



BOE Approved 8/18

Cliffside Park Public Schools

Science

Unit Name: Trees and Weather (Earth Science)

Resource: FOSS Next Generation, Delta Education

Duration: Ten Weeks

Enduring Understandings

Observing Trees

- Trees are living plants.
- Trees have structures: branches, leaves, trunk, and roots.
- Trees differ in size and shape.
- Trees have basic needs: light, air, nutrients, water, and space

Observing Leaves

- Different kinds of trees have different leaves.
- Leaves have properties: size, shape, tip, edge, texture, and color.
- Leaves properties vary.
- Leaves can be described and compared by their properties

Trees Through the Season

- Bark, twigs, leaves, buds, flowers, fruits, and seeds are parts of trees.
- The buds on twigs grow into leaves or flowers.
- Trees change through the seasons.
- Some trees produce seeds that can grow into new trees of the same kind.
- Some trees lose their leaves in winter; others do not.

- Trees are living, growing plants.

Observing Weather

- Seasons change in a predictable annual pattern: fall, winter, spring, and summer.
- Weather is the condition in the air outdoors and can be described.
- Temperature is how hot or cold it is; thermometers measure temperature.
- Wind is moving air; a wind sock indicates wind direction and speed.
- Weather changes.

Essential Questions

Observing Trees

- What did we learn about our schoolyard trees?
- What are the parts of trees?
- What shapes are trees?
- Which trees have similar shapes?
- What can we find out about our adopted trees?
- What do trees need to grow?

Observing Leaves

- What can we observe about leaves?
- What shapes are leaves?
- How are leaves different?
- How are leaf edges different?
- What can we observe about leaves?

Trees Through the Seasons

- What do fall trees look like?
- What do winter trees look like?
- What do spring trees look like?

Observing Weather

- What is the weather today?
- How can we measure the air temperature?
- What does a wind sock tell us about the wind?

Focus of Standards

Student Outcomes	Skills	Assessments
<p>Observing Trees</p> <ul style="list-style-type: none"> ● I can develop an understanding of what plants (and animals) need to survive and the relationship between their needs and where they live. ● I can observe trees in the schoolyard, using the five senses. ● I can compare trees for similarities and differences. ● I can communicate observations made about different kinds of trees, orally and through drawings. ● I can identify trees as resources that are used in everyday life. ● I can help plant and care for a tree. <p>Observing Leaves:</p> <ul style="list-style-type: none"> ● I can observe the sizes, shapes, textures, and colors of tree leaves. ● I can compare the shapes of leaves to common geometric shapes. ● I can compare the sizes and edges of leaves. ● I can record and communicate the similarities and differences among leaves. <p>Trees Through the Seasons:</p> <ul style="list-style-type: none"> ● I can communicate observations and comparisons of trees. ● I can observe and describe seasonal 	<ul style="list-style-type: none"> ● Asking Questions and Defining Problems ● Developing and Using Models ● Classifying Information ● Observing Investigations ● Exploring New Ideas ● Planning and Carrying Out Investigations ● Analyzing and Interpreting Data ● Using Mathematics and Computational Thinking ● Constructing Explanations and Designing Solutions ● Engaging in Argument from Evidence ● Obtaining, Evaluating and Communicating Information 	<p>Assessments:</p> <ul style="list-style-type: none"> ● Formative: Notebook Entries: <ul style="list-style-type: none"> ○ Notebook Entries ○ Teacher Observation ○ Anecdotal Records/Notes ○ Science notebook ○ Embedded Assessment Notes ● Summative Performance <ul style="list-style-type: none"> ○ Foss Post-test on Trees and Weather ○ Vocabulary check ● Benchmark Assessments: <ul style="list-style-type: none"> ○ Investigation Checks ○ Matching- Trees to environment ○ Matching- Trees Based on leaves ○ Matching- Trees based on season ○ matching - Weather to environment ● Alternative: <ul style="list-style-type: none"> ○ Conferences ○ Diagrams ○ Word Bank for vocabulary ○ Modeling ○ Illustrations of Leaves and environment ○ Illustrations of plant life to climate ○ Storybook assembly

changes in trees.

Observing Weather:

- I can monitor local weather and observe the patterns and variations in weather and come to understand the importance of weather forecasts to prepare for severe weather.
- I can compare weather by using senses and tools.
- I can record weather observations using pictures and words.
- I can build and use a windsock.
- I can describe weather changes season to season.

NJ Student Learning Standards: Science

Motion and Stability: Forces and Interactions

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.

K-PS3 Energy

K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface.

K-PS3-2. Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.

K-LS1 From Molecules to Organisms: Structures and Processes

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

Earth's Systems

K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.

K-ESS3 Earth and Human Activity

K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Engineering Design

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

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.

ELA: RI.K.1, RI.K.2, RI.K.3, RI.K.4, RI.K.5,

Math: K.CC.A.1, K.CC.A.2, K.CC.A.3, K.CC.B.4, K.CC.B.5, K.CC.B.6, K.OA.A.1, K.OA.A.2, K.OA.A.3, K.MD.A.1

Career Awareness, Exploration, And Preparation

Strand A: Career Awareness

9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.

8.1.2.A.1 Identify the basic features of a digital device and explain its purpose.

8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).

E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.

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

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which we live.

8.2.2.A.1 Define products produced as a result of technology or of nature.

8.2.2.A.2 Describe how designed products and systems are useful at school, home and work.

8.2.2.A.3 Identify a system and the components that work together to accomplish its purpose.

B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technology systems and products in the global society.

8.2.2.B.1 Identify how technology impacts or improves life.

8.2.2.B.2 Demonstrate how reusing a product affects the local and global environment.

C. Design: The design process is a systematic approach to solving problems.

8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.

8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss.

8.2.2.C.3 Explain why we need to make new products.

D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

8.2.2.D.5 Identify how using a tool (such as a bucket or wagon) aids in reducing work.

Core Instructional Materials:

- FOSS Next Generation: Trees and Weather (2016)

Supplemental Materials: (videos, leveled readers, Readworks, recommended books etc.)

Videos: <https://www.fossweb.com/moduledetail?dDocName=G3842595&classId=>

Recommended books: <https://www.fossweb.com/additional-resources-books-xslt?dDocName=G4292315#non-fiction-books>

NJSLS: Science and Engineering Practices**Practice 1. Asking questions (for science) and defining problems (for engineering)**

Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.

Ask questions based on observations to find more information about the natural and/or designed world(s).

Ask and/or identify questions that can be answered by an investigation.

Practice 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, or storyboard) that represent concrete events or design solutions.

Distinguish between a model and the actual object, process, and/or events the model represents.

Compare models to identify common features and differences.

Practice 3. 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.

With guidance, plan and conduct an investigation in collaboration with peers (for K).

Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.

Evaluate different ways of observing and/or measuring a phenomenon to determine which way can answer a question.

Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.

Make observations (firsthand or from media) and/or measurements of a proposed object or tool or solution to determine if it solves a problem or meets a goal.

Make predictions based on prior experiences.

Practice 4. Analyzing and interpreting data

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Record information (observations, thoughts, and ideas).

Use and share pictures, drawings, and/or writings of observations.

Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.

Compare predictions (based on prior experiences) to what occurred (observable events).

Analyze data from tests of an object or tool to determine if it works as intended.

Practice 6. Constructing explanations (for science) and designing solutions (for engineering)

Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in

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

Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.

Practice 7. 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).

Identify arguments that are supported by evidence.

Distinguish between opinions and evidence in one’s own explanations.

Construct an argument with evidence to support a claim.

Practice 8. 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 and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).

Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question and/or supporting a scientific claim.

Communicate information or design ideas and/or solutions with others in oral and/or written forms using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, and/or design ideas.

21st Century Themes

- **Global Awareness:** students come to understand that humans use natural resources for everything they do and that people affect the world around them.
- **Environmental Literacy:** students will explore the origins of materials and resources that we use everyday (paper, fabric, wood.) Students will learn that these resources are finite and explore strategies for conserving natural resources (recycling.)
- Students will understand what plants and animals need to survive and the relationship between their needs and where they live. Students will gain an understanding of the importance of weather forecasts to prepare for severe weather.

21st Century Skills

Creativity and Innovation

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording and interpreting data to build explanations.

Interdisciplinary Connections

Language Arts

- Ask and answer questions about key details in a text.
- Identify the main topic and retell key details of a text.
- describe the connection between two individuals, events, ideas, or pieces of information in a text.
- Ask and answer questions about unknown words in a text.

- Identify the front cover, back cover, and title page of a book.
- Describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).
- Identify the reasons an author gives to support points in a text.
- Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).
- Actively engage in group reading activities with purpose and understanding.

Foundational Skills

- Demonstrate understanding of the organization and basic features of print. a. Follow words from left to right, top to bottom, and page by page. b. Recognize that spoken words are represented in written language by specific sequences of letters. c. Understand that words are separated by spaces in print. d. Recognize and name all upper- and lowercase letters of the alphabet.
- Know and apply grade-level phonics and word analysis skills in decoding words. a. Demonstrate basic knowledge of one-to-one letter/sound correspondences by producing the primary sound or many of the most frequent sounds for each consonant. b. Associate the long and short sounds with common spellings (graphemes) for the five major vowels. c. Read common high-frequency words by sight (e.g., the, of, to, you, she, my, is, are, do, does). d. Distinguish between similarly spelled words by identifying the sounds of the letters that differ.
- Read emergent-reader texts with purpose and understanding.

Writing Standards

- 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 (e.g., My favorite book is . . .).
- 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.
- Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.
- With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed
- Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).
- With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Speaking and Listening Standards

- Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). b. Continue a conversation through multiple exchanges.
- Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.
- Add drawings or other visual displays to descriptions as desired to provide additional detail.
- Speak audibly and express thoughts, feelings, and ideas clearly.

Mathematical Practices

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Differentiation/Accommodations/Modifications
(Alternate Modes of Instruction and Support)

Modifications to Support Gifted and Talented Students	Modifications to Support English Language Learners	Modifications to Support Our Learners (Students with IEPs/504s and At-Risk Learners)
<p>Recommended non fiction books https://www.fossweb.com/additional-resources-books-xslt?dDocName=G4292315#non-fiction-books The Wonders of the Rainforest</p>	<p>Equipment photo cards (spanish and english) Creating Animals that Disperse Seeds Impatient Flower Pod Exploding Visual cues- image gallery https://www.fossweb.com/additional-resources-image-galleries-xslt?dDocName=G4292315#image-galleries</p>	<p>Storyboard- draw and color different leaves Match the animal with its environment and needs Creating Animals that Disperse Seeds Garden-Based Learning: It's Just the Berries! Indoor and outdoor experiences engage students in plant science. Equipment photo cards</p>

<p>Draw and describe a fish and its needs</p> <p>Draw and describe a sowbug and its needs</p> <p>Debate / Compare and contrast- different trees based on leaf structure</p> <p>Provide appropriate challenge for wide ranging skills and development areas.</p> <p>Participate in inquiry and project-based learning units of study</p> <p>Assigning roles within partnerships</p> <p>Differentiated supports: content, process, product, environment</p>	<p>Vocabulary log-</p> <p>Pronunciation/translation assistance https://dictionary.cambridge.org/us/</p> <p>Vocabulary builder Thesaurus- https://www.thesaurus.com/</p> <p>Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)</p> <p>Pair visual prompts with verbal presentations</p> <p>Front Load and immerse students in literacy and language experiences related to content</p> <p>Provide students with visual models, sentence stems, concrete objects, and hands-on materials.</p> <p>Model procedures for life skills.</p> <p>Collaboration between ELL and general education teacher to maximize learning</p>	<p>Visual cues- image gallery https://www.fossweb.com/additional-resources-image-galleries-xslt?dDocName=G4292315#image-galleries</p> <p>Word walls</p> <p>Review student individual educational plan and/or 504 plan.</p> <p>Establish procedures for accommodations and modifications for assessments as per IEP/504.</p> <p>Establish procedures for modification of classwork and homework as per IEP/504.</p> <p>Modify classroom environment to support academic and physical needs of the students as per IEP/504.</p> <p>Provide appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team.</p> <p>Differentiation through content, process, product, environment</p> <p>Provide Title I services to students not meeting academic standards in ELA and/or Math.</p> <p>Provide instructional adaptations and interventions in the general education classroom.</p> <p>Modify classroom environment to support student needs.</p> <p>Differentiated instruction</p> <p>Basic Skills</p> <p>Intensive individual intervention</p>
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Sources
 NJSLS Science Standards (2017): <http://www.nj.gov/education/cccs/2016/science/>
 NJ: 2014 SLS: Technology: <http://www.state.nj.us/education/cccs/2014/tech/8.pdf>
 NJSLS-S: Science and Engineering Practices: <http://www.nj.gov/education/cccs/2016/science/3-5-ETS1.pdf>

21st Century Life and Careers: <http://www.state.nj.us/education/cccs/2014/career/9.pdf>

Career Ready Practices: <http://www.state.nj.us/education/cccs/2014/career/9.pdf>

2015 FOSS Next Generation: www.FOSSweb.com

NSTA: <https://ngss.nsta.org/>