

Utah	Environmental Science Standards	Essential Environment: The Science Behind the Stories 7e
Standard ENVS.1.1	Develop and use a model to compare and analyze the levels of biological organization within living systems. Examples of levels of biological organization could include organisms, populations, communities, ecosystems, or biospheres.	pp. 38-43 Chapter 2 - ecosystems, organisms; pp. 61-63 Chapter 3 - ecology, organisms, habitat
Standard ENVS.1.2	Ask questions to collect and analyze data for how abiotic factors affect ecosystems and population adaptations. Examples of abiotic factors could include precipitation, temperature, elevation, or soil composition.	p. 28 Chapter 2 - environmental systems
Standard ENVS.1.3	Develop and use models based on Laws of Thermodynamics to predict how energy transfers in ecosystems. Examples of energy transfer could be explained in terms of food chains, food webs, trophic levels, or carrying capacity.	p. 38 Chapter 2 - laws of thermodynamics explained
Standard ENVS.1.4	Analyze and interpret data to construct an argument of the necessity of biogeochemical (matter) cycles to support sustainable ecosystems. Examples of biogeochemical cycles could include, hydrologic, nitrogen, phosphorus, oxygen, or carbon.	pp. 41-50 Chapter 2 - ecosystems, biogeochemical cycles
Standard ENVS.1.5	Construct an argument from evidence to predict changes in biomass, biodiversity, and complexity within ecosystems. Emphasize changes in terms of ecological succession over periods of time.	pp. 38-43 Chapter 2 - ecosystems, biodiversity; pp. 78-89 Chapter 4 - ecological communities
Standard ENVS.1.6	Construct an argument from evidence to support a claim about the value of biodiversity in ecosystem resilience (stability). Emphasize the value of biodiversity in ecosystem resilience. Examples of key factors in ecosystem resilience could include keystone, invasive, native, endemic, indicator, and endangered species.	pp. 78-89 Chapter 4 - ecological communities, keystone
Standard ENVS.2.1	Construct an argument based on evidence about the risks and benefits caused by using renewable and nonrenewable energy sources. Examples of risks and benefits could include environmental, social, or economic factors.	p. 22 Chapter 1 - sustainability; pp. 368-389 Chapter 15 - nonrenewable energy; pp. 404-430 Chapter 16 - renewable energy
Standard ENVS.2.2	Analyze and interpret data to communicate information on the origins, quantity/proportion, and consumption of renewable and nonrenewable energy sources. Examples of renewable energy sources could include wind, solar, geothermal, biofuel, or tidal. Examples of non-renewable energy sources could include fossil fuels and nuclear energy.	pp. 368-389 Chapter 15 - nonrenewable energy; pp. 404-430 Chapter 16 - renewable energy

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Standard ENVS.2.3	Design a solution in the form of a sustainable energy plan for your city, town, county or region of the state. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data to make improvements from iteratively testing solutions, and optimize the solution. Emphasize basing the plan on scientific principles and on the sustainability potential of renewable and nonrenewable energy resources.	pp. 368-389 Chapter 15 - nonrenewable energy; pp. 404-430 Chapter 16 - renewable energy
Standard ENVS.3.1	Construct an argument based on evidence for the effects humans have by obtaining and using natural resources. Emphasize the uses and importance of resources and potential impacts of obtaining them. Examples of human activities to obtain resources could include agriculture, ranching, mining, forestry, fishing, water use, or desalination.	pp. 4-6 Chapter 1 - human use of resources
Standard ENVS.3.2	Obtain, evaluate, and communication information to explain how the location, quantity, and proportion of natural resources may be dependent on multiple environmental factors. Examples of environmental factors course include climate, geologic history, or soil composition.	pp. 4-6 Chapter 1 - human use of resources
Standard ENVS.3.3	Construct an explanation for why governments and organizations manage the use and effect of using natural resources. Emphasize how government and legislation affect management and sustainability plans. Examples of effects of management plans could include sustaining natural populations, market value of goods, or potential environmental impacts.	pp. 13-21 Chapter 1 - scientific funding and ethics; pp. 101-124 Chapter 5 - economics
Standard ENVS.3.4	Design a solution in the form of a resource management plan to sustain (stability) a natural resource in your city, town, county, or region of the state. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data to make improvements from iteratively testing solutions, and optimize the solution. Emphasize basing the plan on scientific principles. Examples of natural resources could include water, air, land, or organisms like trees or fish.	pp. 4-6 Chapter 1 - human use of resources
Standard ENVS.4.1	Construct an argument to evaluate how human population growth affects natural resources and the potential solutions to these effects. Examples of resources affected by human population growth could include food demand, food supply, waste disposal, or land use. Examples of potential solutions could include genetically modified organisms, hydroponics, wastewater treatment, or improved recycling systems.	pp. 146-153 Chapter 7 - feeding the world, food resources

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Standard ENVS.4.2	Construct explanations about the relationship between the quality of life and human impact (effect) on the environment in terms of population growth, education, and gross national product. Emphasize the role of sustainable practices to support both humans and nature.	pp. 146-153 Chapter 7 - feeding the world, food resources
Standard ENVS.4.3	Obtain, evaluate, and communicate information for how humans cause an impact on the environment and how individuals, state and local management plans, and government legislation have identified and adjusted practice to reduce and/or reverse these impacts. Emphasize the process and time necessary to pass Examples of impact could include water and air pollution, climate change, ozone depletion, deforestation, ocean acidification, or urbanization. Examples of adjusted practice could include the reduction of fossil fuel use, criminalization of dumping waste, or outlawing the use of chlorofluorocarbons.	pp. 216-220 Chapter 9 - forest management; pp. 245-248 Chapter 10 - risk management; pp. 266-272; pp. 296-302 Chapter 12 - water pollution
Standard ENVS.4.4	Analyze and interpret data to construct an explanation based on evidence for the causes and impacts of global climate change on human populations and environments. Examples of evidence could include ice cores, ocean acidification, glacier retreat, atmospheric CO2 levels, or air and ocean temperature.	pp. 341-354 Chapter 14 - climate change
Standard ENVS.4.5	Design and defend a solution in the form of a sustainability plan to reduce individual, city, or regional contribution (causes) to environmental impacts. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data to make improvements from iteratively testing solutions, and optimize the solution. Emphasize how market forces and societal demands influence personal choices.	pp. 458-466 Chapter 18 - sustainability planning for cities