

UNIT OVERVIEW

Every student has personal experience with weather of some kind. The Weather unit helps students explore the many different aspects of weather, including temperature, wind, clouds, precipitation, and storms. Certain unit materials address what causes the weather to occur. The unit also draws a connection between the seasons and weather patterns within each season.

Certain reading resources are provided at three reading levels within the unit to support differentiated instruction. Other resources are provided as a set, with different titles offered at each reading level. Dots on student resources indicate the reading level as follows:

- low reading level
- middle reading level
- high reading level

THE BIG IDEA

This unit provides opportunities for students to learn more about natural weather phenomena they observe in their everyday lives. We often select activities, clothing, and a place to live based upon weather. Understanding the weather can also prepare us to take precautions that will keep us safe in the event of severe weather.

Other topics

This unit also addresses topics such as: weather forecasting, temperature extremes, dangerous weather, types of wind, and the importance of the Sun.

SPARK

The spark is designed to get students thinking about the unit's topics and to generate curiosity and discussion.

Materials

- winter gloves
- sweater
- sandals
- umbrella

Activity

Ask for four student volunteers. Have one student put on or hold each item from the materials list. Ask the rest of the class which student seems best dressed for the weather outside today and why. Then ask what kind of weather the other students are dressed for. Collect the items and discuss the activity.



Below are questions to spark discussion.

How does weather help people decide what clothing to wear?

How did you choose your clothing today? Did you think about the weather when you made your choice?

Can you think of any other kinds of weather that you can dress for besides the ones your classmates were dressed for?

What other decisions do you make based on the weather, besides which clothing to wear?

What kinds of things will you do outside today? Will the weather help you choose what to do or what not to do outside?

To get students to think more about how weather affects them, you can give students trifolded pieces of construction paper and have them draw themselves wearing different clothing in three different weather conditions. Then let students share their pictures and then display them or take them home.

Use this activity to begin an introductory discussion about weather. Explain that weather happens everywhere, every day, but it changes. People learn to make choices based on the weather each day. Throughout the unit, students will learn more about weather.

Many of the unit's vocabulary terms are related to the spark activity and can be introduced during the spark. For vocabulary work, see the Vocabulary section in this *Unit Guide*.

PRIOR KNOWLEDGE



Invite students to explain their understanding of weather. Discuss types of weather and what each type of weather looks like, sounds like, smells like, and feels like.

Probing Questions to Think About

Use the following questions to have students begin thinking of what they know about weather.

- What is the weather like outside today?
- Why is it warm on some days and cool on other days?
- Why is it cloudy on some days and clear on other days?
- What is the nicest weather you can imagine?
- What is the worst weather you have ever seen?
- What kind of weather do we usually get here in the summer?
What about in the winter?
- Where do rain, hail, and snow come from? Why does it rain sometimes but snow or hail at other times?
- Has a change in weather ever caught you by surprise? What happened?
How did you stay safe?

Tell students they will learn more about these topics soon.

UNIT MATERIALS

Each unit provides a wide variety of resources related to the unit topic. Students may read books and other passages, work in groups to complete hands-on experiments and investigations, discuss science ideas as a class, watch videos, complete writing tasks, and take assessments.

Resources are available for printing or projecting, and many student resources are also available for students to access digitally on [Kids A-Z](#).

Selected unit resources are available in more than one language.

For a complete list of materials provided with the unit, see the Weather unit page on the Science A–Z website.

VOCABULARY



Use the terms below for vocabulary development throughout the unit. They can be found in boldface in the *Nonfiction Book*, the *Quick Reads*, and/or other unit resources. These terms and definitions are available on *Vocabulary Cards* for student practice. Additional vocabulary lists are provided in the teaching tips for *Investigation Packs* and *FOCUS Books*.

Core Science Terms

These terms are crucial to understanding the unit.

cloud	a group of drops of water or pieces of ice seen in the air
cold	having a low temperature
cool	having a temperature that is between warm and cold
hot	having a high temperature
lightning	a flash of light in the sky made by electricity
rain	liquid water that falls from clouds to the earth
season	a part of the year that lasts three months; winter, spring, summer, and fall
snow	frozen water that falls from clouds in flakes
storm	violent weather with strong winds
temperature	the measure of how hot or cold something is
thunder	a loud noise sometimes heard after lightning strikes
warm	having a temperature that is between cool and hot
weather	a description of the temperature, clouds, rain, wind, and other conditions in the air
wind	moving air

Other Key Science Terms

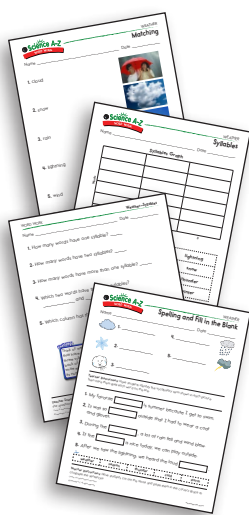
The following vocabulary is not essential for comprehending the unit but may enrich students' vocabulary.

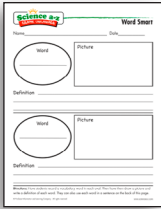
blizzard	a storm with cold temperatures, heavy snow, and strong wind
breeze	a light, slow wind
drift	a big pile of snow caused by wind
fall	the season when temperatures get cooler and days get shorter
flood	water that flows on land that is normally dry, sometimes caused by too much rain
fog	a cloud on the ground
forecaster	a person who predicts what the weather will be in the future
hurricane	a strong, spinning storm with heavy rain and high winds that starts over an ocean
precipitation	water that falls from clouds in the form of rain, snow, sleet, or hail
spring	the season when temperatures get warmer and days get longer
summer	the hottest season, when days are longest
tornado	a storm on land that spins very fast, often causing a lot of damage
winter	the coldest season, when days are shortest

Vocabulary Activities

You may choose to introduce all the terms that will be encountered in the unit before assigning any of the reading components. *Vocabulary Cards* with the key science terms and definitions are provided. Dots on the cards indicate the reading levels of the *Nonfiction Book* or the *Quick Reads* in which each term can be found. If all level dots appear, the term may come from another resource in the unit. Students can use these cards to review and practice the terms in small groups or pairs. The cards can also be used for center activity games such as Concentration.

The *Word Work* activity sheets offer fun puzzles and practice with key vocabulary terms from the unit. For further vocabulary practice and reinforcement, you can choose from the vocabulary *Graphic Organizers*. To build customized vocabulary lessons with terms related to the topic, see [Vocabulary A-Z](#).





Students can use the *Word Smart* vocabulary *Graphic Organizer* to organize information on the science terms. You may want to assign each student one to three words to share his or her *Word Smart* knowledge with classmates. Students who have the same word should first compare their *Word Smart* sheets with each other and then report to the larger group.

The science terms can be used in oral practice. Have students use each term in a spoken sentence.

As students read, encourage them to create a science dictionary by recording new vocabulary terms and definitions in their *SAZ Journal*.

BACKGROUND AND MISCONCEPTIONS

Use this section as a resource for more background knowledge on unit content and to clarify the content for students if misconceptions arise. Refer to Using the Internet below for more ways to extend the learning.



Q: *Are clouds always bright white?*

A: No. Many clouds appear bright white in the sky, but others appear light or dark gray. The thicker a cloud is, the more it absorbs and blocks light, which makes the cloud appear darker. Of course, clouds can also appear to be many other colors when they absorb certain colors of light and reflect others, as we can see in a beautiful sunset, for example.

Q: *Are clouds solid? Could I sit on a cloud?*

A: No. Clouds are made of liquid water droplets and ice crystals suspended in the air. While clouds may look solid from ground level, they could not hold up a person. Students who have flown through clouds in an airplane or experienced fog may have noticed up close how airy and fluid clouds actually are.

Q: *How do I get to the end of a rainbow, and will I become rich when I get there?*

A: Rainbows are optical phenomena seen in air, not physical objects, so one cannot feel a rainbow or travel to the base of one. A rainbow would seem to continue moving away from you if you pursued it. Unfortunately, the pot of gold is a myth as well.

Q: *Isn't snow just rain that freezes on the way down?*

A: No. When rain freezes as it falls to Earth, sleet can form. But snow is precipitation in the form of ice crystals that froze within the cloud and remained frozen all the way to the ground.

Q: *Does lightning make the rumbling noise I hear during a storm?*

A: Not exactly. Lightning does cause thunder, and it is the thunder that makes a loud rumble. As a bolt of lightning slices through the air, it makes the air around it expand very quickly. This sudden movement of air causes vibrations, which make a loud sound. Lightning itself can in fact be heard at times, when it crackles.

Q: *Can I really tell how far away lightning is just by counting seconds?*

A: Yes, you can! Students may think that thunder happens long after lightning, when in fact they happen almost simultaneously. But since light travels much faster than sound, we see the lightning almost instantly, sometimes long before we hear the thunder. The sound of the thunder takes about five seconds to travel each mile (three seconds per kilometer), depending on atmospheric conditions. So yes, you can use these figures to roughly estimate the distance between you and lightning.

Q: *Do seasons occur because the distance between the Sun and Earth changes?*

A: No. If the Earth's distance from the Sun varied significantly, the entire planet would warm and cool at the same time. Seasons occur because our planet is tilted on its axis. During one part of the year, the Northern Hemisphere is tilted toward the Sun and gets the Sun's energy at a more direct angle, causing summer. At the same time, the Southern Hemisphere receives the Sun's energy at a lower angle, causing winter. Six months later, the Earth is on the opposite side of the Sun, but the tilt has not changed, so the seasons are reversed.

Q: *Why can't meteorologists predict the weather correctly all the time?*

A: Modern technology allows scientists to research past weather trends and, using current data, forecast upcoming weather. However, as with many things in nature, there are variations. Global weather is a particularly complex system with too many variables to track reliably. The best that experts can do at this point is to tell the population what is most likely to happen and to prepare us for any severe weather that could be on the way.

EXTENSION ACTIVITIES



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Using the Internet

Most search engines will yield many results when the term *weather* is entered. You can pair the term *weather* with a location or a detail for more useful information. Be aware that some sites may not be educational or intended for the elementary classroom. More specific inquiries are recommended, such as:

- cloud photographs
- thunderstorm safety
- hurricane names
- Michigan weather
- How does snow form?
- wind sports



Projects and Activities

- **Guest:** Invite a meteorologist to speak with students about his or her career and to explain how understanding weather can help students in their daily lives.
- **Inquiry Science:** Bring in various weather tools (such as thermometers, weather vanes, and rain gauges) and let students use them in experiments and explorations they help design.
- **Project:** Help students track local weather forecasts so the class can choose an upcoming day to work or eat lunch outside.
- **Arts:** Create a class mural showing various types of weather.
- **Arts:** Invite groups of students to write and act out a short play in which the characters are clouds, wind, precipitation, and storms.
- **Field Trip:** Arrange a field trip to a local television station to observe how the weather forecast and report occur, including the technology used to research weather and present it to the public.
- **Community Service:** Provide students with opportunities to help people who have been negatively affected by bad weather.
- **Research/Home Connection:** Students can conduct research as a family/home project or in the library/media center to extend the learning about a topic in one of the *Quick Reads* or other unit resources.

