Teacher Information
Hurricanes

I. Objectives

A. Forming Concepts (Introductory) Objectives

1. Define hurricane.
2. Describe the Saffir-Simpson scale of hurricane intensity.
3. Describe how hurricanes form.
4. Describe the three things that favor hurricane intensification.
5. Write what time of year most hurricanes form.
6. Explain where most hurricanes occur.
7. Explain what storm surge is and how it occurs.
8. Describe the effects of storm tide.
9. Describe a hurricane in terms of vertical and horizontal size, wind speed, and duration.

B. Interpreting Data Objectives

1. Graph wind speed vs. storm tide data.
2. Graph storm tide vs. pressure data.
3. Graph wind speed vs. pressure data.
4. Convert millibars to inches of mercury and miles per hour to kilometers per hour to knots.
5. Trace the track of an Atlantic or Pacific hurricane on a tracking chart.

C. Applying Principles Objectives

1. Given pressure information, the students will use the graphs they made from the hurricane data to determine the approximate wind speed of selected hurricanes.
2. Given wind speed information, the students will use the graphs they made from the hurricane data to determine the approximate storm tides of selected hurricanes.
3. Determine what difference the timing of the tide makes on the damage done by a hurricane.
4. Hypothesize what would happen if a hurricane with an intensity of 3 on the Saffir-Simpson Scale hit where they live.

II. Interdisciplinary Uses

A. Social Studies

1. Describe geographic areas most affected by hurricanes
2. Calculate economic effects in areas hit by hurricanes of different intensities.

B. Math

1. Graph numerical data.
2. Convert numerical values to different units.

C. Language Arts

1. Write a newspaper article describing the danger of hurricane storm tide. Include your graphs in the article. In you article, explain what the graphed data means for those who cannot interpret the graphs themselves. Include the Saffir-Simpson Scale.

III. Science Standards Coordination

The Hurricanes activity has been designed to incorporate science standards as specified by the National Science Education Standards (NSES) and the National Science Teachers Association (NSTA) Scope, Sequence, and Coordination (SS&C) of Secondary School Science. Only the major topics are listed. For further explanation of each standard see the complete documents:

NSES - National Academy Press, 2101 Constitution Ave, NW, Washington, DC 20481
NSTA – 1840 Wilson Blvd, Arlington, VA 22201-3000

NSES	SS&C
Structure of earth systems	Water cycle
Earth in the solar system	Precipitation
Transfer of energy	Wind
Understanding about science and technology	Sun as an energy source
Science and technology in society	Water

IV. Advanced Preparation

A. Pre-teaching

Advanced preparation in class is required for the students to properly graph the relationships in the graphs. The concept of a best-fit line must be introduced before the students try to draw a line showing relationships between any two sets of data. None of the graphs show a perfect linear relationship. All graphs use a best-fit line. See the teacher key for clarification of a best-fit line.

B. Materials

1. One computer per two or three students is a recommended minimum.
2. One copy of the Student Activity Book for each student or group of students.

C. Time Required for Completing the Activity

1. The Get Info section takes about 20-30 minutes.
2. The Gather Data section takes about 25-30 minutes.
3. The Application section takes about 10 minutes.

D. Teacher Familiarity

Preview these materials thoroughly. As with all these activities, before using this activity in class, review the sites and work through the activity yourself to learn about Hurricanes so you can answer questions or direct students to the answers.

The activity is set up so students are taken to sites containing information that will be used to answer questions regarding Hurricanes. The sites contain either the answers or the information from which the students can infer the answers. At the end of the activity, there is a list of enrichment activities and related web sites.

E. Select Questions for Students to Answer

It would be prudent for you to read the questions students will be expected to answer. These questions are in order of ascending difficulty. Depending on grade level and ability level, you might want to assign specific questions for your students.

E. Student Grouping

These activities can be done individually or in small groups of two or three students. Students who have Internet access can also do them at home for extra credit.

F. Software Requirements and Duplication Preparation

1. Adobe Acrobat Reader is required to download the pages. Click the "Tech Info" link on the Science with NOAA Research homepage to download Acrobat Reader.
2. Download the Teacher Information, Teacher Key, and Student Activity Book PDF files from the "Teacher Info" web page.
3. Duplicate and distribute student pages. Ideally, each student should have a copy of the Student Activity Book that should be distributed and discussed the day before the exercise.