Unit 1: Natural Selection

Chapters and Sections:

21.2, 21.5, 22.2, 22.3, 23.1-23.4

Essential Knowledge Code and Learning Objectives (LO):

3.C.1

- LO 3.24 The student is able to predict how a change in genotype, when expressed as a phenotype, provides a variation that can be subject to natural selection. [See SP 6.4, 7.2]
- LO 3.25 The student can create a visual representation to illustrate how changes in a DNA nucleotide sequence can result in a change in the polypeptide produced. [See SP 1.1]
- LO 3.26 The student is able to explain the connection between genetic variations in organisms and phenotypic variations in populations. [See SP 7.2]

4.C.1

- LO 4.22 The student is able to construct explanations based on evidence of how variation in molecular units provides cells with a wider range of functions. [See SP 6.2]

1.A.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]

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]

1.A.2

- 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]

4.C.3

- LO 4.25 The student is able to use evidence to justify a claim that a variety of phenotypic responses to a single environmental factor can result from different genotypes within the population. [See SP 6.1]

- LO 4.26 The student is able to use theories and models to make scientific claims and/or predictions about the effects of variation within populations on survival and fitness. [See SP 6.4]

4.C.4

- LO 4.27 The student is able to make scientific claims and predictions about how species diversity within an ecosystem influences ecosystem stability. [See SP 6.4]

1.A.3

- 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]