Unit #2 Chemistry of Life

Content Area: **Science**
Course(s):
Time Period:
Length: **14 days**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Chemistry of Life

Learning Objectives

- Objective 1 - Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
- Objective 2 - 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.

Essential Skills

- Essential Skill 1 - Create a model of the four major categories of organic molecules (carbohydrates, fats, proteins, and nucleic acids) using unique characteristics and primary functions
- Essential Skill 2 - Determine why each major category of organic molecule is essential to life
- Essential Skill 3 - Identify the six elements most common to biological organisms: carbon, hydrogen, oxygen, nitrogen, phosphorous and sulfur
- Essential Skill 4 - Analyze and explain how cells carry out a variety of chemical transformations that allow a transfer of energy from one form to another, the breakdown of molecules into smaller units, and the building of larger molecules from smaller ones
- Essential Skill 5 - Explain how molecules are used to assemble larger molecules with biological activity (including proteins, DNA, sugars and fats)
- Essential Skill 6 - Recognize that most chemical transformations are made possible by protein catalysts called enzymes
- Essential Skill 7 - Identify enzymes as proteins, and determine how they catalyze biochemical reactions
- Essential Skill 8 - Demonstrate that the activities of enzymes are affected by the temperature, and the pH of the surroundings

Standards

SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

Instructional Tasks/Activities

- 3D models: students create various organic molecules using kits
- Assemble protons, neutrons, electrons of individual atoms using manipulatives (candy, beads, etc.) as a group & individually
- Assemble structures of molecules in 3 dimensions using kits
- Assembly of atoms and how the addition and subtraction of protons, neutrons, or electrons change the atom
- Atomic Structure: students determine from periodic table (proton, neutron, electron, energy levels) using candy/ beads/ beans/ coins
- Cellular Respiration lab here change in chemical color in the presence of oxygen
- Draw structures of atoms using periodic table
- Drop in the Bucket Demo (compares total amount of water on Earth compared to actual amount of drinkable freshwater)
- Effect of Enzyme – demo (time one at normal speed and one with enzyme)
- Foldables – organization of material (atomic structure, chemical vs. physical changes, properties of water)
- Group discussion
- Identify physical vs. chemical change and mixture vs. solution: students identify whether a chemical or physical change had occurred in various stations
- Identifying mixtures or solutions in a lab setting
- Inquiry based lab activity: Affect of CO_2 (breath) on Bromothymol blue Solution: students hypothesize then observe the effect of CO_2 on solution
- Magnetic atom kits to build atoms with correct number of protons, neutrons, and electrons
- PowerPoint presentation of material
- Review game
- Simple sample chemical reactions as demos
- Think, pair, share (read assigned section of text individually, discuss with a partner, present material in pairs to class – use PowerPoint as a reference)
- Water Olympics showing the various special properties of water in a lab setting

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