Unit: 3 Weather and Climate

Content Area: **Science**
Course(s): **Science - Grade 3**
Time Period: **8 weeks**
Length: **Weeks**
Status: **Published**

Unit Overview

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. Students use thermometers to record the temperature for several days and analyze their data. Students build anemometers to measure wind speed for several days and then analyze their data. 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. 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. Students go on a world tour. Each group gathers information on the climate of one location to lead the class at their tour stop. Students go on a world tour. Each group gathers information on the climate of one location to lead the class at their tour stop. 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.

Transfer

Students will be able to independently use their learning to...

- Represent data in tables and graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships.
- Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.
- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
- Read and comprehend grade-level appropriate complex text and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

Understandings

Students will understand that...

- Weather changes and temperature, wind, and water affect weather.
- Temperature is measured using tools and there are patterns in the way temperature changes.
- Tools are used to measure wind speed and direction.
- Rain is measured using a rain gauge, snow is measured using a ruler.
- Scientists observe sky conditions, use weather patterns, and technology to gather data to predict weather.
- Climate is an area's typical weather over many years.
- Thunderstorms, hurricanes, tornadoes, blizzards, dust storms and wildfires are forms of extreme weather that are dangerous.
- Scientists investigate storms to help predict hazards and warn people so they can prepare for extreme weather.

Essential Questions

Students will keep considering...

- 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?

Application of Knowledge and Skill

Students will know...

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- Weather changes and temperature, wind, and water affect weather.
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Students will be skilled at...

Students will be skilled at...

- Analyzing and interpreting data
- Constructing explanations and designing solutions
- Developing and using models

Academic Vocabulary

atmosphere

humidity

temperature

water vapor

weather

thermometer

weather station

anemometer

wind vane

drought

evaporation

precipitation

radar

rain guage

air mass

data

front

meterologist

climate

desert

equator

blizzard

dust storm

hurricane

thunderstorm

tornado

wildfire

lightning rod

Learning Goal 1 - Lessons 1, 2, 3, 4, 5,

Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

- Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

SCI.3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Target 1 - Lesson 1

Describe the three components of weather and how they cause weather to change.

- Describe the three components of weather and how they cause weather to change.

Target 2 - Lesson 2

Describe the tools used to measure temperature and demonstrate how to use them.

- Describe the tools used to measure temperature and demonstrate how to use them.

Target 3 - Lesson 2

Analyze temperature data to determine patterns in temperature changes.

- Analyze temperature data to determine patterns in temperature changes.

Target 4 - Lesson 3

Explain how wind forms.

- Explain how wind forms.

Target 5 - Lesson 3

Describe the tools used to measure temperature and demonstrate how to use them.

- Describe the tools used to measure temperature and demonstrate how to use them.

Target 6 - Lesson 3

Analyze wind speed data to determine patterns of change.

- Analyze wind speed data to determine patterns of change.

Target 7 - Lesson 4

Describe the types of precipitation and their relationship to temperature.

- Describe the types of precipitation and their relationship to temperature.

Target 8 - Lesson 4

Describe the tools used to measure precipitation and demonstrate how to use them.

- Describe the tools used to measure precipitation and demonstrate how to use them.

Target 9 - Lesson 4

Analyze precipatation data to determine patterns of change.

- Analyze precipatation data to determine patterns of change.

Target 10 - Lesson 5

Describe and compare the types of clouds and their effect on weather.

- Describe and compare the types of clouds and their effect on weather.

Target 11 - Lesson 5

Explain the relationships among the types of air masses and weather fronts.

- Explain the relationships among the types of air masses and weather fronts.

Target 12 - Lesson 5

Discuss how technology is used to gather information about weather patterns and predict the weather forecast.

- Discuss how technology is used to gather information about weather patterns and predict the weather forecast.

Learning Goal 2 - Lessons 6 & 7

Obtain and combine information to describe climates in different regions of the world.

- Obtain and combine information to describe climates in different regions of the world.

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

Target 1 - Lesson 6

Describe the relationship between weather and climate.

- Describe the relationship between weather and climate.

Target 2 - Lesson 6

Discuss the different types of climate and their location around the world.

- Discuss the different types of climate and their location around the world.

Target 3 - Lesson 6

Examine how climate data is used to make decisions about land use.

- Examine how climate data is used to make decisions about land use.

Learning Goal 3 - Lesson 8

Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

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SCI.3-ESS3-1	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Target 1 - Lesson 8

Discuss how engineers and communities can use weather data to reduce the effects of extreme weather damage.

- Discuss how engineers and communities can use weather data to reduce the effects of extreme weather damage.

Learning Goal 4 - Engineering Design Standards

During this unit, students will have multiple opportunities to investigate a phenomenon, collect data, analyze data, and draw conclusions to solve a problem.

SCI.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.
SCI.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.
SCI.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.

Formative Assessment and Performance Opportunities

- TCI Lesson Game: Students test their understanding of key concepts with an education game.
- TCI Interactive Tutorial: Students can work independently to check their understanding in a safe environment that provides instant feedback but is not graded.
- TCI Interactice Student Notebook: Students record their understanding of both the reading and activity. Review during the lesson to gauge student understanding.
- TCI Vocabulary Cards: Students check their understanding of key vocabulary terms with digital flip cards.

Summative Assessment

TCI Assessment: How Does Extreme Weather Affect People?

Teacher made assessments

Accommodations/Modifications

Setup Your Classroom for Success

Provide a Word Bank to Support Weather Observations and Scripts

Provide Scripts for the Movie Scenes

Assign Easier Topics

Make a Home-School Connection

Review Bar Graphs

Use the Optional Handouts with Temperature Data

Get Students Comfortable with the Term *Anemometer*

Provide Prebuilt Anemometers

Spend Time Modeling How to Use the Anemometers

Support the Reading Notes

Emphasize the Crosscutting Concept Further

Read the Student Text Before the Investigation

Support the Class Presentations

Support Research During the Processing Assignment

Model the Process of Gathering Data and Creating Reports

Provide Sentence Starters

Break Up the Reading

Use Fewer Videos During the Investigation

Scaffold the Processing Assignment

Simplify the Criteria

Use Only One of the Two Engineering Decisions

Unit Resources

- TCI online manual and student text books
- TCI Interactive Student Notebooks
- TCI Vocabulary Cards
- TCI Teacher Material Kit
- TCI activity cards

21st Century Life and Careers

CAEP.9.2.4.A.1	Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
CAEP.9.2.4.A.2	Identify various life roles and civic and work - related activities in the school, home, and community.
CAEP.9.2.4.A.3	Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Interdisciplinary Connections

LA.W.3.1	Write opinion pieces on topics or texts, supporting a point of view with reasons.
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.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.3.9	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.
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.
MA.3.MD.B.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.