Unit 1 Trees and Weather

Content Area: **Science**
Course(s): **Science**
Time Period: **Marking Period 2**
Length: **10 Weeks**
Status: **Published**

Unit Overview

The **Trees and Weather Module** provides students with solid experiences to help them develop an understanding of what plants (and animals) need to survive and the relationship between their needs and where they live. By monitoring local weather, students experience the patterns and variations in weather and come to understand the importance of weather forecasts to prepare for severe weather.

Throughout the module, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; systems and system models; structure and function; and stability and change.

Standards

Disciplinary Core Ideas (DCI's)

K-PS2-1.PS3.C	Relationship Between Energy and Forces
K-PS3-1	Make observations to determine the effect of sunlight on Earth's surface.
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
K-ESS2-2.ESS3.C.1	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-ESS3-1	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-ESS3-2.ETS1.A.1	Asking questions, making observations, and gathering information are helpful in thinking about problems.

Crosscutting Concepts (CC's)

	Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.
CCC.1.1	children recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
CCC.2	Cause and effect: Mechanism and explanation.
	In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
CCC.3.1	students use relative scales (e.g., bigger and smaller; hotter and colder; faster and slower) to describe objects. They use standard units to measure length.
CCC.6.1	students observe the shape and stability of structures of natural and designed objects are related to their function(s).
CCC.7.1	students observe some things stay the same while other things change, and things may change slowly or rapidly.
SCI.K-2.4.2	Systems in the natural and designed world have parts that work together.

Science and Engineering Practices (SEP's)

SEP.1.a	Ask questions based on observations to find more information about the natural and/or designed world(s).
SEP.1.b	Ask and/or identify questions that can be answered by an investigation.
SEP.2.b	Compare models to identify common features and differences.
SEP.3.a	With guidance, plan and conduct an investigation in collaboration with peers (for K).
SEP.4.b	Use and share pictures, drawings, and/or writings of observations.

Essential Questions

Investigation 1 - Observing Trees

- What did we learn about our schoolyard trees?
- What can we find out about our adopted trees?
- What do trees need to grow?

Investigation 2 - Observing Leaves

- What can we observe about leaves?
- How are leaves different?
- What can we observe about leaves?

Investigation 3 - Observing Weather

- What is the weather today?
- What does a wind sock tell us about the wind?

Investigation 4 - Trees Through the Seasons

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

Application of Knowledge: Students will know that...

- Biogeology: Plants and animals can change their environments.
- Conservation of energy and energy transfer: Sunlight warms Earth's surface.
- Developing possible solutions: Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas.
- Natural hazards: Some kinds of severe weather are more likely that others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.
- Natural resources: Living things need water, air, and resources from the land; they live in places that have the things they need.
- Organization for matter and energy flow in organisms: All animals need food in order to live and grow. They obtain their food from plants or from other animals.
- Structure and function: Plants have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. All organisms have external parts.
- Weather and Climate 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.

Application of Skills: Students will be able to...

- compare leaves by their properties
- compare seasonal changes
- conclude that weather forecasts help people prepare for the severe weather that may be likely in that area
- define temperature as how hot or cold it is
- define weather as the condition in the air outdoors
- describe weather changes
- determine that wind is moving air
- differentiate between different leaves from different trees
- differentiate between trees that lose their leaves in winter and those trees that do not lose their leaves in winter
- discover that sunlight warms earths surfaces
- discover that trees are living growing plants
- distinguish between tree size and shapes
- explain how trees change throughout the sesons
- explain leaf properties: size, shape, tip, edge, texture, and color

- identify bark,twigs,leaves, buds, flowers, fruits , seeds as parts of a tree
- identify that trees are living things
- list the basic needs of plants: water,light,air,nutrients,and space
- state that trees have strucures: branches. leaves, trunk, and roots

Assessments

Pre-Assessment/Survey

Investigation 1:

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Survey, Investigation 1 I-Check

Investigation 2 -

- Formative Assessments: Science Notebook entry and Embedded Assessment
- Benchmark Assessments: Investigation 2 I-Check

Investigation 3 -

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Investigation 3 I-Check

Investigation 4 -

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Posttest

Suggested Activities

Investigation 1: Observing Trees

PART 1 Observing Schoolyard Trees (whole class)

- Students begin their study of trees by looking at the variety and structure of trees in the schoolyard. 15-20 minutes
- check the two tree posters -label the parts
- student notebooks entry

Part 2 Tree Parts (whole class/center)

- They work with representational materials to look more closely at the shapes of trees and their parts
- match tree-part cards at a center
- student notebook entry

Part 3 Tree Puzzles (center)

- students use puzzles to learn and compare the different shapes of trees
- practice putting puzzles together
- student notebook entry

Part 4 Tree-Silhouette Cards (whole class/center)

- strudents will work with a partner to play a memory matching game with tree silhoutte cards
- sort tree silhoutte cards and share their sorting rule
- student notebook entry

Part 5 Adopt Schoolyard Trees (whole class)

- They adopt schoolyard trees to observe changes through the year.
- take pictures of the tree
- measure the circumference of the tree with string
- student notebook entry

Part 6 A Tree Comes to Class (whole class)

- read the story A Tree Comes to Class
- obtaina tree form a nursery - a living tree becomes part of the classroom for several weeks
- students complete the investigation by having a ceremony in which they plant their class tree on the school grounds.

Investigation 2: Observing Leaves

Part 1 Leaf Walk (whole class)

- Students begin with a schoolyard walk, focusing on the leaves of trees.
- pickup leaves from the ground
- find leaves that go together by shape
- press the leaves
- student notebook entry

Part 2 Leaf Shapes (center)

- students will work in pairs comparing real leaves to the outlines on the two leaf-shape sorting mats
- students will choose leaf shapes that match geometric shapes
- student notebook entry

Part 3 Comparing Leaves (whole class)

- studetns match leaves with geometric shapes
- go on a leaf hunt to compare properties of leaves
- work at centers with representational materials
- make a leaf book
- online activity- Leaf Sorting
- student notebook entry

Part 4 Matching Leaf Silhouettes (center)

- students work with three different sets of leaf silhoutte matching materials
- review edge, outline, silhouette

Part 5 Leaf Books (center)

- read Our Very Own Tree
- students will glue thier pressed leaves into a book
- watch video Once there was a tree

Investigation 3: Observing Weather

Part 1 Weather Calendar (whole class)

- students share what they know about weather and how it relates to air.
- introduce the class calendar
- students will record the weather by recording it on the class calendar
- student notebook entry

Part 2 Recording Temperature (whole class)

- A class weather monitor begins recording daily weather observations on a class calendar.
- mount the garden thermometer outside where it can be viewed from indoors
- demonstrate ribbon thermometer and record temperature daily
- student notebook entry

Part 3 Wind Direction (whole class/center)

- They use a thermometer to measure relative temperature (how hot or cold it is)
- make a wind sock to observe the wind direction and speed
- students observe and compare objects in the sky during the day and at night.

- student notebook entry

Investigation 4: Trees through the Seasons

Part 1 Fall: What Comes from Trees? (whole class/center)

- students extend their understanding of trees as a growing, changing, living part of their world during each season
- students visit the schoolyard trees and collect ten items they find from under a tree
- observe their twigs, leaves, flowers, and seeds
- sort their collections

Part 2 Fall: Food from Trees (center)

- explore the seeds they found outside
- show students fruits, cut the fruits and ask students to find the seeds
- taste the fruit
- draw the fruit and create one class poster
- Read My Aplle Tree

Part 3 Fall: Visiting Adopted Trees (whole class)

- Students visit the schoolyard trees; observe their twigs, leaves, flowers, and seeds
- compare them to those from a previous season
- online activity Who Lives Here?

Part 4 Winter: Evergreen Hunt (whole class)

- hunt for evergreen trees that match samples of needles from schoolyard trees
- visit each type of evergreen tree to look closely at the foliage

Part 5 Winter: Twigs (center)

- read Our Very Own Tree
- give each student a twig and have them observe it closely
- trade twigs and repeat
- create twig scrapbook

Part 6 Winter: Visiting Adopted Trees (whole class)

- Students visit the schoolyard trees; observe their twigs, leaves, flowers, and seeds
- compare them to those from a previous season

- online activity Who Lives Here?

Part 7 Spring: Forcing Twigs (center)

- compare spring twigs to the twigs in the scrapbook
- sort twigs in vases and predict what might happen
- discuss changes in twigs over time

Part 8 Spring: Bark Hunt (whole class)

- distribute a bark photo to each child and ask them to find others who have a photo exactly like theirs
- go outdoors to find bark that matches their pictures
- make bark rubbings
- add bark rubbungs to scrapbook

Part 9 Spring: Visiting Adopted Trees (whole class)

- Students visit the schoolyard trees; observe their twigs, leaves, flowers, and seeds
- compare them to those from a previous season
- read Maple Trees

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
    - Modifications & accommodations as listed in the student's IEP
    - Assign a peer to help keep student on task
    - Modified or reduced assignments
    - Reduce length of assignment for different mode of delivery
    - Increase one-to-one time
    - Working contract between you and student at risk
    - Prioritize tasks
    - Think in concrete terms and provide hands-on-tasks
    - Position student near helping peer or have quick access to teacher
    - Anticipate where needs will be
    - Break tests down in smaller increments

- Content specific modifications may include:
    - Provide multiple means of representation. Give learners various ways (ie internet, ipads) to acquire information and knowledge.
    - Provide multiple means of action and expression. Offer students alternatives for demonstrating what they know.
    - Provide multiple means of engagement. Help learners get interested, be challenged, and stay motivated.

- Allow students to express their understanding through a variety of modalities.
- Provide more experiences building explanations of the science concepts orally or in writing or drawing.
- Making vocabulary more explicit through new concrete experiences.

Differentiation for ELL's:

- General modifications may include:
  - Strategy groups
  - Teacher conferences
  - Graphic organizers
  - Modification plan
  - Collaboration with ELL Teacher
  - Model and encourage the use of new vocabulary
  - Project the equipment photo card for each objects and write the object's name on the word wall.
  - Activate prior knowledge by showing pictures of different weather conditions. Turn and talk with peer to describe and make connections to what they observe.
  - Provide sentence frames for students who need them
  - Use Spanish provided resources if applicable
  - Include modeling, visuals, and active investigations in small groups at centers.
  - Key vocabulary is usually developed within an activity context with frequent opportunities for interaction and discussion between teacher and student and among students. This provides practice and application of the new vocabulary.
  - Introduce science vocabulary in an authentic context
  - Utilize a ulti- sensory approach

- Content specific vocabulary important for ELL students to understand include:

  - bark branch circumference compare cone conifer desert different flower hardwood leaves living mountain observe ocean pattern plant river root rubbing seed shape similar stem swamp texture tree trunk twig valley Investigation color edge heart line lobed longer narrower outline oval paddle pointed property rough rounded shorter silhouette size smooth spear tip toothed triangle wider air blowing calendar cloud cold cool direction freezing hot monitor moving air overcast partly cloudy rainy snowy streamer sunny temperature thermometer warm weather weather instrument wind wind sock blossom bud evergreen fall flower growth ring leaf scar needle scale season seed spring summer swollen winter branch desert forest fruit leaf living mountain nutrient ocean river root stem swamp tree trunk valley forecast Moon pattern rain gauge star Sun thermometer weather wind sock Investigation season seed growth ring leaf scar needle scale season seed spring summer swollen winter branch desert forest fruit leaf living mountain nutrient ocean river root stem swamp tree trunk valley

Differentiation to extend learni.ng for gifted students may include:

- Integrate language-arts instruction to enhance science learning
- Label diagrams, pictures and science notebook recordings.

- Utilize the Math extension problems and Science extensions provided in Foss Teacher Manual

Integrated/Cross-Disciplinary Instruction

Language Extensions found on FOSSweb with list of trade books

Art extensions

- Create seasonal tree pictures with paint
- Go outdoors to sketch trees
- Make spilt-milk images after reading It Look like Spilt Milk by CHarles G. Shaw
- Construct a pinwheel

Music extension

- Listen to weather music such as “Cloudburst” from the Grand Canyon Suite, Storm Sequence from William Tell overture, “Raindrops Keep Falling on My Head”, “Singin’ in the Rain”, “On the Sunny Side of the Street”, “Good Day, Sunshine”.

Social Studies Extension

- Research cherry blossom trees and their origins
- watch Brainpop "Clouds"
- adopt a schoolyard tree
- plant a tree at our school
- obtain a tree from a nursery

MA.K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality.
MA.K.CC.C	Compare numbers.
MA.K.MD.A	Describe and compare measurable attributes.
SOC.6.1.4.C.CS1	People make decisions based on their needs, wants, and the availability of resources.
SOC.6.3.4	Active Citizenship in the 21st Century: All students will acquire the skills needed to be active, informed citizens who value diversity and promote cultural understanding by working collaboratively to address the challenges that are inherent in living in an interconnected world.
VPA.1.3.2.C.CS2	Actors use voice and movement as tools for storytelling.

Resources

TEACHER MATERIALS:

- Foss teacher's edition
- Fossweb information.

BOOKS: NONFICTION

- *A Tree For All Seasons*
- *A Tree Is a Plant*
- *A Tree Is Nice*
- *Animals in Fall*
- *Animals in Winter*
- *Apple Harvest (Spanish and English)*
- *Apples, Apples Everywhere!: Learning about Apple Harvests*
- *Exploring Fall*
- *Familiar Trees Of North America: The Eastern Or Western Region*
- *From Acorn To Oak Tree*
- *From Maple Trees to Maple Syrup*
- *From Tree to House*
- *From Tree to Table*
- *From Wood To Paper*
- *How Do Apples Grow?*
- *How Do We Learn?*
- *In The Woods*
- *Leaves Fall Down: Learning about Autum Leaves*
- *Look Once, Look Again: Stem & Roots*
- *Look What I Did With A Leaf*
- *My Mother Talks to Trees*
- *Seed, Sprout, Fruit: An Apple Tree Life Cycle*
- *Seeds (Series)*
- *Sky Tree: Seeing Science Through Art*
- *Stems (Series)*
- *Sun (Spanish)*
- *Tell Me, Tree: All About Trees For Kids*
- *Tree*
- *Trees Are Terrific!*
- *Weather & Climate: The People Behind the Science*
- *Weather Watching*

BOOKS: FICTION:

- *Birches*
- *Children of the Earth...Remember*
- *Come on, Rain!*
- *Fall Is Here! I Love It!*
- *Gilberto and the Wind*
- *Grandmother Winter*
- *Hello Ocean*
- *Henry and Mudge and the Tall Tree House*

- *It's Snowing! It's Snowing!*
- *Laughing Tomatoes and Other Spring Poems (Jitomates risueños y otros poemas de primavera)*
- *Mighty Tree*
- *Mud*
- *Night Tree*
- *Old Elm Speaks: Tree Poems*
- *Our Big Home: An Earth Poem*
- *Red Leaf, Yellow Leaf*
- *Sky, Sea, the Jetty, and Me*
- *Sleepy Bear*
- *Someday A Tree*
- *Spring Thaw*
- *Summer: An Alphabet Acrostic*
- *The Great Kapok Tree: A Tale Of The Amazon Rain Forest*
- *The Wind*

WEBSITES:
All websites are appropriate for students.

- Calflora: A Botanical Resource For California On The Internet
- URL: www.na.fs.fed.us Description: This U.S. Forest Service site provides information on fall foliage hotspots, state color reports, and live web-cam sites from around the country. Also provided are many non–Forest Service website links for family activities, crafts, games, and science activities.
- URL: www.iknowthat.com Description: This is a great site for activities, animations, simulations and other resources related to the human body, sounds, matter the solar system, weather and other science topics to supplement sound.
- National Severe Storms Laboratory Photo Album
- URL: www.photolib.noaa.gov Description: The National Severe Storms Laboratory is one of NOAA's internationally known research laboratories, leading the way in investigations of all aspects of severe weather. Headquartered in Norman OK, the people of NSSL, in partnership with the National Weather Service, are dedicated to improving severe weather warnings and forecasts in order to save lives and reduce property damage. This site has an impressive collection of photos of tornadoes, weather instruments, hail, clouds, and lightning.
- URL: www.mbgnet.net Description: This site includes examples of five trees and how they disperse their seeds. Includes student experiments. Primary students may need adult assistance with this site.
- URL: www.arborday.org Description: This is a very simple guide to common trees of eastern, central, and western United States, created by the National Arbor Day Foundation. Primary students may need adult assistance with this site.
- URL: www.arborday.org Everything you need to know about planting, identifying, and purchasing trees.
- URL: www.bami.us Explore photos and information about poisonous plants you may encounter in your schoolyard.
- URL: www.plantnative.org Select your state to get a list of native plants.

21st Century Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.