Section A

Weather and Climate
Activity Title: The Water Cycle

Core Subject: Intermediate Grade Science

Integrated Subjects: Science and Art

Time Frame: One class period

Guiding Question/Statement: The amount of water on Earth never changes. It only changes form as it is recycled through the water cycle.

NCSCOS Objective:
Science Goals
4.01

Specific Lessons/Activities:

Introduction: The teacher reviews the fact that the amount of water on the Earth never changes. It only changes form as it is recycled through the water cycle.

Teacher Input: The water cycle is illustrated on the board or on the overhead projector. The concepts of evaporation, condensation, and precipitation are explained fully using the diagram. The concepts of groundwater and runoff may be discussed at this time.

Guided Activity: Students will copy the illustration of the water cycle into their science notebooks. Colored pencils may be used. Teacher will check to see that students are on target with their drawings and labeling.

Homework: Students will write a paragraph describing the cycle of a drop of ocean water as it is completely recycled through the water cycle and then returns to the ocean.

By Lucy Whaley
Arendell Parrott Academy
Activity Title: Analyzing the Water Cycle

Core Subject: Intermediate Grade Science

Integrated Subjects: Science, Technology and Art

Time Frame: One class period

Guiding Question/Statement: What are the four stages of the water cycle?

NCSCOS Objective:
Science Goal
4.01

Specific Lessons/Activities:

Introduction: Today I will demonstrate the four stages of the water cycle and we will explore how water moves on Earth. You will illustrate this process and identify the four stages.

Demonstration:

1. Fill saucepan half-full of water and turn temperature on high. Remind students to stay seated!!!
2. While water is heating discuss:
   a. Precipitation
   b. Evaporation
   c. Condensation
   d. Accumulation (Runoff)

   Students take notes and teacher gives definitions. Have dictionaries handy to discuss word parts.
3. Have one student come to the front to feel the air above the saucepan. Ask, "How do you describe the air?" (warm) Warm air carries water vapor and rises. This is the evaporation stage.
4. Place a plate one foot above the boiling water. Note water droplets gathering on the plate. Explain that the plate represents the atmosphere where cooler air exists. When warm, moist air cools, the air cannot hold as much water. The water vapor becomes liquid. This is the condensation stage.
5. Continue to hold the plate over the water. Note water falling from the plate. The plate now represents a cloud. When a cloud becomes full, it cannot hold the water droplets anymore and they start to fall. This is the precipitation stage.
6. Discuss the four major forms of precipitation.
7. Precipitation falling from clouds pools together with other droplets, runs off
and accumulates in bodies of water or sinks into the ground (called groundwater).
This is the accumulation stage.
8. This pool of water is like the water in the pot. The sun shining on the pool of water heats the water to begin the process all over again.

Guided Activity: Students work cooperatively to identify the four stages on a chart. Small groups visit Internet sites to do further exploration.

Student Activity: Using notes, students will create a self-made illustration of the water cycle.

Student Assessment:
Accuracy of student created water cycle illustrations can be used to assess student learning.

Conclusion: Today you learned about the stages of the Earth's water cycle. (Review the stages orally.) Tomorrow we will take a closer look at clouds.

By Teri VanDyke
South Greenville School
Unit Title: Weather Data

Core Subject: Intermediate Grade Science

Integrated Subjects: Science, Technology, and Mathematics

Time Frame: Six class periods

Guiding Question/Statement: Can students use their collected data to establish climate trends?

NCSCOS Objectives:
Science
4-4
Computer Technology Skills
Grade 5 Goal 3
Objective 1 and 4
Mathematics
4-1
4-2

Specific Lessons/Activities
Activity 1: Preparation
The teacher needs to provide the students with a general knowledge of weather definitions and with a general knowledge of the instruments used to collect weather data. The teacher also needs to provide students with a general knowledge of spreadsheets and the skills necessary to use a spreadsheet as well as to provide access to the Internet.

Activity 2: Keeping Tabs on the Weather
Students will form groups and determine individual responsibilities to check and record the weather twice daily (morning and afternoon). Each student will have a different task. Students will gather necessary materials and go outside to collect temperature, wind speed and direction, dew point, humidity and pressure. Students will record information with pencil and paper. Then students will use the Internet to gather the same information for their location. Students will go to www.weather.com and click on local outlook. They will type in their zip code. Students will record the data from the web site with pencil and paper.

Activity 3: Using Technology
After the data has been collected, the students will record their data on the spreadsheet program. Students will create various graphs to compare the data from their own instruments with the data from the web site.
Activity 4: Independent Study
Students will continue to observe and record the weather as an independent study throughout the year. Students will be able to observe climate trends.

By Lou Crawford
Sam Bundy School
Activity Title: Weather Warnings

Core Subject: Middle Grades Science

Integrated Subjects: Science and Technology

Time Frame: Five class periods

Guiding Question/Statement: Monitoring weather crises provides for safety planning.

NCSOS Objectives:
Science
4.04

Specific Lessons/Activities:

Introduction: We will watch a live weather broadcast daily and discuss the different weather patterns shown. I will ask questions about how they think weather is predicted. We will then discuss how different weather crises, such as hurricanes, have affected our area and how our families have prepared for them.

Teacher Input: Show examples of different weather tools (hygrometer, anemometer, barometer, thermometer, rain gauge, satellites, and radar) and have them define them for vocabulary. Discuss and demonstrate ways to predict weather using the simple tools mentioned above and how to prepare for weather crises, especially hurricanes. Talk about how our weather usually moves from west to east, but our hurricanes come from the east (coast of Africa) because of the trade winds and ocean currents.

Guided Activity: We will use instruments at the same time each day for five days and make a daily weather chart. Also each day we will try to predict where weather patterns will move and check ourselves using the live weather broadcast the following morning.

Student Assessment:
Students can be assessed by the quality of the data in the daily weather charts. Tell students to pretend that they are relaxing at a seaside resort, and they learn of a hurricane watch.
Ask:
1. What does that broadcast tell you? (Possibility of a hurricane within 36 hours and the safety measures to take)
2. What should you do? (Gather supplies, prepare for possible evacuation)

Have each vocabulary word on a piece of card stock and each definition on a piece of card stock. Play the Memory game where all the cards are turned over and mixed up. Children take turns turning two cards over at a time while trying to find the match of the vocabulary word and its definition.

Conclusion: We will review in class the way that they can predict the weather patterns, including hurricanes, and prepare for weather crises. They will then be expected to work with their parents on making an emergency kit. The kit should include batteries, a flashlight, a radio, candles, bottled water, some canned food and a can opener.

By Lucy Whaley
Arendell Parrott Academy
Unit Title: Weather Station

Core Subject: Middle Grades Science

Integrated Subjects: Science, Mathematics and Geography

Time Frame: Nine-week grading period

Guiding Question/Statement: Having students make and use simple weather measuring devices will give relevance to local and global weather systems.

NCSCOS Objectives:
Science
1.03

Specific Lessons/Activities:

Activity 1: Construction
Students will construct and demonstrate the use of weather equipment. Information on building weather instruments may be found in the reference booklet, "Weather Instruments" that accompanies the FAST I program developed by the University of Hawaii.

Activity 2: Data Collection
Students will log data in a weather notebook and on a class chart. They will check their data at the web site <cnn.com/Weather>. After collecting data for two weeks, the students will graph the data.

Activity 3: Extensions
Use weather information to explain the formation of weather phenomenon. Plot hurricanes and tornadoes on a map using longitude and latitude. Organize a field trip to the National Weather Service in Newport, NC. Investigate how to join School Net on Channel 12 QCTI.

By Margaret Brown
Newport Middle School
Activity Title: Weather Map Investigation

Core Subject: Earth Science

Integrated Subjects: Science and Technology

Time Frame: One 90-minute class period

Guiding Question/Statement: A study of the symbols used on a weather map is helpful in understanding the relationships among temperature, pressure, precipitation, and wind.

NCSOS Objectives:
Earth/Environmental Science
Goal 5: 5.03, 5.04, 5.05, 5.06, 5.07

Specific Lessons/Activities:

Teacher Preparation:
Copy the attached worksheets for this activity. Prepare a copy of weather symbols for the students to use as a reference. If you want to use current weather maps for this activity a good Internet site for weather maps with current data suitable for student use is http://vortex.plymouth.edu/dstreme/.

Introduction: To read a weather map, you must be familiar with the meanings of various map symbols. Circles represent observation stations. A line pointing from the station circle indicates wind direction, extending in the direction from which the wind is blowing. A barb is used to indicate wind speed; each barb represents 10 mph or about 11.5 knots. A knot (nautical mile/hour) is a unit of speed used in air and sea navigation. To the left of each station circle is the temperature in degrees Celsius. A line on a map connecting points of the same temperature is called an isotherm. Above each station circle is the atmospheric pressure in millibars. A millibar is a unit of pressure and is about 1 g/cm². A line joining points on a map that have the same pressure is called an isobar. Isobars help identify fronts and give information about present and future wind movement. An H indicates a center of high pressure. An L indicates a center of low pressure. When an isobar crosses a front, the isobar forms a V with the point facing away from the low-pressure region. The V occurs where the isobar crosses a front.
because winds tend to blow along isobars and because there is a definite shift in wind direction from one side of a front to the other.

In this activity, you will study the symbols used on a weather map to gain an understanding of the relationships among temperature, pressure, precipitation, and winds.

Have the following worksheet and needed references ready for the class to use.

By Kathy Stallings
Edwards Junior High School
Student Worksheet

1. Study the attached legend and use it to interpret the weather map.
2. On your copy of the weather map, find a station whose temperature is 10.0°C. Draw a light pencil line through this station and through all other points that are also labeled 10.0°C.
3. If two stations have temperatures of 11.7°C and 9.5°C, there is an estimated point between them that is 10°C. Draw a light pencil line marking these estimated points. Using a red pencil, draw a continuous line connecting all the points of 10°C. The 10°C isotherm is a closed loop. However, some isotherms will be open curves or curved lines.
4. Using the same method as in Step 3, draw isotherms for 12°C, 16°C and 22°C. Label each isotherm with the temperature it represents.
5. Using the same map, find a station with a barometric pressure of 1004 millibars. Draw a light pencil line through this station and through all other points that are also 1004 millibars. Use the same method of estimation that you used in Step 3 to mark other points of 1004 millibars. Connect all the points of 1004 millibars with a blue pencil line.
6. Lightly draw isobars, using the same method as in Step 5, for isobars 992, 996, 1000, 1004, 1008, 1012, 1016, and 1020.
7. Answer these questions when you have completed your map.
   a. What is the lowest temperature for which you have drawn an isotherm? __________
   b. What is the highest temperature for which you have drawn an isotherm? __________
   c. Is either isotherm a closed loop? If so, which one?
   d. Is the air mass identified by the closed isotherms a cold air mass or a warm air mass? __________
   e. Is there a shift in wind direction associated with either front shown on your map? __________
      Describe the shift. ___________________________________________________________________
   f. What is the value of the lowest isobar drawn? __________
      Is the isobar an open curve or a closed loop? __________
   g. What is the value of the highest isobar drawn? __________
      Is the isobar an open curve or a closed loop? __________
   h. Do the winds blow in a general clockwise or counterclockwise direction around a low-pressure region? __________________________________________________________________
   i. Is the general direction of the winds clockwise or counterclockwise around a high-pressure region? __________________________________________________________________
   j. What are some weather conditions associated with fronts?
      ___________________________________________________________________
k. Assume the following things will happen in the 24 hours after the observations were made for your map.
   The cold front, with its weather and low pressure center, moves about 1000 km in a southeasterly direction.
   The warm front and its weather move about 1000 km eastward.
   The high-pressure center and weather move about 800 km southeastward.

Predict the weather conditions at Station A, twenty-four hours after the observations for your map were made. Record your predictions in a table with columns listing pressure, wind direction, wind speed, temperature and sky condition. Make and record predictions for Station B and Station C.
Section B

Hazardous Weather
Activity Title: The Saffir-Simpson Scale

Core Subject: Intermediate Science

Integrated Subjects: Science, Geography, Language Arts, and Technology

Time Frame: Five class periods

Guiding Question/Statement: Students will understand what the Saffir-Simpson Scale is and how it is used to assess the characteristics of hurricanes.

NCSOS Objectives:
Science Goals
4.03 Technology
4.05 Internet Research
Language Arts
Organizing Materials
Making Comparisons

Specific Lessons/Activities:
Introduction: Use overhead that displays the Saffir-Simpson Scale. Discuss the scale and generally relate it to the four hurricanes that have hit Eastern North Carolina in the past five years (Bertha, Fran, Dennis, and Floyd).

Guided Activity: Divide students into four groups. Assign a hurricane to each group. Have students research their hurricane and compile the data needed to fill in the Saffir-Simpson Scale chart. As students present their findings to the class, discuss differences and similarities among the hurricanes. Have students develop a poster that compares data obtained on all four storms and organize this data into a chart that will enable others to easily compare the storms.

Assessment: Have students discuss their charts and explain the information they have. They will answer a short series of questions about the storms that can be answered by using the information from the charts they have made.

By Penny Manning
Arendell Parrott Academy
Unit Title: Hurricane Floyd

Core Subject: Middle Grades Science

Integrated Subjects: Science, Language Arts, and Technology

Time Frame: Five class periods

Guiding Question/Statement: Students will gain an understanding of how hurricanes form and the possible tracks that hurricanes can take.

NCSCOS Objectives:
Science
Goal 5: 5.05

Specific Lessons/Activities:

Activity 1: Hurricanes
The teacher will introduce the students to what hurricanes are by using a video on hurricanes and how hurricanes form by using a PowerPoint presentation illustrating convection currents.

Activity 2: Tracking
The teacher will use overheads to show students how to use a hurricane-tracking chart. Then students will plot the path of Hurricane Floyd through North Carolina. The students will use this skill in plotting other hurricanes.

Activity 3: Understanding
The teacher will assign a one-page paper on how hurricanes form.

By Frances Louis
J. F. Webb High School
Activity Title: Hurricanes-A Study via the Internet

Core Subject: Earth/Environmental Science

Integrated Subjects: Science and Technology

Time Frame: Two 50-minute periods or one 90-minute period

Guiding Question/Statement: Students will learn how a hurricane forms, how hurricanes are classified, the warning system used and important steps to take in preparing for a hurricane.

NCSOS Objectives:
Earth/Environmental Technology
Goal 5: 5.05 and 5.06 Internet Research

Specific Lessons/Activities:
Students will have been introduced to the basic weather concepts of temperature, pressure, water vapor, cloud formation, precipitation, etc. The purpose of this activity is to introduce students to hurricanes as one type of hazardous weather. While the NCSOS does not call for such complete coverage of this topic, students in Eastern North Carolina live in a hurricane-prone area and it is incumbent upon teachers to go beyond the NCSOS and provide students with “lessons for life”.

Students will be introduced to the activity immediately before going to the computer lab facility. Students will be instructed to work individually or in pairs exploring a NASA Hurricane site http://observe.arc.nasa.gov/nasa/earth/hurricane/splash.html and answering the attached set of questions which will be turned in at the end of the activity.

Five to ten minutes before the end of the session and depending on student progress during the activity, the teacher will collect the activity sheets and review the major points of the lesson through class discussion. (What is necessary for a hurricane to form? When is hurricane season in the Eastern U.S.? What is the difference between a hurricane watch and a hurricane warning? How are hurricanes classified?)

Possible Follow-up Activity
“Hurricanes, Wind and Water” – This is another web-based activity which involves interpretation of infrared satellite images of a hurricane to look at the relationship between wind speed, surface characteristics and air temperatures. This activity could easily involve use of Excel or other computer-based spreadsheet application to analyze data.
By Sue Purser
D. H. Conley High School
HURRICANES - A study via the Internet

Go to-  http://observe.arc.nasa.gov/nasa/earth/hurricane/splash.html

Your job is to explore this web site - be sure to explore all the links as shown on the left side of the introductory screen. As you do so, answer each of the questions below.

Hurricane Creation:
1. What are the 4 basic "ingredients" needed for a hurricane to form?

2. Where do hurricanes form? (over what type of surface and in what geographic location?)

Click on the map and see how a hurricane forms!

3. So... a hurricane is really a group of small_____________ circulating around a___________pressure center with wind speeds of_________.

View the cross section of a hurricane

4. What direction do winds circulate?

5. How do rainbands help perpetuate the hurricane?

6. What is the temperature of the air in the eye of the storm and in what direction is it moving?

7. Where are the most turbulent winds of the hurricane found?

8. What is a tropical disturbance?

9. What must happen for a tropical disturbance to become a tropical depression and a tropical storm to form?

Hurricane Seasons and Prone Areas

10. What are the major areas on Earth where hurricanes form?
Use your mouse to learn about the seasons in these areas

11. When is the hurricane season that affects Eastern NC?

12. What are hurricane-like storms called when they occur in the Pacific Ocean?

13. How will El Nino affect the formation of hurricanes on the East Coast of the United States?

14. What category storm was Hurricane Dennis? Hurricane Floyd? 

Hurricanes and Remote Sensing

15. What do scientists use to help them track hurricanes?

16. What information is collected about the storm in this way?

17. Which type of satellite image is most informative? Why?

Classifying Hurricanes

18. What is the name of the scale used to classify hurricanes? What is the category of a storm based on?

19. Click on each category to read about the damage from each.

20. Describe the damage typical from Hurricane Dennis.

21. Describe the damage typical from Hurricane Floyd.

Caught in a Hurricane

22. What is the difference between a hurricane watch and a hurricane warning?

23. Look at the images showing preparations to make if a hurricane warning is issued. If a storm hits, you may be without electricity for several days. List and explain the specific preparations that will make an electrical outage more tolerable.

24. Why should you not leave your shelter as soon as weather seems calm?
Activity Title: Weather Poster Project

Core Subject: Earth/Environmental Science

Integrated Subjects: Science, Mathematics, and Technology

Time Frame: Two 50-minute periods or one 90-minute period

Guiding Question/Statement: Students will research and share information concerning hazardous weather events.

NCSOS Objectives:
Earth/Environmental
Goal 5: 5.05 and 5.06

Specific Lessons/Activities:

Students are to research one of the following topics and prepare a poster to share the important information about that weather-related event

- El Nino
- Global Warming-Greenhouse Effect
- Hurricanes
- Tornadoes

Their poster should include the following types of information:

- Description of the event
- The weather factors which cause this event
- Parts of the world where this event occurs
- The effect this event has on people and property in the affected area
- Other interesting or important information

Rubrics that can be used for assessment are:

- Completeness of information (50 points)
- Inclusion of diagrams or pictures (20 points)
- Neatness and organization (15 points)
- Originality/Creativity (15 points)

By Sue Purser
D. H. Conley High School
Unit Title: Water, Water Everywhere, and Not a Drop to Drink

Core Subject: Earth/Environmental Science

Integrated Subjects: Earth/Environmental Science, Biology and Geography

Time Frame: Four weeks

Guiding Question/Statement: What environmental hazards are involved with flooding?

NCSOS Objectives:
Earth/Environmental Science
Goal 4: 4.03

Specific Lesson/Activity:

Students will complete a four-week research project using technology and various resources at school and in the community to complete the objectives. Students will begin this activity by using the Internet to learn about and analyze the ecological impact of flooding. The emphasis will be on Eastern North Carolina with the main thrust on the Neuse River Basin.

The instructor will prepare a packet of information containing a cut up map of the Neuse River Basin that includes Wayne, Lenoir, and Duplin Counties. The packet will also contain an instruction sheet, a list of Internet sites, and questions. (See the attachment provided at the end of this activity.) After the instructor explains each section of the packet, students will begin the Internet activity in the computer lab.

When students have completed the packet, they will make a presentation to the class.

By Barbara Stroud
Eastern Wayne High School
Neuse River Basin Study

You are about to begin a 4-week study of the river basin that is located in your geographical area. You are going to learn about the environmental hazards involved with flooding, in particular, the flooding that occurred during Hurricane Floyd. There are a number of items listed below that will be completed during this time,

1. Complete a section of a topographic map showing the following:
   a. Your home
   b. Old and new landfills
   c. Farms
   d. Hog parlors/ poultry operations etc.
   c. Cemeteries
   d. Abandoned service stations
   e. Junk yards
   f. Unofficial "landfills"

Create a legend for the items above using the symbols from the topographic map in the classroom.

Answer the following questions:

1. Which river basin do you live in?
2. Where is your house located in relation to the basin?
3. How far is your home from the flood plain?
4. How many homes were in the flood plain before Floyd?
Neuse River Basin Study

You are about to begin a 4-week study of the river basin that is located in your geographical area. You are going to learn about the environmental hazards involved with flooding, in particular, the flooding that occurred during Hurricane Floyd. There are a number of items listed below that will be completed during this time,

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   e. Junk yards
   f. Unofficial "landfills"

Create a legend for the items above using the symbols from the topographic map in the classroom.

Answer the following questions:

1. Which river basin do you live in?
2. Where is your house located in relation to the basin?
3. How far is your home from the flood plain?
4. How many homes were in the flood plain before Floyd?
5. How many families are living in homes in the flood plain after Floyd?

6. Are there any businesses in the flood plain now? List them.

7. List the type of farms and give their location in regards to the flood plain.

8. Use the questions above to aid in formulating questions for your interview.

To be turned in by ____________________.

2. Internet Study.

Use the web sites below to answer the questions that follow.

http://www.dhhs.state.nc.us/pressrel/9-22-99a.htm

http://checc.sph.unc.edu/rooms/meeting_hall/forums/floyd5-30-00.htm

http://wastenot.ehnr.state.nc.us/success.htm

http://pubs.acs.org/subscribe/journals/esthag-a/35/i11/ht

http://www.cnn.com/WEATHER/9909/24/floyd.01/

http://www.earthfiles.com/earth078.htm

http://www.americanascientist.org/articles/00articles/Mallin.html

Answer the following questions:

1. What were the recommendations for the removal and disposal of dead animals?

2. What are the long- and short-term effects according to Rick Dove?

3. What is the purpose of the Neuse River Foundation?

4. What is meant by the USDA's phrase, "snag and drag" program?

5. According to a study conducted by North Carolina State University, what effects has the flood had on water pollution?

6. What caused the nutrient loading?
7. What type of an effect does nutrient loading have on the estuaries?

8. List and describe six public health dangers because of the flooding.

9. What are the dangers associated with junk cars and abandoned gas stations?

10. What types of environmental lessons have been learned from Hurricane Floyd?

11. Use the questions above to help you develop your interview questions?

To be turned in by _________________.

3. Interview an individual from one of the following that involves your section of the map.

   a. County or city government
   b. Local community college
   c. Business
   d. Local university
   e. Health agency
   f. County extension office

Create questions and submit these questions by _________________.

When I have reviewed the questions, I will discuss your questions with you and return them so that you may begin the process of completing the interview.

4. Prepare a ten-minute presentation, sharing with the class what has been gained from your study. Use PowerPoint, posters, videotape, handouts, etc.

To be presented on ____________________
Activity Title: Turbulent Air in North Carolina

Core Subject: Earth/Environmental Science

Integrated Subjects: Science and Technology

Time Frame: One 90-minute period

Guiding Question/Statement: Students will determine the similarities and differences between two pairs of hurricanes.

NCSCOS Objectives:
Earth/Environmental Science
Goal 5: 5.5

Specific Lessons/Activities:

Students will be given a set of study questions which were obtained from the web site www.usatoday.com. They will be told to go to that site and to click on weather on the left column of the screen. Here they will select one of the two years to be studied, either 1996 or 1999 in the Atlantic. On the following screen they may select one of the two hurricanes, either Bertha or Fran, or Dennis or Floyd. It is from these screens on the individual hurricanes that the questions are to be answered. There are at least ten questions to be answered on each of the hurricanes.

The coordinates for all four hurricanes can be found at this location also. Students are to select three sets of longitude and latitude data from each stage (tropical depression, tropical storm, and hurricane) in the life of the hurricane before hitting North Carolina and after hitting North Carolina. Then they will use the data to plot the track of the hurricanes on their tracking maps. The pairs of hurricanes as stated above are to be plotted together. Each pair is to be on a separate chart using different colored pencils for each hurricane. Students may elect to change colors for the different stages in development of the hurricanes but must label the track with the name and date.

Based on these two sets of information and any other sources they may have, the students will make as many comparisons as they possibly can between the two pairs of hurricanes.

By Sue Walmsley
Greene Central High School
STUDY QUESTIONS - Hurricane Comparisons

Dennis
1. Near what holiday did Dennis finally come on shore in North Carolina?
2. What did Dennis register on the Saffir Simpson Scale?
3. Where (what city) in NC did Dennis make landfall?
4. What was the top wind speed of Dennis when it made landfall?
5. Was Dennis a hurricane when it first hit NC?
6. What was the highest wind speed recorded for Dennis?
7. What types of violent weather did Dennis produce after leaving NC and entering Virginia?
8. What areas of NC were flooded most by Dennis?
9. What highway on the Outer Banks had to be rebuilt after its destruction by Dennis?
10. What town in NC had to move its police station due to flooding by Dennis?

Floyd
1. What were the four worst flooded counties in NC during Hurricane Floyd?
2. What major interstate highway was the dividing line between major flooded areas of NC and those with less flooding?
3. At what height did the Tar River crest near Tarboro after Hurricane Floyd?
4. At what height did the Neuse River crest near Goldsboro after Hurricane Floyd?
5. The president declared how many counties in NC disaster areas?
6. In what county did a 2-million gallon hog waste spill occur which spilled into the Northern Cape Fear?
7. How many feet of water covered the town of Princeville?
8. How many inches of rain did Hurricane Floyd drop in Goldsboro?
9. How many deaths were attributed to Hurricane Floyd?
10. What were the highest winds overland during Hurricane Floyd?
11. What were the highest winds recorded by Hurricane Floyd?

Bertha
1. How much rain fell in the Jacksonville-Wilmington area with Hurricane Bertha?
2. Downtown businesses in Swansboro, NC were under how many feet of water?
3. In what three areas did tornadoes touch down in NC during Bertha?
4. How high did the winds get overland during Hurricane Bertha?
5. What was the highest recorded wind speed for Hurricane Bertha?
6. Where did Bertha come on shore in NC?
7. Which two NC beaches were hardest hit by Bertha?
8. How much rainfall was reported with this storm in Clinton, NC?
9. Storm surges of what height occurred in Pender and New Hanover Counties with Bertha?
10. How many feet of land were lost at the inlet near Shell Island in NC? ...at Kure Beach?
11. How many deaths resulted from Bertha?

Fran
1. What was the storm surge height for Hurricane Fran?
2. Where did Hurricane Fran make landfall?
3. What were the wind speeds of Fran upon making landfall?
4. Did Fran produce tornadoes? Where?
5. How many deaths resulted from Fran?
6. How far out did winds extend with Hurricane Fran?
7. On the Saffir-Simpson Scale, where did Fran fall?
8. What were the strongest sustained winds by Fran?
9. How many inches of rain fell in NC from Hurricane Fran?
10. How low did the barometric pressure get in Fran?
11. Where did most flooding occur with Hurricane Fran?

Make as many comparisons as you possibly can between the two pairs of hurricanes. Show how they were similar and how they were different! Write your paragraph below, and remember, you may include things that were not mentioned in the questions.
Section C

Effects of Hurricanes
Unit Title: Princeville’s Legacy: The Aftermath of Hurricane Floyd

Core Subject: Intermediate Grades Social Studies

Integrated Subjects: Science and Social Studies

Time Frame: Two weeks

Guiding Question/Statement: Students will identify how human interaction with the environment influences a community’s cultural legacy and way of living.

NCSOS Objectives:

Social Studies Goals

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<td>Goal 6</td>
<td>Goal 6: 6.3</td>
</tr>
<tr>
<td>Goal 7: 7.1</td>
<td>Goal 11: 11.3</td>
</tr>
<tr>
<td>Goal 12: 12.2</td>
<td>Skills I and II</td>
</tr>
<tr>
<td>Skills I and II</td>
<td></td>
</tr>
<tr>
<td>Science Goals</td>
<td></td>
</tr>
</tbody>
</table>

Specific Lessons/Activities:

Activity 1: Princeville Information
The teacher will introduce the topic by using the information by Ron Mitchelson that is found on the Hurricanes and People CD accompanying this monograph. Appropriate information will be found under file names Princeville.ppt and Princeville2.ppt. The Floyd photos.ppt file also contains pictures suitable for this activity. The students will write reasonable captions for each picture selected by the teacher. After labeling each picture, students will explain why they chose each caption. Students will identify the main theme of the photos and be encouraged to discuss the events portrayed in them and to share the cause of the event.

Students will write two journal entries about their impressions of Hurricane Floyd from September 15 through October of 1999. They may use an interview if they are not able to remember the storm and then write their reaction to the data provided to them. Willing participants may share their entries orally. The entries can be bound into a class book or a personal journal for future expressions.

Activity 2: Princeville’s History
The teacher will share data from the Princeville.ppt file on the CD with the students so that they can read and outline major notes. The notes will be discussed to identify the founder of the community, why it was settled, the historical importance of the community, and patterns presented in the history of
the community related to the physical location of the town. From this discussion
students will create a timeline for the information presented by the whole group
or cooperative groups. The information is checked by using sequence of
events/timelines and by using self-checking Excel worksheets. Students will be
encouraged to check reference material for more information on Princeville using
the library, Internet, or interviews.

Activity 3: Mapping
Students will first practice naming grid points on a map using a worksheet. Then
students will identify the location of Princeville using coordinate points for latitude
and longitude on a grid map. They will label major bodies of water, landforms,
and man-made contributions of the physical environment. Students will predict
the effects of these three components on the way of life of the inhabitants of
Princeville. They will also identify a few reasons why they think the people
returned to the town after flooding.

Activity 4: Water Cycle
The students will identify possible cause of flooding after reviewing the water
cycle. Science experiments using models to demonstrate evaporation and
condensation (use a plastic zip lock bag with ten grams of water in it. Put the
bag near a heat source and watch for tiny drops of water at the top of the bag.)
Precipitation can be demonstrated by using ice in a bag and a blow dryer to
quickly heat the air. It will also show how heated air expands.

Activity 5: Hurricanes and Floods
Using the Internet, students will review skills to develop an understanding of how
hurricanes, tornadoes, and floods occur. Then students will review historical
data on Hurricanes Floyd and Dennis to identify the causes of the “Flood of the
Century”. Fifth graders need to find information about flooding along the
Mississippi River in 1993 that destroyed towns like Quincy, Illinois, and Hannibal,
Missouri to help them identify similarities in the two events. Students also need to
identify human and environmental causes and whether it is wise to build in areas
protected only by levees. They will put their information in a position paper and
share with their classmates. After this sharing session, students will vote about
whether to rebuild or to move to higher ground. The tallies need to be graphed to
help students see the information visually. They can explore using the data in
various ways by using spreadsheet software.

Activity 6: Hurricane Floyd
Viewing and discussing the video “Hurricane Floyd and Flooding” can conclude
this unit.

By Eloise Davis
J. H. Sampson School
Unit Title: Floyd's Domino Effect

Core Subject: Middle Grades Science

Integrated Subjects: Mathematics, Social Studies, and Art

Time Frame: 2 Weeks

Guiding Question/Statement: What are the short and long term effects of Hurricane Floyd on the Coastal Plain’s ecosystems?

NCSCOS Objectives:
Science Goals

Sixth Grade
Goal 1: 1.03
Goal 2: 2.03 and 2.04

Math Goals
Graphing
Ratios
Interpreting Graphs
Calculation
Social Studies themes
Human/Environmental Interaction
Place

Eighth Grade
Goal 1: 1.02
Goal 2: 2.03 and 2.04

Specific Lessons/Activities for Unit:

Activity 1: Fisheries.
After an introductory unit on ecology, students will spend two class periods researching a species of fish found on slide 11 in the PowerPoint presentation on the Hurricanes and People CD. The presentation prepared by Dr. Joseph Luczkovich is under the file name Estuary Water Quality.ppt and is based on his paper, Effect of Hurricane Floyd Flooding on Pamlico River Estuary Water Quality and Fishes. Students will select one of these fish (bream, pumpkinseed, gar, menhaden, bass, spot, perch, catfish, gizzard shad, flounder, and anchovies) and research it using the Internet and other media resources. They must find the following information: Life Cycle; Place in the Food Chain; Habitat Requirements such as salinity, dissolved oxygen, and temperature; and Economic Value to Human Population. Once they have the information, their homework will be to make a poster showing this information in an artistic way. They will have one week to accomplish this.

Activity 2: Rain Down! Lab Activity to Integrate Mathematics with Science Problem question: How does rainfall affect an ecosystem?
Introduction:
This activity will help students understand the tremendous amount of water that can fall on an area. When that area is paved over, that water runs off into the nearest water body at a fast rate. Students will calculate the area of the school parking lot. Using that area, they will calculate the total volume of water that falls when the rainfall is measured at 2 inches. The students will use measurement skills and make the necessary calculations that will require dimensional analysis, which involves ratios. They will discover that a minor rainfall produces an incredible volume of water. Then they will calculate the amount for rainfall amounts of 3, 4, and 5... inches up to the amount from Hurricane Dennis and Hurricane Floyd. They will graph this information to see the relationship between the amount of rainfall and the amount of runoff.

In Part 1 each student will calculate the number of steps per meter. Each group will be given a section of the parking lot to measure. They will measure the length and width of their section by counting their steps; they will convert the number of steps to meters, and then calculate the area of their section.

In Part 2 the students will share their data to find the total area of the parking lot and then calculate the volume of water from a 2-inch rain. They must convert inches to meters in order to do the calculations. Using the handout, Typical Values of the Rational Runoff Coefficient, the students will determine the amount of runoff based on the coefficients.

Once they have the volume, they will calculate how many liters of water that would be. Then they determine how many 2-liter bottles that amount of water would fill. Another calculation that should impress them is to measure the volume of the classroom to see if the amount of water that ran off the parking lot would fit inside. If not, how big a building would you need?

See Student Worksheet (That’s a Lot of Water!) for step by step directions.

Discussion questions that will lead to formulation of a hypothesis:
1. How much rain probably fell on the entire school property?
2. Did all of it run off?
3. Which areas would produce runoff?
4. Which areas would not produce runoff?
5. What is the difference between the areas?
6. What happens to the water that doesn’t runoff?
7. What happens to the water that does runoff?
8. Use your handout and determine the amount of water that would have runoff for other types of surfaces. What type of surface gave the least amount of runoff?
9. What could we do to a parking lot that would improve its ability to allow water to infiltrate rather than run off?
10. When a hurricane like Dennis or Floyd dumps a lot of rain, what is likely to happen?
11. What changes in the environment will this water produce?
12. How will these changes affect your fish from Activity 1?

Activity 3: Information from Graphs
Using Dr. Luczkovich's PowerPoint presentation on the CD, students will interpret the graphs to look for information to support their hypotheses based on their answers to questions 8 through 10 in the previous activity. Worksheet questions for analysis of PowerPoint data.

Figure 2 (Slide 3):
1. What was the height of the Tar River on September 1?
2. What was the height of the Tar on September 5, the second day of Hurricane Dennis?
3. On what date did the river reach its highest level from Dennis?
4. How many days passed between the rainfall and the highest river level?
5. What could account for this difference?
6. What was the height of the Tar River on September 16, the last day for Hurricane Floyd's passage?
7. On what date did the river reach its highest level from Floyd?
8. How many days passed between the rainfall from Floyd and the highest river level?
9. What could account for this?

Figure 4 (Slide 4):
1. Which of the three graphs in figure 4 show the salinity in the Pamlico River before Floyd came through our region?
2. Why is it important to see what the salinity was in the river before Floyd?
3. In this graph, what is the salinity of the water near the Hwy. 17 Bridge?
4. What happened to the salinity at this site shortly after Floyd? What could account for this change in salinity?
5. In the final graph in Figure 4, where is the saltiest water located? Near the surface or near the bottom? What could account for this?
6. The August graph and the February graph show very different salinity patterns. What could account for these differences?
7. What were the salinity limits for your fish?
8. Would your fish be affected by the change produced by Floyd? If so, how?

Figure 5 (Slide 5):
1. Which of the three graphs shows the lowest dissolved oxygen levels?
2. Which of the three graphs shows the highest dissolved oxygen levels?
3. Based on the data from the first and third graphs in Figure 5, what happens to the amount of oxygen that can be dissolved in water as the temperature increases?
4. Based on the data from the three graphs in Figure 5, what other factors can affect a change in the amount of dissolved oxygen in water?
5. Based on our ecology unit, what other factors can affect a change in the amount of dissolved oxygen in water?
6. What were the dissolved oxygen levels preferred by your fish?
7. Would your fish be affected by the change produced by Floyd and Dennis? If so, how?

Activity 4: Diagramming the Loss of a Fishery to the Food Web
On a large sheet of poster board or newsprint, each group diagrams their fish’s Food Web. All groups tape their webs to the board or wall in the classroom. Using yarn, students connect their individual webs into a single “river web.” Based on the data on the Luczkovich presentation, menhaden were most affected immediately. Students draw a big X through any organism connected by yarn to the menhaden either directly or indirectly. When all connections are eliminated, students can look at the “big picture” representation on the board showing the massive effect on an ecosystem from a short-lived catastrophic event.

Activity 5: Putting It All Together
To review the material presented in this unit and to connect the concepts to their weather and ecology units, create a concept map with the class. Use these items as a start. Discuss causes for hurricanes, causes for rainfall, causes for runoff, and then list the sequence of effects.

FLOYD and DENNIS

Rainfall
Runoff
Effects
Salinity    Dissolved Oxygen

By Nancy Bray
The Oakwood School
That's a Lot of Water!!!!

Procedure:
A. Calculate your meters per step.
   Example: If you need to take twenty steps to walk 10 meters, your meters per step would be 10/20 or 0.5 meters per step.
   1. How many steps did you take to walk ten meters? ______________________
   2. Divide ten meters by your number of steps to calculate your meters per step. ______________________

B. Draw the basic shape of your section of the parking lot. If your section of the parking lot is not a rectangle, divide it up so that it is a series of rectangles.

C. Walk the dimensions of your section of the parking lot. Record your steps per meter on your drawing above.

D. Calculate the length and width of your section of the parking lot by multiplying the number of steps you took by the meters per step you calculate above.
   Example: If you walked 30 steps, you would multiply 30 times the 0.5 meters per step, your distance walked would be 15 meters.

E. Calculate the area of your section.
   \[ \text{Area} = \text{length} \times \text{width} \]

F. To find the volume of rain that fell on the parking lot in the last storm (2 inches is approximately = to 0.05 meters) do the following:
   \[ \text{Volume} = \text{length} \times \text{width} \times \text{height} \]

G. One liter of water is equal to 1000 cubic centimeters. One cubic meter is equal to one million cubic centimeters. Use these facts to calculate how many liters of water fell on our parking lot. How many 2-liter bottles would that amount of water fill?
## Typical Values of the Rational Runoff Coefficient

<table>
<thead>
<tr>
<th>Areas</th>
<th>$C$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed Areas</td>
<td></td>
</tr>
<tr>
<td>Paved (brick, asphalt, concrete)</td>
<td>.70–.95</td>
</tr>
<tr>
<td>Rooftops</td>
<td>.75–.95</td>
</tr>
<tr>
<td>Lawns &lt;2% slope</td>
<td>.05–.17</td>
</tr>
<tr>
<td>Lawns &gt;2% slope</td>
<td>.15–.35</td>
</tr>
<tr>
<td>Undeveloped Areas</td>
<td></td>
</tr>
<tr>
<td>Sandy soil</td>
<td>.10–.20</td>
</tr>
<tr>
<td>Loam</td>
<td>.30–.40</td>
</tr>
<tr>
<td>Clay</td>
<td>.40–.50</td>
</tr>
<tr>
<td>Land Use Type</td>
<td></td>
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<tr>
<td>Commercial</td>
<td>.50–.95</td>
</tr>
<tr>
<td>Residential: single family</td>
<td>.25–.50</td>
</tr>
<tr>
<td>Residential: multi-family</td>
<td>.40–.75</td>
</tr>
<tr>
<td>Industrial</td>
<td>.50–.90</td>
</tr>
<tr>
<td>Parks, cemeteries</td>
<td>.10–.25</td>
</tr>
<tr>
<td>Playgrounds</td>
<td>.20–.35</td>
</tr>
</tbody>
</table>
Unit Title: The Aftermath of Hurricane Floyd: The Human Toll

Core Subject: Middle Grades Social Studies

Integrated Subjects: Social Studies, Science and Language Arts

Time Frame: Four class periods

Guiding Question/Statement: Students will explore, identify, and comprehend the devastating impact of the flooding that resulted from Hurricane Floyd on the people and community of Eastern North Carolina.

NCSOS Objectives:
Social Studies
Goal 3: 3.2
Goal 11
Skills I
Skills III

Science
Goal 1: 1.03 and 1.04

Specific Lessons/Activities:
In a matter of a few days' time two hurricanes hit Eastern North Carolina in rapid succession. The first brought torrential rains that saturated the land and the second caused the waterways along the Tar, Pamlico, and Neuse Rivers to flood. Almost overnight lives were drastically changed. Homes, possessions, food, clothes, pets, and vehicles were soaked, damaged, and too often swept away in disease-laden floodwaters. Many persons were left with little more than the clothes on their backs.

After a major disruption in a family's way of life, the stress levels in the family's dynamic rise tremendously. When there is a flood, the most fundamental needs of a family require enormous amounts of physical, emotional, and spiritual energy. Emotional stresses take a back seat to food, clothing, and shelter. A unit such as this gives students a chance to understand how a hurricane is scientifically classified but it also segues into the emotional cost of the flood. Given the chance to talk with older people and hear what they have to say; given the chance to discuss how willing people are to come from great distances to help; and being able to compare the observations of others with their own may help students cope with and get beyond the overwhelming feelings that accompany a natural disaster.

Activity 1: Saffir-Simpson Scale
Students will learn the Saffir-Simpson Danger-Potential Scale. They will rate Hurricane Floyd and write a three-paragraph (introduction, content body, and conclusion) essay explaining why they chose that rating. Some Internet support sites are:
www.observe.arc.nasa.gov/nasa/earth/hurricane/creation.html
www.observe.arc.nasa.gov/nasa/earth/hurricane/form.html
Activity 2: Literature
Students will read excerpts from *The Diary of Anne Frank* to generate discussion about the stresses that come from having lost your home and having to move in with extended family or complete strangers (shelters). They will read excerpts from *Their Eyes Were Watching God* by Zora Neale Hurston to illustrate the confusion, devastation, and chaos created by a flood and the power of the human spirit to pick up and start again. Other suggested sources for excerpts are: *Dog Heaven* by Cynthia Rylant, *Isaac’s Storm* by Erik Larson, *The Day it Rained Forever* by Virginia T. Gross, and *River Friendly, River Wild* by Jane Kurtz.

Activity 3: Interviews
Students will interview the oldest member of their family or community about how the recent flood has changed their lives and about their memories of storms in the past. Students will share these stories in class discussions. Then the students will compare and contrast their own reactions to the flood to those of the stories they have heard from older members of the communities. A suggested Internet support site is: www.disasterrelief.org/PressRoom/991-12.txt.html

Activity 4: Mapping
Students will research and make a list of the agencies and groups that came to help their families and community/communities. They will locate the place of origin for these agencies and groups and calculate the distances they came to assist us.

Activity 5: Reflection
Based on the previous activities, students will list at least two observations that have made such an impact that their personal outlook on life has changed.

By M. Gwendolyn Lee-Tyson
Aurora Middle School
Unit Title: Hurricane Floyd's Economic Impact

Core Subject: Economics, Legal and Political Systems (ELP)

Integrated Subjects: Social Studies, Geography, and ELP

Time Frame: Three 90-minute periods

Guiding Question/Statement: What are the direct and indirect impacts of Hurricane Floyd?

NCSCOS Objectives:
ELP
Goal 1: 1.3
Goal 3: 3.1
Goal 4: 4.2

Specific Lessons/Activities:
This lesson plan will enable students to apply their knowledge of basic economic concepts and systems in the context of Hurricane Floyd. They will examine how the scarcity imposed by the hurricane affected economic decisions and the use of limited resources. Students will also evaluate how the economic effects of a natural disaster are felt beyond the local economy at the state and national level.

Students should realize the impact a disaster has not only on the citizens directly affected, but on the general population as well. While those directly affected through lost jobs, damaged/lost possessions, etc. feel the worst effects, such things as increased taxes, increased prices for goods, etc. affect us all.

Activity 1: Review
The teacher will review relevant economic concepts and systems and encourage discussion on increased government intervention and regulation as a result of the hurricane. In the discussion, students will review the indirect economic effects of Hurricane Floyd on students and their families.

Activity 2: Flood of the Century
The teacher will show the Eyewitness News 9 video, Flood of the Century, and ask students to consider the immediate economic impact to citizens in the flooded areas.

Activity 3: Guest Speakers
The teacher will invite three speakers (a homeowner, a businessperson, and a state legislator) to address the economic impact of the flood from their perspective.
Activity 4: Brainstorm
The students will brainstorm specific aspects of the flood such as agricultural losses, unemployment, lost revenue, short- and long-term government spending, etc. Students will form cooperative groups to research one of the topics and present visually to the rest of the class. Part of each presentation should address specifically the indirect effect Floyd had on non-flooded North Carolinians and other Americans. A suggested web site for the research would be http://personal.ecu.edu/whitehead/hurricane/

By Jane Pridgen
Creswell High School
Activity Title: River Flooding

Core Subject: Social Studies

Integrated Subjects: Social Studies and Communications Skills

Time Frame: Three 50-minute class periods

Guiding Question/Statement: How does significant river flooding affect people in two regions of the world?

NCSCOS Objectives:
Social Studies  Communications Skills
Goal 3: 3.2  Goal 2: 2.01 and 2.02

Specific Lessons/Activities:

Activity 1: Visual Display
Students will gather flood photos and news stories from the Internet. Each student will prepare a display of their findings complete with retrieved photos and news clips. The visual display will be available for the use of the entire class in preparation for Activity 2.

Activity 2: Essay
The teacher will lead a discussion of the similarities and differences of two regions of the world and the subsequent flooding of each region. The students will then put their observations into essay form by writing about the similarities and differences. One of the regions to be used must be Eastern North Carolina during and after Hurricane Floyd. Prior to undertaking this writing assignment, each student will be given the rubric prepared by the teacher. The student will attach this rubric to the assignment when the written work is submitted for grading. It will be returned to the student upon final grading and after review by the student will be placed in the student's writing portfolio.

By Kimberly Whitley
Arendell Parrott Academy
Activity Title: Hurricanes Dennis and Floyd

Core Subject: Geography

Integrated Subjects: Science, Geography, and Technology

Time Frame: Two 90-minute periods

Guiding Question/Statement: Students will understand the physical, economic, and geographical effects of Hurricane Floyd on Eastern North Carolina.

NCSOS Objectives:
World Geography
Goal 1: 1.1 and 1.3
Goal 2: 2.1 and 2.2
Goal 4: 4.4
Skills I and II

Specific Lessons/Activities:

Activity 1: Hurricane Damage
After learning the climatic and geographical causes of the flooding associated with Hurricane Floyd, students will learn the extent of the physical damage in Eastern North Carolina. Students will use ArcView software to show the extent of flooding at various stages of water level. They will project even higher flood levels to determine possible damage.

Activity 2: Rainfall Statistics
Students will research on the Internet the difference between the average rainfall in Eastern North Carolina in September for at least 25 years and compare these data to the rainfall of September of 1999. They will also research statistical information about farmland flooding, areas of cities flooded, number of lost/condemned homes, etc. Students will add their rainfall and land destruction data to a teacher-created chart. Students will complete an Excel spreadsheet and graph the data. Then they will write an analysis of that data and discuss how it would affect the lives of the population of Eastern North Carolina. Later they will do comparisons with flooding from other parts of the world.

Activity 3: Discussion
Students will discuss the human and economic impact of the flooding before wrapping up with a comprehensive overview of the causes and effects from the flooding associated with Hurricanes Dennis and Floyd.

By Steven Moats
Kinston High School
Title: Hurricane Floyd and Its Impact on North Carolina

Core Subject: Social Studies

Integrated Subjects: Social Studies and Language Arts

Time Frame: Five class periods

Guiding Question/Statement: What was the social impact of Hurricane Floyd on Eastern North Carolina?

NCSCOS Objectives:
Social Studies
Goal 3: 3.1 and 3.2
Goal 4: 4.4
Goal 5: 5.2 and 5.3

Specific Lessons/Activities:

Activity 1: Introduction
The students will view the Eyewitness News 9 video, Flood of the Century. They will use photographs, maps, charts, etc. of impacted areas affected by the storm and flood to discuss the guiding question.

Activity 2: Field Trip
Students will take a field trip to Princeville, Tarboro, and Rocky Mount to see the damage, recovery and aftermath from the flood.

Activity 3: Student Product
The students will make a scrapbook and posters of a particular area of interest they have concerning Hurricane Floyd. They will finish with a short essay, “What should be done now to help with future hurricanes and storms?”

By Ronald Nittoli
Northside High School
Unit Title: Hurricane! Flood! Princeville!

Core Subject: World Geography

Integrated Subjects: English, Mathematics, Science, Geography and History

Time Frame: Three 90-minute periods

Guiding Question/Statement: What are hurricanes and what were the effects of Hurricane Floyd on the people of Princeville and others in Eastern North Carolina?

NCSCOS Objectives:
World Geography
Goal 1
Goal 2
Goal 4
Goal 5
Goal 6
Goal 7

Specific Lessons/Activities:

Activity 1: Personal Memories
The teacher will use photographs found in the Hurricanes and People CD, file Princeville.ppt, to generate discussion. Students will be asked to make captions for the photographs. Students who were flooded during Floyd will be interviewed and students will make journal entries on personal memories.

Activity 2: Group Work
The teacher will divide the class into small groups that will research and report on the following:
   a. Background information on Hurricane Floyd
   b. Background information on Princeville and map work using maps, overhead transparencies and computer displays
   c. Math and sequencing activities that would include a time line of events, the path of Floyd, and water levels
   d. Background information on climate type and characteristics

Other student input may be used with teacher approval.

Activity 3: Presentation
Each group will present information to the whole class. This will be followed by whole class discussion.
Activity 4: Wrap-up
The teacher will show tapes on the flood and Princeville. The students will review material with a teacher-/student-made study guide.

By Lula R. Tucker
North Lenoir High School
Working Web Sites as of 8/6/02

General Weather

http://fumahai_soest.hawaii.edu/cgi-bin/uhomeintro.cgi
http://www.ucar.edu/ucar/
http://www.ssec.wisc.edu/data/index.html
http://www.wral.com/weather/
http://www.weatherwise.org/
http://www.ametsoc.org/dstreme/index.html
http://www.nodc.noaa.gov/dsd/Atog12.html
http://www.cgd.ucar.edu/ccr/index.html

Hazardous Weather

http://www.tornadoquest.com/
http://www.chron.com/content/chronicle/hurricane/
http://observe.arc.nasa.gov/nasa/earth/hurricane/splash.html
http://www.nhc.noaa.gov/AT_Track_chart.pdf
http://www.usatoday.com/weather/hurricane/whur0.htm
http://weather.unisys.com/hurricane/index.html
http://weather.terrapin.com/PastStorms.html
http://observe.arc.nasa.gov/nasa/earth/hurricane/form.html

Effects of Floyd

http://www.dhhs.state.nc.us/pressrel/9-22-99a.htm
http://checc.sph.unc.edu/rooms/meeting_hall/forums/floyd5-30-00.htm
http://waestaehr.state.nc.us/success.htm
http://www.cnn.com/WEATHER/9909/24/floyd_01/
http://www.americanscientist.org/articles/00articles/Mallin.html
http://weather.terrapin.com/DisplayStorm.jsp?STORM=981&dtype=JAVA
http://www.disasterrelief.org/Disasters/990929Floyd14/
http://www.disasterrelief.org/Disasters/990928Tarboro/
http://www.disasterrelief.org/Disasters/990930Floyd15/
http://www.nws.noaa.gov/oh/hurricane/inland_flooding.html
http://www.findarticles.com/m1264/5_31/65278153/p1/article.jhtml
http://personal.ecu.edu/whitehead/hurricane/