

Amherst County Public Schools
Ecology (Bio2) Curriculum Pacing Guide

REV: 8/12

1 st 9 weeks	Student Objectives	Vocabulary
	<p>Chapter 1 Define environmental science, and compare environmental science with ecology. List the 5 major fields of study that contribute to environmental science. Describe the major environmental effects of hunter-gathers, the agricultural revolution, and the industrial revolution. Distinguish between renewable and nonrenewable resources. Classify environmental problems into 3 major categories. Describe the tragedy of the commons. Explain the law of supply and demand. List 3 differences between developed and developing countries. Explain what sustainability is, and describe why it is a goal of environmental science.</p> <p>ENVIRONMENTAL SCIENCE RESOURCES</p>	Environmental science Ecology Agricultural Natural resource Pollution Biodiversity Law of supply and demand Ecological Footprint Sustainability
	<p>Chapter 2 List and describe the steps of the experimental method. Describe why a good hypothesis is not simply a guess. Describe the 2 essential parts of a good experiment. Describe how scientists study subjects in which experiments are not possible. Explain the importance of curiosity and imagination in science. How do scientists use statistics? Explain why the size of a statistical population is important. Describe the 3 types of models commonly used by scientists. Explain the relationship between probability and risk. Explain the importance of conceptual and mathematical models. Describe three values that people consider when making a decision. Describe the 4 steps in the decision making model. Compare the short-term and long-term consequences of 2 decisions regarding a hypothetical environmental issue.</p> <p>SCIENTIFIC METHOD RESOURCES</p>	Observation Hypothesis Prediction Experiment Variable Experimental group Control group Data Correlation Statistics Mean Distribution Probability Sample Risk Model Conceptual model Mathematical model Value Decision-making model

<p>Chapter 17 List 5 factors that influence the value of a fuel. Explain how fuels are used to generate electricity. Identify patterns of energy consumption and production in the USA. Explain how fossil fuels form and how they are used. Compare the advantages and disadvantages of fossil-fuel use. List 3 factors that influence predictions of fossil-fuel production. Describe nuclear fission. Describe how a nuclear power plant works. List 3 advantages and 3 disadvantages of nuclear power. FUELS RESOURCES</p>	<p>Fossil fuels Electric generator Petroleum Oil reserves Nuclear energy Nuclear fission Nuclear fusion</p>
<p>Chapter 18 List 6 forms of renewable energy, and compare their advantages and disadvantages. Describe the differences between passive, active and photovoltaic solar energy. Describe the current state of wind energy technology. Explain the differences in biomass fuel use between developed and developing countries. Describe how hydroelectric energy, geothermal and heat pumps work. Describe 3 alternative energy technologies. Identify 2 ways that H could be used as a fuel source in the future. Explain the difference between energy efficient and energy conservation. Describe 2 forms of energy efficient transportation. Identify 3 ways that you can conserve energy. ENERGY RESOURCES</p>	<p>Renewable energy Passive solar heating Active solar heating Biomass fuel Hydroelectric energy Geothermal energy Alternative energy Ocean thermal energy conversion Fuel cell Energy efficiency Energy conservation</p>

2 nd 9 Weeks	Student Objectives	Vocabulary
	<p>Chapter 4</p> <p>Distinguish between biotic and abiotic factors in an ecosystem. Describe how a population differs from a species. Explain why ecosystems are important to organisms. Explain the process of evolution by natural selection. Explain the concept of adaptation. Describe the steps by which a population of insects becomes resistant to pesticides. Name the 6 kingdoms of organisms and identify two characteristics of each. Explain the importance of bacteria and fungi to the environment. Describe the importance of protists in the ocean environment. Describe how angiosperms and animals depend on each other. Explain why insects are such successful animals.</p> <p>ECOSYSTEMS RESOURCES</p>	<p>Ecosystem Biotic factor Abiotic factor Organism Species Population Community Habitat Natural selection Evolution Adaptation Artificial selection Resistance Bacteria Fungus Protists Gymnosperm Angiosperm Invertebrate Vertebrate</p>
	<p>Chapter 5</p> <p>Describe how energy is transferred from the sun to producers and then to consumers. Describe 1 way in which consumers depend on consumers. List 2 types of consumers. Explain how energy transfer in a food web is more complex than in a food chain. Explain why an energy pyramid is a representation of trophic levels. Describe the long and short term process of the carbon cycle. Identify ways that humans are affecting the carbon cycle. List the 3 stages of the nitrogen cycle. Describe the role that nitrogen fixing bacteria play in the nitrogen and phosphorus cycles. List 2 examples of ecological succession. Explain how a pioneer species contributes to ecological succession. Explain what happens during old-field succession. Describe how lichen contribute to primary succession.</p> <p>ENERGY FLOW RESOURCES</p>	<p>Photosynthesis Producer Consumer Decomposer Cellular respiration Food chain Food web Trophic level Carbon cycle Nitrogen-fixing bacteria Nitrogen cycle Phosphorus cycle Ecological succession Primary succession Secondary succession Pioneer species Climax community</p>

3 rd Nine weeks	Student Objectives	Vocabulary
	<p>Chapter 6 Describe how plants determine the name of a biome. Explain how temperature and precipitation determine which plants grow in an area. Explain how latitude and altitude affect which plants grow in an area. List 3 characteristics of the tropical rainforest. Name and describe the layers of the tropical rainforest. Describe 1 plant of the temperate deciduous forest and an adaptation that helps it survive. Describe 1 adaptation that would help an animal survive in the Taiga Name 2 threats to the worlds forest biomes. Describe the difference between tropical and temperate grasslands. Describe the climate in the chaparral. Describe 2 desert animals and the adaptations that help them survive. Describe 1 threat to the tundra biome. BIOME RESOURCES</p>	Biome Climate Latitude Altitude Tropical rainforest Emergent layer Canopy Epiphyte Understory Temperate rainforest Temperate deciduous forest Taiga Savanna Temperate grassland Chaparral Desert Tundra Permafrost
	<p>Chapter 7 Describe the factors that determine where an organism lives in an aquatic ecosystem. Describe the littoral zone and the benthic zone that make up a lake. Describe 2 environmental functions of wetlands. Describe 1 threat against a river system. Explain why an estuary is a very productive ecosystem. Compare salt marshes and mangrove swamps. Describe 2 threats to coral reefs. Describe 2 threats to ocean organisms ENVIRONMENTS RESOURCES</p>	Wetland Plankton Nekton Benthos Littoral zone Benthic zone eutrophication estuary salt marsh mangrove swamp barrier island coral reef

<p>Chapter 8 Describe the 3 main properties of a population. Describe exponential growth. Describe how the reproductive behavior of individuals can affect the growth rate of the population. Explain how population sizes in nature are regulated. Explain the difference between niche and habitat. Give examples of parts of a niche. Describe the 5 major types of interactions between species. Explain the difference between parasitism and predation. Explain how symbiotic relationships may evolve. POPULATION RESOURCES</p>	Population Density Dispersion Growth rate Reproductive potential Exponential growth Carrying capacity Niche Competition Predation Parasitism Mutualism Commensalism symbiosis
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4 th Nine Weeks	Student Objectives	Vocabulary
	<p>Chapter 10 Describe the diversity of species types on earth, relating the difference between known numbers and estimated numbers. List and describe 3 levels of biodiversity. Explain 4 ways in which biodiversity is important to ecosystems and humans. Analyze the potential value of a single species. Define and give examples of endangered and threatened species. Describe several ways that species are being threatened with extinction globally. Explain which types of threats are having the largest impact on biodiversity. List areas of the world that have high levels of biodiversity and many threats to species. Compare the amount of biodiversity in the US to that of the rest of the world. List and describe 4 types of efforts to save individual species. Explain the advantages of protecting entire ecosystems rather than individual species. Describe the main provisions of the Endangered Species Act. Discuss ways in which efforts to protect endangered species can lead to controversy. Describe 3 examples of worldwide cooperative efforts to prevent extinction. BIODIVERSITY RESOURCES</p>	Biodiversity Gene Keystone species Ecotourism Endangered species Threatened species Exotic species Poaching Endemic species Germ plasm Endangered Species Act Habitat conservation plan Biodiversity treaty

Chapter 13

Explain the difference between weather and climate.

Identify 4 major factors that determine climate.

Explain why different parts of the earth have different climates.

Explain what causes the seasons.

Explain how the ozone layer shields the Earth from much of the sun's harmful rays.

Explain how CFC's damage the ozone layer.

Explain the process by which the ozone hole forms.

Describe the damaging effects of UV radiation.

Explain why the threat to the ozone layer is still continuing.

Explain why Earth's atmosphere is like the glass in a greenhouse.

Explain why carbon dioxide in the atmosphere seems to be increasing.

Explain why many scientists think that the Earth's climate may be becoming increasingly warmer.

Describe what a warmer Earth might be like.

CLIMATE RESOURCES

Climate

Latitude

El Nino

La Nina

Ozone layer

Chlorofluorocarbons

Ozone hole

Polar stratospheric clouds

Greenhouse gas

Global warming

Kyoto protocol