



Horrible Hurricanes

4th grade

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▪ Unit Description

During this unit, students will explore the physical characteristics of hurricanes, how hurricanes are classified, and how to prepare for hurricanes. Investigations involve students exploring the calm in the eye of a hurricane as well as how hurricanes are formed. Past hurricanes and how hurricanes are studied are also investigated.

▪ Student Understandings

- **The students will know** hurricane terminology such as tropical disturbance, tropical depression, tropical storm, hurricane, watch, warning, flash flood, and storm surge. The students will also know the parts of a hurricane: eye, rain bands, eye wall.
- **The students will understand** the devastation that is caused by hurricanes and be able to empathize with those affected. Students will also understand the importance of storm preparation and safety.
- **The students will be able to** explain the stages of hurricane development and how it is formed. Students will be able to track hurricane coordinates on a map. Students will be able to properly prepare for a hurricane by gathering the necessary supplies. Students will be able to discuss hurricane categories, historical hurricanes related to each category, and damage caused by each category.

▪ Guiding Questions

1. What is a hurricane?
2. What conditions are necessary for hurricane formation?
3. How are hurricanes classified?
4. How are hurricanes tracked?
5. How are hurricanes studied?
6. Why is storm preparation important?
7. What are the necessary steps in storm preparation?

Lesson Day 1—Formation and Structure of Hurricanes

- **Approximate Time Frame:** 1 hour 20 minutes
- **Benchmarks:**
 - **Science**
 - ESS-E-A4 investigating, observing, measuring, and describing changes in daily weather patterns and phenomena
 - **Technology**
 - H. Utilize search strategies employing keywords, phrases, and Boolean operators (and, or, not) to access and retrieve information.
 - J. Use technology resources to assist in problem-solving, self-directed learning, and extended learning activities.
 - **Language Arts**
 - ELA-4-E2: Giving and following directions/procedures
 - ELA-4-E7: Participating in a variety of roles in group discussions (e.g., active listener, contributor, discussion leader)
 - ELA-5-E1: Recognizing and using organizational features of printed text, other media, and electronic information (e.g., parts of a text, alphabetizing, captions, legends, pull-down menus, keyword searches, icons, passwords, entry menu features)
 - ELA-5-E3: Locating, gathering, and selecting information using graphic organizers, simple outlining, note taking, and summarizing to produce texts and graphics
- **Objectives:**
 - TSWBAT identify facts associated with hurricanes and writing.
- **Procedures:**
 - **Introduction: (10 minutes)**
 - TSW complete a List, Group, and Label about hurricanes. TSW use post-it notes to write words they associate with hurricanes. TSW then discuss as a class how to group the words and what labels the groups should have.
 - TSW review the graphic organizer for the unit in order to briefly discuss topics that will be thoroughly studied in the unit.
 - **Concept Development: (60 minutes)**
 - TSW read *The Magic School Bus: Inside a Hurricane* by Joanna Cole.
 - After reading the book, TSW discuss important concepts presented in the book.
 - TSW get into jigsaw groups. Each group will be given a topic to research (hurricane vocabulary, hurricane formation, stages of development, hurricane names, classification, preparation, and important people). The group will record their information on a research guide provided by the teacher. Each group member will also have a job (researcher, recorder, facilitator, and monitor). TSW use trade books, encyclopedias, and the Internet to find this information.
 - TSW get with like numbered classmates to “teach” their topic.
 - TSW discuss each topic as a class and clear up any misunderstandings.

○ **Closure: (10 minutes)**

- TSW revisit the List, Group, and Label completed at the beginning of the lesson and make any changes or additions based on information gained during the lesson.
- TSW write three facts they learned in their journals.

▪ **Materials:**

- Graphic organizer for unit
- Post-it notes
- Markers
- *The Magic School Bus: Inside a Hurricane* by Joanna Cole
- Trade books on hurricanes
- Encyclopedias
- Internet/computers
- Research guide
- Websites
 - Information about hurricanes and hurricane hunters
http://www.wafb.com/Global/category.asp?C=80567&nav=menu57_6_1_3
<http://kids.mtpe.hq.nasa.gov/archive/hurricane/index.html>
<http://www.weatherwizkids.com/hurricane1.htm>
<http://www.hurricanehunters.com/cyberfly.htm>
http://www.2theadvocate.com/hurricane_center
 - Hurricane Classifications
<http://www.floridatoday.com/multimedia/hurricane/guide2005/categories.htm>
<http://www.fema.gov/kids/huclasf.htm>
 - Hurricane Preparedness
http://www.wafb.com/Global/category.asp?C=80576&nav=menu57_6_1_4
<http://www.nhc.noaa.gov/HAW2/english/intro.shtml>
www.fema.gov/kids/hurr.htm
www.cnn.com/2002/WEATHER/05/30/hur02.safetytips/
 - Hurricane terms
www.aoml.noaa.gov/general/lib/terms.html
www.hurricaneadvisories.com/term.html

▪ **Evaluation:**

- journal entries
- research guides
- discussion
- teacher observation

Lesson Day 2—Classifying Hurricanes

- **Approximate Time Frame:** 1 hour 10 minutes
- **Benchmarks:**
 - **Science**
 - SI-E-A6 communicating observations and experiments in oral and written formats
 - ESS-E-A4 investigating, observing, measuring, and describing changes in daily weather patterns and phenomena
 - **Math**
 - N-5-E selecting appropriate operation(s) (add, subtract, multiply, and divide) for a given situation
 - N-6-E applying a knowledge of basic math facts and arithmetic operations to real-life situations
 - D-2-E constructing, reading, and interpreting data in charts, graphs, tables, etc
 - **Social Studies**
 - H-1A-E1 demonstrating an understanding of the concepts of time and chronology
 - G-1D-E3 describing the locations, causes, and effects of natural disasters on the environment and society
 - **Language Arts**
 - ELA-4-E2: Giving and following directions/procedures
 - ELA-4-E7: Participating in a variety of roles in group discussions (e.g., active listener, contributor, discussion leader)
 - ELA-5-E3: Locating, gathering, and selecting information using graphic organizers, simple outlining, note taking, and summarizing to produce texts and graphics
 - **Art**
 - VA-CE-E5 Draw on imagination, individual experience, and group activities to generate ideas for visual expression
- **Objectives:**
 - TSWBAT identify and list the categories of hurricanes aeb writing.
 - TSWBAT graph data represented in a chart aeb graphs.
- **Procedures:**
 - **Introduction: (10 minutes)**
 - TSW review the graphic organizer for the unit. TSW discuss what was learned in the previous lesson.
 - TTW introduce this lesson by asking students what the word classify means. TSW complete a word web as a class about classify. TTW explain that the lesson will deal with classifying hurricanes and their word web will be revisited later to see if they were correct about the meaning.
 - **Concept Development: (50 minutes)**
 - TTW introduce the hurricane categories.
 - TSW view a simulation of the damage caused by each category.

- TSW then get into groups. Each group will be assigned a historical hurricane. In an envelope, TSW have information about that hurricane, pictures to accompany it, and a direction sheet. TSW use the information and pictures in order to determine the category of the hurricane. On the worksheet, TSW write the name of the hurricane, what category they think the hurricane was, and an explanation as to why they think it was that category. TSW also place the name of their hurricane on the class time line.
- TSW discuss their conclusions as a class. The answers will be revealed, discussed, and put into a graphic organizer called a key matrix.
- TSW then be given a worksheet that contains a table of the costliest hurricanes. TSW complete the worksheet as a group. TSW then graph the data in the table. TS can use a bar graph, pictograph, or line graph (these will have previously been discussed). The graphs will be drawn on poster board and will be graded using rubric. Students will have the rubric as a guide.
- TSW present their graphs to the class and discuss the worksheet.
- Early finishers... TSW complete hurricane math either on the computer or print it and work it at their desk. TSW check their score. TSW will keep trying until all are answered correctly.

○ **Closure: (10 minutes)**

- TSW revisit the word web completed at the beginning of the lesson and make any changes or additions based on information gained during the lesson.
- If time allows, TSW create hurricane cartoons in their journals in order to illustrate one thing they have learned about classifying hurricanes and the damage each category may cause. TSW also write a description of the cartoon in their journals.

▪ **Materials:**

- unit graphic organizer
- <http://palmbeachpost.com/storm/content/storm/homepage/> (simulation)
- envelope
- direction sheet
- information and pictures of destruction caused by historical hurricanes
- key matrix
- “Costliest Hurricanes” worksheet
- posters
- markers
- rubric
- http://www.fema.gov/kidsApps/quiz_multichoice_questions.do?quiz=math_hurr&action=init (Hurricane Math)
- http://www.fema.gov/kids/h_toons.htm (example of hurricane cartoon)

▪ **Evaluation:**

- journal entries
- graphs (rubric)
- worksheet
- discussion
- teacher observation

Lesson Day 3—Preparation for Hurricanes

- **Approximate Time Frame:** 1 hour 15 minutes
- **Benchmarks:**
 - **Science**
 - PS-E-B3 describing an object's motion by tracing and measuring its position over time
 - SI-E-A6 communicating observations and experiments in oral and written formats
 - ESS-E-A4 investigating, observing, measuring, and describing changes in daily weather patterns and phenomena
 - **Math**
 - G-6-M demonstrating an understanding of the coordinate system (e.g., locate points, identify coordinates, and graph points in a coordinate plane to represent real-world situations)
 - **Social Studies**
 - G-1A-E1 identifying and describing the characteristics and uses of geographic representations, such as various types of maps, globes, graphs, diagrams, photographs, and satellite-produced images
 - G-1D-E3 describing the locations, causes, and effects of natural disasters on the environment and society
 - **Language Arts**
 - ELA-4-E2: Giving and following directions/procedures
 - ELA-4-E7: Participating in a variety of roles in group discussions (e.g., active listener, contributor, discussion leader)
 - ELA-5-E3: Locating, gathering, and selecting information using graphic organizers, simple outlining, note taking, and summarizing to produce texts and graphics
 - **Technology**
 - J. Use technology resources to assist in problem-solving, self-directed learning, and extended learning activities.
- **Objectives:**
 - TSWBAT track a hurricane aeb tracking charts.
 - TSWBAT list items needed in a disaster supply kit aeb writing.
 - TSWBAT explain the preparation needed for a hurricane aeb writing.
- **Procedures:**
 - **Introduction: (10 minutes)**
 - TSW review the graphic organizer for the unit. TSW discuss what was learned in the previous lesson.
 - TSW complete a KWL chart as a class tell what they already know about preparing for a hurricane and what they would like to know.
 - **Concept Development: (55 minutes)**
 - TTW show the students a hurricane tracking map on the overhead. TTW track Hurricane Katrina as a class based on given coordinates. TTW use a think

aloud to demonstrate how to plot the coordinates. TSW volunteer to plot some of the coordinates.

- TSW get with their groups. Each group will be given an envelope containing directions and a tracking map transparency as well as post-it notes. TSW work as a group to track their hurricane and plot it on the map.
 - As a follow up, students will then write items that they think they will need in a hurricane supply kit on the post-it notes. TSW stick these notes on the board.
 - Once TS have finished, TSW share their coordinates with the class on the overhead. TSW give thumbs up if they agree with the plotting and thumbs down if they do not. TSW work as a class to make any corrections.
 - TSW then present their group lists of hurricane preparedness supplies. TTW record the supplies on a class supply list that will be revisited at the end of the lesson.
 - TSW then explore FEMA's website for kids. On this website, TSW learn more about how to prepare for a hurricane. TSW complete a question guide while viewing the website in order to make sure they are looking at the important facts.
 - After exploring the website, TSW discuss as a class and make revisions to the class supply list.
 - TSW discuss their conclusions as a class. The answers will be revealed and discussed.
- **Closure: (10 minutes)**
- TSW revisit the KWL chart and add what they have learned about hurricane preparedness.
 - TSW write a paragraph in their journals of how they would prepare for a hurricane with their family.

▪ **Materials:**

- unit graphic organizer
- chart paper
- transparencies of tracking maps
- hurricane coordinates (past hurricanes from previous lesson)
- direction sheets
- post-it notes
- computers
- www.fema.gov/kids/hurr.htm (FEMA kids website)
- question guide

▪ **Evaluation:**

- journal entries
- tracking charts
- list of supplies
- discussion
- teacher observation

Lesson Day 4—The Study of Hurricanes

- **Approximate Time Frame:** 1 hour 15 minutes
- **Benchmarks:**
 - **Social Studies**
 - G-1D-E3 describing the locations, causes, and effects of natural disasters on the environment and society
 - C-1A-E4 identifying and describing some of the major responsibilities of local, state, and national governments
 - **Language Arts**
 - ELA-4-E7: Participating in a variety of roles in group discussions (e.g., active listener, contributor, discussion leader)
 - ELA-5-E3: Locating, gathering, and selecting information using graphic organizers, simple outlining, note taking, and summarizing to produce texts and graphics
 - **Technology**
 - J. Use technology resources to assist in problem-solving, self-directed learning, and extended learning activities.
- **Objectives:**
 - TSWBAT identify facts about hurricane hunters and writing.
- **Procedures:**
 - **Introduction: (10 minutes)**
 - TSW review the graphic organizer for the unit. TSW discuss what was learned in the previous lesson.
 - TSW complete the anticipation portion of the anticipation/reaction guide about hurricane hunters.
 - **Concept Development: (55 minutes)**
 - TSW get with a partner to go through the cyber flight simulation of a hurricane hunter on the computer. TSW discuss the simulation as a whole class.
 - TSW formulate questions with a partner that they would like to ask a real hurricane hunter. TSW may write their questions in their journals.
 - A real hurricane hunter will talk to the students. TSW ask him their questions. TSW may write his response in their journals.
 - TSW revisit the anticipation/reaction guides and fill in the reaction column based on what they have learned.
 - TSW discuss their reactions as a class.
 - **Closure: (10 minutes)**
 - TSW write a story from the perspective of hurricane hunter who is about to fly into a hurricane. The story will be written in their journals.
- **Materials:**
 - unit graphic organizer
 - anticipation/reaction guide on hurricane hunters

- computers
- <http://www.hurricanehunters.com/cyberfly.htm>

▪ **Evaluation:**

- journal entries
- discussion
- teacher observation

Lesson Day 5—Summative Assessment

- **Approximate Time Frame:** 1 hour
- **Benchmarks:**
 - **Science**
 - PS-E-B3 describing an object's motion by tracing and measuring its position over time
 - ESS-E-A4 investigating, observing, measuring, and describing changes in daily weather patterns and phenomena
 - **Math**
 - G-6-M demonstrating an understanding of the coordinate system (e.g., locate points, identify coordinates, and graph points in a coordinate plane to represent real-world situations)
 - **Social Studies**
 - G-1D-E3 describing the locations, causes, and effects of natural disasters on the environment and society
 - **Language Arts**
 - ELA-4-E2: Giving and following directions/procedures
 - **Art**
 - VA-CE-E5 Draw on imagination, individual experience, and group activities to generate ideas for visual expression
- **Objectives:**
 - TSWBAT explain the formation of a hurricane, stages of development, categories and effects, and preparation for a hurricane aeb a brochure, poster, or flyer.
 - TSWBAT plot a hurricane's coordinates on a tracking map aeb writing.
- **Procedures:**
 - **Introduction: (10 minutes)**
 - TSW review the graphic organizer for the unit. TSW discuss what was learned in the unit.
 - **Concept Development: (55 minutes)**
 - TTW hand out the performance task sheets along with the rubric that will be used to grade it.
 - TTW read the performance task to the students and answer any questions.
 - TTW also go over the rubric with the students.
 - Any materials the students may need are on the back table. TSW be allowed to go by numbers to get their materials.
 - The performance task is attached.
 - **Closure: (5 minutes)**
 - TTW discuss the unit and the performance task with the students again.
- **Materials:**
 - unit graphic organizer
 - performance task sheet
 - rubric

- poster board
- construction paper
- paint
- markers
- computer paper
- other art supplies

▪ **Evaluation:**

- Performance task (rubric)

Name _____ Date _____

Calling All Hurricane Experts

You have been chosen by WBRZ Channel 2 to aid Pat Shingleton, the local meteorologist, in spreading the word about a hurricane that is headed for Brusly. You must create a brochure, poster, or flyer that explains **how the hurricane formed and the stages that it went through in becoming a hurricane**. You will also want to include **the categories that the hurricane could possibly be and what kind of damage could be expected from each**. Pat Shingleton has given you the coordinates that have been taken of the hurricane over the last four days (at the bottom of your page in the chart). You also need to **include a tracking chart with these plotted points** to show the path of the storm (tracking chart is attached). In the event that the hurricane makes it to your area, WBRZ also wants you to make sure the people of Brusly are prepared for the hurricane. **Make sure you include what items should be included in a supply kit, ways to protect their homes, and other safety and evacuation tips**. The town of Brusly is counting on you for information. Good luck!

**When you have finished your poster, flyer, or brochure, lay it on the teacher's desk carefully with your rubric and paper attached.

| Days | Monday | Tuesday | Wednesday | Thursday |
|-------------|------------|------------|------------|------------|
| Coordinates | 22 N, 75 W | 23 N, 76 W | 24 N, 85 W | 25 N, 90 W |
| Category | 1 | 2 | 3 | 3 |

References

Cole, J. (1995). *The magic school bus: Inside a hurricane*. New York: Scholastic, Inc.

National Geographic. (2006). Costliest hurricanes to hit mainland united states, 1900-2004. In National geographic explorer! (Teacher's guide). Retrieved July 24, 2006 from http://magma.nationalgeographic.com/ngexplorer/0601/ax/teachers_guide_0601.pdf .

See websites listed in materials throughout the unit

Attachments

- 1) Unit Graphic Organizer
- 2) Costliest Hurricanes Worksheet
- 3) Hurricane Tracking Chart
- 4) Performance Task