Content Literacy—Science: Extreme Weather

English Language Arts and Science, Grade 3

This unit, which takes approximately three weeks, is designed to teach students literacy skills in the context of learning science. The focus for this unit is weather and weather-related hazards, also known as extreme weather. The literacy component of the unit centers on the use of text features, text structure, and general academic and science vocabularies. Following a general introduction on weather and extreme weather conditions, students research one of four weather-related hazards in small groups where they generate questions, analyze data, and use the questions to direct their learning. The culminating project includes a written report on their specific topic and a group oral presentation on what they have learned.

These Model Curriculum Units are designed to exemplify the expectations outlined in the MA Curriculum Frameworks for English Language Arts/Literacy and Mathematics incorporating the Common Core State Standards as well as all other MA Curriculum Frameworks. These units include lesson plans, Curriculum Embedded Performance Assessments, and resources. In using these units, it is important to consider the variability of learners in your class and make adaptations as necessary.
This document was prepared by the Massachusetts Department of Elementary and Secondary Education
Mitchell D. Chester, Ed.D., Commissioner

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## Stage 1 — Desired Results

### ESTABLISHED GOALS

**G**

**CCSS.ELA-Literacy.RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

**CCSS.ELA-Literacy.RI.3.2** Determine the main idea of a text; recount the key details and explain how they support the main idea.

**CCSS.ELA-Literacy.RI.3.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.

**CCSS.ELA-Literacy.RI.3.7** Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

**CCSS.ELA-Literacy.W.3.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

**CCSS.ELA-Literacy.W.3.2.a** Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.

**CCSS.ELA-Literacy.W.3.2.b** Develop the topic with facts, definitions, and details.

**CCSS.ELA-Literacy.W.3.2.d** Provide a concluding statement or section.

### Transfer

**Students will be able to independently use their learning to...**

- Generate open-ended questions and seek answers through critical analysis of text, media, interviews, and/or observations.
- Communicate ideas effectively in writing to suit a particular audience and purpose.

### Meaning

**UNDERSTANDINGS**

**Students will understand that...**

**U**

**Q1.** What is weather?

**Q2.** How does weather affect our lives?

**Q3.** What are the impacts of extreme weather?

**Q4.** How do we research and learn about a topic?

**ESSENTIAL QUESTIONS**

**K**

**Students will know...**

**K1.** Key factors related to weather conditions and climate (sun, air, and water).

**K2.** Effects of severe weather events.

**K3.** Characteristics of extreme weather events (thunderstorms, blizzards, hurricanes, tornadoes).

**S**

**Students will be skilled at...**

**S1.** Generating open-ended questions to direct research on a given topic.

**S2.** Using text features (graphs, charts, maps, photographs, etc.) to support understanding of weather.

**S3.** Using the author’s text organization to understand main ideas and supporting
<table>
<thead>
<tr>
<th>CCSS.ELA-Literacy.W.3.5</th>
<th>With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing (editing for conventions should demonstrate command of language standards 1–3 up to and including grade 3).</th>
</tr>
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<tbody>
<tr>
<td>CCSS.ELA-Literacy.W.3.7</td>
<td>Conduct short research projects that build knowledge about a topic.</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.3.1</td>
<td>Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.3.1.a</td>
<td>Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.3.1.b</td>
<td>Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.3.1.c</td>
<td>Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.3.1.d</td>
<td>Explain their own ideas and understanding in light of the details.</td>
</tr>
<tr>
<td>K4.</td>
<td>Where extreme weather events are most likely to occur.</td>
</tr>
<tr>
<td>K5.</td>
<td>The impact of extreme weather events on people and the places where they live.</td>
</tr>
<tr>
<td>S4.</td>
<td>Using academic and discipline-related vocabulary related to the unit, orally and in writing.</td>
</tr>
<tr>
<td>S5.</td>
<td>Taking notes on a topic and using them to write a short research report.</td>
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</table>
discussion.
CCSS.ELA-Literacy.SL.3.2 Determine the main ideas and supporting detail of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
CCSS.ELA-Literacy.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
CCSS.ELA-Literacy.L.3.6 Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., “After dinner that night we went looking for them”).

Science and Technology/Engineering
NOTE: These are draft revised STE standards [as of 10/22/13]; final adopted STE standards may be slightly different.
DSTE.3-ESS2-1 3-ESS2-1. Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area. [Clarification Statement: Examples of data could include average temperature, precipitation, wind direction and wind speed.] [Assessment Boundary: Graphical displays are limited to pictographs and bar graphs. Assessment does not include climate change.]
DSTE.3-ESS2-2 3-ESS2-2. Obtain and summarize information about the climate of different regions of the world to illustrate that typical weather conditions over a year vary by region.
DSTE.3-ESS3-1 3-ESS3-1. Evaluate the merit of a design solution that reduces the impacts of weather-related hazard.* [Clarification Statement: Examples of design solutions to weather-related hazard could include a barrier to prevent flooding, a wind resistant roof, and a lightning rod.]

<table>
<thead>
<tr>
<th>Evaluative Criteria</th>
<th>Assessment Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>The written report contains accurate information related to each question.</td>
<td>CURRICULUM EMBEDDED PERFORMANCE ASSESSMENT (PERFORMANCE TASKS) PT</td>
</tr>
<tr>
<td>Illustrations/graphics highlight one of the categories of information.</td>
<td>Performance Task: Students will use their knowledge of typical and extreme weather (hurricanes, blizzards, thunderstorms, or tornadoes) to write a brief research report answering the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather? After students write a report, they make an oral presentation. Students will work in groups and give an oral presentation about their group’s type of extreme weather. The presentation will include a section (paragraph/information) from each student’s written report. Presentations will also include at least one of the following: a visual display of the storm using a video clip or website that describes or illustrates the storm; or examples of the impact of the storm on people’s lives and the land.</td>
</tr>
<tr>
<td>The written report uses text features and text structure.</td>
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<tr>
<td>Students are prepared for their oral presentations and express their ideas clearly.</td>
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Goal: The goal is for students to research and report on their answer to the questions: What conditions lead to one form of extreme weather? What is the impact of that
**extreme weather on our lives? How can we reduce the impact of that extreme weather?**

**Audience:** Initial group presentations will be for other members of the class. After this, other students or parents may be invited to attend the class presentations. The written reports should be turned in for individual assessments.

**Directions:** Students will write a short report on their type of extreme weather. They will:

- Review, organize, and synthesize notes they have taken from multiple sources of information and use their notes to write a report explaining how extreme weather is different from typical weather, and on the impact of this type of extreme weather on our lives.
- Edit and revise the report, using the Student Checklist (see the Appendices).
- Plan the oral presentation with other group members.
- Create or select visuals to illustrate their part of the oral presentation.
- Present their findings in groups on the final day.

<table>
<thead>
<tr>
<th><strong>Active, focused participation in whole-class and small-group discussions</strong></th>
<th><strong>OTHER EVIDENCE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students’ abilities to ask and answer questions about a topic</td>
<td>Students’ participation in discussions</td>
</tr>
<tr>
<td>Written responses to questions that include supporting evidence from texts</td>
<td>Students’ notes after reading</td>
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<tr>
<td></td>
<td>Students’ abilities to locate information based on questions generated in whole class, in small groups, or individually</td>
</tr>
<tr>
<td></td>
<td>Students’ discussions and responses to Essential Questions</td>
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</table>
Stage 3 — Learning Plan

Summary of Key Learning Events and Instruction

**Lessons 1–5: What Is Weather?**

Lesson 1: Students are introduced to the unit and talk about the Essential Questions. Students discuss what they know about weather, and how it affects the way we live. They learn about weather conditions through a teacher read-aloud and whole-class reading text, as well as additional media. The class begins to create a display of weather words.

Lessons 2 and 3: Students learn about the three factors that interact to create weather: the sun, water, and air (temperature, precipitation, and wind). Students continue reading the whole-class text to reinforce concepts and support understanding.

Lesson 4: Students learn about four types of extreme weather characterized by relative amounts of heat (temperature), precipitation and wind: thunderstorms, hurricanes, tornadoes, and blizzards. Read aloud pages related to “wild weather” and “storms.” Students generate questions related to these examples of extreme weather and group questions into general categories.

Lesson 5: Students are introduced to mini-inquiry circles for researching questions about extreme weather using thunderstorms as an example. They learn how to ask authentic questions based on the list of student questions from Lesson 4 and how to use multiple sources to find answers. Students browse books on the four types of extreme weather to determine which type of weather to investigate. They learn about thunderstorms and how to find answers to questions and form groups for mini-inquiry circles.

**Lessons 6–10: Investigating Extreme Weather**

Lessons 6, 7 and 8: Students generate questions about their topic and use these questions for reading, writing, and discussing the information learned in their mini-inquiry circles. They record information learned in their research notebooks. There are mini-lessons on asking questions that require research that can have several answers rather than those for which there is one correct answer. Students ask questions; locate information based on questions; use multiple sources, including websites; and determine important information and take notes.

Lessons 9 and 10: Students learn how to synthesize information gained from multiple sources and write a report. Students use their notes from reading and discussions for their reports and begin writing their individual research reports.

**Lessons 11–13: Going Public!**

Lessons 11 and 12: Students complete individual research reports, participate in a peer-editing conference, and meet with their groups to plan the final presentation on their topic. They each select one section (paragraph) of their written reports to include in the group oral presentation and discuss which visual(s) best illustrates the topic.

Lesson 13: Each group will be allotted 10 to 15 minutes to present what they learned about their weather-related hazard and to answer questions from the class. At the end of the presentations, students discuss how their own topics relate to others that were presented. At
At the end of Lesson 13, students will write a reflection in their research journal, describing what they learned and what part of their group work helped them to learn the most.

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General Resources and Notes

This unit is written to provide students with:

- Content-specific knowledge and understanding of weather and weather-related hazards (extreme weather).
- A review of how to use text features and nonfiction text structure to locate answers to questions.
- An opportunity to work together in small inquiry groups to investigate a topic and report on learning to a larger group.

Preparation

- Speak with K–2 teachers, or the science specialist, to find out what students have learned about weather in order to build upon that background knowledge.
- Collect books for the unit. Several books are designated as whole-class reads to provide a foundation for further study. Other books are suggested for individual or small-group work.
- Collect and organize texts for small-group work based on a type of extreme weather. Specific titles are suggested throughout the unit.
- Since most of the books are at or above third-grade level, it would be helpful to have support specialists during class time for students who are struggling readers.
- Create a list of reading groups with students of similar reading levels for reading whole-class, grade-level text.
- Write Essential Questions on chart paper, one question per chart, for periodic reference during discussions.
- Ensure access is available to websites and media resources.
- Websites on weather: Preview/explore the following websites or other websites on weather before beginning this unit:
  - University of Illinois Extension—Tree House Weather Kids: [www.urbanext.illinois.edu/treehouse/](http://www.urbanext.illinois.edu/treehouse/)
  - National Oceanic and Atmospheric Administration (NOAA) Education Resources: [http://www.education.noaa.gov/](http://www.education.noaa.gov/). These are the education pages for the government's largest collection of weather data. There is a link for weather systems and patterns, a link on the main site for weather and atmosphere, a link for forecasting, and many hands-on experiments for demonstrating the concepts.
  - The Globe Program—Explore Science Investigations section: [http://www.globe.gov/explore-science/globe-investigations](http://www.globe.gov/explore-science/globe-investigations). The atmosphere tab has worksheets for observing and identifying different types of clouds, etc. There's also a student zone section.

Resources

- Texts for whole-class, small-group, and independent reading
• Research Journal: Students will record their learning in a Research Journal. You can create a journal with a stapled packet of pages that include Topic or Question, What I Learned, Words I Learned, and What Questions I Have (see appendices). Or, you may give students notebooks as their Research Journal in which they record this information.

• Word Wall: Word Wall displays are based on several principles from research in vocabulary development: (1) vocabulary knowledge is correlated with comprehension; (2) multiple exposures to vocabulary increase understanding of word meanings; and (3) active engagement in using words supports learning their meaning (Beck, McKeown, & Kucan, *Creating Robust Vocabulary*, 2008). Create a Word Wall of critical words for the study of weather and extreme weather throughout the unit. While you may already have a Word Wall for general vocabulary development and common word patterns, this Word Wall will focus on weather-related words. Locate an area of the room to display a Word Wall of key academic and content-specific words for the unit that is visible and accessible to all students. As you progress through the lessons, decide with the students which words are important to know and add these to the wall.

• Organize the Word Wall display alphabetically, by type of weather (e.g., “Hurricane Words”), or by the three factors that affect weather: sunlight (temperature), air (wind), and water (precipitation). The purpose is to provide a context for students to be actively engaged in learning, using, and thinking about words. It is designed to be interactive so that students can use the words as they read, discuss, and write about a topic. It may also be used for brief teacher-directed or student-directed activities to review and reinforce the meanings of words (e.g., I am thinking of a word... Find a word that relates to... Find two words related to thunderstorms and use them in a sentence). The Word Wall is especially beneficial for English language learners and students with special needs, helping them to read words, relate them to categories, and make connections between words. Consider adding photographs, diagrams, definitions, and connections to illustrate a word's meaning. There are two different categories of words from which the vocabulary is selected: Tier 2 words are high-frequency words that may have different meanings in different contexts; Tier 3 words are low-frequency, content-related words. This website provides information on creating Word Walls in your classroom: www.readingrockets.org/strategies/word_walls/.

Professional Resources


• Stephanie Harvey and Harvey Daniels (2009), *Comprehension and Collaboration: Inquiry Circles in Action*. New York: Heinemann. This book provides information on creating student inquiry circles for research on questions about a topic. This text outlines the stages of research for both short- and long-term research projects.

Key Vocabulary: These science words need a specific content definition: sunlight, temperature, air, wind, water, precipitation, equator, solar, vapor, evaporation, precipitation, cirrus, cumulus, and stratus.
Time: Lessons are designed for approximately 60 minutes. This will allow you time to include additional reading and writing instruction required by the district (basal anthologies, guided reading, writing workshop, etc.) for the remainder of a literacy block.

Note on Science Progression: This unit assumes that students have some understanding of seasonal changes, the purpose of weather forecasting, and considerations of design solutions. The standards addressed in this unit are foundational to later learning when considering changes to an environment, air and ocean interactions on patterns of weather, and human interactions with earth systems. See the map (next page) for a visual of how the standards in this unit fit within a progression of learning across years.
Lessons 1, 2, 3, 4, and 5

Brief Overview of Lessons: Lessons 1, 2 and 3 introduce students to the unit on weather. Students discuss the Essential Questions and review the final performance (CEPA) assessment. Then students generate questions about weather, which are recorded on a chart. Through teacher read-alouds and whole-class reading, students learn the three factors related to weather: sunlight (temperature), air (wind), and water (precipitation). Lessons 4 and 5 introduce students to the interactions of these factors that create four types of extreme weather: thunderstorms, hurricanes, tornadoes, and blizzards. Students are introduced to the format of mini-inquiry circles. Following teacher read-alouds and the reading of a whole-class text in groups, students decide which type of extreme weather they want to explore further in mini-inquiry circles. During this first week, the class begins to create a Word Wall for weather words to be used during discussions and to review concepts learned. As you plan, consider the variability of learners in your class and make adaptations as necessary.

Prior Knowledge Required: The difference between narrative and informational text; text features and their purposes; understanding that asking questions help readers to focus on and locate information; some understanding of weather factors

Estimated Time: 60 minutes for each lesson

Instructional Model: The focus is on whole-class and small-group sharing and learning to provide the foundation for future lessons: listening to and participating in a read-aloud; reading and responding to a text in small groups; generating authentic questions; and learning how to find answers to questions in mini-inquiry circles using multiple
sources. A flexible grouping model for reading the whole-class text is used to ensure that all students have equal access to learning important ideas in text with varying levels of support: significant support, some support, and no support.

**Resources for Lessons**

Student text (one copy for each student):
- *Magic Tree House Fact Tracker: Twisters and Other Terrible Storms* by Will Osborne and Mary Pope Osborne. (Lexile 680L, Guided Reading level R, DRA level 40) NOTE: This text should be included in each of the groups for browsing and mini-inquiry groups.

Teacher read-aloud (one copy):
- *Inside Weather* by Mary Kay Carson

Text to support ELLs and special education students (three to five copies):
- *Weather Words and What They Mean* by Gail Gibbons (Lexile 450L)

Suggested texts for student browsing (one to two copies of each):
- General weather/extreme weather
  - *Weather* by Seymour Simon (Lexile 1020L)
  - *Extreme Weather* by H. Michael Mogil and Barbara Levine (Lexile 1060)**
  - *Weather* (DK Eye Wonder series, DK Publishing) **
  - *Inside Lightning* by Melissa Stewart
  - *Storms!* by Angela Royston
- Hurricanes
  - *Hurricanes* by Seymour Simon
  - *Hurricanes* by Chris Oxlade, Kingfisher Readers series (Lexile 950L)
- Inside Hurricanes by Mary Kay Carson
- Hurricane and Tornado by Jack Challoner (DK Eyewitness series)**

** Tornadoes
- Inside Tornadoes by Mary Kay Carson
- Tornadoes by Christy Steele, Nature on the Rampage series
- Hurricane and Tornado by Jack Challoner, DK Eyewitness series**
- Tornado by Stephen Kramer (Lexile 940)

** Snowstorms and blizzards
- Blizzards by Michael Woods and Mary B. Woods
- White-out Blizzards by Claire Watts
- Blizzard! The Storm that Changed America by Jim Murphy (Lexile 1080L)
- Extreme Weather by H. Michael Mogil and Barbara Levine (Lexile 1060)**
- Weather (DK Eye Wonder series, DK Publishing)**

** Titles are included in more than one group of books.

Websites:
- University of Illinois Extension—Tree House Weather Kids: [www.urbanext.illinois.edu/treehouse/](http://www.urbanext.illinois.edu/treehouse/)

Professional resource:
Materials

- Chart paper
- Research Journal (see appendices for Sample Research Journal)
- Description of Mini-Inquiry Circles (see appendices)
- Inquiry Circle Student Handout (see appendices)
- Browsing Notes Worksheet (see appendices)
- Comparing Weather in the United States handout (see appendices)
- Climate Zone and Weather Worksheet (see appendices)
- Sticky notes and/or index cards
Content Area/Course: English Language Arts and Science, Grade 3
Unit: Extreme Weather (Content Literacy Science)
Time: 60 minutes for each lesson
Lessons 1–5: What Is Weather?

Standard(s)/Unit Goal(s) to be addressed in these lessons
CCSS.ELA-Literacy.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.
CCSS.ELA-Literacy.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
CCSS.ELA-Literacy.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.
CCSS.ELA-Literacy.RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
CCSS.ELA-Literacy.SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
DSTE.3-ESS2-1 3-ESS2-1. Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area. [Clarification Statement: Examples of data could include average temperature, precipitation, wind direction and wind speed.] [Assessment Boundary: Graphical displays are limited to pictographs and bar graphs. Assessment does not include climate change.]
DSTE.3-ESS2-2 3-ESS2-2. Obtain and summarize information about the climate of different regions of the world to illustrate that typical weather conditions over a year vary by region.

Essential Questions addressed in these lessons
Q1. What is weather?
Q2. How does weather affect our lives?
Q3. What are the impacts of extreme weather?
Q4. How do we research and learn about a topic?

Objectives: Students will know and be able to:
- Discuss the three major factors that interact to create weather
- Identify specific types of extreme weather
- Use text, text features, and media to locate answers to their questions
Instructional Tips/Strategies/Notes for Teacher

- Because these initial lessons are based on whole-class participation, make sure that all students have an opportunity to share their ideas—with a partner or in a small group—before the whole-class discussion. Use strategies such as Turn-and-Talk, or Think/Pair/Share to give more students a chance to share ideas.

- You will only be using selected pages in the texts for the read-aloud and for student reading. Point out to students that this is often how informational texts are read.

- Vocabulary for the Word Wall this week: Tier 2 words: extreme, severe, usual; Tier 3 words: weather, climate, precipitation, temperature, wind, atmosphere, lightning, thunder, meteorologist. (Reminder: Tier 2 words are high-frequency words that may have different meanings in different contexts; Tier 3 words are low-frequency, content-related words.)

- Before Lesson 3, gather different books about each type of extreme weather: blizzards, hurricanes, thunderstorms, and tornados (see suggested titles at the beginning of the lesson).

- Lesson 3: For ELLs, students in special education, and other struggling readers, you may want to read the 10 pages on “Moisture” in Weather Words and What They Mean by Gail Gibbons, to clarify and reinforce understanding of the terminology related to water (pages are not numbered). Use pictures of clouds.

- Thunderstorms are used as an ongoing example to model student inquiry and facilitate student learning through the lessons. When students begin to work on their own research and report, they can choose any type of extreme weather discussed in the texts.

- A flexible grouping model for reading the whole-class text ensures that all students have equal access to learning important ideas in text with varying levels of support: significant support, some support, and no support. To maximize student learning:
  - Review which students will work well together during reading and create a list of reading groups.
  - Review key vocabulary and concepts before reading and display these words on a Word Wall.
  - Develop charts with students to display their questions.
  - Plan necessary support in collaboration with ELL or special education teachers.
  - Provide a list of reading/writing activities for students to engage in when they finish reading in their groups.

Anticipated Student Preconceptions/Misconceptions

- Preconception: Weather is caused by luck or chance.
- Misconception: The main factor in weather is temperature.
Lesson Sequence

Lesson 1 (60 minutes) Introduction to unit

Lesson Opening (5 minutes)
- Using the anchor charts, discuss each of the four Essential Questions. You could use different strategies for each question. For example: Turn-and-talk, everyone writes an idea on a sticky note and then post it on the chart, Think/Pair/Share, etc.
- Record students’ thoughts/responses to these questions on the charts.
- Present and discuss the final performance assessment (CEPA), telling students that they will be researching one type of extreme weather, writing a report about the topic, and sharing their learning in a group presentation.

During the Lesson

Interactive Read-aloud (15 minutes)
- Read pages 4–8, stopping after pages 4, 5 and 8 to discuss what they have learned.
  - After page 4: How does weather affect our lives?
  - After page 5: What did we learn about weather? About climate?
- Begin the Word Wall with words learned during read-aloud (e.g., weather, climate, equator). Use a processing activity to engage in with the words (see General Resources and Notes).

Activity: Climate and Weather (15 minutes)
- Ask students to work in small groups of two or three. They need the climate map (world) on pages 7 and 8, and the maps of yearly precipitation on page 29. Have students place these maps side-by-side so they can review and compare all the maps together.
- Give the small groups 10 minutes to compare the maps.
  - Ask them to look for similarities in patterns in several locations of the world that would suggest relationships between climate and precipitation.
  - Ask them to look at several locations in the U.S. maps to describe the likely typical weather for summer and winter in those locations based on the climate zone, precipitation and snowfall.
- Facilitate a whole-class discussion for about 5 minutes on what they observed for patterns and relationships. What types of weather would be typical in the different climate zones? Ask students to describe features of the maps, as represented by color, as evidence. Highlight relationships of precipitation to climate zones.

Reading of Whole-class Text (25 minutes)
• Distribute copies of Magic Tree House Fact Tracker: Twisters and Other Terrible Storms by Will Osborne and Mary Pope Osborne, to each student.
• Preview the book with the whole class, noticing text features such as table of contents, index, diagrams, pictures, and captions. Remind students that these text features help them to find answers to questions they might have.
• Review key vocabulary introduced in this book: atmosphere, temperature, tropical, water vapor. NOTE: There are other content-specific terms in this book that can be mentioned but do not need to be taught for the focus of the unit.
• Review the pages students will read (13–17). Set a purpose for reading: To start to answer Essential Question 1: What is weather?
• Students read pages 13–17 independently, with a partner, or in a small group with you, depending on their needs.

Lesson Closing (5 minutes)
• Introduce students to the Research Journal (a notebook or teacher-made). On the board or chart paper, present the format for note taking:
  o Topic/question (Weather. What is weather?)
  o What did I learn?
  o What words did I learn?
• Ask students to Turn-and-Talk to respond to the questions, What did I learn? What words did I learn? Then have students suggest responses for each section and model how to record this information.
• Review the lesson outcomes by asking students questions about what they learned.
• Preview outcomes for the next lesson: Tomorrow we will learn about the factors that create weather. I will read more from Inside Weather, and you will continue reading in Magic Tree House Fact Tracker: Twisters and Other Terrible Storms. You will write in your Research Journal on your own.

Formative Assessment
• Note students’ participation in class discussions and prior knowledge of weather.
• Note students’ ability to read and learn from text they read.

Lesson 2 (60 minutes) Effects of sunlight (temperature) and air (wind) on weather

Lesson Opening (15 minutes)
• Introduce key vocabulary: temperature, equator, solar.
• Continue reading Inside Weather, pages 10, 11, 12, 15, 16 and 19. These pages describe the impact of the sunlight (temperature) and air (wind) on weather. Use pullout pages and a globe as needed to illustrate the text. Stop periodically to review and discuss what they have learned:
  o After page 10: What are the three main factors behind all weather?
  o After page 11: Where is Earth the hottest? The coolest? How do you think this affects weather in these regions?
During the Lesson
Reading and Response to Whole-class Text (30 minutes)
• Tell students that they will learn more about the effects of wind and sun on weather by reading pages 23–31 in their text, Magic Tree House Fact Tracker: Twisters and Other Terrible Storms.
• Preview pages: note text features (diagram, pictures) and review the index in back that will help them to find information about a specific word or topic.
• Introduce and discuss additional vocabulary words that they will encounter in this text: high pressure, low pressure, equator, poles.
• Students read independently, with a partner, or in a small group with you, depending on their needs.
• Students record new information learned about the factors related to weather in their Research Journal.
NOTE: If some students finish early, they may look at the pullout pages of the read-aloud book.

Lesson Closing (15 minutes)
• Reconvene the whole class to discuss what they learned from their own reading about the effects of the sunlight (temperature) and air (wind) on weather. Frame the discussion around Q1 (What is weather?) and Q2 (How does weather affect our lives?).
  o Ask if any of their questions from the previous day were answered through reading. Where did they find the answers? (e.g., text, text features, glossary)
  o What new questions do they have as a result of today’s reading?
  o Record new learning and new questions on class charts.
• Review the lesson outcomes by asking students questions about what they learned.
• Preview outcomes for the next lesson: Tomorrow we will learn about the third factor that affects weather conditions: water.

Formative Assessment
• Note students’ participation in class discussions and questions about weather.
• Note students’ abilities to read and learn from text they read.
Lesson 3 (60 minutes) Effects of water on weather

Lesson Opening
Interactive Read-Aloud (15 minutes)
• Introduce and discuss key vocabulary for the read-aloud: vapor, evaporation, precipitation, cirrus, cumulus, stratus. Add these new words to the Word Wall.
• Read aloud pages 22–28 in Inside Weather (pullout pages 23, 24, 27, 28).
• During or after reading, ask:
  o Where do we find water on Earth in different forms?
  o What are the three basic types of clouds, and what do they tell us about weather?
  o How does temperature affect precipitation?
• Record important information learned about the effects of the sunlight (temperature) and air (wind) on weather.
• Add new vocabulary to the Word Wall. Choose an interactive strategy for students to process the vocabulary.

During the Lesson
Data collection and prediction (25 minutes)
• Give each student copies of the Comparing Weather in the United States worksheet (in appendices). Review the worksheet: point out where Michigan and Arizona are in the United States, and review the data together. Relate the data to prior maps seen in Inside Weather.
• Think/Pair/Share (10 minutes): Students take a few minutes to consider the data independently. Then they partner up for a few minutes to discuss what they think the typical seasonal weather will be in MI and AZ. Then they check for similarities and differences in their group.
• Ask for volunteers or use no-hand questioning to get their descriptions. Ask for evidence of their reasoning based on the data.
• Return to the Climate Zones map (pp. 6–7), the Air Mass map (p. 21), and provide the Climate Zone and Weather Worksheet (in appendices). Highlight where the four regions are on the map.
• Think/Pair/Share (10 minutes): Students take a few minutes to consider the data independently. Then they partner up for a few minutes to discuss why they think there will or will not be seasons, and what the typical seasonal weather might be in each region. Then the check for similarities and differences in their group. Ask for evidence of their reasoning based on the data.
• Ask for volunteers or use no-hand questioning to get their answers.
• Students record new information learned about the factors related to Massachusetts weather in their Research Journal.
Lesson Closing (20 minutes)

- Place students in heterogeneous groups of three to five students to discuss two questions: (1) What is important to know about the effect of water on weather? (2) How do all three factors: sunlight (temperature), air (wind), and water (precipitation) interact to create weather? Students come to the groups with their book and Research Journal. Tell them to support their answers by reading parts of the text that support their thinking. Circulate among the groups to make sure they understand the task and are using their text and notes for discussion.
- Reconvene the whole class to discuss what they learned from their discussions. Frame the discussion around Q1 (What is weather?) and Q2 (How does weather affect our lives?). Ask if any of their questions from the previous day were answered through reading—where did they find the answers? (e.g., text, text features, glossary) What other questions do they have as a result of today's reading? Record new learning and new questions on class charts.
- Review the lesson outcomes by asking students questions.
- Preview outcomes for the next lesson: Tomorrow we will use what we have learned about the weather to understand different types of extreme weather, or storms.

Lesson 4 (60 minutes) Introduction to extreme weather

Lesson Opening (10 minutes)

- Whole-class discussion: Tell students that sometimes weather conditions become extreme or severe. The extreme weather that occurs most often in the United States is in the form of storms: thunderstorms, hurricanes, tornadoes, and blizzards.
  - Turn-and-Talk to a partner to discuss: (1) What do you know about these types of extreme weather? (2) What questions do you have about these storms?
  - Then in a whole-class discussion, share the questions. (Keep this list of questions for later reference.)
- Explain to students that they will focus their study of weather for the rest of the unit on these four types of extreme weather: thunderstorms, hurricanes, tornadoes, and blizzards.
- Tell students that today's reading will be an introduction to these types of storms so they can begin to think about which example of extreme weather they want to explore further in groups.

During the Lesson

Interactive Read-Aloud (15 minutes)
• Read aloud pages 30, 31, 32 and 37 in Inside Weather (pp. 33–36 are pullout pages that add interesting information to the text, but are not necessary for this introduction to extreme weather). As you read, stop to clarify and discuss the vocabulary in context: destructive, moisture, cyclones, thunderstorms, hurricanes, tornadoes, and blizzards.

• During or after reading, ask: What are temperature, wind, and precipitation (moisture) like in each example of extreme weather? How are these storms alike? How are they different? Which storms have you experienced?

• Add new vocabulary to the Word Wall.

Reading and Response to Whole-class Text (20 minutes)

• Students read chapter 4, pages 41–51 (“Rain and Storms”) in their whole-class texts. After reading they (skim) chapters 5, 6 and 7 in the book about twisters, hurricanes, and blizzards to learn more about different types of extreme weather. Write these page numbers on the board.

• Preview the pages, pointing out the information they will gain from the connected text and text features.

• Have students read these pages independently or in their designated groups with or without a teacher.

• During or after reading students record new information learned about extreme weather conditions in their Research Journal (if you are using teacher-made journals, change the title of the page to “Extreme Weather”).

Lesson Closing (15 minutes)

• Reconvene the whole class. Return to the Essential Questions anchor charts. Ask students to locate and read parts of their text that help to answer these questions: How does extreme weather affect our lives? Why do different kinds of extreme weather occur? Be sure to add new ideas to Q4: How do we research and learn about a topic?

• Ask students what questions they now have about extreme weather.

• Review the lesson outcomes by asking students questions.

• Preview outcomes for the next lesson: Tomorrow we will continue learning about extreme weather and how to study this topic in mini-inquiry groups. You will look through a lot of books on types of extreme weather and decide which type you would like to explore further in your groups.
Lesson 5 (60 minutes) Introduction to mini-inquiry groups

Lesson Opening
Lesson on Mini-inquiry Groups (20 minutes)
- Tell students that once they decide which type of extreme weather they want to investigate, they will work in small groups called mini-inquiry groups (or circles). Discuss the word *inquiry* and its base word, *inquire*.
- Prepare the Inquiry Circle Student Handout (see appendices) for students or create a chart.
- Review with students the steps in this process using student-friendly terms (see Description of Mini-Inquiry Circles in appendices).
- Tell students they will work independently and with their small groups to read, listen to, and view information from different sources about their topic.
- Model the first step in the process (Immerse) using the topic of “thunderstorms” (you will continue using this topic in subsequent model lessons).
  - Tell students you have always been excited and sometimes scared when there are thunderstorms, but you don’t really understand what causes the lightning and thunder.
  - Share that you have a lot of questions that you would like to know more about to understand why thunderstorms happen and where and when they occur. For example:
    - Why do thunderstorms often occur in the summer?
    - What causes the lightning to streak across the sky?
- Invite students to ask questions of their own based on their experience with thunderstorms. Record questions on a chart for use in future lessons.
- Tell students they will be reading about thunderstorms in books and on the Internet to find answers to these questions. They will probably come up with more questions as they read.

During the Lesson
Reading (25 minutes)
- Organize the books by type of storm (see the Overview for Lessons 1–5). Make sure that students know they can continue reading chapters on different storms in their book *Magic Tree House Fact Tracker: Twisters and Other Terrible Storms*.
- Give each student copies of the Browsing Notes Worksheet (see appendices). Review the “browsing” process, pointing out that the focus is on asking questions that they really want answered. Students will record the type of storm they are reviewing and two types of information for that storm:
  - What they learned or noticed (from pictures or text).
  - Questions they have that they would like to answer.
- Students may use as many worksheets as necessary to record this information.
• Remind students to use the table of contents and index in a book as well as the pictures, captions, and charts to locate information that they are curious about.
• Give students time to work in small, heterogeneous groups to browse through books on types of storms, discussing their questions and the information they are finding from this activity.
• Circulate among the groups to help any students who are having difficulty generating questions or reviewing the texts.

Lesson Closing (15 minutes)
• Reconvene the whole class. Have students Turn-and-Talk with a partner to discuss which type of storm they think they want to learn more about. Students record their first and second choices for a topic on an index card, which you will use to form mini-inquiry groups for the next five lessons.
• Review the lesson outcomes by asking students questions about mini-inquiry circles, what they learned from the books they browsed, and what questions they have about the types of extreme weather.
• Preview outcomes for the next lesson: Next time, we will begin working in groups to develop questions and read about our topics.
Lessons 6, 7, 8, 9 and 10

**Brief Overview of Lessons:** Lessons 6, 7 and 8 focus on asking questions to investigate a topic and using multiple sources to find answers to those questions. Students work independently and in mini-inquiry groups to generate questions about their topic, to read self-selected texts, to take notes, and to discuss their learning. All questions require supporting the answer with evidence. Students also learn how to use multiple sources to locate important information and how to take notes. Lessons 9 and 10 prepare students for the final performance assessment (CEPA), where they synthesize their notes to write a report on their topic. Students work in their mini-inquiry groups to review their notes and plan their written report. They begin writing their individual research reports. All mini-lessons that model and demonstrate lesson skills use thunderstorms as the type of extreme weather. Student inquiry groups research the remaining types of storms: hurricanes, tornadoes, and blizzards. As you plan, consider the variability of learners in your class and make adaptations as necessary.

**Prior Knowledge Required:**
- Knowledge of the three factors affecting weather—sunlight (temperature), air (wind), water (precipitation)
- Understanding that extreme weather can take various forms
- Understanding that asking questions helps readers to focus on and locate information

**Estimated Time:** 60 minutes for each lesson

**Instructional Model:** Students work in a variety of groupings: whole class, small group, partners, and independently. Lessons begin with a model lesson on inquiry and end with students sharing their learning. Students work in small mini-inquiry groups to read, discuss texts, and review websites related to their topic.
Resources for Lessons
Core texts for teacher modeling (one copy of each):
- *Inside Weather* by Mary Kay Carson
- *Lightning* by Stephen Kramer (Lexile 800L), for teacher read-aloud
- *Storms!* by Angela Royston
- *Storms* by Seymour Simon (Lexile 940L), for teacher read-aloud

Suggested texts for student browsing (one to two copies of each):
- General weather/extreme weather
  - *Weather* by Seymour Simon (Lexile 1020L)
  - *Extreme Weather* by H. Michael Mogil and Barbara Levine (Lexile 1060)**
  - *Weather* (DK Eye Wonder series, DK Publishing)**
  - *Inside Lightning* by Melissa Stewart
  - *Storms!* by Angela Royston
- Hurricanes
  - *Hurricanes* by Seymour Simon
  - *Hurricanes* by Chris Oxlade, Kingfisher Readers series (Lexile 950L)
  - *Inside Hurricanes* by Mary Kay Carson
  - *Hurricane and Tornado* by Jack Challoner, DK Eyewitness series**
- Tornadoes
  - *Inside Tornadoes* by Mary Kay Carson
  - *Tornadoes* by Christy Steele, Nature on the Rampage series
  - *Hurricane and Tornado* by Jack Challoner, DK Eyewitness series**
  - *Tornado* by Stephen Kramer (Lexile 940)
• Snowstorms and blizzards
  o *Blizzards* by Michael Woods and Mary B. Woods
  o *White-out Blizzards* by Claire Watts
  o *Blizzard! The Storm that Changed America* by Jim Murphy (Lexile 1080L)
  o *Extreme Weather* by H. Michael Mogil and Barbara Levine (Lexile 1060)**
  o *Weather* (DK Eye Wonder series, DK Publishing)**

**Titles are included in more than one group of books.

NOTE: Students should include the whole-class text *Magic Tree House Fact Tracker: Twisters and Other Terrible Storms*, by Will Osborne and Mary Pope Osborne, for use in their mini-inquiry groups.

Websites:

• University of Illinois Extension—Tree House Weather Kids: [www.urbanext.illinois.edu/treehouse/](http://www.urbanext.illinois.edu/treehouse/)
• The Globe Program—Explore Science Investigations section: [http://www.globe.gov/explore-science/globe-investigations](http://www.globe.gov/explore-science/globe-investigations)

Professional resource:
Materials
- Chart paper
- Research Journal
- Note-taking Worksheet (see appendices)
- Student Checklist for Final Performance Assessment (see appendices)
- Sticky notes
- Interactive whiteboard or overhead projector
- Access to computers for website searches
Content Area/Course: English Language Arts and Science, Grade 3
Unit: Extreme Weather (Content Literacy Science)
Time: 60 minutes for each lesson
Lessons 6–10: Investigating Extreme Weather

Standard(s)/Unit Goal(s) to be addressed in these lessons

CCSS.ELA-Literacy.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.
CCSS.ELA-Literacy.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.
CCSS.ELA-Literacy.RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

DSTE.3-ESS2-1 3-ESS2-1. Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area. [Clarification Statement: Examples of data could include average temperature, precipitation, wind direction and wind speed.] [Assessment Boundary: Graphical displays are limited to pictographs and bar graphs. Assessment does not include climate change.]

DSTE.3-ESS3-1 3-ESS3-1. Evaluate the merit of a design solution that reduces the impacts of weather-related hazard.* [Clarification Statement: Examples of design solutions to weather-related hazard could include a barrier to prevent flooding, a wind resistant roof, and a lightning rod.]
Essential Questions addressed in these lessons
Q2. How does weather affect our lives?
Q3. What are the impacts of extreme weather?
Q4. How do we research and learn about a topic?

Objectives: Students will know and be able to:
• Ask authentic questions about their topic (extreme weather)
• Use text, text features, and media to locate answers to their questions
• Take notes from reading and viewing using multiple sources
• Begin to synthesize notes to write a report on their topic
• Work collaboratively in small inquiry groups to share learning

Instructional Tips/Strategies/Notes for Teacher
• Before Lesson 6, create a list of students in each mini-inquiry group based on students’ interests in a specific type of extreme weather (Lesson 5).
• Use your discretion about group numbers and which students work well together. Reading may be done independently, with a partner, or with their groups, but students should meet with their groups each day to discuss their learning. Meet briefly with each group every day to make sure that students are able to read their texts and that discussions are focused on their questions.
• Designate areas where each group will meet to read and discuss related texts.
• Use charts each day to record information that students are learning about their topic to compare and contrast the characteristics of each storm.
• Discuss new vocabulary learned each day and add those words that pertain to all groups (e.g., wind gusts, fronts) to the Word Wall.
• Review norms for effective discussions in groups and post these in the room for review and reference in whole-class discussions.
• Check in with each group daily, providing necessary support to students needing help in reading, note taking, and discussion.
• Preview websites for students and group work. Plan time for computer use to investigate websites either in the classroom or in the computer lab.
• Encourage questions that emphasize the difference between typical and extreme weather in a chosen area or season.
• Ensure at least some of the resources provided include information about different strategies to stay safe in extreme weather and/or about structures to mediate the impact of extreme weather.
• Thunderstorms are used as an ongoing example to model student inquiry and facilitate student learning through the lessons. When students begin to work on their own research and report, they can choose any type of extreme weather discussed in the texts.
Anticipated Student Preconceptions/Misconceptions

- Preconception: When severe weather is forecasted, there is nothing that we can do to protect ourselves.
- Misconceptions: Lightning never strikes twice in the same place. Thunder occurs when clouds collide.

Lesson Sequence

Lesson 6 (60 minutes) Reading with a question in mind

Lesson Opening (10 minutes)

- Tell students they will be working this week in small inquiry-based groups to learn more about one type of extreme weather and how to reduce its impact on our lives or on the land. You have placed them in groups based on the preferences they listed in the last lesson and on the number of students that can be in each group.
- Review the steps for working in groups, explaining that today they will focus on asking questions.
- Review the Essential Questions anchor charts and add new comments to them.
- Review the final performance assessment (CEPA). Tell students that they will be exploring and writing a report on the type of extreme weather that they will study and that they will share their learning from this week in a group presentation.

During the Lesson

Lesson: Asking Different Kinds of Questions (20 minutes)

- Explain to students that we often read with a question in mind, especially when we want to learn more about a topic. We ask these questions before, during, and after reading. Last week we asked a lot of questions about weather. Some of those questions could be answered simply in one or two words. Other questions required us to think more about what we wanted to know and where to find the answer.
- Explain that some questions can be answered in one or two words, a phrase, or a sentence. Sometimes they are Yes-or-No questions. The answer can be found right in the text. Questions often begin with what, when, and where. For example: What are the three factors that create weather? When do thunderstorms usually occur?
- There are other questions that require more research and thinking to answer. They often begin with why, how come, and I wonder why. The answers come from longer texts and/or multiple sources. These questions require us to think and search for the answer.
- Understanding types of questions we ask helps us to find information to answer them.
  - Model asking different kinds of questions about thunderstorms. Introduce this type of extreme weather and then model questions:
    - Is this typical weather?
    - What is a thunderstorm?
- What are characteristics of thunderstorms?
- Are thunderstorms dangerous?
- How do we reduce the impact of thunderstorms on people?
  - Ask students for more examples of questions and then ask students, with a partner, to discuss what type of an answer each of these questions would need.
- Read aloud the first five pages of text in Storms by Seymour Simon (not paginated). As you read aloud, share your insights as your questions start to be answered through the text. Explain how the text is answering your questions—are the answers on the page, or are you synthesizing information? Share any new questions that you develop as you learn more about the topic while reading.

Mini-inquiry Groups (25 minutes)
- Mini-inquiry group norms: Review with students the importance of collaboration in their groups. What ground rules are important in making these groups successful? Begin by listing a few ideas, for example: (1) be prepared by reading your texts to answer questions so you can discuss what you learned; (2) come to the group with your texts and notes (Research Journal). Then ask students to suggest other rules. Write these on a chart for reference in later discussions.
- Place students in groups with suggested books at each meeting area.
- Tell students their goal today is to look through the books and come up with questions they have about their type of extreme weather. They should think about questions that can be answered directly in the text and those that require more research and thinking. Provide each group with chart paper and assign one student in each group to record the questions. Alternatively, students could use sticky notes, each writing their own questions and then posting the sticky notes on the chart. (Students will need this list for the next day's research.)
- Circulate among the groups to make sure that students know what they are to do and are on task.

Lesson Closing (10 minutes)
- Reconvene the whole class to discuss their group work: What worked well in your groups? What would you like to do better next time? What questions did you have about your topic? Have a student from each group share several of the questions generated and recorded on their chart paper.
- Review the lesson outcomes by asking students questions.
- Preview outcomes for the next lesson: Tomorrow we will look at how to get information to answer our questions from multiple sources.

Formative Assessment
Take notes on each group and the quality of authentic questions students generate. Note students who work well according to the group norms.
Lesson 7 (60 minutes) Using multiple sources

Lesson Opening (20 minutes)

- Review the questions you asked yesterday about thunderstorms. Choose two that you want to explore using more than one text to learn the most information. For example: What are the parts or characteristics of thunderstorms? What causes thunderstorms?
- Present the Note-taking Worksheet for this lesson (see appendices) on chart paper, an overhead projector, or interactive whiteboard. Write the first question: What are the characteristics of thunderstorms?
- Using *Inside Weather* by Mary Kay Carson, reread the section on thunderstorms on page 32. Fill in the title of the book on the chart (under Source). As you read, write down any information that answers or is related to the question.
- Next, write down the title of a second text, *Storms!* by Angela Royston. Read pages 18–21, thinking aloud as you read information that answers the question. Write down additional information gained from this second text.
- Using your notes, orally summarize the important information that answers the question: What are the characteristics of thunderstorms (thunder, lightning, rain, wind)?
- Repeat this procedure for the second question: What causes thunderstorms? by rereading the same texts. Tell students they should read with a question in mind so that when they move to another question, they may reread for a different purpose or use new texts.
- Ask students why it is important to use more than one text to find answers to their questions. How were these texts different? How were they the same?

During the Lesson

Mini-inquiry Group Work (30 minutes)

- Pass out the Note-taking Worksheet to students. Remind students they do not need to read a whole text, but only those sections that relate to their questions. They can use the table of contents and index to help them locate appropriate pages. There is also space to write down additional questions (see the “Other questions that I have” section).
- Discuss the format for listing sources. For each book used, they should record the author (last name, first name) followed by the title of the book. Remind students that the first letter of words in the title is capitalized (except for small words like “in,” “and,” etc. Model how to do this with a text you have used on thunderstorms. Tell students that this is called a “citation” and that they will include their citations at the end of their report.
- Students meet in their groups to decide which questions they want to answer. Students should select at least two questions on the list from the previous class to focus their reading. Each student in the group may take different questions or students may work in pairs on the same question(s).
- Students read sections of the texts available at their meeting place, writing information that answers their questions.
- Meet with each group to clarify any questions and to support those students who need assistance in reading and taking notes. (NOTE: You may want to partner a struggling reader with a more capable reader within each group.)
Lesson Closing (10 minutes)
• Reconvene the whole class to discuss their group work: How did it go? What did you learn about your topic? How many texts did you use? How were these texts different?
• Review the lesson outcomes by asking students questions about using multiple sources to research a topic.
• Preview outcomes for the next lesson: Tomorrow we will look at how to use websites in addition to books to help to answer our questions.

Lesson 8 (60 minutes) Using websites to research a topic

Lesson Opening
Using Weather Websites (20 minutes)
• Gather the whole class around a large screen or interactive whiteboard to review websites on weather.
• Review and discuss the importance of using multiple sources to research questions. Yesterday they practiced using more than one text to find information about their questions. Where else might they find information? (e.g., newspapers, TV, Internet, etc.)
• Tell students that today they will learn how to use a different source of information—web sites—to research their questions.
• Open the first site, Tree House Weather Kids: www.urbanext.illinois.edu/treehouse/. Review the home page and links, pointing out that this site reads the text aloud. Explore the link, “Rock ’N Roll Weather,” briefly reviewing sections on different types of extreme weather.
• Students can also explore: http://www.education.noaa.gov/. This is the education site for the government’s largest collection of weather data. Students may want to explore the link for weather systems and patterns or the link on the main site for weather and atmosphere.
• Another choice is the Globe Program website. The Explore Science Investigations section, http://www.globe.gov/explore-science/globe-investigations, has a section about atmosphere. Students can use worksheets for observing and identifying different types of clouds, etc. There is also a student zone section.
• Tell students to work for the remainder of the class exploring these websites and locating additional information related to their topics and questions. They should list (cite) the website they used by writing its name. Remind them that they may come up with additional questions as a result of their website review.

Mini-inquiry Group Work (30 minutes)
• This work is based on the availability of the school computer lab.
• Place two to three students at a computer with their Note-taking Worksheet with questions on their topic. Students locate the links for their storms, read the text, and take notes on their worksheet.
• Circulate among the groups to ensure students are able to navigate the websites and use them to take notes.
• After reviewing sites and taking notes, students reconvene briefly in their mini-inquiry groups to share what they learned.
Lesson Closing (10 minutes)
- Reconvene the whole class to discuss what they learned from their websites. Which (sites) did they use? What was most helpful in learning more about their topics and questions? What kinds of questions did they ask: those that were answered directly in the text or those that required more research and thinking? What other questions do they have as a result of reviewing these sites? Did anyone find interesting information or facts about the storms they are researching?
- Review the lesson outcomes by asking students questions.
- Preview outcomes for the next lesson: Tomorrow you will start to organize your notes in order to write a short report on your topic.

Lesson 9 (60 minutes) Preparation for CEPA

Lesson Opening
Organizing Notes to Write a Report (20 minutes)
- Briefly review the previous three days: We learned about asking questions and about how some questions can be answered directly in the text, but others require more research and thinking to answer them. Then, we researched texts and websites to find answers to those questions. You have a lot of notes on your questions, and today you will start to organize those notes to write a short report about your topic.
- Review the directions for the CEPA with the class. (Use the CEPA Student Instructions as a handout.) Handout copies of the Student Checklist for Final Performance Assessment (see appendices).
- Model how to organize notes for responding to the CEPA questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather?
  o Review your research notes about thunderstorms and share how you will decide on your main points (e.g., what extreme weather is, why the type of storm studied is an example of extreme weather, what the impact is of this type of extreme weather on our lives, and how do we reduce the impact of extreme weather).
  o Model how you select or highlight the words or phrases from your notes that would help you to support these main points.
  o Share your thinking about how to organize the main points that you include in your report.
  o Model how you would begin to write a short paragraph (three to five sentences) for one of the main points (e.g., what extreme weather is), thinking aloud about what information is important and inviting students to add information that should be included.
During the Lesson
Mini-inquiry Group Work (30 minutes)
• Give students a chance to work in their own groups to set up their main points and organize their notes to support each main point. Remind students that they are answering the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather? They should come up with three to five points that they can use to answer each question and have enough research information to provide details about each point.
• Students work independently or with a partner to determine what information they will include in their short report. They share these ideas with the whole group and continue to read texts and use websites to find additional information on their questions.
• Students who are ready may begin drafting.

Lesson Closing (10 minutes)
• Reconvene the whole class to discuss the groups’ plans. Ask one or two students from each group to share the way they will organize their reports.
• Clarify any questions that students have about the writing.
• Review the lesson outcomes by asking students questions.
• Preview outcomes for the next lesson: Tomorrow you will continue writing a draft of your report for your selected type of extreme weather.

Lesson 10 (60 minutes) Drafting the report

Lesson Opening (20 minutes)
• List your main points (three to five) for your thunderstorm report, answering the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather? Discuss the best (logical) order for presenting these points in a report. Number the points in order of presentation.
• Present your notes from a previous day on a second point (different from Lesson 9). Have students help you to turn these notes into a paragraph. Prompt them with the following questions:
  o What is a good opening sentence for a paragraph on this question?
  o What information is important to include to support this opening sentence?
  o What information is interesting but does not necessarily provide more details about this topic? Should that be included anyway?
  o How will I conclude my paragraph? What is a good closing sentence?
  o Model how to use content-specific vocabulary and connecting words and give an example with data, notes from research, or from a specific source.
• Keep this model paragraph up for reference as students write their own paragraphs.
• Ask students to begin (or continue) writing their own reports on their group topics, turning their notes into paragraphs.
  o They must have three to five points to answer the question: What is the impact of extreme weather and how does it affect our lives?
  o Then they will find information in their notes to support each point.
  o Next, they use their notes to write a paragraph that addresses each point.
  o Finally, at the end of the writing period, let them know when it is time to share what they have written with a partner who will help them to understand whether their writing makes sense and if anything else should be included.

**During the Lesson: Writing (30 minutes)**

• Students work independently to organize their notes in the order in which they will include them in their report. They write a paragraph about each of the main points that they will include to answer the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather?
• Meet with students who will have difficulty turning notes into sentences and a paragraph. You may want to do this with individual students or meet with a small group of struggling writers who need prompting to write their paragraphs.
• Five minutes before the end of the writing period, partner students in the same groups to read what they have written.

**Lesson Closing (10 minutes)**

• Review the lesson outcomes by asking students questions about their progress in writing their reports.
• Preview outcomes for the next lesson: Next time you will finish drafting your report and revise it so that it makes sense.
Lessons 11, 12 and 13

Brief Overview of Lessons: In Lessons 11 and 12, students complete their research reports and meet with their groups to plan their final presentations. They each select one section or paragraph of their report to share in their group’s presentation and discuss what visuals best illustrate this topic. Students practice their oral presentations. In Lesson 13, students present what they have learned about typical weather in a particular season in an area, an example of extreme weather there, and a method to reduce the impact of that extreme weather, then to answer questions from the class. At the end of the presentations, students discuss how their own topics relate to the other topics that were presented: How is their type of extreme weather like the types presented by the other groups? How is it different? At the end of the lesson, students write a reflection in their research journals describing what they learned and what part of their group work helped them to learn the most. As you plan, consider the variability of learners in your class and make adaptations as necessary.

Prior Knowledge Required:
- Knowledge of the three factors affecting weather: sunlight (temperature), air (wind), and water (precipitation)
- Understanding of key weather words on the Word Wall
- Understanding that answers to questions can be found in multiple sources

Estimated Time: 60 minutes each for Lessons 11 and 12; 70 minutes for final presentations, Lesson 13.

Instructional Model: Students work independently to complete their written reports; with mini-inquiry groups to share their reports and to plan a group presentation. Whole-group lessons begin and end each class to check the progress of each group and clarify any questions that students might have.
Resources for Lessons
All the texts used in the previous lessons (see Unit Resources)

Materials
- Charts constructed in previous lessons
- Writing paper and construction paper for final reports
- Poster board and markers (for illustrations)
- Reflection Worksheet (see appendices)
- Access to computers for additional website searches
Content Area/Course: English Language Arts and Science, Grade 3
Unit: Extreme Weather: Content Literacy Science
Time: 60–70 minutes for each lesson
Lessons 11–13: Going Public!

Standard(s)/Unit Goal(s) to be addressed in these lessons
CCSS.ELA-Literacy.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.
CCSS.ELA-Literacy.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-Literacy.W.3.2.a Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
CCSS.ELA-Literacy.W.3.2b Develop the topic with facts, definitions, and details.
CCSS.ELA-Literacy.W.3.2.d Provide a concluding statement or section.
CCSS.ELA-Literacy.W.3.7 Conduct short research projects that build knowledge about a topic.
CCSS.ELA-Literacy.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others’ ideas and expressing their own clearly.
CCSS.ELA-Literacy.SL.3.1a Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-Literacy.SL.3.1b Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
CCSS.ELA-Literacy.SL.3.1c Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
CCSS.ELA-Literacy.SL.3.1d Explain their own ideas and understanding in light of the discussion.
CCSS.ELA-Literacy.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
CCSS.ELA-Literacy.L.3.6 Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., "After dinner that night we went looking for them").
DSTE.3-ESS2-1 3-ESS2-1. Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area.
[Clarification Statement: Examples of data could include average temperature, precipitation, wind direction and wind speed.] [Assessment Boundary: Graphical displays are limited to pictographs and bar graphs. Assessment does not include climate change.]
DSTE.3-ESS3-1 3-ESS3-1. Evaluate the merit of a design solution that reduces the impacts of weather-related hazard.* [Clarification Statement: Examples of design solutions to weather-related hazard could include a barrier to prevent flooding, a wind resistant roof, and a lightning rod.]

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Essential Questions addressed in these lessons
Q1. What is weather?
Q2. How does weather affect our lives?
Q3. What are the impacts of extreme weather?
Q4. How do we research and learn about a topic?

Objectives: Students will know and be able to:
• Organize and write a short report about a weather topic.
• Revise and edit the report to submit.
• Work collaboratively in small inquiry groups to plan and present their learning in an oral presentation.
• Reflect on their learning in groups.

Instructional Tips/Strategies/Notes for Teacher
• Before Lesson 11, gather all materials necessary for written reports and oral presentations (see Resources for Lessons section above).
• Students should have access to all texts related to their topic, including those used for read-alouds, as well as a computer to complete searches on related websites. Meet with individual students to support them in writing their reports and to practice reading their parts for the final presentation.
• Meet briefly with each group to ensure that they are dividing the workload for the final presentation.
• Plan areas of the room for final presentations of each group.
• If possible, enlist support teachers to help, including a computer teacher to assist students to continue searching websites.
• Discuss the vocabulary on the Word Wall, asking students to use the words in sentences in preparation for their oral presentations.
• Discuss characteristics of good oral presentations, modeling your own for one question that can be improved.
• Meet with individual students and check in with each group daily, providing feedback as needed in writing and presenting oral presentations.

Anticipated Student Preconceptions/Misconceptions
Preconception: When we present our learning to others, we just need to read aloud what we have written.
Lesson Sequence

**Lesson 11 (60 minutes) Revising the report**

**Lesson Opening (10 minutes)**
- Review the Word Wall, asking students to choose one word that relates to their topic and use it in a sentence.
- Review and discuss how to revise the written report. Include details about how to check or revise:
  - Organization of main points
  - Format for paragraphs (see Lesson 10)
  - Rereading to revise and edit
  - Editing for mechanics and spelling
  - Resources to check for correct spelling
  - Rules of capitalization and punctuation
- Tell students that they will finish writing their reports today and work with a partner to share their own reports and give feedback on their partner’s report.

**During the Lesson: Writing (35 minutes)**
- Students work independently to complete their written reports.
- Meet with individual students or small groups of students to support them in writing their reports, prompting with questions as necessary.
- If possible, offer students who prefer to write their reports on the computer a chance to work on the classroom computer or in the computer lab.

**Lesson Closing (15 minutes)**
- In pairs, students (either from their group or from another group) take turns reading their reports and providing feedback (asking questions, complimenting, etc.).
- Review the lesson outcomes by asking students questions.
- Preview outcomes for the next lesson: Tomorrow you will meet in your groups to plan your presentation.

**Summative Assessment**
Assess students’ written reports based on the CEPA Instructions and accompanying rubric (see CEPA Teacher Instructions and CEPA Student Instructions).
Lesson 12 (60 minutes) Planning the presentation

Lesson Opening (15 minutes)
- Tell students they will be planning their group presentation today. Assign a group leader or facilitator to lead the discussion.
- Remind each group to:
  - Review each others’ reports.
  - Find a paragraph or information from each report to present.
  - Review texts and discuss what illustrations or visuals they should include to illustrate the presentation. They may draw the illustration or copy one from the texts.
- Effective presentations: Remind students of the importance of keeping the interest of their audience. Model a presentation that does not keep the interest of the audience and ask them what the problems are and how the presentation could be improved. Then choose one of your questions from the mini-lessons on thunderstorms and the paragraph you wrote for that question. Present your information in a manner that requires improvement. Some examples of a poor presentation:
  - Just reading report straight through.
  - Reading your report in a monotone.
  - Mumbling, low voice.
  - No eye contact.
  - Presentation is too slow or too fast.
- Ask students how they would improve your presentation. List suggestions on the board.
- Show students materials that you have gathered for their presentations.

During the Lesson: Group Work (40 minutes)
- Students work in their inquiry groups to accomplish steps discussed in whole-class session.
- Students create or locate illustrations for their presentations.
- Students practice their presentations with group members.

Lesson Closing (5 minutes)
- Review the lesson outcomes by asking students questions.
- Preview outcomes for the next lesson: Tomorrow students will present their learning to their peers in other groups. Clarify any questions they have.
Lesson 13 (70 minutes) Presenting reports

Lesson Opening (10 minutes)
• Meet with the whole class to review procedures for the day. Assign one member of each group to introduce the topic and begin the presentation.
• Remind students in each group they have only 10–15 minutes to present their topic.
• Provide students with a brief time to meet with their groups for final practice.

During the Lesson: Presentations (50 minutes)
• Each group presents what they have learned about their example of extreme weather in a designated area of the room.
• Members of the audience ask questions and comment on the similarities and differences between one type of extreme weather and another.

Lesson Closing (10 minutes)
• Convene the whole class to review what they learned from each presentation. What did they learn about each type of extreme weather? What is common among all types? How are they different? What are the big ideas they learned about weather and extreme weather? How do we reduce the impact of extreme weather? Refer to Essential Questions throughout the discussion.
• Tell students that this is the end of the unit but that they still may have questions that they want to explore. What are they?
• Reflection: Have students reflect on their learning in small inquiry groups, using the Reflection Worksheet (see appendices). This may be completed at another time during the day depending on time for the presentations.

Summative Assessment
Take notes on each group’s presentation using the CEPA Rubric.
Curriculum Embedded Performance Assessment (CEPA)
Teacher Instructions

Performance Task: Students will use their knowledge of extreme weather (hurricanes, blizzards, thunderstorms, or tornadoes) to write a brief research report answering the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather?

Students work in their groups to give an oral presentation about their group’s type of extreme weather. The presentation includes a section (paragraph/information) from each student’s written report. Presentations also include at least one of the following: a visual display of the extreme weather using a video clip or website that describes or illustrates the extreme weather and one way to reduce its impact; or descriptive examples of the impact of the extreme weather on people’s lives and one way to reduce that impact.

Goal: The goal is for students to research and report on their answer to the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather?

Audience: Initial group presentations will be for other members of the class. After this, other students or parents may be invited to attend the class presentations. The written reports should be turned in for individual assessments of learning.

Standards Assessed (see CEPA Rubric):
CCSS.ELA-Literacy.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
CCSS.ELA-Literacy.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
CCSS.ELA-Literacy.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.
CCSS.ELA-Literacy.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-Literacy.W.3.5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing (editing for conventions should demonstrate command of language standards 1–3 up to and including grade 3).
CCSS.ELA-Literacy.W.3.7 Conduct short research projects that build knowledge about a topic.
CCSS.ELA-Literacy.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
DSTE.3-ESS2-1 3-ESS2-1. Use graphs and tables of local weather data to describe and predict typical weather during a particular season in an area. [Clarification Statement: Examples of data could include average temperature, precipitation, wind direction and wind speed.] [Assessment Boundary: Graphical displays are limited to pictographs and bar graphs. Assessment does not include climate change.]

DSTE.3-ESS3-1 3-ESS3-1. Evaluate the merit of a design solution that reduces the impacts of weather-related hazard.* [Clarification Statement: Examples of design solutions to weather-related hazard could include a barrier to prevent flooding, a wind resistant roof, and a lightning rod.]

Criteria for Success (show students the CEPA Rubric):

• The report includes information from multiple sources gained from texts and websites (based on student notes of typical and extreme weather) demonstrating understanding of one type of extreme weather (i.e., hurricanes, blizzards, thunderstorms, or tornadoes) and related conditions (temperature, wind, precipitation).
• Students’ reports explain the impact of that extreme weather on our lives and at least one example of how we can reduce the impact of that extreme weather.
• The report contains accurate information related to each question.
• The individual oral presentation includes a visual to illustrate the question being presented.
• Students express ideas clearly in the report and group presentation.
Curriculum Embedded Performance Assessment (CEPA) Student Instructions

**Performance Task:** You will use your knowledge of extreme weather (hurricanes, blizzards, thunderstorms, or tornadoes) to write a brief research report answering the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather? After you write your report, you will give make an oral presentation.

You will work in your groups to give an oral presentation about your group's type of extreme weather. The presentation will include a section (paragraph/information) from each student's written report. Presentations will also include at least one of the following: a visual display of the extreme weather using a video clip or website that describes or illustrates the extreme weather and one way to reduce its impact; or descriptive examples of the impact of the extreme weather on people's lives and one way to reduce that impact.

**Goal:** Your goal is to research and report on the questions: What conditions lead to one form of extreme weather? What is the impact of that extreme weather on our lives? How can we reduce the impact of that extreme weather?

**Audience:** Initial group presentations will be for other members of the class. After this, other students or parents may be invited to attend our class presentations.

**Directions:** Write a short report on your type of extreme weather. You will:

- Review and organize notes that you have taken from multiple sources of information on typical and extreme weather.
• Use your notes to write a report explaining the impact of this type of extreme weather on our lives and how we can reduce its impact.

• Support information in your report with details and examples from your research. You may include information on famous storms (e.g., Hurricane Sandy, the blizzard of 2013, 1978, or 1888).

• Read and revise your report, using the Student Checklist.

• Plan your oral presentation: Meet in your small groups to share and combine your reports into one presentation and decide which part each member of your group will present.

• Create or select visuals to illustrate your part of the oral presentation.

• Present your findings in groups on the final day, using and explaining important words in your presentation.

• Submit your individual final written report. Include sources used for your report at the end.
### CEPA Rubric

<table>
<thead>
<tr>
<th>Written report</th>
<th>4–Exceeds expectations</th>
<th>3–Meets expectations</th>
<th>2–Developing</th>
<th>1–Emerging</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topic/idea development</strong></td>
<td>Full/rich topic development</td>
<td>Adequate topic development</td>
<td>Rudimentary topic development</td>
<td>Little/weak topic development</td>
</tr>
<tr>
<td><em>Introduces and organizes the topic and ideas, provides key details, and may include visuals</em></td>
<td>Logical organization</td>
<td>Adequate organization</td>
<td>Basic organization</td>
<td>Weak organization</td>
</tr>
<tr>
<td></td>
<td>Strong supporting details</td>
<td>Adequate supporting details</td>
<td>Basic supporting details</td>
<td>Weak supporting details</td>
</tr>
<tr>
<td><strong>Content understanding</strong></td>
<td>Rich depth of concept understanding and application</td>
<td>Accurate and appropriate description of conditions and extreme weather</td>
<td>Generally accurate and sufficient description; minor errors</td>
<td>Little or weak understanding of concepts; many errors or misconceptions</td>
</tr>
<tr>
<td><em>Knowledge of extreme weather and related conditions, impact or effect on people’s lives, appropriate method for reducing impact</em></td>
<td>Multiple methods for reducing impact</td>
<td>Appropriate method for reducing impact</td>
<td>Relevant method for reducing impact</td>
<td>Method for reducing impact unlikely to help</td>
</tr>
<tr>
<td><strong>Evidence from the text</strong></td>
<td>Logical and/or persuasive use of evidence</td>
<td>Adequate use of relevant evidence</td>
<td>Basic or simple use of evidence</td>
<td>Little or weak use of evidence</td>
</tr>
<tr>
<td><em>Refers to text (quotations, paraphrases); includes evidence for assertions and information</em></td>
<td>Adequate use of relevant evidence</td>
<td>Adequate use of relevant evidence</td>
<td>Adequate use of relevant evidence</td>
<td>Adequate use of relevant evidence</td>
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<tr>
<td><strong>Accuracy</strong></td>
<td>Accurate and logical use of facts/information</td>
<td>Mostly accurate use of facts/information</td>
<td>Some inaccuracy in facts/information</td>
<td>Inaccurate or weak use of facts/information</td>
</tr>
<tr>
<td><em>Uses facts and information accurately</em></td>
<td>Adequate variety in language and vocabulary that support ideas</td>
<td>Some errors in use of language and vocabulary; rudimentary support for ideas</td>
<td>Simple language and vocabulary that may not support ideas</td>
<td></td>
</tr>
<tr>
<td><strong>Vocabulary and language</strong></td>
<td>Effective use of language and rich vocabulary to support ideas</td>
<td>Adequate variety in language and vocabulary that support ideas</td>
<td>Some errors in use of language and vocabulary; rudimentary support for ideas</td>
<td>Simple language and vocabulary that may not support ideas</td>
</tr>
<tr>
<td><em>Uses vocabulary effectively, including academic vocabulary; uses rich language to support ideas</em></td>
<td>Demonstrates control of standard English conventions</td>
<td>Errors do not interfere with communication</td>
<td>Errors interfere somewhat with communication</td>
<td>Little control of sentence structure, grammar, mechanics</td>
</tr>
<tr>
<td><strong>Standard English conventions</strong></td>
<td>Demonstrates control of standard English conventions</td>
<td>Errors do not interfere with communication</td>
<td>Errors interfere somewhat with communication</td>
<td>Errors interfere somewhat with communication</td>
</tr>
<tr>
<td><em>Uses correct sentence structure, grammar and usage, and mechanics</em></td>
<td>Adequate use of relevant evidence</td>
<td>Adequate use of relevant evidence</td>
<td>Adequate use of relevant evidence</td>
<td>Adequate use of relevant evidence</td>
</tr>
</tbody>
</table>
Unit Resources

Lessons 1–5
Student text (class set—one copy for each student):
• Class set of *Magic Tree House Fact Tracker: Twisters and Other Terrible Storms* by Will Osborne and Mary Pope Osborne. (Lexile 680L, Guided Reading level R, DRA level 40). NOTE: This text should be included in each of the groups for browsing and mini-inquiry groups.

Teacher read-aloud text (one copy):
• *Inside Weather* by Mary Kay Carson

Text to support ELLs and special education students (three to five copies):
• *Weather Words and What They Mean* by Gail Gibbons (Lexile 450L)

Suggested texts for student browsing (one to two copies of each):
• General weather/extreme weather
  o *Weather* by Seymour Simon (Lexile 1020L)
  o *Extreme Weather* by H. Michael Mogil and Barbara Levine (Lexile 1060)**
  o *Weather* (DK Eye Wonder series, DK Publishing)**
  o *Inside Lightning* by Melissa Stewart
  o *Storms!* by Angela Royston
• Hurricanes
  o *Hurricanes* by Seymour Simon
  o *Hurricanes* by Chris Oxlade, Kingfisher Readers series (Lexile 950L)
  o *Inside Hurricanes* by Mary Kay Carson
  o *Hurricane and Tornado* by Jack Challoner, DK Eyewitness series**
• Tornadoes
  o *Inside Tornadoes* by Mary Kay Carson
  o *Tornadoes* by Christy Steele, Nature on the Rampage series
  o *Hurricane and Tornado* by Jack Challoner, DK Eyewitness series**
  o *Tornado* by Stephen Kramer (Lexile 940)
• Snowstorms and blizzards
  o  *Blizzards* by Michael Woods and Mary B. Woods
  o  *White-out Blizzards* by Claire Watts
  o  *Blizzard! The Storm that Changed America* by Jim Murphy (Lexile 1080L)
  o  *Extreme Weather* by H. Michael Mogil and Barbara Levine (Lexile 1060)**
  o  Weather (DK Eye Wonder series, DK Publishing)**
**Titles are included in more than one group of books.

Websites:
• University of Illinois Extension—Tree House Weather Kids: [www.urbanext.illinois.edu/treehouse/](http://www.urbanext.illinois.edu/treehouse/)
• The Globe Program—Explore Science Investigations section: [http://www.globe.gov/explore-science/globe-investigations](http://www.globe.gov/explore-science/globe-investigations)

Professional resource:

Materials
• Chart paper
• Research Journal (see appendices)
• Description of Mini-Inquiry Circles (see appendices)
• Inquiry Circle Student Handout (see appendices)
• Browsing Notes Worksheet (see appendices)
• Comparing Weather in the United States (see appendices)
• Climate Zone and Weather Worksheet (see appendices)
• Sticky notes and/or index cards

Lessons 6–10
Core texts for teacher modeling (one copy of each):
• *Storms* by Seymour Simon, for teacher read-aloud (Lexile 940L)
• *Inside Weather* by Mary Kay Carson
• *Lightning* by Stephen Kramer, for teacher read-aloud (Lexile 800L)
• *Storms!* by Angela Royston
Suggested texts for student mini-inquiry groups (one to two copies of each):

• See list of suggested texts for student browsing, Lessons 1–5

NOTE: Students should include Magic Tree House Fact Tracker: Twisters and Other Terrible Storms by Will Osborne and Mary Pope Osborne for mini-inquiry groups.

Websites:

• See websites for Lessons 1–5

Professional resource:


Materials

• Chart paper
• Research Journal
• Note-taking Worksheet (see appendices)
• Sticky notes
• Interactive whiteboard or overhead projector
• Access to computers for website searches

Lessons 11–13

Texts:

• All the texts used in the previous lessons

Materials

• Charts constructed in previous lessons
• Writing paper and construction paper for final reports
• Poster board and markers (for illustrations)
• Student Checklist for Final Performance Assessment (see appendices)
• CEPA Teacher Instructions, Student Instructions, and Rubric
• Reflection Worksheet (see appendices)
• Access to computers for additional website searches
Appendices

Appendix A: Sample Research Journal (Lessons 1–13)
Appendix B: Comparing Weather in the United States (Lesson 3)
Appendix C: Climate Zone and Weather Worksheet (Lesson 3)
Appendix D: Mini-inquiry Circles Description (Lesson 5)
Appendix E: Inquiry Circle Student Handout (Lesson 5)
Appendix F: Browsing Notes Worksheet (Lesson 5)
Appendix G: Note-taking Worksheet (Lesson 7)
Appendix H: Reflection Worksheet (Lesson 13)
Appendix I: Student Checklist for Final Performance Assessment (Lesson 9)

<table>
<thead>
<tr>
<th>What did I learn?</th>
<th>What new words did I learn?</th>
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What questions do I have?

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<th>What questions do I have?</th>
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Appendix B: Comparing Weather in the United States

**Boston, Massachusetts:**
1. Climate zone: Cool Summer Continental (p. 7)
2. Air mass: Continental Polar (cP)—cool and dry (p. 21)
3. Yearly precipitation: 40-50 inches or 104–128 cm (p. 29)
4. Weather:

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
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<tbody>
<tr>
<td><strong>Temperature</strong></td>
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<tr>
<td>Temperature</td>
<td>Cold 38.7°F</td>
<td>Warm/Cool 55.6°F</td>
<td>Hot 79.3°F</td>
<td>Warm/Cool 61.7°F</td>
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<tr>
<td><strong>Precipitation</strong></td>
<td>3.51 inches (8.91 cm)</td>
<td>3.85 inches (9.78 cm)</td>
<td>3.49 inches (8.86 cm)</td>
<td>3.79 inches (9.63 cm)</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>13.4 MPH Colder dryer</td>
<td>12.8 MPH</td>
<td>11 MPH Warm and more humid</td>
<td>11.8 MPH</td>
</tr>
</tbody>
</table>
Detroit, Michigan:

1. Climate zone: Cool Summer Continental (p. 7)
2. Air mass: Continental Polar (cP)—cool and dry (p. 21)
3. Yearly precipitation: 25–40 inches or 60–104 cm (p. 29)
4. Weather:

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td>Cold 34.3°F</td>
<td>Warm/Cool 58.3°F</td>
<td>Hot 81.3°F</td>
<td>Warm/Cool 61.7°F</td>
</tr>
<tr>
<td><strong>Precipitation</strong></td>
<td>2.17 inches (5.52 cm)</td>
<td>2.85 inches (7.25 cm)</td>
<td>3.30 inches (8.37 cm)</td>
<td>2.86 inches (7.26 cm)</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>11.3 MPH Colder dryer</td>
<td>10.77 MPH</td>
<td>8.5 MPH Warm and more humid</td>
<td>9.6 MPH</td>
</tr>
</tbody>
</table>
Phoenix, Arizona:

1. Climate zone: Dry Desert (p. 7)
2. Air mass: Continental Tropical (CT)—warm/hot and dry
3. Yearly precipitation: 0–35 inches or 0–89 cm (p. 29)
4. Weather:

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Warm 68°F</td>
<td>Hot 85.7°F</td>
<td>Very hot 105.0°F</td>
<td>Hot 88.3°F</td>
</tr>
<tr>
<td>Precipitation</td>
<td>0.91 inches (2.33 cm)</td>
<td>0.46 inches (1.17 cm)</td>
<td>0.69 inches (1.75 cm)</td>
<td>0.62 inches (1.58 cm)</td>
</tr>
<tr>
<td>Wind</td>
<td>7.3 MPH</td>
<td>8.17 MPH</td>
<td>8.97 MPH</td>
<td>6.93 MPH</td>
</tr>
</tbody>
</table>

*(questions on next page)*
1. **Describe** what the typical weather will be like in summer for MI and AZ. Use the data to support your reasoning.

2. **Describe** what the typical weather will be like in winter for MI and AZ. Use the data to support your reasoning.
Appendix C: Climate Zone and Weather Worksheet (Lesson 3)

Use the air mass map and information in columns 1, 2 and 3 below to complete Columns 5, 6 and 7.

- Column 5: Will these regions have seasons? Summer hotter than winter?
- Column 6: What type of weather is likely to be typical in summer?
- Column 7: What type of weather is likely to be typical in winter?

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Australia</td>
<td>Dry Desert</td>
<td>Hot</td>
<td>Continental Tropical (cT) – warm &amp; dry</td>
<td>Almost no rain – 10 inches</td>
<td></td>
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</tr>
<tr>
<td>Indonesia</td>
<td>Wet Tropical</td>
<td>Hot</td>
<td>Maritime Equatorial (mE) – hot &amp; moist</td>
<td>Year round rain – 143 inches</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Central Canada</td>
<td>Subarctic</td>
<td>Cold</td>
<td>Continental Arctic (cA) – cold &amp; dry</td>
<td>Some rain in June to August – 15 inches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New England, USA</td>
<td>Cool Summer Continental</td>
<td>Hot to Cold</td>
<td>Continental Polar (cP) – cool &amp; dry</td>
<td>Rain throughout the year - 50 inches</td>
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</tbody>
</table>
Appendix D: Description of Mini-Inquiry Circles

Steps in the process of these mini-inquiry groups are described in the text, *Comprehension and Collaboration: Inquiry Circles in Action* by Stephanie Harvey and Harvey Daniels (2009, Heinemann). See pages 143–164 of the text for a complete description. A summary of the steps:

**Immerse: Invite Curiosity and Wonder**
- Teacher shares curiosity about a topic and models how to ask authentic questions.
- Students share their own curiosity and ask questions.

**Investigate: Develop Questions, Search for Information, Discover Answers**
- Teacher models how to read, listen, and view with a question in mind.
- Students develop questions and read, listen, and view to answer them.
- Students divide the workload for research.

**Coalesce: Synthesize Information and Build Knowledge**
- Teacher supports students in locating relevant information to find answers to their questions.
- Students synthesize information gained from multiple sources.

**Go Public!**
- Teacher plans time for students to share their learning.
- Students demonstrate learning by sharing answers to their questions and teaching others.
Appendix E: Inquiry Circle Student Handout

Step 1: **Immerse**
Wonder and ask questions (that you are really curious about).

Step 2: **Investigate**
Develop questions and read, listen, and view to search for information that will answer your questions. Decide in your groups which questions each member will explore further.

Step 3: **Synthesize**
Pull together all your information. Decide which ideas are most important in answering your questions and write these in a short report on your topic. Share your learning with your group. Plan your presentation.

Step 4: **Go public!**
Share what you have learned in a class presentation to others.
Appendix F: Browsing Notes Worksheet
What do I want to learn about extreme weather?

Type of Storm: ____________________________

<table>
<thead>
<tr>
<th>What I learned or noticed:</th>
<th>What questions I have:</th>
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<td>(over)</td>
<td></td>
</tr>
<tr>
<td>What I learned or noticed:</td>
<td>What questions I have:</td>
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Appendix G: Note-taking Worksheet

Question: _______________________________________________________________________________

<table>
<thead>
<tr>
<th>Source:</th>
<th>Information/Notes:</th>
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<tbody>
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Other questions that I have:
Appendix H: Reflection Worksheet

Name: ________________________________

Date: _______________

Group/Topic: ________________________________

1. What was the most important information you learned about your topic?

2. What resources were most helpful to you in learning this?

3. What resources did you enjoy using the most?

4. How did your group help you to learn about your topic?

5. What did you like most about working in your group?

6. What would you do differently the next time you work in a group?
Appendix I: Student Checklist for Final Performance Assessment

☐ I have completed taking notes and organizing them from several different sources.

☐ I have written a draft of my report explaining the impact of my extreme weather type on our lives and how to reduce its impact.

☐ My report includes examples and details of this type of extreme weather and the conditions (temperature, wind, precipitation) that lead to it.

☐ I have read, revised, and edited my report.

☐ I have listed all sources used for my report.

☐ I have met with other members of my group to plan our presentation.

☐ I have created an illustration for my part of the presentation.

☐ I have presented my findings to the class and explained any words important to my type of extreme weather.

☐ I have submitted my final report to the teacher.