

Lessons 17–20

Local Weather Data

Prepare

In this lesson set, students analyze weather data to answer the Phenomenon Question **What can we find out by looking at weather data?** In Lesson 17, students analyze morning, afternoon, and night temperature data to identify patterns in daily temperature. In Lessons 18 and 19, students use counting and numbers to develop a summary of one month’s weather data, which they will revisit at the end of the school year when they look for long-term weather patterns. In Lesson 20, students learn how meteorologists use tools to collect data and identify patterns that help them predict future weather.

Student Learning

Knowledge Statement

Weather data collected over time may reveal patterns.

Objectives

- Lesson 17: Use weather data to identify and describe patterns in daily temperature changes.
- Lesson 18: Summarize monthly temperature data.

Concept 2: Weather Data

Focus Question

What does weather data reveal?

Phenomenon Question

What can we find out by looking at weather data?



- Lesson 19: Summarize monthly weather data.
- Lesson 20: Explore how meteorologists predict weather and develop weather forecasts.

Texas Essential Knowledge and Skills Addressed

- K.2C **Collect data** and make observations using simple tools. (Addressed)
- K.2D **Record and organize data and observations using** pictures, **numbers**, and words. (Addressed)
- K.3B **Make predictions based on observable patterns in nature.** (Introduced)
- K.3C **Explore that scientists investigate different things in the natural world** and use tools to help in their investigations. (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.** (Addressed)

English Language Proficiency Standards Addressed

- 3H Narrate, describe, and explain with increasing specificity and detail as more English is acquired.
- 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.
- 4E Read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.



Materials

		Lesson 17	Lesson 18	Lesson 19	Lesson 20	
Student	Prepared bag of linking cubes (1 per student pair)		•	•		
	Science Logbook (Lesson 19 Activity Guide)			•		
	Completed weather log for first month of school (1 per student pair)			•		
	Weather forecast (1 per group)				•	
Teacher	Times of Day Photographs (Lesson 17 Resource A)	•				
	Daily temperature chart preparation: 3" × 3" construction paper squares in colors corresponding to local temperature data (15), chart paper or whiteboard (1), glue or tape, local temperature data for five consecutive days, marker (1), stickers (5), times of day photographs from Lesson 17 Resource A (1 copy of each photograph, optional)	•				
	Demonstration thermometer from Lesson 5	•	•			
	Photograph of students outside during the first week of school		•			
	Completed weather calendar for first month of school or a photograph of this weather calendar with 3" × 3" construction paper color squares for each day's temperature		•	•		
	Temperature and weather linking cube bag preparation (1 set per student pair): linking cubes (quantity and color will vary with local data), plastic bag (1)		•	•		
	Monthly weather poster: 3" × 3" construction paper square in a color corresponding to the temperature that happened most during the first month of school (1), 11" × 17" or larger paper (1 sheet), marker (1), glue or tape, photograph of students from first week of school (1, optional), photograph of weather calendar for first month of school (1, optional)			•	•	
	Cloud Cover Photographs (Lesson 19 Resource)			•		
	Summarize monthly weather data: completed weather log for first month of school (Lesson 7 Resource B), sheet of paper (1), stickers (2 to 5)			•		

Preparation	Identify three corners or areas of the classroom to use for a Question Corners routine. Prepare a color copy of each photograph in Lesson 17 Resource A. During the lesson, post one photograph in each corner.	•			
	Prepare daily temperature chart. (See Lesson 17 Resource B.)	•			
	1 Month Before: Take a class photograph outside during the first week of school.		•		
	On the weather calendar, identify a 3- to 5-day span during which the temperature remained in the same color band (e.g., five green squares in a row). Cover the rest of the weather calendar before Lesson 18 so that only the selected days are visible.		•		
	Prepare bags of linking cubes for temperature data analysis. For each student pair, prepare 1 bag of cubes that correspond in color and quantity to the temperature squares on the weather calendar for the first month of school.		•		
	Prepare a copy of the completed weather log for the first month of school for each student pair.			•	
	Prepare bags of linking cubes for weather data analysis. For each student pair, prepare 1 bag with enough linking cubes to represent the data on the first month of school’s weather log for each part of weather. Consider using a different color linking cube for each part of weather.			•	
	Identify and cue a video of a local weather forecast from a television broadcast or online resource. If possible, use a video that shows the forecast for the upcoming weekend.				•
	Cue meteorologist video: http://phdsci.link/1557 .				•
	Prepare weather forecasts. (See Lesson 20 Resource.)				•

Lesson 19

Objective: Summarize monthly weather data.

Launch 4 minutes

Display the cloud cover photographs (Lesson 19 Resource). Explain that all the photographs show the same place. Ask students to participate in a Mix and Mingle routine to respond to the following questions about the photographs. 📷



- What do you notice about the weather in the pictures?
 - *The weather kind of looks the same in all the pictures.*
 - *It looks cloudy.*

Reveal that a camera took these pictures at the same time each day for three days in a row.

- What part of weather repeats over these three days? 📷
 - *It looks like it was cloudy on all three days.*

Agenda

Launch (4 minutes)

Learn (23 minutes)

- Analyze Monthly Weather Data (15 minutes)
- Summarize Monthly Weather Data (8 minutes)

Land (8 minutes)



Teacher Note

Mix and Mingle is a collaborative conversation routine in which students move around the classroom and share ideas with different peers. After the teacher poses a question, students circulate before pairing up with a peer to discuss their responses. After a few moments, the teacher gives students a signal to move around again before stopping to pair up with a different partner to discuss the same or a new question. This routine provides students time to think as well as an opportunity to share their ideas with peers.



Teacher Note

If necessary, clarify that each photograph shows a moment in time and that clouds change throughout the day but that the weather on all three days can be described as cloudy.

► What do you think the cloud cover will be on the fourth day?

- *I'm not sure because when we looked at temperature on different days, we didn't find a pattern.*
- *I think it might be another cloudy day, since it was cloudy at the same time for three days in a row.*

When students have finished sharing, remind them that a pattern is information that repeats and can be used to predict what will happen. Explain that though the weather was cloudy for three days, students need more information to determine whether there is a pattern. 🌧️

Share that in this lesson, students will use their weather data from the beginning of the school year to find out whether there is enough information to make predictions about upcoming weather.

Learn 23 minutes

Analyze Monthly Weather Data (15 minutes)

Bring the class back together. Display the weather calendar that has data for the first month of school. 📅

Sample weather calendar:



Spotlight on Knowledge and Skills

Explain that when there are several days of the same weather, that is an example of an event repeating over time. Invite students to share their memories of times when the weather was the same for a few days or more (K.3B).



Teacher Note

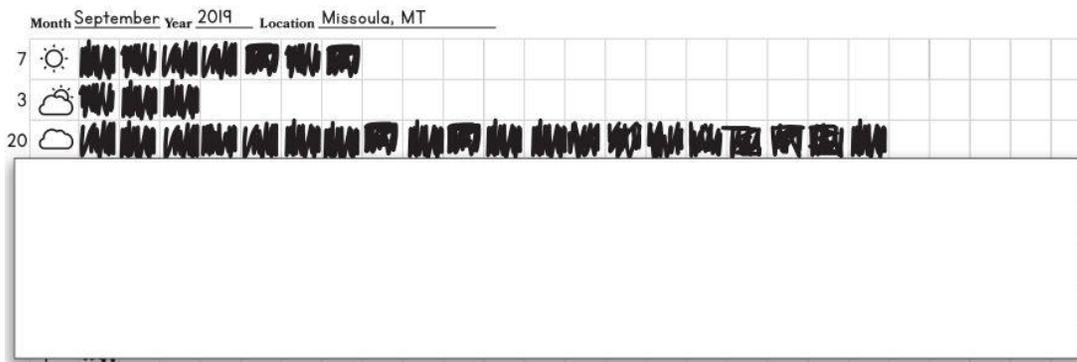
To help students better visualize the weather calendar data for this activity, consider preparing an alternative representation of the data. Create a table, similar to the weather log, with one column for each day of the month. Write the date at the top of each column and label each row with one weather symbol. Use the weather calendar data to fill in the table by coloring the squares corresponding to the conditions present each day.

Ask students to Think–Pair–Share in response to the following question.

- What do you notice about the number of sunny days? Partly sunny days? Cloudy days?
 - *There were a lot of cloudy days.*
 - *There were some sunny days, but there were more cloudy days.*

Invite the class to count aloud the number of days that were sunny, the number of days that were partly sunny, and the number of days that were cloudy. Write each total on the weather log. 

Sample weather log:



- Which kind of cloud cover did we observe the most? 
 - *It was cloudy more days than it was sunny or partly sunny.*
 - *Cloudy because 20 is more than 3 and 7.*
- How did you figure out which kind of cloud cover we observed the most?
 - *I picked cloudy because that row is colored more than the rows for sunny or partly sunny.*
 - *Cloudy days happened the most because that row has the most colored boxes.*

As a class, come to an agreement on the type of cloud cover that happened the most during the month. Instruct students to circle in their Science Logbooks (Lesson 19 Activity Guide) the symbol that shows the cloud cover that happened the most.

Slide the sheet of paper down to reveal the rain and snow rows on the weather log. Tell students they will work with a partner to count the number of rainy days and the number of snowy days for the month.



Differentiation

To support students’ developing counting and numeracy skills for numbers greater than 5 or 10, mark or circle groups of 5 on the weather log.

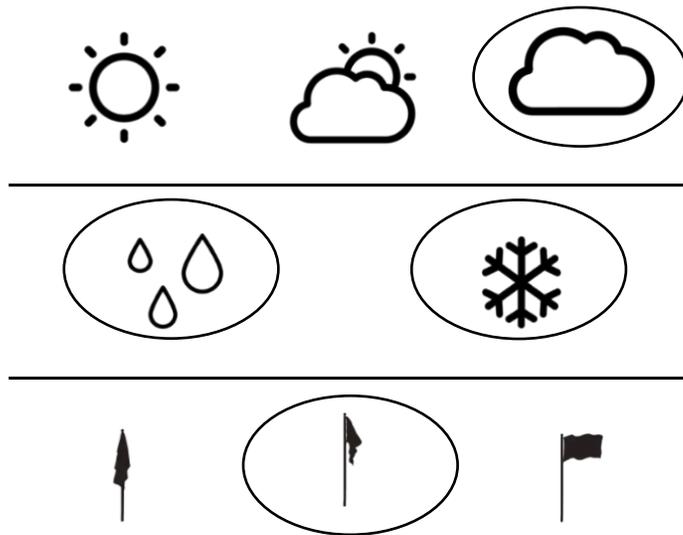


Content Area Connection: Mathematics

When students make observations about the weather log, they use matching and counting strategies to identify whether the number of colored squares in one row is greater than, less than, or equal to the number of colored squares in another row.

Allow students to revise the responses in their Science Logbooks (Lesson 19 Activity Guide) if needed.

Sample student response:



Ask students to share what they circled in their Science Logbooks (Lesson 19 Activity Guide) with someone other than their partner from the previous activity. Encourage students to use sentence frames such as these: ✓

- There were more ____ days than ____ days.
- Most days were ____.

Sample student responses:

- *There were more days that were a little windy than days that were very windy.*
- *Most days were cloudy.*

Lead a class discussion to determine the wind description the class recorded the most and whether the month was mostly rainy, mostly snowy, or neither.



Check for Understanding

Listen for students to use numbers or numerical comparisons (e.g., more, less, most, least) of rainy, snowy, not windy, a little windy, and very windy days as they describe the weather data for the month (3H).

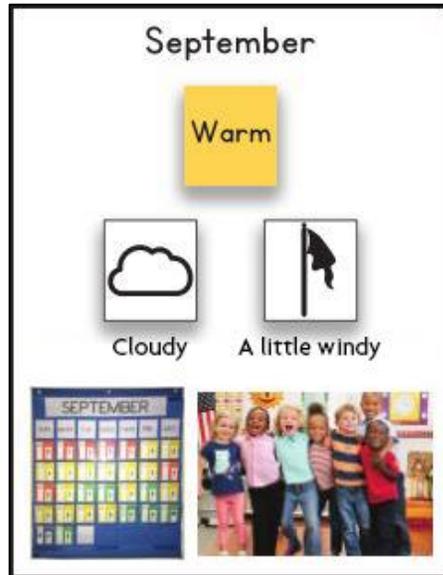
As needed, prompt students to use the weather log data or their linking cubes to support their comparisons. Pose guiding questions such as these:

- Which row is longest, and which row is shortest?
- Was the number of days that were a little windy less or more than the number of days that were very windy?

**Teacher Note**

As the class summarizes the monthly weather data on the monthly weather poster, add the rain or snow symbol only if more than half of the days were rainy or snowy, respectively.

Sample monthly weather poster:

**Teacher Note**

At the end of each month throughout the school year, work with students to develop a weather poster that summarizes the month's weather based on data from the weather calendar and the temperature and weather logs. After creating each monthly weather poster, consider showing students posters from the previous month(s) and asking students to look for trends or changes in weather from month to month. Students will use the posters at the end of the school year to look for patterns over longer periods of time and describe weather changes over seasons (K.8A, K.8B).

► Why do you think we record our weather data each day?

- *Maybe so we can remember what the weather was like.*
- *We can use our weather calendar to look for patterns.*

Confirm that students record weather data to learn about the weather and look for patterns.

Display the cloud cover photographs (Lesson 19 Resource) from this lesson's Launch. Revisit the question students considered at the beginning of the lesson.

► Now do you think you can predict what the cloud cover will be on the fourth day? Why or why not?

- *I don't think we have enough information yet.*
- *We can't tell for sure.*

Reveal to students that on the fourth day at the same time of day, the weather was sunny. Confirm for students that though there are times when the cloud cover is the same for a few days in a row, the weather changes and people cannot use that information to predict the cloud cover for the next day. Tell students that in the next lesson, they will learn how scientists make predictions about the weather.