Fourth Grade:

Nickelodeon

Energy

- 4-PS3-1 – Use evidence to construct an explanation relating the speed of an object to the energy of that object.
- 4-PS3-2 – Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
- 4-PS3-3 – Ask questions and predict outcomes about the changes in energy that occur when objects collide.
- 4-PS3-4 – Apply scientific ideas to design, test, and refine a device that converts energy from on form to another.
- 4-ESS3-1 – Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- PS3.A: Definitions of Energy
    - The faster a given object is moving, the more energy is possesses. (4-PS3-1)
    - Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-2, 4-PS3-3)
- PS3.B: Conservation of Energy and Energy Transfer
    - Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy us typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (4-PS3-2, 4-PS3-3)
    - Light also transfers energy from place to place. (4-PS3-2)
    - Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to being with by transforming the energy of motion into electrical energy. (4-PS3-2, 4-PS3-4)
- PS3.C: Relationship Between Energy and Forces
    - When objects collide, the contact forces transfer energy so as to change the objects' motions. (4-PS3-3)
- PS3.D: Energy in Chemical Processes and Everyday Life
    - The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. (4-PS3-4)
- 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)
- ETS1.A: Defining Engineering Problems

- Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (4-PS3-4)

Nature Valley Water Amazements

Energy

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Waves: Waves and Information

- 4-PS4-1 – Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
- 4-PS4-3 – Generate and compare multiple solutions that use patterns to transfer information.
- PS4.A: Wave Properties
    - Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. (4-PS4-1)
    - Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)
- PS4.C: Information Technologies and Instrumentation
    - Digitalized information can be transmitted over long distances without significant degredation. High-tech devices, such as computers or cell phones, can receive and decode information – convert it from digitized form to voice – and vice versa. (4-PS4-3)
- ETS1.C: Optimizing the Design Solution
    - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (4-PS4-3)

Engineering, Technology, and Applications of Science

- 4-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.
- 4-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.
- 4-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.
- ETS1.A: Defining and Delimiting Engineering Problems
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- ETS1.B: Developing Possible Solutions
    - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (4-ETS1-2)
    - At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas an lead to improved designs. (4-ETS1-2)
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General Mills Lift, Load, & Haul

Energy

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    - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

Cave & Canopy Climber

Structure, Function, and Information Processing

- 4-PS4-2 – Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- 4-LS1-1 – Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 4-LS1-2 – 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.
- PS4.B: Electromagnetic Radiation
    - An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)
- LS1.A: Structure and Function
    - Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)
- LS1.D: Information Processing
    - Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions (4-LS1-2)

Earth's Systems: Processes that Shape the Earth

- 4-ESS1-1 – Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscape over time.
- 4-ESS2-1 – Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- 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.
- ESS1.C: The History of Planet Earth
    - Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of

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certain fossil types indicate the order in which rock layers were formed. (4-ESS1-1)

- ESS2.A: Earth Materials and Systems
    - Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. (4-ESS2-1)
- ESS2.B: Plate Tectonics and Large-Scale System Interactions
    - The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features of Earth. (4-ESS2-2)
- ESS2.E: Biogeology
    - Living things affect the physical characteristics of their regions. (4-ESS2-1)
- ESS3.B: Natural Hazards
    - A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts. (4-ESS3-2)
- ETS1.B: Designing Solutions to Engineering Problems
    - Testing a solution involves investigating how well it performs under a range of likely conditions.

The Market Sponsored by Walmart

N/A

The Homestead Cabin & Farm

Earth's Systems: Processes that Shape the Earth

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Structure, Function, and Information Processing

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Art Studio

N/A

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3M Tinkering Hub

Engineering, Technology, and Applications of Science

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Outdoor Playscape

Structure, Function, and Information Processing

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Earth's Systems: Processes that Shape the Earth

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- 4-ESS2-2 – Analyze and interpret data from maps to describe patterns of Earth's features.
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- ESS1.C: The History of Planet Earth
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- ESS2.E: Biogeology
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    - A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts. (4-ESS3-2)
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Energizer Weather & Nature

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Fifth Grade:

Nickelodeon

Engineering, Technology, and Applications of Science

- 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.
- 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.
- 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.
- ETS1.A: Defining and Delimiting Engineering Problems
    - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (5-ETS1-1)
- ETS1.B: Developing Possible Solutions
    - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (5-ETS1-2)
    - At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (5-ETS1-2)
    - Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (5-ETS1-3)
- ETS1.C: Optimizing the Design Solution
    - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (5-ETS1-3)

Nature Valley Water Amazements

Engineering, Technology, and Applications of Science

- 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.
- 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.
- 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.
- ETS1.A: Defining and Delimiting Engineering Problems
    - Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by

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considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (5-ETS1-1)

- ETS1.B: Developing Possible Solutions
    - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (5-ETS1-2)
    - At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (5-ETS1-2)
    - Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (5-ETS1-3)
- ETS1.C: Optimizing the Design Solution
    - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (5-ETS1-3)

General Mills Lift, Load, & Haul

Engineering, Technology, and Applications of Science

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Cave & Canopy Climber

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 of salt 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.
- ESS2.A: Earth Materials and Systems
  - Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)
- ESS2.C: The Roles of Water in Earth's Surface Processes
  - Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
- ESS3.C: Human Impacts on Earth's 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)

    Matter and Energy in Organisms and Ecosystems
- 5-PS3-1 – 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.
- 5-LS1-1 – Support an argument that plants get the materials they need for growth chiefly from air and water.
- 5-LS2-1 – Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- PS3.D: Energy in Chemical Processes and Everyday Life
  - The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1)
- LS1.C: Organization for Matter and Energy Flow in Organisms

    - Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)
    - Plants acquire their material for growth chiefly from air and water. (5-LS1-1)
- LS2.A: Interdependent Relationships in Ecosystems
    - The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
    - Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)

The Market Sponsored by Walmart

Matter and Energy in Organisms and Ecosystems

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The Homestead Cabin & Farm

Matter and Energy in Organisms and Ecosystems

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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 of salt 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.
- ESS2.A: Earth Materials and Systems
    - Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)
- ESS2.C: The Roles of Water in Earth's Surface Processes
    - Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
- ESS3.C: Human Impacts on Earth's 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)

Art Studio

N/A

3M Tinkering Hub

Engineering, Technology, and Applications of Science

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- ETS1.C: Optimizing the Design Solution
    - Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (5-ETS1-3)

Outdoor Playscape

Earth's Systems

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- ESS3.C: Human Impacts on Earth's Systems

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    - Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)

Energizer Weather & Nature

Earth's Systems

- 5-ESS2-1 – Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

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- 5-ESS2-2 – Describe and graph the amounts of salt 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.
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    - Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)
- ESS2.C: The Roles of Water in Earth's Surface Processes
    - Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)
- ESS3.C: Human Impacts on Earth's 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)

Sixth Grade:

Nickelodeon

Energy

- 6-PS3-3 – Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- 6-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.
- 6-PS3-5 – Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy us transferred to or from the object.
- PS3.A: Definitions of Energy
  - Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. (6-PS3-3, 6-PS3-4)
- PS3.B: Conservation of Energy and Energy Transfer
  - When the motion energy of an object changes, there is inevitably some other change in energy at the same time. (6-PS3-5)
  - The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. (6-PS3-4)
  - Energy is spontaneously transferred out of hotter regions or objects and into colder ones. (6-PS3-3)
- ETS1.A: Defining and Delimiting an Engineering Problem
  - The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. (6-PS3-3)
- ETS1.B: Developing Possible Solutions
  - A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem. (6-PS3-3)

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Nature Valley Water Amazements

Energy

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Engineering, Technology, and Applications of Science

- 6-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.
- 6-ETS1-2 – Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- 6-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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- 6-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.
- ETS1.A: Defining and Delimiting Engineering Problems
    - The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (6-ETS1-1)
- ETS1.B: Developing Possible Solutions
    - A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (6-ETS1-4)
    - There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (6-ETS1-2, 6-ETS1-3)
    - Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (6-ETS1-3)
    - Models of all kinds are important for testing solutions. (6-ETS1-4)
- ETS1.C: Optimizing the Design Solution
    - Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process, some of those characteristics may be incorporated into the new design. (6-ETS1-3)
    - The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (6-ETS1-4)

General Mills Lift, Load, & Haul

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Engineering, Technology, and Applications of Science

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- The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (6-ETS1-4)

Cave & Canopy Climber

Structure, Function, and Information Processing

- 6-LS1-1 – Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- 6-LS1-2 – Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- 6-LS1-3 – Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- 6-LS1-8 – Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
- LS1.A: Structure and Function
  - All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (6-LS1-1)
  - Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (6-LS1-2)
  - In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (6-LS1-3)
- LS1.D: Information Processing
  - Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (6-LS1-8)

    Growth, Development, and Reproduction of Organisms
- 6-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.
- 6-LS1-5 – Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

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- 6-LS3-2 – Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
- LS1.B: Growth and Development of Organisms
    - Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (6-LS3-2)
    - Animals engage in characteristic behaviors that increase the odds of reproduction. (6-LS1-4)
    - Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (6-LS1-4)
    - Genetic factors as well as local conditions affect the growth of the adult plant. (6-LS1-5)
    - Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (6-LS3-2)
- LS3.B: Variation of Traits
    - In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. (6-LS3-2)

The Market Sponsored by Walmart

Structure, Function, and Information Processing

- 6-LS1-1 – Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- 6-LS1-2 – Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- 6-LS1-3 – Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- 6-LS1-8 – Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
- LS1.A: Structure and Function
    - All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (6-LS1-1)
    - Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (6-LS1-2)

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    - In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (6-LS1-3)
- LS1.D: Information Processing
    - Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (6-LS1-8)

The Homestead Cabin & Farm

Structure, Function, and Information Processing

- 6-LS1-1 – Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- 6-LS1-2 – Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- 6-LS1-3 – Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- 6-LS1-8 – Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
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    - In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (6-LS1-3)
- LS1.D: Information Processing
    - Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (6-LS1-8)

      Growth, Development, and Reproduction of Organisms
- 6-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.

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- 6-LS1-5 – Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- 6-LS3-2 – Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
- LS1.B: Growth and Development of Organisms
    - Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (6-LS3-2)
    - Animals engage in characteristic behaviors that increase the odds of reproduction. (6-LS1-4)
    - Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (6-LS1-4)
    - Genetic factors as well as local conditions affect the growth of the adult plant. (6-LS1-5)
    - Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (6-LS3-2)
- LS3.B: Variation of Traits
    - In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. (6-LS3-2)
    -

Art Studio

N/A

3M Tinkering Hub

Energy

- 6-PS3-3 – Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- 6-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.
- 6-PS3-5 – Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy us transferred to or from the object.
- PS3.A: Definitions of Energy
    - Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. (6-PS3-3, 6-PS3-4)
- PS3.B: Conservation of Energy and Energy Transfer

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  - When the motion energy of an object changes, there is inevitably some other change in energy at the same time. (6-PS3-5)
  - The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. (6-PS3-4)
  - Energy is spontaneously transferred out of hotter regions or objects and into colder ones. (6-PS3-3)
- ETS1.A: Defining and Delimiting an Engineering Problem
  - The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. (6-PS3-3)
- ETS1.B: Developing Possible Solutions
  - A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem. (6-PS3-3)

Engineering, Technology, and Applications of Science

- 6-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.
- 6-ETS1-2 – Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- 6-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.
- 6-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.
- ETS1.A: Defining and Delimiting Engineering Problems
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  - Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (6-ETS1-3)

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    - Models of all kinds are important for testing solutions. (6-ETS1-4)
- ETS1.C: Optimizing the Design Solution
    - Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process, some of those characteristics may be incorporated into the new design. (6-ETS1-3)
    - The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (6-ETS1-4)

Outdoor Playscape

Energy

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Earth's Systems

- 6-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.
- ESS2.C: The Roles of Water in Earth's Surface Processes
    - Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (6-ESS2-4)

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    - Global movements of water and its changes in form are propelled by sunlight and gravity. (6-ESS2-4)

      Weather and Climate
- 6-ESS2-5 - Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
- 6-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.
- 6-ESS3-5 – Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
- ESS2.C: The Roles of Water in Earth's Surface Processes
    - The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (6-ESS2-5)
    - Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (6-ESS2-6)
- ESS2.D: Weather and Climate
    - Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (6-ESS2-6)
    - Because these patterns are so complex, weather can only be predicted probabilistically. (6-ESS2-5)
    - The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. (6-ESS2-6)
- 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 (global warming). 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. (6-ESS3-5)

Energizer Weather & Nature

Earth's Systems

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