Indiana Department of Education

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Environmental Science Correlation Guide
2016 Science Indiana Academic Standards to 2022 Performance Expectations*

2016 Indiana Academic Standard	2022 Performance Expectation
Env.1.1 Understand and explain that ecosystems have cyclic fluctuations, such as seasonal changes or changes in population, as a result of migration, birth, and mortality. **Env.2.1** Describe how matter cycles through sources and sinks and how energy is transferred. Explain how matter and energy move between and within components of an environmental system.	**HS-ENV1-1.** Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
Env.1.2 Understand and explain that human beings are part of Earth's ecosystems and give examples of how human activities can, deliberately or inadvertently, alter ecosystems.	**HS-ENV1-2.** Use a computational representation to illustrate that humans are part of Earth's ecosystems and how human activities can, deliberately or inadvertently, alter ecosystems.
Env.1.2 Understand and explain that human beings are part of Earth's ecosystems and give examples of how human activities can, deliberately or inadvertently, alter ecosystems.	**HS-ENV1-3.** Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
Env.1.3 Recognize and describe the difference between systems in equilibrium and systems in disequilibrium. Describe how steady state is achieved through negative and positive feedback loops.	**HS-ENV1-4.** Analyze data regarding differences between systems in equilibrium and systems in disequilibrium. Use corresponding data to support how steady state is achieved through negative and positive feedback loops.
Env.1.5 Identify and measure biological, chemical, and physical (abiotic and biotic) factors within an ecosystem.	**HS-ENV1-5.** Evaluate, measure, and communicate biological, chemical, and physical (abiotic and biotic) factors within an ecosystem.
Env.1.6 Describe the difference between weather and climate. Locate, identify, and describe the major Earth biomes. Explain how biomes are determined by climate (temperature and precipitation patterns) that support specific kinds of plants.	**HS-ENV1-6.** Use a model to locate and describe the major Earth biomes. Analyze data to assess how biomes are determined by climate (temperature and precipitation patterns) that support specific kinds of plants.
Env.1.8 Explain the factors that influence	**HS-ENV1-7.** Observe the difference between

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weather and climate, the action of gravitational forces, and the rotation of the Earth. **Env.1.9** Describe how weather can be influenced by global climatic patterns, such as El Niño and La Niña.	weather and climate. Observe how weather can be influenced by global climatic patterns, such as El Niño and La Niña. Use a model or simulation to observe the factors that influence weather and climate, the action of gravitational forces, and the rotation of the Earth.
	HS-ENV1-8. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.
Env.2.1 Describe how matter cycles through sources and sinks and how energy is transferred. Explain how matter and energy move between and within components of an environmental system.	**HS-ENV2-1.** Construct and revise an explanation based on evidence for the cycling of matter through sources and sinks and how energy is transferred.
	HS-ENV2-2. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem *(These mathematical representations may include ecological pyramids of number, biomass, and energy.)*.
	HS-ENV2-3. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
Env.2.8 Cite examples of how all fuels, renewable and nonrenewable, have advantages and disadvantages that society must question when considering the trade-offs among them, such as how energy use contributes to the rising standard of living in the industrially developing nations. However, explain that this energy use also leads to more rapid depletion of Earth's energy resources and to environmental risks associated with the use of fossil and nuclear fuels.	**HS-ENV2-4.** Analyze and interpret the data on the benefits and disadvantages of the different sources of energy including fossil fuels, nuclear energy, hydroelectric, wind, solar, geothermal and biofuels.
Env.2.6 Understand and describe how layers	**HS-ENV2-5.** Use a model or simulation to

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of energy-rich organic material have been gradually turned into great coal beds and oil pools by the pressure of the overlying earth. Recognize that by burning these fossil fuels, people are passing stored energy back into the environment as heat and releasing large amounts of matter such as carbon dioxide and other air pollutants.	analyze how layers of energy-rich organic material have been gradually turned into great coal beds and oil pools by the pressure of the overlying earth. Observe that by burning these fossil fuels, people are passing stored energy back into the environment as heat and releasing large amounts of matter such as carbon dioxide and other air pollutants.
Env.2.8 Cite examples of how all fuels, renewable and nonrenewable, have advantages and disadvantages that society must question when considering the trade-offs among them, such as how energy use contributes to the rising standard of living in the industrially developing nations. However, explain that this energy use also leads to more rapid depletion of Earth's energy resources and to environmental risks associated with the use of fossil and nuclear fuels.	**HS-ENV2-6.** Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
Env.2.9 Describe how decisions to slow the depletion of energy sources through efficient technologies can be made at many levels, from personal to national, and these technologies involve trade-offs of economic costs and social values.	**HS-ENV2-7.** Analyze computational tools and other technologies that allow for the management of natural resources. Evaluate the trade-offs of these tools regarding human physical and cultural needs versus sustainability and biodiversity.
Env.3.4 Identify natural Earth hazards, such as earthquakes and hurricanes, and identify the regions in which they occur as well as the short-term and long-term effects on the environment and on people.	**HS-ENV3-1.** Construct an explanation based on evidence for how natural Earth hazards, such as earthquakes, tornadoes and hurricanes, affect the environment and human activity on both a short-term and long-term scale.
Env.5.2 Explain how the great diversity of species increases the chance that at least some living organisms will survive in the event of major global changes.	**HS-ENV4-1.** Use a model or simulation to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
Env.5.5 Identify the indirect and direct threats to biodiversity (e.g. habitat loss and destruction, invasion by exotic species,	**HS-ENV4-2.** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

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commercial overfishing and hunting, pollution, climate change, and bioaccumulation and biomagnification of toxins).	
Env.6.2 Explain how the size and rate of growth of the human population in any location is affected by economic, political, religious, technological, and environmental (resource availability) factors.	**HS-ENV5-1.** Analyze and interpret data on how the size and rate of growth of the human population in any location is affected by economic, political, religious, technological, and environmental (resource availability) factors.
Env.8.2 Understand and describe the concept of integrated natural resource management and the values of managing natural resources as an ecological unit.	**HS-ENV5-2.** Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
	HS-ENV5-3. Design, evaluate and refine a technological solution that reduces impacts of human activities on natural systems.
	HS-ENV5-4. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
Env.4.1 Explain environmental policies/organizations (Clean Water Act, Clean Air Act, Endangered Species Act, Species Survival Plan, Resource Conservation and Recovery Act, Department of Energy, and the World Health Organization) and identify their impact.	**HS-ENV6-1.** Conduct an investigation to evaluate the effectiveness of environmental policies and/or organizations (Clean Water Act, Clean Air Act, Endangered Species Act, Species Survival Plan, Resource Conservation and Recovery Act, Department of Energy, and the World Health Organization).
Env.4.2 Understand that environmental policies/decisions have negative and positive impacts on people, societies, and the environment.	**HS-ENV6-2.** Construct an argument to explain that environmental policies/decisions have negative and positive impacts on people, societies, and the environment.

*Performance expectations are three dimensional. All three dimensions (Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts) must be included as part of effective instruction.

For more information, see the Indiana Department of Education's Indiana Academic Standards webpage or contact the Office of Teaching and Learning.