

**11. LAKE PONTCHARTRAIN BASIN FOUNDATION:
Field Trips and Investigations**



Essential Questions:

DID OUR FIELD TRIP MEASURE UP TO MY EXPECTATIONS?

HOW CAN I USE THE KNOWLEDGE GAINED FROM OUR FIELD TRIP?

HOW WILL I PRESENT MY FINDINGS FROM WATER WATCH?

HOW WILL MY INVESTIGATIONS HELP SOLVE WATER POLLUTION PROBLEMS?

LAKE PONTCHARTRAIN BASIN FOUNDATION
Field Trips and Investigations

OVERVIEW:

The Lake Pontchartrain Basin Foundation offers a series of educational programs, including field trips that take students to sites around the Lake Pontchartrain Basin to learn first hand about environmental issues affecting the Lake. The educational activities give students opportunities to contribute to the restoration efforts in the Basin through service projects and data collection.

Two major programs offered are:

WETLAND FIELD TRIPS

To schedule a wetland field trip, call the Coastal Research Laboratory at the University of New Orleans: **(504) 280-6718**.

WATER WATCH






To participate in Water Watch, call the Lake Pontchartrain Basin Foundation's Education Program: **(504) 836-2238**.

To participate in both of these programs, call early in the school year.

OBJECTIVES OF THE EDUCATIONAL PROGRAMS





Wetland Field Trips

The Wetland Field Trip Program focuses on the values of the wetlands of the Lake Pontchartrain Basin. Teachers choose either a land-based or a canoe trip to a wetland area close to their school. The trips enable the students to:

-  place the wetland area they visited in a larger context in relation to their own community and the Lake Pontchartrain Basin as a whole;
-  understand the functions and values of the wetlands of the Lake Pontchartrain Basin;
-  recognize the characteristics of the main wetland habitat types and common plants and animals of the local wetlands;
-  understand the effects on the wetlands of various human activities, including saltwater intrusion, erosion, and pollution, and
-  learn about and possibly participate in projects designed to restore damaged wetlands.

Water Watch

Water Watch guides students through a year-long study of water quality in the drainage canals of the New Orleans metropolitan area and the streams and rivers of the north shore of Lake Pontchartrain. Water Watch enables student participants to:

-  learn a number of methods to assess water quality. They will measure parameters such as fecal coliform bacteria, pH, nitrates, phosphates, and dissolved oxygen;
-  gain an understanding of the condition of the waterways in their community;
-  use their knowledge to inform their peers and the general public of the water quality issues affecting their lives, and
-  be personally involved in the Lake Pontchartrain Basin Foundation's campaign to "Save Our Lake."

MULTIPLE INTELLIGENCES LEARNING ACTIVITIES :

Verbal/ Linguistic: Write a reflective journal of your field trip experiences.

Write poetry describing the macro-invertebrate organisms you find on a field trip.

Write rainstorm poetry.

Logical/ Mathematical: Create a concept map of the blue crab industry.

Study maps of the Lake Pontchartrain Basin and your field trip locations.

Calculate the volume of storm water runoff produced on your school grounds during a heavy rainfall.

Study the effects of nutrients in a classroom experiment.

Conduct macro-invertebrate studies to assess the health of a water body. (See Save Our Streams' web site: www.iwla.org/sos/index.html).

Visual/ Spatial: Visualize a cypress logging operation through guided imagery.

Document your field trip with photography.

Draw scientific and cartoon illustrations of the macro-invertebrate organisms you collect.

Illustrate the journey of a drop of motor oil dumped in the storm drain.

Bodily/ Kinesthetic: Become an organism in the food web in a wetland food web game.

Perform a play about urban runoff.

Make up critter dances after observing the macro-invertebrate organisms you collect.

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Musical: Create wetland food web songs.

Set your rainstorm poems to music using percussion instruments.

Make up critter songs to describe the macro-invertebrate organisms you collect.

Interpersonal: Interview a member of the community about wetlands and water quality issues.

In cooperative groups, create a public education flyer about urban runoff. Use the flyer to educate people in your school neighborhood.

Play the role of a community member in a debate about a land use issue.

Intrapersonal: Write a reflection about your role in cleaning up Lake Pontchartrain and your vision for the Lake's future.

Write a reflection of your field trip experiences.

Naturalist: Keep a journal in words and pictures of observations about how wetland species are adapted to their specialized habitat.

Sharpen your observation skills by playing bingo games. You can play bird, tree, or even aquatic critter bingo!

WETLAND FIELD TRIPS

WHERE :

You can choose from the following wetland trips:

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LaBranche Wetlands in St. Charles Parish

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Wetlands of St. Bernard and Plaquemines Parishes

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Cane Bayou, near Mandeville in St. Tammany Parish

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Bedico Creek, near Madisonville in Tangipahoa Parish

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WHAT :

You can choose a canoe trip or a land-based trip. On the canoe trips, the students learn simple canoe skills as they venture about one mile into the wetlands where they see and hear things they would not encounter on dry land. They sharpen their observation skills and learn about the issues affecting the wetland area. The students also collect and analyze water quality and biological samples. On the land-based trips there is more structured learning time. The focus is on guiding the students in collecting and analyzing meaningful science information, including water quality data and aquatic organisms. The students interpret what they find in the context of the wetland environment they visit. Field trip leaders also help the students see how they might participate in solving the problems faced by wetlands today.

WHY :

The protection of our wetland resources depends on the conscious effort of forward-thinking leaders. The leaders and informed public of tomorrow are among the students of today. Few city dwellers have opportunities to explore the wetlands near their homes, and these trips provide that valuable experience. We want the students to understand the values of our wetland resources in the Basin so they will protect them now and in the future.

WATER WATCH

WHERE :

With help and guidance from Lake Pontchartrain Basin Foundation staff, you and your students choose a water body near your school that you monitor for a whole school year. The water can be a drainage canal, bayou, or river.

WHAT :

What better way to incorporate interdisciplinary, relevant, real-world, hands-on science teaching methods into your curriculum than through investigation of the water quality of water bodies in your community? By participating in Water Watch your students learn valuable science skills, and the data they collect becomes part of a body of scientific knowledge vital to the solution of water pollution problems. You measure a range of parameters on a bi-weekly basis. The parameters include: fecal and total coliform bacteria, dissolved oxygen, nitrates and phosphates, pH, water and air temperature, and general environmental observations. Students analyze the collected data and report the final results to the Lake Pontchartrain Basin Foundation. In the spring the students present their findings at a public symposium for all participants.

WHY :

The students of today are tomorrow's leaders and problem solvers. As educators we have the responsibility of helping students gain the necessary investigative and problem-solving skills in order to be effective stewards of our precious natural resources in the years to come. Water Watch helps build these vital skills at the same time as collecting specific data on the water quality in the Lake Pontchartrain Basin.

WETLAND FIELD TRIP SITES

LABRANCHE WETLANDS - ST. CHARLES PARISH

In the LaBranche Wetlands a canoe trip takes the students along Bayou LaBranche where they learn about the natural wetland habitats and the impact of human activities on the wetlands. The students make observations at several stops along the bayou, and eat lunch deep in the wetlands. Samples of wetland aquatic organisms are collected in dip nets, and water quality parameters such as salinity and dissolved oxygen are measured and put into the context of the whole wetlands system.

Alternatively, you may choose a land-based trip during which the students explore sites in the Bonnet Carré Spillway, learning about the role played by the Mississippi River and its relationship to the wetlands and Lake Pontchartrain.

WETLANDS OF ST. BERNARD AND PLAQUEMINES PARISHES

The theme of this field trip is how saltwater intrusion has altered the landscape and the methods used to push the salt water back in order to restore the wetlands. These field trips are usually land-based, but we also take canoe trips. The land-based trips begin at Shell Beach on the banks of the Mississippi River Gulf Outlet (MRGO). Here we make observations, study maps and aerial photographs of the area, measure the salinity of the water, and collect and study aquatic organisms. This portion illustrates some of the impacts on the landscape created by MRGO, which was constructed to provide a short cut for ships entering the port of New Orleans. Leaving Shell Beach, we travel to St. Bernard State Park where we eat lunch and then begin afternoon activities. We make comparisons between the water samples taken at Shell Beach with samples taken from the Caernarvon Canal, near the Caernarvon Freshwater Diversion Structure. The contrast between the two sites clearly illustrates the influence of salt water intruding from the Gulf of Mexico and fresh water from the Mississippi River. The students should take with them the idea that, despite the damage to the marshes of St. Bernard and Plaquemines Parishes during the 20th Century, it is possible to restore these valuable wetlands with correct management.

Beginning at the natural levee of the Mississippi River, our canoe trip takes the students into the fascinating and beautiful wetlands of Plaquemines Parish. During the trip the students observe natural ridges created by distributary channels of the Mississippi River where lush stands of live oaks and palmettos grow in contrast to the wide open marshes between the ridges. History is all around in the form of structures dating back to French Colonial agricultural practices as well as the Forty Arpent Canal.

CANE BAYOU - ST. TAMMANY PARISH

Cane Bayou is an ideal canoeing field trip site because it offers a rich variety of wetland habitats in a place convenient to most north shore schools. We launch at Highway 190 just outside Mandeville and travel down the bayou, stopping to observe the changes in habitat. The boat launch is in upland forest, but soon we reach an area of swamp at the position of the ancient shoreline. Here is a change in geology from the Pleistocene age to the very recent Holocene age sediments of the marsh. We can detour and meander through intermediate marshes if the water is high enough, observing osprey nests and many species of wildlife. Later we rejoin the main bayou, rounding a bend to see Lake Pontchartrain stretching before us. At the mouth of the bayou we can explore the beds of submersed aquatic vegetation (SAV), a rare but vital habitat that thrives on this section of the north shore.

BEDICO CREEK - TANGIPAHOA PARISH

Bedico Creek, a tributary of the lower Tangipahoa River, gives us access to beautiful cypress-tupelo swamp with an interesting history. The creek is much quieter than the nearby Tangipahoa River, making it a safer canoeing location. As we paddle Bedico Creek, we see giant old-growth cypress trees that survived the logging era of the early 20th Century. The scars left by the logging industry are seen throughout these wetlands, providing an interesting local history lesson. Using aerial photography, we point out that flooded fields are now open ponds lying between Bedico Creek and Madisonville. We also stop to collect samples of organisms and conduct water quality tests. This wild area teems with wildlife to be enjoyed by the observant paddler.

GOING IT ALONE

YOUR OWN WATER QUALITY MONITORING PROGRAM

Although the Lake Pontchartrain Basin Foundation offers high quality field-based experiences such as Water Watch and the Wetland Field Trip Program, you may decide you want to begin your own independent field investigation program.

If, after your experiences with Water Watch, you would like to begin a monitoring program of your own, there are many resources to tap. For example, the Izaak Walton League of America's Save Our Streams Program <http://www.iwla.org/sos/index.html> provides all you will need to begin a biological monitoring program. These monitoring methods using macroinvertebrate sampling techniques, are particularly applicable to the north shore rivers.

If you would like to develop your own monitoring program to measure chemical parameters of a water body in the Basin, the Earthforce website (<http://www.earthforce.org>) contains a section devoted to the Global Rivers Environmental Education Network (GREEN) program. There you will find a wealth of information and resources to help you get started.

Other resources may be found in Appendix D.

YOUR OWN FIELD TRIP PROGRAM

If you would like to try your own field trip to a site in the Lake Pontchartrain Basin, planning is the key. Begin by learning more about the field trip opportunities in the area. The best resource is the *A Guide to the Wetlands of the Lake Pontchartrain Basin*, available from the Lake Pontchartrain Basin Foundation.


Consider these field trip planning guidelines:

1. Before the Trip:




First decide your goals for the trip. Is the purpose of the trip to illustrate concepts learned in the classroom, or is it the beginning of an in-depth investigation of some aspect of the Lake Pontchartrain Basin? Are you studying the Lake itself, a bayou or


river that drains to the Lake, or a wetland area adjacent to the Lake? Do you want to collect meaningful science data, or provide your students with a more “affective” experience? You will need to decide if you want the students to go canoeing or stay on dry land. There are many options, and it is worth spending time doing research.

 Scout the area ahead of time. Set aside several hours to really get to know the place. Take notes about the plants and animals you observe and places suitable for doing activities such as quiet observation, investigations, eating lunch, etc. Visit your place before the trip more than once, if time allows.


 Take care of all logistical details:


- ★ Arrange for transportation well before the trip.
- ★ Line up willing chaperones.
- ★ Obtain permission slips and medical release forms, as required by your school.
- ★ Gather survival supplies such as first aid kit, insect repellent, sunscreen, water and snacks.
- ★ Obtain learning materials such as field sampling and measuring equipment, maps, field guides, and dichotomous keys of local organisms.


 Research the field trip site. With your students, learn about the history and geography of the site. Obtain topographical maps for the area, as well as aerial photography if possible. Conduct library research to discover historical information about the area.

 Use pre-trip activities from this chapter and from other curriculum guides to prepare your students. Practice observation skills and stress that they are essential in the field. Review reflective activities.

2. During the Trip:

 Allow time for quiet, individual observation and reflection, group investigation, and “teachable moments.” Be flexible; there are bound to be interruptions to the plan. They may be wonderful, like a flock of ibises or a bald eagle flying by, or less wonderful, like a student falling in the mud. Both kinds of interruption are memorable and become part of the experience. Don’t allow a minor mishap to spoil the trip.


 Document the trip! If possible, furnish the students with cameras: one per group of four is plenty. Have them keep a record of the shots they take, and why they take them. Discourage photos of only each other; focus attention on the surroundings.


 Keep a notebook of observations that can be organized into a journal after the trip. The notes should include written observations, sketches, and measurements made during investigations.


 Follow safety rules. Stay together as a group. Be patient, silent and alert. Stay on the trail and walk slowly. Avoid sudden movements. Stop when you see something worthwhile. No one goes in the water.

 Be good stewards. Take only pictures; leave only footprints. Leave the area cleaner than you found it.

3. After the Trip:

 If possible, allow time for reflection at the end of the trip in order to allow the students to process and internalize the information and experiences. If there is no time on site, arrange reflection and journal-writing time very soon after the trip. Students should look back at their field notes and write a detailed reflective journal. Alternatively, students can record their experiences in a more visual way through drawings or compiling a photographic journal.

 The reflection should include factual information such as what was measured and observed, as well as the more affective impressions answering questions such as: What do I feel about...? What can I do to help...? How can I educate others about...?




 Depending upon time constraints, there are many follow-up activities. The trip could be the starting point of a major cross-curricular investigation. Or you may just want it to illustrate and solidify concepts related to the Lake Pontchartrain Basin.

YOUR OWN URBAN RUNOFF FIELD TRIP

If your school is in an urban area, there are still many field trip options without even leaving the city streets. The greatest challenge to keeping Lake Pontchartrain's water clean is urban runoff. It is essential that the students understand this issue because they can directly help reduce the amount of pollution entering the Lake by being aware of the impact their daily activities have on water quality.

By following the path of the storm water that drains from Orleans and Jefferson Parishes, the students learn about their role in helping to keep Lake Pontchartrain clean.

Activities during an urban storm water field trip may include one or more of the following:

-  putting storm drain decals in their school neighborhood;
-  visiting a pumping station; and
-  collecting trash along the shore of the Lake.

STORM DRAIN MARKING PROGRAM

The Nonpoint Source Pollution division of the Louisiana Department of Environmental Quality has a program that supplies the materials needed to mark storm drains with a public education message. Storm Drain Markers are 4-inch polyurethane circles with the message "No Dumping, Drains to Lake." Placed on storm drains, markers remind the public not to dump waste into the storm drain and that pollution in the street is directly linked to pollution in the Lake. To organize a storm drain marking project with your class, contact the Louisiana Department of Environmental Quality at **(225) 765-0830** or email andrew_b@exch.deq.state.la.us. For more information, visit the web site: http://nonpoint.deq.state.la.us/pubpart_stdrain.html.

For more information about the marking program, go to www.deq.state.la.us/assistance/litter/stormdrain.htm/.

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A VISIT TO A PUMPING STATION

A great eye-opener for New Orleans and east bank Jefferson Parish residents is a trip to a storm water pumping station. The history and engineering behind keeping our city streets from flooding is fascinating.

To arrange a trip to a New Orleans pumping station, call the Sewerage and Water Board of New Orleans at **(504) 585-2175**.

Be sure to pick up the complimentary Sewerage and Water Board publication *Sewerage and Water Board of New Orleans: How It Began, The Problems It Faces, The Way It Works, The Job It Does*.

To arrange a trip to a Jefferson Parish pumping station, call **(504) 731-6730**.

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TRASH CLEANUP

Trash accumulates in many places along the Lake Pontchartrain shoreline. This trash has often washed out of the drainage canals and then washed back up on the shore at high tide. Your class can participate in the annual International Coastal Cleanup/Great Louisiana Beach and Inland Waterway Cleanup (locally known as “Beach Sweep”) held the third Saturday in September, or you can hold your own clean up event at any time of year. For more information about “Beach Sweep” activities in the Lake Pontchartrain Basin, call the Lake Pontchartrain Basin Foundation’s Education Program at **(504) 836-2238**.

Alternatively, the Department of Environmental Quality Litter Program will be happy to help you with your cleanup project. Contact them at:




Louisiana Department of Environmental Quality
Environmental Assistance Division
Litter Program
Post Office Box 82135
Baton Rouge, LA 70884
(225) 765-0151 or (225) 765-0152







You may obtain International Coastal Cleanup data cards to catalog the types of trash collected. These are collected by the Ocean Conservancy (formerly called the Center for Marine Conservation) each year to keep track of trends in the marine trash problem world-wide.

For more information about the International Coastal Cleanup, go to the web site for the Ocean Conservancy **www.oceanconservancy.org**.

The U.S. Environmental Protection Agency (EPA) also has information about marine debris at **www.epa.gov/owow/**.

For a successful cleanup:

-  You will need trash bags and a place to dispose of the trash once it is collected.
-  Seek out a location that is accessible and safe for the students.
-  Do not let the students climb on concrete “rip rap,” the sea wall or any other place where they could fall into the water.

-  Choose a place where the water close by is shallow.
-  All participants should wear gloves.
-  Discuss safety before beginning any cleanup activity.
-  Provide each group with small flags to mark hazardous trash (e.g., sharp objects, broken glass and hypodermic needles).
-  Assign one adult the task of collecting hazardous objects. Hypodermic needles must be placed in a biohazard container and disposed properly.
-  Measure off specific areas for small groups to clean.

WETLAND ACTIVITIES

JOURNAL WRITING

During the wetland field trip, ask the students to make notes recording their impressions and observations. These can be brief “memory joggers,” such as names of birds, descriptive phrases of something that impressed them, or sketches of their observations. At the end of the day ask the students to put their notes together into a journal describing the field trip.

Extensions:

After the field trip, brainstorm with the class topics that caught the students’ attention. The students can research their favorite topics related to the field trip and make presentations of their findings to the class.

GUIDED IMAGERY

The swamps of south Louisiana were clear-cut for cypress lumber in the early 20th Century. Cypress loggers, however, did not replace the trees they removed. In many areas of Louisiana, the cypress swamps grew back naturally, but some areas failed to regenerate. The following excerpt is from a book written about the Atchafalaya Basin, but could have taken place in the Lake Pontchartrain Basin in areas such as the LaBranche Wetlands or Manchac Swamp.

Tell the students to close their eyes and concentrate on visualizing what is described in the passage you are reading:

From ***The Land of Dead Giants*** by Greg Guirard

At that time logging crews lived in floating camps and didn’t come out of the woods for weeks at a time; it was a rough life. One morning, when the crew was nearing the end of its work in that area, they came upon a cypress tree that was considerably bigger and taller than the rest—a giant among giants—and the men looked at it with wonder; none of them had ever seen a tree that size. They delayed cutting the tree, which was near the center of a small clearing in the swamp, purposely leaving it for last.

Because it was not badly crowded by the other trees, it had grown straight and tall, and its massive branches extended far out in all directions. Like many of the biggest trees, this one served as home for all kinds of birds and animals. Squirrels ran and jumped from branch to branch. Raccoons hid behind moss and leaves, peeking down on the men as they worked the saws and axes, always coming closer. Owls perched on the lower branches, watching quietly. Hawks on the topmost branches looked over a scene totally unfamiliar to them – miles and miles of trees that had always towered to great heights above the swamp floor now lay flat and useless. Egrets and ibis came and went nervously, and songbirds with no other trees to land on filled the branches of this last tree. The air itself around the giant cypress was a swarm of birds and butterflies.

- **After reading the passage to the students, discuss the scene with them; ask them how they feel about the logging of the cypress trees.**
- **Explain that later in the story one of the loggers tries to persuade the company boss to leave this giant tree standing. Ask the students what they would do in this situation. The students can role play the loggers, discussing the fate of the tree and the pros and cons of sparing this tree.**
- **Ask the students to describe the scene from the viewpoint of the hawks looking “over a scene totally unfamiliar to them.”**
- **The students can also draw the scene of the giant tree in the passage.**

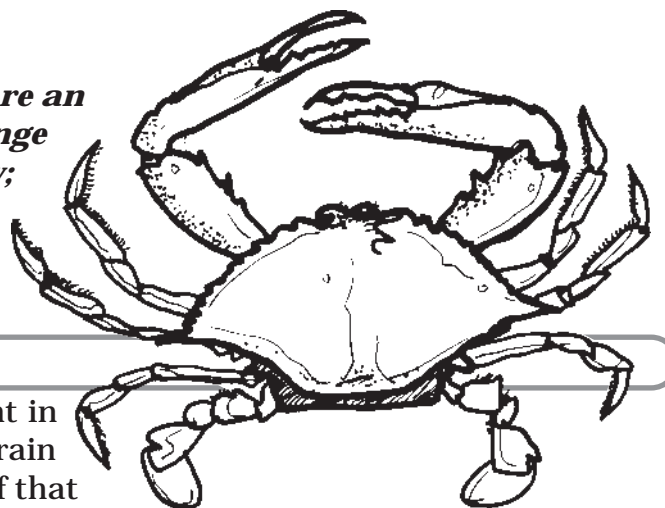
CONCEPT MAPPING

Concept maps or graphic organizers are an excellent way to help students rearrange complex information in a meaningful way; they also enhance comprehension and retention. The following is an example of a “concept mapping” lesson.

Blue Crab

The blue crab is a very important component in the food web of the marsh in the Lake Pontchartrain Basin. But let’s not forget that we also are part of that food web. When the blue crabs are harvested they enter another web of human making—the economic web. The crabber harvests the crabs to make a living. When we eat crab in gumbo at our favorite restaurant, many people’s economic well-being is affected directly and indirectly.

Ask the students to list questions about the details of the blue crab and the crabbing industry and research the answers. Once they have facts and figures, teach them how to make a concept map by following these steps:



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- Share example of concept map with the class so they understand the goal of the activity (See next page).**
 - Write “Blue Crab” in the center of an easel pad or on the chalk board.**
 - Ask the students to brainstorm all the facts and ideas that they have learned or thought about while doing their research.**
 - After all the ideas are listed, group the students and have each group cluster the ideas into like groups or categories and create a finished concept map.**



VALUES

- Valuable fur
- Tasty
- Food for alligators
- Nutritious meat

FOOD

- Marsh grasses
- Roots
- Young trees

HABITAT

- Bayous
- Swamp
- Canals
- Marsh

NUISANCE FEATURES

- Causes canal bank erosion
- “Eat outs”
- Contributes to coastal erosion

NUTRIA



PHYSICAL CHARACTERISTICS

- Naked tail
- Protective outer guard fur
- Large orange teeth
- Good swimmer
- Brown fur

REPRODUCTION

- Many large litters
- Successful
- Overpopulation

The finished concept map should show all the relationships between and among the components. There is no right or wrong way to do a concept map. There will probably be as many forms of concept maps as there are groups! It's fun to display and compare all the results. The students learn from each other this way.

MAP SKILLS

Maps are used extensively to document events such as wetland loss and restoration. During your field trip to a wetland site, different kinds of maps and aerial photographs can enhance the students' understanding of the issues affecting the wetlands. For example, aerial photographs of the LaBranche Wetlands show damage caused by highway construction as well as the projects designed to restore the marsh. Aerial photographs of St. Bernard Parish show the impact of the Mississippi River Gulf Outlet (MRGO).





By studying aerial photography or maps from different time periods, the students can gain an understanding of the drastic changes that have taken place during the past century. The Louisiana Department of Natural Resources produced land use and land cover maps of the coastal zone of Louisiana for the years 1956, 1978 and 1990.

Land use and land cover maps for selected areas and dates may be obtained at the following web addresses:










- (a) **WETMAAP:** www.rac.louisiana.edu/wetmaap
- (b) **National Wetlands Research Center in Lafayette, LA** (data section):
www.nwrc.usgs.gov.
- (c) **Louisiana Department of Natural Resources, Office of Coastal Restoration and Management:** www.savelawetlands.org
- (d) **Coastal Research Laboratory at the University of New Orleans:**
www.coastal.uno.edu

Using the maps and aerial photography that you obtain for your field trip area, the students can be engaged in a number of activities.

Using aerial photographs:

-  Trace your route to the field trip site plus the route you take during the field trip.
-  Ask the students to identify features on the aerial photo, beginning with large, obvious features such as water bodies and then zooming in on smaller features.
-  Point out changes in land use and land cover (habitat type) that show up on the photo. If you use infrared photography, discuss how the shades of red and pink denote different kinds of vegetation.
-  Have the students conduct further research into the use of aerial photography, and specifically infrared photography in the field of wetland and habitat management.

Using topographic maps and land use maps, if available:

-  Locate the high ground, shown by contour lines. What is the elevation?
-  What land uses are associated with the high ground?
-  What natural habitats are associated with the high ground?
-  Locate land areas of lowest elevation.
-  What natural habitats are associated with this low land?
-  Predict sources of pollution from land adjoining your field trip site.
-  Predict some land use changes that could take place in the near future in your field trip area.
-  How could these changes alter the natural habitats?
-  Brainstorm ways in which pollution and land use change effects on the area could be minimized.

Map Resources

The following are sources of maps and aerial photographs:

For a list of map suppliers in Louisiana, visit the United States Geological Survey web site: mapping.usgs.gov/esic/map_dealers/la.html

New Orleans Map Company - topographic maps, satellite images, and aerial photographs:
2727 Edenborn Ave, Metairie, LA 70002. (504) 455-6766.

Louisiana Geological Survey at Louisiana State University. Phone: (225) 388-5320.

Louisiana Department of Natural Resources, Coastal Restoration Division.

Web site: www.savelawetlands.org

U.S.G.S. National Wetlands Research Center. Web site: <http://www.nwrc.usgs.gov>

Louisiana Department of Environmental Quality, GIS Department.

Web site: <http://gisims.ldeq.org/#>

WETMAAP (Wetlands Education Through Mapping and Aerial Photography).

Web site: www.rac.louisiana.edu/wetmaap

U.S. Army Corps of Engineers, New Orleans District.

Web site: www.mvn.usace.army.mil/eng/edsd/map4sale.htm

Parish Libraries - Louisiana Collections. New Orleans Public Library houses the official historical records of the city. 219 Loyola Ave., New Orleans, LA 70112-2044.

(504) 529-READ or go to web site: www.nutrias.org/~nopl/maps/maps.htm

Jefferson Parish central library contains Jefferson Parish-specific information. 4747 W. Napoleon Ave., Metairie, LA 70001. (504) 838-1100.

Web site: <http://www.jefferson.lib.la.us/>

Earl K. Long Library, University of New Orleans, Lakefront Campus, New Orleans, LA 70148. (504) 280-6354. Web site: <http://library.uno.edu/Welcome-on.html>

Tulane University Howard Tilton Library, Special Collections, Jones Hall, Tulane University Libraries, New Orleans LA 70118. (504) 865-5685.

Web site: <http://specialcollections.tulane.edu/~lmiller/RareBooks.html>

The Historic New Orleans Collection is for the serious study of historic maps.

Web site: <http://www.hnoc.org>

Geographic Information Systems

By introducing the students to modern mapping techniques and geographic information systems (GIS), we can open doors to rewarding careers in environment related fields. GIS is a rapidly growing field related to mapping and cartography which involves placing layers of information on top of a base map to give a better understanding of the place. GIS can be done very simply by hand (see Appendix A) or by using sophisticated computer software.

If you are interested in introducing your students to GIS, you can obtain a CD containing satellite imagery of Louisiana and many GIS data layers that show natural and human-made features. The CD also contains the necessary software for accessing the maps (Arcview or Geomedia). You may order a complimentary CD from Louisiana State University at the website: <http://atlas.lsu.edu>. For further information about GIS applications in education, go to the ESRI (Arcview) website: www.esri.com.

You can also access excellent aerial photography of southern Louisiana via the website: <http://atlas.lsu.edu>. These photographs, named Digital Ortho Quarter Quads (DOQQ), are located in the DOQQ downloader section. It is best to use Microsoft Internet Explorer, not Netscape, to download an image. Go to the DOQQ Downloader section and click the parish of interest on the state map that appears, and then click the square of interest. Four downloadable files will appear, one for each quarter quad in a zipped file. Download the one you want. When unzipped, it will yield about ten files in different formats. Choose the format that suits you.

INTERVIEWS

The students can gather a great deal of real-life information as well as historical facts by interviewing community members who are well acquainted with some aspect of the wetland area they visit. Question preparation time is crucial. The students should decide in advance what information they want. For example, the changes fishers have experienced over the years, the effects of erosion, and restoration efforts on the wetlands. Invite the interviewee to the classroom and structure the visit like a panel discussion with a student moderator, a student speaker, and questions from the audience. Each student should prepare one question in advance. The students can record the interview on audio or video tape.

To process the information gathered from the interview, cooperative groups of students can prepare news reports by:

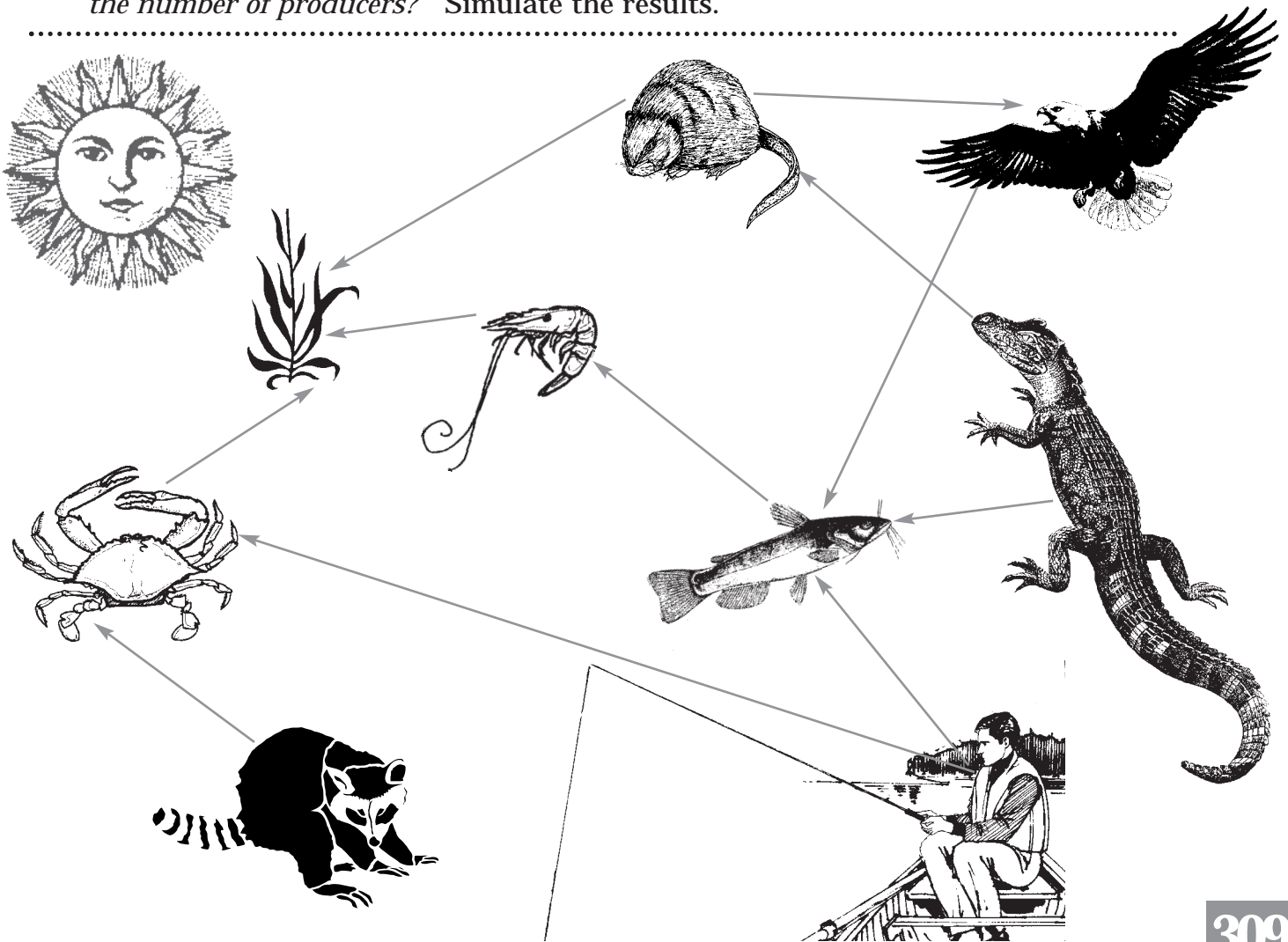
- (a) reviewing and discussing information from the interview;
- (b) brainstorming;
- (c) creating a graphic organizer or concept map of the information gathered, and
- (d) using a segment of the interview in either a TV news cast or a written newspaper story.

FOOD WEB GAME

A great way to reinforce concepts about “who eats whom” in the wetland food web is to make cards with the names of all the organisms (plants, animals, and microbes) you encountered on your field trip or in the course of your research. You will also need a “sun” card.

The students make the cards and play a food web game.

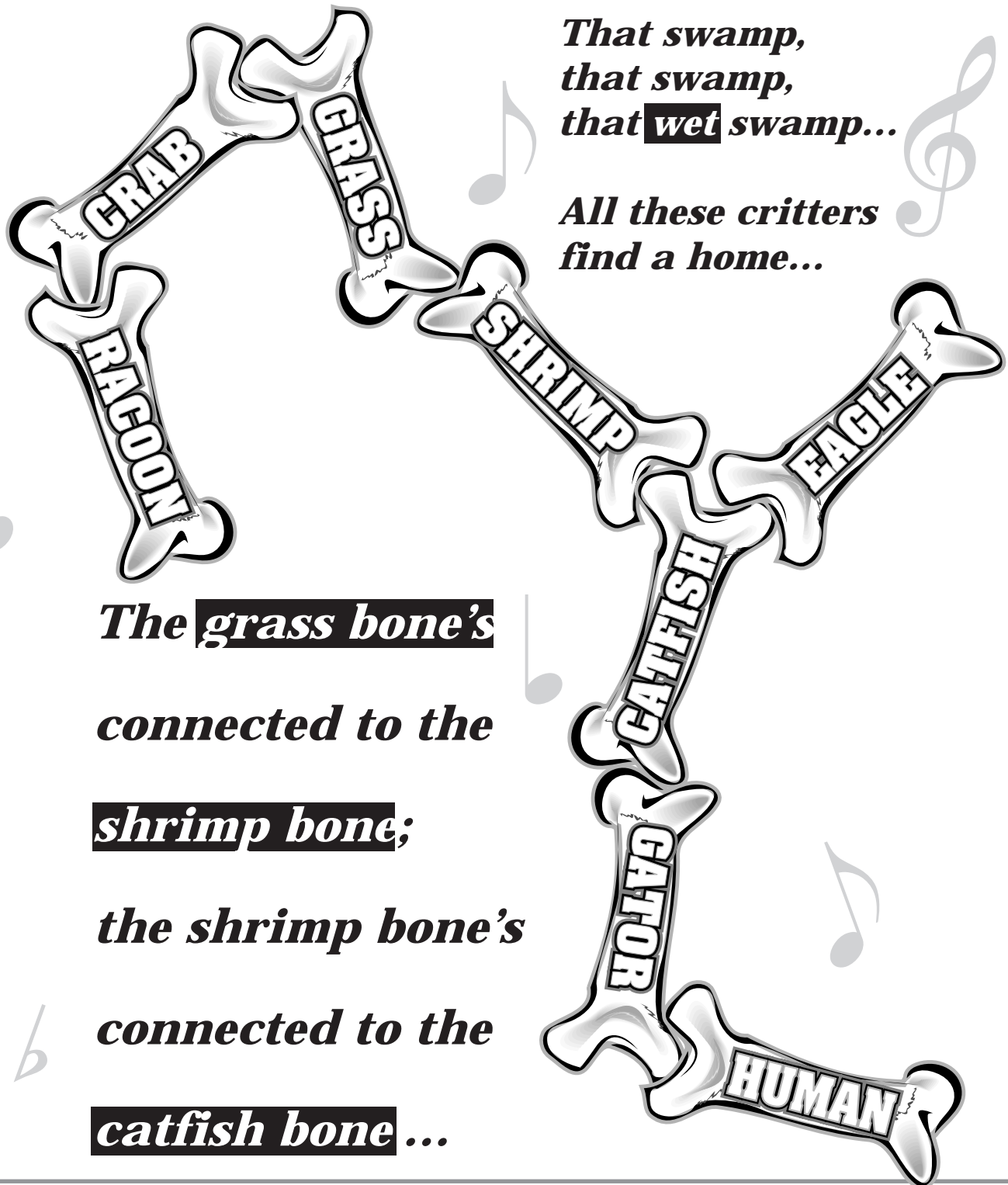
- Wearing their cards around their necks, they “become” an organism.
- Different colored yarn is passed from student to student, beginning with the student wearing the “sun” card, moving to one wearing a “producer” (green plant) card, then to a student wearing a “primary consumer” (herbivore) card, then to one who is a “secondary consumer” and so on.
- Remember to include “detritivores,” “decomposers,” and “scavengers” which are plentiful in the wetlands.
- The first time the food web game is played there may be more questions than answers. Some research may be necessary before you play the game successfully.
- This game is a great opportunity to analyze the food web of the region in which you and your students live. You will want to ask your students questions such as: “What if all the shrimp disappeared?” or “What if there were half the number of producers?” Simulate the results.



WETLAND FOODWEB SONGS


The fascinating array of wildlife encountered on a wetland field trip can generate creative sparks among your students. How about challenging the students to come up with a song to the tune of the old song "Dem Bones". This will work best after doing the Wetland Web game in which the students become familiar with the food web possibilities.

HERE'S A STARTER:



“Wetland Blues” introduces wetland names and themes in a fun way. The students will enjoy putting the words to their own rhythms and music. One way to present this activity is to divide the class into groups and assign a section of the “song” to each group. Ask the groups to put the words into rap or another form of music that appeals to them. They can improvise with percussion instruments to accompany a performance of their section. An extension of this activity is for each student to find information about and an illustration of one or two of the organisms named in the song. The pictures may be used as a display or backdrop to be used when the students perform their musical creation for other classes.

Wetland Blues



Redfish, Blue Crab, White Shrimp, Black Duck
Tadpole, Bullfrog, Cypress Log, Marsh Buck
Gray Goose, Swamp Rabbit, Dragonfly, Crab Roe
Barnacle, Jumping Mouse, Fishhook, Mosquito
Snowy Egret, Periwinkle, Snapping Turtle, Snail
Diving Beetle, Flatfish, Raccoon, Cattail

(Faster)

Alligator, Garfish, Lily Pad, Food Chain
Sea Lettuce, Pelican, Scuba Diver, Acid Rain

(Slow again)




Oyster Shells, Sea Oats
Water Birds, Motor Boats

(Music)

Green Fern, Laughing Gull, Least Tern, Scud
Mosquitofish, Clamworm, Saltmarsh Mud
Speckled Trout, Bluegill, Waterfern, Mink
White Heron, Pitcher Plant, Water to Drink
Sawgrass, Ladybug, Fiddler Crab, Rail
Duckweed, Bulltongue, Kitchen Sink, Rusty Nail

(Faster)



Rockweed, Horsefly, Oak Seed, Water Snake
Pintail, Muskrat, Windsail, Mallard Drake
Whooping Crane, Rainstorm, Swamp Rat, Muddy Shoes
Stingray, Weeping Willow, Wetland Blues

This composition appeared as “Wetland Blues Ode” in Banbury, M. M., Lyons, S. E., Cain, M. A., Rivera, D. B. & Alonzo, S. F. (1992) Wetland blues: a video guidebook for teachers. New Orleans Society for Environmental Education, (p.32). The book is out of print; the video is no longer available.

URBAN STORMWATER RUNOFF FIELD TRIPS

By following the path of the stormwater that drains from Orleans and Jefferson Parishes, the students learn about their role in helping to keep Lake Pontchartrain clean. They begin by participating in stenciling some of the storm drains in their school neighborhood. The stencils say “DUMP NO WASTE; DRAINS TO LAKE,” a message to those who habitually use storm drains to dispose of waste products such as used motor oil and yard care products. After stenciling, the students visit a pumping station. Here they learn about how their city is drained and protected from flooding. At the same time they see the trash that collects at the pumping station grates and learn how much work is needed to remove the trash. Later at the lake shore, they see where the canal enters the Lake and view the trash that makes its way through the grates and washes up along the shore. The students participate in picking up some of the trash and filling out a “trash inventory” to assess the type and sources of the trash.

**DUMP NO WASTE;
DRAINS TO LAKE**

URBAN STORMWATER ACTIVITIES

MAP STUDY

Comparing the present day situation of land drainage in Greater New Orleans with the situation 50 to 100 years ago will give students a perspective on the immensity of the task of draining Orleans and Jefferson Parishes and the reasons behind the special challenges faced by the two drainage districts.

- Assign the students the task of researching changes in land use in their own neighborhood to find out when the closest canal was built, how old the buildings are and other relevant information.
- Have the students work in small groups to look at old and modern maps of the area. Each group can zoom in on a small portion of the modern map. By comparing that site on an old map, they can then identify and list land use changes.
- Ask the students to think about what effect this rapid development has had on the amount of water running off the land into the Lake. For instance ask, “Does concrete have the same properties for water absorption as a marsh?”
- Have each group report on the specific changes in their area, outlining how they think the changes they observe have affected Lake Pontchartrain.

MAKING PICTORIAL FLOW DIAGRAMS

The students illustrate the journey of a drop of rainwater or motor oil from the storm drain to the Lake via the pumping station. These “maps” can take the form of a pictorial diagram similar to the one in The Magic School Bus at the Waterworks by Joanna Cole which deals with water supply. The students can include themselves in the picture, writing captions that tell a story about the journey.

URBAN RUNOFF PLAY

In cooperative groups, the class can create plays to show the importance of keeping pollutants out of storm drains. The class should first brainstorm ideas for the plays. Then in cooperative groups they can choose parts and write lines. Roles in the cooperative groups can include script writer, director, special effects, and actors. The students themselves should take the lead in deciding the content of the play based on what they learned on the field trip.

RAINSTORM POETRY

The drama of a major rainstorm is familiar to almost everyone. The students can brainstorm ideas and words associated with flood events or heavy rain, including what they imagine it might be like in the pumping stations. Using the words and ideas they gather, they can then write simple poetry such as “syntu.”

A syntu is a five line poem written about a natural feature of the Earth. The emphasis is on the five senses.

DIRECTIONS:

- Line 1 is the name of a natural feature: it has one word.
- Line 2 is an observation about the natural feature in Line 1; it refers to one of the five senses: sight, touch, hearing, taste, or smell. There is no limit on the number of words.
- Line 3 is a thought, feeling, or evaluation about the natural feature in Line 1. There is no limit to the number of words.
- Line 4 is another observation about the natural feature in Line 1; it refers to a second sense, one that is different than the one in Line 2. There is no limit to the number of words.
- Line 5 is a synonym for the natural feature in Line 1; it has one word.

Here is
an example of
a syntu:

*Rainstorm
Hear the rumbling thunder
Run outside!
Feel the cool raindrops
Downpour*

RAINSTORM MUSIC

Using tapping fingers, clapping hands, stomping feet, and simple percussion instruments such as homemade rainsticks, the students can put their rainstorm poetry to music and perform it.

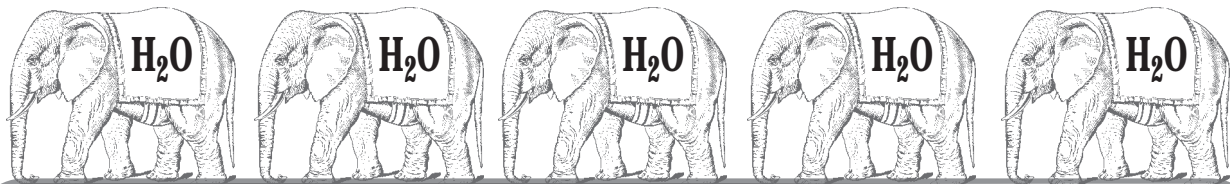
PUBLIC EDUCATION FLYERS

The students can work in cooperative groups to develop a flyer to educate their school and community about wise practices to prevent pollution from entering the drainage system. They will need to research the issues and be sure they have the correct facts. Roles of graphic designer, artist, writer, and editor are needed to divide the tasks. To choose which of the flyers to use in a public education campaign in the neighborhood, the class could ask parents, other students, and faculty to judge a contest. When the winning flyer has been chosen the students can put them around school, go out in the neighborhood to distribute them and talk to the neighbors about their work.

MATH AT THE PUMPING STATION

The pumping station field trip provides opportunities for the students to calculate runoff statistics. The meteorologists give us statistics about the number of inches that fall in a day, month, and year. You can use simple math to calculate the volume (cubic inches or feet) of water that falls on your school grounds, trace this volume to the pump station, and ask questions about the volume of water handled there. The people at the pump station talk in terms of "cubic feet per second" (CFS).

WHO CAN VISUALIZE WHAT THAT MEANS UNLESS THEY WORK AT A PUMP STATION?




Well, here's one way to visualize 10,000 CFS
(the amount pump station Number 6 on the 17th Street Canal can handle):


10,000 CFS is equivalent to 74,800 gallons per second.

An elephant can take 3 gallons into its trunk at one time.

So you would need 2,493 elephants working continually to handle the water this pump can pump into the Lake!

ANOTHER WAY OF VISUALIZING THESE MASSIVE VOLUMES IS:

 *The New Orleans drainage system has the capacity to pump 29 billion gallons per day. Convert that to CFS (1 Cubic foot = 7.48 gallons). Challenge your students, "How many seconds are there in a day?"*

 *This is enough to empty a lake 10 square miles by 13.5 feet deep - or roughly 3.2 miles by 3.2 miles by 13.5 feet deep - every 24 hours (about one sixth of Lake Pontchartrain -- which is 630 square miles by 12 feet deep).*

LAKE REFLECTIONS

After the students have learned how human activities are potentially harmful to Lake Pontchartrain, ask them to write a reflection on their role in maintaining the health of the Lake for future generations. Begin with a discussion of the information they have received and a review of the field trip activities. Allow plenty of quiet, undisturbed time for private thoughts to flow and for the students to express their thoughts freely on paper, using text and/or visual representations.

Activities To Accompany Other Field Trips

FIELD TRIP BINGO GAMES

This activity lends itself to many kinds of field trips to natural areas. You can design the bingo game to suite the location of your field trip. The Leaf Bingo presented on the next page is a suggestion; the pictures of leaves can, however, be replaced by birds, wetland plants or aquatic critters.

Here are sample lists of commonly seen organisms that could be used for bingo games:

Wetland Birds	Wetland Plants	Aquatic Organisms
Great egret	Roseau cane	Giant waterbug
Great blue heron	Marsh hay	Water scorpion
Red winged blackbird	Bald cypress	Dragonfly nymph
Cardinal	Dwarf palmetto	Grass shrimp
Snowy egret	Red maple	Mosquito fish
Grackle	Bulltongue	Predacious diving beetle
Crow	Groundsel bush	Damselfly nymph
	Hackberry	
	Live oak	



LEAF BINGO GAME

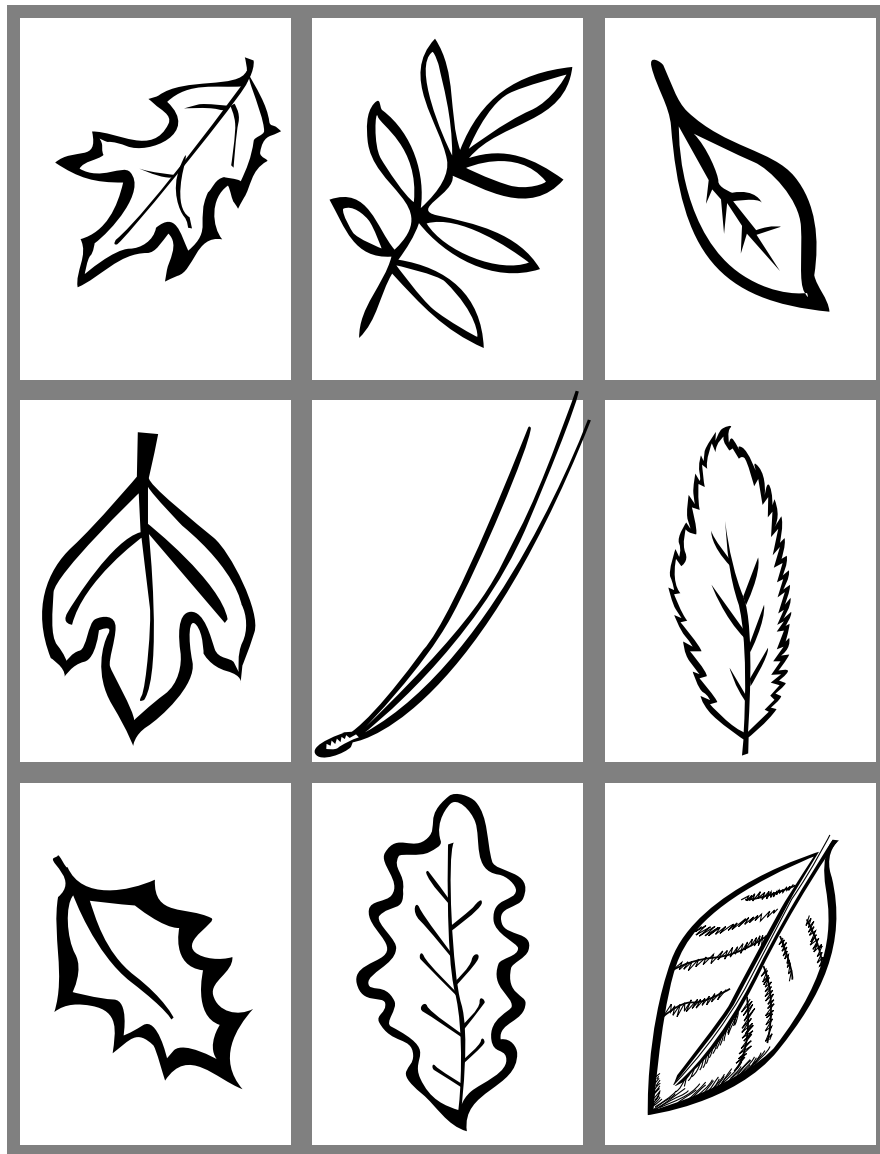
At the beginning of the hike, students are told to collect one of each different kind of leaf they see, preferably from the ground beneath the tree. At the end of the trail, the students can play "Leaf Bingo," using a bingo card marked with leaves commonly found on the trail. For this activity:

Enlarge the figure below to at least 8.5 x 11 inches.

Make a copy for each student.

Students play the game by placing one of their leaves on each leaf drawing that matches. If they make a complete row horizontally, diagonally, or vertically, they score a "bingo."

Have the students "key out" their leaves using a guide to Louisiana trees.



Enlarge
approx.
164%

ROLE PLAYING

Present the students with a dilemma:

A land developer has applied for a permit to clear 80 acres of land adjoining the River. He plans to sell the timber and subdivide the area into parcels of land for single family homes, each on several acres.



Students divide into teams to assess the possible impacts of the land development on the wildlife, the water quality of the river, the benefits to the local economy, or other factors. They should also discuss the measures that could be taken to reduce the potential impacts.



Each team selects a role from which to debate issues and arrive at a decision about whether or not the permit should be given. Roles could include: a biologist, a water chemist, an environmental activist, a member of the parish council, a member of the parish planning commission, a potential homeowner, the developer, and others. Hats and other props help the students assume roles.



Each group selects a spokesperson representing the “role” to sit on a panel.



Each panel member has 3-5 minutes to state his/her case.



The group members ask questions and raise issues for the panel to address.

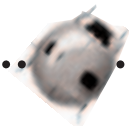


The whole class votes on whether or not to allow the development, based on the evidence/testimony of the panel.

MACROINVERTEBRATE STUDY



On any field trip to a wetland or stream, students can use nets to collect samples of small aquatic invertebrates. In cooperative groups consisting of roles such as net handlers, critter pickers, critter identifiers, and critter recorders, the students collect, identify, record and classify the macroinvertebrates living in the water. This activity can take the form of a fun exploration or can be part of a water quality assessment. Organisms can be classified according to their tolerance of water pollution, and this information can help you assess the water quality of the body of water you are visiting. See “Your Own Water Quality Monitoring Program”, (Page 298) for information needed to develop a biological monitoring activity.



CRITTER DRAWING

Some students may wish to observe the organisms carefully and accurately draw them; others may prefer to create caricature-like drawings. Students who excel in cartooning may want to draw comic strips of life in the river from the point of view of a caddis fly or dragonfly nymph.

CRITTER POETRY

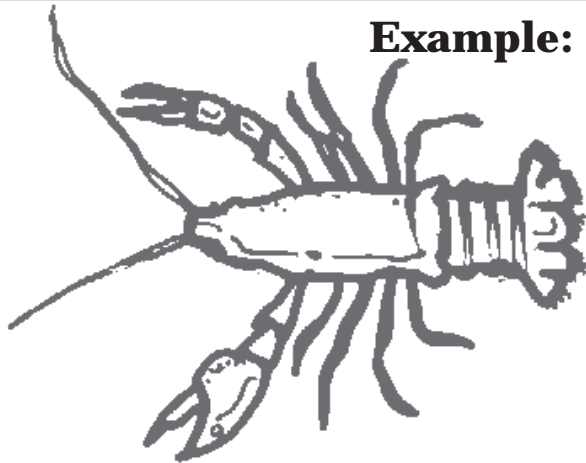
Students can create simple acrostic poems about their favorite critters. An acrostic poem is a form of non-rhyming poetry in which the first letters of each line spell a vertical word, phrase or sentence.

DIRECTIONS TO STUDENTS:

Write your word or phrase vertically.

Each line of poetry begins with the corresponding letter of your chosen word or phrase.

Use as many words as you like in a line.

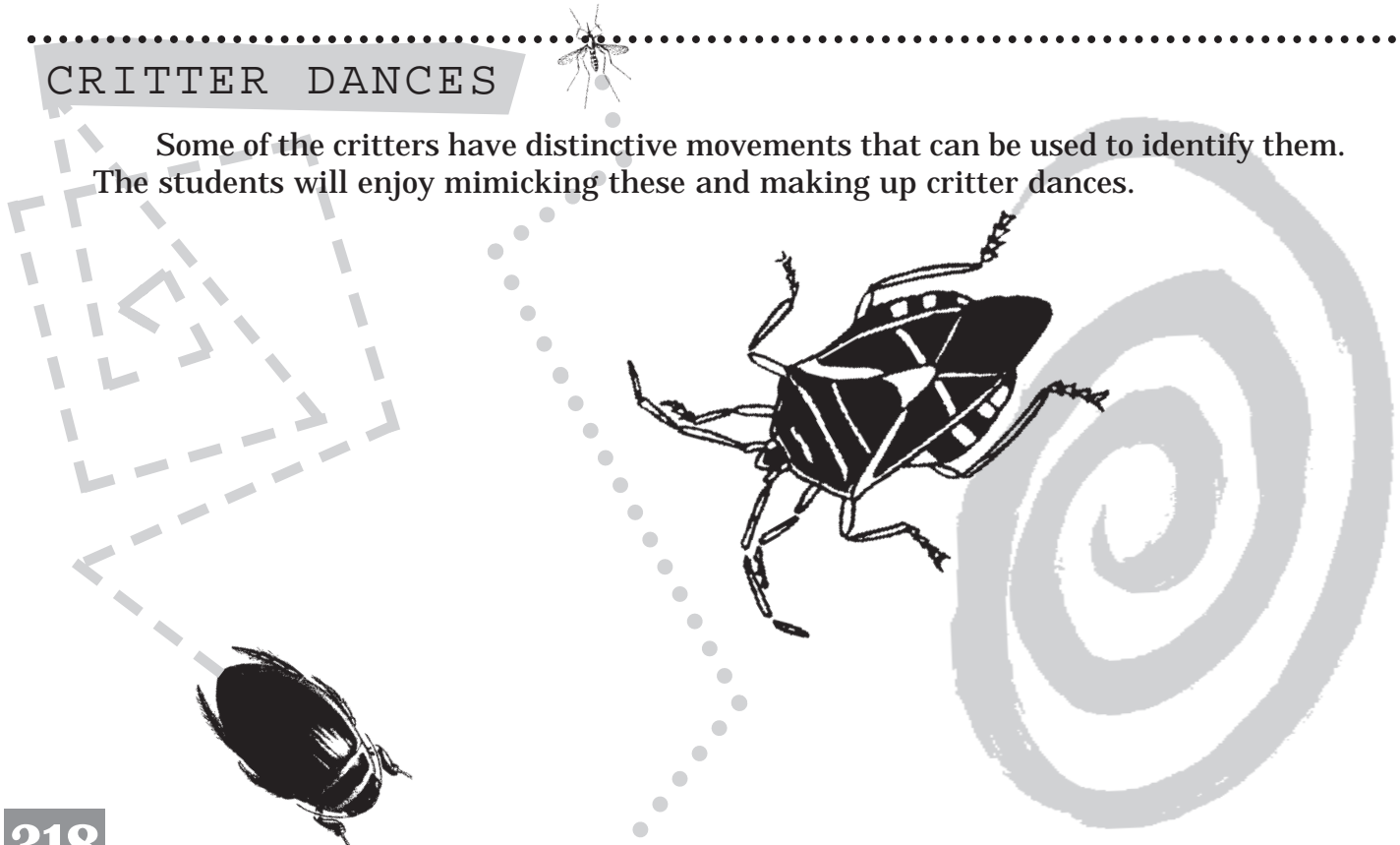


Example:

Crunchy exoskeleton
Really red
Always tasty inside
Water-loving
Feasted upon
In the mud
Suck da heads?

CRITTER DANCES

Some of the critters have distinctive movements that can be used to identify them. The students will enjoy mimicking these and making up critter dances.



*Make up signature songs about each type of critter to the tune of
"I' M A LITTLE TEAPOT"*

Example:

I'm a little caddis fly in my home;
Here's my head, just peeking out.
If you want to see me, look real close –
Because I like to hide in my house!

