

TIME FRAME (month or week)	CONTENT	Skill Number	SKILLS	STANDARD(s)	
	History of Environmental Science	1.01	Students will explain why environmental problems are often complex and interrelated.		
		1.02	Students will realize that environmental problems involve social, ethical, political, and economic issues, not just scientific issues.		
		1.03	Students will understand that acceptable solutions to environmental problems are not often easy to achieve.		
		1.04	Students will differentiate between ethics and morals.		
		1.05	Students will explain the difference between the three different theories of moral responsibility regarding the environment.		
		1.06	Students will describe the influential power that corporations wield because of their size.		
		1.07	Students will describe the ongoing conflict between developmentalist and preservationist philosophies concerning the environment.		
		1.08	Explain the relationship between economic growth and environmental degradation.		
	Organisms and Their Environments	2.01	Define environment.		
		2.02	Differentiate between the abiotic and biotic factors of an ecosystem.		
		2.03	Compare and contrast the interactions of biotic and abiotic components in an ecosystem.		
		2.04	Analyze the effects of abiotic factors on specific organisms and ecosystems.		
		2.05	Examine and explain how organisms modify their environments to sustain their needs.		
		2.06	List the levels of organization in an ecosystem.		
		2.07	Describe how the availability of resources affects the organisms in an ecosystems.		
		2.08	Explain how density-dependent and density independent limiting factors affect populations of organisms.		
		2.09	Relate the term environmental resistance to density-dependent and density-independent limiting factors.		
		2.10	Explain how the carrying capacity of a population is affected by environmental resistance.		
		2.11	Interpret possible causes of population fluctuations among species of organisms.		
	2.12	Define mortality and natality and explain their effect on population and represent each in typical survivorship curves for different kinds of organisms.			

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		2.13	Define immigration and emigration and explain their effect on population.	
		2.14	Explain the different stages of a J-shaped and S-shaped curve.	
		2.15	Examine how energy transfers through the organisms in an ecosystem.	
		2.16	Describe the different energy roles organisms can occupy in an ecosystem and explain their importance to each other.	
		2.17	Explain energy flow in a food chain, food web, and energy pyramid using the terms producer, primary consumer, secondary consumer, tertiary consumer, etc.	
		2.18	Evaluate the efficiency of energy flow in a food chain.	
		2.19	Explain the difference between the different types of consumers (herbivore, omnivore, carnivore, scavenger).	
		2.20	Determine the trophic levels of organisms in a food chain.	
		2.21	Explain how cycles affect the balance in an ecosystem.	
		2.22	Examine the processes involved in an element cycle and describe its role in an ecosystem.	
		2.23	Explain the consequences of interrupting natural cycles (global warming, eutrophication, drought).	
		2.24	Describe how natural selection refines the fit between organism and environment (natural selection).	
		2.25	Identify a species and explain what effects its increase or decline might have on the ecosystem (keystone species, invasive species of PA).	
		2.26	Explain how structure, function and behavior of plant and animals affect their ability to survive.	
		2.27	Describe an organism's adaptations for survival in its habitat (predator/prey interactions).	
		2.28	Describe the major kinds of interactions among organisms (competition, predation, symbiosis).	
		2.29	Compare and contrast the three types of symbiotic relationships (mutualism, commensalism, parasitism).	
		2.30	Define coevolution and describe an example of coevolution in nature (competition, predator/prey relationships).	
		2.31	Explain how management practices may influence specific species (barn owl, white-tailed deer, etc.).	
		2.32	Identify the criteria used by scientists for categorizing organisms as threatened, endangered or extinct (food sources, nesting requirements, rep. rate, etc).	
		2.33	Explain the ecological and economic value of Earth's biodiversity.	
		2.34	Identify five human activities that threaten Earth's biodiversity.	
		2.35	List four ways to protect Earth's biodiversity.	

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		2.36	Identify the major biomes on Earth and explain their similarities and differences.	
		2.37	Identify the adaptations of organisms living in specific biomes and give examples of both plant and animal adaptations.	
		2.38	Identify and explain the succession stages in an ecosystem.	
		2.39	Identify the causes of primary and secondary succession.	
	Human Population Issues	3.01	Describe the current population situation in the United States and the rest of the world.	
		3.02	Analyze how the age distribution of a population and the status and role of women in a culture affect population growth projections.	
		3.03	Compare and contrast the population growth pictures of the developed countries and developing countries of the world.	
		3.04	Describe the implications of the demographic transition concept.	
		3.05	Explain ways that a growing human population will affect the ecosystems of the world.	
		3.06	Explain how developed nations of the world will be under greater pressure to share their abundance with less-developed nations.	
	Human Energy Consumption Trends	3.07	Describe the history of energy consumption of the human population from the beginning of civilization to present day patterns.	
		3.08	Compare the energy use of developed countries (U.S. and European countries) to the energy use of developing countries.	
		3.09	Explain how technology (industrial, transportation) affects energy consumption.	
		3.10	Explain how cheap oil and natural gas led to a consumption-oriented society.	
		3.11	Describe how fossil fuels (oil, coal and natural gas) are formed.	
		3.12	Explain the most important environmental issues related to fossil fuel use (acid rain, emissions, etc).	

		3.13	Analyze the advantages and disadvantages of the renewable alternative sources of energy.	
	Agriculture and Society	4.01	List the physical, chemical, and biological factors involved in soil formation.	
		4.02	Explain the importance of humus to soil fertility.	
		4.03	Explain how soil structure and soil texture influence soil atmosphere and soil water.	
		4.04	Explain the role of living organisms in soil formation and fertility.	
		4.05	Describe the various layers in a soil profile.	
		4.06	Analyze the modern soil and nutrient management practices used by farmers to protect soil from erosion.	
		4.07	Analyze and explain how farm efficiencies have changed human nutrition.	
		4.08	Identify a specific commodity, its origin and its steps in production.	
		4.09	Compare and analyze the cost of a commodity to its production cost.	
		4.10	Identify and describe how food safety issues have impacted production in agriculture.	