Unit 4: Evolution and Diversity 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

Unit 4: Evolution and Diversity of Life

Essential Skills

- Compare and contrast the characteristics of fishes, amphibians, reptiles, and mammals
- Compare and contrast the embryonic development of protostomes and deuterostomes
- Compare homologous and analogous traits
- Define gymnosperms and discuss their characteristics
- Describe how population genetics is used to study the evolution of populations
- Describe how systematics and taxonomy relate to phylogeny
- Describe how the present-day theory of evolution was developed
- Describe the basic factors that causes evolution
- Describe the basic structure of a typical prokaryote
- Describe the basic structure of arthropods and give examples of Hexapoda, Myriapoda, Crustacea, and Chelicerata
- Describe the basic structure of cnidarians and state the function of cnidocytes
- Describe the basic structure of flatworms and give examples of free-living and parasitic flatworms
- Describe the basic structure of nematodes and give examples of free-living and parasitic nematodes
- Describe the basic structure of sponges and state the function of choanocyte
- Describe the characteristics of annelids
- Describe the characteristics of echinoderms
- Describe the definition of species
- Describe the distinguishing traits of the three divisions of nonvascular plants
- Describe the endosymbiotic theory
- Describe the evolutionary history of prokaryotes
- Describe the four characteristics of chordates

- Describe the hierarchy of basic animal classification
- Describe the main characteristics of protists
- Describe the major characteristics of the animal kingdom
- Describe the major classes of seedless vascular plants
- Describe the structure of flower and seed
- Describe the three-part body plan of mollusks and give examples of bivalves, gastropods, and cephalopods
- Discuss the differences between monocots and eudicots
- Discuss the evidence of evolution
- Discuss the importance of fungi
- Discuss the importance of prokaryotes
- Discuss the importance of protists
- Discuss the purpose of cladistics
- Explain allopatric and sympatric speciation
- Explain how Darwin's theory of evolution differed from the current view at the time
- Explain how each evolutionary force can influence the allele frequencies of a population
- Explain the life cycle of an angiosperm
- Explain the origin of mitochondria and chloroplasts
- Explain the processes of animal reproduction and embryonic development
- Identify common misconceptions about evolution
- Identify the new traits that first appear in seedless vascular plants
- List the characteristics of fungi
- List the different levels of the taxonomic classification system
- List the four groups of modern-day gymnosperms and provide examples of each

Objectives

- Analyze natural selection simulations and use the data generated to describe how environmentally favored traits are perpetuated over generations resulting in species survival, while less favorable traits decrease in frequency or may lead to extinction
- Argue how the ecosystems must be maintained to reduce any negative human impact.
- Describe how evolution involves changes in the genetic make-up of whole populations over time, not changes in the genes of an individual organism
- Develop a service-learning project to include the community and to help raise money for the plan.
- Explain how the different organism relationships are important for biological diversity.
- Explain that only mutations in germ cells can create the variation that changes an organism's offspring
- Explaining how the millions of different species on Earth today are related by common ancestry using evidence
- Recognize how heritable characteristics can strongly influence how likely an individual is to survive and reproduce
- Recognize how heritable characteristics can strongly influence what capabilities an organism will have,

therefore influencing how likely it is to survive and reproduce

- Recognize that a change in a species over time does not follow a set pattern or timeline
- --Recognize that changes in DNA (mutations) occur spontaneously at low rates, and some of these changes make no difference to the organism, whereas others can change cells and organism
- Students will work in groups to identify an ecotone with specific groups of organisms from the 5 kingdoms, and develop ways to protect them.
- Trace the progression of conditions that result from genetic mutation in a variety of different organisms

Standards

9-12.HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
9-12.HS-LS4-3	Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.
9-12.HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
9-12.HS-LS4-5	Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
9-12.HS-LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

Instructional Tasks/Activities

- Be able to “sell” the plan to a group of investors (classmates) via a presentation
- Cladogram/Phylogenetic Trees: Interpret a cladogram using traits; create their own cladogram; identify Mutations in a DNA sequence.
- Design a Species – after a natural disaster (describe changes and relationships in DNA, RNA, proteins, characteristics and how they relate to environment)
- Design and Build a structure that performs a specific function to allow survival in a specific environment (hummingbird – STEM)
- Dichotomous Key Lab: Students use plastic frogs and lizards to practice reading and creating dichotomous keys.
- Essays and Application Question practice in groups
- Evolution of the Horse Lab: Students study various species of horse over time and examine their physiological similarities and difference which they then use to study their evolution over time.
- Power point notes
- Review Game
- Vocabulary
- Woolyboogers Lab: Using mythical creatures, students analyze the evolution of feeding adaptations.

Assessment Procedure

- Chapter Tests
- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Homework questions
- Homework questions
- Journal / Student Reflection
- Kahoot
- Laboratory Quizzes
- Laboratory Quizzes Chapter Tests
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Quiz on animals
- Quiz on Darwin and his theories
- Quiz on evidence for evolution
- Quiz on fungi
- Quiz on microbes
- Quiz on plants
- Quiz on protists
- Quiz on vocabulary
- 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