

## Unit 12 – Evolution

### B2.4A

Explain that living things can be classified based on structural, embryological, and molecular (relatedness of DNA sequence) evidence.

### B2.4d

Analyze the relationships among organisms based on their shared physical, biochemical, genetic, and cellular characteristics and functional processes.

### B3.4B

Recognize and describe that a great diversity of species increases the chance that at least some living organisms will survive in the face of cataclysmic changes in the environment.

### **B5.1A**

**Summarize the major concepts of natural selection (differential survival and reproduction of chance inherited variants, depending on environmental conditions).**

**B5.1A.a I can explain how natural selection cannot occur unless organisms can reproduce.**

**B5.1A.b I can explain how natural selection cannot occur unless the required resources for life are available.**

**B5.1A.c I can explain how natural selection cannot occur unless there is genetic variability. Natural selection results in organisms better suited to their environment, which will live longer and reproduce more.**

### B5.1B

Describe how natural selection provides a mechanism for evolution.

### **B5.1c**

**Summarize the relationships between present-day organisms and those that inhabited the Earth in the past (e.g., use fossil record, embryonic stages, homologous structures, chemical basis).**

### B5.1d

Explain how a new species or variety originates through the evolutionary process of natural selection.

### B5.1e

Explain how natural selection leads to organisms that are well-suited for the environment (differential survival and reproduction of chance inherited variants, depending upon environmental conditions).

### B5.1f

Explain, using examples, how the fossil record, comparative anatomy, and other evidence supports the theory of evolution.

### B5.1g

Illustrate how genetic variation is preserved or eliminated from a population through natural selection (evolution) resulting in biodiversity.

### B5.2a

Describe species as reproductively distinct groups of organisms that can be classified based on morphological, behavioral, and molecular structures.

B5.2b

Explain that the degree of kinship between organisms or species can be estimated from similarity of their DNA and protein sequences.

Trace the relationship between environmental changes and changes in the gene pool, such as genetic drift and isolation of subpopulations.

**B5.3A**

**Explain how natural selection acts on individuals, but it is populations that evolve. Relate genetic mutations and genetic variety produced by sexual reproduction to diversity within a given population.**

B5.3B

Describe the role of geographic isolation in speciation.

B5.3C

Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.

B5.3d

Explain how evolution through natural selection can result in changes in biodiversity.

B5.3e

Explain how changes at the gene level are the foundation for changes in populations and eventually the formation of a new species.

B5.3f Demonstrate and explain how biotechnology can improve a population and species.