

Environmental Science and Societal Issues

Essential Curriculum

Unit 1: Environmental Foundations

Evaluate 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-LS2-6](#))

Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. ([HS-LS2-2](#))

Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. ([HS-LS4-5](#))

Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. ([HS-LS2-1](#))

Unit 2: Energy Transfer

Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. ([HS-PS3-3](#))

Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. ([HS-PS1-2](#))

Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. ([HS-PS1-5](#))

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-ESS2-4](#))

Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.* ([HS-ESS3-2](#))

Unit 3: Global Changes

Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. ([HS-ESS2-1](#))

Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. ([HS-ESS2-6](#))

Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. ([HS-ESS2-5](#))

Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. ([HS-ESS3-1](#))

Unit 4: Human Impact

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's systems. ([HS-ESS3-5](#))

Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. ([HS-ESS3-3](#))

Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. ([HS-ESS3-6](#))

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* ([HS-LS2-7](#))

Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.* ([HS-LS4-6](#))

Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* ([HS-ESS3-4](#))