

ENVIRONMENTAL SCIENCE CURRICULUM

Course 18008

Students in Environmental Science will learn the basic principles of science and environmental studies. They will learn about the makeup of the environment with its living and nonliving 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, origins and makeup of Earth, interactions between organisms, biodiversity, global biomes, human impact, water and energy resources, water and air pollution, feeding the World and sustainability.

ENVIRONMENTAL SCIENCE OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
<ul style="list-style-type: none">• Describe why environmental science is important to society.• Understanding how climate affects where organisms can live.• Explain how biodiversity is an important source of resources.• Identify the major types of water and air pollution and their sources.• List some of the features of sustainable agriculture.• Describe the concept of a sustainable community.	<ul style="list-style-type: none">• 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	Pearson Environmental Science

ENVIRONMENTAL SCIENCE MAP:

TIME FRAME	BIG IDEAS	CONCEPTS	ESSENTIAL QUESTIONS	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
<p>Unit 1: Exploring Science and the Environment (Weeks 1-4)</p>	<ul style="list-style-type: none"> • Environmental science is the study of how living things interact and affect their environment. • Energy and materials are needed to support life. • Human life on Earth has changed throughout time due to many unique technologies. • Earth faces many environmental challenges. • Science uses the scientific method to understand problems. • Science plays an important role in how our society works. 	<ol style="list-style-type: none"> 1. Understanding that environmental science includes many different areas of study. 2. Discussing the major things that all living things need to survive. 3. Explaining how life on Earth has changed over time. 4. Understanding major environmental problems. 5. Listing and describing the steps of the scientific method. 6. Explaining why science is important to society. 	<ul style="list-style-type: none"> • Describe the difference between natural environment and built environment. • Outline what an organism needs for survival. • Compare and contrast the agricultural revolution and the industrial revolution. • Explain what diversity means. • Discuss some of the major environmental issues that Earth faces. • Outline the steps of the scientific method. • Describe what makes a good scientist. 	<p>3.1.10.A9 Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements.</p> <p>3.1.12.A9 Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models. Explain the importance of accuracy and precision in making valid measurements. Examine the status of existing theories. Evaluate experimental information for relevance and adherence to science processes. Judge that conclusions are consistent and logical with experimental conditions.</p>	<ul style="list-style-type: none"> • Define environmental science and applied science. • Describe the natural environment and the built environment. • List different areas of study important to environmental science. • List the things that organisms need to survive. • Explain where most of Earth's energy comes from. • Describe how water, oxygen, energy, and nutrients are important. • Discuss how life on Earth has changed over time. • Describe the lifestyle of hunter-gatherers. • Explain how the agricultural revolution changed the world. • Describe how the industrial revolution has affected the environment and people's lives. • Describe a sustainable society. • List five environmental challenges. • Explain why values are important to solving 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

			<p>Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. Communicate and defend a scientific argument.</p> <p>4.1.10.F Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models.</p> <p>4.1.12.C Research how humans affect energy flow within an ecosystem.</p> <p>Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem</p> <p>4.5.10.D Evaluate various methods of managing waste as related to economic, environmental, and technological factors.</p> <p>4.5.12.D Evaluate waste management practices.</p> <p>Analyze current solid waste regulations. Research the impact of new and emerging technologies in the use, reuse, recycling and disposal of materials.</p>	<p>environmental problems.</p> <ul style="list-style-type: none"> • Understand why scientist use the scientific method. • Define each step of the scientific method. • List three characteristics of a good scientist. • Define theory and principle and give an example of each. • Describe why environmental science is important to society. 		
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				Evaluate ways that waste could be reduced during the production of specific product.			
Unit 2: The Dynamic Earth (Weeks 5-7)	<ul style="list-style-type: none"> The formation of the Earth was a unique process that eventually lead to life. Earth is composed a solid layer, a liquid layer, and a layer of gases. Earth cycles many materials, like water, carbon/oxygen, and element necessary for life. Earth's rotation and the Sun's heat have created unique air patterns that control our weather and climate. Earths plate movement has caused major changes on the surface of the planet as well as changed the climate. 	<ol style="list-style-type: none"> Describe the origins of Earth. Identify and describe Earth's three major parts. Describe how water, oxygen, and other elements move through the environment. Define weather and climate. Explain the changed that happen on Earth over short and long time periods. 	<ul style="list-style-type: none"> Describe the layers of Earth. Describe early Earth. Compare and contrast the lithosphere, hydrosphere, and atmosphere. Outline the water cycle. Discuss the oxygen/carbon cycle. Compare weather and climate. Explain the air patterns of Earth. Explain what Pangaea was. Discuss some ways to study Earths history. 	<p>3.3.10.A1 Relate plate tectonics to both slow and rapid changes in the earth's surface.</p> <p>Describe the rock cycle and the processes that are responsible for the formation of igneous, sedimentary, and metamorphic rocks.</p> <p>Relate geochemical cycles to the conservation of matter.</p> <p>Explain how the Earth is composed of a number of dynamic, interacting systems exchanging energy or matter.</p> <p>3.3.10.A2 Analyze the effects on the environment and the carbon cycle of using both renewable and nonrenewable sources of energy.</p> <p>3.3.10.A3 Explain how the evolution of Earth has been driven by interactions between the lithosphere, hydrosphere, atmosphere, and biosphere.</p> <p>3.3.10.A4 Relate geochemical cycles to conservation of matter.</p> <p>Explain how the Earth's systems and its various cycles are driven by energy.</p> <p>3.3.10.A5 Explain how there is only one ocean.</p> <p>Explain the processes of the hydrologic cycle.</p>	<ul style="list-style-type: none"> Describe how and when Earth formed. Name conditions that made the young Earth unwelcoming to life. Explain how some of the earliest life forms created a more livable planet. Describe several efforts of plate movement. Name different part of the hydrosphere. Name several benefits of the atmosphere. Describe the water cycle. Describe the oxygen and carbon cycle. Define element and name elements that are critical for life cycles. Define climate and weather. Explain how air circulation contributes to weather patterns. Understanding how climate affects where organisms can live. Give examples of small and large environmental changes. Describe the impacts of ice ages and global warming. Give examples of the ways scientists 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

				<p>Explain the dynamics of oceanic currents and their relationship to global circulation within the marine environment.</p> <p>3.3.10.A6 Interpret meteorological data to describe and/or predict weather.</p> <p>Explain the phenomena that cause global atmospheric processes such as storms, currents, and wind patterns.</p> <p>3.3.12.A3 Describe the absolute and relative dating methods used to measure geologic time, such as index fossils, radioactive dating, law of superposition, and crosscutting relationships.</p> <p>3.3.12.A6 Explain how the unequal heating of the Earth's surface leads to atmospheric global circulation changes, climate, local short term changes, and weather.</p> <p>Relate the transfer of energy through radiation, conduction, and convection to global atmospheric processes.</p> <p>4.1.10.B Explain the consequences of interrupting natural cycles.</p> <p>4.1.12.B Research solutions to problems caused by interrupting natural cycles.</p>	learn about the past.		
Unit 3: How Living Things Interact (Weeks 8-10)	<ul style="list-style-type: none"> Organisms interact with each other in unique and challenging ways within ecosystems. Producers use photosynthesis 	<ol style="list-style-type: none"> Define ecology and identify biotic and abiotic factors. Describe the parts of an ecosystem. Identify the roles of 	<ul style="list-style-type: none"> Compare and contrast the three levels of biodiversity. Explain how biodiversity is measured. 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations. Explain the concept of carrying capacity in an ecosystem.</p>	<ul style="list-style-type: none"> Define biodiversity. Name the three levels of biodiversity. Describe how the three levels of biodiversity are connected. 	<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>to produce food in which they pass on to consumers for survival.</p> <ul style="list-style-type: none"> • Energy is transferred and changed from one form to another as it travels from one trophic level to another. • Organisms compete and rely on each other for survival in an ecosystem. • Ecosystems change over time. 	<p>producers, consumers, and decomposers.</p> <ol style="list-style-type: none"> 4. Describe food chains and food webs. 5. Define niche, habitat, and predator-prey relationships. 6. Explain succession and how ecosystems change over time. 	<ul style="list-style-type: none"> • Contrast extinction and endangered. • Explain how evolution and natural selection play a part in biodiversity. • Compare and contrast the three types of symbiosis. • Describe some ecosystem services. 	<p>Describe how organisms become classified as threatened or endangered.</p> <p>Describe how limiting factors cause organisms to become extinct.</p> <p>4.1.10.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.A Analyze the significance of biological diversity in an ecosystem.</p> <p>Explain how species adapt to limiting factors in an ecosystem. Analyze the differences between natural causes and human causes of extinction. 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>4.1.7.A Describe the relationships between biotic and abiotic components of an ecosystem.</p> <p>Compare and contrast different biomes and their characteristics Describe symbiotic and predator/prey relationships</p>	<ul style="list-style-type: none"> • Give the estimated number of species on Earth. • Explain why scientists do not know the exact number of species. • Name several ways that scientists learn about new species. • Define evolution. • Explain how species adapt and evolve. • Understand that biodiversity is the result of evolution. • Understand the idea of a web of life. • Describe some of the ways organisms interact. • Explain why the loss of one species can affect many other species. • Describe several ecosystem services. • Explain how biodiversity is an important source of resources. • Describe some ways that biodiversity benefits humans. 	<p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	
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				4.1.8.D Use the theory of natural selection to examine the causes and consequences of extinction.			
Unit 4: The Diversity of Life (Weeks 11-13)	<ul style="list-style-type: none"> The three levels of biodiversity are connected to each other. Earth has lots of species diversity, which is measured and tracked in many unique ways. Evolution and natural selection have contributed to biodiversity on Earth. Earth is a "web of life" in which all species play an important role in. Earth supplies many ecosystem services which are important to biodiversity. 	<ol style="list-style-type: none"> Identify the three levels of biodiversity. Explain how biodiversity is measured. Describe how biodiversity has developed. Understand the concept of a web of life. Explain how biodiversity benefits the planet. 	<ul style="list-style-type: none"> Compare and contrast the three levels of biodiversity. Explain how biodiversity is measured. Contrast extinction and endangered. Explain how evolution and natural selection play a part in biodiversity. Compare and contrast the three types of symbiosis. Describe some ecosystem services. 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations. Explain the concept of carrying capacity in an ecosystem. Describe how organisms become classified as threatened or endangered. Describe how limiting factors cause organisms to become extinct.</p> <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.A Analyze the significance of biological diversity in an ecosystem.</p> <p>Explain how species adapt to limiting factors in an ecosystem. Analyze the differences between natural causes and human causes of extinction. 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</p>	<ul style="list-style-type: none"> Define biodiversity. Name the three levels of biodiversity. Describe how the three levels of biodiversity are connected. Give the estimated number of species on Earth. Explain why scientists do not know the exact number of species. Name several ways that scientists learn about new species. Define evolution. Explain how species adapt and evolve. Understand that biodiversity is the result of evolution. Understand the idea of a web of life. Describe some of the ways organisms interact. Explain why the loss of one species can affect many other species. Describe several ecosystem services. Explain how biodiversity is an important source of resources. Describe some ways that biodiversity benefits humans. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment 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>Unit 5: Biomes of the World (Weeks 14-17)</p>	<ul style="list-style-type: none"> Each biome is unique in its amount of precipitation and temperature ranges. Tropical and Temperate rainforest differ in unique ways. Deciduous and coniferous forest differ in unique ways. There are many different grassland biomes on Earth. There are different tundra and desert biomes located on Earth. There are many different and unique marine biomes on Earth. There are many different and unique 	<ol style="list-style-type: none"> Define biome and compare and contrast terrestrial and aquatic biomes. Describe characteristics and locations of rain forests, coniferous forests, and deciduous forests. Describe characteristics and locations of grasslands, tundra, and deserts. Describe characteristics and locations of marine and freshwater biomes. 	<ul style="list-style-type: none"> How does precipitation and temperature affect a biome? Explain the characteristics of a rain forest biome. Compare and contrast a deciduous and coniferous forest biome. Discuss the different types of grassland biomes. Outline the levels within a marine biome. Discuss the different types of wetlands and their importance to biodiversity. 	<p>4.1.7.A Describe the relationships between biotic and abiotic components of an ecosystem.</p> <p>Compare and contrast different biomes and their characteristics Describe symbiotic and predator/prey relationships</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>4.2.8.B Explain the value of wetlands to other living things.</p>	<ul style="list-style-type: none"> Compare and contrast terrestrial and aquatic biomes. Explain the effects of precipitation and temperature on a biome. Explain the effects of latitude and altitude on a biome. Describe how salinity and water depth affect aquatic biomes. Describe the characteristics of rain forest biomes. Describe how rain forest organisms have adapted to survive. Compare and contrast deciduous and coniferous forest biomes. Describe how each forest biome got its name. Describe how species in each forest biome adapted to the 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	freshwater biomes on Earth.				<p>temperature and precipitations levels.</p> <ul style="list-style-type: none">• Describe how grassland biomes are different from forest biomes.• Describe the characteristics of savannas, temperate grasslands, and chaparrals.• Describe how species have adapted to life in grassland biomes.• Compare and contrast desert and tundra biomes.• Describe tundra plants and animals and their adaptations.• Describe desert plants and animals and their adaptations.• Describe threats to desert and tundra biomes.• Define the vertical and horizontal zones in the ocean.• Explain why coral reefs are important habitats.• Describe three types of coastal wetlands.• Explain the importance of freshwater biomes.• Describe the two categories of freshwater biomes.• Compare and contrast ponds and lakes.• Describe two examples of		
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<p>Unit 6: People and the Environment (Weeks 18-19)</p>	<ul style="list-style-type: none"> • The growth rate of a population increases and decreases due to many factors. • Overpopulation of an area can lead to many problems. • The rate of consumption affects the environment in many ways. • The gap between wealthy and poor nations obtaining and using resources is an issue of equity. 	<ol style="list-style-type: none"> 1. Describe the major trends in the world population. 2. Understand the link between population growth and environmental impact. 3. Understand the link between consumption and environmental impact. 4. Describe some ways that people can reduce their impact on the environment. 	<ul style="list-style-type: none"> • Explain the difference between exponential growth and logistic growth. • Describe the factors that affect the growth of a population. • Compare the population growth rates between a developing country and an industrialized country. • Contrast renewable and non-renewable resources. • Explain ways that we can reduce consumption rates on our resources. 	<p>4.1.10.A Examine the effects of limiting factors on population dynamics.</p> <p>Analyze possible causes of population fluctuations. Explain the concept of carrying capacity in an ecosystem. Describe how organisms become classified as threatened or endangered. Describe how limiting factors cause organisms to become extinct.</p> <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.A Analyze the significance of biological diversity in an ecosystem.</p> <p>Explain how species adapt to limiting factors in an ecosystem. Analyze the differences between natural causes and human causes of extinction. Research wildlife management laws and their effects on biodiversity.</p> <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. Analyze how technologies such as modern mining, harvesting, and transportation</p>	<p>freshwater wetlands.</p> <ul style="list-style-type: none"> • Describe how the global population has changed over time. • Describe exponential growth. • Explain some of the factors that increase and decrease the growth rate. • Define overpopulation. • Explain regional trends in population growth. • Explain how rapid population growth can affect human health and biodiversity. • Define consumption. • Explain how population and consumption rates affect resource use. • Describe the links between overconsumption and the environment. • Describe an equation for measuring human impact on the environment. • Discuss equity and the gaps between wealthy and poor populations. • Describe some ways that people are reducing the impact of consumption. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>
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equipment affect the use of our natural resources.

Describe how local and state agencies manage natural resources.

4.3.10.B

Analyze how humans manage and distribute natural resources.

Describe the use of a natural resource with an emphasis on the environmental consequences of extracting, processing, transporting, using, and disposing of it.

Analyze the impact of technology on the management, distribution, and disposal of natural resources.

4.3.12.A

Evaluate the advantages and disadvantages of using renewable and nonrenewable resources.

Explain how consumption rate affects the sustainability of resource use.

Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels.

4.3.12.B

Analyze factors that influence the local, regional, national, and global availability of natural resources.

Compare the use of natural resources in different countries.

Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism).

<p>Unit 7: Energy (Weeks 20-22)</p>	<ul style="list-style-type: none"> • Energy comes in many forms. • The laws of energy are important to understanding energy use. • Fossil fuels come in many forms and cause many issues. • Nuclear energy has become more important to society, but it has many issues that need addressed. • Solar energy has become more important to society, but it has many issues that need addressed. • There are many alternative energy sources that need addressed for their usefulness and risks. • Everyone has the responsibility to conserve energy. 	<ol style="list-style-type: none"> 1. Understanding what energy is. 2. Name three fossil fuels and their advantages and disadvantages. 3. Describe nuclear energy and its benefits and risks. 4. Name five types of renewable energy and their advantages and disadvantages. 5. Explain how energy experts expect to meet future energy demand. 	<ul style="list-style-type: none"> • Compare and contrast kinetic and potential energy. • Explain the laws of energy. • List the nonrenewable and renewable resources. • Contrast nuclear fission with nuclear fusion. • Contrast passive solar systems with active solar systems. • Outline ways we can use alternative energy sources. • List ways that you can conserve energy. 	<p>3.2.C.A3 Describe the three normal states of matter in terms of energy, particle motion, and phase transitions.</p> <p>Identify the three main types of radioactive decay and compare their properties.</p> <p>Describe the process of radioactive decay by using nuclear equations and explain the concept of half-life for an isotope.</p> <p>Compare and contrast nuclear fission and nuclear fusion.</p> <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. Analyze how technologies such as modern mining, harvesting, and transportation equipment affect the use of our natural resources. 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. Analyze the impact of technology on the management, distribution, and disposal of natural resources.</p> <p>4.3.12.A</p>	<ul style="list-style-type: none"> • Describe potential and kinetic energy. • Explain the first and second laws of energy. • Contrast renewable and non-renewable energy. • Explain what fossil fuels are. • Describe advantages and disadvantages of fossil fuels. • Explain the process of nuclear fission. • Describe the benefits and risks of nuclear energy. • Describe the strengths and weaknesses of solar energy. • Compare passive and active solar systems. • Describe photovoltaic and how they are used today. • Describe hydropower and wind power. • Explain what geothermal energy is and how it is used. • Describe biomass energy. • Describe several methods of conserving energy. • Give several examples of energy conservation. • Describe advances in technology that could meet energy needs. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>
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Evaluate the advantages and disadvantages of using renewable and nonrenewable resources.

Explain how consumption rate affects the sustainability of resource use.

Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels.

4.3.12.B

Analyze factors that influence the local, regional, national, and global availability of natural resources.

Compare the use of natural resources in different countries.

Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism).

4.3.7.A

Explain how products are derived from natural resources.

Describe the process of converting raw materials to consumer goods.

Differentiate between renewable and nonrenewable resources

4.3.7.B

Explain the distribution and management of natural resources.

Differentiate between resource uses: conservation, preservation, and exploitation

4.3.8.A

Compare and contrast alternative sources of energy.

<p>Unit 8: Water Resources and Water Pollution (Weeks 23-24)</p>	<ul style="list-style-type: none"> • Freshwater resources, that are important to life on Earth, are being threatened. • Humans must learn to properly manage their water resources. • Water pollution comes in many forms and is found in many of our water supplies. • Humans have set up laws to help control and prevent pollution and conserve water. 	<ol style="list-style-type: none"> 1. Describe Earth's water resources and why they are important. 2. Identify the main ways water is used and how it is managed. 3. Define three major sources of water pollution. 4. Explain how people can conserve and protect water resources. 	<ul style="list-style-type: none"> • Define a watershed and list the major watersheds of PA. • Compare and contrast surface water with groundwater. • List several ways humans use water. • Contrast point-source and nonpoint-source pollution. • List several pollutants found in our water supplies. • Outline several ways water can be conserved. 	<p>4.1.12.E Research solutions addressing human impacts on ecosystems over time.</p> <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. Investigate and analyze the effects of land use on the quality of water in a watershed.</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> <p>4.2.12.C Analyze the effects of policies and regulations at various governmental levels on water quality.</p> <p>Assess the intended and unintended effects of public policies and regulations relating to water quality.</p> <p>4.2.7.A Explain how water enters, moves through, and leaves a watershed.</p> <p>Explain the concept of stream order. Describe factors that affect the flow and water quality within a watershed</p> <p>4.2.8.A Describe factors that affect the quality of ground and surface waters.</p>	<ul style="list-style-type: none"> • Describe how people and wildlife use water. • Explain how water is distributed on Earth. • Explain how pollution affects people living in a watershed. • Describe how groundwater is stored, used, and recharged. • Describe the three main uses of water. • Explain why water is important to aquatic ecosystems. • Name several ways humans manage water systems. • Describe the link between water pollution and human health. • Identify the major types of water pollution and their sources. • Explain the difference between point-source and nonpoint-source pollution. • Describe how organic and inorganic chemical pollution affect water quality. • Describe several ways that homes, businesses, and farms can conserve water. • Explain how legislation has helped protect water resources. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment 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>4.5.10.C Analyze real-world data and explain how point and non-point source pollution can be detected and eliminated.</p> <p>Compare and contrast the environmental effects of different industrial strategies.</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. Research and analyze the local, state, and national laws that deal with point and non-point source pollution. 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> <p>4.5.7.C Explain how human actions affect the health of the environment.</p> <p>Identify residential and industrial sources of pollution and their effects on environmental health.</p> <p>4.5.8.C Describe how humans can reduce pollution.</p>	<ul style="list-style-type: none"> • Give two examples of how technology can protect water resources. 		
<p>Unit 9: Air Pollution (Weeks 25-26)</p>	<ul style="list-style-type: none"> • Air pollution has become a major problem in our atmosphere. • Air pollution comes in many forms. 	<ol style="list-style-type: none"> 1. Explain what air pollutants are and where they come from. 2. Describe four major forms of urban air pollution. 	<ul style="list-style-type: none"> • Compare and contrast primary and secondary air pollution. • Compare and contrast indoor 	<p>4.5.10.C Analyze real-world data and explain how point and non-point source pollution can be detected and eliminated.</p> <p>Compare and contrast the environmental effects of different industrial strategies.</p>	<ul style="list-style-type: none"> • Define air pollution. • Give examples of natural and human sources of air pollution. • Describe how air pollutants get into 	<p>Students will be given the following: Preferential seating when applicable. Study guides.</p>	<p>Daily assignments. End of the Chapter Test. Labs and Classroom Activities</p>

	<ul style="list-style-type: none"> • Acid rain is an issue that affects many of our environmental resources. • The greenhouse effect has caused global climate issues which affect people and ecosystems. 	<ol style="list-style-type: none"> 3. Explain how acid rain forms and what effect it has. 4. Describe global warming and climate change. 5. Explain some of the ways to reduce air pollution. 	<p>and outdoor air pollution.</p> <ul style="list-style-type: none"> • Compare and contrast industrial and photochemical smog. • Explain how noise and light are air pollutants. • Explain how rain becomes acid rain. • Describe the greenhouse effect and what causes it. 	<p>4.5.10.D Evaluate various methods of managing waste as related to economic, environmental, and technological factors.</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. 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. Research and analyze the local, state, and national laws that deal with point and non-point source pollution. Explain mitigation and its role in maintaining environmental health.</p> <p>4.5.7.C Explain how human actions affect the health of the environment.</p> <p>Identify residential and industrial sources of pollution and their effects on environmental health.</p> <p>4.5.8.C Describe how humans can reduce pollution.</p> <p>4.5.8.D Compare and contrast waste generated from various sources of energy.</p>	<p>and out of the atmosphere.</p> <ul style="list-style-type: none"> • Describe what smog is and where it occurs. • Explain what an urban heat island is. • Explain how noise can be a type of pollution. • Give examples of how light can pollute. • Describe the major sources of acid rain. • Explain why acid rain affects places far from its source. • Describe problems with and solutions to acid rain. • Define global warming and climate change. • Describe the greenhouse effect and how it contributes to global warming. • Name several impacts of climate change on people and ecosystems. 	<p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	
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<p>Unit 10: Solid and Hazardous Waste (Weeks 27-28)</p>	<ul style="list-style-type: none"> • Solid waste comes in many forms and has many characteristics. • Solid waste is disposed of in many ways, both proper and improper. • Hazardous waste comes in many forms and has many characteristics. • Hazardous waste need to dispose of in the appropriate way. • Integrated waste management has become a new and unique way of dealing with solid waste. 	<ol style="list-style-type: none"> 1. Describe the major types of solid waste. 2. Explain four ways solid waste is managed. 3. Describe the major types of hazardous waste. 4. Understand several ways to prevent and control solid waste. 	<ul style="list-style-type: none"> • Compare and contrast biodegradable and non-biodegradable waste. • Compare an open dump to a sanitary landfill. • Describe three types of hazardous waste. • Describe integrated waste management. 	<p>4.5.10.C Analyze real-world data and explain how point and non-point source pollution can be detected and eliminated.</p> <p>Compare and contrast the environmental effects of different industrial strategies.</p> <p>4.5.10.D Evaluate various methods of managing waste as related to economic, environmental, and technological factors.</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. 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. Research and analyze the local, state, and national laws that deal with point and non-point source pollution. Explain mitigation and its role in maintaining environmental health.</p> <p>4.5.12.D Evaluate waste management practices.</p> <p>Analyze current solid waste regulations. Research the impact of new and emerging technologies in the</p>	<ul style="list-style-type: none"> • Define solid waste. • Give examples of different types of solid waste. • Describe the difference between biodegradable and non-biodegradable waste. • Describe three main ways waste is managed. • Explain the pros and cons of burying trash and burning trash. • Explain how recycling, composting, and incineration reduce the amount of waste in landfills. • Describe three characteristics of hazardous waste. • Describe three types of hazardous waste. • Identify three examples of household and industrial waste. • Describe integrated waste management. • Define source reduction. • List two challenges to disposing of hazardous waste. • Explain three things people are doing to help address solid waste problems. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment 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>use, reuse, recycling and disposal of materials. Evaluate ways that waste could be reduced during the production of specific product.</p> <p>4.5.12.E Analyze how consumer demands promote the production of pollutants that affect human health.</p> <p>4.5.7.C Explain how human actions affect the health of the environment.</p> <p>Identify residential and industrial sources of pollution and their effects on environmental health.</p> <p>4.5.7.D Describe the wastes derived from using resources, how the waste is managed, and the potential impact on the environment.</p> <p>4.5.8.C Describe how humans can reduce pollution.</p>			
<p>Unit 11: Feeding the World (Weeks 29-31)</p>	<ul style="list-style-type: none"> • Agriculture has changed and developed over the years. • Soil is formed by many factors. • Soil is affected by farming and many other factors. • The world population requires many nutrients in order to survive. • There are many different 	<ol style="list-style-type: none"> 1. Understanding the environmental impacts of agriculture. 2. Describe the causes and impacts of soil erosion. 3. Explain how the world food supply is distributed and some problems this causes. 4. Describe sustainable approaches to agriculture. 	<ul style="list-style-type: none"> • Explain subsistence agriculture. • Outline the major soil forming factors. • Discuss how farming techniques affect soil. • Explain the dietary requirements for a human. • Explain how organic farming is a sustainable farming practice. 	<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</p>	<ul style="list-style-type: none"> • Describe subsistence agriculture. • Describe industrial agriculture. • Explain some of the benefits and environmental impacts of agriculture. • Explain how soil forms. • Describe soil erosion and its environmental impacts. • Name several ways to reduce soil erosion. 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<p>types of sustainable agriculture.</p> <ul style="list-style-type: none"> The world's fisheries are important, but have major impacts on the environment. 	<p>5. Describe current trends in world fisheries.</p>	<ul style="list-style-type: none"> Discuss the different fishing methods and their impacts on the environment. 	<p>to 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.D Describe how policies, regulations, and laws affect the technologies adopted in agriculture.</p> <p>4.4.7.B Describe the economic importance of agriculture to society.</p> <p>4.4.7.D Identify the positive and negative effects of technology used in agriculture and its effects on the food and fiber system and the environment over time.</p>	<ul style="list-style-type: none"> Explain what the world food supply is. Understand what causes malnutrition. Describe some ways of addressing world hunger. Describe the goals of sustainable agriculture. List some of the features of sustainable agriculture. Give some examples of sustainable agriculture. Describe some environmental impacts of large-scale fishing methods. Describe the strengths and weaknesses of aquiculture. Give examples of sustainable fishing methods 		
<p>Unit 12: Protecting Biodiversity (Weeks 32-34)</p>	<ul style="list-style-type: none"> Extinction of organisms has been an ongoing problem. The main cause of extinction of species is habitat loss. Introducing a species to an area can disrupt the natural process of an area. The trade of wildlife and its 	<ol style="list-style-type: none"> Describe the major threats to biodiversity. Explain the major causes of habitat destruction. Explain how habitat loss is connected to species extinction. Describe how nonnative species affect biodiversity. Explain how wildlife trade 	<ul style="list-style-type: none"> Outline the major causes of biodiversity loss. Explain habitat fragmentation. Discuss the impacts of introducing a species to a new environment. Discuss the views on wildlife. Outline some ways that wildlife is being 	<p>4.1.12.E Research solutions addressing human impacts on ecosystems over time.</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. Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels.</p>	<ul style="list-style-type: none"> Describe the current mass extinction and its causes. Describe the major threats to biodiversity. Describe the main causes of habitat loss. Explain the problems associated with habitat fragmentation. Define deforestation and explain how it is 	<p>Students will be given the following: Preferential seating when applicable.</p> <p>Study guides.</p> <p>Guided notes when applicable,</p> <p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	<p>Daily assignments.</p> <p>End of the Chapter Test.</p> <p>Labs and Classroom Activities</p>

	<p>parts has become a cause of concern.</p> <ul style="list-style-type: none"> Protecting biodiversity for the future is a process that needs addressed. 	<p>affects biodiversity.</p> <p>6. Describe strategies for preventing biodiversity loss.</p>	<p>protected for the future.</p>	<p>4.3.12.B</p> <p>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>affecting biodiversity.</p> <ul style="list-style-type: none"> Define introduced species. Explain how organisms are transported to new environments. Describe three ways introduced species have contributed to biodiversity loss. Define wildlife trade. Explain how wildlife trade contributes to biodiversity loss. Describe how values and perception affect wildlife trade and other biodiversity issues. Describe four ways that people are helping to protect biodiversity. Describe how efforts to protect individual species compare to efforts to protect entire ecosystems. Describe how legislation helps protect biodiversity. 		
<p>Unit 13: A Sustainable World (Weeks 35-36)</p>	<ul style="list-style-type: none"> Sustainability of resources in important and needs to be measured to be successful. Economic growth can be measured in many ways, such as gross domestic product (GDP). 	<ol style="list-style-type: none"> Define sustainability and its application to natural resources. Describe elements of a sustainable global community. Describe features of 	<ul style="list-style-type: none"> Outline ways in which sustainability can be measured. Compare natural capital and financial capital. Define gross domestic product. Outline some indicators of a 	<p>4.3.10.A</p> <p>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>	<ul style="list-style-type: none"> Explain what happened to the Easter Island civilization. Describe the main goals of sustainability. Explain what an indicator of sustainability is and how the indicators are used. Explain the strengths and 	<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"> • Sustainable communities are communities that build around the ideals of sustainability of our resources. • Governments, scientists, businesses, and citizens all play an important part in creating a sustainable society. 	<p>sustainable communities.</p> <p>4. Explain the roles of government, science, business, and citizens in creating a more sustainable world.</p>	<p>good sustainable community.</p> <ul style="list-style-type: none"> • Describe how governments, scientists, businesses, and citizens help create a sustainable world society. 	<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> <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>4.4.12.B Research and evaluate laws and policies that affect the food and fiber system.</p>	<p>weaknesses of the gross domestic product.</p> <ul style="list-style-type: none"> • Describe new ways that people measure economic growth. • Understand the concept of natural capital. • Describe the concept of a sustainable community. • Name several important aspects of sustainable communities. • Give examples of sustainable community indicators. • Explain how governments can help protect the environment. • Define corporate social responsibility and explain what businesses are doing to create a more sustainable society. • Describe the role scientists play in affecting environmental policies. • List four ways that individuals can help address environmental problems. 	<p>Extended time for assignments when needed.</p> <p>Separate testing environment when applicable.</p>	
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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.E
Describe the impact of occupational exposure to pollutants.

Analyze laws and regulations designed to protect human health.

Analyze efforts to prevent, control, and/or reduce pollution through cost and benefit analysis and risk management.

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.