

EAST RUTHERFORD SCHOOL DISTRICT

SCIENCE CURRICULUM

Grade 2



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New Jersey Student Learning Standards

NJSLS 2016

Adopted August 2017

Unit 1 Overview

Relationships in Habitats

Grade: 2

Content Area: Life Science

Pacing: 15 days

Essential Question

Why do we see different living things in different habitats?

Student Learning Objectives (Performance Expectations)

2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.

2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Unit Summary

In this unit of study, students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also compare the diversity of life in different habitats. The crosscutting concepts of cause and effect and structure and function are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Technical Terms

Organisms, Ecology, Molecules, Structures, Processes, Ecosystems, Heredity, Inheritance, Traits, Biological Evolution, Unity, Diversity, Roots, Stem, Leaves, Flowers, Fruits, Habitat, Environment, Reproduce, Cells, Bio-mimicry, Pollination

Formative Assessment Measures

Part A: How does the diversity of plants and animals compare among different habitats?

Students who understand the concepts can:

- Look for patterns and order when making observations about the world.
- Make observations (firsthand or from media) to collect data that can be used to make comparisons
- Make observations of plants and animals to compare the diversity of life in different habitats. (Note: The emphasis is on the diversity of living things in each of a variety of different habitats; assessment does not include specific animal and plant names in specific habitats.)

Part B: What do plants need to live and grow?

Students who understand the concepts can:

- Observe patterns in events generated by cause-and-effect relationships.
- Plan and conduct an investigation collaboratively to produce data to serve as a basis for evidence to answer a question.
- Plan and conduct an investigation to determine whether plants need sunlight and water to grow. (Note: Assessment is limited to one variable at a time.)

Part C: Why do some plants rely on animals for reproduction?

Students who understand the concepts can:

- Describe how the shape and stability of structures are related to their function.
- Develop a simple model based on evidence to represent a proposed object or tool.
- Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
- 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.

Interdisciplinary Connections

NJSL- ELA	NJSL- Mathematics
Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1) W.2.7	Reason abstractly and quantitatively. (2-LS2-1),(K-2-ETS1-1) MP.2
Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1),(K-2-ETS1-1) W.2.8	Model with mathematics. (2-LS2-1),(2-LS2-2),(K-2-ETS1-1) MP.4
Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2) SL.2.5	Use appropriate tools strategically. (2-LS2-1),(K-2-ETS1-1) MP.5
With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1) W.2.6	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS2-2) 2.MD.D.10
Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1) RI.2.1	

Core Instructional Materials	Can include: Textbooks Series, Lab Materials, etc.
21st Century Life and Careers	CRP1; CRP2; CRP4; CRP6; CRP7; CRP8; CRP9; CRP12
Technology Standards	8.1.2.A.1; 8.1.2.A.4; 8.1.2.E.1; 8.2.2.C.1; 8.2.2.E.5

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting
Word walls	Visual aides	Peer tutoring	Challenge assignments
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities
Think alouds	Leveled readers	Extended time	Independent research/inquiry
Read alouds	Assistive technology	Parent communication	Collaborative teamwork
Highlight key vocabulary	Notes/summaries	Modified assignments	Higher level questioning
Annotation guides	Extended time	Counseling	Critical/Analytical thinking tasks
Think-pair- share	Answer masking		Self-directed activities
Visual aides	Answer eliminator		
Modeling	Highlighter		
Cognates	Color contrast		

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Unit 2 Overview	
<u>Properties of Matter</u>	
Grade: 2	
Content Area: Physical Science	
Pacing: 20 days	
Essential Question	
How do the properties of materials determine their use?	
Student Learning Objectives (Performance Expectations)	
<u>2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</u>	
<u>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.*</u>	
Unit Summary	
In this unit of study, students demonstrate an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of patterns, cause and effect, and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.	
Technical Terms	
Properties, Matter, Solid, Liquid, Gas, Plasma, Mass, Hardness, Conductivity, Reaction, Mixture, Temperature, Weight, Volume, Size, Description, Characteristics, Shape, Space, Density	
Formative Assessment Measures	
<i>Part A: How can we sort objects into groups that have similar patterns? Can some materials be a solid or a liquid?</i>	
Students who understand the concepts can: <ul style="list-style-type: none"> • Observe patterns in the natural and human-designed world. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. • Plan and conduct an investigation to describe and classify different kinds of material by their observable properties. • Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share. 	
<i>Part B: What should the three little pigs have used to build their houses?</i>	
Students who understand the concepts can:	

- Observe patterns in the natural and human-designed world.
- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.
- Plan and conduct an investigation to describe and classify different kinds of material by their observable properties.
- Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.

Interdisciplinary Connections

NJSL- ELA	NJSL- Mathematics
Describe how reasons support specific points the author makes in a text. (2-PS1- 2) RI.2.8	Reason abstractly and quantitatively. (2-PS1-2), (K-2-ETS1-3) MP.2
With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-3) W.2.6	Model with mathematics. (2-PS1-1),(2-PS1-2, (K-2-ETS1-3)) MP.4
Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2-PS1-2) W.2.7	Use appropriate tools strategically. (2-PS1-2), (K-2-ETS1-3) MP.5
Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(K-2-ETS1-3) W.2.8	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1),(2-PS1- 2), (K-2-ETS1-3) 2.MD.D.10

Core Instructional Materials	Can include: Textbooks Series, Lab Materials, etc.
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21st Century Life and Careers	CRP1; CRP2; CRP4; CRP6; CRP7; CRP8; CRP9; CRP12
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Technology Standards	8.1.2.A.1; 8.1.2.A.4; 8.1.2.E.1; 8.2.2.C.1; 8.2.2.E.5
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Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting
Word walls	Visual aides	Peer tutoring	Challenge assignments
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities
Think alouds	Leveled readers	Extended time	Independent research/inquiry
Read alouds	Assistive technology	Parent communication	Collaborative teamwork
Highlight key vocabulary	Notes/summaries	Modified assignments	Higher level questioning
Annotation guides	Extended time	Counseling	Critical/Analytical thinking tasks
Think-pair- share	Answer masking		Self-directed activities
Visual aides	Answer eliminator		
Modeling	Highlighter		
Cognates	Color contrast		

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Unit 3 Overview

[Changes to Matter](#)

Grade: 2

Content Area: Physical Science

Pacing: 15 days

Essential Questions

How can objects change? Are all changes reversible?

Student Learning Objectives (Performance Expectations)

[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.](#)

[2-PS1-4: Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.](#)

Unit Summary

In this unit of study, students continue to develop an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of cause and effect and energy and matter are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations, designing solutions, and engaging in argument from evidence. Students are also expected to use these practices to demonstrate understanding of the core ideas

Technical Terms

Separate, Dissolve, Physical Change, Chemical Change, Heating, Cooling, Reversible Change, Irreversible Change

Formative Assessment Measures

Part A: In what ways can an object made of a small set of pieces be disassembled and made into a new object?

Students who understand the concepts are able to:

- Break objects into smaller pieces and put them together into larger pieces or change shapes.
- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
- 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.

Part B: Can all changes caused by heating or cooling be reversed?

- Observe patterns in events generated due to cause-and-effect relationships.
- Construct an argument with evidence to support a claim.
- Construct an argument with evidence that some changes caused by heating or cooling can be reversed, and some cannot.
- Examples of reversible changes could include materials such as water and butter at different temperatures
- Examples of irreversible changes could include: Cooking an egg, Freezing a plant leaf, Heating paper

Interdisciplinary Connections

NJSLs- ELA	NJSLs- Mathematics
<p>Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-PS1-4) RI.2.1</p> <p>Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4) RI.2.3</p> <p>Describe how reasons support specific points the author makes in a text. (2-PS1-4) RI.2.8</p> <p>Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4) W.2.1</p> <p>Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-3) W.2.7</p> <p>Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-3) W.2.8</p>	<p>N/A</p>

Core Instructional Materials	Can include: Textbooks Series, Lab Materials, etc.
21st Century Life and Careers	CRP1; CRP2; CRP4; CRP6; CRP7; CRP8; CRP9; CRP12
Technology Standards	8.1.2.A.1; 8.1.2.A.4; 8.1.2.E.1; 8.2.2.C.1; 8.2.2.E.5

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
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Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities
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Unit 4 Overview

[The Earth's Land and Water](#)

Grade: 2

Content Area: Earth and Space Science

Pacing: 15 days

Essential Question

Where do we find water?

Student Learning Objectives (Performance Expectations)

[2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.](#)

[2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.](#)

Unit Summary

In this unit of study, students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concept of patterns is called out as an organizing concept for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in developing and using models and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Technical Terms

Continents (North, South, Africa, Europe, Asia, Australia, Antarctica), Oceans (Atlantic, Pacific, Indian, Arctic, Southern), Mountain, Fjord, Island, Plain, Peninsula, Glaciers, Icebergs, Ice Caps, Outback, Freshwater, Saltwater, Lakes, Ponds, Rivers, Streams, Reservoir

Formative Assessment Measures

Part A: How can we identify where water is found on Earth and if it is solid or liquid?

Students who understand the concepts are able to:

- Observe patterns in the natural world.
- Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) and other media that will be useful in answering a scientific question.
- Obtain information to identify where water is found on Earth and to communicate that it can be a solid or liquid.

Part B: In what ways can you represent the shapes and kinds of land and bodies of water in an area?

Students who understand the concepts are able to:

- Observe patterns in the natural world.
- Develop a model to represent patterns in the natural world.
- Develop a model to represent the shapes and kinds of land and bodies of water in an area. (Assessment does not include quantitative scaling in models.)

Interdisciplinary Connections

NJSL- ELA	NJSL- Mathematics
<p>With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS2-3) W.2.6</p> <p>Recall information from experiences or gather information from provided sources to answer a question. (2-ESS2-3) W.2.8</p> <p>Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2) SL.2.5</p>	<p>Reason abstractly and quantitatively. (2-ESS2-2) MP.2</p> <p>Model with mathematics. (2-ESS2-2) MP.4</p> <p>Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2) 2.NBT.A.3</p> <p>Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1) 2.MD.B.5</p>

Core Instructional Materials	Can include: Textbooks Series, Lab Materials, etc.
21st Century Life and Careers	CRP1; CRP2; CRP4; CRP6; CRP7; CRP8; CRP9; CRP12
Technology Standards	8.1.2.A.1; 8.1.2.A.4; 8.1.2.E.1; 8.2.2.C.1; 8.2.2.E.5

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
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<p>Scaffolding</p> <p>Word walls</p> <p>Sentence/paragraph frames</p> <p>Bilingual dictionaries/translation</p> <p>Think alouds</p> <p>Read alouds</p> <p>Highlight key vocabulary</p> <p>Annotation guides</p> <p>Think-pair- share</p> <p>Visual aides</p> <p>Modeling</p> <p>Cognates</p>	<p>Word walls</p> <p>Visual aides</p> <p>Graphic organizers</p> <p>Multimedia</p> <p>Leveled readers</p> <p>Assistive technology</p> <p>Notes/summaries</p> <p>Extended time</p> <p>Answer masking</p> <p>Answer eliminator</p> <p>Highlighter</p> <p>Color contrast</p>	<p>Teacher tutoring</p> <p>Peer tutoring</p> <p>Study guides</p> <p>Graphic organizers</p> <p>Extended time</p> <p>Parent communication</p> <p>Modified assignments</p> <p>Counseling</p>	<p>Curriculum compacting</p> <p>Challenge assignments</p> <p>Enrichment activities</p> <p>Tiered activities</p> <p>Independent research/inquiry</p> <p>Collaborative teamwork</p> <p>Higher level questioning</p> <p>Critical/Analytical thinking tasks</p> <p>Self-directed activities</p>
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Unit 5 Overview

[Changes to Earth's Land](#)

Grade: 2

Content: Earth and Space Science

Pacing: 20 days

Essential Question

In what ways do humans slow or prevent wind or water from changing the shape of the land?

Student Learning Objectives (Performance Expectations)

[2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.](#)

[2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*](#)

Unit Summary

In this unit of study, students apply their understanding of the idea that wind and water can change the shape of land to compare design solutions to slow or prevent such change. The crosscutting concepts of stability and change; structure and function; and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, developing and using models, and constructing explanations and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Technical Terms

Eruption, Magma, Lava, Earthquake, Layers of the Earth (Cole, Mantle, Crust), Tectonic Plate, Landslides, Tsunamis, Flood, Hurricane, Wildfire, Weathering, Erosion (i.e. Wind, Water, Soil, etc.), Acid Rain

Formative Assessment Measures

Part A: What evidence can we find to prove that Earth events can occur quickly or slowly?

Students who understand the concepts are able to:

- Make observations from several sources to construct an evidence-based account for natural phenomena.
- Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (Assessment does not include quantitative measurements of timescales.) Some examples of these events include: Volcanic explosions, Earthquakes, Erosion of rocks.

Part B: In what ways do humans slow or prevent wind or water from changing the shape of the land?

Students who understand the concepts are able to:

- Compare multiple solutions to a problem.
- Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. Examples of solutions could include: Different designs of dikes and windbreaks to hold back wind and water, Different designs for using shrubs, grass, and trees to hold back the land.
- Ask questions based on observations to find more information about the natural and/or designed world.

- 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.
- Define a simple problem that can be solved through the development of a new or improved object or tool.
- Develop a simple model based on evidence to represent a proposed object or tool
- 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.

Interdisciplinary Connections

NJSLS- ELA	NJSLS- Mathematics
Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1), (K-2-ETS1-1) RI.2.1	Reason abstractly and quantitatively. (2-ESS1-1), (2-ESS2-1), (K-2-ETS1-1) MP.2
Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1) RI.2.3	Model with mathematics. (2-ESS1-1), (2-ESS2-1) MP.4
With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1), (K-2-ETS1-1) W.2.6	Use appropriate tools strategically. (2-ESS2-1), (K-2-ETS1-1) MP.5

<p>Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1) W.2.7</p> <p>Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1), (K-2-ETS1-1) W.2.8</p> <p>Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1) SL.2.2</p> <p>Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS2-1) RI.2.3</p> <p>Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) SL.2.5</p> <p>Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1) RI.2.9</p>	<p>Understand place value. (2-ESS1-1) 2.NBT.A</p> <p>Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1) 2.MD.B.5</p> <p>Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1) 2.MD.D.10</p>
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Core Instructional Materials	Can include: Textbooks Series, Lab Materials, etc.
21st Century Life and Careers	CRP1; CRP2; CRP4; CRP6; CRP7; CRP8; CRP9; CRP12
Technology Standards	8.1.2.A.1; 8.1.2.A.4; 8.1.2.E.1; 8.2.2.C.1; 8.2.2.E.5

Modifications			
English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting
Word walls	Visual aides	Peer tutoring	Challenge assignments
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Visual aides	Answer eliminator		
Modeling	Highlighter		
Cognates	Color contrast		