



Stafford Township School District

Science Curriculum

Kindergarten

2020 New Jersey Student Learning Standards - Science

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

Original Adoption: August 8, 2022
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Grade: K**Content Area: Science**

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 Student Learning 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

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Recommended Pacing Guide	
Motion and Stability: Forces and Interactions	80 days (September - January)
Energy	30 days (January - February)
From Molecules to Organisms: Structures and Processes	15 days (March) ongoing
Earth Systems	20 days (April) ongoing
Earth and Human Activity	35 days (May - June)
Engineering Design	180 days (September - June) ongoing

Unit 1: K-PS2: Motion and Stability: Forces and Interactions	Duration: 80 days (September - January)
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Standards

K-PS2-1	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
K-PS2-2	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

Science and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
<p>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> <ul style="list-style-type: none"> With guidance, plan and conduct an investigation in 	<p>PS2.A: Forces and Motion</p> <ul style="list-style-type: none"> Pushes and pulls can have different strengths and directions. (K-PS2-1),(K-PS2-2) Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2) <p><i>Connections to Nature of Science</i></p> <p>Scientific Investigations Use a Variety of Methods</p>

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<p>collaboration with peers. (K-PS2-1)</p> <p>Analyzing and Interpreting Data</p> <ul style="list-style-type: none"> 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-PS2-2) 	<p>PS2.B: Types of Interactions</p> <ul style="list-style-type: none"> When objects touch or collide, they push on one another and can change motion. (K-PS2-1) <p>PS3.C: Relationship Between Energy and Forces</p> <ul style="list-style-type: none"> A bigger push or pull makes things speed up or slow down more quickly. (<i>secondary to K-PS2-1</i>) <p>ETS1.A: Defining and Delimiting Engineering Problems</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. Such problems may have many acceptable solutions. (<i>secondary to K-PS2-2</i>) 	<ul style="list-style-type: none"> Scientists use different ways to study the world. (K-PS2-1)
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Interdisciplinary Connections

- Connections to other DCIs in Kindergarten:**
- K.ETS1.A** Defining and delimiting engineering problems (K-PS2-2)
 - K.ETS1.B** Developing Possible Solutions- engineering design (K-PS2-2)

- Articulation of DCIs across grade levels:**
- 2.ETS1.B** Engineering Design (K-PS2-2)
 - 3.PS2.A** Forces and Motion (K-PS2-1), (K-PS2-2)
 - 3.PS2.B** Types of Interactions (K-PS2-1)
 - 4.PS3.A** Definitions of Energy (K-PS2-1)
 - 4.ETS1.A** Defining and Delimiting Engineering Problems (K-PS2-2)

- Connections to NJSLs - English Language Arts**
- RI.K.1** With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)
 - W.K.7** Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS2-1)
 - SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)

- Connections to NJSLs – Mathematics**
- MP.2** Reason abstractly and quantitatively. (K-PS2-1)

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- **K.MD.A.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)
- **K.MD.A.2** Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-PS2-1)

Connections to Technology

- **8.1.2.B.1** Illustrate and communicate original ideas and stories using multiple digital tools and resources.

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 outlines 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

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

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

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

9.4.2.DC.1: Explain differences between ownership and sharing information.

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

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

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

9.4.2.TL.4: Navigate a virtual space to build context and describe the visual continent.

Essential Understandings	Essential Questions
<p>Students will understand that...</p> <ul style="list-style-type: none"> ● Pushes and pulls can have different strengths and directions ● Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. 	<ul style="list-style-type: none"> ● How does friction affect movement? ● What kinds of forces act by touching? ● What kinds of forces act without touching? ● How can a force act upon an object without touching it? ● What happens if you push or pull an object harder

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<ul style="list-style-type: none"> ● When objects touch or collide, they push on one another and can change motion. ● A bigger push or pull makes things speed up or slow down more quickly. ● A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions 	
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Evidence of Student Learning

Formative Assessments	Summative Assessments
<p>Teacher Observations</p> <ul style="list-style-type: none"> ● Anecdotal Notes ● Directed Reading ● Cooperative Group Learning ● Labeling 	<ul style="list-style-type: none"> ● Portfolio Assessment <p>Benchmark Assessment</p> <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Group Work/Class Discussion Rubric ● Guided Observations ● Questions Starters ● Participation Rubric ● Modified Tests/Quizzes/Classwork <p>Mystery Science Activities</p> <ul style="list-style-type: none"> ● Fundamentals Unlimited Books and Assessments

Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.

English Language Arts
 In order to integrate English Language Arts into this unit, students need the opportunity to participate in shared research that will enhance their understanding of the effect of forces (pushes and pulls) on objects. This could include exploring simple books and other media or digital resources. With prompting and support, students should ask and answer questions about key details in texts in order to seek help, get information, or clarify something that they do not understand. With support from adults, students will also recall information from experiences to answer questions and clarify their thinking. With support and/or collaboration, they can use digital tools to produce and publish simple informative writing or to document their observations of the simple force and motion systems they design and build.

Mathematics
 During this unit of study, students will make connections to Mathematics in a number of ways. Kindergartners can use simple nonstandard units to measure the distances that two different objects travel when pushed or pulled or the distances that an object travels when varying the strength of a push or a pull. If using two objects, students can compare them using a measurable attribute, such as weight, to see which object has “more of” or “less of” the attribute, and describe the effect that increased weight has on the distance that an object travels. As students conduct multiple trials with the two objects (or with a single object, varying the strength of the push or pull), they can document the distance traveled in a simple graph. Then they can analyze the data in order to describe the cause-and-effect relationship between forces and motion of objects. As students collect and analyze data, they are learning to reason abstractly and quantitatively and use appropriate tools strategically.

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Vocabulary

Gravity, push, pull, magnets, force, motion, dominoes, runs, ramps, pulleys, levers, friction

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Content Area: Science

Knowledge and Skills

Content	Skills
<p>Students will know...</p> <ul style="list-style-type: none"> ● Pushes and pulls can have different strengths and directions. ● Pushing or pulling on an object can change the speed or direction of its motion and can start and stop it. ● When objects touch or collide, they push one another and can change motion. ● A bigger push or pull makes things speed up or slow down more quickly. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> ● Analyze data and develop an understanding of the effects of different directions of pushes and pulls on the motion of an object to determine if a design solution works as intended to change the speed or direction of an object with a push or pull. ● Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. ● Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. ● Analyze data to determine whether a design solution works as intended to change the speed or direction of an object with a push or a pull.

Instructional Plan

Suggested Activities	Resources
<p>"Domino Runs"- Students construct a Domino run of at least 10 Dominoes and discuss structures in motion.</p>	<ul style="list-style-type: none"> ● Dominoes ● https://www.youtube.com/user/Hevesh5
<p>"Ramps with Paper Towel Tubes"- Students use a half of paper towel roll and blocks to build a working ramp.</p>	<ul style="list-style-type: none"> ● Paper towel rolls ● Blocks ● http://kodokids.com/outdoor-ramps
<p>"Cup Stacking"-Students use plastic cups to create a cup structure and discuss the force of gravity.</p>	<ul style="list-style-type: none"> ● Cups ● YouTube video "Amazing 4-year-old cup stacker"
<p>Students identify and sort objects that only move one way and others that may move in many ways such as roll/slide.</p>	<ul style="list-style-type: none"> ● Different objects
<p>Students explore, predict and observe which objects magnets will/will not attract. Share findings with a group or partner.</p>	<ul style="list-style-type: none"> ● Different objects ● Magnets
<p>With guidance, students collaboratively plan and conduct</p>	<ul style="list-style-type: none"> ● Journals ● Balls

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simple investigations to discover and compare the effects of pushes and pulls on the motion of an object. Students will have opportunities to push and pull a variety of objects. Students should push/pull these objects first with varying strengths, and then in a variety of directions. Students should record their observations using pictures and words, and should participate in class discussions on the effects of varying the strength or direction of a push or pull on an object.

- Toy cars
- Pull toys
- Cans
- Tops
- Boxes.

Students investigate the interactions between colliding objects using pushes and pulls. Students play a game of kickball and observe how the ball is pushed, pulled, started, stopped, or collides with other objects and how it changes position and speed. As a group, students will then brainstorm about other objects being pushed, pulled or colliding and then choose one of those objects to investigate.

- Push Pull-Changing Direction
- Ball

Students design, build, and test their own ramps. Students are introduced to a variety of materials and explore putting them together. Students create plans for ramps by evaluating a variety of materials provided to them.

- Ramps 2: Ramp Builder

Literature

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- Experiments with Magnets by Helen J. Challand
- What Magnets Can Do by Allan Fowler

Accommodations and Modifications

English Language Learners

- Small group instruction-guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Assign a picture or movement to vocabulary words
- Pre Teach vocabulary
- Label items in classroom

Basic Skills

- Preview lessons
- Preview vocabulary words
- Summarize as you go

Economically Disadvantaged

- Extra Materials
- Books for Home
- Study Guides
- "Take Home" Kit

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provided students with necessary academic resources and materials
- Provide visuals
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Integrate the arts into learning activities

Gifted and Talented

- Ask open-ended questions
- Encourage upper level intellectual behavior based on Bloom's Taxonomy (analyzing, evaluating, creating)
- Do not always be explicit, allow for discovery
- Use centers and group students according to ability or interest
- Propose interest-based extension activities
- Use leveled texts and offer an advanced reader reading list
- Ask "why" and "what if" questions
- Use varied modes of pre-assessment and assessment

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- 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
- Debrief students
- Propose interest- based extension activities

Students with IEPs

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications
- Scribe for students who can't write
- Augmentative communication system

Students with 504 plans

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Follow all 504 plan modifications

Students at Risk of Failure

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson

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- 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: K-PS3: Energy	Duration: 30 days (January - February)
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Standards

K-PS3-1	Make observations to determine the effect of sunlight on Earth’s surface.
K-PS3-2	Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.

Science and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
<p>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.</p> <ul style="list-style-type: none"> • Make observations (firsthand or from media) to collect data that can be used to make comparisons. (KPS3-1) <p>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</p>	<p>PS3.B: Conservation of Energy and Energy Transfer</p> <ul style="list-style-type: none"> • Sunlight warms Earth’s surface. (K-PS3-1), (K-PS3-2) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> • Events have causes that generate observable patterns. (K-PS3-1), (K-PS3-2) <p><u>Connections to Nature of Science</u></p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> • Scientists use different ways to study the world. (K-PS3-1)

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constructing evidence-base accounts of natural phenomena and designing solutions.

- Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2)

Interdisciplinary Connections

Connections to other DCIs in Kindergarten:

- **K.ETS1.A** Defining and Delimiting Engineering Problems (K-PS3-2)
- **K.ETS1.B** Developing Possible Solutions- Engineering Design (K-PS3-2)

Articulation of DCIs across grade levels:

- **1.PS4.B** Electromagnetic Radiation (K-PS3-1), (K-PS3-2)
- **2.ETS1.B** Developing Possible Solutions - Engineering Design (K-PS3-2)
 - **3.ESS2.D** Weather and Climate - Earth’s Systems(K-PS3-1)
- **4.ETS1.A** Defining and Delimiting Engineering Problems (K-PS3-2)

Connections to NJSLs - English Language Arts

- **W.K.7** Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1), (K-PS3-2)
- **RI.K.1** With prompting and support, ask and answer questions about key details in a text. (K-PS3-1), (K-PS3-2)
- **SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS3-1), (K-PS3-2)

Connections to NJSLs – Mathematics

- **K.MD.A.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS3-1), (K-PS3-2)
- **K.MD.A.2** Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-PS3-1), (K-PS3-2)
- **K.MD.B.3** Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-PS3-1), (K-PS3-2)

Connections to Technology

- **8.1.2.B.1** Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Career Readiness, Life Literacies and Key Skills

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9.1 Personal Financial Literacy

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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.

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

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This standard outlines 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.

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

9.4.2.TL.4: Navigate a virtual space to build context and describe the visual continent.

Vocabulary

Climate, light, shadows, meteorologist, thermometer, change, patterns

Knowledge and Skills

Content	Skills
Students will know... <ul style="list-style-type: none"> ● Sunlight warms Earth's surface ● Weather is the combination of sunlight, wind, snow or rain and temperature at a 	Students will be able to ... <ul style="list-style-type: none"> ● Ask questions based on observations to find more information about the designed world. ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

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<p>particular time.</p> <ul style="list-style-type: none"> • People measure weather conditions to describe and record the weather and to notice patterns over time. • Some kinds of severe weather are more likely than others in a given region. • Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. • Global warming can affect the environment. 	<ul style="list-style-type: none"> • Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem, such as, global warming. • Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. • Use and share observations of sunlight and its effect on Earth. • Look for patterns and order when making observations about the world.
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Instructional Plan

Suggested Activities	Resources
Introduce Cumulus, Cirrus and Stratus clouds. Bring the class outside on various days to view different types of clouds.	<ul style="list-style-type: none"> • YouTube video-" How are clouds form, types of clouds" • Various non-fiction books
Record daily weather using a graph to notice patterns over time. Discuss weather changes for each season of the year.	<ul style="list-style-type: none"> • Various non-fiction books • BrainPOP jr Video-" Temperature" • Read Alouds-" Weather Words and What They Mean" by Gail Gibbons;" Thunder Cake" by Patricia Polacco; "Cloudy with a Chance of Meatballs' by Judi Barrett
Sunlight's effect on the Earth's surface activities. Take the class on a walk outside on a sunny day. Students will stand in sunny and shady areas and compare the feel and effect on their bodies. Make "Sun Prints" as a whole group-put penny on a dark, bright colored piece of construction paper, put it on a sunny windowsill.	<ul style="list-style-type: none"> • Read Alouds-" Sunshine A Book About Sunlight" by Josephia Sherman; "Sun Up Sun Down" by Gail Gibbons
Students keep track of weather by discussing and recording weather on a daily bar or pictograph.	<ul style="list-style-type: none"> • Journals
Students interpret data from a	<ul style="list-style-type: none"> • Calendar

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<p>weather graph and answer questions such as which weather have we had the most of? Least of? How many more than/less than? Equal to? Students will be able to discuss the warming of the Earth.</p>	
<p>Read the local weather forecast from an online or print resource. Make a list of the words that they use to describe weather (cloudy, sunny, partly cloudy, temperature, and wind). As a class, create symbols that the students can use to record the weather each day.</p>	<ul style="list-style-type: none"> • Examples can be found at http://tinyurl.com/hhhg299.
<p>Use the local weather to make observations, measure, collect, and record data to describe patterns over time. Students will count types of outdoor clothing worn by classmates and use the data to look for patterns in weather over months and seasons.</p>	<ul style="list-style-type: none"> • About the Weather • Calendar • Pictures of clothing
<p>Students will make their own weather station consisting of actual and simplified versions of real weather equipment. The weather station will consist of a thermometer and a student-made weather vane. They will use that equipment to make observations about the local weather.</p>	<ul style="list-style-type: none"> • Watching Weather • Thermometer

Literature

<ul style="list-style-type: none"> • Thunder Cake by Patricia Polacco • Cloudy with a Chance of Meatballs by Judi Barrett • Sunshine A Book About Sunlight by Josephia Sherman • Sun Up Sun Down by Gail Gibbons • Weather Words and What They Mean” by Gail Gibbons • What makes Day and Night? by Franklyn Branley and Arthur Dorros • What Will the Weather Be? by Paul Rogers • Weather Words and What They Mean by Gail Gibbons • The Lonely Polar Bear by Khoa Le
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Websites

Weather Wiz Kids	http://www.weatherwizkids.com/
Treehouse Weather Kids Activities and Games	http://extension.illinois.edu/treehouse/index.cfm
Science A to Z	https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf
Education.com List of Science Activities-	http://www.education.com/activity/kindergarten/science/
Crazy Weather:	https://www.youtube.com/watch?v=UbfsQgigD9M
Weather Videos	http://www.sciencekids.co.nz/videos/weather.html
This is a resource from the National Center for Atmospheric Research and the National Science Foundation that explains the basics of weather and climate. This article is designed as background information for the teacher.	<u>Weather and Climate Basics</u>

Grade: K

Content Area: Science

Accommodations and Modifications

English Language Learners

- Small group instruction-guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Assign a picture or movement to vocabulary words
- Pre Teach vocabulary
- Label items in classroom

Basic Skills

- Preview lessons
- Preview vocabulary words
- Summarize as you go

Economically Disadvantaged

- Extra Materials
- Books for Home
- Study Guides
- "Take Home" Kit

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provided students with necessary academic resources and materials
- Provide visuals
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Integrate the arts into learning activities

Gifted and Talented

- Ask open-ended questions
- Encourage upper level intellectual behavior based on Bloom's Taxonomy (analyzing, evaluating, creating)
- Do not always be explicit, allow for discovery
- Use centers and group students according to ability or interest
- Propose interest- based extension activities
- Use leveled texts and offer an advanced reader reading list
- Ask "why" and "what if" questions
- Use varied modes of pre- assessment and assessment
- 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

Grade: K**Content Area: Science**

- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts
- Organize integrated problem - solving simulations
- Debrief students
- Propose interest- based extension activities

Students with IEPs

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications
- Scribe for students who can't write
- Augmentative communication system

Students with 504 plans

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Follow all 504 plan modifications

Students at 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

Grade: K	Content Area: Science
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- Chants, songs
- Preferential seating

Unit 3: K-LS1: From Molecules to Organisms: Structures and Processes	Duration: 15 days (March) ongoing
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Standards

K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
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Science and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> • Use observations (firsthand or from the media) to describe patterns in the natural world in order to answer scientific questions. (KLS1-1) 	<p>LS1.C: Organization for Matter and Energy Flow in Organisms</p> <ul style="list-style-type: none"> • All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1) 	<p>Patterns</p> <ul style="list-style-type: none"> • Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) <p>Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> • Scientists look for patterns and order when making observations about the world. (K-LS1-1)

Interdisciplinary Connections

Connections to other DCIs in Kindergarten:
N/A

Articulation of DCIs across grade levels:

- LS1.A Structure and Function (K-LS1-1)
- 2.LS2.A Ecosystems: Interactions, Energy, and Dynamics (K-LS1-1)
- 3.LS2.C Ecosystems: Interactions, Energy, and Dynamics (K-LS1-1)
- 3.LS4.B Biological Evolution: Unity and Diversity (K-LS1-1)
- 5.LS1.C Core Ideas In Life Sciences (K-LS1-1)
- 5.LS2.A Ecosystems: Interactions, Energy, and Dynamics (K-LS1-1)

Grade: K

Content Area: Science

Connections to NJSLs - English Language Arts

- W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-LS-1)
- W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-LS-1)
- W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS-1)
- SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-LS-1)

Connections to NJSLs – Mathematics

- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of/less of” the attribute, and describe the difference. (K-LS-1)

Connections to Technology

- 8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.

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 outlines 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

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

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

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

9.4.2.DC.1: Explain differences between ownership and sharing information.

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

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

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

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9.4.2.TL.4: Navigate a virtual space to build context and describe the visual continent.

Vocabulary

Patterns, plants, animals, recycle, habitat, resource, want, needs, hypothesis

Knowledge and Skills

Content	Skills
<p>Students will know...</p> <ul style="list-style-type: none"> • Patterns in the natural and human designed world can be observed and used as evidence • Events have causes that generate observable patterns. • Systems in the natural and designed world have parts that work together. • Scientists look for patterns and order when making observations about the world. • Living things need water, air, and resources from the land, and they live in places that have the things they need. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Construct an argument with evidence to support a claim • Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas • Observe and use patterns in the natural world as evidence • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions • Use observations to describe patterns in what plants need to survive • Use a model to represent the relationships between the needs of different animals and the places they live in the natural world.

Instructional Plan

Suggested Activities	Resources
<p>Students will make a diagram of a plant and label the parts. Discuss the life cycle of a plant and its needs to survive.</p>	<ul style="list-style-type: none"> • BrainPOP. Video-Parts of a plant • Read Aloud-" The Tiny Seed" by Eric Carle
<p>Hibernation Activity- Students will chart and discuss animals that hibernate and animals that do not. Students will create an art project that shows an animal in its habitat during hibernation.</p>	<ul style="list-style-type: none"> • www.SciShowkids.com • Videos- "Animals with Winter Coats" and "Brr! Winter Videos" • Read Alouds-" Bear Snores On" by Karma Wilson, "Over and Under the Snow" by Kate Messner, "Time to Sleep" by Denise Fleming
<p>Introduce "Arbor Day." Discuss importance of trees and the</p>	<ul style="list-style-type: none"> • Read Aloud- "The Great Kapok Tree" by Lynne Cherry; "The Tree Lady" by Joseph Hopkins & Jill McElmurry

Grade: K	Content Area: Science
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interdependency between trees, insects, animals and humans. The students will create a tree to show these interdependencies.	
Introduce "Earth Day." Discuss REDUCE, REUSE & RECYCLE. Go on a group walk outside to pick up trash. Use the items collect to make a class recycled project.	Video-SciShowkids.com-" Recycling" YouTube video-" Reading Rainbow: How trash is recycled with LeVar Burton" Read Aloud-" Compost Stew" by Mary McKenna Siddals
Teacher reads Big Book What's Alive? Take a nature walk and invite students to name /draw/record living and nonliving things observed in nature.	<ul style="list-style-type: none"> ● Big Book- What's Alive?
Students observe and sort (animals and plants) by one attribute at a time. Use picture cards to sort according to body covering, movement, number of legs.	<ul style="list-style-type: none"> ● Picture cards
Students sequence life cycles through dramatization, music, and movement.	<ul style="list-style-type: none"> ● Picture cards ● Books
Students observe and record parts of organisms through drawing and labeling.	<ul style="list-style-type: none"> ● Picture cards ● Books
Students observe a variety of plants and animals (in natural settings or using digital/video) and identify the patterns of basic needs that are common to plants or animals of the same group. Students keep a journal to record how plants/animals live and grow.	<ul style="list-style-type: none"> ● Plants ● Animals ● Journal

Literature

- What's Alive? by Kathleen Weidner Zoefeld
- Are You Living? A Song About Living and Nonliving Things by Laura Purdie Salas
- Living and Nonliving by Lindeen and Carol K.
- Living and Nonliving (My World of Science) by Angela Royston

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- The Tiny Seed by Eric Carle
- Bear Snores on by Karma Wilson
 - Over and Under the Snow by Kate Messner
- Time to Sleep by Denise Fleming
- The Great Kapok Tree by Lynne Cherry
- The Tree Lady by Joseph Hopkins & Jill McElmurry
- Compost Stew by Mary McKenna Siddals

Websites

Education.com List of Science Activities	http://www.education.com/activity/kindergarten/science/
NEX GEN SCIENCE HOMEPAGE	http://smlevinson.wix.com/ocngss
Environment: Ecosystem Around Us	https://www.youtube.com/watch?v=WDLC9igcfQw
Science A to Z	https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf
Teachers' domain provides lesson plans and other multimedia resources (video clips and simulations).	http://www.teachersdomain.org/resource/tdc02.sci.life.colt.nonliving/ http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_living/
Harvard-Smithsonian Center for Astrophysics' Digital Video Library provides short video clips of classroom teachers working with students on the specific learning goals.	http://www.hsdvl.org/video.php?record_serial=1113

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What plants and animals need to survive and how habitats support those needs.	<ul style="list-style-type: none"> • The Needs of Living Things
This is an excellent resource that provides a Teacher Guide, videos, reading resources, and student activity sheets.	<ul style="list-style-type: none"> • Living Things and Their Needs
This unit plan is about living things and environmental interactions.	<ul style="list-style-type: none"> • How do living things Interact

Accommodations and Modifications

English Language Learners

- Small group instruction-guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Assign a picture or movement to vocabulary words
- Pre Teach vocabulary
- Label items in classroom

Basic Skills

- Preview lessons
- Preview vocabulary words
- Summarize as you go

Economically Disadvantaged

- Extra Materials
- Books for Home
- Study Guides
- "Take Home" Kit

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provided students with necessary academic resources and materials
- Provide visuals
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation

Grade: K**Content Area: Science**

- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Integrate the arts into learning activities

Gifted and Talented

- Ask open-ended questions
- Encourage upper level intellectual behavior based on Bloom's Taxonomy (analyzing, evaluating, creating)
- Do not always be explicit, allow for discovery
- Use centers and group students according to ability or interest
- Propose interest- based extension activities
- Use leveled texts and offer an advanced reader reading list
- Ask "why" and "what if" questions
- Use varied modes of pre- assessment and assessment
- 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
- Debrief students
- Propose interest- based extension activities

Students with IEPs

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications
- Scribe for students who can't write
- Augmentative communication system

Students with 504 plans

- 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

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- Preferential seating
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Follow all 504 plan modifications

Students at 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 4: K-ESS2: Earth Systems	Duration: 20 days (April) ongoing
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Standards

K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Science and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> ● Use observations (firsthand or from the media) to describe patterns in the natural world in 	<p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> ● Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. 	<p>Patterns</p> <ul style="list-style-type: none"> ● Patterns in the natural world can be observed, used to describe phenomena, and

Grade: K	Content Area: Science
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<p>order to answer scientific questions. (K-ESS2-1)</p> <p>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).</p> <ul style="list-style-type: none"> Construct an argument with evidence to support a claim. (K-ESS2-2) 	<p>(K-ESS2-1)</p> <p>ESS2.E: Biogeology</p> <ul style="list-style-type: none"> Plants and animals can change their environment. (K-ESS2-2) <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to KESS2-2) 	<p>used as evidence. (K-ESS2-1)</p> <p>Systems and System Models</p> <ul style="list-style-type: none"> Systems in the natural and designed world have parts that work together. (K-ESS2-2) <p>Connections to Nature of Science</p> <p>Science Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. (K-ESS2-1)
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Interdisciplinary Connections

Connections to other DCIs in Kindergarten:

N/A

Articulation of DCIs across grade levels:

- 2.ESS2.A Earth Materials and Systems (K-ESS2-1)
- 3.ESS2.D Weather and Climate (K-ESS2-1)
- 4.ESS2.A Earth Materials and Systems (K-ESS2-1)
- 4.ESS2.E Biogeology (K-ESS2-2)
- 5.ESS2.A Earth Materials and Systems (K-ESS2-2)

Connections to NJSLs - English Language Arts

- W.K.1** Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)
- W.K.2** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2)
- W.K.7** Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-ESS2-1)
- SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS2-1), (K-ESS2-2)

Grade: K

Content Area: Science

- **RL.K.1** With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how). (K-ESS2-2)

Connections to NJSLs – Mathematics

- **MP.2** Reason abstractly and quantitatively. (K-ESS2-1)
 - **MP.4** Model with mathematics. (K-ESS2-1)
- **K.CC.A** Know number names and the count sequence. (K-ESS2-1)
- **K.MD.A.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)
- **K.MD.B.3** Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)

Connections to Technology

- **8.1.2.B.1** Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Career Readiness, Life Literacies and Key Skills

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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 outlines 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

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

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

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

9.4.2.DC.1: Explain differences between ownership and sharing information.

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

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

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

9.4.2.TL.4: Navigate a virtual space to build context and describe the visual content.

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Essential Understandings	Essential Questions
<p>Students will understand that...</p> <ul style="list-style-type: none"> ● Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. ● Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on them. ● Weather forecasting is important to prepare for and respond to severe weather. ● Weather has different patterns. ● The temperature of the Earth's surface (sand, soil, rocks, and water) can be warmer or cooler in relation to the sun's effect. 	<ul style="list-style-type: none"> ● What do plants and animals need to survive? ● What impact do animals and humans have on the environment? ● How are the needs of plants and animals alike or different? ● What predictable, observable patterns occur as a result of the effects of rain, sun, wind, and clouds? ● What is the purpose of weather forecasting? ● How do you protect yourself in different types of weather? ● How is the weather yesterday different from today?

Evidence of Student Learning

Formative Assessments	Summative Assessments
<ul style="list-style-type: none"> ● Teacher Observations ● Anecdotal Notes ● Directed Reading ● Cooperative Group Learning ● Labeling 	<ul style="list-style-type: none"> ● Portfolio Assessment ● Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> ● Science A-Z Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> ● Group Work/Class Discussion Rubric ● Guided Observations ● Questions Starters ● Participation Rubric ● Modified Tests/Quizzes/Classwork ● Science A-Z Activities ● Science Related Reading A-Z Activities ● Mystery Science Activities ● Fundamentals Unlimited Books and Assessments

Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.

Vocabulary

Grade: K	Content Area: Science
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Patterns, plants, animals, habitat, resource, want, needs, climate, meteorologist, thermometer, change, weather

Knowledge and Skills

Content	Skills
<p>Students will know...</p> <ul style="list-style-type: none"> • Patterns in the natural and human designed world can be observed and used as evidence • Events have causes that generate observable patterns. • Systems in the natural and designed world have parts that work together. • Living things need water, air, and resources from the land, and they live in places that have the things they need. • Weather is the combination of sunlight, wind, snow or rain and temperature at a particular time. • People measure weather conditions to describe and record the weather and to notice patterns over time. • Some kinds of severe weather are more likely than others in a given region. • Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> • Observe and use patterns in the natural world as evidence • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions • Use observations to describe patterns in what plants need to survive • Use a model to represent the relationships between the needs of different animals and the places they live in the natural world. • Ask questions based on observations to find more information about the designed world. • Make observations (firsthand or from media) to collect data that can be used to make comparisons. • Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. • Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. • Use and share observation of local weather conditions to describe patterns over time.

Instructional Plan

Suggested Activities	Resources
<p>Students will make a diagram of a plant and label the parts. Discuss the</p>	<ul style="list-style-type: none"> • BrainPOP. Video-Parts of a plant • Read Aloud-" The Tiny Seed" by Eric Carle

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life cycle of a plant and its needs to survive.	
Hibernation Activity- Students will chart and discuss animals that hibernate and animals that do not. Students will create an art project that shows an animal in its habitat during hibernation.	<ul style="list-style-type: none"> • www.SciShowkids.com • Videos- “Animals with Winter Coats” and “Brr! Winter Videos” • Read Alouds-” Bear Snores On” by Karma Wilson, “Over and Under the Snow” by Kate Messner, “Time to Sleep” by Denise Fleming
Introduce “Arbor Day.” Discuss importance of trees and the interdependency between trees, insects, animals and humans. The students will create a tree to show these interdependencies.	<ul style="list-style-type: none"> • Read Aloud- “The Great Kapok Tree” by Lynne Cherry; “The Tree Lady” by Joseph Hopkins & Jill McElmurry
Introduce “Earth Day.” Discuss REDUCE, REUSE & RECYCLE. Go on a group walk outside to pick up trash. Use the items collect to make a class recycled project.	<p>Video-SciShowkids.com-” Recycling” YouTube video-” Reading Rainbow: How trash is recycled with LeVar Burton” Read Aloud-” Compost Stew” by Mary McKenna Siddals</p>
Students interpret data from weather graph and answer questions such as which weather have we had the most of? Least of? How many more than/less than? Equal to?	<ul style="list-style-type: none"> • Calendar
Students observe and sort (animals, humans, and plants) by one attribute at a time. Use picture cards to sort according to body covering, movement, number of legs.	<ul style="list-style-type: none"> • Picture cards
Introduce Cumulus, Cirrus and Stratus clouds. Bring the class outside on various days to view different types of clouds.	<ul style="list-style-type: none"> • YouTube video-” How are clouds form, types of clouds”

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<p>Record daily weather using a graph to notice patterns over time. Discuss weather changes for each season of the year.</p>	<ul style="list-style-type: none"> ● BrainPOP jr Video-" Temperature" ● Read Alouds-" Weather Words and What They Mean" by Gail Gibbons;" Thunder Cake" by Patricia Polacco; "Cloudy with a Chance of Meatballs' by Judi Barrett
<p>Students observe a variety of plants, humans, and animals (in natural settings or using digital/video) and identify the basic needs that are common to plants or animals of the same group. Students keep a journal to record how plants/animals live and grow.</p>	<ul style="list-style-type: none"> ● Plants ● Animals ● Journal
<p>Students keep track of weather by discussing and recording weather on a daily bar or pictograph.</p>	<ul style="list-style-type: none"> ● Journals
<p>Use the local weather to make observations, measure, collect, and record data to describe patterns over time. Students will count types of outdoor clothing worn by classmates and use the data to look for patterns in weather over months and seasons.</p>	<ul style="list-style-type: none"> ● About the Weather ● Calendar ● Pictures of clothing

Literature

- The Tiny Seed by Eric Carle
- Bear Snores on by Karma Wilson
 - Over and Under the Snow by Kate Messner
- Time to Sleep by Denise Fleming
- The Great Kapok Tree by Lynne Cherry
- The Tree Lady by Joseph Hopkins & Jill McElmurry
- Compost Stew by Mary McKenna Siddals
- Thunder Cake by Patricia Polacco
- Cloudy with a Chance of Meatballs by Judi Barrett
 - Weather Words and What They Mean" by Gail Gibbons
- What Will the Weather Be? by Paul Rogers

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Websites

Education.com List of Science Activities	http://www.education.com/activity/kindergarten/science/
Crazy Weather:	https://www.youtube.com/watch?v=UbfsQgigD9M
Weather Videos	http://www.sciencekids.co.nz/videos/weather.html
This is a resource from the National Center for Atmospheric Research and the National Science Foundation that explains the basics of weather and climate. This article is designed as background information for the teacher.	<u>Weather and Climate Basics</u>
Weather Wiz Kids	http://www.weatherwizkids.com/
Treehouse Weather Kids Activities and Games	http://extension.illinois.edu/treehouse/index.cfm
What plants and animals, (humans, too), need to survive and how habitats support those needs.	<ul style="list-style-type: none"> • <u>The Needs of Living Things</u>

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<p>This is an excellent resource that provides a Teacher Guide, videos, reading resources, and student activity sheets.</p>	<ul style="list-style-type: none"> • Living Things and Their Needs
<p>This unit plan is about living things and environmental interactions.</p>	<ul style="list-style-type: none"> • How do living things Interact

Accommodations and Modifications
<p>English Language Learners</p> <ul style="list-style-type: none"> • Small group instruction-guided reading and guided writing • Use books on tape • Allow extra time to complete assignments or tests • Work in a small group • Allow answers to be given orally or dictated • Assign a picture or movement to vocabulary words • Pre Teach vocabulary • Label items in classroom
<p>Basic Skills</p> <ul style="list-style-type: none"> • Preview lessons • Preview vocabulary words • Summarize as you go
<p>Economically Disadvantaged</p> <ul style="list-style-type: none"> • Extra Materials • Books for Home • Study Guides • “Take Home” Kit
<p>Culturally Diverse:</p> <ul style="list-style-type: none"> • Involve families in student learning • Provide social/emotional support • Respect cultural traditions • Build in more group work to encourage interaction with peers • Show photos, videos, and definitions when possible for culturally unique vocabulary • Teach study skills • Provided students with necessary academic resources and materials • Provide visuals • Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps • Provide positive praise to increase motivation • Provide real world connections and emphasize the value of education • Communicate high expectations for the success of all students • Integrate the arts into learning activities
<p>Gifted and Talented</p>

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- Ask open-ended questions
- Encourage upper level intellectual behavior based on Bloom's Taxonomy (analyzing, evaluating, creating)
- Do not always be explicit, allow for discovery
- Use centers and group students according to ability or interest
- Propose interest- based extension activities
- Use leveled texts and offer an advanced reader reading list
- Ask "why" and "what if" questions
- Use varied modes of pre- assessment and assessment
- 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
- Debrief students
- Propose interest- based extension activities

Students with IEPs

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications
- Scribe for students who can't write
- Augmentative communication system

Students with 504 plans

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests

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<ul style="list-style-type: none"> • Work in a small group • Allow answers to be given orally or dictated • Follow all 504 plan modifications
<p>Students at Risk of Failure</p> <ul style="list-style-type: none"> • 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 5: K-ESS3: Earth and Human Activity	Duration: 35 days (May - June)
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Standards

K-ESS3-1	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
K-ESS3-3	Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.

Science and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in grades K–2 builds on</p>	<p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> • Living things need water, air, and 	<p>Cause and Effect</p> <ul style="list-style-type: none"> • Events have causes that generate

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prior experiences and progresses to simple descriptive questions that can be tested.

- Ask questions based on observations to find more information about the designed world. (K-ESS3-2)

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, storyboard) that represent concrete events or design solutions.

- Use a model to represent relationships in the natural world. (K-ESS3-1)

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.

- Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)
- Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3)

resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

ESS3.B: Natural Hazards

- Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2)

ESS3.C: Human Impacts on Earth Systems

- Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)

ETS1.A: Defining and Delimiting Engineering Problems

- Asking questions, making observations, and gathering information are helpful in thinking

observable patterns. (K-ESS3-2), (K-ESS3-3)

Systems and System Models

- Systems in the natural and designed world have parts that work together. (K-ESS3-1)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- People encounter questions about the natural world every day. (K-ESS3-2)

Influence of Engineering, Technology, and Science on Society and the Natural World

- People depend on various technologies in their lives; human life would be very different without

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	<p>about problems. (secondary to K-ESS3-2)</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> • 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 K-ESS3-3) 	<p>technology. (K-ESS3-2)</p>
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Interdisciplinary Connections

- Connections to other DCIs in Kindergarten:**
- K.ETS1.A Defining and Delimiting Engineering Problems (K-ESS3-2), (K-ESS3-3)

- Articulation of DCIs across grade levels:**
- 1.LS1.A Structure and Function (K-ESS3-1)
 - 2.ESS1.C The History of Planet Earth (K-ESS3-2)
 - 2.ETS1.B Developing Possible Solutions (K-ESS3-3)
 - 3.ESS3.B Natural Hazards (K-ESS3-2)
 - 4.ESS3.A Natural Resources (K-ESS3-3)
 - 4.ESS3.B Natural Hazards (K-ESS3-2)
 - 5.LS2.A Independent Relationships in Ecosystems (K-ESS3-1)
 - 5.ESS2.A Earth Materials and Systems (K-ESS3-1)
 - 5.ESS3.C Human Impacts on Earth Systems (K-ESS3-3)

- Connections to NJSL - English Language Arts**
- W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)
 - W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS3-3)
 - W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-ESS2-1)
 - SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2)
 - SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)
 - RI.K.1 With prompting and support, ask and answer questions about key details in a text (e.g., who, what, where, when, why, how). (K-ESS3-2)

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Connections to NJSLs – Mathematics

- MP.2 Reason abstractly and quantitatively. (K-ESS3-1)
- MP.4 Model with mathematics. (K-ESS3-1)
- K.CC Know number names and the count sequence. (K-ESS3-1)
- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS3-2)
- K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS3-2)

Connections to Technology

- 8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.

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 outlines 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

- 9.4.2.Cl.2: Demonstrate originality and inventiveness in work (e.g., 1.3.A.2CR1a).
- 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2CR1b, 8.2.2.ED.3).
- 9.4.2.CT.3: Use a variety of thinking to solve problems (e.g., inductive, deductive).
- 9.4.2.DC.1: Explain differences between ownership and sharing information.
- 9.4.2.DC.2: Explain the importance of respecting digital content of others.
- 9.4.2.DC.4: Compare information that should be kept private to information that might be made public.
- 9.4.2.TL.2: Create a document using a word processing application.
- 9.4.2.TL.4: Navigate a virtual space to build context and describe the visual continent.

Essential Understandings	Essential Questions
Students will understand that...	<ul style="list-style-type: none"> ● What do plants and animals need to survive? ● What impact do animals and humans have on the environment?

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<ul style="list-style-type: none"> • Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on them. • Weather forecasting is important to prepare for and respond to severe weather. • The temperature of the Earth's surface (sand, soil, rocks, and water) can be warmer or cooler in relation to the sun's effect. 	<ul style="list-style-type: none"> • How are the needs of plants and animals alike or different? • What predictable, observable patterns occur as a result of the effects of rain, sun, wind, and clouds? • What is the purpose of weather forecasting? • How do you protect yourself in different types of weather? • What are some solutions that will reduce the impact of climate change and humans on the environment?
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Evidence of Student Learning

Formative Assessments	Summative Assessments
<ul style="list-style-type: none"> • Teacher Observations • Anecdotal Notes • Directed Reading • Cooperative Group Learning • Labeling 	<ul style="list-style-type: none"> • Portfolio Assessment • Benchmark <p>Benchmark Assessment</p> <ul style="list-style-type: none"> • Science A-Z Benchmark Assessment <p>Alternative Assessments</p> <ul style="list-style-type: none"> • Group Work/Class Discussion Rubric • Guided Observations • Questions Starters • Participation Rubric • Modified Tests/Quizzes/Classwork • Science A-Z Activities • Science Related Reading A-Z Activities • Mystery Science Activities • Fundamentals Unlimited Books and Assessments

Performance Tasks: Activities to provide evidence for student learning of content and cognitive skills.

Vocabulary

Patterns, plants, animals, habitat, resource, want, needs, climate, meteorologist, thermometer, change

Knowledge and Skills

Content	Skills
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<p>Students will know...</p> <ul style="list-style-type: none"> ● Patterns in the natural and human designed world can be observed and used as evidence ● Events have causes that generate observable patterns. ● Systems in the natural and designed world have parts that work together. ● Living things need water, air, and resources from the land, and they live in places that have the things they need. ● Weather is the combination of sunlight, wind, snow or rain and temperature at a particular time. ● People measure weather conditions to describe and record the weather and to notice patterns over time. ● Some kinds of severe weather are more likely than others in a given region. ● Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. ● Climate change and humans impact land, water, air, and/or other living things in the local environment. 	<p>Students will be able to ...</p> <ul style="list-style-type: none"> ● Observe and use patterns in the natural world as evidence ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions ● Use observations to describe patterns in what plants, animals, and humans need to survive ● Use a model to represent the relationships between the needs of different animals and the places they live in the natural world. ● Ask questions based on observations to find more information about the impact of climate change and humans on the environment. ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. ● Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. ● Use and share observations of local weather conditions to prepare and respond to severe weather.
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Instructional Plan

Suggested Activities	Resources
<p>Students will make a diagram of a plant and label the parts. Discuss the life cycle of a plant and its needs to survive.</p>	<ul style="list-style-type: none"> ● BrainPOP. Video-Parts of a plant ● Read Aloud-" The Tiny Seed" by Eric Carle
<p>Hibernation Activity- Students will chart and discuss animals that hibernate and animals that do not. Students will create an art project that shows an animal in its habitat during hibernation.</p>	<ul style="list-style-type: none"> ● www.SciShowkids.com ● Videos- "Animals with Winter Coats" and "Brr! Winter Videos" ● Read Alouds-" Bear Snores On" by Karma Wilson, "Over and Under the Snow" by Kate Messner, "Time to Sleep" by Denise Fleming

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<p>Introduce “Arbor Day.” Discuss the importance of trees and the interdependency between trees, insects, animals and humans. The students will create a tree to show these interdependencies.</p>	<ul style="list-style-type: none"> ● Read Aloud- “The Great Kapok Tree” by Lynne Cherry; “The Tree Lady” by Joseph Hopkins & Jill McElmurry
<p>Introduce “Earth Day.” Discuss REDUCE, REUSE & RECYCLE. Go on a group walk outside to pick up trash. Use the items collect to make a class recycled project.</p>	<p>Video-SciShowkids.com-” Recycling” YouTube video-” Reading Rainbow: How trash is recycled with LeVar Burton” Read Aloud-” Compost Stew” by Mary McKenna Siddals</p>
<p>Students interpret data from a weather graph and answer questions such as which weather have we had the most of? Least of? How many more than/less than? Equal to?</p>	<ul style="list-style-type: none"> ● Calendar
<p>Students observe and sort (animals and plants) by one attribute at a time. Use picture cards to sort according to body covering, movement, number of legs.</p>	<ul style="list-style-type: none"> ● Picture cards
<p>Introduce Cumulus, Cirrus and Stratus clouds. Bring the class outside on various days to view different types of clouds.</p>	<ul style="list-style-type: none"> ● YouTube video-” How are clouds form, types of clouds”
<p>Record daily weather using a graph to notice patterns over time. Discuss weather changes for each season of the year.</p>	<ul style="list-style-type: none"> ● BrainPOP jr Video-” Temperature” ● Read Alouds-” Weather Words and What They Mean” by Gail Gibbons;” Thunder Cake” by Patricia Polacco; ”Cloudy with a Chance of Meatballs’ by Judi Barrett
<p>Students observe a variety of plants and animals (in natural settings or using digital/video) and identify the basic needs that are common to plants or animals of the same group. Students</p>	<ul style="list-style-type: none"> ● Plants ● Animals ● Journal

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<p>keep a journal to record how plants/animals live and grow.</p>	
<p>Students keep track of weather by discussing and recording weather on a daily bar or pictograph.</p>	<ul style="list-style-type: none"> ● Journals
<p>Use the local weather to make observations, measure, collect, and record data to describe patterns over time. Students will count types of outdoor clothing worn by classmates and use the data to look for patterns in weather over months and seasons.</p>	<ul style="list-style-type: none"> ● About the Weather ● Calendar ● Pictures of clothing

Literature

- The Lorax by Dr. Seuss
- Fever at the Poles by Stephen Aitken
 - Our House Is On Fire by Jeanette Winter
- What Is Climate Change? By Gail Herman
- The Kids Book of Weather Forecasting by Williamson Kids Can Series
- Weather by National Geographics Readers
- The Weather Girls by Aki
- Cloudy with a Chance of Meatballs by Judi Barrett
- Weather Words and What They Mean” by Gail Gibbons
- What Will the Weather Be? by Paul Rogers
 - The Home Builders by Varsha Bajaj
 - Walk This Wild World by Sam Brewster
 - Nature’s Patchwork Quilt by Mary Miche
 - Listen To Our World by Bill Martin, Jr. & Michael Sampson

Websites

<p>Education.com List of Science Activities</p>	<p>http://www.education.com/activity/kindergarten/science/</p>
<p>Crazy Weather:</p>	<p>https://www.youtube.com/watch?v=UbfsQqiqD9M</p>

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Weather Videos	http://www.sciencekids.co.nz/videos/weather.html
This is a resource from the National Center for Atmospheric Research and the National Science Foundation that explains the basics of weather and climate. This article is designed as background information for the teacher.	Weather and Climate Basics
Weather Wiz Kids	http://www.weatherwizkids.com/
Treehouse Weather Kids Activities and Games	http://extension.illinois.edu/treehouse/index.cfm
What plants, humans, and animals need to survive and how habitats support those needs.	<ul style="list-style-type: none"> • The Needs of Living Things
This is an excellent resource that provides a Teacher Guide, videos, reading resources, and student activity sheets.	<ul style="list-style-type: none"> • Living Things and Their Needs
This unit plan is about living things and environmental interactions.	<ul style="list-style-type: none"> • How do living things Interact

Accommodations and Modifications**English Language Learners**

- Small group instruction-guided reading and guided writing
- Use books on tape

Grade: K**Content Area: Science**

- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Assign a picture or movement to vocabulary words
- Pre Teach vocabulary
- Label items in classroom

Basic Skills

- Preview lessons
- Preview vocabulary words
- Summarize as you go

Economically Disadvantaged

- Extra Materials
- Books for Home
- Study Guides
- "Take Home" Kit

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provided students with necessary academic resources and materials
- Provide visuals
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Integrate the arts into learning activities

Gifted and Talented

- Ask open-ended questions
- Encourage upper level intellectual behavior based on Bloom's Taxonomy (analyzing, evaluating, creating)
- Do not always be explicit, allow for discovery
- Use centers and group students according to ability or interest
- Propose interest- based extension activities
- Use leveled texts and offer an advanced reader reading list
- Ask "why" and "what if" questions
- Use varied modes of pre- assessment and assessment
- 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
- Debrief students

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- Propose interest- based extension activities

Students with IEPs

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications
- Scribe for students who can't write
- Augmentative communication system

Students with 504 plans

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Follow all 504 plan modifications

Students at 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

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Unit 6: K-ETS1: Engineering Design	Duration: 180 days (September - June) ongoing
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Standards

K-2-ETS1-1	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-ETS1-2	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 and Engineering Practices	Discipline Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.</p> <ul style="list-style-type: none"> Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) <p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e.,</p>	<p>ETS1.A: Defining and Delimiting Engineering Problems</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. (K-2-ETS1-1) 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) Before beginning to design a solution, it is 	<p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

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<p>diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> 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.</p> <p>Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)</p>	<p>important to clearly understand the problem. (K-2- ETS1-1)</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions, such as climate change, to other people. (K-2-ETS1-2) <p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3) 	
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Interdisciplinary Connections

Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include:

- Kindergarten (K-PS2-2), (K-ESS3-2)

Connections to K-2-ETS1.B: Developing Possible Solutions include:

- Kindergarten (K-ESS3-3)
- First Grade (1-PS4-4)
- Second Grade (2-LS2-2)

Connections to K-2-ETS1.C: Optimizing the Design Solution include:

- Second Grade (2-ESS2-1)

Articulation of DCIs across grade levels:

- K-2-ETS1.A Defining and Delimiting Engineering Problems (K-PS2-2), (K-ESS3-2)
- K-2-ETS1.B Developing Possible Solutions (K-ESS3-3), (1-PS4-4), (2-LS2-2), (K-ESS3-3)
- K-2-ETS1.C Optimizing the Design Solution (2-ESS2-1)

Connections to NJSL - 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. (K-2-ETS1-1)
- RI.K.1 With prompting and support, ask and answer questions about key details in a text.
- 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. (K-2-ETS1-1), (K-2-ETS1-3)

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- 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.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- 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)

Connections to NJSLs – Mathematics

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

Connections to Technology

- 8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.

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 outlines 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.

21st Century Career Readiness, Life Literacies, and Key Skills

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

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

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

9.4.2.DC.1: Explain differences between ownership and sharing information.

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

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

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

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9.4.2.TL.4: Navigate a virtual space to build context and describe the visual continent.

Vocabulary

Structure, stable, sturdy, building, data, arrange, tower

Knowledge and Skills

Content	Skills
<p>Students will know...</p> <ul style="list-style-type: none"> • How to solve a problem through engineering • To use questioning, observing, and gathering information to help solve problems • A clear understanding of the problem is the first step • Designs can be conveyed through sketches, drawings, or physical models and will aid in communicating with others • Comparing and testing designs is a useful way to determine the best solution to a problem 	<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>Students will construct a new “3 Little Pigs” house constructed well enough to withstand the big bad wolf’s “blow dryer.”</p>	<p>12 “Dot” candies” toothpicks Pinterest Three Little Pigs Book or video</p>
<p>Students will construct “Cat in the Hat” towers using mini red solo cups and square pieces of paper.</p>	<p>Square pieces of paper Mini red solo cups Pinterest</p>
<p>Students will build towers as tall as possible using only toothpicks and playdough.</p>	<p>Toothpicks Playdough Pinterest</p>

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Students will build towers sturdy enough to withstand shaking (earthquake).	Cardboard Toothpicks marshmallows
Students will build towers study enough to withstand shaking (earthquake).	Jenga blocks

Literature

- Three Little Pigs by Walt Disney
- The Cat in the Hat by Dr. Seuss
- Rosie Revere Engineer by Andrea Beaty
- How Do You Lift A Lion? By Robert E. Wells
- The Most Magnificent Thing by Ashley Spires

Websites

Science A to Z	https://www.sciencea-z.com/marketing-content/science-a-z-and-ngss-grade-k.pdf
Education.com List of Science Activities-	http://www.education.com/activity/kindergarten/science/
Science 4 Us Interactive Activities	http://www.science4us.com/k-2-science-lesson-plans/

Accommodations and Modifications

English Language Learners

- Small group instruction-guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Assign a picture or movement to vocabulary words
- Pre Teach vocabulary
- Label items in classroom

Grade: K**Content Area: Science****Basic Skills**

- Preview lessons
- Preview vocabulary words
- Summarize as you go

Economically Disadvantaged

- Extra Materials
- Books for Home
- Study Guides
- "Take Home" K

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provided students with necessary academic resources and materials
- Provide visuals
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Integrate the arts into learning activities

Gifted and Talented

- Ask open- ended questions
- Encourage upper level intellectual behavior based on Bloom's Taxonomy (analyzing, evaluating, creating)
- Do not always be explicit, allow for discovery
- Use centers and group students according to ability or interest
- Propose interest- based extension activities
- Use leveled texts and offer an advanced reader reading list
- Ask "why" and "what if" questions
- Use varied modes of pre- assessment and assessment
- 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
- Debrief students
- Propose interest- based extension activities

Students with IEPs

- Use visuals
- Introduce key vocabulary before lesson
- Teacher reads aloud daily
- Provide peer tutoring

Grade: K**Content Area: Science**

- Use a strong student as a “buddy” (does not necessarily have to speak the primary language)
- Choral reading
- Chants, songs
- Preferential seating
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP/504 modifications
- Scribe for students who can’t write
- Augmentative communication system

Students with 504 plans

- 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
- Assign a picture or movement to vocabulary words
- Small group instruction- guided reading and guided writing
- Use books on tape
- Allow extra time to complete assignments or tests
- Work in a small group
- Allow answers to be given orally or dictated
- Follow all 504 plan modifications

Students at 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