Lesson 5.1
Tornado! Predicting Severe Weather
Lesson Overview

Students learn about how severe weather affects people’s lives and think about a new weather-related problem impacting the Carver and Woodland playgrounds. The teacher reads aloud *Tornado! Predicting Severe Weather* and highlights for students the importance of making predictions in science. Students participate in a new Think and Walk activity to indicate their understanding of severe and not severe weather. The teacher introduces a new weather-related problem with the Carver and Woodland playgrounds—both Carver and Woodland have experienced severe rain, but only Woodland’s playground becomes flooded. The class compares old and new weather data for both schools to learn that the type of weather is not causing the flooding on Woodland’s playground. Students identify differences between the playgrounds that could be responsible for the flooding on only Woodland’s playground. The purpose of this lesson is to introduce students to severe weather and to set up the problem they will investigate for the remainder of the unit.

**Anchor Phenomenon:** Both the Carver and Woodland playgrounds experienced severe rain, but only Woodland’s playground floods.

**Investigative Phenomenon:** The Carver and Woodland playgrounds have the same weather.

**Students learn:**

- Weather affects people most when it is severe.
- Weather is different, depending on where you live.
- Weather scientists make predictions.
- Scientists look for patterns and order when making observations about the world.
- Science assumes natural events happen today as they happened in the past.
Reading: Tornado! Predicting Severe Weather

The teacher reads aloud *Tornado! Predicting Severe Weather*. Students make and check predictions about how strong weather affects people.

Instructional Guide

1. **Connect to prior learning.** Remind students that they have been working as weather scientists to learn about temperature.

   - We were able to help the principals at Carver and Woodland Elementary schools figure out why their playgrounds were different temperatures and why the students there were uncomfortable at different times of the day.

2. **Introduce the Investigation Question.**

   - The weather on the playgrounds at Carver and Woodland affected the students during their recess times.

   - Weather affects people. That means it can change what people do, like what clothes they wear to stay warm or cool, whether they spend time outside or inside, or how they get to work or school.

   Read aloud the Investigation Question you have written on the board, pointing to each word.

   - *When does weather affect people most?*

3. **Introduce the book Tornado! Predicting Severe Weather.**

   - Sometimes the weather in a place becomes very strong.

   - Weather scientists study what happens when weather becomes very strong, and how strong weather might affect people.
Today we will read about a weather scientist who studied how one kind of strong weather—strong wind that became a tornado—affect ed people in the place where they live.

4. Display the front cover of *Tornado! Predicting Severe Weather*. Invite students to share what they notice on the front cover.

5. Revisit making predictions.

   Remember, scientists make predictions about what they are investigating.

   When you make a prediction, you use what you already know to decide what you think might happen.

6. Begin reading and pause at the end of page 7. Highlight how the scientist in the book observes weather over time and uses what she learns to make predictions to help people prepare for severe weather.

   What does Lynn make predictions about?
   [The weather.]

   When you make a prediction, you use what you know to decide what might happen. What are some of the things Lynn does so she can make predictions about weather?
   [She studies the weather, she observes the weather now, she uses her observations to think about what will happen next.]

   How are Lynn’s weather predictions helpful to people?
   [They help people prepare.]

7. Continue reading and pause at the end of page 9. Highlight the kinds of data Lynn gathers to describe and make predictions.

   We read that Lynn observes the weather to make predictions.

   What does she observe? What kinds of data does she record to help her make predictions?
   [Temperature. How fast the wind is blowing. How much rain is falling.]

8. Continue reading and pause at the end of page 11.

   How is the weather becoming very strong on this page?
   [A thunderstorm is starting; a thunderstorm is changing into a tornado; the weather is becoming dangerous.]

9. Continue reading to the end of page 13, and then ask students to make predictions.

   Turn to the person next to you and tell them the answer to this question: *How do you think we would prepare at school for a tornado that is coming?*
Have a few students share their predictions with the class. Depending on their familiarity with tornadoes, student responses will vary. Encourage students to provide a rationale to support their ideas.

10. **Read aloud pages 14 and 15 to check predictions.** Ask students whether their predictions match what you read on the page. Call on a few students to share.

11. **Continue reading through the end of the book and then have students reflect in pairs.**

   - How did the strong weather that we read about affect people?

Circulate to listen to students’ discussions. Invite several volunteers to share their responses with the class. [The students stayed inside the school and away from the windows; cars, buildings, and buses were damaged.]

12. **Have students reflect on severe weather in their own region.**

   - Lynn studies weather and what happens when weather becomes very strong, or severe, in the area where she lives. What are some of the ways that weather can become very strong where we live?

Accept student responses. Follow up by asking how each form of severe weather mentioned affects people.

13. **Have pairs reflect on the purpose of weather forecasting.**

   - Part of Lynn’s job is to make predictions about the weather. Why do weather scientists predict weather? [So people can prepare for the weather. So people know what kind of weather is coming. So people can get ready for severe weather.]

14. **Introduce severe with the vocabulary routine.** Hold up the vocabulary card for severe.

   - This is the word severe. Severe means very strong or harmful.

   - We are going to practice saying the word. Say the word after me: severe.

   - Now say the word together: severe.

   - Now whisper the word severe to your partner.

   - Severe means very strong or harmful.

Post the vocabulary card for severe to the Vocabulary section of the classroom wall.
Teacher Support

Background

About the Book: *Tornado: Predicting Severe Weather*

*Tornado! Predicting Severe Weather* tells the story of real-life weather scientist Lynn Burse and how she studies and predicts severe weather. In this Read-Aloud, students hear about how Burse and her fellow scientists use their observations and measurements of the weather—including wind, rain, temperature, and changes in weather—to make predictions. Many people use these predictions in their daily lives to prepare for severe weather. On one particular occasion, Lynn and her team used their observations of temperature and thunderstorms to predict that a tornado was coming to their area. They warned the people in time for everyone to get to safety, and no one was hurt even though the tornado caused a lot of damage. This book supports students in making connections between what they are learning in the classroom about predicting and preparing for different weather conditions and what scientists in the field do to help keep people safe.

Rationale

Literacy Note: Making Predictions with the Book

Making predictions to understand the content is not as central to students’ reading of the book, *Tornado: Predicting Severe Weather*, as it has been when reading previous books in the unit. Although there are a few opportunities for students to make and check predictions in the book, the focus is more on the scientific practice of making predictions. As students read the book, they learn that some scientists make predictions in order to help people prepare for severe weather.

Instructional Suggestion

Going Further: Severe Weather in Your Region

*Tornado! Predicting Severe Weather* highlights one kind of severe weather that may not occur in your region. You may want to spend some time providing students with additional opportunities to share their ideas about local severe weather, and to investigate what severe weather types do occur in your area. You may wish to use videos, articles, or other informational texts to support students’ familiarity with the different types of severe weather around them. Be sure to ask students to share their ideas about how people might prepare for each form of severe weather.

Rationale

Pedagogical Goals: Understanding the Nature of Science

One goal set forth by the Next Generation Science Standards (NGSS) is for students to understand the nature of science as a discipline and how scientific knowledge develops over time. The NGSS calls out eight understandings about the nature of science that are woven throughout the Amplify Science curriculum. This unit gives students an opportunity to experience the understanding that Scientific Knowledge Assumes an Order and Consistency in Natural Systems. Specifically, *Tornado! Predicting Severe Weather* illustrates the idea that science assumes natural events happen today as they happened in the past.

Assessment

Assessment Opportunities: Assessing Students’ Understanding of Weather and Why We Measure It

This activity can be used to assess students’ understanding of why people measure weather conditions over time—to describe and record the weather and to notice patterns. If you would like to assess students’ understanding of these
ideas, attend to their responses in this activity. Specifically, in Steps 6 and 7 look for whether students make connections between observing and collecting data about weather to being able to make predictions about what weather will happen. If students have difficulty articulating the reason for observing and recording weather, you might revisit page 10 of the book *Tornado!* to point out that different kinds of weather happen at different temperatures. Highlight that thunderstorms happen when the weather is warmer where Lynn lives. Invite students to consider why Lynn might know that thunderstorms happen when the temperatures are warmer. [She observed and recorded the temperature over and over again. She noticed the pattern that thunderstorms happen when the temperature is warmer.] Remind students that weather scientists use what they know to make predictions. They study weather by collecting data and looking for patterns. Help students construct the understanding that making observations of weather and recording information about weather conditions, such as temperature and rainfall, make it easier to predict severe weather.
Reading: Tornado! Predicting Severe Weather

The teacher reads aloud *Tornado! Predicting Severe Weather*. Students make and check predictions about how strong weather affects people.

Instructional Guide

1. **Connect to prior learning.** Remind students that they have been working as weather scientists to learn about temperature.

   Pudimos ayudar a los directores de las escuelas primarias Carver y Woodland a averiguar por qué sus patios de juegos tenían diferentes temperaturas y por qué los estudiantes allí estaban incómodos a diferentes horas del día.

2. **Introduce the Investigation Question.**

   El clima en los patios de juegos en las escuelas Carver y Woodland afectaba a los estudiantes durante sus horas de recreo.

   El clima afecta a la gente. Eso significa que puede cambiar lo que la gente hace, como la ropa que se ponen para mantenerse tibia o fresca, si pasan tiempo afuera o adentro o cómo se trasladan al trabajo o a la escuela.

   Read aloud the Investigation Question you have written on the board, pointing to each word.

   ¿Cuándo afecta más a la gente el clima?

3. **Introduce the book Tornado! Predicting Severe Weather.**

   A veces el clima en un lugar se vuelve muy fuerte.

   Los científicos del clima estudian qué sucede cuando el clima se vuelve muy fuerte, y cómo podría afectar a la gente el clima fuerte.
Hoy leeremos acerca de un científico del clima que estudió cómo un tipo de clima fuerte (viento fuerte que se convirtió en un tornado) afectó a la gente en el lugar donde vive.

4. Display the front cover of Tornado! Predicting Severe Weather. Invite students to share what they notice on the front cover.

5. Revisit making predictions.

Recuerden, los científicos hacen predicciones mientras están investigando.

Cuando hacen una predicción, usan lo que ya saben para decidir lo que piensan que podría pasar.

6. Begin reading and pause at the end of page 7. Highlight how the scientist in the book observes weather over time and uses what she learns to make predictions to help people prepare for severe weather.

¿Acerca de qué hace predicciones Lynn? [El clima].

Cuando hacen una predicción, usan lo que ya saben para decidir lo que podría pasar. ¿Cuáles son algunas de las cosas que hace Lynn para poder hacer predicciones acerca del clima? [Ella estudia el clima, observa el clima ahora, usa sus observaciones para pensar en lo que ocurrirá a continuación].

¿De qué manera son útiles para la gente las predicciones del clima de Lynn? [Ayudan a la gente a prepararse].

7. Continue reading and pause at the end of page 9. Highlight the kinds of data Lynn gathers to describe and make predictions.

Leímos que Lynn observa el clima para hacer predicciones.

¿Qué observa ella? ¿Qué tipos de datos apunta para ayudarla a hacer predicciones? [Temperatura. Qué tan rápido está soplando el viento. Cuánta lluvia está cayendo].

8. Continue reading and pause at the end of page 11.

¿De qué manera el clima se está poniendo muy fuerte en esta página? [Está comenzando una tormenta eléctrica; una tormenta eléctrica se está convirtiendo en un tornado; el clima se está poniendo peligroso].

9. Continue reading to the end of page 13, and then ask students to make predictions.

Acérquense a la persona junto a ustedes y déjale la respuesta a esta pregunta: ¿Cómo piensan que nos prepararíamos en la escuela para un tornado que se aproxime?
Have a few students share their predictions with the class. Depending on their familiarity with tornadoes, student responses will vary. Encourage students to provide a rationale to support their ideas.

10. Read aloud pages 14 and 15 to check predictions. Ask students whether their predictions match what you read on the page. Call on a few students to share.

11. Continue reading through the end of the book and then have students reflect in pairs.

12. Have students reflect on severe weather in their own region.

13. Have pairs reflect on the purpose of weather forecasting.

14. Introduce severe with the vocabulary routine. Hold up the vocabulary card for severe.

¿De qué manera afectó a la gente el clima fuerte sobre el que leímos?

¿Cuáles son algunas de las maneras en que el clima se puede volver muy fuerte donde vivimos?

Accept student responses. Follow up by asking how each form of severe weather mentioned affects people.

¿Qué manera afectó a la gente el clima fuerte sobre el que leímos?

¿Cuáles son algunas de las maneras en que el clima se puede volver muy fuerte donde vivimos?

Parte del trabajo de Lynn es hacer predicciones acerca del clima. ¿Por qué los científicos del clima predicen el clima?

[Para que la gente pueda prepararse para el clima. Para que la gente sepa qué tipo de clima se aproxima. Para que la gente pueda prepararse para el clima severo].

Esta es la palabra severo. Severo significa muy fuerte o dañino.

Vamos a practicar decir la palabra. Digan la palabra después de mí: severo.

Ahora digan la palabra juntos: severo.

Ahora susurren la palabra severo a su compañero o compañera.

Severo significa muy fuerte o dañino.

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Teacher Support

Background

About the Book: Tornado: Predicting Severe Weather
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