Unit 5: Photosynthesis and Cellular Respiration

Content Area: **Template**
Course(s):
Time Period:
Length:
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Unit 5: Photosynthesis and Cellular Respiration

Learning Objectives

- How do organisms store and carry energy?
- How does light energy get converted to the chemical energy that organisms can use?
- What is the source of energy in living things?

Essential Skills

- Apply data representations and new models to revise predictions and explanations
- Apply scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence
- Construct and describe the function of Adenosine Triphosphate (ATP).
- Demonstrate how sunlight's energy supports the vast majority of living things on the planet.
- Describe the process of cellular respiration with special attention given to glycolysis, the Krebs Cycle, and the electron transport chain.
- Describe the process of photosynthesis with special attention given to the light dependent and light independent reactions.
- Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences
- Reflect on and revise observations as new evidence emerges
- Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams

Standards

9-12.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
9-12.HS-LS2-5	Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
9-12.HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.
9-12.HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy.

Instructional Tasks/Activities

- Chapter Test
- Chromatography Lab Activity: Students identify pigments in different plants and describe their function in the process of photosynthesis.
- Glucose Story: Students write a story indicating each step of cellular respiration
- Muscle Fatigue Lab: students demonstrate muscle fatigue by squeezing clothes pins. Students explain the reason for muscle fatigue in terms of cellular respiration
- Order of Photosynthesis: Students arrange index cards with steps of photosynthesis chronologically.
- Photosynthesis Lab Activity (Pasco): Using elodea, students will examine how the amount of light affects the oxygen level (rate of photosynthesis) in an enclosed environment
- Review game
- Vocabulary Quizzes
- Yeast Fermentation Lab: students prepare solutions of yeast and various levels of sugar with balloon on Erlenmeyer flasks. Students observe varying levels of fermentation. Student explain the reaction and why it varied between solutions

Assessment Procedure

- Cellular Respiration Poster: students draw and label each step of the cellular respiration as it occurs near and within the mitochondria.
- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Foldables – organization of material
- Group discussion
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance

- Photosynthesis Flip Book: students draw and label each step of photosynthesis (2 different books for light-dependent and light- independent reactions)
- PowerPoint presentation of material
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating

- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

N/A

Resources

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5