

Options EHS Ecology		Scope and Sequence
Unit	Lesson	Objectives
Scientific Inquiry and Analysis		
Scientific Inquiry		
		Describe the steps involved in scientific inquiry.
		Differentiate between an observation and an inference.
		Explain the relationship between variables and controls in an experiment.
		Compare and contrast scientific theories and scientific laws.
Laboratory Tools and Safety		
		Describe the use of various common laboratory tools.
		Differentiate between light, dissecting, and electron microscopes.
		Identify safety equipment found in a science lab.
		Explain the importance of following common lab rules and procedures.
Scientific Measurement		
		Explain the purpose of utilizing the metric system in scientific measurement.
		Identify the basic SI units utilized in scientific measurement.
		Calculate values utilizing the metric conversion process.
		Describe the use of significant figures and rounding in scientific measurement.
Introduction to Ecology		
Ecology 101		
		Describe the levels of organization in the biosphere.
		Identify the major biomes found on Earth.
		Compare and contrast major ecosystems found on Earth.
		Skills used: create a flow chart, compare and contrast

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	Ecology 102	
		Identify factors that can cause change within an ecosystem.
		Evaluate the effects of different factors on ecosystem stability.
		Describe changes that can occur within an ecosystem.
		Skills used: understanding cause and effect, making logical connections, interpreting observations
	Trophic Levels and Food Webs	
		Explain how relationships between organisms in an ecosystem contribute to energy flow within a food chain.
		Analyze the effects of changes in populations on food web dynamics.
		Differentiate between three types of energy pyramids.
		Analyze relationships between producers, consumers, and decomposers in an ecosystem.
		Skills used: compare and contrast, create a structure diagram, understanding cause and effect, interpreting observations
	Adaptation	
		Describe the development of the theory of evolution.
		Explain the theory of evolution.
		Relate adaptations of organisms to resource competition.
		Skills used: create a timeline, making logical connections
	Global Connection: Changing Migratory Patterns	
		Explain how migratory patterns change in response to alterations in an ecosystem.
Habitats		
	Skills Lesson: Contrasting Observations or Objects	

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		List characteristics of two or more observable events or objects.
		Organize characteristics on a chart or graph.
		Distinguish differences between the two events or objects.
	Organismal Relationships	
		Describe three types of interactions between organisms in an ecosystem.
		Compare and contrast mutualism, parasitism, and commensalism.
		Explain the effects of competitive exclusion on an ecosystem.
		Skills used: compare and contrast, understanding cause and effect
	Biodiversity	
		Analyze the effects of local evolution or migration on an ecosystem.
		Predict the impact of removing or adding organisms on a food chain.
		Explain how changes in biodiversity impact an ecosystem.
		Skills used: making predictions, making logical connections
	Land Habitats	
		Differentiate between biotic and abiotic factors in various ecosystems.
		Explain the adaptations of indigenous species to their respective ecosystems.
		Skills used: compare and contrast
	Aquatic Habitats	
		Compare and contrast the components of marine and freshwater ecosystems.
		Differentiate between terrestrial and aquatic energy pyramids.
		Skills used: compare and contrast
	Population Dynamics	

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	Population Size	Identify biotic and abiotic factors that limit population growth. Evaluate the effect of various factors on population size. Analyze population patterns within ecosystems. Skills used: interpreting data, understanding cause and effect, making logical connections
	Population Genetics	Describe the effect of genetics on the growth rate and carrying capacity of a population. Evaluate the effects of events on gene flow. Skills used: interpreting data, understanding cause and effect
	Determining Population Size	Compare and contrast various methods of determining population size. Discriminate between major population growth models. Compute population density. Skills used: interpreting data, compare and contrast, calculating data
	Measuring Populations	Compare and contrast various types of population distribution. Differentiate between stabilizing, disruptive, and directional selection utilizing a graph. Illustrate the structure of a given population demographic. Skills used: compare and contrast, create a structure diagram, interpreting data
	Global Connection: Human Impact on Population Size	Evaluate human impact on wildlife population size.
Arid and Semi-Arid Biomes		

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	Skills Lesson: Making Comparisons	
		Identify like systems or events to be compared and contrasted.
		List characteristics of the compared systems or events.
		Group characteristics by similarities and differences.
		Contrast unlike characteristics of two or more phenomena.
	Characteristics of Biomes	
		Identify the characteristics used to define all biomes.
		Summarize the history of biomes on Earth.
		Describe the impact of humanity on Earth's biomes.
		Compare and contrast artificial and natural changes within a biome.
		Skills used: compare and contrast, understanding cause and effect, identifying trends
	Desert and Desert-Scrub Biomes	
		Identify the characteristics of desert and desert-scrub biomes.
		Evaluate ways organisms have adapted to desert and desert-scrub environments.
		Skills used: making logical connections, compare and contrast
	The Chaparral	
		Identify the characteristics of chaparral biomes.
		Evaluate ways organisms have adapted to chaparral.
		Skills used: making logical connections
	Alpine and Taiga Biomes	
		Identify the characteristics of the alpine and taiga biomes.
		Evaluate ways organisms have adapted to the alpine and taiga biomes.

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		Skills used: making logical connections, compare and contrast
	The Tundra	
		Identify the characteristics of the tundra.
		Evaluate ways organisms have adapted to the tundra.
		Skills used: making logical connections
Temperate, Wet, and Aquatic Biomes		
	Savanna and Grassland Biomes	
		Identify the characteristics of the savanna and grassland biomes.
		Evaluate ways organisms have adapted to the savanna and grasslands.
		Skills used: making logical connections, compare and contrast
	Deciduous Forests	
		Identify the characteristics of deciduous forests.
		Evaluate ways organisms have adapted to deciduous forests.
		Skills used: making logical connections
	The Rainforest	
		Identify the characteristics of the rainforest.
		Evaluate ways organisms have adapted to the rainforest.
		Skills used: making logical connections
	Freshwater and Marine Biomes	
		Identify characteristics that are unique to each of the aquatic biomes.
		Compare and contrast the adaptations of organisms in the aquatic biomes to their respective environments.
		Describe how humans utilize resources from each of the aquatic biomes.

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		Explain how human understanding of aquatic ecosystems has changed throughout history.
		Skills used: compare and contrast, identifying trends
	Global Connection: Why Invasive Species Thrive	
		Relate the ability of invasive species to thrive in their new habitat to resource competition.
Earth's Systems		
	Skills Lesson: Modeling Systems and Cycles	
		Identify a system or cycle to be modeled.
		Determine the main parts or processes of the system or cycle.
		Organize the parts or processes sequentially.
		Model the main parts or processes of the system or cycle.
	Systems of the Biosphere	
		Describe Earth's systems in terms of energy, matter, time, and space.
		Explain the interactions between Earth's systems.
	Patterns in Systems	
		Describe various patterns found in the Earth system.
		Identify methods of measuring constancy and change in a system.
Earth's Cycles		
	The Cycles of Matter	
		Describe various cycles of matter that take place on Earth.
		Evaluate the role played by cycles in sustaining life.
		Explain the change in energy that occurs between each cycle in an ecosystem.
	The Water Cycle	

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		Describe the steps of the water cycle.
		Explain the relationship between living organisms and the water cycle.
		Identify possible sources of water contamination.
	Effects of Cycles on Ecosystems	
		Explain how fluctuations in abiotic cycles influence populations.
		Describe the movement of carbon compounds through a food web.
		Describe the effects of abiotic cycles on local ecosystems.
	Global Connection: Recycling on Earth	
		Compare human recycling techniques to similar cycles in nature.
The Air		
	Skills Lesson: Evaluating Explanations	
		Identify a given explanation for an event or process.
		Research data relating to the explanation.
		Categorize researched information as being factual or biased.
		Evaluate the given explanation based on researched data.
	Atmospheric Pollution	
		Overview the composition and function of each layer of the atmosphere.
		Identify various common atmospheric pollutants.
		Differentiate between primary and secondary pollutants.
		Examine the effects of pollution on health.
		Skills used: evaluate the validity of an explanation
	Ozone	

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		Explain how the ozone layer is formed.
		Analyze the importance of the ozone layer in sustaining life.
		Compare and contrast various factors that cause ozone depletion.
		Relate fluctuations in ozone to human health and the environment.
	Air Quality	
		Identify various causes of air pollution.
		Explain the impact of air pollution on the environment.
		Assess the methods that can be utilized to improve air quality.
		Propose alternative methods of improving air quality.
		Skills used: compare and contrast support and opposition
	Climate	
	Succession	
		Identify various causes of succession in ecosystems.
		Differentiate between primary and secondary succession in ecosystems.
		Explain the importance of succession in maintaining ecosystems.
	Climate and Change in Ecosystems	
		Identify various effects of climate changes on an ecosystem.
		Describe environmental factors that can cause changes in ecosystems.
		Compare and contrast the benefits and disadvantages of natural change to ecosystems.
	Global Change	
		Predict future changes in the global climate.
		Assess current theories regarding global climate change.

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		Analyze environment changes and their connection to global warming.
		Skills used: making predictions based on data
	A History of Global Climate Change	
		Compare current and past global climate trends.
		Explain how long-term global climate shifts impact Earth's ecosystems.
		Describe the effects of greenhouse gases on the atmosphere.
		Analyze various theories related to global warming.
		Skills used: compare and contrast support and opposition
	Global Connection: Algal Blooms	
		Connect the formation of algal blooms to climate change.
Cumulative Test Review		
Cumulative Exam		