

Unit 04: Weather and Climate

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **FY**
Status: **Published**

Standards Alignment

New Jersey Student Learning Standards

3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1	Engineering Design
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
3-ESS3	Earth and Human Activity
3-ESS2-2	Obtain and combine information to describe climates in different regions of the world.
3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
3-ESS2	Earth's Systems
3-ESS3-1	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.2.5	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.
TECH.8.2.5.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.5.A.2	Investigate and present factors that influence the development and function of a product and a system.
TECH.8.2.5.A.3	Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints.
TECH.8.2.5.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.5.C.1	Collaborate with peers to illustrate components of a designed system.
TECH.8.2.5.C.4	Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.
TECH.8.2.5.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.
TECH.8.2.5.D.2	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process to evaluate potential solutions.

Interdisciplinary Connections: NJSL for ELA, Social Studies, Science and/or Math Section

LA.K-12.NJLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
LA.K-12.NJLSA.R3	Analyze how and why individuals, events, and ideas develop and interact over the course of a text. Integration of Knowledge and Ideas
LA.K-12.NJLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
LA.K-12.NJLSA.R8	Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
LA.RI.3	Reading Informational Text Key Ideas and Details
LA.RI.3.1	Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
LA.K-12.NJLSA.W	Writing Text Types and Purposes
LA.RI.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
LA.K-12.NJLSA.W2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and

	analysis of content.
LA.RI.3.7	Use information gained from text features (e.g., illustrations, maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
LA.RI.3.8	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text.
LA.K-12.NJSLSA.W8	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
LA.K-12.NJSLSA.SL	Speaking and Listening Comprehension and Collaboration
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
LA.K-12.NJSLSA.SL4	Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
LA.K-12.NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
LA.W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
LA.SL.3.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
LA.SL.3.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
LA.SL.3.5	Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media Literacy

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale

Unit Rationale

The purpose of this unit...

This unit develops the idea that by paying careful attention to clouds, wind, and other weather clues around us, we can predict the daily weather and make sense of why places on earth look and feel the way they do.

Meaning

Essential Questions

Essential Questions

- Where do clouds come from? (Foundational for 3-ESS2-1)
- How can we predict when it's going to storm? (3-ESS2-1)
- Why are some places always hot? (3-ESS2-2)
- How can you keep a house from blowing away in a windstorm? (3-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3)

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

- Clouds may look like white, fluffy, cotton, but they are actually made of water through evaporation and condensation.
- There are many different types of clouds.
- Understanding cloud patterns help predict what kind of weather might happen next.
- Different places in the world have different weather conditions.
- Strong winds can cause different types of natural hazards such as hurricanes, dust storms, and tornadoes.

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know...

- Mystery 1: what clouds made of and how they form.
- Mystery 1: what happens when water changes from liquid to gas.
- Mystery 2: how to make predictions about the weather by observing clouds and their changes.
- Mystery 3: how to use patterns on a map to discover the world's five major climate zones.
- Mystery 4: the effects of natural hazards, such as tornadoes, hurricanes, and dust storms, and how to keep a house from blowing away in a windstorm.

Skills

Skills

Student will be skilled at ...

- Using evidence from a model to explain what clouds are.
- Analyzing cloud scenarios and determining if a storm will occur and why.
- Analyzing and interpreting data from multiple locations to determine climate patterns across the world.
- Developing and using a model of a home in order to design a solution that keeps the roof attached to the home and stops the home from blowing away in the wind.

Stage 3: Learning Plan

Resource and Mentor Texts

Resources and Mentor Texts

- Mystery Science Stormy Skies Unit (see attachment)
- NJ State Model Curriculum

Mentor Texts:

- **Rabe, T. (2004).** *Oh Say Can You Say What's the Weather Today?* The Cat in the Hat and friends travel to learn how weather is studied and predicted. Covers various types of weather, tools used by meteorologists, and how to stay safe during storms.
- **Gibbons, G. (1993).** *Weather Forecasting.* With straightforward text and colorful pictures, this behind-the-scenes look at a modern weather station answers basic questions kids ask most, and makes weather forecasting more fun and accessible than ever.
- **Dean, J. (2013).** *Freddy the Frogcaster.* Freddy the Frog loves learning about the weather, and he's known for having the best predictions in town. But what happens when the town picnic is almost ruined by a storm that catches the local frogcaster by surprise? Freddy has to step in to save the day!
- **DeWitt, L. (2015).** *What Will the Weather Be?* Uses colorful, simple diagrams to explain meteorology in a fun, engaging way. Perfect for young readers and budding meteorologists, this bestseller is filled with rich climate vocabulary and clear explanations of everyday weather instruments like thermometers and barometers.
- **Alberti, T. (2006).** *Climates.* Showcases Earth's diverse climates and will help children compare and contrast polar and boreal climates with those in tropical, subtropical, temperate, mountain and desert climates.
- **Seuss, D. (1949).** *Bartholomew and the Oobleck.* This entertaining tale about a king who makes a new type of precipitation fall from the sky can serve as a great conversation-starter about designing solutions to weather-related hazards.
- **Simon, S. (2001).** *Tornadoes.* A fact-filled book about severe storms: their structure, intensity and the scale used to measure the intensity, formation, and results of a tornado.

[Mystery Science Stormy Skies Unit](#)

Formative Assessment Strategies

Formative Assessment Strategies

- Science notebooks
- Group discussions (thumbs up, thumbs down, turn & talk)
- Analysis of student work
- Teacher observation
- Prepared written quizzes
- Admit/Exit Tickets
- Strategic questioning
- Think-pair-share
- Content check-ins using Kahoot, Quizizz
- Grand conversations

Learning Activities/Unit of Study

Learning Activities/Unit of Study

The learning activities for this unit are directly linked to Mystery Science. The attachments provided are the lesson plans for each mystery. All worksheets and materials for each mystery are provided via link to Mystery Science within each lesson plan.

[Weather-Mystery 1](#)

[Weather-Mystery 2](#)

[Weather-Mystery 3](#)

[Weather-Mystery 4](#)

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, Gifted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

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Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers.

Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.