize the ATP cycle.
- Use mathematical representations to describe the flow of energy and the cycling of matter in an ecosystem.
  - o Describe how carbon and oxygen are cycled through ecosystems.
  - o Explain how photosynthesis is related to climate.
  - o Contrast the flow of energy and chemicals in ecosystems.
  - o Summarize the relationship between cellular respiration and photosynthesis.
- Compare and contrast food chains and food webs.
  - o Compare and contrast how autotrophs and heterotrophs obtain food.
  - o Explain how trophic levels relate to food chains and food webs.
- Use a model to illustrate the reactants and products of photosynthesis and explain how those products are used by organisms.
  - o Identify the overall reactants and products of photosynthesis.
  - o Describe the structure of a chloroplast.
  - o Explain how light interacts with pigments.
  - o Explain what causes trees to change color in the fall.
  - o Identify the inputs and outputs of the light reactions.
  - o Identify the inputs and outputs of the Calvin cycle.
  - o Summarize the overall process of photosynthesis.
- Use a model to illustrate the reactants and products of cellular respiration and explain how those products are used by organisms.
  - o Identify the overall reactants and products of cellular respiration.
  - o Describe the structure of a mitochondrion.
  - o Relate breathing and cellular respiration.
  - o Explain how cellular respiration harvests the energy in food.
  - o Tell how "falling" electrons are a source of energy.
  - o Explain the role of electron transport chains.
  - o Summarize the three stages of cellular respiration and identify where ATP is made.
- Explain the importance of anaerobic processes in energy production.
  - o Describe how fermentation is different from cellular respiration.
- Design an experiment to test environmental factors that can affect the processes of cellular respiration and photosynthesis.