

KINDERGARTEN SCIENCE

PHYSICAL SCIENCE: Matter, Energy, and its Interactions

Students will understand the structure and properties of matter and explain how the interactions among objects can be described and represented by the motion, forces, and energy of the objects.

GRADE-LEVEL STANDARD: K (Pushes and Pulls & Earth's Sun)
Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

LIFE SCIENCE: Matter and Energy in Ecosystems

Students will understand the characteristics and functions of organisms and the physical and behavioral interactions between matter and organisms within an ecosystem.

GRADE-LEVEL STANDARD: K (Animals, Plants, and Their Environment)
Use observations to describe patterns of what plants and animals (including humans) need to survive.

EARTH AND SPACE SCIENCE: Earth's Origin, Systems, and Human Impact

Students will understand Earth's origin and how Earth's surface processes and human activities affect each other.

GRADE-LEVEL STANDARD K (Weather and Climate)
Use and share observations of local weather conditions to describe patterns over time.
Ask questions about the purpose of weather forecasting to prepare for and respond to severe weather.
Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
Make observations to determine the effect of sunlight on Earth's surface.

1ST GRADE SCIENCE

PHYSICAL SCIENCE: Matter, Energy, and its Interactions

Students will understand the structure and properties of matter and explain how the interactions among objects can be described and represented by the motion, forces, and energy of the objects.

GRADE-LEVEL STANDARD- <u>Sight and Sound</u>
Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.
Make observations to construct an evidence-based account that objects can be seen only when illuminated.

LIFE SCIENCE: Organism's Structure, Function, and Information Processing

Students will understand how organisms live, grow, respond to their environment, and reproduce using molecular, structural, and chemical biology.

GRADE-LEVEL STANDARD- <u>Survival Needs</u>
** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

EARTH AND SPACE SCIENCE: Earth's Origin, Systems, and Human Impact

Students will understand Earth's origin and how Earth's surface processes and human activities affect each other.

GRADE-LEVEL STANDARD- <u>Patterns and Cycles</u>
Use observations of the sun, moon, and stars to describe patterns that can be predicted.
Make observations at different times of year to relate the amount of daylight to the time of year.

2ND GRADE SCIENCE



PHYSICAL SCIENCE: Matter, Energy, and its Interactions

Students will understand the structure and properties of matter and explain how the interactions among objects can be described and represented by the motion, forces, and energy of the objects.

GRADE-LEVEL STANDARD- Properties of Matter
Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
Construct an argument with evidence that some changes caused by heating and cooling can be reversed and some cannot.

LIFE SCIENCE: Matter and Energy in Ecosystems

Students will understand the characteristics and functions of organisms and the physical and behavioral interactions between matter and organisms within an ecosystem.

GRADE-LEVEL STANDARD- Interdependence in Ecosystems
Plan and conduct an investigation to determine if plants need sunlight and water to grow.
** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

LIFE SCIENCE: Heredity, Natural Selection and Biodiversity of Organisms

Students will understand genetics, variation of traits, adaptation, natural selection, and biodiversity.

GRADE-LEVEL STANDARD- Interdependence in Ecosystems
Make observations of plants and animals to compare the diversity of life in different habitats.

EARTH AND SPACE SCIENCE: Earth's Origin, Systems, and Human Impact

Students will understand Earth's origin and how Earth's surface processes and human activities affect each other.

GRADE-LEVEL STANDARD- Wind and Water
Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
Develop a model to represent the shapes and kinds of land and bodies of water in an area.

3RD GRADE SCIENCE

PHYSICAL SCIENCE: Matter, Energy, and its Interactions

Students will understand the structure and properties of matter and explain how the interactions among objects can be described and represented by the motion, forces, and energy of the objects.

GRADE-LEVEL STANDARD- Forces and Interactions

Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

Make observations and/ or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

** Define a simple design problem that can be solved by applying scientific ideas about magnets

LIFE SCIENCE: Organism's Structure, Function, and Information Processing

Students will understand how organisms live, grow, respond to their environment, and reproduce using molecular, structural, and chemical biology.

GRADE-LEVEL STANDARD- Life Cycles and Traits

Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

LIFE SCIENCE: Matter and Energy in Ecosystems

Students will understand the characteristics and functions of organisms and the physical and behavioral interactions between matter and organisms within an ecosystem.

GRADE-LEVEL STANDARD- Environmental Impacts on Organisms

Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

** 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.

LIFE SCIENCE: Heredity, Natural Selection and Biodiversity of Organisms

Students will understand genetics, variation of traits, adaptation, natural selection, and biodiversity.

GRADE-LEVEL STANDARD- Life Cycles and Traits

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.

Use evidence to support the explanation that traits can be influenced by the environment.

EARTH AND SPACE SCIENCE: Earth's Origin, Systems, and Human Impact

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GRADE-LEVEL STANDARD- Weather Patterns
Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

4TH GRADE SCIENCE

PHYSICAL SCIENCE: Matter, Energy, and its Interactions

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GRADE-LEVEL STANDARD- Energy (conservation of energy) and Waves

Use evidence to construct an explanation relating the speed of an object to the energy of that object.

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

Obtain information to describe that energy and fuels are derived from natural resources and that their uses affect the environment.

Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

Develop a model that demonstrates waves can cause objects to move.

LIFE SCIENCE: Organism's Structure, Function, and Information Processing

Students will understand how organisms live, grow, respond to their environment, and reproduce using molecular, structural, and chemical biology.

GRADE-LEVEL STANDARD- Structures and Senses

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

Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

EARTH AND SPACE SCIENCE: Earth's Origin, Systems, and Human Impact

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GRADE-LEVEL STANDARD- Processes that Shape the Earth

Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

I can make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

5TH GRADE SCIENCE

PHYSICAL SCIENCE: Matter, Energy, and its Interactions

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GRADE-LEVEL STANDARD - <u>Structures of Matter</u>
Develop a model to describe that matter is made of particles too small to be seen.
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.
Conduct an investigation to determine whether the mixing of two or more substances results in new substances

LIFE SCIENCE: Organism's Structure, Function, and Information Processing

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GRADE-LEVEL STANDARD - <u>Matter and Energy in Organisms and Ecosystems</u>
Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

EARTH AND SPACE SCIENCE: Earth's Origin, Systems, and Human Impact

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GRADE-LEVEL STANDARD - <u>Earth Systems and Space's Systems</u>
Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
Support an argument that the gravitational force exerted by Earth on objects is directed down.
Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

6TH GRADE SCIENCE



PHYSICAL SCIENCE: Matter, Energy, and its Interactions

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GRADE-LEVEL STANDARD <u>Thermal Energy</u>
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. (PS1-4)
** Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.* (PS3-3)
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. (PS3-4)
Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (PS3-5)
<u>Light and Matter</u> Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (PS4-2) • Light waves are reflected, absorbed, or transmitted through the object, depending on the object's material. • Light waves travel in a straight line, except at the surfaces between different transparent materials.
Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. (PS4-3)

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GRADE-LEVEL STANDARD <u>Cells and Systems</u>
Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. (LS1-1)
Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function. (LS1-2)
Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. LS1-3)
Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. (LS1-8)

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GRADE-LEVEL STANDARD Rock Cycling, Plate Tectonics and Natural Hazard
Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. (ESS2-1)
Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. (ESS2-2)
Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. (ESS2-4)
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. (ESS2-6)
Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. (ESS3-2)

