**Unit 8 – Natural Selection**

Chapters 10.1-10.4, 11.1-11.3, 11.5-11.6, 12.4, 17.1-17.2, and 17.4

*Biology*

**Student Learning Targets**

*Always know the vocabulary!*

**\_\_\_\_ 8.1 Describe the factors that Darwin considered when developing his Theory of Evolution. (pg. 280-286)**

* **8.1.A** Describe at least two observations Darwin made during his voyage on the *Beagle* and how these observations guided his thoughts on how species change over time. (pg. 284-285)
* **8.1.B** Explain the process of artificial selection and how this idea aided Darwin in the development of his theory on natural selection. (pg. 286)

**\_\_\_\_ 8.2 Explain the process of natural selection and how it leads to descent with modification. (pg. 287-291)**

* **8.2.A** Explain the four main principles of natural selection and how they can lead to evolution. (pg. 288)
* **8.2.B** Explain how fitness of organisms relates to changes in populations over time. (pg. 289)
* **8.2.C** Discuss how environmental changes can lead to the selection of certain variations in a population. (pg. 290-291)
* **8.2.D** Explain why natural selection does not lead to “perfect” organisms. (pg. 291)

**\_\_\_\_ 8.3 Discuss the various forms of evidence for evolution. (pg. 292-296)**

* **8.3.A** Explain how the fossil record supports Darwin’s concept of descent with modification. (pg. 282, 285, & 292)
* **8.3.B** Explain how biogeography and the adaptations of organisms to specific environments provide evidence for the theory of evolution. (pg. 292-293)
* **8.3.C** Understand provided examples showing how embryology has served as further evidence for evolution. (pg. 293-294)
* **8.3.D** Compare and contrast homologous, analogous, and vestigial structures and explain how they relate to descent with modification. (pg. 294-296)
* **8.3.E** Explain how evidence from molecular biology reveals further information regarding species’ relatedness. (pg. 496)

**\_\_\_\_ 8.4 Describe the significance of genetic variation within a population, and identify sources of genetic variation. (pg. 308-309)**

* **8.4.A** Explain how genetic variation leads to some organisms in a population being more likely to survive and reproduce than others. (pg. 308)
* **8.4.B** Describe the two main sources of new genetic variation in populations. (pg. 309)

**\_\_\_\_ 8.5 Describe how evolution can occur through methods other than natural selection. (pg. 315-318 & 322-323)**

* **8.5.A** Define gene flow, and explain how it can change the allele number and types of alleles present in a population. (pg. 315)
* **8.5.B** Define genetic drift, and explain how it leads to changes in allele frequencies that can have negative effects on a population. (pg. 316-317)
* **8.5.C** Explain the bottleneck effect and the founder effect as specific examples of how genetic drift can occur. (pg. 316)
* **8.5.D** Explain how variation in populations can affect mating and sexual selection. (pg. 318)

**\_\_\_\_ 8.6 Explain how reproductive isolation can lead to speciation. (pg. 324-326)**

* **8.6.A** Define species, and explain how an inability to mate or produce fertile offspring can lead to speciation. (pg. 324 & class notes)
* **8.6.B** Explain and provide examples of behavioral, geographic, and temporal isolation. (pg. 325-326)

**\_\_\_\_ 8.7 Compare and contrast the different patterns and rates of evolution and extinction. (pg. 327-330)**

* **8.7.A** Distinguish between convergent and divergent evolution. (pg. 328)
* **8.7.B** Explain how coevolution can lead to species changing in response to each other. (pg. 329)
* **8.7.C** Compare background and mass extinctions and how common each has been in Earth’s history. (pg. 330)
* **8.7.D** Compare punctuated equilibrium to gradual change in regards to the rate of evolution. (pg. 331 & class notes)
* **8.7.E** Define adaptive radiation, and explain how natural selection could lead to adaptive radiation. (pg. 331 & class notes)

**\_\_\_\_ 8.8 Explain the theory of endosymbiosis and how it explains the evolution of eukaryotic cells. (pg. 351)**

**\_\_\_\_ 8.9 Explain how the diversity of life on Earth has led to the need for a system of taxonomy, including the use of binomial nomenclature. (pg. 486-488)**

**\_\_\_\_ 8.10 Explain the purpose of a cladogram, and use a cladogram to explain evolutionary relationships between species. (pg. 492-496)**

**\_\_\_\_ 8.11 Describe the three domains of classification in the current tree of life and why scientists have made modifications to these classification systems throughout history. (pg. 502-503)**

**Scientific Skills Learning Targets**

*These are skills that are used repeatedly through all units and do not correspond to any one particular unit.*

**\_\_\_\_ SS.1** Identify the following parts of a scientific article, and explain the purpose of each section (title, abstract, introduction, materials, methods, results/calculations, discussion/conclusion, acknowledgements, and citations/references).

**\_\_\_\_ SS.2** Examine data from a scientific article to learn more about biological concepts.

\_\_\_\_ **SS.3** Use a database to find scientific articles about various topics.

\_\_\_\_ **SS.4** Write a scientific article about lab work with the appropriate sections and information.

\_\_\_\_ **SS.5** Use a microscope safely and appropriately in the classroom.

**\_\_\_\_** **SS.6** Use a spreadsheet program (such as Excel or Google Sheets) to perform basic calculations, and generate an accurate representation of data in both tables and graphs.

\_\_\_\_ **SS.7** Use APA citations to reference the work of other authors.

**\_\_\_\_** **SS.8** Identify primary and summary research articles, explain the different purposes for these types of articles, and read these articles for understanding.

\_\_\_\_ **SS.9** Apply concepts of statistics and probability to support or refute scientific explanations.

**\_\_\_\_ SS.10** Explain why various types of data would be collected to answer a scientific question.

