

LESSON 4 Hurricane Preparedness

Lesson at a Glance

Students view videos and images of hurricane hazards, to gather information (collect data) about hazards, then make a list of the actions they would need in a family disaster plan to prepare for a hurricane. Students complete part of a K-W-L chart to record what they learned in this lesson.

Lesson Duration

Two 45-minute periods

Essential Question(s)

What are hurricane hazards?

How can we prepare for hurricanes?

Related HCPS III Benchmark(s):

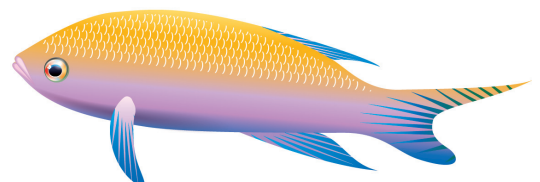
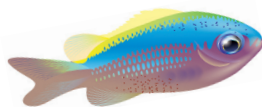
Science SC.3.1.2
Safely collect and analyze data to answer a question.

Key Concepts

- Key hurricane hazards include storm surge, inland flooding, and powerful wind, including tornadoes.
- Making a hurricane plan helps to mitigate the hazards.

Instructional Objectives

- I can describe hurricane hazards.
- I can describe how to prepare for a hurricane.



Assessment Tools

Benchmark Rubric:

Topic		Scientific Inquiry	
Benchmark SC.3.1.2		Safely collect and analyze data to answer a question	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Summarize and share analysis of data collected safely to answer a question	Safely collect and analyze data to answer a question	With assistance, safely collect and analyze data	With assistance, safely collect data and attempt to analyze data

Assessment/Evidence Pieces

Lesson

- Student Worksheet: Observation of Hurricane Hazards

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • Method to present PowerPoint • PowerPoint <i>Hurricane Hazards Video</i> or Video clip: <i>Storm Surge</i> (see URL below) 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Photo set of five hurricane hazard photos 	<ul style="list-style-type: none"> • Worksheet: <i>Observations of Hurricane Hazards</i> • KWL sheet from Lesson 1 • Hazard preparedness check lists from various organizations

Instructional Resources

Teacher Reading: *Hurricane Hazards and Preparedness*

PowerPoint *Hurricane Hazards Video* (or weblink)

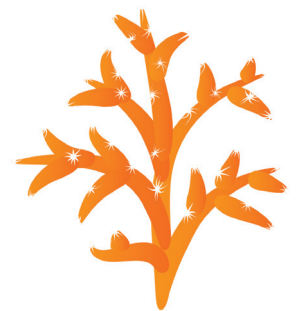
Student Worksheet: *How Do We Watch Hurricanes? Flash Cards*

Student Worksheet: *Observations of Hurricane Hazards*

Optional - Student Worksheet: *Unit Self-Assessment* (found at beginning of unit)

URL: <http://www.srh.noaa.gov/media/key/Storm/StormSurge07092005.wmv>

Play “Storm Surge Video July 9, 2005” from National Weather Service Key West Weather Forecast Office photo gallery site



Student Vocabulary Words

hurricane hazards: Hazards created by a hurricane including storm surge, heavy rains and high winds.

hurricane preparedness: a plan or action to ensure survival in hurricane conditions.

hurricane: a severe tropical cyclone with maximum sustained surface wind (using the U.S. 1-minute average) is 74 mph or 119 km/hr or more, heavy rains, enormous waves, and subsequent flooding that can damage buildings and beaches. It is an area of low pressure around which winds blow counterclockwise in the Northern Hemisphere. The term hurricane is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline. The term cyclone is used for Indian Ocean tropical cyclones.

inland flooding: While the storm surge is related to the winds of the hurricane, inland flooding is more often a result of rainfall. Often during a hurricane, the storm will stall over an area resulting in enough rainfall to flood inland areas.

storm surge: The storm surge is the water on the coast that is pushed in by hurricane winds. This water exaggerates the normal tides, so that the water level can rise as much as 15 feet or more. The storm surge can cause coastal flooding. The amount of the storm surge is determined by the slope of the land offshore, as well as, the strength of the hurricane.

tropical depression: a tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) is 38 mph or 62 km/hr or less.

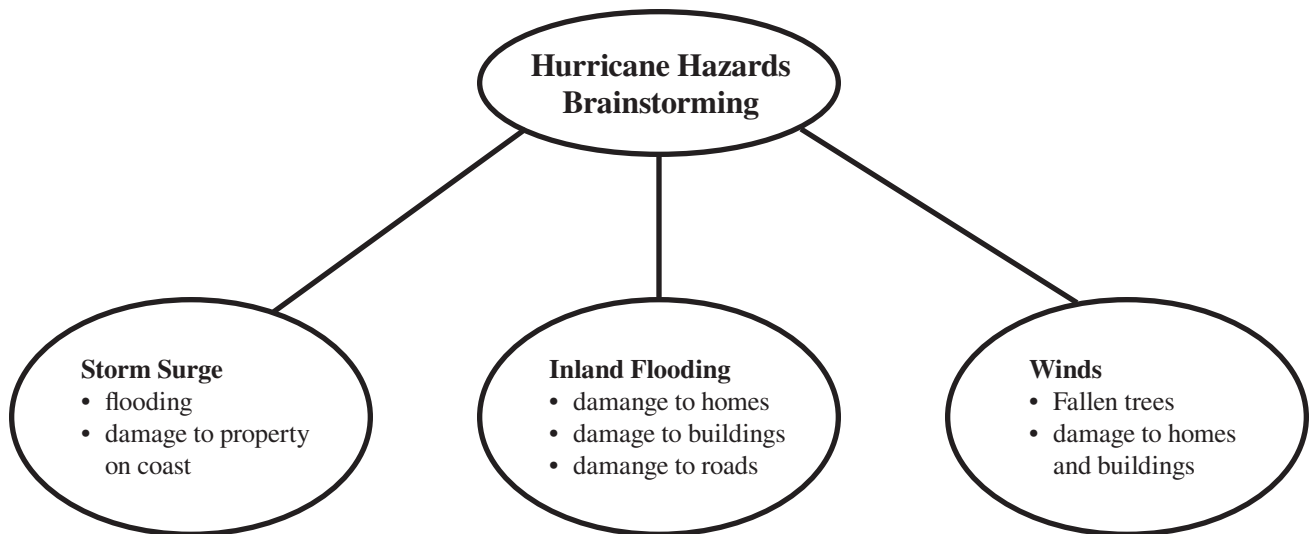
tropical storm: a tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 39 mph or 63 km/hr to 73 mph or 118 km/hr.

Lesson Plan

Lesson Preparation

- Review the Science Background provided in the Unit's Overview and the Teacher Reading *Hurricane Hazards and Preparedness*.
- Preview the PowerPoint *Hurricane Hazards Video* or the online link to the video <http://www.srh.noaa.gov/media/key/Storm/StormSurge07092005.wmv> and make arrangements to project it.
- Preview the *Model for Brainstorming on Hurricane Hazards* found below.
- Preview and make copies of the Student Worksheets *How Do We Watch Hurricanes?* *Flash Cards* (one set per group) and *Observations of Hurricane Hazards*, one per student.
- Add to the Word Wall if you've created one.





I. *The Hurricane Hazards Video*

- A. Review with students the key elements of hurricanes: high winds, heavy rain, and damage to property.
- B. Write the term **hurricane hazards** on the board. Ask student what they think the term means, and help them to understand that it refers to dangers to humans caused by hurricanes.
- C. Ask students to look carefully at a video (or pictures) and to gather information about the dangers or hurricane hazards they observe. Show *Hurricane Hazards Video* “Storm Surge July 9 2005,” <http://www.srh.noaa.gov/media/key/Storm/StormSurge07092005.wmv> (Some computers/internet connections may have trouble with the video, if so the still pictures on the web site or other websites with similar material may be used instead.) This video-clip shows the force of water from storm surge, as well as winds and some inland flooding. Stop the video as needed to ask students what they are seeing. Record their observations on the board.
- D. The teacher may choose to do one of the following:
 - 1) Write the terms **Storm Surge**, **Inland Flooding** and **High Winds** on the board. Classify each of the student’s observations from the video using these terms. Use the *Model for Brainstorming on Hurricane Hazards* as an example of how to arrange terms.
or
 - 2) Have students share their observations from the video and have them classify the observations. Students can then develop the headings for their classification of their observations.
- E. Divide students into groups. Distribute a set of *How Do We Watch Hurricanes? Flash Cards* to each group along with a copy for each student of the Student Worksheet *Observations of Hurricane Hazards*.
- F. Ask groups of students to examine each photo carefully, describe what they see, and classify the kinds of hazards (storm surges, inland flooding, strong winds).

II. *Hurricane Preparedness*

- A. Briefly review types of hurricane hazards with students (storm surge, heavy rains, inland flooding, winds).
- B. Have students brainstorm ways to be prepared for a hurricane. Assemble the class’ ideas. (NOTE: the students’ checklist may be missing a few items or include items that are non-essential. They will use the checklists from various organizations to refine their list.)

- C. Collect and assemble hurricane preparedness checklists from various organizations. (See web links below.) Ask students to compare and contrast information from the various checklists and the ideas they shared as a class.

www.nhc.noaa.gov/HAW2/english/prepare/supply_kit.shtml

www.fema.gov/areyouready/

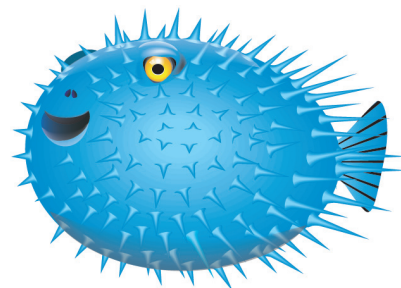
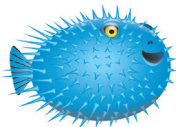
- D. Have students use what they have learned and create their own hurricane preparedness checklist.

III. Extending the K-W-L Chart

- A. Ask students to add what they learned to the right column of the K-W-L chart.
- B. Discuss with students what they learned about preparing for hurricane hazards. Encourage students to add to or modify what they wrote in the L column. You may want to have them date what they write so that their progress may be tracked over the course of the unit.
- C. Students may also want to add more questions to their W section. You may also want them to date these additions as well to monitor their progress over the course of the unit.

Extended Activities

- Students can review their hurricane preparedness checklist with their parents or guardians. They can also develop a pet plan as part of their hurricane preparedness plan:
http://www.nhc.noaa.gov/HAW2/english/prepare/pet_plan.shtml
- Here are additional resources for hurricane hazards and preparedness:
More about storm surge: http://www.nhc.noaa.gov/HAW2/english/storm_surge.shtml
More about inland flooding: http://www.nhc.noaa.gov/HAW2/english/inland_flood.shtml
More about high winds: http://www.nhc.noaa.gov/HAW2/english/high_winds.shtml
More about Disaster Supply Kit: http://www.nhc.noaa.gov/HAW2/english/prepare/supply_kit.shtml
- This video gives a good overview of the dangers associated with flooding, particularly (but not only) flooding from hurricanes:
http://www.weather.gov/os/water/XWATER/PAM/VIDEOS/8MIN/Hidden_Danger_sorenson3.mov



LESSON 4 Teacher Reading

Hurricane Hazards and Preparedness

There are three major hazards associated with hurricanes: storm surges, inland flooding, and winds.

Storm Surge: The storm surge is the water on the coast that is pushed in by the hurricane winds. This water exaggerates the normal tides, so that the water level can rise as much as 15 feet or more. The storm surge can cause coastal flooding. The amount of the storm surge is determined by the slope of the land offshore as well as the strength of the hurricane.

Inland Flooding: While the storm surge is related to the winds of the hurricane, inland flooding is more often a result of rainfall. Often during a hurricane, the storm will stall over an area resulting in enough rainfall to flood inland areas.

High Winds: High winds are measured according to the Saffir-Simpson Hurricane scale. A Category 1 hurricane has slower winds than a Category 5 hurricane. It is important to note that areas that have not prepared for hurricanes can have severe damage with only a Category 1 hurricane.

In order to prepare for a hurricane, families should:

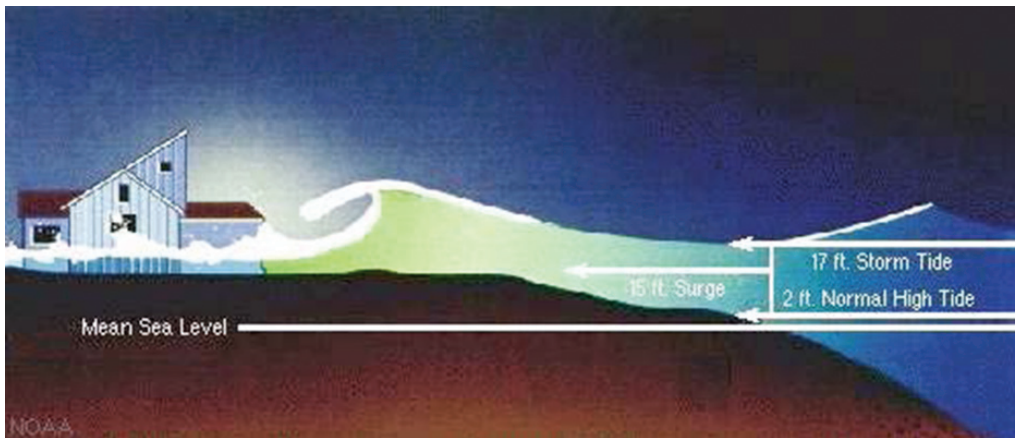
- Develop a family plan that analyzes their vulnerability to hurricane hazards.
- Create a disaster supply kit that includes food and water, first aid kits, and emergency supplies for pets, and other items.
- Secure your home by strengthening it so wind and debris cannot blow in.

LESSON 4 How Do We Watch Hurricanes Flash Cards

What do you see? What type of hazard is it?



What do you see? What type of hazard is it?



LESSON 4 How Do We Watch Hurricanes Flash Cards

What do you see? What type of hazard is it?



What do you see? What type of hazard is it?



LESSON 4 How Do We Watch Hurricanes Flash Cards

What do you see? What type of hazard is it?



Buffalo Bayou, Looking upstream from Main St., 6/9/01


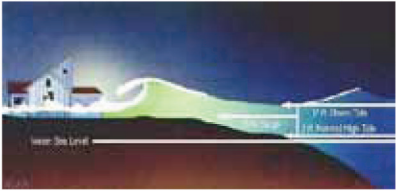




LESSON 4 Observations of Hurricane Hazards

NAME: _____ DATE: _____

Directions :

1. Record what you see in each picture.
2. Identify the kind of hazard or hazards you see in each picture.

Image	What do you see?	What type of hazard is it?
1. 		
2. 		
3. 		
4. 		
5. 