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Lesson Plan: **The Fury of Nature: Hurricanes and the Gulf Coast** (High School Social Studies and Science)

Objective:

Using prior knowledge of natural disasters, students will interpret primary source footage and documents through analyzing the impact of Hurricane Beulah on the Gulf Coast. Students will further analyze natural disasters by comparing the effects and responses to Hurricane Beulah and Hurricane Katrina.

Description:

Hurricane Beulah blew through south Texas and northeastern Mexico in September of 1967. Although 95 tornadoes touched down throughout the area, the heavy rainfall that accompanied Beulah inflicted the storm's worst damage. At the time, it caused the worst flood damage in Texas state history, costing \$200 million, roughly equal to \$1.5 billion in today's dollars. Using the newsreel *Angry Waters: Worst Flood in Texas History*, this lesson plan explores the disaster and suggests points of comparison with the more recent Hurricane Katrina. The lesson targets TEKS objectives in United States History Studies Since the Reconstruction, World Geography Studies, United States Government, and Environmental Systems.

Films:

- *Angry Waters: Worst Flood in Texas History:*
http://www.texasarchive.org/library/index.php/Angry_Waters_-_Worst_Flood_in_Texas_History
- *Floods: Hurricane Aftermath Kills 11 in Texas:*
http://www.texasarchive.org/library/index.php/Floods_-_Hurricane_Aftermath_Kills_11_in_Texas
- *Mexican Refugees Return Home:*
http://www.texasarchive.org/library/index.php/Mexican_Refugees_Return_Home

Accompanying Worksheets:

- *Natural Disaster Frayer Model:*
http://www.texasarchive.org/education/lesson_plans/ndfm.pdf

Resources:

- http://www.climate.noaa.gov/index.jsp?pg=/education/edu_index.jsp&edu=literacy: this National Oceanic and Atmospheric Administration (NOAA) Education



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Web page features a downloadable Climate Literacy Guide, streaming climate literacy presentations, and other environmental literacy educational materials.

- <http://www.climate.noaa.gov/education/hurricanes/stormsurge.pdf>: prepared by the NOAA, this document *Storm Surge* contains student activities and teacher resources related to hurricane flooding.
- <http://environment.nationalgeographic.com/environment/natural-disasters/forces-of-nature.html?section=h>: this National Geographic site contains an interactive lab, a map of historical hurricanes, and case studies. With photos and video footage, the 1900 Galveston hurricane is a featured case study.
- <http://earthobservatory.nasa.gov/Features/Hurricanes/>: this NASA Web site details the science behind hurricanes.
- <http://www.lamer.lsu.edu/resources/hurricanes.htm>: this Web site lists links to educational resources about hurricanes on the Web. It includes sites for kids, general hurricane information, teacher resources, data and research, hurricane images, and special sections on Hurricane Katrina.
- http://serc.carleton.edu/research_education/katrina/: this Web site provides Internet resources for teaching about Hurricane Katrina. Topics include physiography, human impacts and development, aftermath of the storm, and human health concerns.

Process:

Prior Knowledge

1. The following activity assumes that students have a basic understanding of extreme weather and natural disasters such as hurricanes, tornados, and floods.
2. Students should know that Texas' diverse landscape is susceptible to many types of extreme weather.
3. Students should have a basic familiarity of both current and historical hurricane activity in the Gulf Coast. A basic working knowledge of Hurricane Katrina is assumed.
4. OPTIONAL: Have students complete the *Natural Disaster Frayer Model* worksheet to engage their prior knowledge of natural disasters.

Hook

1. Ask students to recount any experiences they have had with hurricanes or other major natural disasters. Ask questions that elicit details, such as: What did each



- student do to prepare for the event? Did the student stay in his home, or go somewhere else for shelter? How did the student and her family decide to what to do? What was the student's experience before, during, and after the event? How did the student feel?
2. As a class, brainstorm the ways one prepares for a hurricane or other natural disaster. After creating the list, ask the students to think about how they know to do these things. Ask them to think critically about who has the knowledge of impending natural disasters, and what methods the community has for alerting and informing the population. Ideally, how should local, state, and federal resources respond before, during, and after the event?

Lesson

1. Students will watch three films: *Angry Waters: Worst Flood in Texas History*, *Floods: Hurricane Aftermath Kills 11 in Texas* and *Mexican Refugees Return Home*.
2. Questions for discussion: have students respond to questions a and b with the instructor, and answer c and d on their own paper.
 - a. Why do communities commonly flood after hurricanes?
 - b. How can flooding be prevented?
 - c. After viewing the film(s), what similarities do you see between this footage and scenes from Hurricane Katrina or another recent natural disaster?
 - d. What is the reaction of the children in the video? Why is this surprising?
 - e. How is the government responding to the aftermath of the hurricane? How is the community responding?
 - f. What is the importance and significance of emergency relief in disaster situations?
3. Reading to understand:
 - a. Have students read the following articles. The first article recounts local survivors of Hurricane Beulah, while the second describes the experiences of a man who lived through Hurricane Katrina in 2005.
 - i. Nelsen, Aaron. "40 Years Later: Memories of Hurricane Beulah Still Vivid in Minds of Survivors." Brownsville Herald 16 Sept. 2007. 2 July 2009
<<http://www.brownsvilleherald.com/articles/hurricane-80279-storm-beulah.html>>
 - ii. Homan, Michael. "One of the Millions of Hurricane Katrina Stories." Weblog post. Michael Homan. 5 Sept. 2005. 2 July 2009



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<http://michaelhoman.blogspot.com/2005/09/one-of-millions-of-hurricane-katrina.html>.

- b. Students will answer the following questions on their own for use with small group or class discussion:
- i. What was the most devastating part of the storm for the survivors of Hurricane Beulah?
 - ii. How did the stories of people in Hurricane Beulah differ from one another? Who seemed to be the most affected by it?
 - iii. What social factors explain why some people were greatly affected, and others were only mildly worried?
 - iv. Provide three examples of how Hurricane Beulah and Hurricane Katrina were similar.
 - v. Provide three examples of how the two hurricanes were different.
 - vi. After viewing the film and reading backgrounds about the survivors, how have reactions towards hurricanes changed in the past 50 years?
 - vii. How did Hurricane Beulah directly affect hurricane response in Texas?
 - viii. Why do disaster relief and recovery seem to take such a long time? How do you think Hurricane Katrina has affected the future of American response to a natural disaster?
 - ix. How can the tragic aftermath of Hurricane Katrina be prevented the next time a major storm threatens the United States?

TEKS:

United States History Studies since Reconstruction (9th Grade)

2.C: Analyze social issues such as the treatment of minorities.

9.A: Analyze the effects of physical and human geographic factors on major events.

11.A: Identify the effects of population growth and distribution and predict future effects on the physical environment.

15.D: Predict the effects of selected contemporary legislation on the roles of state and federal governments.

24.A: Locate and use primary and secondary sources such as computer software, databases, media and news services, biographies, interviews, and artifacts to acquire information about the United States.



24.C: Explain and apply different methods that historians use to interpret the past, including the use of primary and secondary sources, points of view, frames of reference, and historical context.

World Geography Studies

2.A: Describe the human and physical characteristics of the same place at different periods of history.

3.A: Attribute occurrences of weather phenomena and climate to annual changes in Earth-Sun relationships.

3.B: Describe the physical environment of regions and the physical processes that affect these regions.

8.C: Describe the impact of and analyze the reaction of the environment to abnormal and/or hazardous environmental conditions.

19.B: Analyze ways technological innovations have allowed humans to adapt to places shaped by physical processes such as floods, earthquakes, and hurricanes.

21.B: Analyze and evaluate the validity and utility of multiple sources of geographic information such as primary and secondary sources, aerial photographs, and maps.

United States Government

3.A: Give examples of the processes used by individuals, political parties, interest groups, or the media to affect public policy.

9.G: Explain the major responsibilities of the federal government for domestic and foreign policy.

9.H: Compare the structure and functions of the Texas state government to the federal system.

9.I: Analyze the structure and functions of local government.

Environmental Systems

3.C: Evaluate the impact of research on scientific thought, society, and the environment.



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5.E: Analyze and evaluate the economic significance and interdependence of components of the environmental system

8.A: Analyze and describe the effects on environments of events such as hurricanes.