

Virtual Field Trip Standards

Powering the Planet: Renewable Energy

[Next Generation Science Standards](#)

NGSS Lead States. 2013. *Next Generation Science Standards: For States, By States*. Washington, DC: The National Academies Press.

Grade	Topic	Disciplinary Core Idea	Performance Expectation
K	Earth Systems	ESS3.A Natural Resources - Living things need water, air, and resources from the land and they live in places that have the things they need. Humans use natural resources for everything they do.	K-ESS3-1 Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
K	Earth Systems	ESS3.C Human Impacts on Earth Systems - things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.	K-ESS3-3 Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
2nd grade	Life Science	LS4.D Biodiversity and Humans - There are many different kinds of living things in any area, and they exist in different places on land and in water.	2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.
3rd grade	Life Science	LS4.D Biodiversity and Humans - Populations live in a variety of habitats, and change in those habitats affects the organisms living there.	3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
3rd grade	Life Science	LS2.C Ecosystem Dynamics, Functioning, and Resilience - when the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.	3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

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4 th grade	Physical Science	ESS3.A Natural Resources – Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.	4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
5th grade	Earth Systems	ESS3.C Human Impacts on Earth Systems - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.	5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
Middle School	Life Science	LS2.C Ecosystem Dynamics, Functioning, and Resilience - Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.	MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
Middle School	Life Science	LS2.C Ecosystem Dynamics, Functioning, and Resilience - Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.	MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
Middle School	Life Science	LS4.D Biodiversity and Humans - Changes in biodiversity can influence humans' resources such as food, energy, and medicines, as well as ecosystem services that humans rely on - for example, water purification and recycling.	MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Grade	Topic	Disciplinary Core Idea	Performance Expectation
Middle School	Earth Systems	ESS3.A Nature Resources – Humans depend on Earth’s land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.	MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.
Middle School	Earth Systems	ESS3.C Human Impacts on Earth Systems - Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things.	MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
Middle School	Earth Systems	ESS3.C Human Impacts on Earth Systems - Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.	MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.
Middle School	Earth Systems	ESS3.D Global Climate Change – Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth’s mean surface temperature. Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.	MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.