



UNIT 3

WEATHER & CLIMATE



Unit 3: Weather & Climate

4 weeks

In this unit, students focus on severe weather events and weather forecasting. Students will learn about the purpose of weather forecasting: how to prepare for severe weather in our local region, as well as how to respond to severe weather events. Local severe weather, such as thunderstorms, tornados, floods, hail, and winter weather systems that bring snowstorms or ice storms, are the focus of this unit of study.

Students will build on their experiences from the first semester and continue to develop their understanding of how sunlight affects the Earth's surface, using observations to determine relative temperatures of various surfaces. Students will work to find ways to reduce the effects of sunlight on an area, and they will design and build structures that will reduce this warming effect.

Students will continue their understanding of patterns and variations in local weather. Observations and recordings of local weather conditions will continue to be made to describe patterns over time. This will involve analysis and interpretation of the data collected and recorded.

Unit 3 Performance Expectations

- ❖ **K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.**
Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water.
Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.
- ❖ **K-PS3-2 Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.***
Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.
- ❖ **K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time.**
Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, or warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon or the number of sunny days versus cloudy days in different months.
Assessment Boundary: Assessment of quantitative observations is limited to whole numbers and relative measures such as warmer/cooler.
- ❖ **K-ESS3-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.***
Clarification Statement: Emphasis is on local forms of severe weather.

Unit 3 Essential Questions:

- ❖ How does sunlight affect the Earth's surface? How can we reduce the effects of the sun?
- ❖ What is the purpose of weather forecasting?
- ❖ How do you prepare for severe weather?

In Unit 3, students will understand...

- ❖ 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.
- ❖ Some kinds of severe weather are more likely than others within a given region.
- ❖ Weather scientists forecast severe weather so that communities can prepare for and respond to these events.
- ❖ Sunlight warms Earth's surface. Tools and materials can be used to reduce the warming effect of sunlight on an area.
- ❖ Events have causes that generate observable patterns.
- ❖ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- ❖ Scientists use different ways to study the world and look for patterns when making observations about the world.
- ❖ Asking questions, making observations, and gathering information are helpful in learning about the world around them. People encounter questions about the natural world every day.

Unit Vocabulary:

observe/observation	season	effect(s)
measure	air	storm
record	heat	forecast
weather	energy	severe weather
temperature	sunlight	prepare/respond to

Additional Content Connections:

*These connections provide opportunities to score to other content standards with focused instruction.

ELA:

- ❖ Speaking and Listening
 - SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood
 - SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups

Math:

- ❖ Measurement and Data (*observations of measurable attributes*)
 - K.MD.A.1 Describe several measurable attributes of a single object, including but not limited to length, weight, height, and temperature. (Vocabulary may include short, long, heavy, light, tall, hot, cold, warm or cool.)
 - K.MD.A.2 Describe the difference when comparing two objects (side-by-side) with a measureable attribute in common, to see which object has more of or less of the common attribute. (Vocabulary may include shorter, longer, taller, lighter, heavier, warmer, cooler, or holds more.)
 - K.MD.C.4 Understand concepts of time including morning, afternoon, evening, today, yesterday, tomorrow, day, week, month, and year. Understand that clocks, both analog and digital, and calendars are tools that measure time.

Social Studies:

- ❖ Geography
 - G.9.K.3 Identify ways weather and climate impact daily life.

Weather and Climate

Students who demonstrate understanding can:

- K-PS3-1 Make observations to determine the effect of sunlight on Earth’s surface.** Clarification Statement: Examples of Earth’s surface could include sand, soil, rocks, and water. [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]
- K-PS3-2 Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.*** Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.
- K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time.** Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, or warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon or the number of sunny days versus cloudy days in different months. [Assessment Boundary: Assessment of quantitative observations is limited to whole numbers and relative measures such as warmer/cooler.]
- K-ESS2-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.*** Clarification Statement: Emphasis is on local forms of severe weather.

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.</p> <ul style="list-style-type: none"> ▪ Ask questions based on observations to find more information about the designed world. (K-ESS3-2) <p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> ▪ Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> ▪ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1) <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> ▪ 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) <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> ▪ Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) <p style="text-align: center;">Connections to Nature of Science</p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> ▪ Scientists use different ways to study the world. (K-PS3-1) <p>Science Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> ▪ Scientists look for patterns and order when making observations about the world. (K-ESS2-1) 	<p>PS3.B: Conservation of Energy and Energy Transfer</p> <ul style="list-style-type: none"> ▪ Sunlight warms Earth’s surface. (K-PS3-1, K-PS3-2) <p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> ▪ 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) <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> ▪ 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) <p>ETS1.A: Defining and Delimiting an Engineering Problem</p> <ul style="list-style-type: none"> ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-ESS3-2) 	<p>Patterns</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>Cause and Effect</p> <ul style="list-style-type: none"> ▪ Events have causes that generate observable patterns. (K-PS3-1, K-PS3-2, K-ESS3-2) <p style="text-align: center;">-----</p> <p style="text-align: center;">Connections to Engineering, Technology, and Applications of Science</p> <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> ▪ People encounter questions about the natural world every day. (K-ESS3-2) <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <ul style="list-style-type: none"> ▪ People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)