5. Evolution

Content Area: **Science**
Course(s): **Generic Course**
Time Period: **Marking Period 3**
Length: **5 weeks**
Status: **Published**

Standards

AP Biology Essential Knowledge Standards:

1A.1, 1A.2, 1A.3, 1A.4, 1B.1, 1B.2, 1C.1, 1C.2, 1C.3, 1D.1, 1D.2

2A.2, 2C.2, 2D.1, 2D.2,

3A.1, 3A.2, 3A.3, 3C.1, 3C.2,

4A.4, 4A.6, 4B.3, 4C.3, 4C.4

Goals/Objectives

Learning Objectives:

LO 1.4 The student is able to evaluate data-based evidence that describes evolutionary changes in the genetic makeup of a population over time. [See **SP 5.3**]

LO 1.5 The student is able to connect evolutionary changes in a population over time to a change in the environment.[See **SP 7.1**]

LO 1.1 The student is able to convert a data set from a table of numbers that reflect a change in the genetic makeup of a population over time and to apply mathematical methods and conceptual understandings to

investigate the cause(s) and effect(s) of this change. [See **SP 1.5, 2.2**]

LO 1.2 The student is able to evaluate evidence provided by data to qualitatively and quantitatively investigate the role of natural selection in evolution. [See **SP 2.2, 5.3**]

LO 1.3 The student is able to apply mathematical methods to data from a real or simulated population to predict what will happen to the population in the future. [See **SP 2.2**]

LO 1.6 The student is able to use data from mathematical models based on the Hardy-Weinberg equilibrium to analyze genetic drift and effects of selection in the evolution of specific populations. [See **SP 1.4, 2.1**]

LO 1.7 The student is able to justify data from mathematical models based on the Hardy-Weinberg equilibrium to analyze genetic drift and the effects of selection in the evolution of specific populations. [See **SP 2.1**]

LO 1.8 The student is able to make predictions about the effects of genetic drift, migration and artificial selection on the genetic makeup of a population. [See **SP 6.4**]

LO 1.9 The student is able to evaluate evidence provided by data from many scientific disciplines that support biological evolution. [See **SP 5.3**]

LO 1.10 The student is able to refine evidence based on data from many scientific disciplines that support biological evolution. [See **SP 5.2**]

LO 1.11 The student is able to design a plan to answer scientific questions regarding how organisms have changed over time using information from morphology, biochemistry and geology. [See **SP 4.2**]

LO 1.12 The student is able to connect scientific evidence from many scientific disciplines to support the modern concept of evolution. [See **SP 7.1**]

LO 1.13 The student is able to construct and/or justify mathematical models, diagrams or simulations that represent processes of biological evolution. [See **SP 1.1, 2.1**]

LO 1.14 The student is able to pose scientific questions that correctly identify essential properties of shared, core life processes that provide insights into the history of life on Earth. [See **SP 3.1**]

LO 1.15 The student is able to describe specific examples of conserved core biological processes and features shared by all domains or within one domain of life, and how these shared, conserved core processes and features support the concept of common ancestry for all organisms. [See **SP 7.2**]

LO 1.16 The student is able to justify the scientific claim that organisms share many conserved core processes and features that evolved and are widely distributed among organisms today. [See **SP 6.1**]

LO 1.17 The student is able to pose scientific questions about a group of organisms whose relatedness is described by a phylogenetic tree or cladogram in order to (1) identify shared characteristics, (2) make inferences about the evolutionary history of the group, and (3) identify character data that could extend or improve the phylogenetic tree. [See **SP 3.1**]

LO 1.18 The student is able to evaluate evidence provided by a data set in conjunction with a phylogenetic tree or a simple cladogram to determine evolutionary history and speciation. [See **SP 5.3**]

LO 1.19 The student is able create a phylogenetic tree or simple cladogram that correctly represents evolutionary history and speciation from a provided data set. [See **SP 1.1**]

LO 1.20 The student is able to analyze data related to questions of speciation and

extinction throughout the Earth's history. [See **SP 5.1**]

LO 1.21 The student is able to design a plan for collecting data to investigate the scientific claim that speciation and extinction have occurred throughout the Earth's history. [See **SP 4.2**]

LO 1.22 The student is able to use data from a real or simulated population(s), based on graphs or models of types of selection, to predict what will happen to the population in the future. [See **SP 6.4**]

LO 1.23 The student is able to justify the selection of data that address questions

related to reproductive isolation and speciation. [See **SP 4.1**]

LO 1.24 The student is able to describe speciation in an isolated population and connect it to change in gene frequency, change in environment, natural selection and/or genetic drift. [See **SP 7.2**]

LO 1.25 The student is able to describe a model that represents evolution within a population. [See **SP 1.2**]

LO 1.26 The student is able to evaluate given data sets that illustrate evolution as an ongoing process. [See **SP 5.3**]

LO 1.27 The student is able to describe a scientific hypothesis about the origin of life on Earth. [See **SP 1.2**]

LO 1.28 The student is able to evaluate scientific questions based on hypotheses about the origin of life on Earth. [See **SP 3.3**]

LO 1.29 The student is able to describe the reasons for revisions of scientific hypotheses of the origin of life on Earth. [See **SP 6.3**]

LO 1.30 The student is able to evaluate scientific hypotheses about the origin of life on Earth. [See **SP 6.5**]

LO 1.31 The student is able to evaluate the accuracy and legitimacy of data to answer scientific questions about the origin of life on Earth. [See **SP 4.4**]

LO 1.32 The student is able to justify the selection of geological, physical, and chemical data that reveal early Earth conditions. [See **SP 4.1**]

Content

Ch 22,23,24,25,26,

- Natural Selection Forces of Evolution Evidence of Evolution Measuring Evolutionary Change
- Speciation
- Origin of Life
- Biodiversity

- Classification & Cladistics Phylogeny of Domains Phylogeny of Eukarya Phylogeny of Chordates

Skills

Science Skills Practices for AP Biology

- use representatives and models to communicate scientific phenomena and solve problems
- use mathematics appropriately
- engage in scientific questioning to extend thinking or to guide investigations
- plan and implement data collection
- perform data analysis and evaluation
- work with scientific explanations and theories
- connect and relate knowledge across various scales, concepts, and representations in and across domains.