Unit 1: Nature of Science and Chemistry of Life

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

Nature of Science and Chemistry of Life: (~3 weeks)

Learning Objectives

- Contrast condensation reactions (dehydration synthesis) and hydrolysis and model these reactions
- Describe the characteristics, structure, and function of organic macromolecules (carbohydrates, lipids, proteins, and nucleic acids) and their importance to living organisms.
- Distinguish between inorganic and organic compounds
- Identify basic elements of living organisms
- Introduction to scientific inquiry, nature of science, and role of technology in shaping scientific knowledge.
- Introduction to the four big ideas, enduring understandings and science practices.
- List and describe water's unique properties; relate properties to structure; describe importance of these properties to living organisms.
- Math: mean, median, standard deviation, Chi- square, standard error of the mean
- Nature of Molecules, Properties of Water and The Chemical Building Blocks of Life
- Review of Scientific Method and Experimental Design/Set-up: experimental questions, experimental groups, testable hypothesis, variables, constants, sample size, data collection & analysis, conclusion, repetition/verification, and presentation.
- Science as a Process

Essential Skills

- 2.C.2
- 2.A.3
- 4.A.1
- Big Idea 2

- Big Idea 4
- Science Practice 1
- Science Practice 2
- Science Practice 3
- Science Practice 4
- Science Practice 5
- Science Practice 6
- Science Practice 7

Standards

SCI.BIO.1.C.1	Speciation and extinction have occurred throughout the Earth's history.
SCI.BIO.1.C.1.a	Speciation rates can vary, especially when adaptive radiation occurs when new habitats become available.

Instructional Tasks/Activities

Please note: Some activities, labs, and/or projects are subject to change, activity with numbers in parentheses indicates AP Biology required lab.

- Assessment of student understanding of scientific inquiry where students select a question of their choice and propose a plan to explain everything they would do to use science to answer their question.
- Case Studies: Secret of Popcorn Popping and Sweet Indigestion
- From Monomers to Polymers- paper lab where students construct four major macromolecules (carbohydrates, lipids, protein, and DNA) using paper and scissors. The lab allows students to model dehydration synthesis in polymer formation and explore how molecular interactions affect both the structure and function of organic molecules.
- Fruit Fly Behavior Lab (12)
- Guided Notes
- Inquiry Cubes- students use observations and deductive reasoning to make predictions and think like scientists.
- M&M Chi Square Lab
- Practice Free Response Question on Organic Molecules from previous AP Exam
- Properties of Water Lab- students visit different stations and test substances allowing them to explore surface tension, polarity, capillary action, and specific heat of water.
- She Turned Me into a Newt – students create, justify, critique and debate proposals for testing various common superstitions
- Students design and conduct a basic experiment to practice foundations of experimental design including set-up, data analysis using mathematics and graphing.
- Summative Assessment: Nature of Science and Chemistry of Life Test
- Termite Lab (Bik red ink- they love)

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
- 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

Resources

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