

**AP Biology**  
**Student Learning Plan**  
**Ecology Unit 2 - 16 Days**  
**Math skills: Population growth, logistic growth curves**

Day/Date	Topic/Objectives	Support
Day 1 Introduction Homeostasis	<input type="checkbox"/> How do living organisms respond to seasonal changes? <input type="checkbox"/> <input type="checkbox"/> Describe the role of photosynthetic, chemosynthetic and heterotrophic organisms in an ecosystem <input type="checkbox"/> Explain how factors in an ecosystem impact homeostasis and describe the mechanisms that organisms have evolved to maintain equilibrium <input type="checkbox"/> Describe the interaction of biotic and abiotic factors in an ecosystem	
Day 2 Population dynamics	<input type="checkbox"/> How does the predator-prey relationship relate to population growth? <input type="checkbox"/> How do predators establish territory? <input type="checkbox"/> How does prey use pack behavior? <input type="checkbox"/> What factors limit the density of populations? <input type="checkbox"/> How can population interact?	56.1-3
Day 3 Population Growth	<input type="checkbox"/> How do populations respond to excess free energy? <input type="checkbox"/> Use data to support models of human population growth <input type="checkbox"/> What type of graph is used to represent unconstrained population growth? <input type="checkbox"/> What type of graph is used to represent controlled population growth? <input type="checkbox"/> What is the environmental result of unconstrained population growth? <input type="checkbox"/> What density dependent and independent factors limit population growth?	56.4-5
Day 4 Niches and Relationships	<input type="checkbox"/> How does establishment of niches contribute to the survival of populations? <input type="checkbox"/> How do competition, parasitism, predation and mutualism affect population dynamics?	57.1-3
Day 5 Community Interactions	<input type="checkbox"/> What new behaviors emerge as individuals interact in populations? <input type="checkbox"/> What reproductive strategies do living organisms use? <input type="checkbox"/> How does metabolic rate relate to size of organisms? <input type="checkbox"/> How can complex population interactions be studied? <input type="checkbox"/> What types of data are used to study human population growth?	57.4-5
Day 6 Biogeochemical cycles	<input type="checkbox"/> How does the nitrogen cycle make nutrients available to living organisms? <input type="checkbox"/> How do living organisms eliminate nitrogenous waste? <input type="checkbox"/> How does the addition of nitrogen based fertilizers affect aquatic ecosystems? <input type="checkbox"/> What is the primary difference between energy and matter in terms of cycles?	58.1-58.2
Day 7 Species Interactions	<input type="checkbox"/> What strategies do organisms use for seasonal reproduction <input type="checkbox"/> What is the relationship between body size and metabolic strategies <input type="checkbox"/> What are the consequences of excess free energy in an individual and a population	58.3-4

	<input type="checkbox"/> What are the consequences of insufficient free energy in an individual and an population	
Day 8 Succession	<input type="checkbox"/> How does the distribution of ecosystems change over time <input type="checkbox"/> What large scale events have impacted this change over time	59.1 – 2
Day 9 Biomes	<input type="checkbox"/> How do biotic and abiotic factors combine to define biomes at a global level?	59.3-4
Day 10 Human Impact	<input type="checkbox"/> How do human activities accelerate ecosystem change over time?	59.5-6
Day 11 Math and modeling	<input type="checkbox"/> How are models and simulations used to help scientists better understand complex systems?	
Day 12 Biodiversity	<input type="checkbox"/> How does species diversity impact ecosystems? <input type="checkbox"/> What is the impact of newly introduced species into existing ecosystems?	60.1-2
Day 13 Extinction	<input type="checkbox"/> What impact has human activity had on species diversity over time?	60.3-4
Day 14 Earth in Crisis	<input type="checkbox"/> How do human activities impact the homeostatic balance of the ecosystem?	
Day 15 Review	<input type="checkbox"/>	
Day 16 Test	<input type="checkbox"/>	

Vocabulary:

- |                                 |                               |   |
|---------------------------------|-------------------------------|---|
| 1. biomass                      | 22. fecundity                 | 45. species diversity                       |
| 2. keystone species             | 23. food chain                | 46. survivorship                            |
| 3. primary succession           | 24. food web                  | 47. symbiosis                               |
| 4. succession                   | 25. fundamental niche         | 48. sympatric species                       |
| 5. ammonification               | 26. generation time           | 49. temperature-sensitive sex determination |
| 6. Batesian mimicry             | 27. global warming            | 50. trophic levels                          |
| 7. biogeochemical cycles        | 28. greenhouse effect         |   |
| 8. biological magnification     | 29. interspecific competition |   |
| 9. carrying capacity            | 30. K-selected                |   |
| 10. character displacement      | 31. microclimate              |   |
| 11. cohort                      | 32. mortality                 |   |
| 12. commensalism                | 33. Mullerian mimicry         |   |
| 13. competitive exclusion       | 34. mutualism                 |   |
| 14. cost of reproduction        | 35. niche                     |   |
| 15. demography                  | 36. parasitism                |   |
| 16. denitrification             | 37. populations               |   |
| 17. density-dependent effects   | 38. primary producers         |   |
| 18. density-independent effects | 39. <i>r</i> -selected        |   |
| 19. detritivore                 | 40. rain shadow effect        |   |
| 20. endemic                     | 41. realized niche            |   |
| 21. eutrophic                   | 42. secondary succession      |   |
|                                 | 43. sex ratio                 |   |
|                                 | 44. sigmoidal growth curve    |   |