



NGSS - Science Priority Standards K-8

NGSS: Science: Kindergarten

Ecosystem Relationships

K.LS1.1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

Weather & Climate

K.ESS2.1 Use and share observations of local weather conditions to describe patterns over time.

K.PS3.1 Make observations to determine the effect of sunlight on Earth's surface.

Engineering Design: Kindergarten - Grade 2

K-2.ETS1.1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2.ETS1.2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2.ETS1.3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NGSS - Science: Grade 1

Light & Sound

1.PS4.2 Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.

Function & Information Processing

1.LS1.2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

Inheritance/Variation of Traits

1.LS3.1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Space Systems: Patterns & Cycles

1.ESS1.2 Make observations at different times of year to relate the amount of daylight to the time of year.

Engineering Design: Kindergarten - Grade 2

K-2.ETS1.1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2.ETS1.2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2.ETS1.3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NGSS - Science: Grade 2

Structure & Properties of Matter

- 2.PS1.1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

Interdependent Relationships in Ecosystems

- 2.LS4.1** Use and share observations of local weather conditions to describe patterns over time.

Processes that Shape the Earth

- 2.ESS2.1** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

Engineering Design: Kindergarten - Grade 2

- K-2.ETS1.1** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2.ETS1.2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- K-2.ETS1.3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NGSS: Science: Grade 3

Forces & Interaction

- 3.PS2.1** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3.PS2.3** Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

Interdependent Relationships Ecosystems

- 3.LS4.1** Use and share observations of local weather conditions to describe patterns over time.

Inheritance, Variation of Traits, & Life Cycle

- 3.LS1.1** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
- 3.LS3.1** Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

Weather & Climate

- 3.ESS2.1** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
- 3.ESS3.1** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Engineering Design: Grades 3-5

- 3-5.ETS1.1** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5.ETS1.2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5.ETS1.3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

NGSS: Science: Grade 4

Energy

- 4.PS3.4** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

Waves

- 4.PS4.3** Generate and compare multiple solutions that use patterns to transfer information.

Structure, Function, and Information Processing

- 4.LS1.1** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Earth's Systems: Processes that Shape the Earth

- 4.ESS2.2** Analyze and interpret data from maps to describe patterns of Earth's features.
- 4.ESS3.2** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Engineering Design: Grades 3-5

- 3-5.ETS1.1** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5.ETS1.2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5.ETS1.3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

NGSS - Science: Grade 5

Structure & Properties of Matter

- 5.PS1.1** Develop a model to describe that matter is made of particles too small to be seen.
- 5.PS1.2** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved

Matter & Energy in Organisms and Ecosystems

- 5.PS3.1** Use models to describe that that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- 5.LS2.1** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Earth's Systems

- 5.ESS2.1** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- 5.ESS2.2** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- 5.ESS3.1** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Engineering Design: Grades 3-5

- 3-5.ETS1.1** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5.ETS1.2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5.ETS1.3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

NGSS - Science: Grades 6-8

Earth Space Science

Earth & Space Sciences

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| MS.ESS1.1 | Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. |
| MS.ESS1.2 | Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. |
| MS.ESS1.3 | Analyze and interpret data to determine scale properties of objects in the solar system. |

History of Earth

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| MS.ESS2.2 | Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. |
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Earth's Systems

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| MS.ESS2.1 | Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. |
| MS.ESS2.4 | Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. |

Weather & Climate

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| MS.ESS2.5 | Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. |
| MS.ESS2.6 | Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. |

Life Science

Structure, Function, & Information Processing

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| MS.LS1.3 | Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. |
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Matter & Energy in Organisms & Ecosystems

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| MS.LS2.1 | Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. |
| MS.LS2.4 | Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. |

Interdependent Relationships in Ecosystems

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| MS.LS2.2 | Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. |
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Growth, Development, & Reproduction of Organisms

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| MS.LS1.4 | Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. |
| MS.LS1.5 | Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. |
| MS.LS3.1 | Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. |
| MS.LS4.5 | Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. |

Natural Selection & Adaptation

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| MS.LS4.1 | Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. |
| MS.LS4.4 | Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. |

Physical Science

Structure & Properties of Matter

- MS.PS1.1** Develop models to describe the atomic composition of simple molecules and extended structures.
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- MS.PS1.4** Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
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Chemical Reactions

- MS.PS1.5** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
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Forces & Interactions

- MS.PS2.1** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
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- MS.PS2.3** Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
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Energy

- MS.PS3.1** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
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- MS.PS3.4** Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
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Waves & Electromagnetic Radiation

- MS.PS4.2** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
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Engineering Design

- MS.ETS1.1** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions
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- MS.ETS1.2** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
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- MS.ETS1.3** Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
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- MS.ETS1.4** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
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[1] Updated March 2022