

Kindergarten Science

Unit 4: Weather Patterns

16 lessons and a unit quiz. Use this pack with the **Weather Patterns Student Reader** (print it, or download it once from the course) to teach the whole unit without the internet.

What is in this pack

- A lesson plan for each chapter: the Big Question, words to know, which pages to read, questions to talk over and the activity pages.
- The unit quiz, ready to print.
- Answers for the teacher at the back: every discussion question and the quiz key.

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Lesson schedule

Two or three lessons a week, about 30 minutes each. Tick each one off as you go.

	Lesson	Reader pages	Activity pages
☐	Getting started: Meet the Big Question	PDF pages 6–13	—
☐	Lesson 1.1: The Sun and Sunlight	PDF pages 14–17	AP 1.1.1
☐	Lesson 1.2: Investigating Sunlight and Shade on Earth Materials	—	AP 1.2.1
☐	Lesson 1.3: Lesson 1 Roundup: Sunlight on Earth’s Surface	—	AP 1.3.1
☐	Lesson 2.1: Defining the Problem and Brainstorming Solutions	PDF pages 18–19	AP 2.1.1, AP 2.1.2
☐	Lesson 2.2: Building a Model Structure	—	—
☐	Lesson 2.3: Testing Student Models	—	AP 2.3.1
☐	Lesson 2.4: Lesson 2 Roundup: Comparing Solutions	—	AP 2.4.1, AP 2.4.2
☐	Lesson 3.1: Observing Temperature Patterns in a Day	PDF pages 20–25	AP 3.1.1, AP 3.1.2
☐	Lesson 3.2: Organizing Weather Observations	—	AP 3.2.1
☐	Lesson 3.3: Interpreting Seasonal Patterns	—	AP 3.3.1, AP 3.3.2
☐	Lesson 3.4: Lesson 3 Roundup: Predicting the Weather	—	AP 3.4.1, AP 3.4.2
☐	Lesson 4.1: Observing Severe Weather	PDF pages 26–31	AP 4.1.1
☐	Lesson 4.2: Collecting Information About Severe Weather Patterns	—	AP 4.2.1, AP 4.2.2, AP 4.2.3
☐	Lesson 4.3: How Are Weather Warnings Communicated?	—	AP 4.3.1
☐	Lesson 4.4: Lesson 4 Roundup: Responding to Weather Warnings	PDF pages 32–42	AP 4.4.1, AP 4.4.2, AP 4.4.3
☐	Unit review and assessment	—	AP UO.1, AP UO.3, AP UC.1, AP US.1
☐	Words quiz	—	—

Page numbers are the PDF page numbers of the Student Reader file, so they match what your PDF reader shows.

Getting started: Meet the Big Question

THE BIG QUESTION

How do we know when to take an umbrella with us?

Words to know

- **observe** — to watch something and notice details about it (observation, n. the process of noticing details or a specific detail that is noticed)
- **temperature** — the measure of how hot or cold something is
- **thermometer** — an instrument that measures temperature
- **weather** — the condition of the air outside at a given place and time

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 25–42: the steps, materials and timing for this lesson.

Read

Read Student Book, Chapters 1–2: “The Heat Is On” and “What Is Weather?”: PDF pages 6–13. Look at the pictures and maps together.

Talk it over

1. See the Online Resources Guide for a link to the recommended website: www.coreknowledge.org/cksci-online-resources Ask students the following: • What would you like to do to stay cool during a heat wave?
2. Ask students the following questions: LITERAL—Why is school canceled today?
3. Explain that for each number students counted, they should think about the room getting hotter. (See Know the Standards.) INFERENTIAL—Why do you think Hanna feels lucky?
4. UNIT OPENER 23 Ask students the following questions: LITERAL—What three activities do Hanna and her grandmother do indoors?
5. DCI ESS3.B CCC 2 4 24 WEATHER PATTERNS Ask students the following questions: LITERAL—Why does Grandma think it would be nice to take a walk?
6. INFERENTIAL—Why does Hanna look confused?
7. Ask students, How does your hand feel as the water evaporates?
8. Divide that range into four groups that will best work for your local weather. 30 WEATHER PATTERNS • What kinds of clothing do you need to wear to go outside if the air is hot?
9. It can even be rainy and windy at the same time! 7 Ask students the following questions: INFERENTIAL—What are words that describe the weather in these pictures?
10. INFERENTIAL—What kinds of activities are good to do in fair weather?

11. INFERENTIAL—How do you think a balloon might help scientists get information about weather?

12. Ask students, What is the job of the helium balloon?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do we know when to take an umbrella with us?
- Use one of today's words in a sentence of your own.

Lesson 1.1: The Sun and Sunlight

THE BIG QUESTION

What does sunlight do?

Words to know

- **materials** — matter that makes up different things
- **surface** — the outside part or uppermost layer of an object

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 43–50: the steps, materials and timing for this lesson.

Read

Read Student Book, Chapter 3: “The Sun Heats Earth”: PDF pages 14–17. Look at the pictures and maps together.

Talk it over

1. After a few minutes, have students compare their ice cubes and answer the following questions: • How did you decide where to place your ice cube?
2. NGSS Elements • Where on Earth's surface is soil found?
3. Ask students clarifying questions: SEP 3 DCI PS3.B • How are you going to test what sunlight does to Earth?
4. CCC 2 Differentiation Teacher Development • How will you measure the warming?
5. LESSON 1.1 | THE SUN AND SUNLIGHT 43 • Why will you compare your team's results with those of other teams?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What does sunlight do?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 1.1.1: Our Investigation Plan — Teacher Guide PDF page 186

Lesson 1.2: Investigating Sunlight and Shade on Earth Materials

THE BIG QUESTION

How do sunlight and shade affect the warmth of sand, soil, and water?

Words to know

- **claim** — a statement of something one believes to be true
- **evidence** — a detail that supports a claim or helps prove an idea is true
- **measure** — to determine the amount of something
- **pattern** — a reliable system of traits or a set of repeating details

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 51–56: the steps, materials and timing for this lesson.

Talk it over

1. to find out if the sun warms them Ask students, What is the purpose of placing another group of these materials in the shade, where there is no sunlight?
2. Ask students, What are the three materials found on the surface of Earth that we will test?
3. CCC 2 3D Learning • How did the cups of soil compare in temperature?
4. Then ask a guiding question, such as, When something is in the shade, what is it not getting?
5. Ask students clarifying questions: • What test did we do to answer this question?
6. Encourage students to use their observations to predict how other materials on Earth's surface are affected by sunlight: • Ask students, How do you think rocks are affected by sunlight?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How do sunlight and shade affect the warmth of sand, soil, and water?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 1.2.1: How Does Sunlight Affect Sand, Soil, and Water? — Teacher Guide PDF page 187

Lesson 1.3: Lesson 1 Roundup: Sunlight on Earth's Surface

THE BIG QUESTION

What does an umbrella do to light?

Words to know

- **Earth** — the planet on which we live
- **heat wave** — a long period of weather that is hotter than normal
- **materials** — matter that makes up different things
- **shade** — an area in shadow from direct sunlight
- **star** — an object in space that gives off its own light
- **surface** — the outside part or uppermost layer of an object

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 57–66: the steps, materials and timing for this lesson.

Talk it over

1. yes 56 WEATHER PATTERNS Ask students, When does the air feel warmer, in the morning when you go to school or in the afternoon when you leave school?
2. Use the following prompts to guide the discussion: • Ask students, What did you observe about sand, soil, and water placed in the sun and shade?
3. See the Online Resources Guide for a link to the recommended video. www.coreknowledge.org/cksci-online-resources • Ask students, How do you feel when the sun shines down on you?
4. LITERAL—What kind of object in space is the sun?
5. You can still tell that it is daytime. 11 LITERAL—Which is the closest star to Earth?
6. INFERENTIAL—Where is the sun in the picture of a cloudy day?
7. LITERAL—What materials on Earth's surface are warmed by the sun?
8. Ask students, Where can we find shade near our school?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What does an umbrella do to light?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 1.3.1: Words for Your Drawing — Teacher Guide PDF page 188

Lesson 2.1: Defining the Problem and Brainstorming Solutions

THE BIG QUESTION

How can we use materials to reduce warming from sunlight?

Words to know

- **design** — a plan to show how something is made or how a process should work (v. to develop a plan for a device or a solution to a problem)
- **problem** — a condition that falls short of satisfying a want or a need
- **solution** — a process, action, or device that fixes a problem

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 67–76: the steps, materials and timing for this lesson.

Read

Read Student Book, Chapter 4: “People Work Together to Find Solutions”: PDF pages 18–19. Look at the pictures and maps together.

Talk it over

1. Remind students that they learned about how sunlight affects materials on Earth's surface in Lesson 1: • Monitor Progress Ask students, What happened to the soil, sand, and water you placed in the sunlight?
2. Remind students to think about the results of their investigations with sand, soil, water, and ice in Lesson 1. • Ask students, What will happen to this ice cube if we place the bag in sunlight?
3. LESSON 2.1 | DEFINING THE PROBLEM AND BRAINSTORMING SOLUTIONS 67 • Ask students, What will happen to this ice cube if we place the bag in the shade compared to in sunlight?
4. Guide students to state the engineering problem by showing them a table set up with samples of materials they can use. • Ask students, What could you build to save your ice cube from melting very fast outside?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How can we use materials to reduce warming from sunlight?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 2.1.1: Sheep and Shade — Teacher Guide PDF page 189

- Activity Page 2.1.2: Saving Our Ice Cube — Teacher Guide PDF page 190

Lesson 2.2: Building a Model Structure

THE BIG QUESTION

What do people design to reduce warming from sunlight?

Words to know

- **design** — a plan to show how something is made or how a process should work (v. to develop a plan for a device or a solution to a problem)
- **solution** — a process, action, or device that fixes a problem

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 77–84: the steps, materials and timing for this lesson.

Talk it over

1. , What is the shape of your team's structure?
2. , What materials did you use to build it?
3. Monitor Progress Ask students, What job (function) does each part of your structure do?
4. , What do you expect your structure to do?
5. , How did the investigation in which you placed soil, sand, and water in the sun help you solve the problem?
6. INFERENTIAL—What do all three structures in the pictures do to make people feel cooler?
7. Ask students, What do you expect your structure to be able to do?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What do people design to reduce warming from sunlight?
- Use one of today's words in a sentence of your own.

Lesson 2.3: Testing Student Models

THE BIG QUESTION

How well does our plan to reduce warming from sunlight work?

Words to know

- **severe weather** — weather that can cause damage

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 85–90: the steps, materials and timing for this lesson.

Talk it over

1. Use the following prompts to guide the discussion: • Ask students, What kinds of shade structures were shown in Chapter 4?
2. Explain that students will place one ice cube in the sunlight and the other under their structure. • Ask students, What do you expect your structure to do for the ice cube?
3. While students are waiting, guide a discussion to make sure they understand what they can learn from their test: • Ask students, Based on what you know about shade and sunlight, which ice cube do you expect will melt first?
4. Where are most of the X's, and what does that mean?
5. LESSON 2.3 | TESTING STUDENT MODELS 83 • Ask each team in turn, Did your structure work as you planned?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How well does our plan to reduce warming from sunlight work?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 2.3.1: Testing Our Structure — Teacher Guide PDF page 191

Lesson 2.4: Lesson 2 Roundup: Comparing Solutions

THE BIG QUESTION

How can we reduce the warming effect of sunlight on an area?

Words to know

- **pattern** — a reliable system of traits or a set of repeating details

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 91–95: the steps, materials and timing for this lesson.

Talk it over

1. Use the following prompts to guide the discussion: • Ask students, What test did you do to find out how well your structure worked?
2. CCC 2 3D Learning Teacher Development • Ask students, What pattern did you find in how fast the ice cube melted?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How can we reduce the warming effect of sunlight on an area?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 2.4.1: Engineering Fair Badges — Teacher Guide PDF page 192
- Activity Page 2.4.2: Engineering Fair Visitor Card — Teacher Guide PDF page 193

Lesson 3.1: Observing Temperature Patterns in a Day

THE BIG QUESTION

What can we notice about air temperature at different times of day?

Words to know

- **pattern** — a reliable system of traits or a set of repeating details

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 96–105: the steps, materials and timing for this lesson.

Read

Read Student Book, Chapter 5: “Weather Changes from Season to Season”: PDF pages 20–25. Look at the pictures and maps together.

Talk it over

1. construction paper (9 by 12 inches, 1 sheet per student) How Does Air Temperature Change over a Day?
2. Monitor Progress 94 WEATHER PATTERNS • Ask students, If these structures were large, how could they be used in hot, sunny weather?
3. Discuss how these words are used to compare one temperature to another: • Ask students, Was the temperature warmer or cooler than this morning?
4. After recoding observations on three days, have students look at their data on Activity Page 3.1.2: • 3D Learning Ask students, How did the air temperature change from morning to afternoon on the first day?
5. Ask students, What evidence do you have to support this sentence?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What can we notice about air temperature at different times of day?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 3.1.1: How Does the Air Feel? — Teacher Guide PDF page 194
- Activity Page 3.1.2: How Does Air Temperature Change over a Day? — Teacher Guide PDF page 195

Lesson 3.2: Organizing Weather Observations

THE BIG QUESTION

How can organizing our observations help us describe the weather?

Words to know

- **meteorologist** — a weather forecaster; a scientist who studies weather and climate

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 106–110: the steps, materials and timing for this lesson.

Talk it over

1. , Were there more cold and cool days or warm and hot days?
2. Ask students, What kind of job does a meteorologist do?
3. Point out that this is the same kind of work meteorologists do: • Ask students, Were there more sunny or cold days?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How can organizing our observations help us describe the weather?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 3.2.1: How Many Days of Each Kind of Weather? — Teacher Guide PDF page 196

Lesson 3.3: Interpreting Seasonal Patterns

THE BIG QUESTION

How does this month's weather compare with weather in other seasons?

Words to know

- **season** — a three-month part of the year determined by the weather and daylight hours

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 111–115: the steps, materials and timing for this lesson.

Talk it over

1. AP 3.3.1 • Ask students, Which months have more rainy or snowy days than December?
2. Guide a discussion of weather patterns that answers the following questions: • Ask students, Which month(s) has (have) the most sunny days?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How does this month's weather compare with weather in other seasons?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 3.3.1: Rainy or Snowy Days — Teacher Guide PDF page 197
- Activity Page 3.3.2: Sunny Days in — Teacher Guide PDF page 198

Lesson 3.4: Lesson 3 Roundup: Predicting the Weather

THE BIG QUESTION

What do television meteorologists do?

Words to know

- **data** — information that is observed or measured and recorded
- **predict** — to say that something is expected to happen
- **season** — a three-month part of the year determined by the weather and daylight hours
- **spring** — the season of the year between winter and summer when temperature starts to warm
- **summer** — the season of the year between spring and fall when days are longer and temperature is warm or hot
- **temperature** — the measure of how hot or cold something is
- **winter** — the season of the year between fall and spring when days are shorter and temperature is cooler or cold

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 116–126: the steps, materials and timing for this lesson.

Talk it over

1. question board Activity Pages What Should I Wear Today?
2. because the seasons repeat themselves, making a pattern Activity Page Give each student a copy of What Should I Wear Today?
3. Ask students, What kind of work does a meteorologist (weather scientist) do?
4. LITERAL—What happens to the air temperature after the sun sets at night?
5. INFERENTIAL—How do you think the air would feel if you went outside before sunrise?
6. LITERAL—At what times of the year do heat waves happen where Hanna lives?
7. SEP 2 SEP 6 DCI ESS2.D CCC 1 Differentiation 19 LITERAL—What is the air temperature like in winter?
8. SEP 6 DCI ESS2.D CCC 1 Differentiation Language Arts Connection Teacher Development 20 LITERAL—What happens to some trees in the fall?
9. LESSON 3.4 | LESSON 3 ROUNDUP: PREDICTING THE WEATHER 117
INFERENTIAL—What kind of weather do plants need to grow new leaves and make flowers?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What do television meteorologists do?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 3.4.1: What Should I Wear Today? — Teacher Guide PDF page 199
- Activity Page 3.4.2: Today's Weather Around the USA — Teacher Guide PDF page 200

Lesson 4.1: Observing Severe Weather

THE BIG QUESTION

What problems are caused by severe weather?

Words to know

- **severe weather** — weather that can cause damage

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 127–137: the steps, materials and timing for this lesson.

Read

Read Student Book, Chapter 6: “Weather Can Be Severe”: PDF pages 26–31. Look at the pictures and maps together.

Talk it over

1. Remind students that they learned in Lesson 3 that some kinds of weather are more likely in one season or another: • Ask students, What season is most likely to have snowy weather?
2. Why would people test the siren every month?
3. Write the science questions on a poster page titled, “Our Questions About Heat Waves.” • What kinds of problems are caused by ?
4. LESSON 4.1 | OBSERVING SEVERE WEATHER 127 • Is it likely that we ?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What problems are caused by severe weather?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 4.1.1: Comparing Severe Weather — Teacher Guide PDF page 201

Lesson 4.2: Collecting Information About Severe Weather Patterns

THE BIG QUESTION

What should we do when severe weather is likely?

Words to know

- **observe** — to watch something and notice details about it (observation, n. the process of noticing details or a specific detail that is noticed)

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 138–143: the steps, materials and timing for this lesson.

Talk it over

1. Use the following prompts to discuss patterns: • What kind of pattern do you see in states that get hurricanes?
2. Use the following prompts to discuss local, regional, and national patterns: • Does our state get blizzards?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What should we do when severe weather is likely?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 4.2.1: Are Hurricanes Likely Where We Live? — Teacher Guide PDF page 202
- Activity Page 4.2.2: Are Tornadoes Likely Where We Live? — Teacher Guide PDF page 203
- Activity Page 4.2.3: Are Blizzards Possible Where We Live? — Teacher Guide PDF page 204

Lesson 4.3: How Are Weather Warnings Communicated?

THE BIG QUESTION

How Are Weather Warnings Communicated?

Words to know

- **forecast** — a data-based prediction of future conditions
ent Book page numbers are listed lary terms related to the unit that n used within the Student Book, and ulary words are not intended for use

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 144–149: the steps, materials and timing for this lesson.

Talk it over

1. Build on student prior knowledge by asking students, Is the place we live likely to get hurricanes, tornadoes, or blizzards?
2. Guide a discussion of how weather scientists communicate forecasts with severe weather maps using the following prompts:
 - Ask students, What patterns do you see in where severe weather is forecast today?
3. Is there a way to find out severe weather is on its way?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: How Are Weather Warnings Communicated?
- Use one of today's words in a sentence of your own.

Activity pages

- Activity Page 4.3.1: Where Can We Use Severe Weather Warning Tools? — Teacher Guide PDF page 205

Lesson 4.4: Lesson 4 Roundup: Responding to Weather Warnings

THE BIG QUESTION

What should we do when severe weather is likely?

Words to know

- **blizzard** — a severe snowstorm with high winds
- **forecast** — a data-based prediction of future conditions
- **pattern** — a reliable system of traits or a set of repeating details
- **tornado** — a spinning, funnel-shaped column of air that extends from the clouds down toward the ground

Teacher's lesson plan

Follow the Teacher Guide, PDF pages 150–180: the steps, materials and timing for this lesson.

Read

Read Student Book, Chapter 7: “Science in Action”: PDF pages 32–42. Look at the pictures and maps together.

Talk it over

1. Remind students that, earlier in Lesson 4, they read maps showing severe weather patterns and explored some tools for warning people about severe weather. • DCI ESS3.B Ask students, What kinds of severe weather are likely where we live?
2. DCI ETS1.A CCC 1 Connection to Engineering, Technology, and Applications of Science • Ask students, What are some tools that scientists use to warn people that severe weather is coming?
3. LESSON 4.4 | LESSON 4 ROUNDUP: RESPONDING TO WEATHER WARNINGS 145 Build on student prior knowledge by asking students, What do people need to do when they are warned of severe weather?
4. Discuss the advantages of closing school early in the morning or the night before. • Ask students, How would canceling school the night before help families?
5. INFERENTIAL—What kinds of severe weather have you already learned about?
6. LITERAL—Where do hurricanes begin?
7. INFERENTIAL—How could strong wind cause damage?
8. INFERENTIAL—What could cause the snow to form mounds, as in the second picture?

9. INFERENCE—How does going under spraying water make people feel on a hot day?
10. INFERENCE—What rules might a community have for water use during a drought emergency?
11. INFERENCE—Why is it important to predict a hurricane at least a few days before it happens?
12. Ask students, Are tornadoes likely in our state?
13. Use the following prompts to summarize what students have learned about each kind of severe weather: AP 4.4.3 • Ask students, What is the weather like during this kind of severe weather?
14. Heat wave: sunny and unusually hot temperatures for more than two days • Ask students, Should pets be brought inside or objects such as chairs and bicycles be brought in or tied down?
15. Heat wave: yes (check mark in the table), though objects do not have to be tied down • Ask students, Should people go inside and stay inside?
16. Heat wave: yes (check mark in the table) • Ask students, Should all the members of a family have a go bag that they can take if their home is no longer safe during severe weather?
17. Narrate as you go—pulling on shorts and a T-shirt, sneakers, a wide-brimmed hat for the sun, wearing sunglasses, and adding sunscreen to exposed skin. • Ask students, Should we use the umbrella for sunny, warm weather, and why?
18. UNIT CAPSTONE | WEATHER PATTERNS 161 • Ask students, Is this the kind of weather that might cause school to be canceled, and why?
19. Have students narrate as they are putting on shorts, a T-shirt, a rain jacket with a hood, and rain boots. • Ask students, Should we use the umbrella for rainy, warm weather, and why?
20. Have students narrate as they are putting on snow pants, a heavy jacket, a warm hat, mittens, and snow boots. • Ask students, Should we use the umbrella for snowy, cold weather, and why?
21. Rainy, Very Windy Weather: As students act out getting ready to go out, have them narrate putting on rain boots and a rain jacket. • Ask students, Should we use the umbrella for rainy, very windy weather, and why?
22. Hurricane: If students act out getting ready to go outdoors, quickly redirect them with the questions below: • Ask students, How should people get ready if they know a hurricane is coming?
23. Tornado: If students act out getting ready to go outdoors, quickly redirect them with the questions below: • Ask students, How should people get ready if they know there might be a tornado nearby?
24. They may also act out staying indoors where there is air conditioning. • Ask students, Will you take an umbrella outdoors for a heat wave, and why?

25. By now, students should be comfortable answering the question, Which kinds of weather could cause school to be canceled?
26. UNIT SUPPLEMENT | SCIENCE IN ACTION: MEETING A WEATHER SCIENTIST 167
LITERAL—Where does the weather map show a possible hurricane?
27. LITERAL—What kind of weather does Noah specialize in?
28. INFERENTIAL—Why does Noah call himself a “hurricane hunter”?
29. LITERAL—What do the instruments on Noah’s planes measure?
30. INFERENTIAL—Why is it important to know this?
31. UNIT SUPPLEMENT | SCIENCE IN ACTION: MEETING A WEATHER SCIENTIST 171
LITERAL—What kinds of tools did scientists use back in the 1800s to show the weather?
32. LITERAL—What did Cleveland Abbe use patterns to do?
33. Cleveland Abbe was its first lead meteorologist. 33 172 WEATHER PATTERNS
LITERAL—What does the National Weather Service do?

Answers are at the back of this pack.

Check for understanding

- Answer the Big Question in a sentence or two: What should we do when severe 4.4 Responding to Weather Warnings (two class sessions) weather is likely?
- Use one of today’s words in a sentence of your own.

Activity pages

- Activity Page 4.4.1: Plan a Go Bag — Teacher Guide PDF page 206
- Activity Page 4.4.2: Choose Ten Things for a Go Bag — Teacher Guide PDF page 207
- Activity Page 4.4.3: Safety in Severe Weather — Teacher Guide PDF page 208

UNIT REVIEW

Unit review and assessment

- Activity page answer key (for the teacher): Teacher Guide PDF pages 211-212
- Activity Page UO.1 — Teacher Guide PDF page 183
- Activity Page UO.3 — Teacher Guide PDF page 185
- Activity Page UC.1 — Teacher Guide PDF page 209
- Activity Page US.1 — Teacher Guide PDF page 210

WORDS QUIZ

Weather Patterns

Name: _____ Date: _____

Circle the letter of the best answer.

- 1.** Which word means “an object in space that gives off its own light”?
 - a) summer
 - b) instrument
 - c) star
 - d) shade
- 2.** Which word means “to decide that an event will not take place (canceled, adj. called off)”?
 - a) data
 - b) cancel
 - c) design
 - d) hurricane
- 3.** Which word means “a weather forecaster; a scientist who studies weather and climate”?
 - a) hurricane
 - b) warmer
 - c) Earth
 - d) meteorologist
- 4.** Which word means “describing a time or place in which rain is falling”?
 - a) pattern
 - b) emergency siren
 - c) snowy
 - d) rainy
- 5.** Which word means “the star that Earth moves around and that provides Earth with light and heat”?
 - a) cloudy
 - b) cool
 - c) sun
 - d) hurricane
- 6.** Which word means “a tool for doing scientific work”?
 - a) sun
 - b) instrument
 - c) cancel
 - d) hurricane

- 7.** Which word means “all people together as a whole group”?
- a) public
 - b) forecast
 - c) structure
 - d) cold
- 8.** Which word means “a three-month part of the year determined by the weather and daylight hours”?
- a) solution
 - b) blizzard
 - c) melt
 - d) season
- 9.** Which word means “the planet on which we live”?
- a) Earth
 - b) thermometer
 - c) claim
 - d) smartphone
- 10.** Which word means “a detail that supports a claim or helps prove an idea is true”?
- a) hurricane
 - b) fair
 - c) evidence
 - d) cloudy
- 11.** Which word means “a severe snowstorm with high winds”?
- a) blizzard
 - b) smartphone
 - c) warmer
 - d) forecast
- 12.** Which word means “a tropical storm with winds greater than seventy-four miles an hour usually accompanied by rain, thunder, and lightning”?
- a) wind
 - b) hurricane
 - c) month
 - d) instrument

Answers

Getting started: Meet the Big Question

1. **See the Online Resources Guide for a link to the recommended website: www.coreknowledge.org/cksci-online-resources Ask students the following:**
 - **What would you like to do to stay cool during a heat wave?**
Accept all reasonable answers. Examples include going swimming, staying indoors with air conditioning, making lemonade, and playing video games.
2. **Ask students the following questions: LITERAL—Why is school canceled today?**
Because it is too hot for students to stay in the school building 22
3. **Explain that for each number students counted, they should think about the room getting hotter. (See Know the Standards.) INFERENTIAL—Why do you think Hanna feels lucky?**
Because she can play all day, instead of doing schoolwork INFERENTIAL—Why might Hanna also feel a little sad about school being canceled?
4. **UNIT OPENER 23 Ask students the following questions: LITERAL—What three activities do Hanna and her grandmother do indoors?**
Play a card game, make snacks, and watch television INFERENTIAL—What does an air conditioner do to indoor air?
5. **DCI ESS3.B CCC 2 4 24 WEATHER PATTERNS Ask students the following questions: LITERAL—Why does Grandma think it would be nice to take a walk?**
They will be able to get some vegetables for dinner. INFERENTIAL—How will walking slowly and taking along water help?
6. **INFERENTIAL—Why does Hanna look confused?**
She cannot understand why her grandmother thinks she needs an umbrella on a sunny day. INFERENTIAL—What are some reasons that Grandma might be carrying an umbrella?
7. **Ask students, How does your hand feel as the water evaporates?**
Even cooler Finally, have students formulate cause-and-effect statements to tell Hanna why she should put a little of the water from her bottle on her skin as she walks to the farmers market with her grandmother.
8. **Divide that range into four groups that will best work for your local weather. 30 WEATHER PATTERNS • What kinds of clothing do you need to wear to go outside if the air is hot?**
Shorts and a T-shirt or a bathing suit
9. **It can even be rainy and windy at the same time! 7 Ask students the following questions: INFERENTIAL—What are words that describe the weather in these pictures?**
Snowy, cold, wet, cloudy INFERENTIAL—What are three words that describe our

weather today?

10. **INFERENTIAL—What kinds of activities are good to do in fair weather?**

Playing, soccer, hiking, picnicking LITERAL—What can you learn about weather from watching clouds?

11. **INFERENTIAL—How do you think a balloon might help scientists get information about weather?**

It must carry tools for measuring weather.

12. **Ask students, What is the job of the helium balloon?**

To carry the box of weather tools and instruments high into the air Explain that the balloon carries the box of weather instruments and that measurements are taken as the box drops through the air.

Lesson 1.1: The Sun and Sunlight

1. **After a few minutes, have students compare their ice cubes and answer the following questions: • How did you decide where to place your ice cube?**

Answers will vary. Some students may say that they put them in the sun and others that they put them in the shade. Others may say they put them on a particular type or color of material. Some may hold the cups in their warm hands or place the cup and cube where no light or heat could get to it.

2. **NGSS Elements • Where on Earth’s surface is soil found?**

In forests, grasslands, gardens, farms

3. **Ask students clarifying questions: SEP 3 DCI PS3.B • How are you going to test what sunlight does to Earth?**

We are going to put sand, soil, and water in the sun and see if they warm up.

4. **CCC 2 Differentiation Teacher Development • How will you measure the warming?**

By feeling them with our hands

5. **LESSON 1.1 | THE SUN AND SUNLIGHT 43 • Why will you compare your team’s results with those of other teams?**

To find out if our materials warmed in the same ways (patterns)

Lesson 1.2: Investigating Sunlight and Shade on Earth Materials

1. **to find out if the sun warms them Ask students, What is the purpose of placing another group of these materials in the shade, where there is no sunlight?**

See Know the Science.

2. **Ask students, What are the three materials found on the surface of Earth that we will test?**

Sand, soil, and water

3. **CCC 2 3D Learning • How did the cups of soil compare in temperature?**

The soil in the sun should have felt warmer, and the soil in the shade should have felt cooler.

4. **Then ask a guiding question, such as, When something is in the shade, what is it not getting?**
Sunlight
5. **Ask students clarifying questions: • What test did we do to answer this question?**
We put sand, soil, and water in the sun and in the shade and then checked their temperatures.
6. **Encourage students to use their observations to predict how other materials on Earth’s surface are affected by sunlight: • Ask students, How do you think rocks are affected by sunlight?**
Rocks probably warm, too.

Lesson 1.3: Lesson 1 Roundup: Sunlight on Earth’s Surface

1. **yes 56 WEATHER PATTERNS Ask students, When does the air feel warmer, in the morning when you go to school or in the afternoon when you leave school?**
See Know the Science.
2. **Use the following prompts to guide the discussion: • Ask students, What did you observe about sand, soil, and water placed in the sun and shade?**
The materials in the sun warmed up, and the ones in the shade did not warm as much.
3. **See the Online Resources Guide for a link to the recommended video. www.coreknowledge.org/cksci-online-resources • Ask students, How do you feel when the sun shines down on you?**
Warm
4. **LITERAL—What kind of object in space is the sun?**
It is a star. LITERAL—What objects in the picture are warmed by the sun?
5. **You can still tell that it is daytime. 11 LITERAL—Which is the closest star to Earth?**
The sun INFERENTIAL—Why do you think the sun looks so much bigger than other stars?
6. **INFERENTIAL—Where is the sun in the picture of a cloudy day?**
It is above/on the other side of the clouds. Page 12
7. **LITERAL—What materials on Earth’s surface are warmed by the sun?**
Dirt, sand, rock, grass, water INFERENTIAL—If the children in the photos were to lie down on the grass or sand, would they be warmed by the sun, too?
8. **Ask students, Where can we find shade near our school?**
Next to a school wall, under a climbing gym, under a picnic table, under a tree
CHALLENGE—Guide students to plan an investigation to find out how the temperature of materials left in the sun changes beyond the fifteen minutes or so they already observed in Lesson 1.2. Place one or more of the earth materials back in the sun, and use a digital thermometer to check their temperatures every ten to fifteen minutes over the course of an hour. LITERAL—Why are we cooler in the shade than in the sun?

Lesson 2.1: Defining the Problem and Brainstorming Solutions

1. **Remind students that they learned about how sunlight affects materials on Earth's surface in Lesson 1: • Monitor Progress Ask students, What happened to the soil, sand, and water you placed in the sunlight?**

They were warmed.

2. **Remind students to think about the results of their investigations with sand, soil, water, and ice in Lesson 1. • Ask students, What will happen to this ice cube if we place the bag in sunlight?**

It will melt quickly.

3. **LESSON 2.1 | DEFINING THE PROBLEM AND BRAINSTORMING SOLUTIONS 67 • Ask students, What will happen to this ice cube if we place the bag in the shade compared to in sunlight?**

It will melt more slowly than in the sunlight.

4. **Guide students to state the engineering problem by showing them a table set up with samples of materials they can use. • Ask students, What could you build to save your ice cube from melting very fast outside?**

We could make something that will make shade over the ice.

Lesson 2.2: Building a Model Structure

1. **, What is the shape of your team's structure?**

K-2-ETS1-2

2. **, What materials did you use to build it?**

K-PS3-2

3. **Monitor Progress Ask students, What job (function) does each part of your structure do?**

K-2-ETS1-2

4. **, What do you expect your structure to do?**

K-PS3-2, K-2-ETS1-2

5. **, How did the investigation in which you placed soil, sand, and water in the sun help you solve the problem?**

K-PS3-2

6. **INFERENTIAL—What do all three structures in the pictures do to make people feel cooler?**

They make shade for people to sit in. INFERENTIAL—What activities can people do comfortably on a hot, sunny day if under these structures?

7. **Ask students, What do you expect your structure to be able to do?**

It should make shade to slow the warming of an ice cube. CHALLENGE—If there are two teams that finish quickly, have them compare their two designs by using measurable attributes such as height (Which one is taller/shorter?) and by counting and comparing the number of different materials they used to make their structures. (See Know the Standards 2.)

Lesson 2.3: Testing Student Models

1. **Use the following prompts to guide the discussion:** • **Ask students, What kinds of shade structures were shown in Chapter 4?**

A shade shelter with sail-like parts, one with a roof like a house, and one that resembles a box with fence sides

2. **Explain that students will place one ice cube in the sunlight and the other under their structure.** • **Ask students, What do you expect your structure to do for the ice cube?**

We expect our structure to slow the ice cube under it from melting.

3. **While students are waiting, guide a discussion to make sure they understand what they can learn from their test:** • **Ask students, Based on what you know about shade and sunlight, which ice cube do you expect will melt first?**

The one that is in the sunlight, without shade

4. **Where are most of the X's, and what does that mean?**

Most of the X's are in the column for "In Open Sunlight." That means that most of the structures worked.

5. **LESSON 2.3 | TESTING STUDENT MODELS 83** • **Ask each team in turn, Did your structure work as you planned?**

Yes, we hoped it would make things under it less warm, and it did. **SUPPORT**—Invite English language learners and other students to come up to the table and point to the labels and data to help them in communicating answers to the questions.

Lesson 2.4: Lesson 2 Roundup: Comparing Solutions

1. **Use the following prompts to guide the discussion:** • **Ask students, What test did you do to find out how well your structure worked?**

We took our structures outside in the sun and put an ice cube in the shade we made. We also put an ice cube in the sun. Then we watched to see which melted first.

2. **CCC 2 3D Learning Teacher Development** • **Ask students, What pattern did you find in how fast the ice cube melted?**

Most structures should have slowed the melting of the ice cubes under them.

Lesson 3.1: Observing Temperature Patterns in a Day

1. **construction paper (9 by 12 inches, 1 sheet per student) How Does Air Temperature Change over a Day?**

AP 3.1.2

2. **Monitor Progress 94 WEATHER PATTERNS** • **Ask students, If these structures were large, how could they be used in hot, sunny weather?**

People could sit under one and stay cooler than if they were in the sun.

3. **Discuss how these words are used to compare one temperature to another:** • **Ask students, Was the temperature warmer or cooler than this morning?**

The temperature was likely warmer.

4. **After recoding observations on three days, have students look at their data on Activity Page 3.1.2: • 3D Learning Ask students, How did the air temperature change from morning to afternoon on the first day?**

It started cooler and got warmer.

5. **Ask students, What evidence do you have to support this sentence?**

We made observations and wrote them down in the chart above the sentence. Point out to students that they are acting as scientists when they look for patterns about the weather where they live.

Lesson 3.2: Organizing Weather Observations

1. **, Were there more cold and cool days or warm and hot days?**

See Know the Standards.

2. **Ask students, What kind of job does a meteorologist do?**

A meteorologist observes the weather using weather tools.

3. **Point out that this is the same kind of work meteorologists do: • Ask students, Were there more sunny or cold days?**

Answers will vary.

Lesson 3.3: Interpreting Seasonal Patterns

1. **AP 3.3.1 • Ask students, Which months have more rainy or snowy days than December?**

January, March, April, May, and July

2. **Guide a discussion of weather patterns that answers the following questions: • Ask students, Which month(s) has (have) the most sunny days?**

Answer will vary.

Lesson 3.4: Lesson 3 Roundup: Predicting the Weather

1. **question board Activity Pages What Should I Wear Today?**

AP 3.4.1

2. **because the seasons repeat themselves, making a pattern Activity Page Give each student a copy of What Should I Wear Today?**

AP 3.4.1

3. **Ask students, What kind of work does a meteorologist (weather scientist) do?**

Observe and record the weather, look for patterns in the weather, report to people what the weather is and what it will be

4. **LITERAL—What happens to the air temperature after the sun sets at night?**

It gets cooler. LITERAL—What happens to the air temperature after the sun rises in the morning?

5. **INFERENTIAL—How do you think the air would feel if you went outside before sunrise?**

It would feel cooler than in the daytime. CORE VOCABULARY—Remind students that a pattern is something that repeats, and explain that to be sure there is a pattern to

how the air temperature changes in the daytime and nighttime, they would have to observe the changes a few times. Page 17

6. **LITERAL—At what times of the year do heat waves happen where Hanna lives?**

Only in the summer INFERENTIAL—What are some clues from the picture that it is summer now where Hanna lives?

7. **SEP 2 SEP 6 DCI ESS2.D CCC 1 Differentiation 19 LITERAL—What is the air temperature like in winter?**

Cooler than other times of year CORE VOCABULARY—Explain to students that summer is the season that includes the months June, July, and August and that fall is the season that includes September, October, and November. LITERAL—Which season is warmer: summer or fall?

8. **SEP 6 DCI ESS2.D CCC 1 Differentiation Language Arts Connection Teacher Development 20 LITERAL—What happens to some trees in the fall?**

They lose their leaves. EXTEND—Point out to students that fall has another, older name, autumn. The newer name, fall, should remind them of what happens to some leaves in that season. Have students use the word fall twice in a sentence, each time with a different meaning. For example, “I see the leaves fall in the fall.” (See Know the Standards.)

9. **LESSON 3.4 | LESSON 3 ROUNDUP: PREDICTING THE WEATHER 117 INFERENTIAL—What kind of weather do plants need to grow new leaves and make flowers?**

They need warmer weather. INFERENTIAL—Look at the picture of the baby birds. Why is it important that they are hatched in warm weather?

Lesson 4.1: Observing Severe Weather

1. **Remind students that they learned in Lesson 3 that some kinds of weather are more likely in one season or another: • Ask students, What season is most likely to have snowy weather?**

Winter

2. **Why would people test the siren every month?**

To make sure it works Why would the siren need to be heard from miles around?

3. **Write the science questions on a poster page titled, “Our Questions About Heat Waves.” • What kinds of problems are caused by ?**

Heat waves

4. **LESSON 4.1 | OBSERVING SEVERE WEATHER 127 • Is it likely that we ?**

Experience a heat wave where we live

Lesson 4.2: Collecting Information About Severe Weather Patterns

1. **Use the following prompts to discuss patterns: • What kind of pattern do you see in states that get hurricanes?**

They are all touching one another and on only one side of our country.

2. **Use the following prompts to discuss local, regional, and national patterns:**
 - **Does our state get blizzards?**Answers will vary.

Lesson 4.3: How Are Weather Warnings Communicated?

1. **Build on student prior knowledge by asking students, Is the place we live likely to get hurricanes, tornadoes, or blizzards?**

Answers will vary with location. Point out that there is another type of severe weather that occurs in many places— thunderstorms. Explain that thunderstorms have wind, heavy rain, and lightning and can cause flooding. All of these can be dangerous to people. Explain that today the class will learn about the tools weather scientists and communities use to alert people that severe weather is about to start.
2. **Guide a discussion of how weather scientists communicate forecasts with severe weather maps using the following prompts:** • **Ask students, What patterns do you see in where severe weather is forecast today?**

Answer will vary. Students may say that all the severe weather is in one part of the country, that it is evenly sprinkled throughout the country, or that there is no severe weather at all.
3. **Is there a way to find out severe weather is on its way?**

Accept all reasonable answers, such as checking your phone for emergency alerts.

Lesson 4.4: Lesson 4 Roundup: Responding to Weather Warnings

1. **Remind students that, earlier in Lesson 4, they read maps showing severe weather patterns and explored some tools for warning people about severe weather.** • **DCI ESS3.B Ask students, What kinds of severe weather are likely where we live?**

Answers will vary with location.
2. **DCI ETS1.A CCC 1 Connection to Engineering, Technology, and Applications of Science** • **Ask students, What are some tools that scientists use to warn people that severe weather is coming?**

Online severe weather maps, weather radios, television, smartphone apps, and emergency sirens
3. **LESSON 4.4 | LESSON 4 ROUNDUP: RESPONDING TO WEATHER WARNINGS**
145 Build on student prior knowledge by asking students, What do people need to do when they are warned of severe weather?

Accept all reasonable answers. Explain that today the class will learn about ways people can plan for severe weather.
4. **Discuss the advantages of closing school early in the morning or the night before.** • **Ask students, How would canceling school the night before help families?**

They can plan who will care for their young children while their parents or guardians go to work.

5. **INFERENTIAL—What kinds of severe weather have you already learned about?**
Heat waves, thunderstorms, hurricanes, tornadoes, and blizzards
INFERENTIAL—What evidence of severe weather do you see in the picture?
6. **LITERAL—Where do hurricanes begin?**
Over the ocean
Pause in the reading, and explain to students that this picture was taken using cameras up in space and pointed down toward Earth. Point out the green area in the photo showing land. Display alongside it a map of the United States so that students can identify the land as the states of Florida, Georgia, South Carolina, and North Carolina.
INFERENTIAL—What does the other photo tell you about the effects of hurricanes?
7. **INFERENTIAL—How could strong wind cause damage?**
It could blow buildings and trees down. Flying objects blown in the wind can crash into things.
8. **INFERENTIAL—What could cause the snow to form mounds, as in the second picture?**
It collects as it falls until it piles up and becomes deep.
INFERENTIAL—Why should people not drive cars in a blizzard?
9. **INFERENTIAL—How does going under spraying water make people feel on a hot day?**
Cooler
INFERENTIAL—What did the plants in the picture look like before the drought?
10. **INFERENTIAL—What rules might a community have for water use during a drought emergency?**
People might not be allowed to use sprinklers or wash cars. They might have to take fewer showers or baths.
EVALUATIVE—What would be the best way to warn everyone in a community about a heat wave—an online map, a siren, a weather radio, television, or a smartphone app? Explain your reasoning.
11. **INFERENTIAL—Why is it important to predict a hurricane at least a few days before it happens?**
So people can get ready for the storm
12. **Ask students, Are tornadoes likely in our state?**
Answers will vary with location. (See Know the Science 2.)
INFERENTIAL—What signals should people listen for to know when to enter a tornado shelter?
13. **Use the following prompts to summarize what students have learned about each kind of severe weather: AP 4.4.3 • Ask students, What is the weather like during this kind of severe weather?**
Hurricane: heavy rain, strong winds, flooding
14. **Heat wave: sunny and unusually hot temperatures for more than two days • Ask students, Should pets be brought inside or objects such as chairs and bicycles be brought in or tied down?**
Hurricane: yes (check mark in the table)

15. **Heat wave: yes (check mark in the table), though objects do not have to be tied down • Ask students, Should people go inside and stay inside?**
Hurricane: yes (check mark in the table)
16. **Heat wave: yes (check mark in the table) • Ask students, Should all the members of a family have a go bag that they can take if their home is no longer safe during severe weather?**
Hurricane: yes (check mark in the table)
17. **Narrate as you go—pulling on shorts and a T-shirt, sneakers, a wide-brimmed hat for the sun, wearing sunglasses, and adding sunscreen to exposed skin. • Ask students, Should we use the umbrella for sunny, warm weather, and why?**
Yes, we can use it to make shade so that we will not get as warm as in the sunlight.
18. **UNIT CAPSTONE | WEATHER PATTERNS 161 • Ask students, Is this the kind of weather that might cause school to be canceled, and why?**
No, sunny, warm weather is not dangerous to people inside a building.
19. **Have students narrate as they are putting on shorts, a T-shirt, a rain jacket with a hood, and rain boots. • Ask students, Should we use the umbrella for rainy, warm weather, and why?**
Yes, we can use it to keep the rain off our face and legs.
20. **Have students narrate as they are putting on snow pants, a heavy jacket, a warm hat, mittens, and snow boots. • Ask students, Should we use the umbrella for snowy, cold weather, and why?**
Sometimes, the snow is very wet and soaks our clothes, so maybe the umbrella can be useful.
21. **Rainy, Very Windy Weather: As students act out getting ready to go out, have them narrate putting on rain boots and a rain jacket. • Ask students, Should we use the umbrella for rainy, very windy weather, and why?**
No, because the wind could break the umbrella or blow it away
22. **Hurricane: If students act out getting ready to go outdoors, quickly redirect them with the questions below: • Ask students, How should people get ready if they know a hurricane is coming?**
They should stay indoors and listen to weather warnings on television, a weather radio, or a smartphone app.
23. **Tornado: If students act out getting ready to go outdoors, quickly redirect them with the questions below: • Ask students, How should people get ready if they know there might be a tornado nearby?**
They should stay indoors and listen to weather warnings on television, a weather radio, or a smartphone app.
24. **They may also act out staying indoors where there is air conditioning. • Ask students, Will you take an umbrella outdoors for a heat wave, and why?**
Yes, if you go out, an umbrella would make shade to keep you cooler.

25. **By now, students should be comfortable answering the question, Which kinds of weather could cause school to be canceled?**
Severe weather such as hurricanes, tornadoes, heat waves, and blizzards
26. **UNIT SUPPLEMENT | SCIENCE IN ACTION: MEETING A WEATHER SCIENTIST 167 LITERAL—Where does the weather map show a possible hurricane?**
Have students point to or describe the hurricane symbol that they see off the western coast of Africa. **INFERENTIAL—Why are the residents unsure of the situation with the weather?**
27. **LITERAL—What kind of weather does Noah specialize in?**
Hurricanes **INFERENTIAL—Why do you think meteorologists need to have so many computer and television screens around them?**
28. **INFERENTIAL—Why does Noah call himself a “hurricane hunter”?**
Because he flies into hurricanes and looks/hunts for information. **LITERAL—How does Noah fly into a hurricane?**
29. **LITERAL—What do the instruments on Noah’s planes measure?**
They can measure the hurricane’s wind and rain. **LITERAL—What does this information help meteorologists determine?**
30. **INFERENTIAL—Why is it important to know this?**
So people on the land can prepare for the hurricane Page 32
31. **UNIT SUPPLEMENT | SCIENCE IN ACTION: MEETING A WEATHER SCIENTIST 171 LITERAL—What kinds of tools did scientists use back in the 1800s to show the weather?**
They used maps.
32. **LITERAL—What did Cleveland Abbe use patterns to do?**
He used patterns to make predictions about what the weather would be in the days ahead. Page 33
33. **Cleveland Abbe was its first lead meteorologist. 33 172 WEATHER PATTERNS LITERAL—What does the National Weather Service do?**
It shares weather information with the public. The word public refers to all the people in a society. **LITERAL—When was it formed?**

Unit quiz key

1. c 2. b 3. d 4. d 5. c 6. b 7. a 8. d 9. a 10. c 11. a 12. b