



Stafford Township School District

Science Curriculum Grade 2

2020 New Jersey Student Learning Standards - Science

https://www.nj.gov/education/standards/science/Docs/NJSLS-Science_K-12.pdf

Original Adoption: September 12, 2022

Mission

Stafford Township School District, together with parents/guardians and community, shall provide a secure, nurturing environment that promotes a positive self-image through solid educational achievements that promote attainment of the core curriculum content standards and promotes behavior enabling our students to become life-long learners in a technological society.

Philosophy

The purpose of the Stafford Township School District Science Curriculum is to develop scientific understanding and civic efficacy (the readiness and willingness to assume citizenship responsibilities and to make informed and reasoned decisions for the public good as citizens). The New Jersey Core Curriculum Content Standards for Science reflect the belief that all students can and must learn enough science to assume their role as concerned citizens, equipped with necessary information and decision-making skills.

The need for scientific literacy in today's increasingly technological world, for fundamental reforms in how science is taught, and for established standards in science education are by now well-known and documented. Presidential appeals for excellence, combined with expressions of concern from scientists and educators, have led to national, state, and local initiatives. New Jersey is host to an impressive array of scientific and technological industries, and should play a leadership role in the development and implementation of standards for the teaching and learning of science.

Promoting and respecting individual student growth, the science program recognizes that:

- Students gain an understanding and appreciation of science and its impact on daily life.
- Develop critical thinking skills which enable them to function as lifelong learners and to examine and evaluate issues of importance to all Americans.
- Acquire basic literacy in the core disciplines of science and have the understandings needed to apply this knowledge to their lives as citizens.
- Understand science as the context for future environmental awareness.
- Participate in activities that enhance the common good and increase the general welfare.

As a result, teachers in the Stafford Township School District have clear responsibilities to help all children think, read, write, listen, and speak. Therefore, they will:

- Have high expectations for all students.
- Promote the teaching of critical thinking.
- Value the needs of students as key elements in instructional planning.
- Provide adequate resources for children to explore the content area.
- Relate current events as needed to enhance content area instruction.
- Communicate regularly and clearly with parents/guardians and encourage them to be a part of the learning process.
- Teach the full spectrum of science outlined by the provided strands

Primary Interdisciplinary Connections: Language Arts, Math, Technology

Unit 1: Matter and It's Interactions		Duration: 25 days (September – November)
Standards		
<p>2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</p> <p>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.</p> <p>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.</p> <p>2-PS1-4 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.</p>		
Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
<p style="text-align: center;">Planning and Carrying Out Investigations</p> <p>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.</p> <p>Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question (2-PS1-1)</p>	<p style="text-align: center;">PS1.A: Structure and Properties of Matter</p> <p>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)</p> <p>A great variety of objects can be built up from a small set of pieces. (2-PS1-3)</p>	<p style="text-align: center;">Patterns</p> <p>Patterns in the natural and human designed world can be observed. (2-PS1-1)</p>
<p style="text-align: center;">Analyzing and Interpreting Data</p> <p>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)</p>	<p style="text-align: center;">PS1.B: Chemical Reactions</p> <p>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)</p>	<p style="text-align: center;">Cause and Effect</p> <p>Events have causes that generate observable patterns. (2-PS1-4)</p> <p>Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2)</p>
<p style="text-align: center;">Constructing Explanations and Designing Solutions</p> <p>Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of</p>		<p style="text-align: center;">Energy and Matter</p> <p>Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3)</p>

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). Construct an argument with evidence to support a claim. (2-PS1-4)		Connections to Engineering, Technology, and Applications of Science 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)
		Connections to Nature of Science Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena Scientists search for cause and effect relationships to explain natural events. (2-PS1-4)
Interdisciplinary Connections Computer Science & Design Thinking Standards		
<p>9.4.2.TL.1 Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).</p> <p>9.4.2.TL.2 Create a document using a word processing application.</p> <p>9.4.2.TL.3 Enter information into a spreadsheet and sort the information.</p> <p>9.4.2.TL.5 Describe the difference between real and virtual experiences.</p> <p>8.2.2.ITH.5 Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution.</p> <p>8.2.2.ED.2 Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.</p> <p>8.2.2.ED.3 Select and use appropriate tools and materials to build a product using the design process.</p> <p>8.2.2.ED.4 Identify constraints and their role in the engineering design process.</p>		

ELA Standards

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 and 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 Standards

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)

Career Readiness, Life Literacies and Key Skills

This outlines concepts and skills necessary for New Jersey's students to thrive in an ever-changing world. Intended for integration throughout all K-12 academic and technical content areas, the 2020 New Jersey Student Learning Standards — Career Readiness, Life Literacies, and Key Skills (NJSLS-CLKS) provides the framework for students to learn the concepts, skills, and practices essential to the successful navigation of career exploration and preparation, personal finances and digital literacy.

<https://www.nj.gov/education/standards/clicks/index.shtml>

9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

9.2 Career Awareness

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

9.3 Career and Technical Education

This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.

9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Career Readiness, Life Literacies, and Key Skills

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

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-ETS-1-1, 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.CI.2 Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

9.4.2.DC.1 Explain the differences between ownership and sharing of information.

9.4.2.DC.2 Explain the importance of respecting digital content of others.

9.4.2.DC.3 Explain how to be safe online and follow safe practices when using the Internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

9.4.2.DC.4 Compare information that should be kept private to information that might be made public.

9.4.2.DC.5 Explain what a digital footprint is and how it is created.

9.4.2.DC.6 Identify respectful and responsible ways to communicate in digital environments.

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

9.4.2.IML.2 Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

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).

9.4.2.IML.4 Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

Essential Understandings

Students will understand that...

- Matter exists as different substances that have various observable properties.
- Properties such as strength, flexibility, hardness, texture, and absorbency determine the purpose of matter.
- Objects may break into smaller pieces and be put together into larger pieces, or change shapes.

Essential Questions

- How can you describe and classify different kinds of materials?
- Which properties of different materials make them suitable for select functions?
- How can an object made of a small set of pieces be disassembled and made into a new object?

<ul style="list-style-type: none"> Some materials experience permanent changes when heated or cooled, while others have changes that are reversible. 	<ul style="list-style-type: none"> How does heating and cooling change matter?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
<p>Building Structures: Work together to brainstorm a list of possible structures that could be built with different materials. For example, students can build bridges or houses. Select one structure from the list and determine the intended purpose of that structure. Select two or three different materials that can be used to build the structure. Investigate the physical properties of the materials, including shape, strength, flexibility, hardness, texture, or absorbency. Collect and analyze data to determine whether or not the given materials have properties that are suited for the intended purpose of the selected structure. In groups, students will use one of the materials to build the structure. (Teachers should have different groups use different types of materials) Test and compare how each structure performs. It is useful to compare the strengths and weaknesses of each structure and material used.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> Graphic Organizers & Guided Note Taking Directed Reading Cooperative Group Learning Homework Journal Entries Teacher Observation <p>Summative Assessments</p> <ul style="list-style-type: none"> RST- Research Simulation Task Associated Unit tests, quizzes Labs and engineering based projects <p>Benchmark Assessment</p> <ul style="list-style-type: none"> Mystery Science Unit Assessment Lesson Quiz <p>Alternative Assessments</p> <ul style="list-style-type: none"> Mystery Science Activities Science A-Z Activities Question Starters Participation Rubric Modified Tests/Quizzes/Homework
Vocabulary	
solid, matter, States of matter, plasma, gas, liquid, temperature, heat, energy, condensation, melting, freezing, chemical symbol, kinetic energy, vaporization, physical change, chemical change, sublimation, melting point, chemical property, element, boiling point, physical properties, atom, mass, mixture, nucleus, property, molecule, solution, volume, freezing point and vapor	
Knowledge and Skills	

Content	Skills
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> • 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 • different properties are suited to different purposes • a great variety of objects can be built up from a small set of pieces • heating or cooling a substance may cause changes that can be observed (sometimes these changes are reversible, and sometimes they are not) 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> • Plan and conduct an investigation collaboratively to produce describe and classify different kinds of materials by their observed properties. • Analyze data from tests of an object or tool to determine if it works as intended. • Make observations (firsthand or from media) to construct an evidence-based account of how an object made of a small set of pieces can be assembled. • Construct an argument with evidence that some change caused by heating or cooling can be reversed and some cannot. • Search for cause and effect relationships to explain natural events.
Instructional Plan	
Suggested Activities	Resources
<p>Why do we wear clothes? Students explore the different properties of materials used for clothing. In the activity, students select materials they need to construct a hat that protects them from the sun.</p>	<p>https://mysteryscience.com/materials/mystery-1/material-properties-engineering/64?r=6359979</p>
<p>Can you really fry an egg on a hot sidewalk? Students consider the insulating and conducting properties of different materials. In the activity, students test different materials to determine which material is best for making oven mitts.</p>	<p>https://mysteryscience.com/materials/mystery-2/material-properties-classifying-materials/65?r=6359979</p>
<p>Why are so many toys made out of plastic? Students learn about melting and the solid & liquid states of matter, then discover why plastic was invented. In the activity, students test the “moldable” property of candy.</p>	<p>https://mysteryscience.com/materials/mystery-3/material-changes-phases-of-matter/66?r=6359979</p>
<p>What materials might be invented in the future? Students learn how new materials are invented. In the activity, they create a design for an invention that uses a futuristic material.</p>	<p>https://mysteryscience.com/materials/mystery-4/material-inventions-engineering/67?r=6359979</p>

Literature	
<ul style="list-style-type: none"> ● <i>What is the World Made of?</i>_By Kathleen Weidner Zoehfeld and Paul Meisel ● <i>Solids, Liquids, and Gases</i> by Ginger Garrett ● <i>Many Kinds of Matter: A Look at Solids, Liquids, and Gases</i> by Jennifer Boothroyd ● <i>It Does Matter!: Different States of Matter</i>_by Baby Professor 	
Websites	
Activities related to every unit of science for grade two.	www.betterlesson.com
Science website with various second grade science activities. This website requires membership.	The Happy Scientist
Science website with various second grade science activities.	Hooked On Science
Earth science related activities.	Earth Sci Week
Brainpop video on matter	Brainpop video
Accommodations & Modifications	
English Language Learners: <ul style="list-style-type: none"> ● Provide ELL students with multiple literacy strategies ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community ● Provide extra time ● Pre-teach vocabulary using visuals and gestures ● Chunk texts ● Summarize as you go ● Preview lessons ● Graphic Organizers ● Highlight key words ● Sentence starters ● Prompting and cuing ● Activate schema ● Build background knowledge 	
Basic Skills: <ul style="list-style-type: none"> ● Pre-teach vocabulary using visuals and gestures ● Chunk texts ● Summarize as you go 	

- Preview lessons
- Graphic organizers
- Highlight keywords
- Sentence Starters
- Prompting and cuing
- Activate schema
- Build background knowledge

Economically Disadvantaged

- Extra Materials for Home
- Books for Home
- Study Guides
- “Take Home” Kit

Gifted and Talented:

- Higher level questioning
- Students design questions
- Choice board to extend learning
- Expose to sophisticated vocabulary
- Extend reading response to further enrich understanding (see extension activities in unit binder)
- Discuss how readers and writers connect
- Create comic strip showing connections to reading lives: illustrate and caption
- Create poem using rich adjectives and detailed illustrations
- Write paragraph in notebook about things they are passionate about
- Have students choose someone in their family they would write a biography about and why
- Collect artifacts to decorate notebook at home-discuss with class
- Have students create a poster showing their favorite reading spot
- Have students create anchor charts to explain strategy taught to hand around the room
- Students can expand on discussions with family members in their notebooks
- Expand reading genre while independent reading to reflect a well-rounded book bag

Students with IEPs

- Follow all IEP modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text

- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
- Have a designated reader
- Hear instructions orally
- Record a lesson, instead of taking note
- Have another student share class notes with him
- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students with 504 plans

- Follow all 504 plan modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
- Have a designated reader
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- Have another student share class notes with him
- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students at risk for failure

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher reads aloud daily
- Provide peer tutoring
- Use a strong student as a “buddy” (does not necessarily have to speak the primary language)
- Choral reading
- Chants, songs
- Preferential seating

Unit 2: Ecosystems: Interactions, Energy, & Dynamics		Duration: 26 days (December – February)
Standards		
<p>2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.</p> <p>2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.</p> <p>2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.</p>		
Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
<p style="text-align: center;">Developing and Using Models</p> <p>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)</p>	<p style="text-align: center;">LS2.A: Interdependent Relationships in Ecosystems</p> <p>Plants depend on water and light to grow. (2-LS2-1)</p> <p>Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)</p>	<p style="text-align: center;">Cause and Effect</p> <p>Events have causes that generate observable patterns. (2-LS2-1)</p>
<p style="text-align: center;">Planning and Carrying Out Investigations</p> <p>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.</p> <p>Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1)</p>	<p style="text-align: center;">ETS1.B: Developing Possible Solutions</p> <p>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)</p>	<p style="text-align: center;">Structure and Function</p> <p>The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2)</p>
	<p style="text-align: center;">LS4.D: Biodiversity and Humans</p> <p>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)</p>	<p style="text-align: center;">Connections to Nature of Science Scientific</p> <p>Knowledge is Based on Empirical Evidence Scientists look for patterns and</p>

		order when making observations about the world. (2-LS4-1)
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**Interdisciplinary Connections
Computer Science and Design Thinking Standards**

9.4.2.TL.1 Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).

9.4.2.TL.2 Create a document using a word processing application.

9.4.2.TL.3 Enter information into a spreadsheet and sort the information.

9.4.2.TL.5 Describe the difference between real and virtual experiences.

8.2.2.ITH.5 Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution.

8.2.2.ED.2 Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.

8.2.2.ED.3 Select and use appropriate tools and materials to build a product using the design process.

8.2.2.ED.4 Identify constraints and their role in the engineering design process.

ELA Standards

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)

Math Standards

MP.2 Reason abstractly and quantitatively. (2-LS2-1)

MP.4 Model with mathematics. (2-LS2-1), (2-LS2-2)

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, a compare problems using information presented in a bar graph. (2-LS2-2)

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Career Readiness, Life Literacies, and Key Skills

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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-ETS-1-1, 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.CI.2 Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

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9.4.2.DC.3 Explain how to be safe online and follow safe practices when using the Internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

9.4.2.DC.4 Compare information that should be kept private to information that might be made public.

9.4.2.DC.5 Explain what a digital footprint is and how it is created.

9.4.2.DC.6 Identify respectful and responsible ways to communicate in digital environments.

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

9.4.2.IML.2 Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

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).

9.4.2.IML.4 Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

Essential Understandings

Essential Questions

<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Plants need water and light. ● Seed dispersal and pollination of plants occur when animals eat and travel to various areas. ● Diversity is dependent on availability of life sustaining resources. 	<ul style="list-style-type: none"> ● Do plants and animals need sunlight and water to grow? ● What are the steps that occur when animals help disperse seeds or aid in pollinating plants? ● What are observations that can be made about the diversity of living things in different habitats?
<p>Evidence of Student Learning</p>	
<p>Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i></p>	<p>Other Assessments</p>
<p>Plant Investigations Based on a given plan for the investigation, students describe the following evidence to be collected:</p> <ul style="list-style-type: none"> ○ Descriptions based on observations (firsthand or from media) of habitats, including land habitats (e.g., playground, garden, forest, parking lot) and water habitats (e.g., pond, stream, lake). ○ Descriptions based on observations (firsthand or from media) of different types of living things in each habitat (e.g., trees, grasses, flowering plants, lizards, squirrels, ants, fish, clams). ○ Comparisons of the different types of living things that can be found in different habitats. <p>Students develop a simple model that mimics the function of an animal I seed dispersal or pollination of plants. Students identify the relevant components of their model, including those components that mimic the natural structure of an animal that helps it disperse seeds (e.g., hair that snares seeds, squirrel cheek pouches that transport seeds) or that mimic the natural structure of an animal that helps it pollinate plants (e.g., bees have fuzzy bodies to which pollen sticks, hummingbirds have bills that transport pollen). The relevant components of the model include: relevant structures of the animal, relevant structures of the plant, pollen or seeds from plants.</p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning ● Homework ● Journal Entries ● Teacher Observation <p>Summative Assessments</p> <ul style="list-style-type: none"> ● RST- Research Simulation Task ● Associated Unit tests, quizzes ● Labs and engineering based projects <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Mystery Science Unit Assessment ● Lesson Quiz <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Mystery Science Activities ● Science A-Z Activities ● Question Starters ● Participation Rubric ● Modified Tests/Quizzes/Homework

<p>In the model, students describe relationships between components, including evidence that the developed model mimics how plant and animal structures interact to move pollen or disperse seeds. Students describe the relationships between components that allow for movement of pollen or seeds. Students describe the relationships between the parts of the model they are developing and the parts of the animal they are mimicking. Students use the model to describe how the structure of the model gives rise to the function, and how the structure-function relationships in the natural world that allow some animals to disperse seeds or pollinate plants.</p>	
Vocabulary	
Ecosystems, habitat, producer, consumer, climate, food chain, environment, organism, prey, predator, scavenger, pollutant, seed dispersal, pollination, primary consumer, secondary consumer	
Knowledge and Skills	
Content	Skills
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● Plants depend on water and light to grow. ● plants depend on animals for pollination or to move their seeds around ● there are many different kinds of living things in any area, and they exist in different places on land and in water 	<p><i>Students will be able to ...</i></p> <ul style="list-style-type: none"> ● Make observations to compare the diversity of plants and animals in different habitats. ● Develop a simple model that mimics the function of an animal dispersing seeds or pollinating plants. ● Plan and conduct an investigation to determine if plants need sunlight and water to grow.
Instructional Plan	
Suggested Activities	Resources
<p>How did a tree travel halfway around the world?</p> <p>Students will learn how seeds must get away from their parent plant in order to survive.</p>	<p>https://mysteryscience.com/plants/structure-function-adaptations?r=6359979#plants-1.0</p>
<p>Do plants eat dirt?</p>	<p>https://mysteryscience.com/plants/mystery-2/roots-water-minerals/85?r=6359979</p>

Students will learn the importance of water (which is taken in by the roots) for plants, and what it is about dirt that plants really need. They'll build a Root Viewer to see up close how roots behave	
Why do trees grow so tall? Students will learn the importance of sunlight to plants, which is collected by their leaves. Knowing how plants respond to sunlight, they will build creative Grass Heads. This mystery requires two class periods.	https://mysteryscience.com/plants/mystery-3/light-leaves-competition/86?r=6359979
Should you water a cactus? Students will learn that plants have different needs in terms of sunlight and water. In the activity we will revisit our Grass Heads.	https://mysteryscience.com/plants/mystery-4/adaptations-habitat/87?r=6359979
Where do plants grow best? Students will practice thinking like gardeners.	https://mysteryscience.com/plants/mystery-5/adaptations-habitat/88?r=6359979
Literature	
<ul style="list-style-type: none"> ● <i>Trees</i> by Gail Gibbons ● <i>Plants and Tree Ecosystems! From Wetlands to Forests</i> by Left Brain Kids ● <i>Many Biomes, One Earth</i> by Sneed B. Collard III and James M. Needham ● <i>Tree of Life: The Incredible Biodiversity of Life on Earth</i> by Rochelle Strauss and Margot Thompson 	
Websites	
Activities related to every unit of science for grade two.	www.betterlesson.com
Science website with various second grade science activities. This website requires membership.	The Happy Scientist
Science website with various second grade science activities.	Hooked On Science
Earth science related activities.	Earth Sci Week
Brainpop video on matter	Brainpop video
Accommodations & Modifications	
English Language Learners: <ul style="list-style-type: none"> ● Provide ELL students with multiple literacy strategies ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community ● Provide extra time ● Pre-teach vocabulary using visuals and gestures 	

- Chunk texts
- Summarize as you go
- Preview lessons
- Graphic Organizers
- Highlight key words
- Sentence starters
- Prompting and cuing
- Activate schema
- Build background knowledge

Basic Skills:

- Pre-teach vocabulary using visuals and gestures
- Chunk texts
- Summarize as you go
- Preview lessons
- Graphic organizers
- Highlight keywords
- Sentence Starters
- Prompting and cuing
- Activate schema
- Build background knowledge

Economically Disadvantaged

- Extra Materials for Home
- Books for Home
- Study Guides
- “Take Home” Kit

Gifted and Talented:

- Higher level questioning
- Students design questions
- Choice board to extend learning
- Expose to sophisticated vocabulary
- Extend reading response to further enrich understanding (see extension activities in unit binder)
- Discuss how readers and writers connect
- Create comic strip showing connections to reading lives: illustrate and caption
- Create poem using rich adjectives and detailed illustrations
- Write paragraph in notebook about things they are passionate about
- Have students choose someone in their family they would write a biography about and why

- Collect artifacts to decorate notebook at home-discuss with class
- Have students create a poster showing their favorite reading spot
- Have students create anchor charts to explain strategy taught to hand around the room
- Students can expand on discussions with family members in their notebooks
- Expand reading genre while independent reading to reflect a well-rounded book bag

Students with IEPs

- Follow all IEP modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
- Have a designated reader
- Hear instructions orally
- Record a lesson, instead of taking note
- Have another student share class notes with him
- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students with 504 plans

- Follow all 504 plan modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
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- Hear instructions orally
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- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students in risk of failure

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher reads aloud daily
- Provide peer tutoring
- Use a strong student as a “buddy” (does not necessarily have to speak the primary language)
- Choral reading
- Chants, songs
- Preferential seating

Unit 3: Earth’s Place in the Universe/Earth Systems		Duration: 20 days (March – June)
Standards		
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.	
2-ESS2-2	Develop a model to represent the shapes and kinds of land and bodies of water in an area.	
2-ESS2-3	Obtain information to identify where water is found on Earth and that it can be solid or liquid.	
Science and Engineering Practices	Discipline Core Ideas/Unit Enduring Understandings	Crosscutting Concepts
<p style="text-align: center;">Constructing Explanations and Designing Solutions</p> <p>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.</p> <p>Make observations from several sources to construct an evidence based account for natural phenomena. (2-ESS1-1)</p>	<p style="text-align: center;">ESS1.C: The History of Planet Earth</p> <p>Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)</p>	<p style="text-align: center;">Stability and Change</p> <p>Things may change slowly or rapidly. (2-ESS1-1)</p>

<p>Compare multiple solutions to a problem. (2-ESS2-1)</p>		
<p>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.</p> <p>Develop a model to represent patterns in the natural world. (2- ESS2-2) Develop a model to represent patterns in the natural world. (2- ESS2-2)</p>	<p>ESS2.A: Earth Materials and Systems Wind and water can change the shape of the land. (2-ESS2-1)</p>	<p>Patterns Patterns in the natural world can be observed. (2-ESS2-2), (2-ESS2-3)</p>
<p>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.</p> <p>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)</p>	<p>ESS2.A: Earth Materials and Systems Wind and water can change the shape of the land. (2-ESS2-1)</p>	<p>Connections to Engineering, Technology, and Applications of Science 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)</p>
	<p>ETS1.C: Optimizing the Design Solution Because there is always more than one possible solution to a problem, it is useful</p>	<p>Connections to Nature of Science Science Addresses Questions About the Natural and Material World Scientists study the natural and material world. (2-ESS2-1)</p>

	to compare and test designs. (secondary to 2-ESS2-1)	
	<p>ESS2.C: The Roles of Water in Earth's Surface Processes</p> <p>Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)</p>	
	<p>ETS1.C: Optimizing the Design Solution</p> <p>Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary to 2-ESS2-1)</p>	
Interdisciplinary Connections		
Computer Science and Design Thinking Standards		
<p>9.4.2.TL.1 Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1).</p> <p>9.4.2.TL.2 Create a document using a word processing application.</p> <p>9.4.2.TL.3 Enter information into a spreadsheet and sort the information.</p> <p>9.4.2.TL.5 Describe the difference between real and virtual experiences.</p> <p>8.2.2.ITH.5 Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution.</p> <p>8.2.2.ED.2 Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.</p> <p>8.2.2.ED.3 Select and use appropriate tools and materials to build a product using the design process.</p> <p>8.2.2.ED.4 Identify constraints and their role in the engineering design process.</p>		
ELA Standards		
<p>RI.2.1 Ask and answer such questions as who, what, where, when, why, and how, and how to demonstrate understanding of key details in text. (2-ESS1-1)</p> <p>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)</p> <p>RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)</p> <p>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)</p> <p>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)</p>		

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)
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. (2-ESS2-2)

Math Standards

MP.2 Reason abstractly and quantitatively. (2-ESS1-1)
MP.4 Model with mathematics. (2-ESS1-1)
MP.5 Use appropriate tools strategically. (2-ESS2-1)
2.NBT.A Understand place value. (2-ESS1-1)
2.NBT.A.3 Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
2.MD.B.5 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)

Career Readiness, Life Literacies and Key Skills

This outlines concepts and skills necessary for New Jersey's students to thrive in an ever-changing world. Intended for integration throughout all K-12 academic and technical content areas, the 2020 New Jersey Student Learning Standards — Career Readiness, Life Literacies, and Key Skills (NJSLS-CLKS) provides the framework for students to learn the concepts, skills, and practices essential to the successful navigation of career exploration and preparation, personal finances and digital literacy.

<https://www.nj.gov/education/standards/clicks/index.shtml>

9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

9.2 Career Awareness

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

9.3 Career and Technical Education

This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.

9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Career Readiness, Life Literacies, and Key Skills

- 9.1.2.CR.1** Recognize ways to volunteer in the classroom, school and community.
- 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-ETS-1-1, 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.CI.2** Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
- 9.4.2.DC.1** Explain the differences between ownership and sharing of information.
- 9.4.2.DC.2** Explain the importance of respecting digital content of others.
- 9.4.2.DC.3** Explain how to be safe online and follow safe practices when using the Internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).
- 9.4.2.DC.4** Compare information that should be kept private to information that might be made public.
- 9.4.2.DC.5** Explain what a digital footprint is and how it is created.
- 9.4.2.DC.6** Identify respectful and responsible ways to communicate in digital environments.
- 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.1** Identify a simple search term to find information in a search engine or digital resource.
- 9.4.2.IML.2** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
- 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).
- 9.4.2.IML.4** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

Essential Understandings	Essential Questions
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● Patterns in the natural world can be observed. ● Things may change slowly or rapidly such as erosion of rocks, glaciers melting, volcanic explosions, and earthquakes. ● Developing and using technology has impacts on the natural world. ● Humans have designed multiple solutions to slow or prevent wind or water from changing the shape of the land, such as windbreaks, shrubs, grass and trees. 	<ul style="list-style-type: none"> ● Why do some Earth events happen very slowly or quickly? ● What are different solutions designed to prevent wind or water changing the shape of land? ● How can a map represent the shape and kind of water in a specified area? ● Where and why is water on Earth found in both solid and liquid form?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
Create solutions to prevent wind and water damage	<p>Formative Assessments</p> <ul style="list-style-type: none"> ● Graphic Organizers & Guided Note Taking

<p>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. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.</p>	<ul style="list-style-type: none"> ● Directed Reading ● Cooperative Group Learning ● Homework ● Journal Entries <p>Summative Assessments</p> <ul style="list-style-type: none"> ● RST- Research Simulation Task ● Associated Unit tests ● Quizzes ● Labs and engineering based projects <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Mystery Science Unit Assessment ● Lesson Quiz <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Mystery Science Activities ● Science A-Z Activities ● Question Starters ● Participation Rubric ● Modified Tests/Quizzes/Homework
Vocabulary	
Geology, water erosion, weathering, rock erosion, weathering, wind vane, barometer, thermometer, rain gauge, rock, minerals, volcano, topographic maps, plate tectonics, rock cycle, Earth's layers	
Knowledge and Skills	
Content	Skills
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● Some events happen very quickly, others occur very slowly, over a time period much longer than one can observe ● Wind and water can change the shape of the land ● Maps show where things are located ● One can map the shapes and kinds of land and water in any area ● Water is found in the ocean, rivers, lakes, and ponds ● Water exists as solid ice and in liquid form 	<p><i>Students will be able to...</i></p> <ul style="list-style-type: none"> ● Investigate the properties of water. ● Develop a model to represent patterns in the natural world. ● Make observations from several sources to construct an evidence-based account for natural phenomena. ● Compare multiple solutions to a problem. ● Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries,

<ul style="list-style-type: none"> It is useful to compare and test designs when there is more than one solution to a problem 	<p>electronic menus, icons), and other media that will be useful in answering a scientific question.</p>
Instructional Plan	
Suggested Activities	Resources
<p>If you floated down a river, where would you end up? Students develop a model of the earth's surface and use it to discover an important principle about how rivers work.</p>	<p>https://mysteryscience.com/water/earth-s-surface-processes?r=6359979#water-1.0</p>
<p>Why is there sand at the beach? Students investigate the effects of rocks tumbling in a river. From the results of their investigation, they construct an explanation for why there is sand at a beach.</p>	<p>https://mysteryscience.com/water/mystery-2/erosion-earth-s-surface-landforms/113?r=6359979</p>
<p>What's strong enough to make a canyon? Students use a model of rain and land to explain what causes a canyon to form.</p>	<p>https://mysteryscience.com/water/mystery-3/erosion-earth-s-surface-landforms/114?r=6359979</p>
<p>How can you stop a landslide? Students compare multiple solutions for preventing erosion. In the activity, they design and test ways to keep water from washing away a hill modeled out of cornmeal.</p>	<p>https://mysteryscience.com/water/mystery-4/erosion-engineering/152?r=6359979</p>
Literature	
<ul style="list-style-type: none"> <i>Earthquakes</i>- SchoolWide <i>Erosion</i>- SchoolWide <i>How Mountains are Made</i>- SchoolWide <i>What Shapes the Land?</i>- SchoolWide 	
Websites	
Activities related to every unit of science for grade two.	www.betterlesson.com
Science website with various second grade science activities. This website requires membership.	The Happy Scientist
Science website with various second grade science activities.	Hooked On Science
Earth science related activities.	Earth Sci Week
Accommodations & Modifications	
<p>English Language Learners:</p> <ul style="list-style-type: none"> Provide ELL students with multiple literacy strategies 	

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community
- Provide extra time
- Pre-teach vocabulary using visuals and gestures
- Chunk texts
- Summarize as you go
- Preview lessons
- Graphic Organizers
- Highlight key words
- Sentence starters
- Prompting and cuing
- Activate schema
- Build background knowledge

Basic Skills:

- Pre-teach vocabulary using visuals and gestures
- Chunk texts
- Summarize as you go
- Preview lessons
- Graphic organizers
- Highlight keywords
- Sentence Starters
- Prompting and cuing
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Economically Disadvantaged

- Extra Materials for Home
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Gifted and Talented:

- Higher level questioning
- Students design questions
- Choice board to extend learning
- Expose to sophisticated vocabulary
- Extend reading response to further enrich understanding (see extension activities in unit binder)
- Discuss how readers and writers connect

- Create comic strip showing connections to reading lives: illustrate and caption
- Create poem using rich adjectives and detailed illustrations
- Write paragraph in notebook about things they are passionate about
- Have students choose someone in their family they would write a biography about and why
- Collect artifacts to decorate notebook at home-discuss with class
- Have students create a poster showing their favorite reading spot
- Have students create anchor charts to explain strategy taught to hand around the room
- Students can expand on discussions with family members in their notebooks
- Expand reading genre while independent reading to reflect a well-rounded book bag

Students with IEPs

- Follow all IEP modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
- Have a designated reader
- Hear instructions orally
- Record a lesson, instead of taking note
- Have another student share class notes with him
- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students with 504 plans

- Follow all 504 plan modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size

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Students at risk for failure

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher reads aloud daily
- Provide peer tutoring
- Use a strong student as a “buddy” (does not necessarily have to speak the primary language)
- Choral reading
- Chants, songs
- Preferential seating

Unit 4: Engineering Design		Duration: 17 days (November-January)/Ongoing	
Standards			
K-2-ETS-1-1	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-ETS-1-2	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-ETS-1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.		
Science and Engineering Practices		Discipline Core Ideas/Unit Enduring Understandings	
Asking Questions and Defining Problems		ETS1.A: Defining and Delimiting Engineering Problems	
<p>Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.</p> <p>Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2- ETS1-1)</p> <p>Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)</p>		<p>A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)</p> <p>Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)</p> <p>Before beginning to design a solution, it is important to clearly understand the problem. (K-2- ETS1-1)</p>	
Developing and Using Models		ETS1.B: Developing Possible Solutions	
<p>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.</p>		<p>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. (K-2-ETS1-2)</p>	
Crosscutting Concepts			
Structure and Function			
<p>The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)</p>			

Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)		
<p>Analyzing and Interpreting Data 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. (K-2-ETS1-3)</p>	<p>ETS1.C: Optimizing the Design Solution Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)</p>	
Interdisciplinary Connections		
<p style="text-align: center;">Computer Science and Design Thinking Standards</p> <p>9.4.2.TL.1 Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1). 9.4.2.TL.2 Create a document using a word processing application. 9.4.2.TL.3 Enter information into a spreadsheet and sort the information. 9.4.2.TL.5 Describe the difference between real and virtual experiences. 8.2.2.ITH.5 Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution. 8.2.2.ED.2 Collaborate to solve a simple problem, or to illustrate how to build a product using the design process. 8.2.2.ED.3 Select and use appropriate tools and materials to build a product using the design process. 8.2.2.ED.4 Identify constraints and their role in the engineering design process.</p>		
ELA Standards		
<p>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. (K-2-ETS1-1) W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including collaboration with peers. (K-2-ETS1-1), (K-2-ETS1-3) W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1), (K-2-ETS1-3) 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)</p> <p style="text-align: center;">Math Standards</p> <p>MP.5 Use appropriate tools strategically. (1-PS4-4) MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1), (K-2-ETS1-3)</p>		

MP.4 Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3)

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)

Career Readiness, Life Literacies and Key Skills

This outlines concepts and skills necessary for New Jersey's students to thrive in an ever-changing world. Intended for integration throughout all K-12 academic and technical content areas, the 2020 New Jersey Student Learning Standards — Career Readiness, Life Literacies, and Key Skills (NJSLS-CLKS) provides the framework for students to learn the concepts, skills, and practices essential to the successful navigation of career exploration and preparation, personal finances and digital literacy.

<https://www.nj.gov/education/standards/clicks/index.shtml>

9.1 Personal Financial Literacy

This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.

9.2 Career Awareness

This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.

9.3 Career and Technical Education

This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.

9.4 Life Literacies and Key Skills

This standard outline key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy* that are critical for students to develop to live and work in an interconnected global economy.

Career Readiness, Life Literacies, and Key Skills

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

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-ETS-1-1, 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.CI.2 Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).

9.4.2.DC.1 Explain the differences between ownership and sharing of information.

9.4.2.DC.2 Explain the importance of respecting digital content of others.

9.4.2.DC.3 Explain how to be safe online and follow safe practices when using the Internet (e.g., 8.1.2.NI.3, 8.1.2.NI.4).

9.4.2.DC.4 Compare information that should be kept private to information that might be made public.

<p>9.4.2.DC.5 Explain what a digital footprint is and how it is created.</p> <p>9.4.2.DC.6 Identify respectful and responsible ways to communicate in digital environments.</p> <p>9.4.2.DC.7 Describe actions peers can take to positively impact climate change (e.g., 6.3.2.CivicsPD.1).</p> <p>9.4.2.IML.1 Identify a simple search term to find information in a search engine or digital resource.</p> <p>9.4.2.IML.2 Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).</p> <p>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).</p> <p>9.4.2.IML.4 Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).</p>	
Essential Understandings	Essential Questions
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • The shape and stability of structures of natural and designed objects are related to their function(s). • A situation that people want to change or create can be approached as a problem to be solved through engineering. • Asking questions, making observations, and gathering information are helpful in thinking about problems. • Before beginning to design a solution, it is important to clearly understand the problem. • 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. • Because there is always more than one possible solution to a problem, it is useful to compare and test designs. 	<ul style="list-style-type: none"> • How are asking questions, gathering information, and making observation helpful when thinking about problems? • How does sketching or creating a model to illustrate its shape help solve a given problem? • How does testing a model determine its strengths and weaknesses in solving a given problem?
Evidence of Student Learning	
Performance Tasks: <i>Activities to provide evidence for student learning of content and cognitive skills.</i>	Other Assessments
Erosion can be a big problem in our environment. Students can be proactive to stop its destruction. Design an erosion control of your own.	<p>Formative Assessments</p> <ul style="list-style-type: none"> • Graphic Organizers & Guided Note Taking • Directed Reading • Cooperative Group Learning • Homework

	<ul style="list-style-type: none"> ● Journal Entries <p>Summative Assessments</p> <ul style="list-style-type: none"> ● RST- Research Simulation Task ● Associated Unit tests, quizzes ● Labs and engineering based projects <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Mystery Science Unit Assessment ● Lesson Quiz <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Mystery Science Activities ● Science A-Z Activities ● Question Starters ● Participation Rubric ● Modified Tests/Quizzes/Homework
Vocabulary	
Technology, engineering, technological design	
Knowledge and Skills	
Content	Skills
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> ● A situation that people want to change or create can be approached as a problem to be solved through engineering ● Asking questions, making observations, and gathering information are helpful in thinking about problems ● Before beginning to design a solution, it is important to clearly understand the problem ● 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 ● Because there is always more than one possible solution to a problem, it is useful to compare and test designs 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> ● Ask questions based on observations to find more information about the natural and/or designed world(s). ● 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. ● Analyze data from tests of an object or tool to determine if it works as intended.

Instructional Plan	
Suggested Activities	Resources
<p>Evidence of erosion The class will take a mini field trip on the school grounds to find evidence of erosion. As they find evidence, the students will stop, observe and report. We then discuss the types of erosion damage they have seen in their own neighborhood. Then we go back inside and create their own erosion solution for one of the problems we have witnessed. They will then share their ideas with the class.</p>	<p>https://betterlesson.com/lesson/640745/finding-erosion-at-our-school</p>
<p>Shade Students will demonstrate knowledge of the engineering and design process by creating a structure that provides shade.</p>	<p>https://betterlesson.com/lesson/644795/a-place-in-the-shade-an-engineering-challenge</p>
<p>Student Engineers Student teams are challenged to navigate a table tennis ball through a timed obstacle course using only the provided unconventional “tools.” Teams act as engineers by working through the steps of the engineering design process to complete the overall task with each group member responsible to accomplish one of the obstacle course challenges.</p>	<p>https://www.teachengineering.org/activities/view/ucd_derbytool_activity1</p>
<p>Building Bridges Students explore why bridges are shaped differently. Students distinguish between beam, arch, and suspension bridges and learn how bridge designs counteract and redirect forces and motion. In the culminating design challenge, students design, construct, and test their own bridges.</p>	<p>http://www.asee.org/documents/conferences/k12/2011/07/17-Ready-for-Primary-Time.pdf</p>
<p>Gases Students will demonstrate knowledge of gases to design and build a model of a hot air balloon that will float.</p>	<p>http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/ (hot air balloon challenge)</p>
Literature	
<ul style="list-style-type: none"> ● <i>Building a House</i> by Byron Barton ● <i>Engineering the ABC's: How Engineers Shape Our World</i> by Patty O'Brien Novak ● <i>Janice VanCleave's Engineering for Every Kid: Easy Activities That Make Learning Science Fun</i> by Janice VanCleave ● <i>Three Billy Goats Gruff</i> by Peter Christen Asbjørnsen ● <i>How Things Work: 100 Ways Parents and Kids Can Share the Secrets of Technology</i> by Neil Ardley 	
Websites	
<p>Activities related to every unit of science for grade two.</p>	<p>www.betterlesson.com</p>

Science website with various second grade science activities. This website requires membership.	The Happy Scientist
Science website with various second grade science activities.	Hooked On Science
RESA - Leading learning for all Website with multiple science activities for NGSS	http://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/
Accommodations & Modifications	
<p>English Language Learners:</p> <ul style="list-style-type: none"> ● Provide ELL students with multiple literacy strategies ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community ● Provide extra time ● Pre-teach vocabulary using visuals and gestures ● Chunk texts ● Summarize as you go ● Preview lessons ● Graphic Organizers ● Highlight key words ● Sentence starters ● Prompting and cuing ● Activate schema ● Build background knowledge 	
<p>Basic Skills:</p> <ul style="list-style-type: none"> ● Pre-teach vocabulary using visuals and gestures ● Chunk texts ● Summarize as you go ● Preview lessons ● Graphic organizers ● Highlight keywords ● Sentence Starters ● Prompting and cuing ● Activate schema <p>Build background knowledge</p>	
<p>Economically Disadvantaged</p> <ul style="list-style-type: none"> ● Extra Materials for Home 	

- Books for Home
- Study Guide
- "Take Home" Kit

Gifted and Talented:

- Higher level questioning
- Students design questions
- Choice board to extend learning
- Expose to sophisticated vocabulary
- Extend reading response to further enrich understanding (see extension activities in unit binder)
- Discuss how readers and writers connect
- Create comic strip showing connections to reading lives: illustrate and caption
- Create poem using rich adjectives and detailed illustrations
- Write paragraph in notebook about things they are passionate about
- Have students choose someone in their family they would write a biography about and why
- Collect artifacts to decorate notebook at home-discuss with class
- Have students create a poster showing their favorite reading spot
- Have students create anchor charts to explain strategy taught to hand around the room
- Students can expand on discussions with family members in their notebooks

Expand reading genre while independent reading to reflect a well-rounded book bag

Students with IEPs

- Follow all IEP modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
- Have a designated reader
- Hear instructions orally
- Record a lesson, instead of taking note
- Have another student share class notes with him
- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students with 504 plans

- Follow all 504 plan modifications
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Listen to audio recordings instead of reading text
- Learn content from audio books, movies, videos and digital media instead of reading print versions
- Work with fewer items per page or line and/or materials in a larger print size
- Have a designated reader
- Hear instructions orally
- Record a lesson, instead of taking note
- Have another student share class notes with him
- Be given an outline of a lesson
- Use visual presentations of verbal material, such as word webs and visual organizers
- Be given a written list of instruction

Students in risk of failure

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher reads aloud daily
- Provide peer tutoring
- Use a strong student as a “buddy” (does not necessarily have to speak the primary language)
- Choral reading
- Chants, songs
- Preferential seating