

AP ENVIRONMENTAL SCIENCE CURRICULUM

Course 18009

Students in AP Environmental Science will learn the basic principles of science and environmental studies. They will learn about the abiotic components, the biotic components, and the interactions between them. The course will also include human influence on the environment and steps humans can take to protect the environment. Major topics will include: basics of environmental studies, distribution patterns of life, population biology, environmental health, food and hunger, sustainable farming, biodiversity, Earth resources, climate change, air and water quality, and environmental management. The prerequisites for this course are passing the Biology Keystone Exam or passing the Keystone Biology course as well as passing the Environmental Science course.

AP ENVIRONMENTAL SCIENCE OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
<ul style="list-style-type: none">• Describe environmental science, including its origins and goals.• Understand the components of an ecosystem and how they interact.• Have an understanding of the global distribution of biomes and species and the factors that affect those distributions.• Describe the dynamics of population growth.• Discuss the movement, distribution, and fate of toxins in the environment.• Discuss the topic of climate change including evidence, effects, and possible solutions.• Summarize causes, effects, and management issues related to air and water pollution.	<ul style="list-style-type: none">• Use the scientific method to analyze and evaluate evidence and resolve conflicts.• Compare and contrast scientific theories.• Evaluate experimental information for relevance and adherence to science processes.• Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.	Chapter Tests	1-year	McGraw Hill Environmental Science: A Global Concern

AP ENVIRONMENTAL SCIENCE MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
<p>Unit 1: (Understanding Our Environment) (Weeks 1-2)</p>	<ul style="list-style-type: none"> Environmental Science is the systematic study of our environment and our proper place in it. Our ideas about our environment have come from many places and through growing technological advancements. Sustainable development is essential to our future here on Earth. Environmental ethics, faith, and justice are important values to instill in all humans. 	<ol style="list-style-type: none"> Understanding that Environmental Science can be used to solve many of the environmental challenges we face today. Describing the major environmental concepts that lead to our current environmental standards. Discussing the importance of sustainable development to our society. Understanding that environmental ethics, faith and justice are important to controlling the environmental challenges we face. 	<ul style="list-style-type: none"> What is Environmental Science? What is the state of our environment today? Where do our ideas about our environment come from? What is sustainable development and what are its core concepts? How important are environmental ethics, faith, and justice? 	<p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.10.F Compare and contrast scientific theories.</p> <p>Know that both direct and indirect observations are used by scientists to study the natural world and universe.</p> <p>Identify questions and concepts that guide scientific investigations.</p> <p>Formulate and revise explanations and models using logic and evidence.</p> <p>Recognize and analyze alternative explanations and models.</p> <p>4.5.12.A Research how technology influences the sustainable use of natural resources.</p> <p>Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p> <p>4.5.12.F Examine the status of existing theories.</p>	<ul style="list-style-type: none"> Explain what environmental science is, and how it draws on different kinds of knowledge. Identify some early thinkers on environment and resources, and contrast some of their ideas. Describe sustainable development and its goals. Explain core concepts in sustainable development. Identify ways in which ethics and faith might promote sustainability and conservation. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

				<p>Evaluate experimental information for relevance and adherence to science processes.</p> <p>Judge that conclusions are consistent and logical with experimental conditions.</p> <p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.</p> <p>Communicate and defend a scientific argument.</p>			
<p>Unit 2: (Principles of Science and Systems) (Weeks 3-4)</p>	<ul style="list-style-type: none"> • Science is a process for producing knowledge methodically and logically. • The idea of systems is central in environmental science. • Science is an incremental process in which many people gradually reach a consensus. 	<ol style="list-style-type: none"> 1. Understanding that science is based on many different principles. 2. Describing how to use the scientific method. 3. Describing what a hypothesis is and the importance of it being testable. 4. Describing the difference between an open and a closed system. 5. Understanding that systems are important in environmental science. 	<ul style="list-style-type: none"> • What are the steps used in the scientific method? • What are some of the basic principles of science? • Why are systems important in our environment? • How can we evaluate the validity of claims about science? 	<p>3.2.12.A6 Examine the status of existing theories.</p> <p>Evaluate experimental information for relevance and adherence to science processes.</p> <p>Judge that conclusions are consistent and logical with experimental conditions.</p> <p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.</p> <p>Communicate and defend a scientific argument.</p> <p>4.1.10.F Compare and contrast scientific theories.</p> <p>Know that both direct and indirect observations are used by scientists to study the natural world and universe.</p> <p>Identify questions and concepts that guide scientific investigations.</p> <p>Formulate and revise explanations and models using logic and evidence.</p>	<ul style="list-style-type: none"> • Describe the scientific method and explain how it works. • Explain systems and how they're useful in science. • Evaluate the role of scientific consensus and conflict. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

				<p>Recognize and analyze alternative explanations and models.</p> <p>4.4.12.E Examine the status of existing theories.</p> <p>Evaluate experimental information for relevance and adherence to science processes.</p> <p>Judge that conclusions are consistent and logical with experimental conditions.</p> <p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.</p> <p>Communicate and defend a scientific argument.</p> <p>4.5.12.F Examine the status of existing theories.</p> <p>Evaluate experimental information for relevance and adherence to science processes.</p> <p>Judge that conclusions are consistent and logical with experimental conditions.</p> <p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.</p> <p>Communicate and defend a scientific argument.</p>			
<p>Unit 3: (Matter, Energy, and Life) (Weeks 5-6)</p>	<ul style="list-style-type: none"> All life depends on matter and energy. The cycling of matter and 	<p>1. Understanding how matter and energy cycle within an ecosystem and how it is important to</p>	<ul style="list-style-type: none"> Why is carbon an important element to living things? What is the 10% Rule of 	<p>3.1.10.A7 Describe the relationship between the structure of organic molecules and the function they serve in living organisms.</p>	<ul style="list-style-type: none"> Describe matter, energy, and molecules and give simple examples of the role of four major 	<p>Students will be given the following: Preferential seating when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p>

	<p>energy are important to maintaining an ecosystem.</p> <ul style="list-style-type: none"> Ecosystems are composed of many different trophic level, which construct unique food chains and food webs 	<p>that ecosystem.</p> <ol style="list-style-type: none"> Describing the different trophic levels with in an ecosystem, from producers to the top consumers. Understanding the 10% Rule of energy as it flows through an ecosystem. Describing the important elements to living things. 	<p>energy flow and what happens to the rest of the energy?</p> <ul style="list-style-type: none"> Why are photosynthesis and cellular respiration considered to be complementary processes within an ecosystem? Why are their fewer organisms in the higher trophic levels than in the lower trophic levels? 	<p>Explain how cells store and use information to guide their functions.</p> <p>3.2.10.A2 Compare and contrast different bond types that result in the formation of molecules and compounds.</p> <p>Explain why compounds are composed of integer ratios of elements.</p> <p>3.2.10.B2 Explain how the overall energy flowing through a system remains constant.</p> <p>Describe the work-energy theorem.</p> <p>Explain the relationships between work and power.</p> <p>3.2.12.B2 Explain how energy flowing through an open system can be lost.</p> <p>Demonstrate how the law of conservation of momentum and conservation of energy provide alternate approaches to predict and describe the motion of objects.</p> <p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.10.C Evaluate the efficiency of energy flow within a food web.</p> <p>Describe how energy is converted from one form to another as it moves through a food web (photosynthetic, geothermal).</p> <p>4.1.12.B</p>	<p>kinds of organic compounds in living cells.</p> <ul style="list-style-type: none"> Define energy and explain how thermodynamics regulates ecosystems. Understand how living organisms capture energy and create organic compounds. Define species, population, communities, and ecosystems, and summarize the ecological significance of trophic levels. Understand pathways in the water, carbon, nitrogen, sulfur, and phosphorous cycles. 	<p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Labs and Classroom Activities</p>
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<p>Unit 4: (Evolution, Biological Communities, and Species Interactions) (Weeks 7-8)</p>	<ul style="list-style-type: none"> Evolution produces species diversity. Species interactions shape biological communities. Community properties affect species and populations. Communities are dynamic and change over time. 	<ol style="list-style-type: none"> Natural selection acting on spontaneous mutations results in evolution. Competition, predation, and symbiosis are all important interactions that shape biological communities. Productivity, abundance or diversity, and resilience or stability are all important properties that affect a species and population. Introduced species can cause profound community changes. 	<ul style="list-style-type: none"> What is natural selection and why is it important to species survival? What are the three types of symbiotic relationships that exist within ecosystems? Why is biodiversity and important concept to humans' survival? What is succession and why is it important to community changes? 	<p>3.1.10.C1 Explain the mechanisms of biological evolution.</p> <p>3.1.12.C1 Analyze how natural selection leads to speciation.</p> <p>3.1.12.C3 CONSTANCY AND CHANGE Analyze the evidence to support various theories of evolution (gradualism, punctuated equilibrium).</p> <p>Evaluate survival of the fittest in terms of species that have remained unchanged over long periods of time.</p>	<ul style="list-style-type: none"> Describe how evolution produces species diversity. Discuss how species interactions shape biological communities. Summarize how community properties affect species and populations. Explain why communities are dynamic and change over time. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>
<p>Unit 5: (Biomes: Global Patterns of Life) (Weeks 9-10)</p>	<ul style="list-style-type: none"> Terrestrial biomes are characterized by temperature and amount of precipitation. Marine biomes are 	<ol style="list-style-type: none"> Hot, humid terrestrial regions usually have more productivity than cold or 	<ul style="list-style-type: none"> How does temperature and amount of precipitation affect the type of terrestrial biome that 	<p>4.1.10.D Research practices that impact biodiversity in specific ecosystems.</p>	<ul style="list-style-type: none"> Recognize the characteristics of major terrestrial biomes and factors that determine their distribution. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p>

	<p>characterized by depth, temperature and salinity.</p> <ul style="list-style-type: none"> Freshwater biomes vary according to depth, light penetration and size. Humans' disturbance has changed some of our major biomes. 	<ol style="list-style-type: none"> dry terrestrial regions. Coral reefs and estuaries are among the world's most productive and diverse marine biomes. Shallow wetlands biomes can be very productive and diverse. Temperate forest and temperate grasslands are the world's most extensively disturbed environments. 	<p>exist in an area?</p> <ul style="list-style-type: none"> How does depth, temperature and salinity affect the type of marine biome that exist in an area? What is the importance of light within marine and freshwater biomes? What type of biomes do most humans live in? 	<p>Analyze the relationship between habitat changes to plant and animal population fluctuations.</p> <p>4.1.10.E</p> <p>Analyze how humans influence the pattern of natural changes (e.g. primary / secondary succession and desertification) in ecosystems over time.</p> <p>4.1.12.D</p> <p>Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <p>Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p>	<ul style="list-style-type: none"> Understand how and why marine environments vary with depth and distance from shore. Compare the characteristics and biological importance of major freshwater ecosystems. Summarize the overall patterns of human disturbance of world biomes. 	<p>Guided notes when applicable.</p>	<p>Labs and Classroom Activities</p>
<p>Unit 6: (Population Biology) (Weeks 11-12)</p>	<ul style="list-style-type: none"> Unrestrained exponential growth can alter population sizes. Factors like births, immigration, deaths and emigration regulate population growth within an area. Things like island biogeography or isolation of populations can lead to loss of genetic diversity and cause harmful effect within a population 	<ol style="list-style-type: none"> Most populations have a carrying capacity that regulates the size their population can grow to. Biotic factors (living things) are often intrinsic factors to population growth, while abiotic (non-living things) are often extrinsic factors. Loss of genetic diversity causes a number of 	<ul style="list-style-type: none"> What is exponential growth? What are the main interspecific population regulatory interactions and how do they work? What is island biogeography and why is it important in conservation biology? Why does genetic diversity tend to persist in large populations, but gradually drift or shift in 	<p>4.1.10.A</p> <p>Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations.</p> <p>Explain the concept of carrying capacity in an ecosystem.</p> <p>Describe how organisms become classified as threatened or endangered.</p> <p>Describe how limiting factors cause organisms to become extinct.</p> <p>4.1.12.A</p> <p>Analyze the significance of biological diversity in an ecosystem.</p> <p>Explain how species adapt to limiting factors in an ecosystem.</p>	<ul style="list-style-type: none"> Describe the dynamics of population growth. Compare and contrast the factors that regulate population growth. Identify some applications of population dynamics in conservation biology. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

		harmful effects in a population.	small populations?	Analyze the differences between natural causes and human causes of extinction. Research wildlife management laws and their effects on biodiversity.			
Unit 7: (Human Population) (Weeks 13-14)	<ul style="list-style-type: none"> Human populations have grown exponentially within the past two centuries. Technology has been the driving force to the rapid growth of human populations, but not without consequences. Factors such as fertility rate and life expectancy are driving forces to population growth within an area. A demographic transition can lead to stable population size. 	<ol style="list-style-type: none"> Exponential growth within the human population has mainly been driven by technological advances. Technology, while driving up the carrying capacity for humans, has many negative consequences. There are many factors that influence our desire to have children. A demographic transition often accompanies economic development. 	<ul style="list-style-type: none"> How has technology increased the carrying capacity of Earth for the growth of humans? What are some negative effects of all the technology we now have? What are some factors that influence someone's desire to have children? What is social justice and how does it play an important role in population growth? 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations.</p> <p>Explain the concept of carrying capacity in an ecosystem.</p> <p>Describe how organisms become classified as threatened or endangered.</p> <p>Describe how limiting factors cause organisms to become extinct.</p> <p>4.1.12.A Analyze the significance of biological diversity in an ecosystem.</p> <p>Explain how species adapt to limiting factors in an ecosystem.</p> <p>Analyze the differences between natural causes and human causes of extinction.</p> <p>Research wildlife management laws and their effects on biodiversity.</p>	<ul style="list-style-type: none"> Trace the history of human population growth. Summarize different perspectives on population growth. Analyze some of the factors that determine population growth. Describe how a demographic transition can lead to stable population size. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>
Unit 8: (Environmental Health and Toxicology) (Weeks 15-16)	<ul style="list-style-type: none"> The global disease burden is changing. Many toxins are harmful in extremely dilute concentrations, and many of 	<ol style="list-style-type: none"> Infectious disease are decreasing, while chronic conditions are increasing (heart disease, 	<ul style="list-style-type: none"> Why has the global disease burden change? How can you determine if a product that you are 	<p>4.5.10.E Describe the impact of occupational exposure to pollutants.</p> <p>Analyze laws and regulations designed to protect human health.</p>	<ul style="list-style-type: none"> Describe health and disease and how the global disease burden is now changing. Summarize the principles of toxicology. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<p>these can be found in our homes.</p> <ul style="list-style-type: none"> • Solubility and mobility determine where and when chemicals move through the environment and into our bodies. • A fundamental principle of toxicology is that the dose makes the poison. • Establishing health policies is difficult because, do risk outweigh benefits? 	<p>stroke, and diabetes).</p> <ol style="list-style-type: none"> 2. Many of the products that we purchase to use in our homes contain harmful toxins. 3. Some chemicals, such as heavy metals and organic compounds, can become persistent in our environment and cause bioaccumulation within a food web. 4. The development of health policies has become a very difficult process due to benefits and risks. 	<p>purchasing is toxic?</p> <ul style="list-style-type: none"> • What is bioaccumulation and how does it affect organisms? • Why is it difficult to develop health policies? 	<p>Analyze efforts to prevent, control, and/or reduce pollution through cost and benefit analysis and risk management.</p> <p>4.5.12.C Analyze the costs and benefits of means to control pollution.</p> <p>Analyze the role of technology in the reduction of pollution.</p> <p>Research and analyze the local, state, and national laws that deal with point and non-point source pollution.</p> <p>Explain mitigation and its role in maintaining environmental health.</p> <p>4.5.12.E Analyze how consumer demands promote the production of pollutants that affect human health.</p>	<ul style="list-style-type: none"> • Discuss the movement, distribution, and fate of toxins in the environment. • Explain ways we evaluate toxicity and risk. • Relate how we establish health policy. 	<p>Guided notes when applicable.</p>	
<p>Unit 9: (Food and Hunger) (Weeks 17-18)</p>	<ul style="list-style-type: none"> • Food production has grown faster than population, but hunger remains widespread. • The key food sources across the world are rice, wheat, and corn (maize). • The green revolution increased production 	<ol style="list-style-type: none"> 1. Many humans live in poverty and lack food, but yet overeating is a growing problem in some countries. 2. A balanced diet is essential to being healthy. 3. Grains are very important to feeding the growing population, but meats are 	<ul style="list-style-type: none"> • Why does chronic hunger still exist even though food production has grown faster than the population? • Why has the production of meats and fish become a problem? • What is genetic modification and why has it become a controversial 	<p>4.4.10.A Explain the relationships between and among the components of the food and fiber system.</p> <p>(i.e., production, processing, research and development, marketing, distribution, and regulations.)</p> <p>4.4.10.B Analyze the effects of agriculture on a society's economy, environment, standard of living, and foreign trade.</p> <p>4.4.10.C Analyze how agricultural sciences and technologies strive to</p>	<ul style="list-style-type: none"> • Describe patterns of world hunger and nutritional requirements. • Identify key food sources, including protein-rich foods. • Explain new crops and genetic engineering. • Discuss how policy can affect food resources. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<p>through breeding, fertilizer, and irrigation.</p> <ul style="list-style-type: none"> Governments support farm production and innovation. 	<p>needed for their proteins.</p> <ol style="list-style-type: none"> Genetic modification of crops are part of the green revolution. Food production is a very important economic question. 	<p>topic in the development of crops?</p> <ul style="list-style-type: none"> Why are governments strong supporters of farm production and innovation? 	<p>increase efficiency while balancing the needs of society with the conservation of our natural resources.</p> <p>4.4.10.D Evaluate the use of technologies to increase plant and animal productivity.</p> <p>4.4.12.A Research and analyze the social, political, economic, and environmental factors that affect agricultural systems.</p> <p>4.4.12.B Research and evaluate laws and policies that affect the food and fiber system.</p> <p>4.4.12.C Analyze research and development initiatives as they relate to agriculture.</p> <p>4.4.12.D Describe how policies, regulations, and laws affect the technologies adopted in agriculture.</p>			
<p>Unit 10: (Farming: Conventional and Sustainable Practices) (Weeks 19-20)</p>	<ul style="list-style-type: none"> Soils are formed by five essential factors. Soils are essential to human lives, we use it, abuse it, and try to conserve it. Modern agriculture relies heavily on the use of pesticides to control pests. Organic and sustainable agriculture 	<ol style="list-style-type: none"> Soils are composed of mineral grains, organic matter, organisms, water and air. Soil takes thousands of years to make, but we can destroy it within seconds. Pesticides have been used throughout the production on crops, 	<ul style="list-style-type: none"> What is soil composed of? How do we use, abuse, and conserve soils? Why have some pesticides become a problem in our environment? (Example: DDT) Why has pesticide use increased throughout time? 	<p>4.4.10.A Explain the relationships between and among the components of the food and fiber system. (i.e., production, processing, research and development, marketing, distribution, and regulations.)</p> <p>4.4.10.B Analyze the effects of agriculture on a society's economy, environment, standard of living, and foreign trade.</p> <p>4.4.10.C Analyze how agricultural sciences and technologies strive to increase efficiency while balancing the needs of society</p>	<ul style="list-style-type: none"> Describe the components of soils. Explain the ways we use, abuse, and conserve soils. Discuss our principle pesticides and their environmental effects. Describe several methods of organic and sustainable agriculture. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	include using many techniques that are to conserve our soils.	some have been beneficial while other have become harmful. 4. Sustainable and organic farming include strategies like IPM, crop rotation, and soil management.	<ul style="list-style-type: none"> • What is IPM and how is it important? • What does "organic" mean? 	<p>with the conservation of our natural resources.</p> <p>4.4.10.D Evaluate the use of technologies to increase plant and animal productivity.</p> <p>4.4.12.A Research and analyze the social, political, economic, and environmental factors that affect agricultural systems.</p> <p>4.4.12.B Research and evaluate laws and policies that affect the food and fiber system.</p> <p>4.4.12.C Analyze research and development initiatives as they relate to agriculture.</p> <p>4.4.12.D Describe how policies, regulations, and laws affect the technologies adopted in agriculture.</p>			
Unit 11: (Biodiversity: Preserving Species) (Weeks 21-22)	<ul style="list-style-type: none"> • Biodiversity includes genetic, species, and ecological variety. • Extinction rates are far higher today than in the past. • Endangered species management has become an important and controversial topic. • Captive breeding and species survival plans 	<ol style="list-style-type: none"> 1. Diversity at all levels (genetic, species, and ecological) are important to maintain biodiversity on Earth. 2. There are many threats to biodiversity today, many have human influence. 3. Endangered species protection is controversial. 4. Zoos were set up to protect biodiversity by allowing 	<ul style="list-style-type: none"> • What is biodiversity and why is it important? • What threatens biodiversity? • What is the Endangered Species Act and when was it passed? • Why are there limits to the number of species that can be preserved in captivity? 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations.</p> <p>Explain the concept of carrying capacity in an ecosystem.</p> <p>Describe how organisms become classified as threatened or endangered. Describe how limiting factors cause organisms to become extinct.</p> <p>4.1.12.A Analyze the significance of biological diversity in an ecosystem.</p>	<ul style="list-style-type: none"> • Discuss biodiversity and the species concept as well as some of the ways we benefit from biodiversity. • Characterize the threats to biodiversity. • Evaluate endangered species management. • Assess captive breeding and species survival plans. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	have become important tools in managing biodiversity.	captive breeding.		<p>Explain how species adapt to limiting factors in an ecosystem.</p> <p>Analyze the differences between natural causes and human causes of extinction.</p> <p>Research wildlife management laws and their effects on biodiversity.</p> <p>4.1.12.D Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <p>Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.12.A Research how technology influences the sustainable use of natural resources.</p> <p>Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p>			
Unit 12: (Biodiversity: Preserving Landscapes) (Weeks 23-24)	<ul style="list-style-type: none"> Forest provide habitat for biodiversity, are valuable resources for 	1. Forest are essential to wildlife and humans by supplying many	<ul style="list-style-type: none"> Why is it important to protect our forest resources? 	4.1.10.D Research practices that impact biodiversity in specific ecosystems.	<ul style="list-style-type: none"> Discuss the types and uses of world forests. Describe the location and state 	Students will be given the following: Preferential seating when applicable.	<p>Daily assignments.</p> <p>End of the Chapter Test.</p>

	<p>humans, and supply essential ecological services.</p> <ul style="list-style-type: none"> Grasslands cover 1/4 of the world's land and are valuable to the human economy and in protecting biodiversity. Parks and preserves have been set aside to try to protect some of our natural resources. 	<p>ecological services and running the economy.</p> <ol style="list-style-type: none"> Grasslands are valuable resources to both wildlife and humans, both as a habitat and to supply food. Some species and habitats need protected, parks and preserves are the key to protection. 	<ul style="list-style-type: none"> What benefit do grasslands supply to both wildlife and humans? Why are parks and preserves set up? 	<p>Analyze the relationship between habitat changes to plant and animal population fluctuations.</p> <p>4.1.12.D Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <p>Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.10.B Describe the impact of integrated pest management practices on the environment.</p> <p>4.5.12.A Research how technology influences the sustainable use of natural resources.</p> <p>Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p> <p>4.5.12.B Evaluate pest management using methods such as cost/benefit analysis, cumulative effects analysis, environmental impact analysis, ethical analysis, and risk analysis.</p>	<p>of grazing lands around the world.</p> <ul style="list-style-type: none"> Summarize the types and locations of nature preserves. 	<p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Labs and Classroom Activities</p>
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<p>Unit 13: (Restoration Ecology) (Weeks 25-26)</p>	<ul style="list-style-type: none"> Restoration is one way of helping nature to heal. Restoration is good for human economies and cultures. Restoring our biomes is important to maintaining biodiversity and to ensure that we will have food sources in the future. 	<ol style="list-style-type: none"> A lot of our biomes need our help to heal, restoration is the key. Restoration helps to boost economies and is good for cultural wellbeing. Without the restoration of vulnerable biomes, biodiversity could decline. 	<ul style="list-style-type: none"> What is the importance of restoration? Why should we focus restoration on vulnerable biomes, like grasslands and wetlands? Explain how restoration can be healthy to cultural beliefs? 	<p>4.1.10.D Research practices that impact biodiversity in specific ecosystems.</p> <p>Analyze the relationship between habitat changes to plant and animal population fluctuations.</p> <p>4.1.12.D Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <p>Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.1.12.E Research solutions addressing human impacts on ecosystems over time.</p> <p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.10.B Describe the impact of integrated pest management practices on the environment.</p> <p>4.5.12.A Research how technology influences the sustainable use of natural resources.</p> <p>Analyze how consumer demands drive the development of technology enabling the</p>	<ul style="list-style-type: none"> Illustrate ways we can help nature heal. Explain how restoration can benefit society as well as nature. Summarize plans to restore prairies. Compare approaches to restoring wetlands and streams. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>
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				<p>sustainable use of natural resources.</p> <p>4.5.12.B Evaluate pest management using methods such as cost/benefit analysis, cumulative effects analysis, environmental impact analysis, ethical analysis, and risk analysis.</p> <p>4.5.12.C Analyze the costs and benefits of means to control pollution.</p> <p>Analyze the role of technology in the reduction of pollution.</p> <p>Research and analyze the local, state, and national laws that deal with point and non-point source pollution.</p> <p>Explain mitigation and its role in maintaining environmental health.</p>			
<p>Unit 14: (Geology and Earth Resources) (Weeks 27-28)</p>	<ul style="list-style-type: none"> The rock cycle involves formation of three general rock types, all caused by a different earth process. Earth supplies may resources for human use. Extraction of earth's resources has many environmental effects. There are many geological hazards associated with earth, such as earthquakes, landslides, and erosion. 	<ol style="list-style-type: none"> Earth have many different processes, many are involved in forming the minerals that we use today. Extraction of earth's resources has many negative effects to humans and wildlife. Earth's changing landscape is caused by many different factors, such as plates moving, wind or water. 	<ul style="list-style-type: none"> What is the rock cycle? What are some important mineral resources that we extract from earth? What are some of the environmental effects to the extraction of earth's resource? What causes an earthquake and a tsunami to occur? 	<p>4.3.10.A Evaluate factors affecting the use of natural resources.</p> <p>Evaluate the effect of consumer demands on the use of natural resources.</p> <p>Analyze how technologies such as modern mining, harvesting, and transportation equipment affect the use of our natural resources.</p> <p>Describe how local and state agencies manage natural resources.</p> <p>4.3.10.B Analyze how humans manage and distribute natural resources.</p> <p>Describe the use of a natural resource with an emphasis on the environmental consequences of extracting, processing, transporting, using, and disposing of it.</p>	<ul style="list-style-type: none"> Summarize the processes that shape the earth and its resources. Describe several earth resources of economic value. Outline the environmental effects of resource extraction. Identify several geological hazards, and explain how they occur. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

				<p>Analyze the impact of technology on the management, distribution, and disposal of natural resources.</p> <p>4.3.12.A Evaluate the advantages and disadvantages of using renewable and nonrenewable resources.</p> <p>Explain how consumption rate affects the sustainability of resource use.</p> <p>Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels.</p> <p>4.3.12.B Analyze factors that influence the local, regional, national, and global availability of natural resources.</p> <p>Compare the use of natural resources in different countries.</p> <p>Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism).</p>			
<p>Unit 15: (Climate Change) (Weeks 29-30)</p>	<ul style="list-style-type: none"> The atmosphere is a layer of gases around earth that allow life to exist here. Weather patterns occur within the troposphere of earth's atmosphere. Weather is caused by the sun and wind patterns. 	<ol style="list-style-type: none"> Earth has several layers of gas surrounding it, this is the atmosphere, which protects us. Weather determines what we do and wear on a daily basis. Earth has had several periods of climate change occur, but this is the 	<ul style="list-style-type: none"> What is the atmosphere? What level of the atmosphere does our weather occur it? Why is this climate change considered to be caused by humans, when none of the rest have none? What are some things that we 	<p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.10.D Evaluate various methods of managing waste as related to economic, environmental, and technological factors.</p>	<ul style="list-style-type: none"> Describe the general composition and structure of the atmosphere. Explain processes that shape regional and seasonal weather patterns. Outline some factors in natural climate variability. Explain how we know that recent climate change is human-caused. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<ul style="list-style-type: none"> • Earth has gone through many different climate changes throughout history, the most recent is human caused. • Humans have been working to solve the problem of climate change. 	<p>first caused by humans.</p> <p>4. In order to save our planet, we have to come up with solutions to climate change</p>	<p>as humans can do to help control climate change?</p>	<p>4.5.10.E Describe the impact of occupational exposure to pollutants.</p> <p>Analyze laws and regulations designed to protect human health.</p> <p>Analyze efforts to prevent, control, and/or reduce pollution through cost and benefit analysis and risk management.</p>	<ul style="list-style-type: none"> • List some effects of climate change. • Identify some solutions being developed to slow climate change. 		
<p>Unit 16: (Air Pollution) (Weeks 31-32)</p>	<ul style="list-style-type: none"> • Air pollution affects human health and causes environmental problems. • The earth's natural process have made air pollution a bigger problem. • There are many things that are being done to help control air pollution. 	<ol style="list-style-type: none"> 1. Human health is affected by pollutants in the air. 2. Air pollution can become more dangerous when earth's processes change the composition of the pollutants. 3. Controlling air pollution is important to preserving earth. 	<ul style="list-style-type: none"> • What are some causes of air pollution? • What can be done to control air pollution? • How does air pollution affect an ecosystem? • How does air pollution affect building? 	<p>4.5.10.A Explain how public policy encourages or discourages the sustainable use of natural resources.</p> <p>Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).</p> <p>4.5.10.E Describe the impact of occupational exposure to pollutants.</p> <p>Analyze laws and regulations designed to protect human health.</p> <p>Analyze efforts to prevent, control, and/or reduce pollution through cost and benefit analysis and risk management.</p> <p>4.5.12.A Research how technology influences the sustainable use of natural resources.</p> <p>Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p>	<ul style="list-style-type: none"> • Identify natural and human-caused sources of air pollution. • Explain how atmospheric circulation affects air quality. • Compare the effects of air pollution. • Evaluate air pollution control efforts and progress. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

				<p>4.5.12.C Analyze the costs and benefits of means to control pollution.</p> <p>Analyze the role of technology in the reduction of pollution.</p> <p>Research and analyze the local, state, and national laws that deal with point and non-point source pollution.</p> <p>Explain mitigation and its role in maintaining environmental health.</p>			
<p>Unit 17: (Water Use and Management) (Weeks 33-34)</p>	<ul style="list-style-type: none"> • Less than 3% of all earth's water is freshwater, with about 1% being usable to living organisms. • Water use is increasing worldwide, with many countries starting to see scarcity or stress on their supplies. • Conservation of water is a very important process, without water all life will die. 	<ol style="list-style-type: none"> 1. Earth is 78% water, but only 3% of it is freshwater with only 1% being usable to living organisms. 2. Water is becoming scarce due to overuse for irrigation and watering of livestock, as well as water pollution. 3. Water conservation has to be one of our biggest concerns, without water life will die. 	<ul style="list-style-type: none"> • What percent of earth's water is usable to living things? • Why is water becoming scarce? • What are some things that can be done to conserve water, both at your house and by industries? 	<p>4.2.10.A Examine the interactions between abiotic and biotic factors within a watershed.</p> <p>Describe how topography influences the flow of water in a watershed. Describe how vegetation affects water runoff.</p> <p>Investigate and analyze the effects of land use on the quality of water in a watershed.</p> <p>4.2.10.B Examine how human interactions impact wetlands and their surrounding environments.</p> <p>Describe how land use decisions affect wetlands</p> <p>4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem.</p> <p>Explain how limiting factors affect the growth and reproduction of freshwater organisms.</p> <p>4.2.12.A Examine environmental laws related to land use management and its impact on the water quality and flow within a watershed.</p>	<ul style="list-style-type: none"> • Summarize why water is a precious resource and why shortages occur. • Summarize water availability and use. • Investigate freshwater shortages. • Appreciate how we might get by with less water. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

4.2.12.B

Analyze the effects of policies and regulations at various governmental levels on wetlands and their surrounding environments.

Examine various public policies relating to wetlands.

Investigate the intended and unintended effects of public policies and regulations relating to wetlands.

4.2.12.C

Analyze the effects of policies and regulations at various governmental levels on water quality.

Assess the intended and unintended effects of public policies and regulations relating to water quality.

4.5.10.A

Explain how public policy encourages or discourages the sustainable use of natural resources.

Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).

4.5.10.C

Analyze real-world data and explain how point and non-point source pollution can be detected and eliminated.

Compare and contrast the environmental effects of different industrial strategies.

4.5.10.E

				<p>Describe the impact of occupational exposure to pollutants.</p> <p>Analyze laws and regulations designed to protect human health.</p> <p>Analyze efforts to prevent, control, and/or reduce pollution through cost and benefit analysis and risk management.</p> <p>4.5.12.A Research how technology influences the sustainable use of natural resources.</p> <p>Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p> <p>4.5.12.E Analyze how consumer demands promote the production of pollutants that affect human health.</p>			
<p>Unit 18: (Water Pollution) (Weeks 35-36)</p>	<ul style="list-style-type: none"> Waterborne diseases kill hundreds of millions of people. Water pollution can destroy an aquatic ecosystem. Several laws have been put in place to try to improve the quality of water, both surface water and groundwater. 	<ol style="list-style-type: none"> Water pollution has caused many problems, from death of humans to destruction of entire ecosystems. Government legislation has been working on trying to control as well as clean up water pollution. 	<ul style="list-style-type: none"> What are some of the laws that have been set up to conserve our water? What is eutrophication and how does it affect a water source? 	<p>4.2.10.B Examine how human interactions impact wetlands and their surrounding environments.</p> <p>Describe how land use decisions affect wetlands</p> <p>4.2.10.C Explain the relationship between water quality and the diversity of life in a freshwater ecosystem.</p> <p>Explain how limiting factors affect the growth and reproduction of freshwater organisms.</p> <p>4.2.12.B Analyze the effects of policies and regulations at various governmental levels on wetlands and their surrounding environments.</p>	<ul style="list-style-type: none"> Describe the types and effects of water pollution. Investigate water quality today. Explain water pollution control. Summarize some water legislation. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

Examine various public policies relating to wetlands.

Investigate the intended and unintended effects of public polices and regulations relating to wetlands.

4.2.12.C

Analyze the effects of policies and regulations at various governmental levels on water quality.

Assess the intended and unintended effects of public polices and regulations relating to water quality.

4.5.10.A

Explain how public policy encourages or discourages the sustainable use of natural resources.

Research laws and policies that address the sustainable use of natural resources (e.g., solid and liquid waste management, industry, agriculture and enterprise).

4.5.10.D

Evaluate various methods of managing waste as related to economic, environmental, and technological factors.

4.5.12.A

Research how technology influences the sustainable use of natural resources.

Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.

4.5.12.E

Analyze how consumer demands promote the production of

				pollutants that affect human health.			
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