Weather and Seasons Lesson 0d: How Can We Keep Track of the Weather?

Grade: Kindergarten	Length of lesson: 39 minutes	Placement of lesson in unit: 0d of 4 prelessons on weather (taught at the beginning of the year before the lesson series begins)
Unit central question: Is How do you know?	weather the same everywhere all of the time?	Lesson focus question: How can we keep track of the weather?

Main learning goal: We can use symbols and calendars to keep a record of the weather from day to day.

Science content storyline: Weather is what it looks like and feels like outside. Weather includes temperature, sunlight, clouds, rain or snow, and wind. In addition to observing the weather, we can measure temperatures using a thermometer. We can also use symbols and a calendar to keep track of the weather from day to day.

Ideal student response to the focus question: [Students should describe weather qualitatively.] Weather is what it looks like and feels like outside. It can be sunny or cloudy, rainy or dry, hot or cold, windy or calm. We can observe the weather by looking outside, and we can use a thermometer to measure the temperature so we can see how hot or cold it is. We can also use symbols and a calendar to keep track of the weather from day to day.

Preparation

Materials Needed

- Science notebooks
- Chart paper and markers
- Large class weather calendar (from lesson 0c)
- Large outdoor working thermometer
- Optional: "Check Out the Weather" song (YouTube video, https://www .youtube.com/watch?v=RmSKsyJ15vg)

Student Handouts and Teacher Masters

- 0.3 Weather Cards (Teacher Master) (for word wall, from lesson 0c)
- 0.4 Blue, Green, Red, Yellow Temperature Stickers, 1" size (Teacher Master) (See Ahead of Time)
- 0.5 Cloud, Rain, Sun, Wind Weather Stickers, 1" size (Teacher Master) (See Ahead of Time)
- 0.6 Weekly Weather Chart (4–5 charts per student) (See Ahead of Time)

Ahead of Time

- Review the content background document.
- Decide whether to use the "Check Out the Weather" YouTube song in this lesson.
- Print handouts 0.4 (Blue, Green, Red, and Yellow) and 0.5 (Cloud, Rain, Sun, Wind) stickers on Uline S-8075 laser label paper. Make sure to print enough stickers to record data throughout the fall and winter.
- Make sure the class weather calendar is posted where everyone can see it. Place the temperature and weather stickers nearby.
- The Weekly Weather Chart (handout 0.6) is sized so you can print two copies on a single page, but each students needs only 4–5 charts to paste into her or his science notebook. You can use the charts for the first month of data collection or throughout the fall.
- Make sure the working thermometer is in a location where it will yield the most accurate temperature readings year-round. Avoid direct sunlight and excessive shade.
- Throughout the fall and winter, students will collect weather data each weekday and use temperature and weather stickers to record the data on a class calendar. You won't collect weekend weather data for this lesson series. Save the calendars to use for the lesson series in the spring. The month before the lesson series begins in the spring, collect morning and afternoon temperature data for use in lesson 3. Collect temperatures at the same time of day, such as when school begins and releases each day.
- ELL support: Meet with ELL students in advance and introduce them to the lesson content, structure, materials, and activities so they know what's expected and can participate more fully. Identify vocabulary terms in the lesson plan to review with students in advance, including *temperature*, *thermometer*, *degrees*, and *measure*. Post vocabulary words around the room and near the thermometer.

Lesson 0d General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
5 min	Link to previous lesson: The teacher engages students in reviewing their outdoor weather and temperature observations from the previous lesson.	Weather is what it looks like and feels like outside. We can describe the weather outside as sunny or cloudy, windy or calm, hot or cold, rainy, snowy, or dry. We can also find out how hot or cold it is outside by measuring the temperature with a thermometer.
2 min	Lesson focus question: The teacher introduces the focus question, <i>How can we keep track of the weather?</i> Then students share what they think this means.	
8 min	Setup for activity: The teacher reviews the words and pictures on the class weather chart, and students use the words to describe what the weather can be like outside. Then the teacher reviews how to measure the temperature outside using a thermometer.	 Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. We can observe the weather and use specific words to describe it. We can also find out how hot or cold it is outside by measuring the temperature with a thermometer.
8 min	Activity: The teacher takes the class outside to observe the weather and measure the temperature with a thermometer.	Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind.
7 min	Follow-up to activity: Students record their outdoor temperature reading on the class weather calendar and use temperature and weather stickers to record the conditions they observed (Sun, clouds, rain, wind). Then they compare their temperature readings over the past two day and set up their own weekly weather charts.	We can observe the weather and measure the temperature with a thermometer every day. We can also use symbols and a calendar to keep track of the weather from day to day.
8 min	Synthesize/summarize today's lesson: The teacher revisits the focus question. Then students add temperature and weather stickers to their weekly weather charts to reflect the observations they recorded on their class weather calendar. Afterward, they give a brief weather report for the day.	 Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. We can use our eyes to observe the weather outside, and we can use a thermometer to measure temperatures. We can also use symbols and a calendar to keep track of the weather from day to day.
1 min	Link to next lesson: The teacher reminds students that every day over the next month, they'll observe the weather outside, measure temperatures, and keep a record of their data to help them understand how weather changes over time.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
5 min	Synopsis: The teacher engages students in reviewing their outdoor weather and temperature observations from the previous lesson. Main science idea(s): • Weather is what it looks like and feels like outside. We can describe the weather outside as sunny or cloudy, windy or calm, hot or cold, rainy, snowy, or dry. We can also find out how hot or cold it is outside by measuring the temperature with a thermometer.	Summarize key science ideas. Ask questions to elicit student ideas and predictions.	Show slides 1 and 2. During our last lesson, we went outside and observed our weather. Who can share with us something you observed about the weather when we went outside? Use the sentence starter "I observed that" What else did you observe while we were outside?	Sample dialogue: I observed that it was hot! I was sweating! We used a thermometer to measure the temperature outside, and it showed that it was hot. I observed that it was mostly cloudy. I saw more clouds than Sun in the sky.	How could you tell it was hot? How did you know it was mostly cloudy? What did you use to observe those clouds?
				i used my cycs.	Did you observe

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			So when we went outside last time, we observed that it was [mostly cloudy with no breeze or rain]. What did we find out when we measured the temperature with the thermometer? That's right! It was a [hot] day! Today we're going to measure the outside temperature again and record it on our class weather calendar. We're also going to record other things on our calendar that we observe about today's weather, like whether it's sunny or cloudy or rainy or windy.	No. There wasn't any rain. No. There wasn't any breeze or wind. It was hot! The thermometer said that it was 80 degrees outside!	or feel any rain? Did you observe or feel any wind?
2 min	Synopsis: The teacher introduces the focus question, <i>How can we keep track of the weather?</i> Then students share what they think this means.	Set the purpose with a focus question or goal statement.	Show slide 3. The focus question we'll be thinking about in this lesson is How can we keep track of the weather? NOTE TO TEACHER: Write the focus question on the board and draw a box around it. Then have students repeat the question aloud with you as you point to each word.		

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		Highlight key science ideas and focus question throughout.	What do you think it means to keep track of something? Any other ideas? Show slide 4. When we talk about keeping track of the weather, it means that we'll find a way to remember what the weather is like from day to day. Remember last time when we shaded in the red bar on the thermometer on our class calendar? That's one way of keeping track of something. Shading in the red bar will help us remember what the temperature was on that day. So today we'll use temperature and weather stickers to help us remember what the weather outside is like.	It could mean knowing where things are. It could mean writing something down. Maybe it means drawing a picture of something?	
8 min	Setup for Activity Synopsis: The teacher	Select content	Show slide 5. We've been using a lot of different words to		

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	reviews the words and pictures on the class weather chart, and students use the words to describe what the weather can be like outside. Then the teacher reviews how to measure the temperature outside using a thermometer. Main science ideas(:) • Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. • We can observe the weather and use specific words to describe it. We can also find out how hot or cold it is outside by measuring the temperature with a thermometer.	representations and models matched to the learning goal and engage students in their use.	words on our clar of these words to like outside? ELL support: D could reinforce the having ELL studictures for each NOTE TO TEA descriptions, point weather chart from simple picture you could also point weather word was suggest new weather words. You could also point weather words in word listed on the Add the heading the third column blank until later thermometer dur temperature (hot	ouring the lesson phe weather words ents draw and lab word in their science to the words on the words and all (from handout ther words, add to diagrams or iconould also have stated to the words and their science note their science note to the words and their science note their science note that the words and their science note their science note their science note that the lesson, exciting this discussion	preview, you on the chart by bel their own ence notebooks. Ints share their the class on point to the attention with the word. You pictures on the 0.3). If students them to the chart as to illustrate addents draw and bebooks for each easure This?" for leave the column ept for adding an to show how wired.	It can be sunny or cloudy. We can observe the sky with our eyes. You drew a picture of the Sun. It can be rainy. Sometimes it can be windy or breezy.	How can we tell if it's sunny or cloudy? What picture did I draw on the chart to show it's sunny? Who can use another word on our chart to describe the weather? How would you describe weather that we can feel on our faces or arms? What did I draw on the chart to show that it's windy outside?
			Weather	icon.]	This?	Wavy lines.	What else could

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			Sunny Cloudy Snowy Rainy Hot/Cold Thermometer Windy/Calm	A tree with some leaves blowing away from it.	we draw on the chart to show that it's windy? What weather words can we use to describe the
			How did we measure the temperature outside? That's right! I'll draw a picture of a thermometer on our class weather chart for "hot or cold" and write "thermometer" in the third column to show that's how we measure temperature.	It can be hot or cold! We measured the temperature with a thermometer.	temperature?
		Summarize key	Now let's look at our weather calendar. Who can tell us what our temperature was last time?	The thermometer showed that it was [hot]. We shaded in the thermometer on the calendar to show it was [hot].	What did we do to show this on our calendar?
		science ideas.	So weather is what it looks like and feels like outside, and we can describe our weather observations using different words. We can also		

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			use a thermometer to measure temperatures.		
			Show slide 6.		
		Highlight key science ideas and focus	Now let's think about today's focus question, <i>How</i> can we keep track of the weather?		
		question throughout.	When we measure something like temperature, that means we count something, right?		
		Summarize key science ideas.	A thermometer has numbers on it to show the degrees of temperature, and that's what we count. Last time, we saw that the temperature outside was [80] degrees, so we shaded in the thermometer on our weather calendar to help us keep track of the temperature.		
			NOTE TO TEACHER: Remind students that degrees are used to measure temperature in the same way pounds are used to measure weight or feet and inches are used to measure length.		
			Another way to keep track of the weather is to record our observations on the class weather calendar using temperature and weather stickers. That's what we'll do today and over the next few months to help us remember what the weather was like from day to day.		
8 min	Activity Synopsis: The teacher takes the class outside to observe the weather and	Select activities that are matched to the learning goal.	NOTE TO TEACHER: Organize the class to go outside and observe the weather. Choose a different student each day to observe the outdoor thermometer and then mark the reading on the demonstration thermometer. You may also want to		

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	measure the temperature with a thermometer. Main science ideas: • Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. • We can observe the weather and measure the temperature with a thermometer every day. We can also use symbols and a calendar to keep track of the weather from day to day.		have different students be responsible for remembering whether it's sunny, cloudy, rainy, or windy outside. When students take a temperature reading, make sure they hold the outdoor thermometer by the edges so the heat from their hands doesn't affect the reading. As students observe the weather, ask the following questions. What do you observe about the weather today? How would you describe it using our weather words? What else do you observe about the weather today? NOTE TO TEACHER: Consider having students share their observations with a partner using weather words.	Sample dialogue: It's cooler today. My skin doesn't feel as hot as it did yesterday. I can see the Sun in the sky. It's a little cloudy, too. Mostly sunny. Because there are only a few clouds in the sky. It's not raining.	How do you know that it's cooler today? Do you think it's mostly cloudy or mostly sunny today? How do you know that?

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				I don't see or feel any rain.	And what do you observe or feel that tells you it isn't raining?
				There isn't any wind today.	What do you observe or feel that tells you it isn't windy?
				The trees aren't blowing.	ish t windy?
			Now let's look at the temperature on our outdoor	I don't feel any breeze on my skin.	
			thermometer Would our lead weather investigator come up and point to the top of the red bar on the thermometer?		
			What numbers on the thermometer are next to the top of the red bar?	There's a [seven] and a [five].	
			So the number on our thermometer is [75]. This means that today's temperature is [75] degrees.		
			So we'll have our lead weather investigation move the red ribbon on our demonstration thermometer to [75] degrees.		
			Now let's go back inside and record our		

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			observations on our class weather calendar.		
7 min	Synopsis: Students record their outdoor temperature reading on the class weather calendar and use temperature and weather stickers to record the conditions they observed (Sun, clouds, rain, wind). Then they compare their temperature readings over the past two day and set up their own weekly weather charts. Main science idea(s): • Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. • We can observe the weather and measure the temperature with a thermometer every day. We can also use symbols and a calendar to keep track of the weather from day to day.	Select content representations and models matched to the learning goal and engage students in their use. Engage students in communicating in scientific ways. Engage students in analyzing and interpreting data and observations.	NOTE TO TEACHER: When students return to class, have them gather around the class weather calendar. Let's gather over here by our class weather calendar. Today we're going to use temperature and weather stickers to record our observations on the calendar. NOTE TO TEACHER: Show students the temperature and weather stickers (from handouts 0.4 and 0.5) that they'll use to record their weather observations on the class weather calendar. Make sure to explain that instead of shading in the thermometer on the calendar to show the temperature, they'll use stickers to show whether the temperature is hot, warm, cool, or cold. Show slide 7. First, let's talk about our weather observations. Make sure to use the words on our class weather chart or on our weather wall. Who can tell me what it looked like and felt like outside today? Was it sunny? So which of these weather stickers should we put on our class calendar to show that it's [sunny] today?	Sample dialogue: It was mostly sunny outside.	

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			Can you come up and put the [Sun] sticker on our calendar? Make sure to put it in the box for today. Next, let's talk about clouds. Were there any clouds in the sky today? So do you think we need to put the cloud sticker on our calendar?	The Sun sticker. There were only a few clouds in the sky. No, because it wasn't mostly cloudy today.	
			What about rain? So do we need to put a rain sticker on our calendar for today?	There was no rain today.	Does anyone agree or disagree?
			What about wind? So do we need to put a wind sticker on our calendar today?	The trees were barely moving, so it wasn't really windy today. No.	
			What's the last thing we need to record on our weather calendar? Let's look at our demonstration thermometer so we can choose the right thermometer sticker for our weather calendar.	The temperature!	

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			Where was the top of the red bar on our outdoor thermometer?	At 75 degrees.	
			So it was [75] degrees out today. Look at the colors and labels on our thermometer weather card. Is [75] degrees hot or warm?	It's warm.	
			Can you come up and put a [yellow] thermometer sticker on our calendar to show that the temperature is [warm] today?		
			Now let's look at the temperature we shaded in last time on our calendar. What number does the top of our red bar line up with on the thermometer?	The eight and the	
			So our temperature yesterday was [80] degrees. Is that hot or warm.	zero. It's hot.	
			So we can remember that the temperature was <i>[hot]</i> last time because we shaded in the thermometer on our calendar. And that helps us compare yesterday's temperature with today's temperature.		
			Can I have a volunteer come up and put a [red] sticker on our calendar for yesterday to show that the temperature was [hot]?		
			Thank you.		
		Highlight key science ideas and focus	So when we look at the temperatures we've recorded on our calendar so far, we can already see a change in our weather.		

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		question throughout.	What was the temperature yesterday? What does the color tell us? And what is today's temperature? Is it hot or warm? So how did the temperature change from yesterday to today? That's right! The temperature changed from [hot] to [warm]. Now we've recorded all of our weather	Sample responses: It was hot. It's warm. It went from hot to warm.	
			observations for today on our class calendar. Over the next few months, we'll keep track of what happens with our weather and temperature each day by putting temperature and weather stickers on our calendar. Next, you're going to set up your own weekly weather chart so you can keep a record of the weather too. NOTE TO TEACHER: Distribute four or five copies of handout 0.6 (Weekly Weather Chart) to each student and have students paste it into their science notebooks. Then have students circle the		
8 min	Synthesize/Summarize Today's Lesson	Highlight key	icons on the handout to record the weather for each day. Show slide 8. Today's focus question is How can we keep track		

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	Synopsis: The teacher revisits the focus question. Then students add temperature and weather stickers to their weekly weather charts to reflect the observations they recorded on their class weather calendar. Afterward, they give a brief weather report for the day. Main science idea(s): • Weather is what it looks like and feels like outside. Weather includes temperatures, sunlight, clouds, rain or snow, and wind. • We can use our eyes to observe the weather outside, and we can use a thermometer to measure temperatures. We can also use symbols and a calendar to keep track of the weather from day to day.	science ideas and focus question throughout. Select content representations and models matched to the learning goal and engage students in their use.	What are two ways we can keep track of the weather? What helps us keep track of the temperature? And what helps us keep track of our other weather observations? What did we put on our weather calendar today to help us remember what the weather was like outside? Now that you have your own weekly weather charts to help you keep track of the weather, let's circle the icons to record our weather observations so they match our class weather calendar. Turn to your first weekly weather chart. NOTE TO TEACHER: Demonstrate for students how to circle the icons on their weekly weather charts (handout 0.6). What did we decide about whether it's sunny or cloudy today? Which weather sticker did we put on the calendar to show that it's [sunny] today? So you can circle the [Sun] icon on your weather chart for today.	We can record the temperature on our class weather calendar and our weekly weather charts. We put stickers on the calendar! Sample dialogue: We said it's mostly sunny. The Sun sticker.	

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		Engage students in using and applying new science ideas in a variety of ways and contexts.	What did we decide about whether it's rainy or windy today? So do you need to circle those icons on your weather chart? And who remembers what today's temperature is? Is that hot or warm? Which thermometer icon do you need to circle on your chart? So go ahead and circle the [yellow] thermometer icon on your chart. Now we've recorded today's weather on our class calendar and on our weekly weather charts! Show slide 9. Next, let's think about what we could tell other people about today's weather. If you were a weather reporter on TV, what words would you use to describe today's weather? Turn and Talk: Turn to an elbow partner and talk about what the weather report you'd give. What would you tell people about today's weather? Use our weather words, and be ready to share your weather report with the class.	It isn't rainy or windy today. No. It's 75 degrees. It's warm. The yellow thermometer icon for warm.	

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			Whole-class share-out: So who would like to share your weather report for today? What would you tell people about today's weather?		
			What else could you tell people if you were a TV weather reporter?	Sample dialogue: We'd say that it's mostly sunny today.	
			What would you say about the temperature? You did an excellent job reporting today's	We'd tell people that there isn't any rain or wind today. We'd tell people that it's 75 degrees today, and it's warm.	
1 min	Link to Novt Losson		weather!		
1 min	Synopsis: The teacher reminds students that every day over the next month, they'll observe the weather outside, measure temperatures, and keep a record of their data to help them understand how weather changes over time.	Link science ideas to other science ideas.	Remember that every day for the next few months, we'll work together to decide what the weather is like outside. We'll observe the weather and measure the temperature. Then we'll record this information on our class weather calendar and our weekly weather charts so we can keep track of how the weather changes from day to day. Each day, I'll ask one of you to be our lead weather investigator. You'll be responsible for measuring the temperature outside and recording it on our class weather calendar, just like a weather person on TV! I'll ask others to remember what		

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			the weather was like so we can add the right temperature and weather stickers to our calendar. NOTE TO TEACHER: You can use your own procedure to collect the weather data, but the data must be collected at the same time each day using a consistent method. It must also include different conditions, such as sunny or cloudy, rainy or dry, and windy or calm, as well as the temperature reading on the thermometer (see next lesson). This is important so that students will have comparison data to use later in the lesson series. When you've finished collecting weather for each month, store the classroom calendars in a safe place to use again when the lesson series begins. It will be helpful to have a variety of months to choose from during the lesson series, so don't get rid of the calendar data until the lesson series is complete.		