



GREAT NECK PUBLIC SCHOOLS

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Phipps Administration Building
Office of Instruction
345 Lakeville Road
Great Neck, New York 11020

516.441.4009
516.441.4010
Fax 516.441.4992

AP Environmental Science Course Profile

<u>Department</u>	Science		
<u>Course Name</u>	Advanced Placement Environmental Science		
<u>Course Length</u>	1 Year		
<u>High School Credits</u>	1.0 unit of credit		
<u>Description</u>	The AP Environmental Science course is designed to engage students with the scientific principles, concepts, and methodologies required to understand the interrelationships within the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.		
<u>Target/eligible students</u>	Students should have completed two years of high school laboratory science—one year of life science and one year of physical science (e.g., a year of biology and a year of chemistry). Due to the quantitative analysis required in the course, students should also have taken at least one year of algebra. Also desirable, but not necessary, is a course in earth science.		
<u>State Learning Standards Link(s)</u>	New York State P-12 Science Learning Standards -HS. Matter and Energy in Organisms and Ecosystems -HS. Interdependent Relationships in Ecosystems -HS. Natural Selection and Evolution -HS. Space Systems -HS. History of the Earth -HS. Earth's Systems -HS. Weather and Climate -HS. Human Sustainability -HS. Engineering Design		pg. 12 pg. 14 pg. 18 pg. 20 pg. 22 pg. 24 pg. 26 pg. 28 pg. 30
<u>Primary texts and materials</u>	Course and Exam Description (CED)		
<u>Scope/Sequence</u>	*Standards/themes	Key ideas, Term, and concepts (page numbers taken from the CED)	
<u>Unit 1: The Living World</u>	HS-LS1-5, HS-LS1-6, HS-LS1-7, HS-LS2-3, HS-LS2-4, HS-LS2-5, HS-ESS2-6	The first unit sets the foundation for the course by examining the Earth as a system with interdependent components, processes, and relationships. Students will examine the distribution of resources in ecosystems and its influences on species interactions. There is a global distribution of terrestrial and aquatic biomes—regional ecosystems—that each have specific environmental features based on their shared climate. This distribution is dynamic, and it has changed due to global climate change. Each ecosystem relies on biogeochemical cycles for survival. These cycles facilitate the acquisition and transfer of energy into usable forms, and they can be altered by human activities. In subsequent units, students will apply their understanding of ecosystems to the living world and	Pg. 40

		examine the importance of biodiversity. as well as analyze an environmental problem and propose a solution	
<u>Unit 2: The Living World: Biodiversity</u>	HS-LS2-1, HS-LS2-2 HS-LS2-6, HS-LS2-7, HS-LS2-8, HS-LS4-2, HS-LS4-3, HS-LS4-4, HS-LS4-5	Biodiversity, which includes genetic, species, and habitat diversity, is critically important to ecosystems. Biodiversity in ecosystems is a key component to sustaining life within the living world. Natural and human disruptions have short- and long-term impacts on ecosystems. Ecological succession can occur in terrestrial and aquatic ecosystems in both developed and developing areas. Organisms within ecosystems must adapt to the changes created by these disruptions. In subsequent units, students will examine in greater detail how populations change over time and design an investigation using the scientific method laboratory standard.	pg. 56
<u>Unit 3: Populations</u>	HS-LS2-1, HS-LS2-2, HS-LS2-6, HS-LS2-8, HS-LS4-2, HS-LS4-3, HS-ESS3-3	Populations within ecosystems change over time in response to a variety of factors. This unit examines the relationship between the type of species and the changes in a habitat over time. Specialist species are advantaged by habitats that remain constant, while generalist species tend to be advantaged by habitats that are changing. Different reproductive patterns, including those exhibited by K- and r-selected species, also impact changes to population. Population growth is limited by environmental factors, especially by the availability of resources and space. In subsequent units, students will explore how increases in populations affect earth systems and resources, land and water use, and energy resources. By analyzing population data, and completing calculations, students will then propose solutions to various population problems.	pg. 68
<u>Unit 4: Earth Systems and Resources</u>	HS-ESS1-1, HS-ESS1-4, HS-ESS1-7, HS-ESS1-5, HS-ESS2-1, HS-ESS2-2, HS-ESS2-3, HS-ESS2-5	This unit explores earth systems and its resources that support life. Geological changes that occur to earth systems at convergent and divergent boundaries can result in the creation of mountains, island arcs, earthquakes, volcanoes, and seafloor spreading. Soils are a resource, formed when parent material is weathered, transported, and deposited. The atmosphere is another resource, composed of certain percentages of major gasses. Climate is influenced by the sun's energy, Earth's geography, and the movement of air and water. In subsequent units, students will examine how humans use natural resources and the impact on the environment.	pg. 84
<u>Unit 5: Land and Water Use</u>	HS-ESS2-2, HS-ESS2-5, HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS-ESS3-6, HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4	This unit explores human activities that disrupt ecosystems both positively and negatively and the methods employed to reduce impact. It examines human use of natural resources through many means, including mining and clearcutting, and the impacts on the environment. Agricultural practices in particular can cause environmental disruption. For example, one of the largest uses of freshwater is for irrigation. Every irrigation method employed for agriculture has its own benefits and drawbacks. In subsequent units, students will examine different types of energy resources, the consumption of these resources, and the impact on the environment.	pg. 98
<u>Unit 6:Energy Resources and Consumption</u>	HS-ESS3-2, HS-ESS3-3, HS-ESS3-4,	This unit examines human use of renewable and nonrenewable sources of energy and its impact on the	pg. 124

	HS.ESS3-6, HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4	environment. Energy consumption differs throughout the world and the availability of natural energy resources depends on the region's geologic history. Subsequent units will examine the impact of human activity on the atmosphere, land, and water.	
<u>Unit 7: Atmospheric Pollution</u>	HS-LS2-7, HS-ESS3-1, HS-ESS3-2, HS-ESS3-4, HS.ESS3-6, HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4	Air pollution has many sources and effects, both indoors and outdoors. Air is a natural resource that covers the Earth and crosses many system boundaries. Human activities affect the quality of the air both indoors and outdoors. Through legislation, the Clean Air Act regulates the emission of air pollutants that affect human health. The gasses and particulates in the atmosphere come from both natural and human sources; once air pollution sources are identified, methods can be used to reduce it. Subsequent units will focus on pollution's impacts to land and water.	pg. 144
<u>Unit 8: Aquatic and Terrestrial Pollution</u>	HS-ESS2-5, HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS.ESS3-6, HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4	Pollution created by human activities directly impacts ecosystems in the air, on land, and in water. The source of pollution can sometimes be easy to identify, but other times the source is diffused. There are many human health issues that can be linked to pollution. Legislation has been created to reduce discharges of pollution in water and regulate drinking water. Increases in waste cause global concerns for organisms that live on land and in water. In the final unit, students will explore how local and regional human activities can have a global impact.	pg. 160
<u>Unit 9: Global Change</u>	HS. ESS2-2, HS. ESS2-4, HS-ESS3-5, HS-ESS2-8, HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS.ESS3-6, HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4	A central aspect of environmental science is to understand the global impact of local and regional human activities. Humans can mitigate their impact through sustainable use of resources. Human activities can cause ozone depletion in the stratosphere and increases in the greenhouse gasses in the atmosphere. Increases in greenhouse gasses can cause human health and environmental problems. These environmental problems include global climate change, ocean warming, and endangered species. Overall, this course provides an opportunity to examine the interrelationships among the natural world and challenges students to evaluate and propose solutions to a variety of environmental problems.	pg. 186
<u>Additional Notes</u>			