Unit 2: Speciation

Chapters and Sections:

24.1-24.4, 25.1-25.5, 26.1-26.3, 26.5

Essential Knowledge Code and Learning Objectives (LO):

1.C.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]

2.E.2

- LO 2.35 The student is able to design a plan for collecting data to support the scientific claim that the timing and coordination of physiological events involve regulation. [See SP 4.2]
- LO 2.36 The student is able to justify scientific claims with evidence to show how timing and coordination of physiological events involve regulation. [See SP 6.1]
- LO 2.37 The student is able to connect concepts that describe mechanisms that regulate the timing and coordination of physiological events. [See SP 7.2]

1.C.3

- 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]

1.C.1

- 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]

1.B.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]

1.D.1

- 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]

1.A.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]

4.B.3

- LO 4.19 The student is able to use data analysis to refine observations and measurements regarding the effect of population interactions on patterns of species distribution and abundance. [See SP 5.2]

2.E.1

- LO 2.31 The student can connect concepts in and across domains to show that timing and coordination of specific events are necessary for normal development in an organism and that these events are regulated by multiple mechanisms. [See SP 7.2]
- LO 2.32 The student is able to use a graph or diagram to analyze situations or solve problems (quantitatively or qualitatively) that involve timing and coordination of events necessary for normal development in an organism. [See SP 1.4]
- LO 2.33 The student is able to justify scientific claims with scientific evidence to show that timing and coordination of several events are necessary for normal development in an organism and that these events are regulated by multiple mechanisms. [See SP 6.1]
- LO 2.34 The student is able to describe the role of programmed cell death in development and differentiation, the reuse of molecules, and the maintenance of dynamic homeostasis. [See SP 7.1]

1.B.2

- 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]

1.D.2

- 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]