**Unit Seven – Ecology**

**Biology Student Learning Targets**

**(Textbook sections: 13.1 &13.2, Chapters 14 - 16)**

**Know all relevant vocabulary.**

**\_\_\_\_\_ 7.1 Describe the different levels of organization (individual organism, population, community, ecosystem and biosphere) that ecologists study within environments (p.372-3, 428-9)**

**\_\_\_\_\_ 7.2 Describe the research methods ecologists use to study the environment. (Observation, Experimentation, and Modeling)** (p.374-376)

* + 7.2.A Know that observation includes both direct and indirect observations and how each is used (p.374)
	+ 7.2.B Explain how the different sampling techniques discussed in class can be used to estimate the size of a population (p.374-6)

**\_\_\_\_\_ 7.3 Identify biotic and abiotic factors in an ecosystem** (p.378)

* + 7.3.A Define biotic and abiotic factors and provide examples of each. (p.378)
	+ 7.3.B Explain how changing one factor in an ecosystem can affect other factors (p.379)
	+ 7.3.B Explain what biodiversity is and how its preservation is important to the future of the biosphere (p.379 & 468)

**\_\_\_\_\_ 7.4 Explain what biodiversity is and its importance to an ecosystem (p.379, 468-471)**

* + 7.4.A Define biodiversity and explain how its preservation is important to the future of the biosphere (p. 468)
	+ 7.4.B Explain how habitat destruction and introduced species effects biodiversity (p.468-471)

**\_\_\_\_\_ 7.5 Explain how an organism’s habitat and niche relate to its function within an ecosystem (p.402-3)**

* + 7.5.A Define habitat and niche (p.402)
	+ 7.5.B Explain competitive exclusion and what happens when two organisms occupy the same niche (p.402-3)

**\_\_\_\_\_ 7.6 Explain how organisms interact both individually and as a community** (p.405-8)

* + 7.6.A Explain predator-prey interactions and provide examples of adaptations that both predators and prey have that make them well suited to their role in the environment (p.405-6)
	+ 7.6.B Define symbiotic relationship and explain the difference between the three main types of symbiotic relationships (p.406-8)

**\_\_\_\_\_ 7.7 Describe and calculate population density and explain how it affects a population’s growth** (p.410,417-18)

* + 7.7.A Define and calculate population density (p.410)
	+ 7.7.B Differentiate between density-dependent and density-independent factors affecting populations and provide examples of each (p.417-18)

**\_\_\_\_\_ 7.8 Describe how populations growth** (p.414-6, 454)

* + 7.8.A Describe 4 factors that affect population size (p.414)
	+ 7.8.B Compare and contrast exponential and logistic growth (p.415)
	+ 7.8.C Define carrying capacity and explain how limiting factors determine the carrying capacity of a population. (p.416-8)
	+ 7.8.D Describe the growth curve of the human population and why it has grown in this way. (p.454-5)

**\_\_\_\_\_ 7.9 Describe Ecological Succession and compare and contrast primary vs. secondary succession (**p.419-21)

**\_\_\_\_\_ 7.10 Explain how Climate is a key abiotic factor affecting the biosphere** (p.430-1)

* + 7.10.A Differentiate between climate, weather, and microclimate (p.430)
	+ 7.10.B Explain why there is uneven heating of the Earth’s surface and how this affects the types of environments in different parts of the world (p.431)
	+ 7.10.C Define biome and list the two primary factors that determine biome classification (p. 434)

**\_\_\_\_\_ 7.11 Explain the effects of human population on the biosphere (including air & water pollution, climate change, greenhouse effect, habitat fragmentation and loss, introduced species** (p. 457-71)

* + 7.11.A Summarize the current state and effects of human population growth on Earth (p.454-7)
	+ 7.11.B Describe the greenhouse effect and how it relates to climate change (p.460-462)
	+ 7.11.C Explain how an introduced species may affect an ecosystem (p.470)

**\_\_\_\_\_ 7.12 Describe how conservation methods can help protect and restore ecosystems** (p.472-5)

* + 7.12.A Define sustainable development and describe conservation methods used by ecologists (p.472-5)

**Scientific Skills Learning Targets**

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

*Refer to scientific skills introduced and practiced in previous units on those learning targets.*

\_\_\_\_ **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.

