

## WATCH OUT CARIBBEAN HERE WE COME!: TEACHER GUIDE

**Subject:** Earth Science, Geography

**Grade Level:** Middle School

**Last Updated:** October 24, 2008

### **Case Summary**

Did the 8<sup>th</sup> grade class cruise weather the storm? Tune in to the National Weather channel and track Aquilla. The National Oceanic and Atmospheric Administration (NOAA) will have updates hourly. The captain has asked for help in plotting his new course to avoid Aquilla.

### **Credits**

This case was written by Dericka DeLoney (teacher, Columbia Middle School, Decatur, GA) and Aron Barbey (PhD student, Psychology, Emory University, Atlanta GA) fellows of the Emory University PRISM program (<http://www.prism.emory.edu>).

### **Learning Objectives**

The learner will be able to:

1. Explain how hurricanes are formed.
2. Show where hurricanes are formed, and explain why they are formed in these areas.
3. Name and describe the cloud types associated with hurricanes.
4. Name and describe the instruments used in measuring hurricane data.
5. Identify storms and storm movement using national weather data.
6. Compare hurricane climatology and the intensities of different hurricanes,
7. Read The Saffir-Simpson scale and Beaufort wind scale,
8. Explain how hurricanes are named.
9. Explain how tropical depression and hurricanes are formally classified.
10. Relate global warming to the increasing number of hurricanes in the Atlantic Basin.
11. Explain how air pressure changes during changing weather systems.
12. Define the terms: storm surge, waves, wind shear, solar radiation, spf, hurricane preparedness, water cycle, evaporation & condensation.

### **Georgia Performance Standards**

*SCSh1.* Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science. (NSES Content Standard A)

*S8CS1.* Students will explore the importance of curiosity, honesty, openness, and skepticism in science. (NSES Content Standard A)

*S8CS2.* Students will use standard safety practices for all classroom laboratory and field investigations. (NSES Content Standard F)

*S8CS3.* Students will use computation and estimation skills necessary for analyzing data and following scientific explanations. (NSES Content Standard A)

- S8CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities. (NSES Content Standard A)
- S8CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters. (NSES Content Standards A, F, & G)
- S8CS6. Students will communicate scientific ideas and activities clearly. (NSES Content Standards A & E)
- S8CS9. Students will understand the features of the process of scientific inquiry. (NSES Content Standard A)
- SCS10. Students will enhance reading in all curriculum areas (NSES Content Standards A, D, F, & G):
- a. reading in all curriculum areas (e.g. technical texts in science)
  - c. building vocabulary knowledge
  - d. establishing context
- S6E3. Students will recognize the significant role of water in earth processes. (NSES Content Standard D)
- S6E4. Students will understand how the distribution of land and oceans affects climate and weather. (NSES Content Standard D)

## Assessment

### Individual Assessments:

1. Individual students will track the route of the hurricane on an Atlantic Basin Map using the data given for Hurricane Aquilla.
  - a. Include date, wind speed, longitudinal and latitudinal coordinates. Only record the highest wind speed and coordinates of the day.
2. Benchmark test covering weather.
3. Learning Issue Research Reports with proper citation.
4. Students self and peer evaluation rubric.

### Group Assessments:

1. Completed box chart and learning issues for each scene.
2. Presentation (5 to 10 min) on the hurricane's damage within the last decade in Jamaica and the Grand Cayman Islands. Can be presented as a skit, poster, or PowerPoint presentation, list sources of information and all group members.
  - a. List the year(s), island, and extent of damage.
  - b. Discuss weather conditions such as temperature (air and water), air pressure, precipitation.
3. Select one group members map to plot an alternate route for the cruise captain to avoid the hurricane. Also, include the original route before the storm. Use a different color for each event. Make a key on the bottom right side of the map. Include first and last name of each member and period.
4. Develop a trifold brochure on safety during a hurricane while on a cruise
  - a. On front cover picture of cruise ship and safety symbol

- b. Inside front cover mini discussion of tropical depression to hurricane development in chart format with wind speeds and how you feel
- c. In center: Safety gear, where to go on ship and precautions needed include graphics and clear simple directions.
- d. Inside right: Warm words of encouragement and assurance.
- e. Back Center: Cruise line's name and picture, Ship's name, captain's name
- f. Back Center bottom: Group members name.

### **Implementation Strategy**

This is a Problem-Based Learning (PBL) case, designed for use in standard public school classrooms of about 28 students. Subgroups of about 4-5 students were ideal for small group (team) work, such as reading the scenes, breaking down the data, questions, hypotheses, and learning issues, and assuming research responsibilities. Small groups were facilitated by at least one adult (teacher and PRISM graduate student). Students researched learning issues individually and in pairs and reported findings to the small group. Small groups reconvened with the whole class and their teacher frequently to review separate findings and summarize data and new directions.

### **Implementation Schedule**

Day 1 (Monday) 60 minutes total

- Role play scene 1 (whole group)
- Brainstorm and construct box chart (Facts/Questions/Hypotheses/Learning Issues (FQHL) in small groups
- Review box charts having reporter from each group report two findings from FQHL;
- Recorders from other groups check if have same response
- Divide and assign learning issues (individual and duplicate responsibility)
- HW – Research assigned learning issues; use appropriate citation.

Day 2 (Tues/Wed) 110 minutes total

- Discuss learning issues within small group (5 min)
- Discuss learning issues with whole class (10 min)
- Role play scene 2
- Complete box chart (FQHL) in small groups (15 min)
- Review box charts having reporter from each group report two findings from FQHL
- Recorders from other groups check if have same response
- Divide and assign learning issues (individual and duplicate responsibility)
- HW – Complete presentation blueprint

Day 3 (Thurs/Fri) 110 minutes total

- In small groups prepare 5 – 10 minute presentation (PowerPoint, poster, skit, your choice)
- Present findings to class
- Role play scene 3
- Complete box chart (FQHL) in small groups
- Review box charts having reporter from each group report two findings from FQHL
- Recorders from other groups check if have same response
- Divide and assign learning issues (individual and duplicate responsibility)

Day 4 (Monday) 60 minutes total

- Opening activity – review map skills (longitudinal and latitude)
- Role play scene 4
- Each student will track Hurricane Aquilla on an Atlantic Basin Hurricane tracking map using data from a real hurricane.
- Include the planned route for the cruise to Jamaica and Grand Cayman (different color)
- Include alternate route of cruise to avoid the hurricane (different color pencil)
- Reconvene and discuss findings in groups (20 min.), then as a class
- Homework: Work on individual presentation components
- Work on presentations during class (~60 min.)

Day 5 (Tues/Wed) 120 minutes total

- Case evaluation, wrap-up

## Resources

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