

Appendix B

Module Storyline

Anchor Phenomenon: Cliff Dwellings at Mesa Verde

Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

Conceptual Overview

Weather affects people and their surroundings.

1. Weather is the combination of sunlight, clouds, wind, rain and snow, and temperature in a particular place at a particular time. Different parts of weather have different effects on people and their surroundings.
2. Analyzing weather data can reveal patterns.
3. Meteorologists can predict severe weather so that communities can prepare.

Focus Content Standards

- 1.5A Classify objects by observable properties such as larger and smaller, heavier and lighter, shape, color, and texture.
- 1.5B Predict and identify changes in materials caused by heating and cooling.
- 1.6A Identify and discuss how different forms of energy such as light, thermal, and sound are important to everyday life.

1.6C	Demonstrate and record the ways that objects can move such as in a straight line, zig zag, up and down, back and forth, round and round, and fast and slow.
1.8A	Record weather information, including relative temperature such as hot or cold, clear or cloudy, calm or windy, and rainy or icy.
1.8B	Observe and record changes in the appearance of objects in the sky such as the Moon and stars, including the Sun.
1.8C	Identify characteristics of the seasons of the year and day and night.
1.8D	Demonstrate that air is all around us and observe that wind is moving air.

Concept 1: Parts of Weather (Lessons 1–11)
Focus Question: What is weather?

Lessons 1–2

<p>Phenomenon Question: How could people who lived at Mesa Verde protect themselves from the weather?</p> <p>Phenomenon: Shelter at Mesa Verde</p> <p>Lesson Set Objective: Students develop an anchor model of a cliff dwelling to compare and describe how people inside or outside the dwelling may have experienced different kinds of weather.</p> <p>Knowledge Statement: Shelters can protect people from the weather.</p>	<p>Wonder:* We begin by looking at a picture of a tent in the rain. We share what we wonder about the picture, how we think people use tents, and what weather we see.</p> <p>Then we build a tent using blankets, boxes, and sheets. We go inside the tent and explore, while thinking about how we feel inside the tent compared with how we feel outside the tent.</p> <p>Organize: Next, we compare the weather at our school today with the weather in the picture of the tent and consider the kind of weather in which a tent would be more helpful. We learn that a tent is a kind of shelter and that shelters protect people from the weather. We then discuss other kinds of shelters that people use to protect themselves from the weather.</p> <p>Our teacher shows us a picture of a cliff and tells us that the picture is of a place called Mesa Verde. We share where we think we would go if we were at Mesa Verde and it started to rain.</p> <p>Wonder: Then we look at another picture and wonder whether it shows the same place as the first picture. It looks like there is a building in the cliff. Our teacher confirms that the pictures show the same place.</p> <p>Next, our teacher shows us a painting of a lot of little homes in a cliff, and we listen to a read aloud about the Ancestral Pueblo people who lived at Mesa Verde long ago. We realize there is still a lot to learn. Our teacher explains that people today know about the Ancestral Pueblo people who lived at Mesa Verde because scientists,</p>
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* The purple headings indicate the relevant content stage within the content learning cycle. See the Implementation Guide for more information on the content learning cycle.



who study the world around them, have studied Mesa Verde’s cliff dwellings. We think about whether we would prefer to be in a cliff dwelling or in a tent if it were raining outside. We are not able to answer the question yet because there is much more to figure out about cliff dwellings.

Organize: We make a model of a Mesa Verde cliff dwelling, which we will use to help us learn more about the real cliff dwellings at Mesa Verde. We work as a class to decide which details and parts to include, and our teacher adds each item to the anchor model.



Mesa Verde Cliff Dwellings

The cliff dwellings at Mesa Verde protected the Ancestral Pueblo people from the weather.

We think the cliff dwellings may have protected people at Mesa Verde from the weather, but we aren’t sure how. Our teacher shares that we will explore the purpose of cliff dwellings as we answer the Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

Lesson 3

Phenomenon Question: What can we do outside today?

Phenomenon: Parts of local weather

Lesson Set Objective: Students compare drawings of today’s weather and ask questions about weather that the class uses to build a driving question board.

Knowledge Statement: Weather has

Organize: We begin by going outside and drawing a picture that shows us doing an activity in today’s weather.

Reveal: Then our teacher asks us to work in groups to sort pictures that show various outdoor activities into two categories: activities we could do in today’s weather and activities we could not do in today’s weather. We share with the class the reasons that we could or could not do each activity in today’s weather.

Wonder/Organize: Next, we return to the picture we drew at the beginning of the lesson and share our drawing with a partner. We ask our partner a question about their drawing. Our teacher tells us that asking questions helps scientists figure out what else they need to learn about. Our teacher records our questions and uses them as well as other questions we have about weather to create a driving question board. At the top of the driving question

many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature.

board, our teacher writes the Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

Unanswered Questions

How can it be cool even when it is sunny?	How do people know what tomorrow's weather will be like?	Where does rain come from?	Why doesn't it snow here?
Why does it feel cool outside today, but yesterday it felt warm?	Why did my partner say it was warm, but I said it was cold?	Is a thunderstorm part of the weather?	Why didn't my partner and I draw the same number of clouds?

Related Phenomena:

The roof over the park picnic tables protects me from rain.	Our school keeps us cool when it is warm outside.
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Distill: We didn't know it, but our teacher had been recording weather words that we used when we discussed how we sorted the pictures of outdoor activities earlier in the lesson. We sort the recorded words into four groups: how cloudy or sunny it is, how windy it is, whether it is raining or snowing, and how warm or cool it is. Our teacher adds symbols that we will use to describe the weather throughout the module. We begin an anchor chart to summarize our learning.

Weather
<p>Parts of Weather</p> <ul style="list-style-type: none"> Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature.

Lessons 4–7

Phenomenon Question: How can we describe the weather?

Phenomenon: Describing local weather

Lesson Set Objective: Students observe and sort photographs to compare and describe cloud cover and snow or rain in the same place at different times.

Knowledge Statement: People can observe or measure cloud cover, rain and snow, temperature, and wind to describe the weather.

Organize: We begin by drawing a picture in our Science Logbooks that shows today’s weather. We share what we draw and realize that we didn’t all draw the weather the same way. We realize that it would be helpful to have common language for describing the weather.

Reveal: Our teacher asks us to work in groups to sort pictures by cloud cover. We sort the pictures and describe the different amounts of cloud cover as sunny, partly sunny, and cloudy. Then we sort the same pictures by looking at rain or snow. We sort the pictures into three categories: not raining or snowing, raining, and snowing. We create a parts of weather chart to record how we describe different parts of weather, and we add a symbol for each description.

Distill: Next, we compare the picture we drew of today’s weather with the picture we drew of the weather during the previous lesson and notice that the weather is not always the same in a place. We add our new understanding to the anchor chart.

Weather
<p>Parts of Weather</p> <ul style="list-style-type: none"> • Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature. • The weather in a place is not the same all the time.

Our teacher shows us a weather calendar and tells us that we will explore how the weather changes over time by recording information about the weather every day. On the weather calendar, we record our observations of today’s weather, including the amount of cloud cover and whether it is raining or snowing. We notice that we are not sure how to describe the temperature or wind.

Wonder/Organize: Our teacher asks a couple of students to each place a finger in a cup of water—hot water for one student and cold for the other. Both students tell the class how their water feels. Then the two students together place their finger in a third cup of water. Even though they are both touching the same water, they describe it in different ways. We realize it would be helpful to describe temperature in the same way. Our teacher shows us a thermometer. We discuss where we have seen a thermometer before, and we observe different parts of it, including the red line inside.

Reveal: We put a thermometer in two different cups of water and watch the red line move up or down. The color bands on the side of the thermometer show us what the temperature is. We draw red lines on thermometer images in our Science Logbooks to show where the red line stops for each cup. Then we circle the color bands that represent the temperatures of the two cups of water.

Distill: We act out what the thermometer’s red line did when we put the thermometer in each cup. The red line moved up when we put the thermometer in warmer water and moved down when we put it in cooler water. We act out what we think the red line would do if we were measuring the temperature of other things.

Then we act out what we think the thermometer’s red line would do if we were outside. We see that everyone acted out the temperature in different ways. Our teacher gives us words to describe temperature: very hot, hot, warm, cool, cold, and very cold. We add a picture of a color-coded thermometer with these words to our parts of weather chart. We use a thermometer to measure the outdoor temperature, and we add today’s temperature to the weather calendar.

Organize: Next, our teacher shows us videos of flags moving in the wind, and we act out how the flag moves in each video. We don’t all act out the flags the same way. Our teacher shows us the weather calendar, and we notice that we do not have a way to describe the wind. We decide that we need to make a tool to measure how windy it is so we can record wind descriptions on the weather calendar.

Reveal: We work with a partner to test different materials that we can use to create our tool. We explore how a little wind from a fan and a lot of wind from a hair dryer make the different materials move, and we record observations in our Science Logbook. We choose materials for our tool that move differently depending on whether the materials are in front of the fan or the hair dryer.

Distill: Our teacher tells us that engineers are people who use their creativity and science knowledge to solve problems and that engineers follow a set of steps called the engineering design process. Our teacher explains that we are following the steps of the engineering design process to make our wind measuring tool. We reflect on what we did in the lesson and discuss how we went through the Ask, Imagine, and Plan stages.

Reveal: Next, we work with our partner to build and test our wind measuring tool. If our tool doesn’t show the difference between a little wind and a lot of wind, we make changes and test again. We then share how our tool measures the wind and what we did to make our tool better. We reflect on how we used the Create, Improve, and Share stages of the engineering design process. Then we work as a class, by offering suggestions, to make a class wind measuring tool that we can use every day.

Distill: We decide to describe wind as not windy, a little windy, and very windy, and we add a symbol for each

	<p>description to our parts of weather chart. We describe today’s wind to complete a daily weather report, and we record today’s weather on the weather calendar. Our teacher shows us a temperature log and a weather log that we will also use each day to keep track of the weather.</p>
<p>Lessons 8–9</p>	
<p>Phenomenon Question: How does the weather affect us when we play at the playground?</p> <p>Phenomenon: Effects of weather on playground materials</p> <p>Lesson Set Objective: Students investigate how sunlight, wind, and rain affect materials found at a playground, and they distill that some materials change while others stay the same. Students then ask questions to guide an investigation of the warming effect of sunlight on Earth’s surface.</p> <p>Knowledge Statement: Sunlight, wind, and rain can affect people and their surroundings.</p>	<p>Wonder: We begin by observing a picture of a playground. We notice that the sky is cloudy and the ground is wet.</p> <p>Organize: We share what we think is the best weather for playing outside and think about how the playground might look in that weather.</p> <p>Reveal: Then our teacher gives us a pan containing soil, rocks, and a plant. We also get items that we can use to model wind and rain to investigate how those parts of weather affect the materials in the pan. We see that the wind makes some materials move. We also notice that rain makes everything wet and turns the dirt into mud. Next, our teacher shows us rocks that are in sunlight and rocks that are not in sunlight. We touch both groups of rocks at the same time and notice that the rocks that are in sunlight are warmer than the rocks that are not in sunlight. We think that sunlight makes the rocks warmer. We update the anchor chart with what we noticed during our investigations.</p> <div data-bbox="716 834 1864 1130" style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Weather</p> <hr/> <p>Parts of Weather</p> <ul style="list-style-type: none"> • Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature. • The weather in a place is not the same all the time. • Sunlight, wind, and rain can affect the things around us. </div> <p>Distill: We use what we observed during the investigations to consider how sunlight, wind, and rain affect our playground.</p> <p>Organize: Next, we observe a picture of a different playground and notice that the playground has a roof. We ask questions about why there is a roof over the playground. Our teacher tells us that the playground in the picture is in a place that can get very hot. We work with a partner to ask a weather-related question about the playground. We agree on a question for our next investigation: Does it feel cooler in the shade than it does in the sunlight? We</p>



decide to go to our school playground to investigate.

Reveal: We go outside and move around the playground to explore where we feel warmest and where we feel coolest. We think it feels warmest in the sunlight and coolest in the shade. We don't know for sure, so we measure the temperature of a cup of water in the sunlight and a cup of water in the shade to confirm that it is warmer in the sunny area than in the shady area.

Distill: We look at the picture of the covered playground again and discuss why the playground has a roof. We think it is because people feel warmer in the sunlight, and they can cool down by going in the shade. We update the anchor chart with our new learning.

Weather

Parts of Weather

- Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature.
- The weather in a place is not the same all the time.
- Sunlight, wind, and rain can affect the things around us.
- We feel cooler in the shade because the sunlight is blocked.

Lessons 10–11

Phenomenon Question: What is the weather like at Mesa Verde?

Phenomenon: Effects of weather at Mesa Verde

Lesson Set Objective: Students apply their understanding of the warming effect of sunlight to compare the temperature on top of a mesa with the temperature inside a cliff dwelling and determine that on a hot day, people at Mesa Verde would have been warmer

Wonder: We reflect on what we have learned about how the weather affects us and our surroundings, and we think about how we can protect ourselves from the weather.

Organize: Our teacher plays three videos, each showing a different home. We share how each home is different from the others and also share whether we think the homes protect people from the weather.

Reveal: Our teacher divides the class into groups and gives each group a poster showing a different home. Our group describes the weather in our picture. Then we decide whether the home on our poster could protect people from different parts of weather.

Distill: We participate in a Gallery Walk to observe and compare posters. We look for similarities and differences between the homes on the posters. We notice that not all of the homes protect people from the same parts of weather. This is because the homes are in different places and the weather is not the same everywhere. We



on top of the mesa than in a cliff dwelling.

Knowledge Statement: Weather is the combination of sunlight, clouds, wind, rain and snow, and temperature in a particular place at a particular time. Different parts of weather have different effects on people and their surroundings.

consider whether our school is a shelter, and we identify the parts of weather it protects us from.

Organize: Next, we go outside to observe and measure the weather. We record our observations and measurements on a weather recording sheet and return to the classroom.

Know: We begin the Conceptual Checkpoint by using a webcam to observe the weather at Mesa Verde. We use the webcam and an online resource to describe the weather at Mesa Verde, and we record our descriptions on a weather recording sheet. We use the weather recording sheets for Mesa Verde and our school’s location to confirm that the weather can be different in different places. We then compare the temperature where we are with the temperature at Mesa Verde to identify which place is warmer. Next, we look at the painting of Mesa Verde from an earlier lesson. Our teacher shares additional information about the weather at Mesa Verde and explains that people at Mesa Verde spent time inside the cliff dwellings and grew food on top of the mesa. We return to the anchor model. Our teacher places one wooden doll on top of the mesa and two inside the cliff dwelling and uses a flashlight to model sunlight. We determine that a person on top of the mesa would feel warmer on a hot, sunny day than a person inside the cliff dwelling.

We model the other parts of weather to consider which parts of the cliff dwelling protected people from wind and rain and add labels to the anchor model to reflect our new learning.

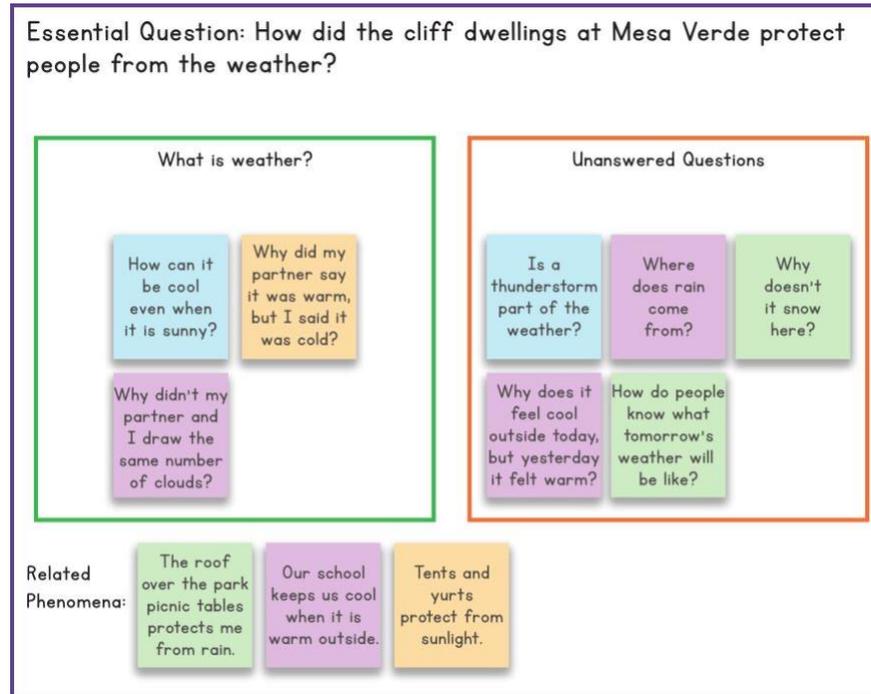


Mesa Verde Cliff Dwellings

The cliff dwellings at Mesa Verde protected the Ancestral Pueblo people from the weather. The top and sides of the cliff dwellings protected people from sunlight, wind, and rain. The rooms inside blocked the wind.

We return to the driving question board to determine which questions we can now answer. Our teacher reads each question aloud, and we sort the questions into two columns: questions that we can now answer and questions that we cannot yet answer. After we sort all the questions, we think about the similarities among the questions that we

can now answer. We notice that these questions all have to do with what weather is and how to describe it. Our teacher then posts the Concept 1 Focus Question: What is weather? We use what we have learned so far to think about how we can answer this question. We share our ideas with the class.



Application of Concepts (Lessons 12–16): Engineering Challenge

Lessons 12–16 (Engineering Challenge)

Phenomenon Question: How can we help archaeologists feel cooler when they work?

Phenomenon: Engineering a shelter to

Wonder: We begin by watching a video that shows people working outside. Our teacher tells us that the people in the video are archaeologists—scientists who study people who lived long ago. We wonder about the effects of warm, sunny weather on archaeologists working outside at Mesa Verde.

Organize: We begin the engineering design process with the Ask stage. We identify the archaeologists' problem and decide to make a model of a shelter to create shade for them. We think about how we will know whether the

protect archaeologists from sunlight

Lesson Set Objective: Students define a problem and build a model of a shelter that would protect archaeologists working at a dig site from the warming effects of sunlight by making them feel cooler.

Knowledge Statement: People can use the engineering design process to create shelters for shade.

shelter works and realize that we will need to test our shelter to determine whether it would protect the archaeologists from sunlight.

Reveal: Next, we move to the Imagine stage to investigate different materials and further brainstorm ideas for our solution. Our teacher introduces the available materials and asks us to think about how we can use these materials to create a model shelter. We test the materials by using a flashlight to determine which ones create more shade.

Then we move to the Plan stage. We determine which materials we want to use and draw a detailed diagram of our model shelter.

During the Create stage, we work in pairs to use our selected materials to make our shelter. After we create the shelter, we test our work by using a flashlight to model sunlight and consider whether our shelter is successful. During the Improve stage, we think about the results of the test, make improvements to our shelter, and retest our work. We consider whether our improvements make the shelter better at creating shade.

Distill: In the Share stage, we present our work and learning to the class. We also reflect on other pairs’ shelters to notice that, although each pair created a different shelter, we all used materials to create a shelter to help protect archaeologists from sunlight. We reflect on the Create and Improve stages of the engineering design process by discussing how our shelters would help the archaeologists. Then we draw pictures of our model shelters to share our ideas.

Know: Our teacher asks us to share examples of other shelters and then shows us a picture of a building called Casa Batlló. We talk about the building and consider whether it was designed only to protect people from the weather. We don’t think the building’s only purpose is to protect people because it looks really fancy. Our teacher tells us that the building is a work of art and that people can visit it like a museum.

Concept 2: Weather Data (Lessons 17–21)

Focus Question: What does weather data reveal?

Lessons 17–20

Phenomenon Question: What can we find out by looking at weather data?

Phenomenon: Analyzing local weather

Wonder: We think about archaeologists working at a dig site. We share whether we think the archaeologists need a shelter most in the morning, in the afternoon, or at night.

Organize: Next, we look at three pictures, each showing people at different times of the day. We use our

data

Lesson Set Objective: Students use counting and numbers to look for patterns in weather data.

Knowledge Statement: Weather data collected over time may reveal patterns.

observations, as well as our experiences, to select the picture that shows the time of day when we would be most likely to need a jacket. Then we select the picture that shows the time of day when we would be most likely to need clothes for warmer weather, such as short sleeves or shorts. We notice that at different times of day, we need different clothes to feel comfortable. That makes us think that the temperature might change throughout the day. We decide to look at temperature data to figure out how the temperature changes throughout the day.

Reveal: Our teacher shows us a chart with local morning, afternoon, and night temperatures for five recent days. We look at the chart and share what we notice. Then our teacher uses the demonstration thermometer to show us the morning, afternoon, and night temperatures for each day. We act out how the temperature changed throughout each day. We see that it is usually cooler in the morning and at night and warmer in the afternoon. Our teacher tells us that we noticed a pattern—information that repeats and allows us to figure out what might happen next. We conclude that the temperature tomorrow will be cooler in the morning, warmer in the afternoon, and cooler again at night because the temperature almost always follows this pattern. We add our new learning to the anchor chart.

Weather

Parts of Weather

- Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature.
- The weather in a place is not the same all the time.
- Sunlight, wind, and rain can affect the things around us.
- We feel cooler in the shade because the sunlight is blocked.

Weather Data

- The way the temperature changes during the day is a pattern.

Distill: We revisit the pictures of different times of day and identify the picture that shows the warmest part of the day, the afternoon. We consider why it is helpful to know that the weather changes throughout the day: This knowledge can help us plan our activities and choose our clothes.

Organize: Next, our teacher shows us a picture of our class from the beginning of the school year. We compare the clothes we are wearing today with the clothes we are wearing in the picture. We already know how the temperature changes throughout a single day. Now we wonder about how the temperature changes over longer

periods of time.

Reveal: We look at the weather calendar. Our teacher has covered up most of the calendar so that we can only see weather data for a few days in a row. We notice that those days were all the same temperature. We wonder whether we can use that data to predict the next day's temperature. Our teacher uncovers the rest of the weather calendar, and we see that the next day had a different temperature from the days we had been looking at. We conclude that when the temperature repeats for a few days in a row, that is not a pattern because we cannot use it to make predictions. We decide that we should collect more data to look for patterns in temperature throughout the year.

Next, we use the color squares on the weather calendar from the first month of school to figure out which temperature happened most often during the month. We work together to sort the color squares and arrange them in rows by color. We count the number of squares that represent each temperature, and then we work with a partner to count linking cubes that show the same information.

Distill: We use the linking cubes to figure out which temperature we recorded most often throughout the month. Then our class works together to develop a monthly weather poster that shows the temperature we recorded most often. Our teacher tells us we will use monthly weather posters to help us look for patterns in temperature throughout the school year. We wonder whether there are patterns in cloud cover or rainy days.

Organize: Our teacher shows us three pictures of the same place. In all the pictures, the weather is cloudy. Our teacher tells us that the pictures were taken at the same time each day for three days in a row. We share that we are not sure whether we can predict the cloud cover for the fourth day, and we need more information to determine whether there is a pattern.

Reveal: We revisit the weather calendar from the first month of school and look for examples of when a part of weather was the same for three or more days in a row. We find days in a row that had a repeating kind of weather, but after a few days the weather changed. We think we need more information to determine whether there are patterns in our weather data, and our teacher tells us we will use our class weather logs each month to look for patterns throughout the year. We look at the class weather log for the first month of school and determine as a class which description of cloud cover we recorded most often for the month. Next, we work with a partner to count the number of rainy and snowy days and to determine which wind description the class recorded most often.

Distill: We update the monthly weather poster to include the descriptions of cloud cover, rain, snow, and wind that we recorded most often during the month. We reflect on why we record weather data each day and determine that the reason is so that we can look for patterns.

We revisit the pictures showing three days of cloudy skies, and we think that we are not able to predict the cloud cover for the fourth day. Our teacher reveals that it was sunny on the fourth day at the same place and time, confirming that it is not possible to predict cloud cover by looking at a few days of weather data.

Wonder: We think about what we would need to know if we were planning a party outside for the upcoming weekend. We look at our local weather forecast and think about how scientists figure out what the weather will be in the future. We don't think they use the same tools we use to measure the weather.

Reveal: Our teacher shows us a video of a meteorologist, and we discuss how the tools meteorologists use provide more data than the ones we use. We find out that meteorologists look for patterns in their data to predict what the weather will be like in the future.

We think that meteorologists share weather forecasts with people so that people can make plans, decide how to dress, or choose to stay inside. Our teacher divides the class into groups and provides each group with a weather forecast. All the groups receive weather forecasts for the same days, but each group has a forecast for a different city. As a group, we plan a presentation about our forecast, and then we share it with the class.

Distill: We revisit the forecast from the beginning of the lesson and decide which weekend day would be better for a party outside. Then we add our new understandings to the anchor chart.

Weather
<p>Parts of Weather</p> <ul style="list-style-type: none"> • Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature. • The weather in a place is not the same all the time. • Sunlight, wind, and rain can affect the things around us. • We feel cooler in the shade because the sunlight is blocked.
<p>Weather Data</p> <ul style="list-style-type: none"> • The way the temperature changes during the day is a pattern. • Meteorologists use patterns to make predictions about future weather. • Meteorologists share weather forecasts with us.

Lesson 21

Phenomenon Question: What can we find out about Mesa Verde by looking at weather data?

Phenomenon: Analyzing Mesa Verde temperature data

Lesson Set Objective: Students observe temperature data to compare morning, afternoon, and night temperatures at Mesa Verde and notice patterns in daily temperature changes.

Knowledge Statement: Analyzing weather data can reveal patterns.

Organize: Our teacher displays the painting of Mesa Verde from the beginning of the module. We think about where we would want to play at different times of day. We notice where the people in the painting are during the day, and we think about where they would be at night.

Next, our teacher shows us pictures of a cliff dwelling at Mesa Verde in the morning, in the afternoon, and at night. Our teacher reads aloud information about what it was like to live at Mesa Verde when the Ancestral Pueblo people lived there. Specifically, we learn that the people had to climb to the top of the mesa to grow their food. We share which time of day we would prefer to work on top of the mesa.

Know: We begin the Conceptual Checkpoint by looking at morning temperatures from Mesa Verde. We sort linking cubes representing the temperatures by color, and we work as a class to count the green cubes. Then we work together in our groups to count the blue cubes and the yellow cubes. Next, we count the linking cubes that represent the afternoon and night temperatures. We work independently to record the most common temperature for each time of day. Our teacher asks us to look at the temperatures we recorded and share the time of day we would want to play outside.

Then our teacher shows us the morning, afternoon, and night temperatures for one day at Mesa Verde. We identify what we think will happen to the temperatures the next day from the morning to the afternoon, and then from the afternoon to the night, by circling either a thermometer with a red arrow going up or a thermometer with a red arrow going down. We determine that the temperature will go up from the morning to the afternoon, and down from the afternoon to the night. Next, we debrief the Conceptual Checkpoint and reflect on our learning.

We take a virtual tour of the inside of a cliff dwelling. We determine that the cliff dwelling helped people stay cool on sunny days by providing shade. We think people also went inside the cliff dwelling to stay warm on cold nights. Our teacher tells us that people burned small fires inside the cliff dwelling to stay warm. We return to the anchor model and add orange squares and blue squares to the labels to indicate which parts of a cliff dwelling protected people from hot and cold temperatures. We also add a ring of small rocks inside the cliff dwelling to create a fire pit, and we use a black crayon to color the underside of the cliff above the fire pit.



Mesa Verde Cliff Dwellings

The cliff dwellings at Mesa Verde protected the Ancestral Pueblo people from the weather. The top and sides of the cliff dwellings protected people from sunlight, wind, and rain. The rooms inside blocked the wind. **The cliff dwellings also helped people stay cool during hot days and warm during cold nights.**

We revisit the driving question board to determine which questions we can now answer with our learning from Concept 2 lessons. As our teacher reads each question aloud, we sort the questions into three columns: questions we can answer by using knowledge we gained during Concept 1 lessons, questions we can answer by using our learning in Concept 2 lessons, and questions we cannot yet answer. After all the questions are sorted, we think about the similarities among the new questions that we can now answer. We notice that all the questions are about how the weather changes and how we can know what the weather will be like in the future. Our teacher shares the Concept 2 Focus Question: What does weather data reveal? We use what we have learned so far to think about how we can answer this question. We share our learning with the class.

Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

<p style="text-align: center; border: 1px solid green; border-radius: 10px;">What is weather?</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid lightblue; padding: 5px; width: 45%;">How can it be cool even when it is sunny?</div> <div style="border: 1px solid orange; padding: 5px; width: 45%;">Why did my partner say it was warm, but I said it was cold?</div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid purple; padding: 5px; width: 100%;">Why didn't my partner and I draw the same number of clouds?</div> </div>	<p style="text-align: center; border: 1px solid blue; border-radius: 10px;">What does weather data reveal?</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid lightgreen; padding: 5px; width: 45%;">How do people know what tomorrow's weather will be like?</div> <div style="border: 1px solid purple; padding: 5px; width: 45%;">Why does it feel cool outside today, but yesterday it felt warm?</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid lightblue; padding: 5px; width: 45%;">Is it always warmest in the afternoon, even on cold days?</div> <div style="border: 1px solid orange; padding: 5px; width: 45%;">Would it be warmer in the afternoon even if it's cloudy outside?</div> </div>	<p style="text-align: center; border: 1px solid orange; border-radius: 10px;">Unanswered Questions</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid lightblue; padding: 5px; width: 45%;">Is a thunderstorm part of the weather?</div> <div style="border: 1px solid purple; padding: 5px; width: 45%;">Where does rain come from?</div> </div> <div style="margin-top: 10px;"> <div style="border: 1px solid lightgreen; padding: 5px; width: 100%;">Why doesn't it snow here?</div> </div>
<p>Related Phenomena:</p> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid lightgreen; padding: 5px; width: 30%;">The roof over the park picnic tables protects me from rain.</div> <div style="border: 1px solid purple; padding: 5px; width: 30%;">Our school keeps us cool when it is warm outside.</div> <div style="border: 1px solid orange; padding: 5px; width: 30%;">Tents and yurts protect from sunlight.</div> </div>		

Concept 3: Severe Weather (Lessons 22–27)

Focus Question: How does severe weather affect us?

Lessons 22–24

Phenomenon Question: How can weather be harmful?

Phenomenon: Effects of different kinds of severe weather on communities

Lesson Set Objective: Students observe

Wonder: Our teacher shows us a picture of branches on a road. We wonder what kind of weather made the branches fall. We don't think it was the weather that we usually observe at our school.

Organize: Next, our teacher shows us a video of a thunderstorm, and we compare the weather we see in the video with our everyday weather. We share that we don't think it is safe to be outside during a thunderstorm, and our teacher confirms that a thunderstorm is a kind of severe weather, or weather that can be harmful. Our teacher tells

examples of severe weather and ask questions to find out more information. Students then act out different kinds of severe weather to develop an understanding of how the scale of severe weather distinguishes it from everyday weather.

Knowledge Statement: Severe weather can be harmful to communities.

us we will learn more about thunderstorms and other kinds of severe weather.

Reveal: As a class, we look at pictures of thunderstorms and draw a picture to show the common characteristics of a thunderstorm. Then, on a class chart, we record a description and the parts of weather that make up a thunderstorm.

Next, we work in groups to learn more about a specific kind of severe weather. We look at pictures and discuss what we see. Then we draw a picture of that kind of severe weather. Next, our teacher meets with each group and shows us a video of the severe weather that is in our pictures. We identify the parts of weather that make up our kind of severe weather and figure out with our group how we could act out the weather to share what we learned with others.

Distill: We watch each other act out different kinds of severe weather, and we add what we learn about each one to a class chart. We learn that each kind of severe weather is made up of parts of weather we already know about, such as rain, wind, or snow. We also notice that severe weather is more intense than everyday weather.

Reveal: Next, our teacher shows us a picture of dried plants, and we wonder why the plants in the picture have died. We learn that a drought affected the plants. Our teacher tells us that a drought is a kind of severe weather in which there is too little rain or snow and that a drought takes place over a long period of time.

Distill: We add our new learning about severe weather to the anchor chart.

Weather
<p>Parts of Weather</p> <ul style="list-style-type: none"> • Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature. • The weather in a place is not the same all the time. • Sunlight, wind, and rain can affect the things around us. • We feel cooler in the shade because the sunlight is blocked.
<p>Weather Data</p> <ul style="list-style-type: none"> • The way the temperature changes during the day is a pattern. • Meteorologists use patterns to make predictions about future weather. • Meteorologists share weather forecasts with us.

Severe Weather

- There are different kinds of severe weather.
- Severe weather can be harmful.

Wonder: We revisit the drought picture and wonder how different kinds of severe weather might affect our community.

Organize: Our teacher displays pictures of communities that have been damaged, and we discuss how the pictures are similar. We think that severe weather caused the damage.

Reveal: We look at each picture to identify what kind of severe weather caused the damage shown. Our teacher confirms the kind of severe weather—hurricane, tornado, or blizzard— that caused the damage in each picture.

Distill: Then we draw a picture in our Science Logbooks to show how a kind of severe weather might affect our local community. We share our drawing with a partner, and then discuss our ideas with the class.

We update the anchor chart with our new understanding of how weather can be dangerous.

Weather

Parts of Weather

- Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature.
- The weather in a place is not the same all the time.
- Sunlight, wind, and rain can affect the things around us.
- We feel cooler in the shade because the sunlight is blocked.

Weather Data

- The way the temperature changes during the day is a pattern.
- Meteorologists use patterns to make predictions about future weather.
- Meteorologists share weather forecasts with us.

Severe Weather

- There are different kinds of severe weather.
- Severe weather can be harmful to communities.

Lessons 25–26

Phenomenon Question: How can we prepare for severe weather?

Phenomenon: Preparing for local severe weather

Lesson Set Objective: Students use counting and numbers to identify and describe patterns that reveal that some kinds of severe weather are more likely than others in a given area.

Knowledge Statement: Meteorologists use patterns to forecast severe weather so that communities can prepare and respond.

Wonder: Our teacher shows us a weather forecast for a warm day with a thunderstorm. We wonder whether our area could have a forecast for a thunderstorm as well as what other kinds of severe weather could happen in our area.

Organize: Next, we think about why meteorologists share severe weather forecasts and decide we should find out what kinds of severe weather we need to prepare for.

Reveal: We work in groups to look at severe weather data. Each group looks at data for a different city. We count how many times each kind of severe weather happened in our assigned city during a 10-year period. We find that in each place, some kinds of severe weather happened more than others.

Distill: We conclude that in a given area, some kinds of severe weather are more likely than others to happen.

We compare our data with a partner from a different group and also notice that the kinds of severe weather can be different in different places.

We identify a pattern in the data: Some kinds of severe weather are more likely than others in certain places, which allows people to predict what kinds of severe weather are likely to happen there in the future. We add our new learning to the anchor chart.

Weather
<p>Parts of Weather</p> <ul style="list-style-type: none"> • Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature. • The weather in a place is not the same all the time. • Sunlight, wind, and rain can affect the things around us. • We feel cooler in the shade because the sunlight is blocked.
Weather Data

- The way the temperature changes during the day is a pattern.
- Meteorologists use patterns to make predictions about future weather.
- Meteorologists share weather forecasts with us.

Severe Weather

- There are different kinds of severe weather.
- Severe weather can be harmful to communities.
- Different places get different kinds of severe weather. In each place, some kinds of severe weather happen more than others.

Next, our teacher displays severe weather data for our local area. As a class, we count the number of times each kind of severe weather happened in our area during a 10-year period. We identify the kind of severe weather that happens most in our area as well as the kinds of severe weather that do not happen often.

Organize: Our teacher plays the sound of a warning siren and tells us that this sound lets people know when a tornado is close to their community. We think about other ways people find out that severe weather may happen in their area.

Reveal: Then we discuss why there are severe weather warnings and how meteorologists know when severe weather is coming. We ask questions about preparing for severe weather in our area. Our teacher shows us a video that answers some of our questions and that explains how to prepare for and respond to a kind of severe weather that could happen in our area.

Distill: We use what we learned from the video to draw a picture that shows how people can prepare for a particular kind of severe weather. Our teacher shares that our school and community have plans in place for if severe weather were to happen in our area. We update the anchor chart to reflect our understanding of how to prepare for severe weather.

Weather

	<p>Parts of Weather</p> <ul style="list-style-type: none"> • Weather has many parts. These parts include sunlight, clouds, wind, rain and snow, and temperature. • The weather in a place is not the same all the time. • Sunlight, wind, and rain can affect the things around us. • We feel cooler in the shade because the sunlight is blocked. <p>Weather Data</p> <ul style="list-style-type: none"> • The way the temperature changes during the day is a pattern. • Meteorologists use patterns to make predictions about future weather. • Meteorologists share weather forecasts with us. <p>Severe Weather</p> <ul style="list-style-type: none"> • There are different kinds of severe weather. • Severe weather can be harmful to communities. • Different places get different kinds of severe weather. In each place, some kinds of severe weather happen more than others. • Forecasts and warnings help people prepare for severe weather in their communities.
<p>Lesson 27</p>	
<p>Phenomenon Question: How did severe weather affect people at Mesa Verde?</p> <p>Phenomenon: Effects of severe weather at Mesa Verde</p> <p>Lesson Set Objective: Students observe and compare data to describe patterns of severe weather in the Mesa Verde</p>	<p>Organize: Our teacher displays a picture of a room in Spruce Tree House, a cliff dwelling at Mesa Verde. We notice and wonder about the picture. Then our teacher reads aloud about clues that the Ancestral Pueblo people left behind at Mesa Verde. Our teacher asks us where in the room we think there are clues, and then tells us that scientists have evidence that severe weather may have been one reason that the Ancestral Pueblo people left the cliff dwellings. We wonder what kind of severe weather caused the people to leave.</p> <p>We then look at a picture of a cross-section of wood showing tree rings. Our teacher tells us that tree rings in the wood from cliff dwelling roofs offer clues about what the weather was like when the Ancestral Pueblo people lived in the cliff dwellings.</p>

area.

Knowledge Statement: People can predict severe weather so that communities can prepare.

Know: We begin the Conceptual Checkpoint by looking at recent severe weather data for Mesa Verde to determine what kinds of severe weather happen there now. We count how many times each kind of severe weather happened during a 10-year period and find that drought happened most often. We then predict that blizzards and hurricanes will not happen at Mesa Verde in the next 10 years because there was not a single blizzard or hurricane in the data.

Our teacher tells us that the severe weather that happens at Mesa Verde now is similar to the severe weather that might have happened when the Ancestral Pueblo people lived there. As a class, we discuss and update the anchor model to show where people might have gone when severe weather, such as a thunderstorm or a tornado, was coming. We then revisit the severe weather data from Mesa Verde and share how having too little water may have affected people at Mesa Verde. Our teacher tells us that tree ring data provides evidence that drought may have been one of the reasons why the Ancestral Pueblo people left the cliff dwellings at Mesa Verde. We update our anchor model.



Mesa Verde Cliff Dwellings

The cliff dwellings at Mesa Verde protected the Ancestral Pueblo people from the weather. The top and sides of the cliff dwellings protected people from sunlight, wind, and rain. The rooms inside blocked the wind. The cliff dwellings also helped people stay cool during hot days and warm during cold nights. [The cliff dwellings may have protected the Ancestral Pueblo people from some kinds of severe weather. Drought may be one reason that the Ancestral Pueblo people moved away from Mesa Verde.](#)

We revisit the driving question board to determine which questions we can now answer by using our learning from Concept 3 lessons. As our teacher reads each question aloud, we sort the questions into three columns: questions we can answer by using knowledge we gained during Concept 1 lessons, questions we can answer by using our learning in Concept 2 lessons, and questions we can answer by using our learning in Concept 3 lessons. After we sort all the questions, we think about the similarities among the new questions that we can now answer. We notice that all the questions are about severe weather and how it affects people. Our teacher then shares the Concept 3

Focus Question: How does severe weather affect us? We use what we have learned to think about how we can answer this question. We share our learning with the class.

Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

What is weather?

- *Why did my partner say it was warm, but I said it was cold?*
- *How can it be cool even when it is sunny?*
- *Why didn't my partner and I draw the same number of clouds?*

What does weather data reveal?

- *How do people know what tomorrow's weather will be like?*
- *Why does it feel cool outside today, but yesterday it felt warm?*
- *Is it always warmest in the afternoon, even on cold days?*
- *Would it be warmer in the afternoon even if it's cloudy outside?*

How does severe weather affect us?

- *Is a thunderstorm part of the weather?*
- *Could the weather where we live make branches fall?*
- *What do I do if there is a tornado?*
- *What kinds of severe weather might happen here?*

Related Phenomena

- *The roof over the park picnic tables protects me from rain.*
- *Our school keeps us cool when it is warm outside.*
- *Tents and yurts protect from sunlight.*
- *Our school can protect us from severe weather.*
- *Emergency shelters can protect us when there is severe weather.*

Application of Concepts (Lessons 28–30): Socratic Seminar, End-of-Module Assessment
Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather?

Lessons 28–30 (End-of-Module Socratic Seminar, Assessment, and Debrief)

<p>Phenomenon Question: How did the Blizzard of 1978 affect people in Boston?</p> <p>Phenomenon: Blizzard of 1978 in Boston</p> <p>Lesson Set Objective: Students use counting and numbers to identify patterns that explain the weather conditions in Boston during the Blizzard of 1978 and consider how people can prepare for those conditions.</p> <p>Knowledge Statement: Weather affects people and their surroundings.</p>	<p>Distill: As a class, we participate in a Socratic Seminar and discuss our Essential Question: How did the cliff dwellings at Mesa Verde protect people from the weather? We use our work products from throughout the module to help us answer this question.</p> <p>Know: In the End-of-Module Assessment, we show our understanding of how weather can affect people and their surroundings and how people can prepare for severe weather. Then we reflect on our learning from throughout the module.</p> <p>We then discuss any remaining questions about how weather affects people and their surroundings.</p>
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