

Englewood on the Palisades Charter School

Science Curriculum

Grade Two

Aligned With the 2026 New Jersey Student Learning Standards

The Vision for Science Education in New Jersey

2026 New Jersey Student Learning Standards for Science

The New Jersey Student Learning Standards for Science (NJSLS-S) describe the expectations for what students should know and be able to do as well as promote three-dimensional science instruction across the three science domains (i.e., physical sciences, life science, Earth and space sciences). From the earliest grades, the expectation is that students will engage in learning experiences that enable them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and discuss those arguments (in appropriate ways relative to their grade level).

The foundation of the NJSLS-S reflects three dimensions — science and engineering practices, disciplinary core ideas, and crosscutting concepts. The performance expectations are derived from the interplay of these three dimensions. It is essential that these three components are integrated into all learning experiences. Within each standard document, the three dimensions are intentionally presented as integrated components to foster sensemaking and designing solutions to problems. Because the NJSLS-S is built on the notions of coherence and contextuality, each of the science and engineering practices and crosscutting concepts appear multiple times across topics and at every grade level. Additionally, the three dimensions should be an integral part of every curriculum unit and should not be taught in isolation.

Mission

All students will possess an understanding of scientific concepts and processes required for personal decision-making, participation in civic life, and preparation for careers in STEM fields (for those that chose).

Vision

Prepare students to become scientifically literate individuals who can effectively:

- Apply scientific thinking, skills, and understanding to real-world phenomena and problems;

- Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;
- Conduct investigations, solve problems, and engage in discussions;
- Discuss open-ended questions that focus on the strength of the evidence used to generate claims;
- Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well-reasoned claims; and
- Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.

(NJ DOE, 2022)

New Jersey Legislative Statutes and Administrative Code

Science

Amistad Law: *N.J.S.A. 18A 52:164-88*

[African Americans in Science](#)
[8 Amazing Black Scientists and How They Changed History](#)
[African American Scientists and Inventors](#)

Holocaust Law: *N.J.S.A. 18A:35-28*

[Georg Bredig: Scientist, Humanist, and Holocaust Survivor](#)

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*

<https://prideinstem.org/>
[LGBTQ+ Scientists Through History](#)
[Celebrating Scientists With Disabilities](#)

Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*

Ada Twist, Scientist by Andrea Beaty [Ada Twist, Scientist Activities](#)

How Many Stars in the Sky by Lenny Hort [How Many Stars in the Sky? | RIF.org](#)

Mae Among the Stars by Roda Amhed [Mae Among the Stars STEM Activity](#)

The Outdoor Scientist by Temple Grandin

2nd Grade Science Curriculum

A 2nd-grade science curriculum aligns with the New Jersey Student Learning Standards (NJSLS) and provides young learners with a solid foundation in scientific inquiry skills and early understanding of key science concepts. Throughout the year, the curriculum should incorporate hands-on activities, nature walks, observations, and exploration to engage 2nd-grade students and make learning science interactive and fun. Formative assessments, observations, and ongoing progress monitoring should be used to ensure that students are meeting the learning objectives. The curriculum should be flexible and adaptable to meet the individual needs and learning styles of the students.

Grade Two Units and Pacing	
Unit 1: Matter	9 weeks
Unit 2: Ecosystems	9 weeks
Unit 3: Earth's Land and Water	9 weeks
Unit 4: Changes to Earth's Land	9 weeks
Total Number of Weeks:	36 weeks

Unit 1 - Matter

Unit Goals:

In this unit, students will plan and participate in science inquiries to describe types, properties, and purposes of matter. The students will examine and classify real life objects within the three states of matter (solids, liquids, and gasses) and describe their properties and practical uses through a variety of activities.

Duration: 9 weeks

Essential Questions:

- How do we describe matter?
- How can properties of matter be used to design the best solution to a real-world problem?
- How can we put matter together and take it apart?
- How does temperature affect and change matter?

Enduring Understandings:

- Everything on Earth is made up of matter.
- Matter falls into three states - solids, liquids, or gasses.
- Matter can be described by distinguishing properties.
- Temperature can affect matter by changing states of matter (i.e, heating a solid can melt it).

Key NJSLS Strands:

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

● K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. ● K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. ● K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.		
Science & Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1) Analyzing and Interpreting Data	PS1.A: Structure and Properties of Matter ● Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) ● Different properties are suited to different purposes. (2-PS1-2), (2-PS1-3) ● A great variety of objects can be built up from a small set of pieces. (2-PS1-3)	Patterns ● Patterns in the natural and human designed world can be observed. (2-PS1-1) Cause and Effect ● Events have causes that generate observable patterns. (2-PS1-4) ● Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) Energy and Matter ● Objects may break into smaller pieces and be put together into

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. - Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2) Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3) Engaging in Argument from Evidence Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).	PS1.B: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)	larger pieces or change shapes. (2-PS1-3) <i>Connections to Engineering, Technology, and Applications of Science</i> Influence of Engineering, Technology, and Science on Society and the Natural World - Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (2-PS1-2) <i>Connections to Nature of Science</i> Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena - Scientists search for cause and effect relationships to explain natural events. (2-PS1-4)
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Construct an argument with evidence to support a claim. (2-PS1-4)		
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Interdisciplinary Connections

English Language Arts

- RI.2.1 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.2.3 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.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2), (2-PS1-4)
- W.2.1 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.2.7 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), (2-PS1-3)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1), (2-PS1-2), (2-PS1-3)

Math

- MP.2 Reason abstractly and quantitatively. (2-PS1-2)
- MP.4 Model with mathematics. (2-PS1-1), (2-PS1-2)
- MP.5 Use appropriate tools strategically. (2-PS1-2)
- 2.MD.D.10 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)

8.2 Technology Education, Engineering, Design and Computational Thinking-Programming:

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

9.4 Life Literacies and Key Skills:

- 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- 9.4.2.DC.7: Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).
- 9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).

21st-Century Skills

- 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
- 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

Career Ready Practices

- CRP 4: Communicate clearly and effectively and with reason.
- CRP 6: Demonstrate creativity and innovation while completing the following STEM activity.
- CRP 8: Utilize critical thinking to make sense of problems and persevere in solving them.

Technology Integration

- 9.4.2.TL.4: Navigate a virtual space to build context and describe the visual content.
- 9.4.2.TL.5: Describe the difference between real and virtual experiences.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. Construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. Construct an argument with evidence that some	Properties of Matter • Describe Matter • Solids • Liquids and Gasses • Use Matter Changes to Matter • Put Matter Together • Mixtures • Temperature Changes Matter	Formative Assessments: Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments	Materials: paper, plastic, wood, metal, fabric, magnifying glasses. Rulers, thermometers ice, clay, wax, and rubber bands building blocks interlocking puzzle pieces ice cubes, crayons, chocolate, and butter Vocabulary foldables Activities: Material Investigation Station: • Set up stations with various materials • Students rotate through stations to observe and describe the properties of each	Matter Solid Liquid Gas Property Texture Shape Mass Volume Density State of Matter Freezing Melting Evaporation Condensation Mixture

changes caused by heating or cooling can be reversed and some cannot.		Cumulative/Benchmark Assessments	material (e.g., color, texture, flexibility). • Guide st. to classify the materials into categories based on their properties (e.g., hard/soft, smooth/rough). • After exploration, discuss which materials might be best suited for different purposes (e.g., building a sturdy bridge, making a soft pillow). Material Testing Experiment • Have students hypothesize which material (ice, clay, wax, rubber bands) would be best for making a bouncy ball.	Solution Melt Freeze Boil Heat Cool Chemical Change Physical Change Reversible Change Irreversible Change Solidification Vaporization Condense Substance
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			● Help st. conduct experiments to test the properties of each material (e.g., bounce height, stretchiness). ● Sts. record their data and observations in a chart or graph. ● Discuss which material performed the best and why it was suited for the intended purpose. Object Transformation Challenge: ● Challenge them to disassemble the pieces of a small set of building blocks or interlocking puzzle pieces and use them to create a new object. ● Afterward, have students present their creations to the	
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			class and explain how they transformed the pieces. Heating and Cooling Investigation • Have students predict what will happen to materials like ice cubes, crayons, chocolate, and butter when heated or cooled. • Conduct experiments to test their predictions (e.g., melting ice, melting crayons, melting chocolate). • Discuss which changes were reversible (e.g., freezing water back into ice) and which were irreversible (e.g., melting crayons).	
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			● Students can construct arguments supported by evidence from their experiments. Links: Sid the Science Kid Videos Brain Pop Jr. - Heat Brain Pop Jr. - Properties of Matter Mentor Texts: <i>What is the World Made Of? All About Solids, Liquids, and Gases</i> by Kathleen Weidner Zoehfeld <i>What's the Matter in Mr. Whiskers' Room?</i> by Michael Elsohn Ross <i>Matter: Physical Science for Kids</i> by Andi Diehn	
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			<i>A Solid Starts with a Seed: Exploring Matter</i> by Michael Dahl	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests ● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition ● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials

	● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	● Work toward longer passages as skills in English increase ● Use visuals ● Introduce/highlight key vocabulary before lesson ● Teacher models reading aloud daily ● Provide peer tutoring ● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments ● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts ● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.

Accelerating Students	● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Organize and offer flexible small group learning activities ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Expose students to beyond level texts.
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Unit 2 - Ecosystems

Unit Goals: Students will obtain scientific information from observations, media, and texts to extend their understanding of living things in habitats and plants and their needs. Students will explore how living things depend on each other and have specific needs to survive.
Duration: 9 weeks
Essential Questions: ● What is a habitat? ● Why do living things live in diverse habitats? ● How do living things survive? ● Why do plants need water and light? ● How do plants and animals successfully coexist and support each other?
Enduring Understandings: ● Many different living things coexist in a variety of diverse habitats. ● Plants need light and water to survive.

Plants depend on animals by spreading seeds.		
Key NJSLS Strands: 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. 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.]		
Science & Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2) Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.	LS2.A: Interdependent Relationships in Ecosystems - Plants depend on water and light to grow. (2-LS2-1) - Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) ETS1.B: Developing Possible Solutions - Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (secondary to 2-LS2-2) LS4.D: Biodiversity and Humans - There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)	<i>Connections to Nature of Science</i> Cause and Effect - Events have causes that generate observable patterns. (2-LS2-1) Structure and Function - The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2) Scientific Knowledge is Based on Empirical Evidence - Scientists look for patterns and order when making observations about the world. (2-LS4-1)

• Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1) • Make observations (firsthand or from media) to collect data that can be used to make comparisons. (2-LS4-1)		
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Interdisciplinary Connections		
English Language Arts RI.MF.K.6 With prompting and support, describe the relationship between illustrations and the text in which they appear. W.IW.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts to convey ideas. SL.PE.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups. W.2.7 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.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1) SL.2.5 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) Math MP.2 Reason abstractly and quantitatively. (2-LS2-1) MP.4 Model with mathematics. (2-LS2-1), (2-LS2-2) MP.5 Use appropriate tools strategically. (2-LS2-1)		

2.MD.D.10 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)

8.2 Technology Education, Engineering, Design and Computational Thinking-Programming

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be

solved through the development of a new or improved object or tool.

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

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

9.4 Life Literacies and Key Skills

9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

9.4.2.DC.7: Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).

9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).

21st-Century Skills

9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.

Career Ready Practices

9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem.

9.4.2.DC.7: Describe actions peers can take to positively impact climate change.

9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults.

Technology Integration

CRP 4: Communicate clearly and effectively and with reason while working with partners on various lab assignments.
 CRP 8: Utilize critical thinking to make sense of problems and persevere in solving them when working on the Celery and Pollination experiments.
 CRP 11: Use technology to enhance productivity.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Describe how different plants and animals live together in a variety of habitats Explain why plants need sunlight and water to grow Explain how plants depend on animals to continue life	Living Things in Habitats Habitats Forests and Grasslands Water Habitats Hot and Cold Deserts Plants and Their Needs Plants Need Water Plants Need Light Plants Make More Plants	Formative Assessments Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions	Materials: Cardboard or shoeboxes Art supplies Reference materials or books about different habitats Pictures or figurines of plants and animals Two identical potted plants Sunlight source (window or lamp) Watering can or spray bottle	Habitat Environment Ecosystem Adaptation Community Interdependence Biodiversity Food chain Photosynthesis Pollination

		Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Notebook or journal for recording observations Pictures or models of flowers and insects (bees, butterflies) Flower costumes or props for role-playing Pollen (could be represented by small pom-poms or beads) Small cups or containers for holding pollen Checklist of plants and animals found in the habitat Clipboards or notebooks Pencils or pens Magnifying glasses or binoculars Vocabulary foldables Activities: Habitat Exploration: Small groups choose a habitat to research.	Producer Consumer Decomposer Predator Prey Shelter Oxygen Carbon dioxide Nutrients Survival
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			Provide materials for students to create dioramas or drawings representing their assigned habitat, including animals and plants found in that habitat. Each group will present their diorama or drawing to the class, explaining how different plants and animals interact and depend on each other for survival in their habitat. Plant Needs Experiment: Provide two identical potted plants and place one in a well-lit area and the other in a dark area. Students observe and record the growth of each plant over a period of time. Discuss the differences in growth between the two plants. Plant-Animal Interdependence Activity:	
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			Have students role-play as flowers and insects, acting out the process of pollination by transferring "pollen" from one "flower" to another. Habitat Hunt: Organize a hunt where students can explore different habitats, either virtually or on school grounds. Provide students with a checklist of plants and animals commonly found in the area. They will document the interactions between plants and animals they encounter during the scavenger hunt. Links: Sid the Science Kid Videos The Great Plant Escape How Do Plants Get Pollinated?	
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			Brain Pop Jr. Parts of a Plant Brain Pop Jr. Plant Adaptations Brain Pop Jr. Life Cycle of a Plant Mentor Texts: <i>The Tiny Seed</i> by Eric Carle <i>The Carrot Seed</i> by Ruth Krauss <i>The Curious Garden</i> by Peter Brown <i>Who Will Plant a Tree?</i> by Jerry Pallotta <i>From Bird Poop to Wind: How Seeds Get Around</i> by Ellen Lawrence <i>The Dandelion Seed</i> by Joseph Anthony	
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			<i>Flip, Float, Fly! Seeds on the Move</i> by JoAnn Macken <i>The Busy Tree</i> by Jennifer Ward <i>Under One Rock: Bugs, Slugs and Other Ughs</i> by Anthony Fredericks <i>In the Small, Small Pond</i> by Denise Fleming <i>Cactus Hotel</i> by Brenda Guiberson <i>Plant a Seed of Peace</i> by Rebecca Seiling	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson

	● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests ● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition ● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials ● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on

	task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	• Work toward longer passages as skills in English increase • Use visuals • Introduce/highlight key vocabulary before lesson • Teacher models reading aloud daily • Provide peer tutoring • Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers • Guided notes and/or scaffold outline for written assignments • Provide students with English Learner leveled readers • Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts • As students share ideas, include a drawing or annotation to illustrate connections. • Invite students to use gestures as they count.
Accelerating Students	• Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) • Provide options, alternatives and choices to differentiate and broaden the curriculum • Organize and offer flexible small group learning activities • Provide whole group enrichment explorations • Teach cognitive and methodological skills • Use center, stations, or contracts • Organize integrated problem-solving simulations • Propose interest-based extension activities • Expose students to beyond level texts.

Unit 3 - Earth's Land and Water

Unit Goals: In this unit of study, students will create models and maps to explore landforms, oceans, and bodies of water on the Earth's Surface.		
Duration: 9 weeks		
Essential Questions: • How can we describe Earth's surface? • What can we learn from maps? • Where are Earth's oceans and freshwater?		
Enduring Understandings: • The Earth is made up of many types of landforms and bodies of water in a variety of states of matter. • We can learn about the Earth's surface including landforms and bodies of water by analyzing maps. • Maps show where things are located, including the shapes and kinds of land and water in any area. • Water is found in oceans, rivers, lakes and ponds. • Water exists as solid ice and in liquid form. • How water, air and the sun play a role in climate change.		
Key NJSLS Strands: • 2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.] • 2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid.		
Science & Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.	ESS2.B: Plate Tectonics and LargeScale System Interactions • Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)	Patterns • Patterns in the natural world can be observed. (2-ESS2-2), (2-ESS2-3)

• Develop a model to represent patterns in the natural world. (2-ESS2-2) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information • 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. (2-ESS2-3)	ESS2.C: The Roles of Water in Earth’s Surface Processes • Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)	
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Interdisciplinary Connections
English Language Arts • RI.2.1 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.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1) • W.2.6 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), (K-2-ETS1-3) • W.2.7 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.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1), (K-2-ETS1-1), (K-2-ETS1-3)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
- SL.2.5 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)

Math

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1), (K-2-ETS1-1), (K-2-ETS1-3)
- MP.4 Model with mathematics. (2-ESS1-1), (K-2-ETS1-1), (K-2-ETS1-3)
- MP.5 Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)
- 2.NBT.A Understand place value. (2-ESS1-1)
- 2.MD.D.10 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), (K-2-ETS1-3)

Computer Science and Design Thinking

- 8.1.2.CS.1 Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
- 8.1.2.DA.4 Make predictions based on data using charts or graphs.

21st-Century Skills

- 9.4.2.CI.1 Demonstrate openness to new ideas and perspectives.

Career Ready Practices

- CRP 4 Communicate clearly and effectively and with reason within the Mystery Science labs.
- CRP 6 Demonstrate creativity and innovation while completing the following STEM activity
- CRP 8 Utilize critical thinking to make sense of problems and persevere in solving them

Technology Integration				
9.4.2.IML.1 Identify a simple search term to find information in a search engine or digital resource.				

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Describe the properties of landforms. Describe the properties of bodies of water. Distinguish the differences among bodies of water. Use maps to locate bodies of water.	- Describe Earth's Surface - Oceans - Fresh Water	Formative Assessments: Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments	Materials: Paper Pencils or crayons Pictures or cards depicting natural disasters Sorting containers or bins Sand or soil Rocks Spray bottle for water Small brushes or tools for "weathering" Pots or containers Soil	Mountain Hill Valley Plateau Canyon Cliff Peninsula Plain Volcano Delta Ocean Sea Lake Pond River

		Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Seeds (e.g., beans, radishes) Sunlight source (e.g., window) Watering can or spray bottle Poster board or large paper Markers or colored pencils Pictures or drawings of plants and sunlight Shoebox or small container Toy plants and animals Small rocks or pebbles Soil or sand Pollen (e.g., small pom-poms, beads) Small cups or containers	Stream Creek Waterfall Marsh Swamp Saltwater Freshwater Tidal Non-tidal Standing Flowing Permanent Seasonal Map Compass Legend Scale Symbols Latitude
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			Glue or tape Vocabulary foldables Activities: Before-and-After Drawings Natural Disasters Sorting Role-Play Weathering and Erosion Plant Growth Experiment Photosynthesis Poster Creation Seed Planting Observation Model Ecosystem Building Pollination Role-Play	Longitude Equator Hemispheres Continents
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			Plant-Animal Interaction Poster Creation Links: Sid the Science Kid Videos Brain Pop Jr. Landforms Mentor Texts: <i>The Magic School Bus Inside the Earth</i> by Joanna Cole <i>If You Lived with the Sioux Indians</i> by Ann McGovern <i>Water Dance</i> by Thomas Locker <i>Oceans: Dolphins, sharks, penguins, and more!</i> by Johnna Rizzo <i>A Drop Around the World</i> by Barbara Shaw McKinney	
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			<i>Pond</i> by Donald M. Silver <i>Maps and Globes</i> by Jack Knowlton <i>There's a Map on My Lap!</i> by Tish Rabe	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests

	● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition ● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials ● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	● Work toward longer passages as skills in English increase ● Use visuals ● Introduce/highlight key vocabulary before lesson ● Teacher models reading aloud daily ● Provide peer tutoring ● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments

	● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts ● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.
Accelerating Students	● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Organize and offer flexible small group learning activities ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Expose students to beyond level texts.

Unit 4 - Changes to Earth’s Land

Unit Goals: Students will make observations, take part in science inquiries, and explain why changes to the Earth’s surface can happen quickly and slowly over time.
Duration: 9 weeks
Essential Questions: ● How do wind and water change the Earth’s surface? ● How does Earth’s surface change quickly? ● How does Earth’s surface change slowly over time?

How can people cause and prevent changes to Earth’s surface?		
Enduring Understandings: - Some events happen very quickly such as volcanic explosions and earthquakes; others, such as the erosion of rocks, occur very slowly over a time period much longer than one can observe. - Wind and water can change the shape of land. - Humans have designed multiple solutions to slow or prevent wind or water from changing the shape of the land, such as dikes, windbreaks, and using shrubs, grass, and trees.		
Key NJSLS Strands: 2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly. [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] 2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]		
Science & Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. Make observations from several sources to construct an evidence based account for natural phenomena. (2-ESS1-1)	ESS1.C: The History of Planet Earth - Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) ESS2.A: Earth Materials and Systems - Wind and water can change the shape of the land. (2-ESS2-1)	Stability and Change - Things may change slowly or rapidly. (2-ESS1-1) <i>Connections to Engineering, Technology, and Applications of Science</i> Influence of Engineering, Technology, and Science on Society and the Natural World - Developing and using technology has impacts on the natural world. (2-ESS2-1)

• Compare multiple solutions to a problem. (2-ESS2-1)		<i>Connections to Nature of Science</i> Science Addresses Questions About the Natural and Material World • Scientists study the natural and material world. (2-ESS2-1)
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Interdisciplinary Connections

English Language Arts

- RI.2.1 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.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)
- W.2.6 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), (K-2-ETS1-3)
- W.2.7 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.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1), (K-2-ETS1-1), (K-2-ETS1-3)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
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Math

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1), (K-2-ETS1-1), (K-2-ETS1-3)
- MP.4 Model with mathematics. (2-ESS1-1), (K-2-ETS1-1), (K-2-ETS1-3)
- MP.5 Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3)

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- 8.1.2.CS.1 Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
- 8.1.2.DA.4 Make predictions based on data using charts or graphs.

21st-Century Skills:

- 9.4.2.CI.1 Demonstrate openness to new ideas and perspectives.

Career Ready Practices:

- CRP 4 Communicate clearly and effectively and with reason within the Mystery Science labs.
- CRP 6 Demonstrate creativity and innovation while completing the following STEM activity
- CRP 8 Utilize critical thinking to make sense of problems and persevere in solving them

Technology Integration

- 9.4.2.IML.1 Identify a simple search term to find information in a search engine or digital resource.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Describe how the Earth's surface can change slowly over time (i.e. weathering, erosion)	• Weathering and Erosion • Quick Changes to Earth's Surface	Formative Assessments: Lesson Quizzes Lesson Self-assessment	Materials: Picture cards or drawings Trays or containers	Weathering Erosion Deposition

Describe how the Earth's surface can change quickly (earthquakes, floods) Create and discuss ways that people can cause and help prevent changes to the Earth's surface.	● Slowing Earth's Changes	Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Sand or soil Rocks Water Sandpaper (optional) Shake table or trays of sand or rice Small objects (toy buildings, LEGO structures) Spray bottle Charts or posters illustrating human impact Whiteboard or flipchart paper Markers Cardboard Tape Shallow tray Paper	Landform Canyon Valley Delta Plateau Floodplain Earthquake Fault Seismic waves Landslide Tsunami Hurricane Flood Human impact Deforestation Pollution Conservation
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			Vocabulary foldables Activities: Slow Changes vs. Quick Changes Sorting Activity Modeling Weathering and Erosion Earthquake Simulation Flood Experiment Human Impact Discussion Modeling Landslides Constructing a Barrier Before and After Pictures Story Writing Field Trip or Virtual Tour Links: Sid the Science Kid Videos	
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			Brain Pop Jr. Fast Land Changes Brain Pop Jr. Slow Land Changes Mentor Texts: <i>The Magic School Bus Inside the Earth</i> by Joanna Cole <i>Earthquake! (Earth in Action)</i> by Simon Seymour <i>Rocks in His Head</i> by Carol Otis Hurst <i>After the Storm</i> by Linda Ashman <i>Island: A Story of the Galápagos</i> by Jason Chin <i>The Magic School Bus Inside the Earth</i> by Joanna Cole	
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			<i>How Mountains Are Made</i> by Kathleen Weidner Zoehfeld <i>Rocks, Dirt, Worms & Weeds: A Fun, User-Friendly Illustrated Guide to Creating a Vegetable or Flower Garden with Your Kids</i> by Jeff Hutton	
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	● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments ● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts ● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.
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Prepared by Julie Lang, MA

References

NGSS Lead States. 2013. *Next Generation Science Standards: For States, By States*. Washington, DC: The National Academies Press.

NJ DOE. (2024). *New Jersey Science 2023 Student Learning Standards*. Office of Standards, Division of Teaching and Learning Services, New Jersey Department of Education. <https://www.nj.gov/education/standards/science/Index.shtml>