

Unit 1 Weather and Climate

Unit Summary: In this unit of study, students organize and use data to describe typical weather conditions expected during a particular season. By applying their understanding of weather-related hazards, students are able to make a claim about the merits of a design solution that reduces the impact of such hazards.

Concepts & Vocabulary: Key vocabulary may include but are not limited to: Weather conditions (e.g. average temperature, precipitation and wind direction), Seasons, Areas, Patterns, Climate, Regions, Weather-related hazard (e.g. heavy rain or snow, strong winds, lightning, etc.), Impact (e.g. flooding, fires), Cause and effect, Design solution.

Key Concepts: Identify and test cause and effect relationships to explain change. Use data to understand graphical displays and typical weather conditions expected during a particular season. Climate describes the range of an area's typical weather conditions and the extent to which those conditions vary over the years. Science affects everyday life. People's needs and wants change over time, as do their demands for new and improved technologies.

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE) (Established Goals / Content Standards)

3-ESS2-1: Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction. Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs.

3-ESS2-2: Obtain and combine information to describe climates in different regions of the world.

3-ESS3-1: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Plan and conduct investigations collaboratively to produce evidence to answer a question. (1-PS4-1),(2-LS2-1)</p> <ul style="list-style-type: none"> • Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) • Make a claim about the merits of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1) • Obtain and combine 	<p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> • 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. (3-ESS2-1) Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over the years. (3-ESS2-2) <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> • A variety of natural hazards 	<p>Patterns</p> <ul style="list-style-type: none"> • Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2) <p>Cause and Effect</p> <ul style="list-style-type: none"> • Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)

<p>information from books and other reliable media to explain phenomena. (3-ESS2-2)</p>	<p>result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)</p>	
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<p>Enduring Understandings (1-3 max) Students will understand that:</p> <p>Patterns of change can be used to make weather predictions.</p> <p>People record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next and how to limit damage from severe weather.</p>	<p>Essential Questions (1-2 EQ per EU)</p> <p>How can weather patterns be used to predict results and solve problems?</p> <p>How do weather related hazards cause problems and how can the damage they cause be limited?</p> <p>How effective is the solution that limits the damage?</p>
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<p style="text-align: center;">Stage 2 – Model Assessment</p>	
<p>Summative Performance Task(s): Students will create a model using materials to build a barrier or protective wall to prevent your home from flooding during a storm surge. Students must be able to defend their solution and design. (Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.)</p> <p>Audience:</p> <ul style="list-style-type: none"> By what criteria AND what audience will “performances of understanding” be judged? <p>Student Self-Reflection Rubric https://www.exemplars.com/assets/files/seed.pdf</p>	<p>Formative Evidence:</p> <p>Weather article followed by quiz https://newsela.com/read/elem-sci-the-seasons/id/31567/</p> <p>Brain Pop Video with Quiz https://www.brainpop.com/science/weather/seasons/</p> <p>What causes windy weather article with quiz https://newsela.com/read/elem-big-q-what-causes-windy-weather/id/43853/</p> <p>Free Internet Resource (including assessments): https://www.teachervision.com/all-kinds-weather</p> <p>Mystery Science End of Unit Assessments https://mysteryscience.com/weather/weather-climate/assessments</p>

Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. (Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.)
Examples of data could include:

- o Average temperature
- o Precipitation
- o Wind direction

Stage 3 – Learning Plan Resources and Activities

Suggested Resources for Planning:

Mystery Science - www.mysteryscience.com

Newsela - www.newsela.com

[Weather Science content for Kids and Teens:](#) The National Weather Service has several education resources available at this website.

[NOAA Education Resources:](#) The National Oceanic and Atmospheric Administration (NOAA) provides education resources at this website.

Learning Activities:

Learning Activities (that can be found on Mystery Science), but are not limited to:

Gas Experiment:

In this activity, students will create a mini cloud in a cup. Students will examine a clear cup — then you'll add hot water to the cup. If you have several bottles of water, you may want to appoint responsible students to help you pour water.

Climate Decoder

In this activity, students work in pairs to color a map and figure out the climates of different locations around the world.

Protect My Home!

In this lesson, students will create a model barrier or protective wall which could be used to prevent home flooding during a storm surge. <http://betterlesson.com/lesson/634338/protect-my-home>

Building an Earthquake Resistant Structure

In this lesson, students will build an earthquake resistant structure.

<http://betterlesson.com/lesson/636080/building-an-earthquake-resistant-structure>

Free Internet Resources including weather videos, activities and final projects

<https://thewonderofscience.com/3-weather-and-climate>

<http://weather.thinkport.org/home.html>

<https://www.weareteachers.com/best-weather-activities/>

<https://thehomeschoolscientist.com/weather-stem-activities/>
<https://www.nationalgeographic.org/activity/create-weather-map/>
<https://betterlesson.com/lesson/616162/what-is-weather>

Wonderopolis Articles

<https://www.wonderopolis.org/wonder/how-much-rain-can-a-cloud-hold>
<https://www.wonderopolis.org/wonder/what-does-a-barometer-measure>
<https://www.wonderopolis.org/wonder/how-do-clouds-form>

Weather Inclusive Website (including games)

<https://scijinks.gov/menu/games/>

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the “why do I need to know this” questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence

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