

Lessons 22–24

Effects of Severe Weather

Prepare

In Concept 3, students build on their understanding of weather and patterns as they learn about severe weather. In Lesson 22, students observe examples of severe weather and ask questions to find out more information about blizzards, hurricanes, and tornadoes. In Lesson 23, students share what they learned by acting out different kinds of severe weather to develop an understanding that severe weather typically involves more intense rain, heavier snow, or stronger wind than everyday weather. Finally, in Lesson 24, students use their new knowledge to explore how severe weather can affect communities.

Student Learning

Knowledge Statement

Severe weather can be harmful to communities.

Concept 3: Severe Weather

Focus Question

How does severe weather affect us?

Phenomenon Question

How can weather be harmful?



Objectives

- Lesson 22: Observe and record information about different kinds of severe weather.
- Lesson 23: Share information about different kinds of severe weather.
- Lesson 24: Describe how severe weather affects communities.

Texas Essential Knowledge and Skills Addressed

- K.2A **Ask questions about** organisms, **objects**, and events **observed in the natural world**. (Addressed)
- K.2D **Record and organize data and observations using pictures, numbers**, and words. (Addressed)
- K.4B **Use the senses as a tool of observation to identify properties** and patterns of organisms, objects, and **events in the environment**. (Addressed)
- K.8A **Observe and describe weather changes from day to day** and over seasons. (Addressed)
- K.8B **Identify events that have repeating patterns, including** seasons of the year and **day and night**. (Mastered)
- K.8C **Observe, describe, and illustrate objects in the sky, such as the clouds**, Moon, and stars, including the Sun. (Addressed)

English Language Proficiency Standards Addressed

- 2F Listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD ROM to build and reinforce concept and language attainment.
- 4A Learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words.



Materials

		Lesson 22	Lesson 23	Lesson 24
Student	Severe Weather Photographs (Lesson 22 Resource D) (1 copy per class)	•		
	Science Logbook (Lesson 22 Activity Guide)	•	•	
	Science Logbook (Lesson 24 Activity Guide)			•
Teacher	Fallen Branches Photograph (Lesson 22 Resource A)	•		
	Weather calendar	•		
	Thunderstorm Photographs (Lesson 22 Resource B)	•		
	Severe weather symbols (1 set)	•	•	
	Effects of Drought on Plants Photograph (Lesson 23 Resource)		•	•
	Effects of Severe Weather Photographs (Lesson 24 Resource)			•
Preparation	Identify several consecutive days of mild weather (e.g., sunny, partly sunny, not windy, a little windy) on the weather calendar.	•		
	Cue thunderstorm video, typhoon video, tornado video, and blizzard video: http://phdsci.link/1526 , http://phdsci.link/1528 , http://phdsci.link/1529 , and http://phdsci.link/1527 .	•		
	Prepare severe weather symbols. (See Lesson 22 Resource C.)	•		
	Prepare to distribute a copy of Lesson 22 Resource D to students. During the lesson, each group will receive photographs for one kind of severe weather.	•		

Lesson 22

Objective: Observe and record information about different kinds of severe weather.

Launch 5 minutes



Teacher Note

Students may have had experiences with or heard stories about severe weather that could cause them to feel anxious or frightened. Throughout this module, provide opportunities for students to ask questions and share their feelings and experiences. If any of the subject matter or lesson materials may be too intense for students, adjust or omit as necessary.

Display the photograph of fallen branches on a road (Lesson 22 Resource A).



► What do you notice about the branches in the picture?

- *It looks like the branches fell from the trees.*

Agenda

Launch (5 minutes)

Learn (27 minutes)

- Observe Thunderstorms (9 minutes)
- Observe Hurricanes, Tornadoes, and Blizzards (18 minutes)

Land (3 minutes)

- *The branches are blocking the road.*

► What do you wonder about the branches in the picture?

- *Why did the branches fall down?*
- *I wonder how the branches got on the road.*

Reveal to students that the branches fell because of the weather. Draw students' attention to the consecutive days of mild weather identified on the weather calendar during lesson preparation. 

► Do you think the weather during these days could have caused branches to fall like the ones in the picture? Why or why not?

- *Most days were sunny, and I don't think sunny weather could make branches fall.*
- *I don't think it was windy enough to make them fall.*

► What questions do you have about the weather that can make branches fall?

- *Could the weather where we live make branches fall?*
- *Does it have to be really windy to make branches fall?*

Record relevant student questions on individual sticky notes, and add the notes to the driving question board. Tell students that in this lesson, they will learn more about weather that can cause branches to fall.

Learn 27 minutes

Observe Thunderstorms (9 minutes)

Play the video of a thunderstorm (<http://phdsci.link/1526>).  After students watch the video, ask them to Think–Pair–Share in response to the following questions.

► How would you describe the weather during the thunderstorm?

- *There are lots of dark clouds.*
- *It looks really windy. And I see lightning!*



Teacher Note

If the weather calendar does not show consecutive days of mild weather (e.g., sunny, partly sunny, not windy, a little windy), point to a single day when the weather was mild. Alternatively, if the weather on the day of the lesson is mild, ask students whether the branches would fall on a day like today.



Teacher Note

Throughout Concept 3, as students learn about thunderstorms as a kind of severe weather, they observe videos and data for severe thunderstorms. Severe thunderstorms are distinct from other thunderstorms. The National Weather Service considers a thunderstorm severe when it includes winds of at least 58 miles per hour, hail with a diameter of at least 1 inch, or a tornado (NOAA NWS, n.d.) (2F).

► How is the weather in the video different from the everyday weather in our area?

- *We don't have thunder and lightning every day.*
- *It looks like there was a lot more wind than we normally get.*

Agree that thunderstorms are different from everyday weather because they have a lot of wind and rain, as well as thunder and lightning.

► Do you think it would be safe to be outside during a thunderstorm?

- *No, the lightning looks dangerous.*
- *No, my mom says you need to be inside when there's a thunderstorm.*

Agree that thunderstorms can be dangerous. Explain that a thunderstorm is a kind of **severe weather**, or weather that can be harmful. 🗉 Clarify that all thunderstorms can be dangerous but that some are more severe than others.



English Language Development

Introduce the term *severe weather* explicitly. Providing the Spanish cognate for *severe* (*severo*) may be helpful (4A).

Tell students that in this lesson, they will learn more about thunderstorms and other kinds of severe weather as they explore the Phenomenon Question **How can weather be harmful?**

Display the thunderstorm photographs (Lesson 22 Resource B).

► What do you notice about the weather in these pictures?

- *Some of the pictures show a thunderstorm near a city.*
- *The lightning looks like a big stick of light.*

Invite students to use what they notice about the weather in the photographs to ask questions about thunderstorms.

► What do you wonder about the weather in these pictures?

- *Is it always really cloudy when there is a thunderstorm?*
- *When there is lightning, is there always thunder too?*



Teacher Note

Throughout Concept 3, students observe and describe kinds of severe weather. The definition of *severe weather* is updated in Lesson 24 to include that severe weather can be harmful to communities.

As students share, record relevant student questions on sticky notes, and add the notes to the driving question board.

► How is the weather in these pictures the same?

- *All the pictures show lightning.*
- *All the pictures also have clouds.*

On a whiteboard or a sheet of chart paper, make a sketch of a thunderstorm, incorporating the common characteristics of thunderstorms that students mention.

Sample class drawing:



Then begin a class severe weather chart that has three columns. 📄 Label the left column Severe Weather, the middle column Symbol, and the right column Description. Tell students they will use the chart to record their descriptions of severe weather.

► How should we show a thunderstorm on the chart?

- *Let's draw a cloud and a lightning bolt.*
- *Maybe add some rain.*

Write Thunderstorm in the Severe Weather column, and add the symbol for a thunderstorm (Lesson 22 Resource C) to the middle column. Ask students how they would describe the parts of weather that make up a thunderstorm. Record student responses in the Description column of the table.



Teacher Note

Create the severe weather chart on a sheet of chart paper or a whiteboard to display over the next few lessons. The class will continue to develop this chart in Lesson 23. Leave space at the bottom to add additional rows for tornado, hurricane, blizzard, and drought.



Sample class chart:

Severe Weather	Symbol	Description
Thunderstorm		<ul style="list-style-type: none"> ▪ Rainy ▪ Windy ▪ Very cloudy ▪ Thunder ▪ Lightning

Explain to students that they will work in groups and that each group will learn about a kind of severe weather: either tornadoes, hurricanes, or blizzards. Tell students that in the next lesson, their group will act out their assigned kind of severe weather to teach their classmates about it. 

▶ How could we act out a thunderstorm? 

- We could clap our hands and stomp our feet really loudly to act like thunder.
- We could also show that it's rainy and windy. Maybe we could use our hands to show rain blowing in the wind.

Highlight student responses that offer safe and creative ideas for acting out thunderstorms to teach others about them. 

Observe Hurricanes, Tornadoes, and Blizzards (18 minutes)

Divide the class into three groups. Distribute to each group the photographs of one kind of severe weather (Lesson 22 Resource D). Have students observe the photographs and discuss what they see. As students discuss their ideas, circulate and assist each group with identifying the kind of severe weather they have. Then help students find and circle that kind of severe weather in their Science Logbooks (Lesson 22 Activity Guide).

Sample student response (for tornado):

Tornado

 Hurricane

 Blizzard



Differentiation

Provide appropriate accommodations for students with motor difficulties. For example, suggest ways that all students can participate in acting out severe weather, such as by making sounds for rain or wind.



Teacher Note

If students need support thinking of ways to act out a thunderstorm, ask them about the weather they observed in the thunderstorm video and photographs. Students should consider how to act out parts of weather, such as rain and wind, as well as other characteristics of thunderstorms, such as thunder and lightning.



Extension

Invite students to safely act out a thunderstorm. Then have students act out everyday rainy weather. Consider displaying the photograph of a tent in the rain (Lesson 1 Resource A) next to one of the thunderstorm photographs (Lesson 22 Resource B). Then ask students to compare thunderstorms with rainy weather. Prompt students with guiding questions such as these: How is a thunderstorm different from everyday rainy weather? Do you think it is windier during a thunderstorm or during rainy weather?

Next, instruct groups to observe their photographs and discuss the following questions: What do you notice? What parts of weather do you see? What is the same about the weather in these pictures?

Provide time for group discussion, and then tell students to draw a picture in their Science Logbooks (Lesson 22 Activity Guide) of the severe weather in the photographs. Refer students to the class thunderstorm sketch as an example.

Sample student response (for tornado):



As students observe and draw, meet with one group at a time. In each meeting, start by asking students to share the questions they have after observing their photographs. ✓

Sample questions:

- *Is a tornado part of a cloud?*
- *Do hurricanes always happen near water?*
- *How much does it snow during a blizzard?*

Record at least one question from each group on a sticky note to add to the driving question board. Next, explain that the group will watch a video showing the kind of severe weather that is in their photographs. Guide students to look for information in the video that might help answer their questions. For the blizzard group, play the video of a blizzard in Hokkaido, Japan (<http://phdsci.link/1527>). For the hurricane group, play the video of a typhoon in Miyakojima Island, Japan (<http://phdsci.link/1528>). 📺 For the tornado group, play the video of a tornado in Kansas (<http://phdsci.link/1529>).

Have students circle in their Science Logbooks (Lesson 22 Activity Guide) the parts of weather they observe in their video.



Check for Understanding

Listen for students to use their observations of the photographs to ask questions about their kind of severe weather.

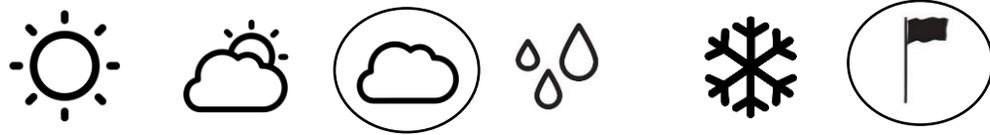
If students need support framing questions, provide a word bank of question words, such as *what, why, how, and where*.



Teacher Note

Hurricanes and typhoons are the same kind of severe weather. The only difference is the location where the storm occurs. When these storms form in the North Atlantic, the northeastern Pacific, the Caribbean Sea, or the Gulf of Mexico, they are called hurricanes. Those that form in the northwestern Pacific are called typhoons (2F).

Sample student response (for tornado):



Land 3 minutes

Bring the class back together to reflect on what they have learned about severe weather so far.

- ▶ Imagine that you hear a weather forecast that says there will be a thunderstorm later today. How do you think the weather would be during the thunderstorm?
 - *I think it would be cloudy and rainy.*
 - *I think there would be lightning and thunder too!*
- ▶ How would a thunderstorm this afternoon change your plans for the day?
 - *I wouldn't want to walk home from school.*
 - *I don't think I would play outside after school.*

Build on student responses to reaffirm that thunderstorms can be dangerous. Tell students that in the next lesson, each group will act out the kind of severe weather they learned about.