

Unit Overview	
Content Area: Earth Science	
Unit Title: Weather and Effects of the Sun	Unit: 1
Target Course/Grade Level: Kindergarten	Timeline: 15 days
<p>Unit Summary:</p> <p><u>What is the weather like today and how is it different from yesterday?</u></p> <p>In this unit of study, students develop an understanding of patterns and variations in local weather and the use of weather forecasting to prepare for and respond to severe weather. The crosscutting concepts of patterns; cause and effect; interdependence of science, engineering, and technology; and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in asking questions, analyzing and interpreting data, and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate an understanding of the core ideas.</p> <p>Note: Unlike other science units, the Weather unit is intended to become a part of the classroom routine throughout the year. Some weather patterns are not obvious unless the students collect data over long periods of time. For example, in some locations it is sunnier during some parts of a year than others. The temperature outside will change from fall, winter, spring, to summer. Also, during some periods, the weather data should be recorded in the morning and then again in the afternoon. Students will be able to observe patterns in temperature through the course of the day.</p> <p>This unit is based on K-ESS2-1, K-ESS3-2, and K-2-ETS1-1.</p> <p><u>Why is the sun's energy important?</u></p> <p>During this unit of study, students apply an understanding of the effects of the sun on the Earth's surface. The crosscutting concepts of <i>cause and effect</i> and <i>structure and function</i> are called out as organizing concepts for this disciplinary core idea. Students are expected to demonstrate grade-appropriate proficiency in <i>developing and using models; planning and carrying out investigations; analyzing and interpreting data; and designing solutions</i>. Students are also expected to use these practices to demonstrate an understanding of the core ideas.</p> <p>This unit is based on K-PS3-1, K-PS3-2, K-2-ETS1-1, K-2-ETS1-2, and K-2-ETS1-3.</p>	
Learning Targets	
NJSL-Science	

K-ESS2-1	Use and Share observations of local weather and conditions to describe patterns over time
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather
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 effects of sunlight on an area

Disciplinary Core Ideas

ESS2.D: 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. (K-ESS2-1)

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)

ETS1.A: Defining and Delimiting an Engineering Problem

· A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)

· Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)

· Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

PS3.B: Conservation of Energy and Energy Transfer

· Sunlight warms Earth's surface. (K-PS3-1),(K-PS3-2)

ETS1.A: Defining and Delimiting Engineering Problems

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· Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)

· Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

ETS1.B: Developing Possible Solutions

· Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2)

ETS1.C: Optimizing the Design Solution

Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

Analyzing and Interpreting Data

- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1)

Asking Questions and Defining Problems

- Ask questions based on observations to find more information about the designed world. (K-ESS3-2)
- 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. (K-2-ETS1-1)

Obtaining, Evaluating, and Communicating Information

- Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2)

Planning and Carrying Out Investigations

- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1)

Constructing Explanations 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)

Asking Questions and Defining Problems

- 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)

Developing and Using Models

- Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

Analyzing and Interpreting Data

Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

NJSLS Connections

Primary Interdisciplinary Connections

English Language Arts/Literacy:

RL.K.1- With prompting and support, ask and answer questions about key details in a text

RL.K.3- With prompting and support identify characters, setting and major events in a story

RL.K.4 Ask and answer questions about unknown words in a text

RL.K.7 With prompting and support, describe the relationship between illustrations and the story in which they appear

SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and text with peers and adults in a small and large group

<p>Mathematics: K.MD.A2- 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</p>	
<p>Unit Essential Questions What is weather? Where does the water go? What can we conclude about weather from our data? How can we be safe during a thunderstorm? How can we predict/prepare for severe weather? Why is the sun’s energy important?</p>	<p>Unit Understandings -Weather is one of the easiest aspects of nature to observe. People use weather observation to make decisions about clothing and activities every day. -Meteorologist use their knowledge of weather components and patterns to predict weather. Sometimes weather can be severe and potentially dangerous -Sunlight affects both living and nonliving components. It drives the water cycle and heats Earth’s surface, which makes life possible. Not all surfaces heat up or retain heat in the same way.</p>
<p>Unit Learning Targets (Outcomes) – Formative Assessment <i>Students who understand the concepts are able to ...</i></p>	
<ul style="list-style-type: none"> · Describe ways that weather influence human behavior 	
<ul style="list-style-type: none"> · Observe and describe weather conditions including temperature, wind speed, precipitation, and sky conditions 	
<ul style="list-style-type: none"> · Record daily observation of general weather conditions, create/ analysis weather patterns 	
<ul style="list-style-type: none"> · Understanding how meteorologists (weather forecaster) predict weather from observed patterns 	
<ul style="list-style-type: none"> · Describe at least two kinds of severe weather 	
<ul style="list-style-type: none"> · Explain what steps families should take to prepare for severe weather 	
<ul style="list-style-type: none"> · Describe the sunlight heats the Earth’s surface 	
<ul style="list-style-type: none"> · Design and build a structure that will reduce the warming effects of sunlight on an area 	
<p>Cross Cutting Concepts:</p> <p><u>Patterns</u></p> <ul style="list-style-type: none"> · Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1) <p><u>Cause and Effect</u></p> <ul style="list-style-type: none"> · Events have causes that generate observable patterns. (K-ESS3-2) <p><u>Structure and Function</u></p> <p>The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)</p>	
<p>Integration of Technology: Web-based textbook, interactive whiteboard, interactive texts, videos, digital board builder</p>	

Technology Resources:

<http://www.knowingscience.com/TeacherResources> -
google drive- Kindergarten Knowing Science

Opportunities for Differentiation: Differentiation and support tips, which includes suggestions for ELL, struggling students, and accelerated students, are available below the instructional practice section of each model lesson.

Teacher Notes:

Career Ready Practices: *In this unit the following career ready practices are addressed*

- CRP1: Act as a reasonable and contributing citizen and employee
- CRP2: Apply appropriate academic and technical skills
- CRP3: Attend to personal health and financial well-being
- CRP4: Communicate clearly and effectively and with reason
- CRP5: Consider the environmental, social and economic impacts of decisions
- CRP6: Demonstrate creativity and innovation
- CRP7: Employ valid and reliable research strategies
- CRP8: Utilize critical thinking to make sense of problems and persevere in solving them
- CRP9: Model integrity, ethical leadership and effective management
- CRP10: Plan education and career paths aligned to personal goals
- CRP11: Use technology to enhance productivity
- CRP12: Work productively in teams while using cultural global competence

Prior Learning- by the end of Grade __ , students understand that:

Evidence of Learning

Summative Assessment

N/A

Equipment needed: Whiteboard, laptops, headphones, and hands-on materials for lessons

Teacher Instructional Resources:

Fiction:

- Little Cloud- Eric Carle
 - Cloudy with a Chance of Meatballs- Judi Barrett
 - Franklin and the Thunderstorm- Paulette Bourgeois
 - Magic Monsters Learn About Weather- Sylvia Tester
 - What's a Bear to Wear?- Laura Rossiter
- NonFiction*
- The Best Book of Weather- Simon Adams
 - Can it Rain Cats and Dogs?: Questions and Answers about Weather - Melvin and Gilda Berger
 - Clouds-Anne Rockwell

Modifications for ELL's, Special Education, 504, and Gifted and Talented Students:

(Note: Teachers identify the modifications that they will use in the unit. See NGSS Appendix D: All Standards, All Students/Case Studies for vignettes and explanations of the modifications.)

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principles
(http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA)

<u>ACTIVITIES</u>	<u>MATERIALS</u>
1.1- Session 1- What is weather?	-Weather Journal -Activity Sheet 1: Weather Observations
1.1- Session 2- What is temperature?	-My Weather Journal -Activity Sheet 2: What Will I Wear?
1.1- Session 3- What is wind?	-My Weather Journal -Wind ribbon (ribbon & shower curtain ring)
1.1- Session 4- What is precipitation?	-Weather Journal -Activity Sheet 3: Rain in a Bag -Water Cycle Kit -Rain(ziplock, blue food coloring, water, masking tape)

<p>1.1- Session 5- What can clouds tell us about the weather?</p>	<p>-My Weather Journal -Activity Sheet 4: Clouds -Cloud kit (cotton balls, glue, sky condition labels) -Activity Sheet 5: Sky Condition Labels</p>
<p>1.1- Session 6- Where does the water go?</p>	<p>-Weather Journal -Spray bottle</p>
<p>1.1- Session 7- What can we conclude about weather from our data?</p>	<p>-Weather Journal</p>
<p>1.2- Session 2- How can we be safe during a thunderstorm?</p>	<p>-Activity Sheet 1: Predicting Weather -Activity Sheet 2: Weather Safety Flap Book</p>
<p>1.2- Session 3- How can we prepare for severe weather?</p>	<p>-Activity sheet 4: My Ready Kit</p>
<p>2.1- Session 1- Why is the Sun's energy important?</p>	<p>-We Love Sunlight! booklet</p>
<p>2.1- Session 2- How does the Sun warm Earth's materials?</p>	<p>-Sunlight Kit (Gravel, water, sand, 2- 8 oz containers)</p>