WEATHER TO THE EXTREME

SCIENCE

K

KINDERGARTEN

This guide links the *Weather to the Extreme* unit to the Texas Essential Knowledge and Skills (TEKS) for kindergarteners. *Weather to the Extreme* is a science unit that allows students to study extreme weather and natural disasters along with more typical weather patterns. *Weather to the Extreme* also has interdisciplinary connections to English Language Arts and Social Studies disciplines. For example, students will compose original texts, as outlined in the English Language Arts and Reading TEKS, and understand physical and human characteristics of the environment, as described in the Social Studies TEKS. The following document includes the applicable TEKS and the details of the *Weather to the Extreme* unit. The final section of this document presents the applicable Texas College and Career Readiness Standards adopted by the Texas Higher Education Coordinating Board (THECB) on January 24, 2008.

Description of Unit

In this task, students will explore seasonal weather changes, as well as extreme weather and natural disasters. Students will examine weather patterns and use charts and instruments to track changes over time. They will compare and contrast different kinds of weather and the different seasons. Their learning will culminate in a "weather report" in which they predict what the weather will be like in the near future.

Goals

Students will meet these goals in their explorations:

- Become familiar with weather patterns in different parts of the world
- Gain awareness of some severe weather characteristics and how to prepare for such an event
- Ask questions and explore theories
- Have opportunities to generate new ideas
- Develop the essential skills of communicating, creative problem solving, and logical thinking

- Understand the potential effect of a severe weather event on a community

Phase I. Learning Experiences

1. Read a book to introduce the weather unit. Possible books include *Oh Say Can You Say What's the Weather Today?* by Tish Rabe and provide students with note cards so that they can make sketches to remember important facts or events.

2. Discuss different kinds of weather and seasonal patterns. Ask students to describe the weather in various seasons. You may wish to have students create murals of the four seasons in cooperative groups.

3. Create a weather chart to track the weather over a period of time. Students can create a classroom graph with the number of sunny, cloudy, and rainy days. Set a thermometer outside of the classroom and have students (individually or in pairs) record the temperature each day. You may also wish to set up cups or beakers for measuring rainfall. One possible resource for introducing the concept of tracking weather is *The Kid's Book of Weather Forecasting: Build a Weather Station, "Read the Sky," & Make Predictions!* by Mark Breen and Kathleen Friestad.

4. Take a field trip or invite in a guest speaker, such as a meteorologist or a weather chaser from the local news station, to learn about seasonal weather patterns and extreme weather.

5. Discuss different natural disasters. Consider the following questions:
   - What causes each type of weather phenomenon?
   - What should you do if you know from a weather report that this phenomenon is on its way?
   - Since some kinds of weather phenomenon are specific to certain parts of the earth or terrains, where might you need to be concerned about a hurricane, tornado, blizzard, flood, or dust storm?

   Each student should choose a natural disaster and illustrate it. Talk about how natural disasters might affect the local community, families of the people in the community, and each person individually. How can you prepare for a natural disaster that might occur in your area?

Phase II. Independent Research

A. Research process

1. Selecting a topic. Form small groups based on interest in exploring a specific weather phenomenon (e.g., thunderstorms, tornados, hurricanes).

2. Asking guiding questions. Each group creates a KWL chart. Encourage the student to include questions like, "Does this phenomenon occur at a particular time of year? In a particular season? In a particular geographic area? What conditions (temperature,

barometric pressure) must exist for the phenomenon to occur? How can this phenomenon be predicted? What safety precautions need to be taken?"

3. Creating a research proposal. Brainstorm with students how to find the answers to the questions in their *W* column.

4. Conducting the research. Collaborate with the librarian to provide books and/or websites with visuals that students can access with help. View local weather reports to help students analyze the kinds of information and visuals the meteorologist uses. Revisit the KWL chart near the end of the unit to reflect on student learning.

5. Sharing findings. Each student takes a different role in the production of the weather report (e.g., script writer, graphic design, producer, meteorologist).

B. The product

Each group develops a weather report and delivers it as a meteorologist would. The report should include illustrations of the local weather. Students can use patterns to predict when their phenomenon might come (i.e., how do we know the phenomenon is likely to occur?) and can also offer ways to prepare for it.

C. Communication

Each group presents the weather report to classmates using appropriate vocabulary. The group should take questions or comments at the end of the report. The Q&A session should be impromptu and unscripted in order to reflect student learning accurately.

D. A completed project consists of:

1. KWL chart
2. Notes for weather report
3. Weather report
4. Videotape or audiotape of the weather report, including the Q&A session

Additional Resources

Students are encouraged to work with their teachers and parents/guardians to conduct the research necessary to support and enhance each task, following local district guidelines. Online resources like The Smithsonian Museum, The Library of Congress, The Texas State Archives, Texas State Historical Association, and National Geographic's Kids offer information on a variety of topics and could serve as a good starting place.

Texas Essential Knowledge and Skills

The unit may address the following TEKS:

English Language Arts and Reading:

K.1 Understands how English is written and printed
K.2 Displays phonological awareness
K.4 Comprehends a variety of texts drawing on useful strategies as needed
K.6 Analyzes, makes inferences, and draws conclusions about theme and genre in different cultural, historical, and contemporary contexts and provides evidence from the text to support their understanding
K.9 Analyzes, makes inferences, and draws conclusions about the author's purpose in cultural, historical, and contemporary contexts and provides evidence from the text to support their understanding
K.10 Analyzes, makes inferences, and draws conclusions about expository text and provides evidence from text to support their understanding
K.13 Uses elements of the writing process (planning, drafting, revising, editing, and publishing) to compose text
K.14 Writes literary texts to express their ideas and feelings about real or imagined people, events, and ideas
K.16 Understands the function and uses of the conventions of academic language when speaking and writing
K.17 Writes legibly and use appropriate capitalization and punctuation conventions in their compositions
K.18 Spells correctly
K.19 Asks open-ended research questions and develops a plan for answering them
K.21 Uses comprehension skills to listen attentively to others in formal and informal settings
K.22 Speaks clearly and to the point, using the conventions of language

Mathematics:

K.1 Uses mathematical processes to acquire and demonstrate mathematical understanding
K.2 Applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system
K.3 Applies mathematical process standards to develop an understanding of addition and subtraction situations in order to solve problems
K.7 Applies mathematical process standards to directly compare measurable attributes
K.8 Applies mathematical process standards to collect and organize data to make it useful for interpreting information

Science:

K.1 Conducts classroom and outdoor investigations following home and school safety procedures and uses environmentally appropriate and responsible practices
K.2 Develops abilities to ask questions and seek answers in classroom and outdoor investigations

K.3	Knows that information and critical thinking are used in scientific problem solving
K.4	Uses age-appropriate tools and models to investigate the natural world
K.5	Knows that objects have properties and patterns
K.6	Knows that energy, force, and motion are related and are a part of their everyday life
Social Studies:	
K.3	Understands the concept of chronology
K.5	Understands physical and human characteristics of place
K.14	Applies critical-thinking skills to organize and use information acquired from a variety of valid sources, including electronic technology
K.15	Communicates in oral and visual forms
K.16	Uses problem-solving and decision-making skills, working independently and with others, in a variety of settings

THECB College Readiness Standards

This unit may address the following THECB College Readiness Standards:

English Language Arts:	
IV.A.2	Interprets a speaker's message; identifies the position taken and the evidence in support of that position
IV.A.3	Uses a variety of strategies to enhance listening comprehension
IV.B.2	Listens actively and effectively in one-on-one communication situations
IV.B.3	Listens actively and effectively in group discussions
Social Studies:	
I.A.2	Analyzes the interaction between human communities and the environment
IV.A.1	Identifies and analyzes the main idea(s) and point(s) of view in sources
IV.C.1	Understands/interprets presentations critically
Cross-Disciplinary Standards:	
I.E.1	Works independently
I.E.2	Works collaboratively
II.C.2	Explores a research topic