May Gr. 3: Unit 3: Weather / Climate Change

Content Area: **Science**
Course(s):
Time Period: **May**
Length: **6-8 Weeks**
Status: **Published**

Unit Overview

In this unit, students learn about weather, how to measure temperature, wind, rain and snow, how people predict weather, and how the weather and climate are related.

Enduring Understandings

Weater is created by a combination of environmental factors in a region.

We can measure temperature, wind, rain and snow using certain methods.

Predicting weather is important and can be done with reasonable accuracy.

Weather and the climate of a region are related.

Essential Questions

What makes weather?

How is temperature measured?

How is wind measured?

How are rain and snow measured?

How is weather predicted?

How are weather and climate related?

How does extreme weather affect people?

How can people reduce extreme weather damage?

Instructional Strategies & Learning Activities

TEACHERS: These units are linked directly to TCI Science Alive! NGSS teaching materials.

What Makes Weather?

Students act as movie makers. They watch videos to observe weather in different movie locations. Then they create a movie scene about experiencing weather in one of those locations.

Reading Further: Weather Superheroes

- 2

How Is Temperature Measured?

Students use thermometers to record the temperature for several days and analyze their data.

Reading Further: Too Hot, Too Cold!

- 3

How Is Wind Measured?

Students build anemometers to measure wind speed for several days and then analyze their data.

Reading Further: Big City Weather

- 4

How Are Rain and Snow Measured?

Students build rain gauges to measure rainfall for five days. They graph the daily rainfall in their area and then make predictions based on data.

Reading Further: The Driest Place on Earth

- 5

How Is Weather Predicted?

Students work in groups to design and build a weather station. Then they analyze weather data and use the data to predict weather for the following year.

Reading Further: Animal Weather Forecasters

- 6

How Are Weather and Climate Related?

Students go on a world tour. Each group gathers information on the climate of one location to lead the class at their tour stop.

Reading Further: Wild Turkeys Are Back

- 7

How Does Extreme Weather Affect People?

Students act as storm chasers. They watch videos of extreme weather and identify what type of extreme weather is shown. Then they examine images to find out the effects of extreme weather.

Reading Further: Weather Beacons

- 8

How Can People Reduce Extreme Weather Damage?

Students determine the criteria and constraints of lightning rod and levee designs. They debate and vote for one lightning rod design and one levee design.

Reading Further: Weather on Fire

Integration of Career Exploration, Life Literacies and Key Skills

9.4.5.CI.1	Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).
9.2.5.CAP.1	Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
9.4.5.CI.2	Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue (e.g., 6.3.5.CivicsPD.3, W.5.7).
9.4.5.CT.2	Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
9.4.5.DC.4	Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).
9.4.5.DC.8	Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).
9.4.5.IML.6	Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions (e.g., RI.5.7, 6.1.5.HistoryCC.7, 7.1.NM. IPRET.5).
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.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
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.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology and Design Integration

Students will interact with the SmartBoards, Chromebooks, and Document Camera.

	Data can be organized, displayed, and presented to highlight relationships.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.2.5.ED.1	Explain the functions of a system and its subsystems.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).

8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.
8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.
8.2.5.ITH.1	Explain how societal needs and wants influence the development and function of a product and a system.
	Technology innovation and improvement may be influenced by a variety of factors. Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world.
TECH.8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
TECH.8.1.5.A.2	Format a document using a word processing application to enhance text and include graphics, symbols and/or pictures.
TECH.8.1.5.A.4	Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
TECH.8.1.5.A.CS1	Understand and use technology systems
TECH.8.1.5.A.CS2	Select and use applications effectively and productively.
TECH.8.1.5.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.5.D.1	Understand the need for and use of copyrights.
TECH.8.1.5.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.5.E.CS2	Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
TECH.8.1.5.E.CS3	Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.
TECH.8.2.5.A.1	Compare and contrast how products made in nature differ from products that are human made in how they are produced and used.
TECH.8.2.5.B.CS2	The effects of technology on the environment.
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.C.CS2	The application of engineering design.

Interdisciplinary Connections

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.RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.
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.RI.3.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.
LA.RI.3.5	Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
LA.RI.3.6	Distinguish their own point of view from that of the author of a text.
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.RI.3.9	Compare, contrast and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) the most important points and key details presented in two texts on the same topic.
LA.RI.3.10	By the end of the year, read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed.
LA.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding and encoding words.
LA.RF.3.4	Read with sufficient accuracy and fluency to support comprehension.
MA.3.MD.A	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
MA.3.MD.A.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
LA.W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons.
LA.W.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
LA.W.3.4	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
LA.W.3.7	Conduct short research projects that build knowledge about a topic.
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.L.3.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.L.3.2	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
LA.L.3.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.

Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good

grades, gifted students may be risk averse.

- **Definitions of Differentiation Components**:
    - Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    - Process – how the student will acquire the content information.
    - Product – how the student will demonstrate understanding of the content.
    - Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

Utilize differentiation suggestions in the TCI Science Alive! program for enrichment and support.

Modifications & Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

Utilize 504 and IEP accommodations where required.

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

DRA

Additional Benchmarks used in this unit:

Nonfiction DRA

Nonfiction Aimsweb

Formative Assessments

- Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

  Formative Assessments used in this unit:

- TCI worksheets, quizzes
- Questioning and Discussion
- Teacher observation
- Labs and Hands on activities
- Whiteboard Response
- Think-Pair Share
- Workbook pages
- Writing/Performance rubrics included in lesson

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

Unit assessments in the TCI program

Performance Task

Instructional Materials

Materials for labs indicated in TCI program

Standards

3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
3-ESS2	Earth’s Systems
3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
	Examples of data could include average temperature, precipitation, and wind direction.
	Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.
	Analyzing and Interpreting Data
	Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.
	Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships.
ESS2.D	Weather and Climate
	Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.
	Patterns
	Patterns of change can be used to make predictions.
3-ESS2-2	Obtain and combine information to describe climates in different regions of the world.
	Obtaining, Evaluating, and Communicating Information
	Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.
	Obtain and combine information from books and other reliable media to explain phenomena.
ESS2.D	Weather and Climate
	Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.
	Patterns
	Patterns of change can be used to make predictions.