

ARE YOU READY FOR EXTREME WEATHER?

GRADES 6-8
GEORGE DURRETT

TIME ALLOTMENT:

Two 45-minute class periods

OVERVIEW:

Man has been fighting to control the environment throughout the ages. The one aspect that is uncontrollable is weather. Regardless of the dangers of extreme weather conditions, people insist on living in areas where they can be confronted with hurricanes, blizzards, tornadoes, mudslides, and floods.

Through the activities in this lesson students will become familiar with extreme weather conditions, what causes them, how meteorologists track weather, and the best precautions to take in order to survive. After examining Web sites and viewing the video clips, students will design a safety plan for each of the extreme weather conditions discussed in the video.

SUBJECT MATTER:

Science

LEARNING OBJECTIVES:

Students will be able to:

- Explain the causes of various extreme weather conditions.
- Identify areas that are at risk.
- Plan for the safest way to deal with extreme weather.
- Describe how meteorologists use maps and technology to predict weather.



STANDARDS:

National Science Education Standards

<http://www.nap.edu/readingroom/books/nses/html/>

Science and Technology

CONTENT STANDARD E:

As a result of activities in grades 5-8, all students should develop

- Abilities of technological design
- Understandings about science and technology

Science in Personal and Social Perspectives

CONTENT STANDARD F:

As a result of activities in grades 5-8, all students should develop understanding of

- Personal health
- Populations, resources, and environments
- Natural hazards
- Risks and benefits
- Science and technology in society

Louisiana Science Frameworks:

State Standards for Curriculum Development

<http://www.doe.state.la.us/doe/assessment/standards/SCIENCE.pdf>

Science and the Environment - In learning environmental science, students will develop an appreciation of the natural environment, learn the importance of environmental quality, and acquire a sense of stewardship. As consumers and citizens, they will be able to recognize how our personal, professional, and political actions affect the natural world.

Benchmarks

ESS-M-A11: Understanding that the atmosphere interacts with the hydrosphere to affect weather and climate conditions;

SI-M-A7: Communicating scientific procedures, information, and explanations

SE-M-A4: Understanding that human actions can create risks and consequences in the environment

MEDIA COMPONENT:**Video:**

Enviro-Tacklebox™ — *Extreme Weather* (Louisiana Public Broadcasting) This video introduces students to the causes of extreme weather and the importance of being prepared.

Web sites:**Enviro-Tacklebox™**

<http://www.envirotacklebox.org> This is Louisiana Public Broadcasting's Web site providing teaching information, streaming media, and student activities involving environmental science. RealOne Player is used to view the video and can be downloaded from the Web site.

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions.

WeatherEye <http://weathereye.kgan.com/expert/blizzard/> Go to this Web site to find information on blizzards and download photo.

PBS: Nova <http://www.pbs.org/wgbh/nova/flood/water.html> Go to this Web site to obtain information on floods and download photo.

NCDC/Publications/Extremes and Events/Hurricanes <http://www.ncdc.noaa.gov/oa/climate/severeweather/hurricanes.html> This Web site has information on hurricanes and a photo.

CNN Weather <http://www.cnn.com/WEATHER/9802/13/california.storms/> Go to this Web site for articles on mudslides and photo.

USA TODAY Weather <http://www.usatoday.com/weather/resources/basics/twist0.htm> Go to this Web site for tornado information and the gallery of tornado photos.

MATERIALS:*Per Each Student:*

- Pictures of a tornado, hurricane, blizzard, mudslide, and flood.
- Pencil and paper
- Questions for viewing the video

Per Each Group of Four to Five Students:

- Group Assignment Sheets

Per Group :

- Video: **Enviro-Tacklebox™—*Extreme Weather***

PREP FOR TEACHERS:

1. Prior to teaching this lesson, bookmark the Web sites used in the lesson on each computer in your classroom and view film. Download the photos from the selected Web sites.
2. Prepare the hands-on element of the lesson by:
Providing a poster board and markers for each group.
Arrange access to computer lab or rotate groups within class.
3. When using media, provide students with a **FOCUS FOR MEDIA INTERACTION**, a specific task to complete and/or information to identify during or after viewing of video segments, Web sites, or other multimedia elements.

INTRODUCTORY ACTIVITY:

1. Distribute the pictures of extreme weather to each student. Ask your students to examine the pictures and explain what is happening.
2. After the students have discussed the pictures, ask them what hazards they have encountered where they live and what have been the results of the extreme weather in their area. Answers will vary, according to the school's locale. (*Guide the students to realize that extreme weather conditions do not happen very often. When they do happen, we need to be prepared because they can cause property damage and loss of life.*)

LEARNING ACTIVITIES:

1. Ask your students what they know about preparing for extreme weather. Answers will reflect what the students have learned about emergency procedures at school such as “duck and cover” for tornado warnings.
2. Explain to your students that it is important to know the conditions that cause extreme weather so that they can be prepared when it happens. Guide them to understand that one day they may live in areas that will have extreme weather that is of a different form than they are now familiar with. Tell them that they are about to watch a segment of *Enviro-Tacklebox™ — Extreme Weather* that will inform them about hurricanes, mudslides, tornadoes, blizzards, and floods.
3. Insert *Enviro-Tacklebox™ — Extreme Weather* into your VCR. **Provide your students with a FOCUS FOR MEDIA INTERACTION**, asking them to answer the following questions.

1. Where is the Weather Channel located?
2. What does a meteorologist do?
3. What are the two big technological advances in studying weather?
4. Give some examples of extreme weather.

Start the video at the beginning and pause the tape after the man in the hat appears at the front of the barge. This segment is approximately five minutes long.

Check for comprehension. (**Answers: 1. The Weather Channel is in Atlanta, Georgia. 2. Meteorologists gather weather information to inform people. 3. The two big technological advances in studying weather are satellites and doppler radar. 4. Some examples of extreme weather are tornados, hurricanes, mud slides, blizzards, and floods.**)

4. Tell your students they are about to watch another segment of *Enviro-Tacklebox™ — Extreme Weather*. Provide students with a **FOCUS FOR MEDIA INTERACTION**, asking them to answer the following questions.
 1. What is an evacuation?
 2. When Hurricane George headed for New Orleans, to which location were many people evacuated and why?
 3. How does a hurricane develop?

Start the tape at the stopping point and play it until the girl says, “I second that.” This segment is approximately five minutes long.

Check for comprehension. (**Answers: 1. An evacuation is when the authorities aid people in moving to safety. 2. When Hurricane George headed to New Orleans, people were evacuated to the Super Dome, because New Orleans is below sea level. 3. A hurricane develops when warm air over water rises in a circular fashion releasing heat. As the warm air rises, more air flows in increasing the force of the circular winds.**)

5. Tell the students they are about to watch another segment of *Enviro-Tacklebox™ — Extreme Weather*. Provide the students with a **FOCUS FOR MEDIA INTERACTION**, asking them to answer the following questions.

1. What happens when hot dry winds flow out of Santa Ana?
2. What environmental clues come from weather balloons?
3. What is a supercell thunderstorm?
4. What percent of tornados cause most of the fatalities?
5. What conditions create Tornado Alley?

Start the tape at the stopping point and stop after *Holy Mackerel!* This segment is approximately four minutes long.

Check for comprehension. (**Answers: 1. When the hot dry winds flow out of Santa Ana, lightning is prevalent. It can start fires that are then fanned by winds. 2. The environmental clues from weather balloons are readings of the temperature, wind, and humidity. 3. A supercell thunderstorm is formed when warm, moist air rises into cool dry air in the upper atmosphere, causing winds to change direction. The winds create a rotating updraft. 4. Two percent of all tornados create two thirds of the fatalities. 5. Tornado Alley is caused by the warm moist air from the Gulf of Mexico meeting the cool dry air from the Rocky Mountains.**)

6. Tell the students they are about to watch the final segment of ***Enviro-Tacklebox™ — Extreme Weather***. Provide a **FOCUS FOR MEDIA INTERACTION**, by asking the students to answer the following question.

1. What can you do to protect yourself from tornados at school?
2. What can you do to protect yourself from tornados at home?
3. What are storm chasers?
4. What can you do to prepare for extreme weather?

Start the film at the stopping point and play until the end. This segment is approximately five minutes long. Check for comprehension. (*To protect yourself from tornados at school, close all doors, head for a hallway or area without windows, and duck on the floor with your hands covering the base of your skull and neck. To protect yourself from tornados at home, go into a bathroom and lie in the tub with a mattress covering you. This will cut down on the chances that you will be hit with flying debris. Storm chasers are professionals that chase hurricanes in order to gather information that will help the public. You can prepare for extreme weather by knowing your local weather conditions, staying informed, knowing the evacuation routes, finding local shelters, and having several days of supplies prepared ahead of time.*)

CULMINATING ACTIVITIES:

Have the students visit the Web sites to gather information and create posters on the safety provisions for their assigned extreme weather. Following this, they will present to the class.

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions.

Group 1

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Extreme Heat. Go to Tips On Prevention and Managing Heat.

Group 2

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Extreme Cold. Find ways to protect yourself, your home and your car against extreme cold.

Group 3

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Floods. Gather information about water quality, food safety, and sanitation and hygiene.

Group 4

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Hurricanes. Gather information from Preparing for Hurricanes and Hurricanes and Your Health and Safety.

Group 5

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Tornadoes. Gather information from Severe Weather: Watching for Tornadoes and advance planning at home.

Assessment

The students can be assessed by their group work and the test.

CROSS-CURRICULAR EXTENSIONS:**ART/PHOTOGRAPHY:**

- Search the Web for pictures of extreme weather. Have the students make a collage of the pictures that will illustrate the dangers of extreme weather.

LANGUAGE ARTS:

- Write a story about a day in the life of an extreme weather victim. The student can choose the setting and procedure from the material presented in the group projects.

MATHEMATICS:

- Research the statistics on how often certain types of extreme weather occur.

TECHNOLOGY/SCIENCE:

- Investigate the history of extreme weather over the last century.

COMMUNITY CONNECTIONS:

- Have a local meteorologist visit the class and explain how he or she predicts extreme weather.
- Take a field trip to a local weather station.
- Have a representative from the state police visit and explain how precautions are taken and the steps in evacuation.

STUDENT MATERIALS:

- Video questions
- Group assignments

Extreme Test**VIDEO QUESTIONS****Segment 1**

1. Where is the Weather Channel located?
2. What does a meteorologist do?
3. What are the two big technological advances in studying weather?
4. Give some examples of extreme weather.

Segment 2

1. What is an evacuation?
2. When Hurricane George headed for New Orleans, to which locations were many people evacuated and why?
3. How does a hurricane develop?

Segment 3

1. What happens when hot dry winds flow out of Santa Ana?
2. What environmental clues come from weather balloons?
3. What is a supercell thunderstorm?
4. What percent of tornados cause most of the fatalities?
5. What conditions create Tornado Alley?

Segment 4

1. What can you do to protect yourself from tornados at school?
2. What can you do to protect yourself from tornados at home?
3. What are storm chasers?
4. What can you do to prepare for extreme weather?

GROUP ASSIGNMENTS**Group 1**

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm>

This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Extreme Heat. Go to Tips On Prevention and Managing Heat.

Group 2

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm>

This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Extreme Cold. Find ways to protect you, your home and your car against extreme cold.

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This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Floods. Gather information about water quality, food safety, and sanitation and hygiene.

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National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm>

This Web site offers ways to protect yourself against many types of extreme conditions. Go to Web site and click on Hurricanes. Gather information from Preparing for Hurricanes and Hurricanes and Your Health and Safety.

Group 5

National Center for Environmental Health <http://www.cdc.gov/nceh/hsb/extreme.htm> This Website offers

ways to protect yourself against many types of extreme conditions. Go to Website and click on Tornados.

Gather information from Severe Weather: Watching for Tornados and advance planning at home.

EXTREME TEST

Directions: Answer the question by circling the best answer.

1. Where is the Weather Channel located?
 - A) Baton Rouge, Louisiana
 - B) New York, New York
 - C) Atlanta, Georgia
 - D) Denver, Colorado
2. A meteorologist...
 - A) studies habitats.
 - B) is an expert in geological phenomenon.
 - C) controls emergency procedures.
 - D) studies and predicts the weather.
3. What happens when dry winds flow out of Santa Ana?
 - A) The crops shrivel and die.
 - B) Rains follow in a few weeks leading to dangerous floods.
 - C) Lightning occurs and the dry winds fan them.
 - D) They are a prediction of an extreme winter.
4. What percentage of tornadoes cause two-thirds of the fatalities?
 - A) Two percent
 - B) Fifty percent
 - C) Ten percent
 - D) Twenty percent
5. What are storm chasers?
 - A) People that put themselves needlessly in danger for a thrill.
 - B) Weather balloons that alert meteorologists to signs of tornados.
 - C) Students and meteorologists that collect data on tornados.
 - D) Ordinary citizens that track hurricanes.

Directions: Answer Correct or Incorrect to the following questions.

6. _____ An evacuation is an effort made by authorities to move the at risk population out of danger of extreme weather.
7. _____ A hurricane is developed from hot winds rising from water in a circular fashion releasing heat. As the warm air rises, more air flows in increasing the force of the circular winds.
8. _____ When Hurricane George headed for New Orleans, many of the people were evacuated to Baton Rouge.
9. _____ In order to protect yourself from tornados at home, close all doors and windows and watch the weather report.
10. _____ Examples of extreme weather includes floods, blizzards, mudslides, hurricanes, and tornadoes.

Short Answer: Answer in complete sentences.

11. Explain the characteristics of a supercell thunderstorm.

12. Explain what you can do to prepare for extreme weather.

13. What conditions create Tornado Alley?

14. What are the two big technological advances in studying weather?

15. What environmental clues come from weather balloons?