

New Paltz Central School District

Science

Advanced Placement Environmental Science

TIME	UNIT/ESSENTIAL QUESTIONS	SKILLS	ASSESSMENTS
re bo t co	<p><u>UNIT 4: Biomes, Biodiversity, Restoration, and Management</u></p> <ul style="list-style-type: none"> • What are the characteristics of the major biomes of the Earth? • What are the ways to protect, repair, and manage ecological hot spots? 	<ul style="list-style-type: none"> • Use the Grinnell method of field journaling • Use the Quadrant Sampling method • Write a scientific paper • Identify local flora • Design, conduct, and report the results of a scientific research experiment 	<ul style="list-style-type: none"> • Chapter quiz • Labs
	<p><u>UNIT 5: Biodiversity, Land Use, and Nature Preservation</u></p> <ul style="list-style-type: none"> • How do the mass extinctions in the past differ from the rate of biodiversity loss experienced today? • What are the major challenges to preserving biodiversity on the planet? • How has land use changed throughout human history? • What are some threats to our national parks? • What are some of the negative results of deforestation? • Why are wetlands so valuable as a resource? 	<ul style="list-style-type: none"> • Compare the biodiversity between two areas using the Shannon-Weaver index 	<ul style="list-style-type: none"> • Chapter quiz • Labs

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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">10530<0Z</p>	<p><u>UNIT 6: Population Dynamics</u></p> <ul style="list-style-type: none"> • How do you estimate the population of groups of organisms in a large area? • What factors might regulate the population growth of an organism? 	<ul style="list-style-type: none"> • Estimate the population of an organism in an area 	<ul style="list-style-type: none"> • Unit test • Labs
	<p><u>UNIT 7: Human Populations</u></p> <ul style="list-style-type: none"> • What are some possible solutions to the soaring world population growth? • How does the growth rate of humans affect the use of world resources and health of the environment? • How do developed and underdeveloped countries differ in age structure, birth rates, infant mortality, death rates, male to female ratios, and population growth? • How do you calculate the doubling time of organisms and the growth rate of a population? 	<ul style="list-style-type: none"> • Calculate the doubling time of a population using the rule of 70 • Read age structure histograms • Interpret graphs of population data such as infant mortality and fertility rate • Calculate the percent growth rate of a population over a given time period 	<ul style="list-style-type: none"> • Chapter quiz • Labs
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">20505110005001</p>	<p><u>UNIT 8: Environmental Health and Toxicology</u></p> <ul style="list-style-type: none"> • How do you measure the toxicity of a substance? • How do the results of toxicity tests relate to environmental degradation and human health? • What are the effects of radiation on the growth of plants? • How are irradiated organisms affected by the dose and time of exposure? 	<ul style="list-style-type: none"> • Conduct a disease risk analysis by measuring toxic materials' effect on organisms • Calculate the LD50 for various toxic materials • Graph experimental and control data as a function of time and radiation data 	<ul style="list-style-type: none"> • Unit test • Labs

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<p>7 8 9 10 11 12</p>	<p>UNIT 12: Air, Weather, and Climate</p> <ul style="list-style-type: none"> • How does the differential heating of the planet create global wind patterns? • What are the major factors influencing the different climates of the world? • What effect do El Nino and La Nina have on global weather patterns? • How does the greenhouse effect work, what are typical greenhouse gases, and how can we reduce the emission of these gases? • What are the global repercussions of the greenhouse effect? • How has the weather changed since your parents were young? • What will the impact of global warming on our Mid-Western farmland and North-Eastern hardwoods? 	<ul style="list-style-type: none"> • Measure atmospheric pressure, temperature, relative humidity, and wind direction • Illustrate and explain the greenhouse effect • Analyze the impact of global warming 	<ul style="list-style-type: none"> • Chapter quiz • Labs
<p>7 8 9 10 11 12</p>	<p>UNIT 13: Air Pollution</p> <ul style="list-style-type: none"> • How does air pollution affect organisms, including humans? • How does the air in New Paltz compare to the EPA quality standards for air pollutants? • What are the effects of acid rain on the environment? • How do we/can we reduce the emission of pollutants that cause acid rain? • How do weather patterns affect the deposition of acid precipitation? • How do weather and topography relate to air pollution? • What is causing the thinning of the ozone? • Why is the protection of the ozone important to us? 	<ul style="list-style-type: none"> • Collect and measure particulate matter • Measure the pH of water 	<ul style="list-style-type: none"> • Chapter quiz • Labs

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40-45	<p><u>UNIT 14: Water Use and Management</u></p> <ul style="list-style-type: none"> • What indoor water conservation tips would you give to your family to cut down on your home water use? 	<ul style="list-style-type: none"> • Calculate private water use 	<ul style="list-style-type: none"> • Chapter quiz • Labs
50-55	<p><u>UNIT 15: Water Pollution</u></p> <ul style="list-style-type: none"> • What are the ways that water pollution affects organisms? • What is the relationship between BOD and DO? • How do the EPA water quality standards compare with the water quality of New Paltz streams? • How can we reduce water pollution? • How does a sewage treatment plant work? • What is the comparison of nitrogen, phosphorus, dissolved suspended solids, BOD and toxic substances before and after sewage treatment? 	<ul style="list-style-type: none"> • Identify and quantify aquatic insects to determine the health of a stream • Measure the DO, BOD, pH, nitrates, phosphates, temperature, total solids, and fecal coliform to determine the health of a stream • Identify each step of the sewage treatment plant from input to output 	<ul style="list-style-type: none"> • Unit test • Labs

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M a r c h	<p><u>UNIT 16: Solid, Toxic, and Hazardous Waste</u></p> <ul style="list-style-type: none"> • What kinds and amounts of wastes are generated in a typical house in New Paltz? • How does the amount of solid waste your family generates compare to the United States municipal solid waste data? • How does a solid waste landfill work? • How do you evaluate the effectiveness of waste disposal methods at a landfill? • How can we reduce the amount of material that ends up in solid waste landfills? 	<ul style="list-style-type: none"> • Calculate the quantities of solid waste generated by town, county, and state 	<ul style="list-style-type: none"> • Chapter quiz • Labs
	<p><u>UNIT 17: Environmental Economics, Policy, and Law</u></p> <ul style="list-style-type: none"> • What are the local, state, and national laws that apply to the air, water, and toxic waste regulations? • How are the cost-benefit ratios determined and how are they used in natural resource management? 	<ul style="list-style-type: none"> • Calculate the cost-benefit analysis of various projects or actions • Utilize the cost-benefit ratio to determine if a project is economically justified 	<ul style="list-style-type: none"> • Unit test • Labs
M a y	<p><u>UNIT 18: Conventional Energy</u></p> <ul style="list-style-type: none"> • What are renewable and non-renewable resources? • How do you determine the rate of energy use for a private home? • How can the use of conventional energy resources be reduced? 	<ul style="list-style-type: none"> • Analyze energy consumption data for natural gas, electricity, and gasoline • Calculate monthly and annual costs for energy use 	<ul style="list-style-type: none"> • Chapter quiz • Labs

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A p r i l	<p><u>UNIT 19: Sustainable Energy</u></p> <ul style="list-style-type: none"> • How do the different alternative energy uses compare in terms of consumption rate and efficiency? • How do we conserve and preserve energy resources in terms of reducing use, using efficient energy devices, and alternative renewable resources? 	<ul style="list-style-type: none"> • Build a solar oven 	<ul style="list-style-type: none"> • Unit test • Labs
A p r i l M a y	<p><u>UNIT 20: Urbanization, Sustainable Cities, and Personal Action</u></p> <ul style="list-style-type: none"> • What are some alternative uses of land that create an economical, ecological, uncontaminated, and sustainable environment? • What are the goals of sustainable development? • What changes in urbanization are predicted in the next 50 years? • How could American cities be redesigned to be more ecologically sound and culturally amenable? 	<ul style="list-style-type: none"> • Design a sustainable urban area 	<ul style="list-style-type: none"> • Chapter quiz • Lab • AP examination