

Unit 3 overview

The following overview explains how the unit follows the 5-E learning cycle and gives tips for teaching specific activities.

Unit objectives

In this unit, students will

- use appearance and surface data to determine hurricane category;
- describe the relationship between Saffir-Simpson category and economic impact on society;
- compare characteristics of destructive hurricanes to those of “average” hurricanes;
- investigate hurricanes and society in pre-historical, historical, and present-day context, focusing on the role of coastal population growth on increasing hurricane hazards; and
- identify hurricane risks for major East Coast cities using hurricane landfall probability data.

3.1 – Sources of hurricane risk (Engage)

Students will visit a website that discusses hurricane hazards. After visiting the sites and answering the questions, divide students into small groups and have them do the following:

- A. Make a list of the hazards, both direct and indirect, associated with hurricanes.
- B. Rank these hazards in order of seriousness. (Students may need to define what they mean by “seriousness.”)
- C. Identify areas that would most likely be at risk from each hazard, such as coastal versus inland, flat versus mountainous, or wealthy versus poor.
- D. List ways to prevent deaths and damage caused by each hazard.

Have each group share their list with the rest of the class.

3.2 – The top ten US hurricanes (Explore)

This section opens by comparing the frequency and damage caused by different hurricanes of each category using a chart viewed with the Media Viewer. Next, students investigate the 10 most destructive hurricanes of the 20th century. They learn how paths of destructive hurricanes differ from average hurricanes. They also learn where these monster storms made landfall. Finally, students study trends in damage and death caused by cyclones through time and consider societal explanations for these trends. Encourage students who complete this section early to explore some of their own questions.

3.3 – Exploring hurricane hazards (Explain)

This section provides eyewitness accounts of historic hurricanes and allows students to deepen their understanding of the impact of hurricanes on humans. Students also learn about the etymology of the word hurricane, which affirms that these storms have been active throughout history. A presentation of demographic trends in the US reveals the tremendous coastal population growth and the potential for disaster.

3.4 – Risk to coastal communities (Elaborate)

In this section, students use a probability theme to determine the annual risk of hurricanes for selected East Coast cities. The cities are then ranked on the basis of their hurricane hazard. Using the Select by Theme operation, students select all of the states that have any risk from hurricanes and calculate the total population that could be affected by these storms.

Evaluating students

A unit assessment is provided to gauge student understanding of the concepts in this activity. Alternatively, you might ask students to construct a layout with maps, text, and charts that explains one or more of the key concepts in this activity. See the Guide to ArcView GIS for instructions on creating layouts.

As a culminating project for this module, give the following assignment or some variation on it to groups of three students. They can share their “plan” with the rest of the class via a paper, poster, video production, or other multimedia presentation. Encourage them to utilize ArcView in preparing their presentation.

The assignment

Civilizations have always located near the coastlines of continents. The oceans provide food, travel for trade and exploration, and a moderate climate. As you observed in this activity, these coastlines are the sites of many of Earth’s natural hazards.

Knowing that people will not abandon the coastlines to live in safer areas, and knowing what you now understand about hurricanes, develop a plan to reduce the impact of hurricanes on cities along the Atlantic and Gulf Coasts.