

2 Title: Environmental Biology

Unit:	Ecosystem Basics: Abiotic and Biotic Factors and Their Interactions				
Big Ideas:	How do abiotic factors affect biotic living conditions?				
Unit Essential Questions:	<p>What are biotic and abiotic components in ecosystems? How can abiotic/biotic factors act as limiting factors in a population? How does energy flow through trophic levels in a food chain? Why does an organism's role in the environment impact other species and the ecosystem? What is biomass and how does energy flow in a food web? Why are nutrient/element cycles important to understand the balance of an ecosystem? What is the effect of carrying capacity on populations? What factors affect changes in population of various species? How do scientists monitor population growth? What is the effect of human impact on various ecosystems?</p>				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
Ecosystem Basics Abiotic and Biotic Factors Trophic levels & Energy Flow Habitats and Niches Cycles Carrying Capacity Population Dynamics Human Impact	3.4.9-12.A-F	Abiotic Biotic Ecology ecosystem Species Population Habitat Community Ecotone Producer/consumers Herbivore carnivore omnivore Detritus Biomass Carrying capacity	Videos discussion groups Journaling readings worksheets Research work Wildlife posters/pics Nature walks Field marks/ID	Macbooks/internet smartboard journal articles powerpoint animations videos wildlife specimens	discussions research notes quizzes tests presentations journal entries organisms ID's
Unit:	Biodiversity, Species Interaction & Evolution				
Big Ideas:	How do species of animals and plants interact and depend on each other for survival?				

Unit Essential Questions:	<p>What is the significance of diversity in ecosystems? Using examples, What are important adaptations of organisms and how do they allow them to survive? What are criteria and methods for protecting endangered species? What are the stages of primary and secondary succession in an ecosystem? What are the causes and criteria for succession to occur? What are terrestrial biomes and their characteristics? What is the human impact on changes to succession and species survival?</p>				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
Biodiversity Species Interaction Evolution Threatened, Endangered, and Extinct species Succession Terrestrial Biomes Human Impact	3.3.9-12 Q-R	Biodiversity Evolution Adaptations Extinct, endangered, extirpated Speciation Niche Native, introduced, keystone species Mutualisms, commensalism Succession Pioneer species Climax community	Videos discussion groups Journaling readings worksheets Research work Wildlife posters/pics Nature walks Field marks/ID	Macbooks/internet smartboard journal articles powerpoint animations videos wildlife specimens	discussions research notes quizzes tests presentations journal entries organisms ID's

Unit:	Aquatics and watersheds				
Big Ideas:	<p>What are the major freshwater and saltwater biomes? What indicator species in aquatic environments? What are watersheds and why are they so important? What effect does humans have on them?</p>				
Unit Essential Questions:	<p>What biotic and abiotic characteristics define the different fresh and saltwater biomes? Why is it important to read topography for identifying watersheds? What is a watershed and why are high quality watersheds important? What are Pennsylvania's major watersheds? What are wetlands and how are they affected by human behavior? What are biological, physical and chemical methods of determining water quality? What are the major aquatic organisms in Pennsylvania and what is their niche? What are the human impacts on aquatic habitats? Why is clean water an important resource?</p>				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments

Aquatic biomes Stream: physical Stream: biological Watersheds Wetlands Human impact	3.4.9-12.C	Salinity Estuary Wetland Reef Mangrove Coastal zone Limnetic Oligotrophic Eutrophic Profundal Littoral Benthic Point/nonpoint source Water table	Videos discussion groups Journaling readings worksheets Research work Wildlife posters/pics Nature walks Field marks/ID	Macbooks/internet smartboard journal articles powerpoint animations videos wildlife specimens	discussions research notes quizzes tests presentations journal entries organisms ID's
Unit:	Wildlife				
Big Ideas:	How do we identify wildlife? What basic dynamics and ecosystems are necessary for understanding wildlife ecology? What is the importance of genetic diversity to a healthy species? Why is wildlife and conservation management important for wildlife? What issues are most important for humans to consider on the effect they have on wildlife?				
Unit Essential Questions:	How do we classify and organize wildlife? What are the survival requirements and ecological dynamics needed for wildlife? What conservation and management strategies are important to improve wildlife and their habitat? How do humans affect wildlife?				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
Animal ID's Conservation and management Biodiversity	3.4.9-12.H	Field marks Predator-prey relationships Succession Food web Adaptations Wildlife management Conservation biology Biodiversity Endangered Extinct Native Introduced/invasive Keystone Extirpated Threatened Fragmentation	Videos discussion groups Journaling readings worksheets Research work Wildlife posters/pics Nature walks Field marks/ID	Macbooks/internet smartboard journal articles powerpoint animations videos wildlife specimens	discussions research notes quizzes tests presentations journal entries organisms ID's
Unit:	Forestry				
Big Ideas:	What are the major trees of Pennsylvania and their growth needs? What are general forestry management practices? How are trees used in the economy of PA for industry and recreation? How do trees affect watersheds? What threats do forests face?				
Unit Essential Questions:	What are the common trees of PA? What are the common lumbering trees and their uses? What are the basic forest types in PA? What is the effect of forests on industry, economy, and recreation? Why are forests so important for watersheds? What are human effects on forests in PA? What are other threats to forests other than humans?				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments

<p>Trees Forest ecology Forest resource management</p>	<p>3.4.9-12.G</p>	<p>Canopy Understory Ground layer Cambium Xylem Phloem Snags Nurse log Indicator species Merchantable Board foot Clearcut Deforestation Browse DBH High grade Fragmentation silviculture</p>	<p>Videos discussion groups Journaling readings worksheets Research work Wildlife posters/pics Nature walks Field marks/ID</p>	<p>Macbooks/internet smartboard journal articles powerpoint animations videos wildlife specimens</p>	<p>discussions research notes quizzes tests presentations journal entries organisms ID's</p>
<p>Unit:</p>					

Unit:	Climate change				
Big Ideas:	What are the causes and consequences of a warming Earth?				
Unit Essential Questions:	What factors determine Earth's climate? What evidence shows that global climate change is occurring, and why it is happening? What are the effects of climate change? How can we respond to climate change?				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
	3.3.9-12.C,D,E 3.3.9-12.H, I 3.3.8-12.O	Greenhouse effect global climate change proxy indicator carbon footprint desertification			

Unit:	The Atmosphere and Air Pollution				
Big Ideas:	How can we ensure that everyone has clean air to breathe?				
Unit Essential Questions:	How can we describe Earth's atmosphere? What are the sources of air pollution? What measures can limit and prevent pollution of the atmosphere?				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
	3.3.9-12.L	atmospheric layers primary and secondary air pollutants radiation conduction convection temperature inversions smog acid deposition ozone depletion CFC			
Unit:	Renewable and Nonrenewable Resources				
Big Ideas:	Can we depend on nonrenewable energy resources for our energy needs? What are the potential uses and limitations of renewable energy sources?				
Unit Essential Questions:	What is energy and how is it used? How did fossil fuels formed? How are they obtained and used? What problems are associated with fossil fuel use? What are the advantages and disadvantages of nuclear energy? How can we use biomass energy and geothermal energy? How can water be used to address energy needs? How can we rely on the sun and the wind for power? How can we use hydrogen as a source of energy?				
Concept & Pacing	New Emphasis (Pa Core Standard)	Key Vocabulary	Mini-Lessons/Activities	Instructional Materials	Assessments
	3.3.9-12.O, P	renewable energy nonrenewable energy sustainable use biomass energy geothermal energy			

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Big Ideas:					
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