CA NGSS TIME Prescreen Review Guide

Weather and Climate Patterns, Grade 3

Building Blocks OF SCIENCE™ | 3D

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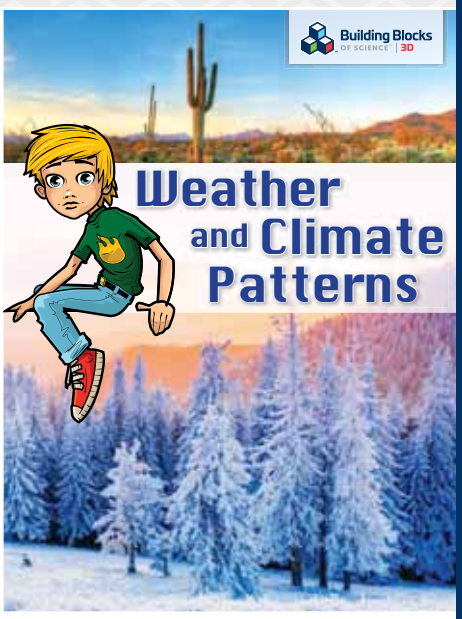
Weather and Climate Patterns



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Building Blocks OF SCIENCE™ | 3D

This prescreen tool uses one Building Blocks of Science™ 3D unit to provide a roadmap of how the program meets the criteria of the CA NGSS* Toolkit of Instructional Materials Evaluation. Each page of this document highlights features in the Teacher's Guide, with page references from the printed version. All the information found in the printed Teacher's Guide is also accessible in the digital version of the Teacher's Guide, which you can view at www.carolina.com/bbs3dreview. Both versions of the Teacher's Guide will be provided to all teachers who implement Building Blocks of Science 3D. In addition to the digital support, the equipment for the investigations is also part of the all-inclusive package that teachers receive.

To help with your review, here's an overview of the program's organization:

- Building Blocks of Science 3D consists of 18 units that cover the grade-level CA NGSS Performance Expectations and the three dimensions
- There are three units per grade level
- Each unit is divided into lessons, each lesson is divided into investigations

The cornerstone of each lesson is a phenomena-based, hands-on, three-dimensional learning experience **for all students.** Each all-inclusive unit includes:

- Investigative phenomena that provides real-world context for each lesson
- Notebook prompts that help students use data and ideas to develop evidence-based claims
- Informational texts that support the science content—in English and in Spanish
- Thought-provoking questions in every investigation for the teacher to ask to support students' sensemaking
- A comprehensive assessment system that provides formative, summative, pre- and post-assessments
- A complete digital version for every classroom—instantly access instruction, simulations, literacy, assessments and more at www.carolina.com/bbs3dreview

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CA NGSS TIME Prescreen Review Guide

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All digital resources—no annual license fee

Leveled literacy

All-inclusive, phenomena-based science

Building Blocks of Science™ 3D has already been reviewed by the Instructional Materials Advisory Panel (IMAP) and the Content Review Panel (CRP). They determined that Building Blocks of Science 3D meets the requirements of Chapter 13 of the CA Science Framework. This takes the verification of program requirements as outlined by the Framework out of adoption committee's responsibility, allowing the committee time to focus on developing a district lens for review.

Weather and Climate Patterns, Grade 3

The examples in this prescreen tool are reflective of formatting and features that consistently appear throughout each unit in the program.

You can review the scope and sequence of instruction for the entire unit in the Evidence of Instructional Scaffolding chart on the previous pages of this Reviewer's Guide and in the unit's Teacher's Guide (pages xxii-xxiii).

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Weather and Climate Patterns.***

Criteria	Evidence from Weather and Climate Patterns
Use Phenomena/Problems Materials provide relevant and authentic learning contexts through which students: • engage as directly as possible with phenomena or problems to ask and answer their questions as well as questions from other sources; and • have the potential to use the three dimensions to make sense of phenomena or design solutions to problems.	The **Anchoring Phenomenon** for for the unit is the connection between weather and climate. This provides an authentic context for student learning throughout the unit. **1.** The unit begins instruction in Lesson 1 with an **Anchoring Phenomenon** (pg. 32) narrative, which is shared with the class. The Phenomena Video (pg. 32) accompanies this narrative. It is found at www.carolina.com/bbs3dreview • **Click on:** Unit Title > Unit Overview > Digital Resources **2.** A lesson-specific **Investigative Phenomenon** (pg. 32) opens each lesson. Students ask questions that they want to answer and that will be revisited at the end of each lesson in the Phenomenon discussion (pg. 44). **3. Investigation** titles are posed as a question to set a problem for students to solve (pg. 148). **4. Investigations** always put phenomena in students' hands. This unit emphasizes gathering, organizing, and analyzing data to look for patterns over the course of the lessons. In Lesson 1, Investigation B (pgs. 39-41), students investigate different tools to measure weather and work in groups to use a thermometer to observe that temperature can change based on location. **5. Tell Me More** More prompts at the end of each investigation provide opportunities for formative assessment as students complete a task in which they apply their learning to additional phenomena, which helps students to develop more complex and complete understandings over time (pg. 153). **6. Using three dimensions:** The 3Ds are listed at the start of each investigation and are integrated into instruction at point of use (pg. 151).

Examples

ANCHORING PHENOMENON

Step outside or look out the window, and you can observe weather. Perhaps it is cold and rainy today where you live, but in other parts of the world it may be hot and sunny, or perhaps a tropical storm is developing. "Climate" refers to an area's average weather pattern over many years, and climate influences the weather. This phenomenon has impacted Earth throughout its geologic history. In fact, dangerous weather events occur around the world every day as a result of climate variability. How does climate variability influence the probability of a weather event? What do scientists need to know to inform people about the weather and prevent damage and deaths from extreme weather events? The anchoring phenomenon for *Weather and Climate Patterns* is recognizing that weather and climate are connected.

Read the investigative phenomenon aloud to the class. Encourage students to generate questions about what they hear. Keep track of students' questions on a class chart, or have students record the questions in their science notebooks. Refer to these questions at the end of the lesson and throughout the unit to support the unit's anchoring phenomenon.

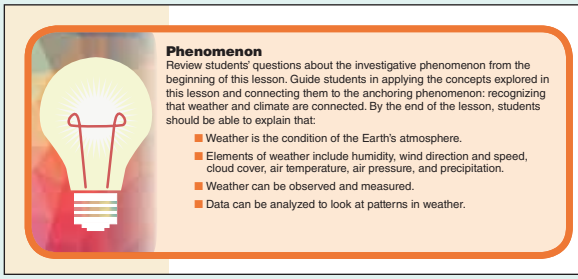
Investigative Phenomenon for Lesson 1: You are ready to leave for school when your older brother hands you a raincoat. You look outside and see that the Sun is shining. What does this make you wonder?

Anticipated Questions:

- Is it going to rain?
- How does your brother know that you will need a raincoat?
- Can it rain when the Sun is shining?

Phenomena Video: Watch the phenomena video for *Weather and Climate Patterns* as a class. As you watch, encourage students to record questions in their science notebooks about what they see in the video. At the end of the video, create a class chart of students' questions. Save this chart to refer to at the end of the unit.

1. Phenomena (pg. 32)



Phenomenon

Review students' questions about the investigative phenomenon from the beginning of this lesson. Guide students in applying the concepts explored in this lesson and connecting them to the anchoring phenomenon: recognizing that weather and climate are connected. By the end of the lesson, students should be able to explain that:

- Weather is the condition of the Earth's atmosphere.
- Elements of weather include humidity, wind direction and speed, cloud cover, air temperature, air pressure, and precipitation.
- Weather can be observed and measured.
- Data can be analyzed to look at patterns in weather.

2. Phenomena (pg. 44)

Investigation A

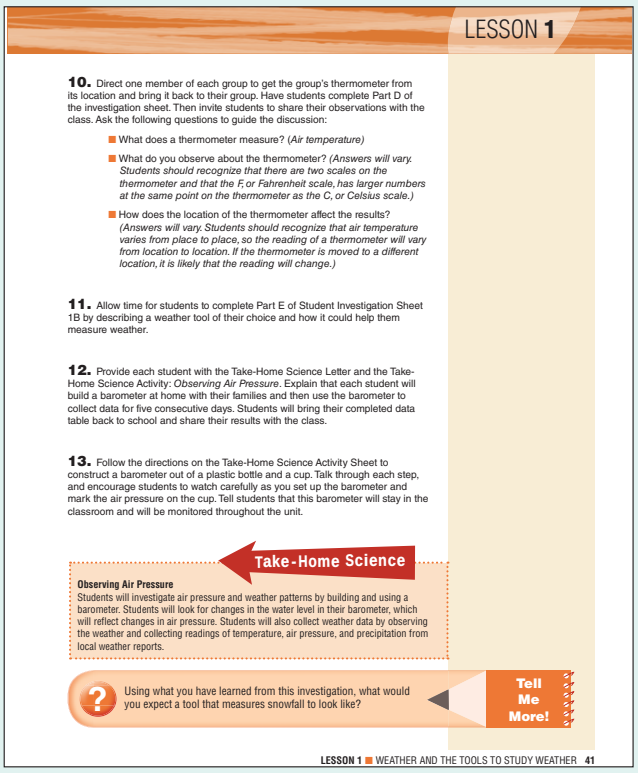
HOW CAN DANGEROUS WEATHER AFFECT AN AREA?

MATERIALS

■ **Student**
1 Science notebook*
1 Student Investigation Sheet 4A: *How Can Dangerous Weather Affect an Area?*
■ **Class**
"Our Ideas About Weather" class chart* (from Lesson 1)
■ **Teacher**
1 Teacher Sheet 4A: *Major Tropical Storms*
1 Student Investigation Sheet 4A: *How Can Dangerous Weather Affect an Area?* (Teacher's Version)
1 Inflatable globe
Chart paper or whiteboard*
Computer or tablet with Internet access*
Markers*
Projection system*
Small sticker dots or a roll of tape*

*These materials are needed but not supplied.

3. Investigations as questions (pg. 148)



LESSON 1

10. Direct one member of each group to get the group's thermometer from its location and bring it back to their group. Have students complete Part D of the investigation sheet. Then invite students to share their observations with the class. Ask the following questions to guide the discussion:

- What does a thermometer measure? *(Air temperature)*
- What do you observe about the thermometer? *(Answers will vary. Students should recognize that there are two scales on the thermometer and that the F, or Fahrenheit scale, has larger numbers at the same point on the thermometer as the C, or Celsius scale.)*
- How does the location of the thermometer affect the results? *(Answers will vary. Students should recognize that air temperature varies from place to place, so the reading of a thermometer will vary from location to location. If the thermometer is moved to a different location, it is likely that the reading will change.)*

11. Allow time for students to complete Part E of Student Investigation Sheet 1B by describing a weather tool of their choice and how it could help them measure weather.

12. Provide each student with the Take-Home Science Letter and the Take-Home Science Activity: *Observing Air Pressure*. Explain that each student will build a barometer at home with their families and then use the barometer to collect data for five consecutive days. Students will bring their completed data table back to school and share their results with the class.

13. Follow the directions on the Take-Home Science Activity Sheet to construct a barometer out of a plastic bottle and a cup. Talk through each step, and encourage students to watch carefully as you set up the barometer and mark the air pressure on the cup. Tell students that this barometer will stay in the classroom and will be monitored throughout the unit.

Take-Home Science

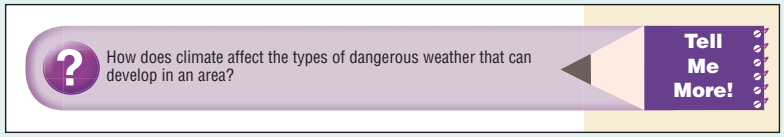
Observing Air Pressure
Students will investigate air pressure and weather patterns by building and using a barometer. Students will look for changes in the water level in their barometer, which will reflect changes in air pressure. Students will also collect weather data by observing the weather and collecting readings of temperature, air pressure, and precipitation from local weather reports.

Using what you have learned from this investigation, what would you expect a tool that measures snowfall to look like?

Tell Me More!

LESSON 1 ■ WEATHER AND THE TOOLS TO STUDY WEATHER 41

4. Phenomena in students' hands (pg. 41)



How does climate affect the types of dangerous weather that can develop in an area?

Tell Me More!

5. Formative assessment (pg. 153)

Investigation B

WHAT ARE EXAMPLES OF WEATHER HAZARDS?

MATERIALS

■ **Student**
1 Science notebook*
1 Student Investigation Sheet 4B.1: *How Can We Describe Our Weather Hazard?*
1 Student investigation Sheet 4B.2: *What Are Examples of Weather Hazards?*
■ **Class**
Chart paper* (optional)
Colored pencils or markers* (optional)
Research materials (including science books and magazines, dictionaries, and computers with Internet access as available)*
■ **Teacher**
1 Student investigation Sheet 4B.2: *What Are Examples of Weather Hazards?* (Teacher's Version)
Chart paper or whiteboard*
Markers*

*These materials are needed but not supplied.

Local Weather Observations
At the beginning or end of this investigation, have the class or a small group

Disciplinary Core Ideas
■ **ESS2.D:** Weather and Climate
■ **ESS3.B:** Natural Hazards

Science and Engineering Practice
■ Obtaining, Evaluating, and Communicating Information

Crosscutting Concepts
■ Patterns
■ Cause and Effect
■ Stability and Change

5Es
■ Explain

Digital Component
■ **Interactive Whiteboard:** Weather Hazards

6. Integrated three dimensions (pg. 151)

Weather and Climate Patterns, Grade 3

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Weather and Climate Patterns.***

Criteria	Evidence from Weather and Climate Patterns
Presence of Logical Sequence Student learning across the three dimensions is: • arranged in a logical sequence; and • sufficient and appropriate for students to figure out the phenomena or problems.	***Weather and Climate Patterns*** is a grade 3 Earth and space science unit. This unit supports NGSS Performance Expectations and provides connections to earth and space science and engineering: • **3-ESS2-1; 3-ESS2-2;3-ESS3-1; 3-5-ETS1-2** **1. NGSS** for the unit (pg. vi) **2. Evidence of Instructional Scaffolding** (pgs. xxii–xxii) **3. Investigations** refer to previous learnings and provide multiple opportunities to use the 3Ds to make sense of phenomena and problems (Investigation C, pg. 42, Step 1) to build a conceptual progression upon prior learning. **4. Tell Me More** prompts at the end of each investigation provide opportunities for formative assessment as students complete a task in which they apply their learning to additional phenomena, developing more complex and complete understandings over time (pg. 72). **5. Notebooking** ttasks for each investigation provide authentic opportunities for students to share evidence-based arguments and reasoning (pgs. 69-75 and Student investigation Sheet 2A, Parts C-D).

Examples

Next Generation Science Standards

The Building Blocks of Science unit *Weather and Climate Patterns* integrates process skills as defined by the Next Generation Science Standards (NGSS).

Performance Expectations
- **3-ESS2-1:** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
- **3-ESS2-2:** Obtain and combine information to describe climates in different regions of the world.
- **3-ESS3-1:** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
- **3-5-ETS1-2:** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Disciplinary Core Ideas
- **ESS2.D:** Weather and Climate
- **ESS3.B:** Natural Hazards
- **ETS1.B:** Developing Possible Solutions

Science and Engineering Practices
- Analyzing and Interpreting Data
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information

Crosscutting Concepts
- Patterns
- Cause and Effect
- Stability and Change

1. NGSS for unit (pg. vi)

Evidence of Instructional Scaffolding

Scaffolding is a crucial yet natural element in all classrooms. Building Blocks of Science strives to simplify this instructional strategy by integrating this guided process into each unit, systematically building upon student knowledge, using hands-on learning to reinforce concepts, and employing student-driven inquiry. These strategies introduce new concepts and, with practice and review, lead students toward mastery. It is important to integrate scaffolding not only throughout the unit but also throughout each lesson. As students demonstrate understanding of a concept, they should be encouraged to take a leadership role in class or to attempt assignments independently. Additionally, scaffolding reveals opportunities for differentiation. Below-level learners require more reinforcement as they learn new skills, so the process toward mastery will need to be adjusted. Above-level learners do not need as much support and achieve mastery more quickly; therefore, these students can be assigned more independent study.

	Lesson 1 ▸	Lesson 2 ▸
OBJECTIVES	■ Recognize that weather is the conditions in the atmosphere at a specific time and place. ■ Identify words that can be used to describe weather. ■ Make observations about local weather conditions. ■ Investigate tools that measure weather. ■ Analyze patterns in weather data to make predictions about weather.	■ Analyze and graph the daily averages for temperature and precipitation in an area. ■ Estimate the weekly averages for temperature and precipitation in an area. ■ Analyze graphs of yearly temperature and precipitation data to look for weather patterns. ■ Investigate relationships between weather conditions in various cities to predict typical weather conditions during a particular season in the Northern Hemisphere.
SCAFFOLDING	Students should know: ■ Weather is the atmospheric conditions in a specific place at a specific time. ■ There are many kinds of weather tools, such as windsocks, thermometers, and barometers, that measure specific attributes of the weather, such as wind speed, temperature, and air pressure. ■ Patterns in weather data can be used to make predictions about future weather.	Students should know: ■ Technology such as weather balloons, satellites, and radar can be used to collect weather data. ■ Weather conditions can differ by time, place, and season. ■ Temperature and precipitation data can be analyzed to look for patterns in specific areas. ■ Long-range patterns in temperature and precipitation can be used to predict seasonal weather patterns.

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2. Evidence of Instructional Scaffolding (pgs. xxii–xxii)

■ Are there any interesting observations that you would like to share?

Digital Tip
Use the Air Pressure simulation to provide students with more context for how air pressure works.

1. Remind students that in the previous investigation, the class talked about tools that are used to measure weather. Ask:
- When measuring weather, what are we really measuring? *(The characteristics of air.)*
- What do you think are elements of weather we can observe? *(Answers will vary. Students may provide answers such as air temperature, air pressure, humidity, wind, clouds, rain, snow, hail, etc.)*
- What is someone who studies and predicts the weather called? *(A meteorologist)*

3. Build on prior learning (pg. 42)

Tell Me More!
If you were traveling to City A this weekend, what clothing should you take to wear?

4. Apply new learning (pg. 72)

C. Analyze

1. What type of precipitation does the data display? _____

2. Which day had the highest temperature? _____

3. Which day had the most precipitation? _____

4. What is the general pattern in the temperature data over the course of the week? _____

_____

_____

5. What is the general pattern in the precipitation data over the course of the week? _____

_____

D. Explain

1. What is an advantage of showing data in a graph? _____

_____

_____

2. If you were forecasting the weather for City A, what weather would you predict for Saturday? Why would you make that prediction? _____

_____

_____

5. Notebooking (Student Investigation Sheet 2A)

Weather and Climate Patterns, Grade 3

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Weather and Climate Patterns.***

Criteria	Evidence from Weather and Climate Patterns
Students Are Figuring Out Materials position students to make sense of phenomena and design solutions to problems by: • asking and answering questions that link learning over time; and • using the three dimensions to link prior knowledge and negotiate new understandings and abilities.	**1.** Each investigation provides an opportunity for students to make sense of phenomena and data (Lesson 3, Investigation A, pgs. 106-107) students review past learning and organize data (Step 1), analyze data to compare two cities (Student Investigation Sheet 3A), and share their findings with the class (Steps 6-7). **2.** Opportunities to engineer design solutions are integrated into the instruction (Lesson 5, Investigation B, pgs. 178-179); students work in groups to design and build a solution that reduces the impact of a weather hazard (Student Investigation Sheet 5B.1).

Examples

1. As a class, review the term "weather" and discuss what influences weather. During the discussion, encourage students to refer to the local weather data they have been collecting. If you haven't already done so, share today's weather forecast with students. Then use the following questions to guide a class discussion:

- Do our weather conditions today match the forecast for today's weather?
- How is today's weather different from yesterday's weather?
- Have you noticed any patterns in our weather over the past week?

1. Making sense of phenomena (pg. 106)

Student Investigation Sheet 5B.1

Name _____

How Well Does the Solution Reduce the Impact of the Weather Hazard?

Date _____

A. Claim, Evidence, and Reasoning

1. Describe the solution: _____

2. How well does this solution reduce the impact of the weather hazard? Make a claim to answer the question. Support your claim with evidence and reasoning from this unit's investigations.

Claim (a statement or conclusion that answers the question you are testing)	
Evidence (data that supports your claim)	**Reasoning** (a justification explaining why your evidence supports your claim using scientific principles)

B. Evaluate

1. What could be done to improve the solution? _____

2. What other ideas do you have about how to reduce impacts from the weather hazard you researched? _____

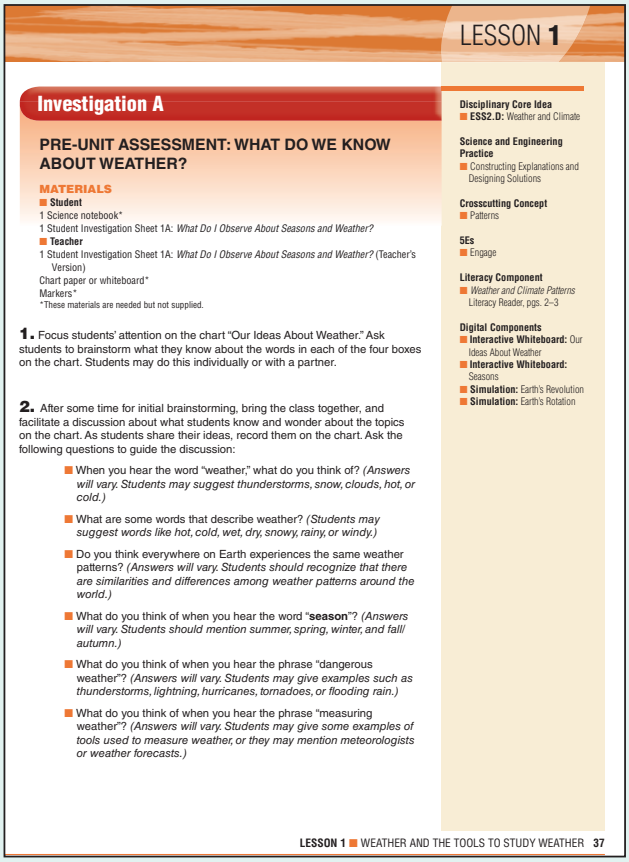
2. Three dimensions applied to engineering challenge
(Student Investigation Sheet 5B.1)

Weather and Climate Patterns, Grade 3

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Weather and Climate Patterns.***

Criteria	Evidence from Weather and Climate Patterns
Three-dimensional Performances Materials include assessments designed to: • match the targeted learning goals; and • elicit evidence of students' use of the three dimensions to make sense of phenomena and/or to design solutions to problems.	Three-dimensional assessment system provides 3D assessment throughout the unit to monitor new growth over time. **1. Pre-Assessment:** Lesson 1, Investigation A (pgs. 37-38): Students draw upon prior knowledge to develop a chart to share understanding about weather. **2. Formative assessment** opportunities are part of every lesson. The Tell Me More prompt on page 38 focuses on the 3Ds listed on page 37. **3. Assessment Strategies** at the end of every lesson (pg. 46) provide strategies for using Student Investigation Sheets and Tell Me More prompts to assess the 3Ds. Also available digitally at ww.carolina.com/bbs3dreview • **Click on:** Unit Title > Unit Overview > Digital Resources **4. Summative Assessments** in every unit's final lesson provide a performance task for group assessment of the 3Ds (pgs. 178-179) and a written assessment (after Student Investigation Sheet 5B.2). A scenario-based assessment is also available online at ww.carolina.com/bbs3dreview • **Click on:** Unit Title > Unit Overview > Digital Resources **5. Summative Assessment Remediation Strategies** list lessons to revisit for Performance Expectations-specific remediation based on individual assessment items (chart follows Summative Assessment Answer Key).

Examples



LESSON 1

Investigation A

PRE-UNIT ASSESSMENT: WHAT DO WE KNOW ABOUT WEATHER?

MATERIALS

- **Student**

1 Science notebook*
1 Student Investigation Sheet 1A: *What Do I Observe About Seasons and Weather?*

- **Teacher**

1 Student Investigation Sheet 1A: *What Do I Observe About Seasons and Weather?* (Teacher's Version)
Chart paper or whiteboard*
Markers*
*These materials are needed but not supplied.

1. Focus students' attention on the chart "Our Ideas About Weather." Ask students to brainstorm what they know about the words in each of the four boxes on the chart. Students may do this individually or with a partner.

2. After some time for initial brainstorming, bring the class together, and facilitate a discussion about what students know and wonder about the topics on the chart. As students share their ideas, record them on the chart. Ask the following questions to guide the discussion:

- When you hear the word "weather," what do you think of? *(Answers will vary. Students may suggest thunderstorms, snow, clouds, hot, or cold.)*
- What are some words that describe weather? *(Students may suggest words like hot, cold, wet, dry, snowy, rainy, or windy.)*
- Do you think everywhere on Earth experiences the same weather patterns? *(Answers will vary. Students should recognize that there are similarities and differences among weather patterns around the world.)*
- What do you think of when you hear the word "**season**"? *(Answers will vary. Students should mention summer, spring, winter, and fall/autumn.)*
- What do you think of when you hear the phrase "dangerous weather"? *(Answers will vary. Students may give examples such as thunderstorms, lightning, hurricanes, tornadoes, or flooding rain.)*
- What do you think of when you hear the phrase "measuring weather"? *(Answers will vary. Students may give some examples of tools used to measure weather, or they may mention meteorologists or weather forecasts.)*

Disciplinary Core Idea
- **ESS2.D:** Weather and Climate

Science and Engineering Practice
- Constructing Explanations and Designing Solutions

Crosscutting Concept
- Patterns

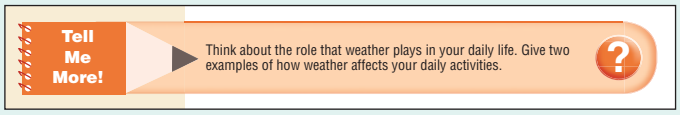
5Es
- Engage

Literacy Component
- *Weather and Climate Patterns* Literacy Reader, pgs. 2–3

Digital Components
- **Interactive Whiteboard:** Our Ideas About Weather
- **Interactive Whiteboard:** Seasons
- **Simulation:** Earth's Revolution
- **Simulation:** Earth's Rotation

LESSON 1 ■ WEATHER AND THE TOOLS TO STUDY WEATHER 37

1. Pre-assessment (pg. 37)



Tell Me More!

Think about the role that weather plays in your daily life. Give two examples of how weather affects your daily activities.

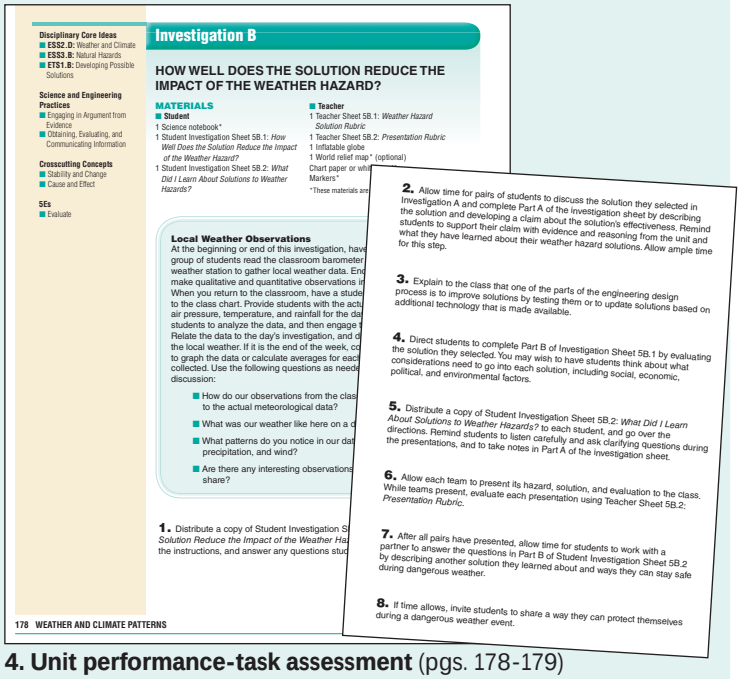
2. Formative assessment (pg. 38)

ASSESSMENT STRATEGIES

1. Investigation A

- The discussion in Investigation A is designed as a pre-unit assessment to help you find out what students already know about weather.
- Review Student Investigation Sheet 1A: *What Do I Observe About Seasons and Weather?* to gauge students' knowledge of seasonal weather patterns in your area. Provide additional support for students who do not understand this concept.
- Use students' responses to the Tell Me More question to assess how well they understand that weather can affect daily activities. If students do not seem to understand this concept, you may wish to provide additional examples for review.

3. Assessment Strategies (pg. 46)



Disciplinary Core Ideas
- **ESS2.D:** Weather and Climate
- **ESS3.B:** Natural Hazards
- **ETS1.B:** Developing Possible Solutions

Science and Engineering Practices
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information

Crosscutting Concepts
- Stability and Change
- Cause and Effect

5Es
- Evaluate

Investigation B

HOW WELL DOES THE SOLUTION REDUCE THE IMPACT OF THE WEATHER HAZARD?

MATERIALS

- **Student**

1 Science notebook*
1 Student Investigation Sheet 5B.1: *How Well Does the Solution Reduce the Impact of the Weather Hazard?*
1 Student Investigation Sheet 5B.2: *What Did I Learn About Solutions to Weather Hazards?*

- **Teacher**

1 Teacher Sheet 5B.1: *Weather Hazard Solution Rubric*
1 Teacher Sheet 5B.2: *Presentation Rubric*
1 Inflatable globe
1 World relief map* (optional)
Chart paper or whi
Markers*
*These materials are

Local Weather Observations

At the beginning or end of this investigation, have
group of students read the classroom barometer
weather station to gather local weather data. End
make qualitative and quantitative observations i
When you return to the classroom, have a stude
to the class chart. Provide students with the acta
air pressure, temperature, and rainfall for the da
students to analyze the data, and then engage
Relate the data to the day's investigation, and d
the local weather. If it is the end of the week, co
to graph the data or calculate averages for each
collected. Use the following questions as needed
discussion:

- How do our observations from the clas
to the actual meteorological data?
- What was our weather like here on a d
- What patterns do you notice in our dat
precipitation, and wind?
- Are there any interesting observations
share?

1. Distribute a copy of Student Investigation S
Solution Reduce the Impact of the Weather Ha
the instructions, and answer any questions stud

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2. Allow time for pairs of students to discuss the solution they selected in Investigation A and complete Part A of the investigation sheet by describing the solution and developing a claim about the solution's effectiveness. Remind students to support their claim with evidence and reasoning from the unit and what they have learned about their weather hazard solutions. Allow ample time for this step.

3. Explain to the class that one of the parts of the engineering design process is to improve solutions by testing them or to update solutions based on additional technology that is made available.

4. Direct students to complete Part B of Investigation Sheet 5B.1 by evaluating the solution they selected. You may wish to have students think about what considerations need to go into each solution, including social, economic, political, and environmental factors.

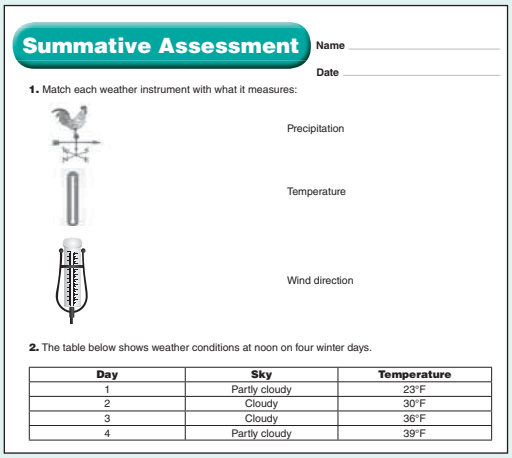
5. Distribute a copy of Student Investigation Sheet 5B.2: *What Did I Learn About Solutions to Weather Hazards?* to each student, and go over the directions. Remind students to listen carefully and ask clarifying questions during the presentations, and to take notes in Part A of the investigation sheet.

6. Allow each team to present its hazard, solution, and evaluation to the class. While teams present, evaluate each presentation using Teacher Sheet 5B.2: *Presentation Rubric*.

7. After all pairs have presented, allow time for students to work with a partner to answer the questions in Part B of Student Investigation Sheet 5B.2 by describing another solution they learned about and ways they can stay safe during dangerous weather.

8. If time allows, invite students to share a way they can protect themselves during a dangerous weather event.

4. Unit performance-task assessment (pgs. 178-179)



Summative Assessment

Name _____

Date _____

1. Match each weather instrument with what it measures:

Precipitation

Temperature

Wind direction

2. The table below shows weather conditions at noon on four winter days.

Day	Sky	Temperature
1	Partly cloudy	23°F
2	Cloudy	30°F
3	Cloudy	36°F
4	Partly cloudy	39°F

4. Summative Assessment (pg. 191)

Summative Assessment Remediation Strategies

The chart below shows which lessons support the unit's performance expectations. Based on the outcome of each student's summative assessment, you can develop remediation strategies using the relevant lessons from the unit.

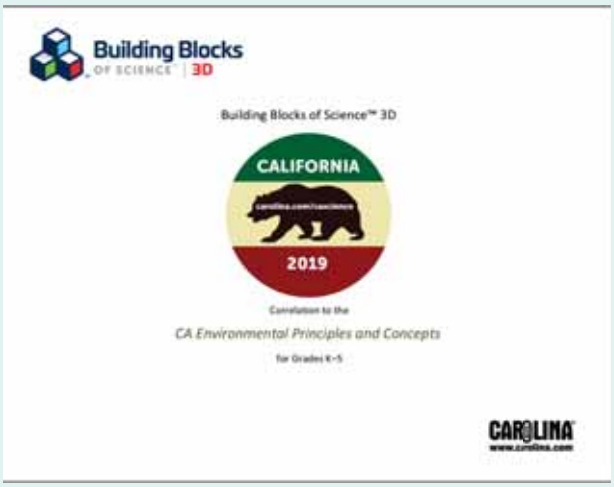
Summative Assessment Item Number	Performance Expectation Addressed	Lessons to Revisit
1	3-ESS2-1	Lesson 1
2	3-ESS2-1	Lesson 2
3	3-ESS2-1	Lesson 1
4	3-ESS2-1	Lesson 2
5	3-ESS2-1	Lesson 1
6	3-ESS2-1	Lesson 4
7	3-ESS3-1	Lesson 3
8	3-ESS2-2	Lesson 4
9	3-ESSE-1	Lesson 1
10	3-ESS2-1	Lesson 2
11	3-ESS2-1	Lesson 2
12	3-ESS2-1	Lesson 3
13	3-ESS2-2	Lesson 3
14	3-ESS2-2	Lesson 3
15	3-ESS2-2	Lesson 3

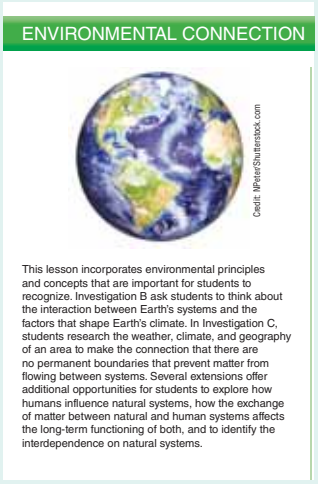
5. Summative Assessment Remediation Strategies (pg. 207)

Weather and Climate Patterns, Grade 3

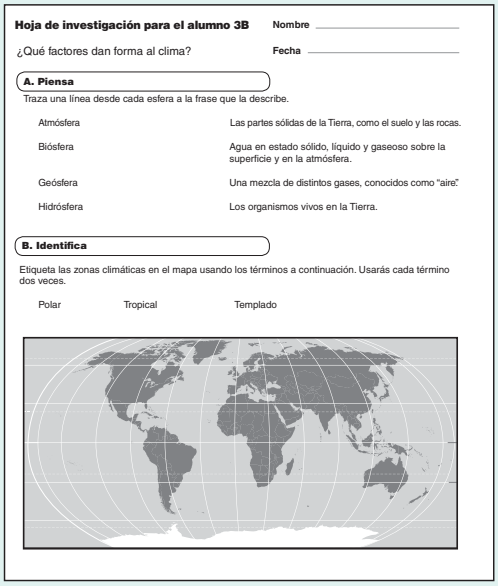
To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Weather and Climate Patterns.***

District Lens and Helpful Supports	Evidence from Weather and Climate Patterns
1. Environmental Principles and Concepts (EP&Cs)	Units include EP&Cs at the end of relevant lessons (pgs. 115, 154, 182). A complete of Building Blocks of Science 3D to the Environmental Principles and Concepts is available online at www.carolina.com/cascience • **Click on:** Building Blocks of Science 3D > Correlations
2. Spanish Teacher and Student Materials	All student-facing materials are available in Spanish in both print and digital formats. Teacher instruction is also available in Spanish.





Coming soon: Digital Spanish Teacher's Guide



District Lens and Helpful Supports	Evidence from Weather and Climate Patterns
3. 5Es	The 5Es are identified for each lesson: • Lesson Overview Charts (pgs. xxv-xxix) • Side column at the start of each investigation (pg. 69)
4. Alignment to ELA Programs and ELD Standards	Correlations to Benchmark, Wonders, and CA ELD Standards are found at www.carolina.com/cascience • **Click on:** Building Blocks of Science 3D > Correlations
5. Common Core Math and ELA	The Language Arts and Math Standards are identified for each lesson: • Lesson Overview Charts (pgs. xxv-xxix)

PH WEATHER DATA?

■ **Teacher**
1 Literacy and Science 2A: *How Can Weather Technology Be Used?* (Teacher's Version)
1 Student Investigation Sheet 1C: *What Is the Benefit of Understanding Patterns in Weather?* (Teacher's Version)
1 Student Investigation Sheet 2A: *Can I Analyze and Graph Weather Data?* (Teacher's Version)
Chart paper or whiteboard*
Computer or tablet with Internet access*
Markers*

Disciplinary Core Ideas
■ **ESS2.D:** Weather and Climate

Science and Engineering Practice
■ Analyzing and Interpreting Data

Crosscutting Concepts
■ Patterns
■ Stability and Change

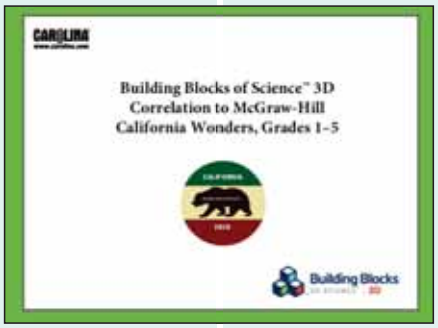
5Es
■ Explain

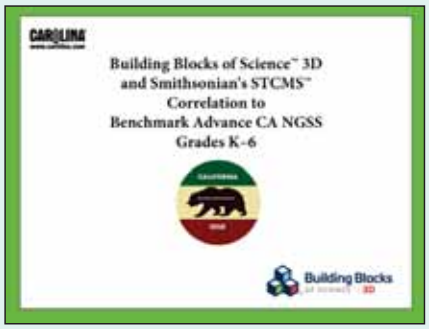
Literacy Component
■ *Weather and Climate Patterns* Literacy Reader, pgs. 6–7, 14–15

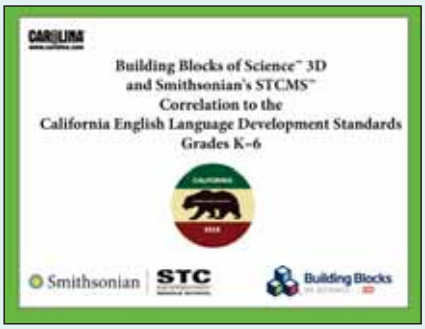
Investigation Overview

Investigation A: Pre-Unit Assessment: What Do We Know About Weather?
5Es: Engage
As a class, students develop a chart to share their ideas about weather.
■ **Teacher Preparation:** 5 minutes
■ **Lesson:** 30 minutes
Tell Me More! Think about the role that weather plays in your daily life. Give two examples of how weather affects your daily activities.

Investigation B: What Tools Do We Use to Measure Weather?
5Es: Engage, Explore
Students investigate different tools to measure weather and work in groups to use a thermometer to observe that temperature can change based on location.







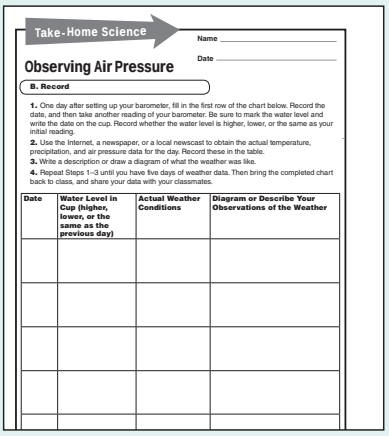
Language Arts and Math Standards
Language Arts
■ **L.3.4:** Vocabulary Acquisition and Use
■ **L.3.5:** Vocabulary Acquisition and Use
■ **L.3.6:** Vocabulary Acquisition and Use
■ **RI.3.1:** Key Ideas and Details
■ **RI.3.3:** Key Ideas and Details
■ **RF 3.3:** Phonics and Word Recognition
■ **SL.3.1:** Comprehension and Collaboration
■ **SL.3.3:** Comprehension and Collaboration
■ **W.3.2:** Text Type and Purposes

Math
■ **3.MD.A.2:** Solve problems involving measurement and estimations.
■ **3.NBT.A.1:** Use place value understanding and properties of operations to perform multi-digit arithmetic.

Weather and Climate Patterns, Grade 3

To access resources online, visit **www.carolina.com/bbs3dreview** and click on ***Weather and Climate Patterns.***

District Lens and Helpful Supports	Evidence from Weather and Climate Patterns
6. Take-Home Science	Take-Home Science Activities reinforce learning. (pg. 57- 59)
7. Safety	Safety, pgs. xvii-xviii
8. Literacy Support	• Literacy Articles provide additional informational text in support of investigations (Literacy Article 2B) • Literacy Connections (Appendix B, pgs. 212-214) provide additional literacy strategies



Take-Home Science

Name _____

Date _____

Observing Air Pressure

B. Record

1. One day after setting up your barometer, fill in the first row of the chart below. Record the date, and then take another reading of your barometer. Be sure to mark the water level and write the date on the cup. Record whether the water level is higher, lower, or the same as your initial reading.

2. Use the Internet, a newspaper, or a local newscast to obtain the actual temperature, precipitation, and air pressure data for the day. Record these in the table.

3. Write a description or draw a diagram of what the weather was like.

4. Repeat Steps 1–3 until you have five days of weather data. Then bring the completed chart back to class, and share your data with your classmates.

Date	Water Level in Cup (higher, lower, or the same as the previous day)	Actual Weather Conditions	Diagram or Describe Your Observations of the Weather

Safety Contract

In our science class, we are working like scientists.

In science class, I will:

- Listen to directions
- Complete each step of the experiment
- Look, feel, smell, and listen but never taste
- Wait to begin until my teacher tells me
- Wear safety goggles when my teacher tells me
- Ask my teacher to approve any experiment I plan on my own or with classmates
- Keep my hands away from my mouth and eyes as I work
- Tie back long hair
- Tuck in loose clothing
- Keep my workstation neat
- Put away materials after use
- Follow all safety rules

I have read this contract and will follow these safety rules in science class.

Student's signature _____

Date _____

I have read this safety contract and understand what is expected of my child during science class.

Parent/Guardian's signature _____

Date _____

Note to Parent/Guardian:

Literacy Connections: *Weather and Climate Patterns*

Students have wide and varied reading abilities and comprehension levels. Because of this, Building Blocks of Science® includes literacy components that can be incorporated into language arts or science sessions or that can be used outside of the classroom. These components can be completed and reviewed with the whole class, in small groups, in peer-teaching pairs, or individually to complement the inquiries, concepts, and core ideas presented in the unit. Literacy components can also be assigned to differentiate instruction. English language learners and developing readers may especially benefit from using these resources in small groups or high-ability/low-ability peer groups.

What Can a Weather Forecast Tell Me?

"This is Rachel Rainstorm, reporting for Channel 4 news from Orlando, Florida. This weekend the weather was extremely wet across the state. Because of unusually high afternoon temperatures and very humid air, summer storms popped up in many areas. Many of these storms were severe and caused a lot of damage.

"Thunderstorms raged across the state on both Saturday and Sunday evenings. These storms lit up the sky with lightning. There were 132 recorded lightning strikes on Sunday night alone. Wind gusts ranged from 40 to 58 mph. Many residents reported damaged roofs and fallen trees because of the high winds.

"Now let's look at the week ahead. We will see a dramatic change in our local weather. Gone are the high daily temperatures. We are looking at several cool, sunny days ahead.

"Expect daily highs to be in the mid-60s and lows to be in the middle 50s. The chance of rain will remain around 20 percent all week. Looks like a great week to get outside and enjoy the wonderful weather! I'm Rachel Rainstorm, giving you your weather roundup for Channel 4 news."

Questions

1. Rachel Rainstorm is forecasting during what season?

2. What led to weekend storms in the state?

3. What is the forecast for the week ahead?

4. Why is it helpful to know about the forecasted weather in your area?

Credit: michaeljung/Shutterstock.com

District Lens and Helpful Supports	Evidence from Weather and Climate Patterns
9. Science in the News	Pull phenomena from today's news into your classroom with these projects (pgs. 215-218).

Teacher Sheet: Science in the News Article Report

To help students understand a concept, it is often helpful to associate it with an event or phenomenon. Depending on the topic, students may be able to draw connections to recent events in the news or to historical events in your area. Using a literacy tool like an article report is a helpful way to bring in literacy, reading comprehension, and science topics at any grade level.

Science in the News articles can be assigned at any point during a unit to assist students in seeing the "real-world connection" to a particular concept. These articles should be provided by the teacher in lower grades, but students in grades 3–5 may be ready for the challenge of selecting their own articles independently. The following guidelines will help you find appropriate articles. If you ask students to locate their own articles, you may wish to provide some of these guidelines along with the specific requirements for the assignment. Students at all grades are provided with an article report sheet to help them analyze their article and draw connections between it and the unit concepts. For students in grades 3–5, a rubric is provided in this appendix to help them to evaluate an article for bias and credibility.

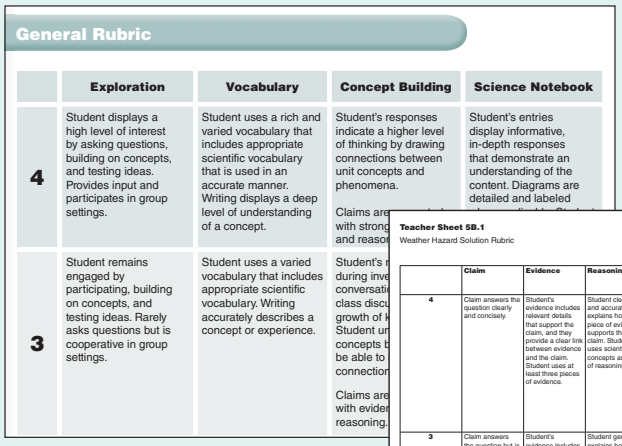
10. Innovators in Science

A diverse group of STEM professionals have impacted science. These scientists and engineers help students see themselves in these careers. Accessible online at www.carolina.com/bbs3dreview

- **Click on:** Unit Overview > Unit Resources > Digital Resources > Innovators in Science

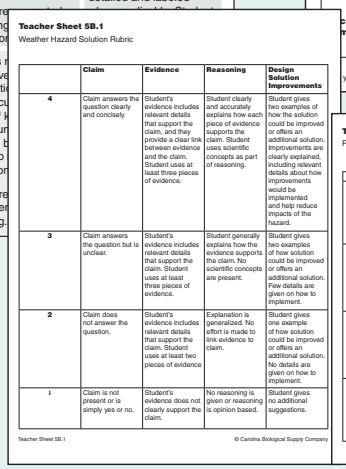
11. Rubrics for Science

- Teacher Sheet 5B.1 and Teacher Sheet 5B.2
- Appendix A (pg. 210)
- Science in the News: Article Credibility Rubric (pg. 218)



General Rubric

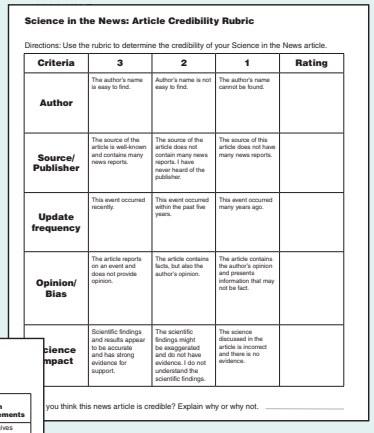
	Exploration	Vocabulary	Concept Building	Science Notebook
4	Student displays a high level of interest by asking questions, building on concepts, and testing ideas. Provides input and participates in group settings.	Student uses a rich and varied vocabulary that includes appropriate scientific vocabulary that is used in an accurate manner. Writing displays a deep level of understanding of a concept.	Student's responses indicate a higher level of thinking by drawing connections between unit concepts and phenomena. Claims are with strong and reaso	Student's entries display informative, in-depth responses that demonstrate an understanding of the content. Diagrams are detailed and labeled
3	Student remains engaged by participating, building on concepts, and testing ideas. Rarely asks questions but is cooperative in group settings.	Student uses a varied vocabulary that includes appropriate scientific vocabulary. Writing accurately describes a concept or experience.	Student's during inve conversati class discu growth of Student ur concepts b be able to connectior Claims are with evider reasoning.	



Teacher Sheet 5B.1
Weather Hazard Solution Rubric

	Claim	Evidence	Reasoning	Design Solution Improvements
4	Claim answers the question clearly and concisely.	Student's evidence includes relevant details that support the claim, and they provide a clear link between evidence and the claim. Student uses at least three pieces of evidence.	Student clearly and accurately explains how each piece of evidence supports the claim. Student uses scientific concepts as part of reasoning.	Student gives two examples of how the solution could be improved or offers an additional solution. Improvements are clearly explained, including relevant details about how improvements would be implemented and help reduce impacts of the hazard.
3	Claim answers the question but is unclear.	Student's evidence includes relevant details that support the claim. Student uses at least three pieces of evidence.	Student generally explains how the evidence supports the claim. No scientific concepts are present.	Student gives two examples of how solution could be improved or offers an additional solution. Few details are given on how to implement.
2	Claim does not answer the question.	Student's evidence includes relevant details that support the claim. Student uses at least two pieces of evidence	Explanation is generalized. No effort is made to link evidence to claim.	Student gives one example of how solution could be improved or offers an additional solution. No details are given on how to implement.
1	Claim is not present or is simply yes or no.	Student's evidence does not clearly support the claim.	No reasoning is given or reasoning is opinion based.	Student gives no additional suggestions.

Teacher Sheet 5B.1 © Carolina Biological Supply Company

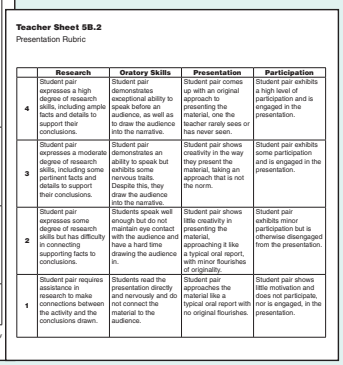


Science in the News: Article Credibility Rubric

Directions: Use the rubric to determine the credibility of your Science in the News article.

Criteria	3	2	1	Rating
Author	The author's name is easy to find.	Author's name is not easy to find.	The author's name cannot be found.	
Source/ Publisher	The source of the article is well-known and contains many news reports.	The source of the article does not contain many news reports. I have never heard of the publisher.	The source of this article does not have many news reports.	
Update frequency	This event occurred recently.	This event occurred within the past five years.	This event occurred many years ago.	
Opinion/ Bias	The article reports on an event and does not provide opinion.	The article contains facts, but also the author's opinion.	The article contains the author's opinion and presents information that may not be fact.	
cience mpact	Scientific findings and results appear to be accurate and has strong evidence for support.	The scientific findings might be exaggerated and do not have evidence. I do not understand the scientific findings.	The science discussed in the article is incorrect and there is no evidence.	

you think this news article is credible? Explain why or why not.



Teacher Sheet 5B.2
Presentation Rubric

	Research	Oratory Skills	Presentation	Participation
4	Student pair expresses a high degree of research skills, including ample facts and details to support their conclusions.	Student pair demonstrates exceptional ability to speak before an audience, as well as to draw the audience into the narrative.	Student pair comes up with an original approach to presenting the material, one the teacher rarely sees or has never seen.	Student pair exhibits a high level of participation and is engaged in the presentation.
3	Student pair expresses a moderate degree of research skills, including some pertinent facts and details to support their conclusions.	Student pair demonstrates an ability to speak but exhibits some nervous trails. Despite this, they draw the audience into the narrative.	Student pair shows creativity in the way they present the material, taking an approach that is not the norm.	Student pair exhibits some participation and is engaged in the presentation.
2	Student pair expresses some degree of research skills but has difficulty in connecting supporting facts to conclusions.	Student pair speak well enough but do not maintain eye contact with the audience and have a hard time drawing the audience in.	Student pair shows little creativity in presenting the material, approaching it like a typical oral report, with minor flourishes of originality.	Student pair exhibits minor participation but is otherwise disengaged from the presentation.
1	Student pair requires assistance in research to make connections between the activity and the conclusions drawn.	Students read the presentation directly and nervously and do not connect the material to the audience.	Student pair approaches the material like a typical oral report with no original flourishes.	Student pair shows little motivation and does not participate, nor is engaged, in the presentation.

District Lens and Helpful Supports	Evidence from Weather and Climate Patterns

12. Differentiated Instruction

- Cross-curricular Extensions (pg. 115)
- Teaching Tips (pg. 110)
- Differentiation Strategies (pg. 71)

Teaching Tip

Students may think that Earth's distance from the Sun is what determines seasons. Remind students that the tilt of Earth, combined with Earth's motion around the Sun, affects the amount of sunlight that hits a specific hemisphere of the planet during the year.

Differentiation Strategy

Challenge students to calculate the weekly average for temperature and precipitation and share how they calculated their results.

EXTENSIONS

Biomes
Have students learn more about climate zones by researching the world's biomes and the different organisms that call them home. Your class can focus on one biome, or you can divide the class into small groups and assign each group a different biome. Encourage students to create a visual that showcases the plants and animals that are found there and the environmental factors such as temperature and rainfall that make each biome unique. You may also have students research what problems may be facing the biomes they researched.

Books on Extremes
Read *Sophie Scott Goes South* by Alison Lester to follow along with the travels of a young Sophie to Antarctica. Then take a trip to the Sonoran Desert and read *Desert Giant: The World of the Saguro Cactus* by Barbara Bash. Encourage students to compare and contrast the different climates in the books and the organisms that call them home.

13. Teacher Preparation and Support

- Background Information (pg. 36)
- Teacher preparation for investigations (pg. 67)
- Teacher Answer Keys (pg. 87, Student Investigation Sheet 2A: Teacher's Version)
- Teaching Tips (pg. 43)

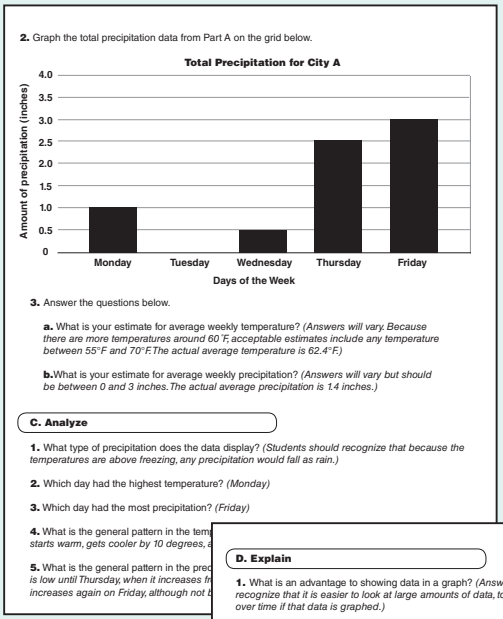
BACKGROUND INFORMATION

In this unit, students will learn about weather and climate. A basic understanding of this unit is that **weather** is the condition of the atmosphere at a specific time and place. Earth is surrounded by a layer of gases called the **atmosphere** that protect the planet and influence the weather. When we describe weather as hot or cold, wet or dry, or windy, we are actually describing characteristics of **air**. It's not hard to figure out what the weather is; just step outside or look out a window.

However, knowing the current weather conditions is not always enough. People want to know what the weather is going to be. In fact, there's a whole science called **meteorology** that exists just to predict or forecast the weather. About 600 years ago, when the first instruments to measure weather were invented, predicting weather was mostly speculation. Today, **meteorologists**, the scientists who study the weather, have a worldwide system to watch the weather and dependable ways of predicting what it will do next.

Teaching Tip

Snow-to-liquid ratios compare the amount of liquid precipitation with inches of snow. In colder temperatures, snow is lighter and has more air space, which results in more inches of snow. If snow falls at the freezing point (32°F), it typically is wet, heavy snow, which is more compact and results in fewer inches of accumulation.



2. Graph the total precipitation data from Part A on the grid below.

3. Answer the questions below.

a. What is your estimate for average weekly temperature? *(Answers will vary. Because there are more temperatures around 60°F, acceptable estimates include any temperature between 55°F and 70°F. The actual average temperature is 62.4°F.)*

b. What is your estimate for average weekly precipitation? *(Answers will vary but should be between 0 and 3 inches. The actual average precipitation is 1.4 inches.)*

C. Analyze

1. What type of precipitation does the data display? *(Students should recognize that because the temperatures are above freezing, any precipitation would fall as rain.)*

2. Which day had the highest temperature? *(Monday)*

3. Which day had the most precipitation? *(Friday)*

4. What is the general pattern in the temp
starts warm, gets cooler by 10 degrees, a

5. What is the general pattern in the prec
is low until Thursday, when it increases fr
increases again on Friday, although not t

D. Explain

1. What is an advantage to showing data in a graph? *(Answers will vary. Students should recognize that it is easier to look at large amounts of data, to see patterns, and to see trends over time if that data is graphed.)*

2. If you were forecasting the weather for City A, what weather would you predict for Saturday? Why would you make that prediction? *(Answers will vary. Students should use evidence from the data chart or graph when giving their prediction. Most students will state that it will be warm with some possibility of rain.)*

TEACHER PREPARATION

Investigation A

1. For each student, make one copy of Student Investigation Sheet 2A: *Can I Analyze and Graph Weather Data?* and one copy of Literacy and Science 2A: *How Can Weather Technology Be Used?*

2. Students will need access to their completed copies of Student Investigation Sheet 1C: *What Is the Benefit of Understanding Patterns in Weather?* from Lesson 1 for a discussion on averages.

3. Have markers and colored pencils available for students to use for their graphs.

Investigation B

1. Make one copy of Student Investigation Sheet 2B: *Can I Analyze Patterns in Weather in Various Places?* for each student.

2. Make eight copies of Teacher Sheet 2B.1: *Guidelines for City Weather Posters.*

3. Make one copy of Teacher Sheet 2B.2: *Weather Data for Eight Cities*,

Summary of Evidence for *Weather and Climate Patterns*

How does a phenomenon/problem organize the learning?

The unit begins with a class discussion of an **Anchoring Phenomenon** and a viewing of a Phenomena Video to generate student-driven questions about the unit's central phenomena. Each lesson kicks off with an **Investigative Phenomenon**, sparking student questions that can be explored through that lesson's investigations, which put phenomena directly into students' hands. Questions are provided for the teacher to help guide instruction, dispel misconceptions, and connect concepts to prior learning as students engage with the unit's the three dimensions through hands-on investigations, data gathering and analysis, notebooking, and discourse.

How are learning opportunities sequenced to enable students to make sense of the phenomena or problems?

The sequence is clearly presented in the **Evidence of Instructional Scaffolding** chart in the front of the Teacher's Guide. Performance Expectations were initially mapped out along with the Crosscutting Concepts, Science and Engineering Practices, and Disciplinary Core Ideas to ensure grade-level instruction of NGSS. Each lesson connects to the previous, creating a seamless, connected instructional path for students. Where appropriate, engineering and other science-discipline PEs are integrated to eliminate any "silos of science." Students experience science and engineering as an integrated whole.

What is the path of student thinking from their prior knowledge to the expected three-dimensional learning outcomes?

By starting with an **Anchoring Phenomenon** and a **Pre-Assessment** lesson to tap into students' prior knowledge, the teacher is able to evaluate what understandings students bring to the sequence of learning for the new unit. Teacher questioning strategies are built into each investigation to tie to the unit's three dimensions, clarify any misconceptions, and help students make meaning out of what they discover in the investigations.

How do students show/demonstrate their three-dimensional understanding of the phenomenon?

- **Pre-Unit Assessment and Post-Unit Assessment Opportunities:** The pre-unit assessment asks students to draw upon previous knowledge, allowing teachers to gauge their levels of understanding. The post-unit assessment touches upon the topics and concepts from the entire unit and evaluates students' learning. Students are asked to compare the pre-unit assessment and post-unit assessment activities to evaluate growth.
- **Formative Assessment Strategies:** At the end of each lesson, specific strategies are listed for each investigation. These include ways to utilize Student Investigation Sheets and Tell Me More prompts as assessment tools. In lower grades, an Assessment Observation Sheet lists what to look for as you work with small groups of students.
- **Literacy and Digital Components:** These resources can be assigned to differentiate assignments and to assess student progress as needed.
- **General Rubric: Appendix A** includes a rubric that provides an expected progression of skills and understanding of science content. These guidelines can be used to assess students throughout the course of the unit.
- **Summative Assessment:** This unit-specific, cumulative assessment allows students to demonstrate their understanding of content presented by responding to questions in a variety of formats. Each question is aligned to performance expectations and provides insight on students' understanding of the concepts addressed. An answer key is provided, as well as a chart that indicates the performance expectation addressed by each question and lessons to revisit if remediation is required.
- **Digital Scenario-based Assessment:** This digital assessment resource supplies phenomena-driven questions that apply the unit's learning to new, authentic situations. It provides an alternative form of summative assessment that can be administered and corrected by the computer. Scores are sent to a report for the teacher.

Evidence of Instructional Scaffolding

Scaffolding is a crucial yet natural element in all classrooms. Building Blocks of Science strives to simplify this instructional strategy by integrating this guided process into each unit, systematically building upon student knowledge, using hands-on learning to reinforce concepts, and employing student-driven inquiry. These strategies introduce new concepts and, with practice and review, lead students toward mastery. It is important to integrate scaffolding not only throughout the unit but also throughout each lesson. As students demonstrate understanding of a concept, they should be encouraged to take a leadership role in class or to attempt assignments independently. Additionally, scaffolding reveals opportunities for differentiation. Below-level learners require more reinforcement as they learn new skills, so the process toward mastery will need to be adjusted. Above-level learners do not need as much support and achieve mastery more quickly; therefore, these students can be assigned more independent study.

	Lesson 1 ▸	Lesson 2 ▸
OBJECTIVES	■ Recognize that weather is the conditions in the atmosphere at a specific time and place. ■ Identify words that can be used to describe weather. ■ Make observations about local weather conditions. ■ Investigate tools that measure weather. ■ Analyze patterns in weather data to make predictions about weather.	■ Analyze and graph the daily averages for temperature and precipitation in an area. ■ Estimate the weekly averages for temperature and precipitation in an area. ■ Analyze graphs of yearly temperature and precipitation data to look for weather patterns. ■ Investigate relationships between weather conditions in various cities to predict typical weather conditions during a particular season in the Northern Hemisphere.
SCAFFOLDING	Students should know: ■ Weather is the atmospheric conditions in a specific place at a specific time. ■ There are many kinds of weather tools, such as windsocks, thermometers, and barometers, that measure specific attributes of the weather, such as wind speed, temperature, and air pressure. ■ Patterns in weather data can be used to make predictions about future weather.	Students should know: ■ Technology such as weather balloons, satellites, and radar can be used to collect weather data. ■ Weather conditions can differ by time, place, and season. ■ Temperature and precipitation data can be analyzed to look for patterns in specific areas. ■ Long-range patterns in temperature and precipitation can be used to predict seasonal weather patterns.

	Lesson 3 ▸	Lesson 4 ▸	Lesson 5
OBJECTIVES	■ Describe the relationship between weather and climate. ■ Identify the parts of Earth's climate system and the factors that can affect climate. ■ Recognize the different climate zones and where they are located on Earth. ■ Discuss patterns among Earth's climate system and climate zones.	■ Recognize that dangerous and severe weather is generally caused by warm and cold air masses meeting. ■ Identify types of weather hazards. ■ Describe patterns in climate and dangerous weather. ■ Describe the effects of a specific type of dangerous weather, tropical storms.	■ Describe the impacts of weather hazards on people and property. ■ Research weather hazards and proposed design solutions that lessen the weather-related impact on people and property. ■ Present findings of research on proposed solutions to reduce the impact of weather hazards. ■ Evaluate a proposed solution to a problem caused by weather hazards and make a claim to determine whether the solution reduces the impact of the hazard. ■ Evaluate learning from throughout the unit and compare that knowledge to initial ideas from the beginning of the unit.
SCAFFOLDING	Students should know: ■ Climate is the general weather patterns and long-term trends of an area. ■ Many factors determine an area's climate, but two of the most important are air temperature and precipitation. ■ Earth's surface can be broken into climate zones based on air temperature and air circulation.	Students should know: ■ Air pressure and air circulation impact formation of weather and dangerous weather. ■ Dangerous weather is a type of natural hazard that has the potential to cause damage or loss of life. ■ A tropical storm is a dangerous weather event that causes weather hazards such as heavy rain, flooding, and high winds to affect an area. ■ Meteorologists continue to study patterns in weather and climate to improve warning systems for storms.	Students should know: ■ An engineer is someone who uses science to solve problems or fulfill needs. ■ Design solutions have been used to reduce the impact of weather hazards in an area. ■ Proposed solutions to weather hazards have many considerations, including social, economic, political, and environmental factors. ■ Weather hazards can affect people or property at any time, so having a plan before a dangerous weather event is important.

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Learning Framework

Kindergarten	**Push, Pull, Go** *K-PS2-1; K-PS2-2; K-2-ETS1-1; K-2-ETS1-2*	**Living Things and Their Needs** *K-LS1-1; K-ESS2-2; K-ESS3-1; K-ESS3-3; K-2-ETS1-2*	**Weather and Sky** *K-PS1-1; K-PS3-1; K-PS3-2; K-ESS2-1; K-ESS3-2; K-2-ETS1-1; K-2-ETS1-2*
1st Grade	**Light and Sound Waves** *1-PS4-1; 1-PS4-2; 1-PS4-3; 1-PS4-4; K-2-ETS1-1; K-2-ETS1-2*	**Exploring Organisms** *1-LS1-1; 1-LS1-2; 1-LS3-1; K-2-ETS1-2*	**Sky Watchers** *1-ESS1-1; 1-ESS1-2*
2nd Grade	**Matter** *2-PS1-1; 2-PS1-2; 2-PS1-3; 2-PS1-4; K-2-ETS1-1; K-2-ETS1-2*	**Ecosystem Diversity** *2-LS2-1; 2-LS2-2; 2-LS4-1; K-2-ETS1-2; K-2-ETS1-3*	**Earth Materials** *2-PS1-1; 2-ESS1-1; 2-ESS2-1; 2-ESS2-2; 2-ESS2-3; K-2-ETS1-1; K-2-ETS1-2*
3rd Grade	**Forces and Interactions** *3-PS2-1; 3-PS2-2; 3-PS2-3; 3-PS2-4; 3-5-ETS1-1; 3-5 ETS1-2*	**Life in Ecosystems** *3-LS1-1; 3-LS2-1; 3-LS3-1; 3-LS3-2; 3-LS4-1; 3-LS4-2; 3-LS4-3; 3-LS4-4; 3-5-ETS1-2*	**Weather and Climate Patterns** *3-ESS2-1; 3-ESS2-2; 3-ESS2-3; 3-ESS3-1; 3-5-ETS1-2*
4th Grade	**Energy Works** *4-PS3-1; 4-PS3-2; 4-PS3-3; 4-PS3-4; 4-PS4-1; 4-PS4-3; 4-ESS3-1; 3-5 ETS1-2; 3-5-ETS1-3*	**Plant and Animal Structures** *4-LS1-1; 4-LS1-2; 4-PS4-2; 3-5-ETS1-2*	**Changing Earth** *4-ESS1-1; 4-ESS2-1; 4-ESS2-2; 4-ESS3-2; 3-5-ETS1-2*
5th Grade	**Structure and Properties of Matter** *5-PS1-1; 5-PS1-2; 5-PS1-3; 5-PS1-4; 3-5-ETS1-2*	**Matter and Energy in Ecosystems** *5-PS3-1; 5-LS1-1; 5-LS2-1; 5-ESS2-1; 5-ESS3-1; 3-5-ETS1-3*	**Earth and Space Systems** *5-PS2-1; 5-ESS1-1; 5-ESS1-2; 5-ESS2-1; 5-ESS2-2; 5-ESS3-1; 3-5-ETS1-2*

Have questions? Please join us at www.carolina.com/bbs or www.carolina.com/cascience, or contact us at cascience@carolina.com.

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