Unit 1 Evolution

Content Area: **Science**
Course(s): **AP Biology**
Time Period: **Semester 1**
Length: **2 weeks**
Status: **Published**

Standards

SCI.HS-LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
SCI.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.
SCI.HS-LS4-2	Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.
SCI.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.
SCI.HS-LS4-1	Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

Enduring Understandings

Change in the genetic makeup of a population over time is evolution.

Organisms are linked by lines of descent from common ancestry.

Life continues to evolve within a changing environment.

The origin of living systems is explained by natural processes.

Essential Questions

What were the historical theories that influenced Darwin?

How does Natural selection work as the primary mechanism of evolution?

How are populations of organisms influenced by their environment?

How is regulation of gene expression responsible for determination, differentiation, morphogenesis and

organogenesis?

How are developmental mechanisms conserved between species?

What mechanisms are in place to ensure species specific fertilization and to limit polyspermy?

What are the pros and cons of various types of asexual and sexual reproduction?

How are a few genes responsible for so much of our development?

How are these master genes also implicated in the evolution of different body forms?

Knowledge and Skills

Natural selection is a major mechanism of evolution

Natural selection acts on phenotypic variations in populations.

Evolutionary change is also driven by random processes.

Biological evolution is supported by scientific evidence from many disciplines, including mathematics

Organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.

Phylogenetic trees and cladograms are graphical representations (models) of evolutionary history that can be tested.

Speciation and extinction have occurred throughout the Earth's history.

Speciation may occur when two populations become reproductively isolated from each other.

Populations of organisms continue to evolve.

There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.

Scientific evidence from many different disciplines supports models of the origin of life.

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit

Modifications

https://docs.google.com/document/d/1ODqaPP69YkcFiyG72fIT8XsUIe3K1VSG7nxuc4CpCec/edit

Resources

Wisconsin Fast Plants for AP Investigation 1 - Artificial Selection; Laptops for AP Investigation 2 - Modeling Population Genetics and AP Investigation 3 - Determining Evolutionary Reslationships with BLAST