

Environmental Science: Grades 9, 10, 11, 12

Adopted 2022

Environmental Systems

- 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. [HS-ENV1-1](#)
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- 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. [HS-ENV1-2](#)
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- 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. [HS-ENV1-3](#)
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- 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. [HS-ENV1-4](#)
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- HS-ENV1-5.** Evaluate, measure, and communicate biological, chemical, and physical (abiotic and biotic) factors within an ecosystem. [HS-ENV1-5](#)
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- 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. [HS-ENV1-6](#)
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- a.** Observe the difference between weather and climate. [HS-ENV1-7.A](#)
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- b.** Observe how weather can be influenced by global climatic patterns, such as El Niño and La Niña. [HS-ENV1-7.B](#)
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- c.** 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-ENV1-7.C](#)

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. [HS-ENV1-8](#)

Flow of Matter and Energy

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-ENV2-1](#)

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-ENV2-2](#)

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. [HS-ENV2-3](#)

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. [HS-ENV2-4](#)

HS-ENV2-5. Use a model or simulation to 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. [HS-ENV2-5](#)

HS-ENV2-6. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. [HS-ENV2-6](#)

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. [HS-ENV2-7](#)

Natural Hazards

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. [HS-ENV3-1](#)

Biodiversity

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. [HS-ENV4-1](#)

HS-ENV4-2. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. [HS-ENV4-2](#)

The Effect of Human Population and Activities on the Environment

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. [HS-ENV5-1](#)

HS-ENV5-2. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. [HS-ENV5-2](#)

HS-ENV5-3. Design, evaluate and refine a technological solution that reduces impacts of human activities on natural systems. [HS-ENV5-3](#)

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. [HS-ENV5-4](#)

Environmental Policy

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). [HS-ENV6-1](#)

HS-ENV6-2. Construct an argument to explain that environmental policies/decisions have negative and positive impacts on people, societies, and the environment. [HS-ENV6-2](#)