Unit #5 Photosynthesis and Cellular Respiration

Content Area: **Science**
Course(s):
Time Period:
Length: **28 days**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Photosynthesis and Cellular Respiration

Learning Objectives

- Objective 1 - Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis
- Objective 2 - Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
- Objective 3 - 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.
- Objective 4 - . Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.
- Objective 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.

Essential Skills

- Essential Skill 1 - Apply scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence
- Essential Skill 2 - Reflect on and revise observations as new evidence emerges
- Essential Skill 3 - Apply data representations and new models to revise predictions and explanations
- Essential Skill 4 - Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences
- Essential Skill 5 - Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams
- Essential Skill 6 - Demonstrate how sunlight's energy supports the vast majority of living things on the planet.
- Essential Skill 7 - Describe the process of photosynthesis with special attention given to the light

dependent and light independent reactions.

- Essential Skill 8 - Describe the process of cellular respiration with special attention given to glycolysis, the Krebs Cycle, and the electron transport chain.
- Essential Skill 9 - Construct and describe the function of Adenosine Triphosphate (ATP).

Standards

SCI.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.
SCI.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.
SCI.HS-LS1-5	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Instructional Tasks/Activities

- Cellular Respiration Poster: students draw and label each step of the cellular respirations it occurs near and within the mitochondria
- Foldables – organization of material
- Group discussion
- Inquiry based laboratory: 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
- 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 Flip Book: students draw and label each step of photosynthesis (2 different books for light-dependent and light-independent reactions)
- 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
- PowerPoint presentation of material
- Review game
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)

Assessment Procedure

- Classroom Total Participation Technique

- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Appropriate Content Specific Online Resource
- 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 Slides
- 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

Resources

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