

## Next Generation National Science Education Standards for Kindergarten\*

**Little Scientists®**

**National Science Education Standards for Kindergarten**

**Performance Expectations**

**Unit that Best Addresses this Performance Expectation**

K-PS2 Motion and Stability: Forces and interactions: Pushes and Pulls	K-PS2-1. 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.	<b>What is a Force?</b>
	K-PS2-2. 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.	<b>What is a Force?</b>
K-PS3 Energy: Weather & Climate	K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface	<b>What is Weather?</b>
	K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight	<b>What is Weather?</b>
K-LS1 From Molecules to Organisms: Structures and Processes	K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.	<b>What is an Ecosystem?</b>
K-ESS2 Earth's Systems	K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.	<b>What is Weather?</b>
	K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	<b>What is an Ecosystem?</b>
K-ESS3 Earth and Human Activity	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	<b>What is an Ecosystem?</b>
	K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.	<b>What is Weather?</b>
	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.	<b>What is an Ecosystem?</b>
K-2-ETS1 Engineering Design	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.	<b>All</b>
		<b>All</b>

	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.	<b>All</b>

\* Based on the Next Generation National Science Education Standards 4.2013

<http://www.nextgenscience.org/next-generation-science-standards>

## Next Generation National Science Education Standards for Kindergarten\*

### Science & Engineering Practices

### How do Little Scientists® Kindergarten Units Address this Science & Engineering Practice?

Asking questions	In all Little Scientists® Kindergarten Units students ask and answer questions. They use these science and engineering practices to demonstrate understanding of the core ideas.
Developing and using models	In all Little Scientists® Kindergarten Units students develop and use models. They use these science and engineering practices to demonstrate understanding of the core ideas.
Planning and carrying out investigations	In all Little Scientists® Kindergarten Units students plan and carry out investigations. They use these science and engineering practices to demonstrate understanding of the core ideas.
Analyzing and interpreting data	In all Little Scientists® Kindergarten Units students analyze and interpret data. They use these science and engineering practices to demonstrate understanding of the core ideas.
Designing solutions	In all Little Scientists® Kindergarten Units students design solutions. They use these science and engineering practices to demonstrate understanding of the core ideas.
Engaging in argument from evidence	In all Little Scientists® Kindergarten Units students engage in argument from evidence. They use these science and engineering practices to demonstrate understanding of the core ideas.
Obtaining, evaluating, and communicating information	In all Little Scientists® Kindergarten Units Students obtain, evaluate, and communicate information. They use these science and engineering practices to demonstrate understanding of the core ideas.

Next Generation National Science Education Standards for Grade 1*		Little Scientists® Unit that Best Addresses this Performance Expectation
National Science Education Standards for Grade 1	Performance Expectations	
1-PS4 Waves and their Applications in Technologies for Information Transfer	1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	What is Sound?
	1-PS4-2. Make observations to construct an evidence-based account that objects can be seen only when illuminated.	What is Light?
	1-PS4-3. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	What is Light?
	1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	What is Light? What is Sound?
1-LS1 From Molecules to Organisms: Structures and Processes	1-LS1-1. 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.*	What are Plants?
	1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	What are Life Cycles?
1-LS3 Heredity: Inheritance and 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.	What are Life Cycles?
1-ESS1 Earth's Place in the Universe	1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.	What is Our Sun? What is the Solar System?
	1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year.	What is Our Sun?
K-2-ETS1 Engineering Design	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.	All
	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.	All

	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.	All

\* Based on the Next Generation National Science Education Standards 4.2013

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**Science &  
Engineering  
Practices****How do Little Scientists® First Grade Units Address this Science & Engineering Practice?**

Planning and  
carrying out  
investigations

In all Little Scientists® First Grade Units students plan and carry out investigations. They use these science and engineering practices to demonstrate understanding of the core ideas.

Analyzing and  
interpreting  
data

In all Little Scientists® First Grade Units students analyze and interpret data. They use these science and engineering practices to demonstrate understanding of the core ideas.

Constructing  
explanations  
and  
designing  
solutions

In all Little Scientists® First Grade Units Students construct explanations and design solutions. They use these science and engineering practices to demonstrate understanding of the core ideas.

Obtaining,  
evaluating,  
and  
communicati  
ng  
information

In all Little Scientists® First Grade Units Students obtain, evaluate, and communicate information. They use these science and engineering practices to demonstrate understanding of the core ideas.

Next Generation National Science Education Standards for Grade 2*		Little Scientists®
National Science Education Standards for Grade 2	Performance Expectations	Unit that Best Addresses this Performance Expectation
2-PS1 Matter and its Interactions	2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties	What are Materials?
	2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*	What are Materials?
	2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.	What is Engineering?
	2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.	What is Materials? What is Water?
2-LS2 Ecosystems: Interactions, Energy, and Dynamics	2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Life Cycle of Plants
	2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	Life Cycle of Plants
2-LS4 Biological Evolution: Unity and Diversity	2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.	What is Diversity?
2-ESS1 Earth's Place in the Universe	2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	What are Landforms?
2-ESS2 Earth's Systems	2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	What are Landforms?
	2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.	What are Landforms?
	2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.	What is Water?
K-2-ETS1 Engineering Design	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.	All

	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.	All
	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.	All

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## Next Generation National Science Education Standards for Grade 2\*

<b>Science &amp; Engineering Practices</b>	<b>How do Little Scientists® Second Grade Units Address this Science &amp; Engineering Practice?</b>
Developing and using models	In all Little Scientists® Second Grade Units students develop and use models. They use these science and engineering practices to demonstrate understanding of the core ideas.
Planning and carrying out investigations	In all Little Scientists® Second Grade Units students plan and carry out investigations. They use these science and engineering practices to demonstrate understanding of the core ideas.
Analyzing and interpreting data	In all Little Scientists® Second Grade Units students analyze and interpret data. They use these science and engineering practices to demonstrate understanding of the core ideas.
Constructing explanations and designing solutions	In all Little Scientists® Second Grade Units Students construct explanations and design solutions. They use these science and engineering practices to demonstrate understanding of the core ideas.
Engaging in argument from evidence	In all Little Scientists® Second Grade Units students engage in argument from evidence. They use these science and engineering practices to demonstrate understanding of the core ideas.
Obtaining, evaluating, and communicating information	In all Little Scientists® Second Grade Units Students obtain, evaluate, and communicate information. They use these science and engineering practices to demonstrate understanding of the core ideas.

Next Generation National Science Education Standards for Grade 3*		Little Scientists® Unit that Best Addresses this Performance Expectation
National Science Education Standards for Grade 3	Performance Expectations	
3-PS2 Motion and Stability: Forces and Interactions	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.	Force & Motion
	3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Force & Motion
	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.	What are Properties of Magnets?
	3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.	What are Properties of Magnets?
3-LS1 From Molecules to Organisms: Structures and Processes	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.	What is Heredity?
3-LS2 Ecosystems: Interactions, Energy, and Dynamics	3-LS2-1. Construct an argument that some animals form groups that help members survive.	What is Evolution?
3-LS3 Heredity: Inheritance and Variation of Traits	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.	What is Evolution?
	3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.	What is Evolution?
3-LS4 Biological Evolution: Unity and Diversity	3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	What is Evolution?
	3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.	What is Evolution?

	3-LS4-3. 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.	What is Evolution?
	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.	What is Evolution?
3-ESS2 Earth's Systems	3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	What is Climate?
	3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.	What is Climate?
3-ESS3 Earth and Human Activity	3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	What is Climate?

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## Next Generation National Science Education Standards for Grade 3\*

### Science & Engineering Practices

### How do Little Scientists® Third Grade Units Address this Science & Engineering Practice?

Asking questions and defining problems

In all Little Scientists® Third Grade Units students ask questions and define problems. They use these science and engineering practices to demonstrate understanding of the core ideas.

Developing and using models

In all Little Scientists® Third Grade Units students develop and use models. They use these science and engineering practices to demonstrate understanding of the core ideas.

Planning and carrying out investigations

In all Little Scientists® Third Grade Units students plan and carry out investigations. They use these science and engineering practices to demonstrate understanding of the core ideas.

Analyzing and interpreting data

In all Little Scientists® Third Grade Units students analyze and interpret data. They use these science and engineering practices to demonstrate understanding of the core ideas.

Constructing explanations and designing solutions

In all Little Scientists® Third Grade Units Students construct explanations and design solutions. They use these science and engineering practices to demonstrate understanding of the core ideas.

Engaging in argument

In all Little Scientists® Third Grade Units students engage in argument from evidence. They use these science and engineering practices to demonstrate understanding of the core ideas.

from evidence	
Obtaining, evaluating, and communicating information	In all Little Scientists® Third Grade Units Students obtain, evaluate, and communicate information. They use these science and engineering practices to demonstrate understanding of the core ideas.

Next Generation National Science Education Standards for Grade 4*		Little Scientists® Unit that Best Addresses this Performance Expectation
National Science Education Standards for Grade 4	Performance Expectations	
4-PS3 Energy	4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.	What is Energy?
	4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	What is Energy?
	4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide	What is Energy?
	4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	What is Energy?
4-PS4 Waves and their Applications in Technologies for Information Transfer	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.	Light & Sound
	4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	Light & Sound
	4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.	Light & Sound
4-LS1 From Molecules to Organisms: Structures and Processes	4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	What are the Structures of Organisms?
	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.	What are Senses?
4-ESS1 Earth's Place in the Universe	4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.	What are the Landforms on Earth?
4-ESS2 Earth's Systems	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.	How does Weather Affect Earth?

	4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.	What are the Landforms on Earth?
4-ESS3 Earth and Human Activity	4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	What is Energy?
	4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans	How does Weather Affect Earth?

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## Next Generation National Science Education Standards for Grade 4\*

### Science & Engineering Practices

### How do Little Scientists® Fourth Grade Units Address this Science & Engineering Practice?

Asking questions

In all Little Scientists® Fourth Grade Units students ask questions. They use these science and engineering practices to demonstrate understanding of the core ideas.

Developing and using models

In all Little Scientists® Fourth Grade Units students develop and use models. They use these science and engineering practices to demonstrate understanding of the core ideas.

Planning and carrying out investigations

In all Little Scientists® Fourth Grade Units students plan and carry out investigations. They use these science and engineering practices to demonstrate understanding of the core ideas.

Analyzing and interpreting data

In all Little Scientists® Fourth Grade Units students analyze and interpret data. They use these science and engineering practices to demonstrate understanding of the core ideas.

Constructing explanations and designing solutions

In all Little Scientists® Fourth Grade Units Students construct explanations and design solutions. They use these science and engineering practices to demonstrate understanding of the core ideas.

Engaging in argument from evidence

In all Little Scientists® Fourth Grade Units students engage in argument from evidence. They use these science and engineering practices to demonstrate understanding of the core ideas.



Obtaining,  
evaluating,  
and  
communicati  
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information

In all Little Scientists® Fourth Grade Units Students obtain, evaluate, and communicate information. They use these science and engineering practices to demonstrate understanding of the core ideas.

Next Generation National Science Education Standards for Grade 5*		Little Scientists® Unit that Best Addresses this Performance Expectation
National Science Education Standards for Grade 5	Performance Expectations	
5-PS1 Matter and Its Interactions	5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.	What are Chemicals?
	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.	What are Chemicals?
	5-PS1-3. Make observations and measurements to identify materials based on their properties.	What are Chemicals?
	5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	What are Chemicals?
5-PS2 Motion and Stability: Forces and	5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.	What is Gravity?
5-PS3 Energy Interactions	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.	What is Energy Flow in an Ecosystem?
5-LS1 From Molecules to Organisms: Structures and Processes	5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.	What is Energy Flow in an Ecosystem?
5-LS2 Ecosystems: Interactions, Energy, and Dynamics	5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	What is Energy Flow in an Ecosystem?
5-ESS1 Earth's Place in the Universe	5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	Why do we have Changing Seasons?
	5-ESS1-2. 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.	Why do we have Changing Seasons?
5-ESS2 Earth's Systems	5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	How Can We Protect Earth's Resources?

	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.	How Can We Protect Earth's Resources?
5-ESS3 Earth and Human Activity	5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	How Can We Protect Earth's Resources?
3-5-ETS1 Engineering Design	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.	All
	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.	All
	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.	All

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Next Generation National Science Education Standards for Grade 5\*

Science & Engineering Practices

How do Little Scientists® Fifth Grade Units Addresses this Science & Engineering Practice

Developing and using models

In all Little Scientists® Fifth Grade Units students develop and use models. They use these science and engineering practices to demonstrate understanding of the core ideas.

Planning and carrying out investigations

In all Little Scientists® Fifth Grade Units students plan and carry out investigations. They use these science and engineering practices to demonstrate understanding of the core ideas.

Analyzing and interpreting data

In all Little Scientists® Fifth Grade Units students analyze and interpret data. They use these science and engineering practices to demonstrate understanding of the core ideas.

Using mathematics and computational thinking

In all Little Scientists® Fifth Grade Units students use mathematics and computational thinking. They use these science and engineering practices to demonstrate understanding of the core ideas.

Engaging in argument from evidence

In all Little Scientists® Fifth Grade Units students engage in argument from evidence. They use these science and engineering practices to demonstrate understanding of the core ideas.

Obtaining,  
evaluating, and  
communicating  
information

In all Little Scientists® Fifth Grade Units Students obtain, evaluate, and communicate information. They use these science and engineering practices to demonstrate understanding of the core ideas.