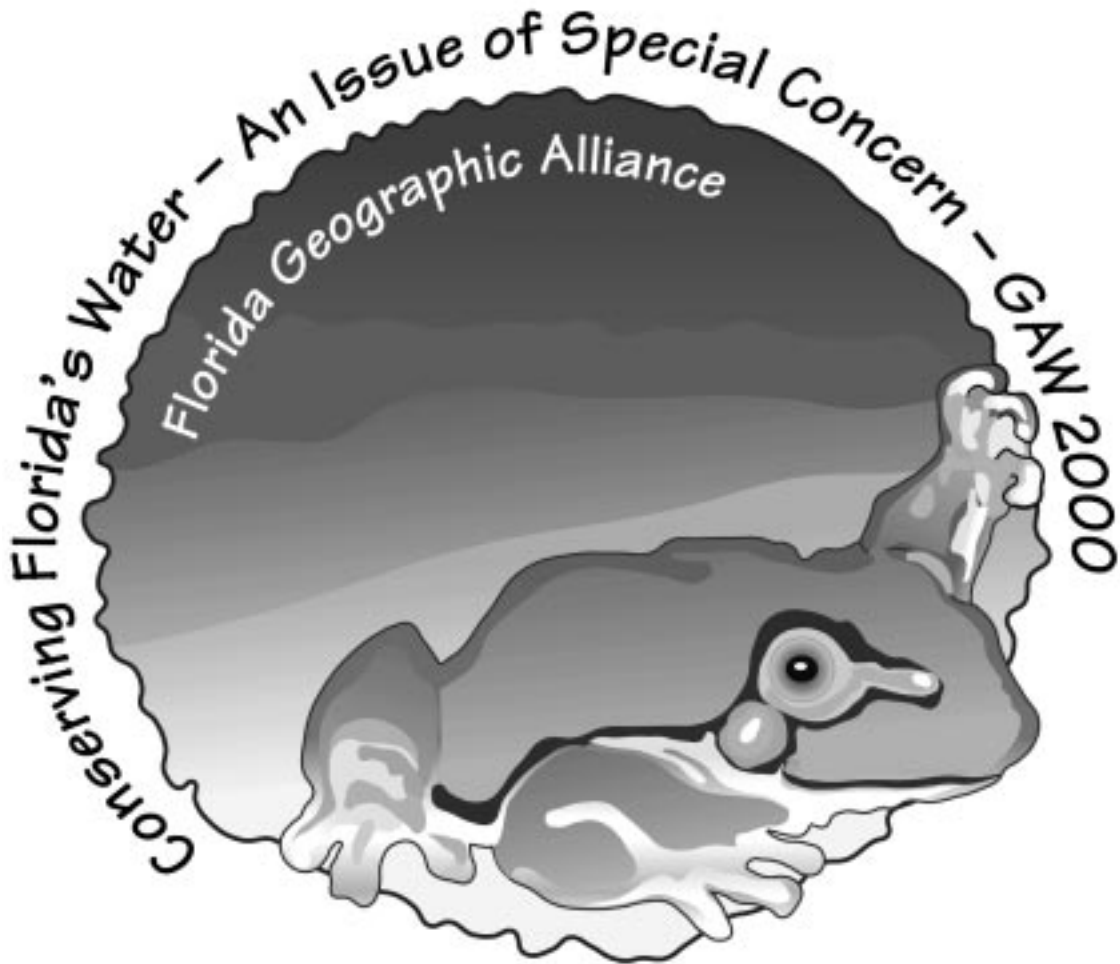


Geography Awareness Week

November 12-18, 2000



Here Today, Here Tomorrow: A Geographic Focus on Conservation FLORIDA'S TEACHER PACKET

Included in this packet: Introductory letter, Report Form, Background Information, Study Questions

Lesson plans:

A Virtual Field Trip to Wild Florida
Water Conservation
Who Uses Waterways & Why: Case
Study of Alexander Springs
Agricultural and Commercial Lands
Interpreting Florida Water Use
Timeline
Xeriscape
Hiking in Florida
Recreational Irrigation
Canoeing in Florida
Aquifer Recharge
The Hydrologic Cycle

Conservation Lands in Florida
Modeling the Formation of a River

GAW 2000 Team:

Mary Ellen Adlam
Jim Curtis
Donna Ellis
Bob Hight
Mike McDonald
Patty Sheffer
Elizabeth Smith
Barbara Watson



FLORIDA GEOGRAPHIC ALLIANCE

getp.freac.fsu.edu/gaw/



Here Today, Here Tomorrow: A Focus on Geographic Conservation

Geography Awareness Week November 12-18, 2000

Hello Geography Teachers,

The 2000 Geography Awareness Week (GAW) approaches and the Florida Geographic Alliance has worked up some interesting activities for you. The National Geographic Society's poster theme is "Here Today, Here Tomorrow: A Focus on Geographic Conservation" so the Florida packet shares the same focus. Since water is such a vital issue to the state of Florida and we are always concerned about educating learners of all ages about the importance of water conservation, we chose to focus on Florida's Water as our main topic.

Thanks to the generous support of our Department of Education and the United Star Distance Learning Consortium through the Web World Wonders Project (<http://webworldwonders.firn.edu>), we were able to produce the water poster and curriculum guide you received for this year's program. You will also find a wealth of resources including excerpts, maps and graphics from the Water Atlas of Florida for use with the activities and the poster on the GAW website (<http://getp.freac.fsu.edu/gaw/>). The website also provides a number of links to related sites as well as media contacts so you can let the community know what you are doing for Geography Awareness Week in your classroom. Geography Awareness Week is a great time to get your students involved with real life activities that impact their world. The student's creative products can often times be our best advertisements so be sure to contact those media folks and let them know what you are up to.

Once again there is a Geographic Information Systems Day (GIS) scheduled during the week. One link that we would like to call your attention to is the ESRI website. Here you will find the information for a great community atlas project. If you are one of the schools that complete the project by the deadline, ESRI will send you free GIS software for your school. The Florida Geographic Alliance will help prepare you for the project with an inservice workshop and assist you and your students as they complete their community atlas. Please consider participating and do not hesitate to call or e-mail us to set up an inservice. The Community Atlas is another project that the media may want to highlight.

As usual, we would love to hear about all of the activities that your students participate in during the week so please return the reporting form or fill one out on the website. Your responses help us write the reports that provide the funding for future programs. We know that our Florida teachers are some of the best in the country and we like to share your successes at the national level.

Thanks for participating and we hope to hear from you soon. If you need extra posters, materials, or assistance, please do not hesitate to contact the Alliance office at (850) 644-2007.

Sincerely, Laurie and Ed

Contents

Report Form	4
Brainteasers:	5
Lesson Plans	6
A Virtual Field Trip to Wild Florida	6
Water Conservation	10
Who Uses Waterways & Why: Case Study of Alexander Springs	12
Agriculture and Commercial Water Use	16
Interpreting Florida Water Use	23
Time Line	27
Xeriscape	30
Hiking in Florida's Natural Environment	34
Recreational Irrigation	36
Canoeing in Florida's Natural Environment	38
Aquifer Recharge	40
The Water Cycle	44
Conservation Lands in Florida	50
Modeling The Formation of a River	52
Transparency Masters	56
Reference Materials	64
Book List	65
GAW Daily Activities	70
Study Questions	75
Resources	78

REPORT FORM



FLORIDA GEOGRAPHIC ALLIANCE

Dear Teacher:

Please indicate the activities that you incorporated in your classroom during Geography Awareness Week. We appreciate you filling in the information below. Please list any activities before, during, and after Awareness week. It is very important that you return this to ensure that we can provide Geography Awareness Week materials in the future.

PLEASE take photographs of kids participating in Geography Awareness Week activities and mail them to us (or attach to an e-mail) so we can add them to our web site (the address is: <http://getp.freac.fsu.edu/gaw/>).

Activities for Geography Awareness Week 2000

Teacher:

Subject:

Grade:

School:

Address:

email address:

Monday 11/13:

Tuesday 11/14:

Wednesday 11/15:

Thursday 11/16:

Friday 11/17:

Mail this form and any photos to:

Florida Geographic Alliance
C2200 University Center
Florida State University
Tallahassee, FL 32306-2641

Brainteasers:

Monday:

How much of the earth's water is drinkable?

A: One Percent

Tuesday:

According to the poster, in which Water Management District could you find the highest demand for fresh water? What has caused this demand?

A: South Florida has the highest demand for fresh water because it has a greater population than the rest of Florida's water management districts.

Wednesday:

According to the poster, in what year did the State Board of Health declare the Peace River "...suffering severely from excessive organic and chemical pollution?" Where is the Peace River? How do you think the pollution impacted the life around this river?

A: The year was 1955. The Peace River runs through Arcadia, in the southern part of the Southwest Water Management District. Fish and plant life were dying, water was undrinkable, etc.

Thursday:

Find the region in which you live on the poster. Locate the pie chart that represents your region. Which category shows the highest use of water?

A: Answers will vary depending on your region.

Friday:

List three ways in which we can conserve our drinking water.

A: Answers will vary but here are some ideas:

Turn off water while brushing your teeth or washing your face.

Place a five pound brick in the tank of your toilet to disperse the water.

Use Xeriscaping to reduce the amount of water your lawns need.

Alternative Questions:

What is an ecosystem?

A: An ecosystem is any area where the Earth's living and non-living systems interact.

How do our activities affect the quality of our drinking water?

A: Chemicals we use to clean our cars or fertilize the land goes into our streams in the form of run off which later finds its way into our drinking water.

Alternative questions were taken from: Florida Geology Educational Video Project.

A Virtual Field Trip To Wild Florida

(An Adaptation from a Problems and Prospects field lab produced by The Academy of Public Service, Umatilla High School, Lake County Florida)

Grade Level: Adaptable for all grades.

Time: 1-2 days

Concept: environment, human impacts on the natural environment

Generalization: The physical environment will suggest and limit people's activities, but does not dictate.

Objectives: Students will:

- 1) use critical thinking skills and observation to investigate and record characteristics of the natural environment in Florida.
- 2) compare and contrast the impacts that people have made on these environmentally sensitive areas of Florida.

Materials:

Things To Think About Guide (this can be made into an overhead and handout for students)

Environmental Observation Data Collection Sheet

Computers with internet access (If you have only one computer or limited computers, you can print the data sets and supporting materials for groups to work with until their turn comes up.)

Procedures:

Initiating Activity:

Ask students to think about how much damage a single person on a deserted island could cause, (they will most likely say very little) and then ask them what would happen if that same person was on a bulldozer. Tell the students that today they are going on a field trip to some special places throughout Florida without leaving the classroom. This virtual field trip is going to let them make some observations of nature without disturbing the natural surroundings. Place the Things To Think Guide on the overhead and give students a few minutes to think about their responses and any questions it may bring to mind. Have students share their responses and ask their questions. If a particular question seems like it could be answered during their virtual field trip, have them write it on their Things To Think About Guide.

Virtual Field Trip Activity:

Students are now ready to explore the environments of Florida. Set up the field trip by handing out their Environmental Observation Data Collection Sheets and putting the students in groups. (The groups will be determined by the number of computers with internet access, if every student is sitting at a computer, it is still recommended that they work together so they have someone to discuss their observations with.)

Assign the students to one of the webcam sites at the Web World Wonders website (<http://webworldwonders.firn.edu>). Let them explore the camera sites and work on their observational skills

by filling out the Data Collection Sheets and sketching what they see. Once they have finished their personal observations, have them explore the site for ecosystem data, weather data and other pieces of information that will help them answer their Things To Think About questions.

Once they have finished their data collection, ask them to talk with their partner about what they observed and the answers to their Things To Think About Guide. When they have successfully completed the Data Sheet and Things To Think About Guide, have the group find another group that looked at the same site and compare notes. Remind the students that if they have discrepancies, they can always go back to the site together to do another observation.

Culminating Activity: Have students in their original groups find another group that observed a different site. Ask the two groups to discuss what they saw. Ask them to find the similarities and differences between the sites as well as the impacts that people have made to each site. After a few minutes of discussion ask the groups to share with the class what they came up with.

Evaluation: Completion of their Things To Think About Guide and Data Collection Sheet along with their group discussions will provide the data for the students to create a field trip log or report that discusses what they learned on their virtual field trip. The supporting data (Things To Think About and Data Sheet) should be turned in with the final report or log.

National Geography Standards:

Standard 8: Student knows and understands the characteristics and spatial distribution of ecosystems on the Earth's surface.

Standard 14: Student knows and understands how human actions modify the physical environment.

Sunshine State Standards:

SC.D.2.3: the student understands the need for protection of the natural systems on Earth.

SS.B.2.3: the student understands the interactions of people and the physical environment.

Resources:

The Web World Wonders website (<http://webworldwonders.firn.edu>) and the related links off the site.

Things To Think About Guide

Before you visit the Web World Wonders site, think about ways you can sharpen your senses and your observational powers.

1. When you visit the Web World Wonders site, think about the value that these locations hold for you and others who live in or visit the state of Florida.
2. Do you see any evidence of vegetation?
3. Do you see any evidence that the water level may sometimes be higher than it is now? Do you see water marks on trees or shrubs? Do you see any leaves or other debris washed up against the trunks of trees?
4. Do you find any evidence of human activity in or around the area?
5. Do you see any evidence of animals? Example: feathers, tracks, bones, nests, etc.
6. Do you see places that look like they would make good areas for nests, dens, or homes? (sketch the location)
7. Do you see any evidence of animal feeding, such as holes in trees?
8. Do you see any animal constructions, such as spider webs?

Sketch anything interesting you observe:

Environmental Observation Data Collection Sheet

Date: _____

Observer's Name: _____

Weather Conditions: Sunny _____ Cloudy _____ Rainy _____
 Hot _____ Cold _____ Moderate _____

Location and comments: _____

General Topography: _____

Land Use:

 Human Alterations: _____

 Nearby Uses: _____

 Disturbances: _____

Birds/comments: _____

Insects/comments: _____

Animals/comments: _____

Vegetation/comments: _____

Water/comments: _____

Sketches:

Water Conservation

Grade Level: Adaptable for all grades.

Time: 2-3 days

Concept: Home and school usage of water, retrofitting

Generalization: Improper management of water use will lead to problems with the environment and society.

Objectives: Students will:

- 1) use research skills to better understand water usage at home and school.
- 2) develop water conservation plans for home and school.

Materials:

computers with internet access

St. John's Water Management District handout "Home Water Use: A Family Survey"

Northwest Florida Water Management District handout "Retro Fit It"

Procedure:

Initiating activity:

Begin the class by asking students how many times a day they wash their hands or brush their teeth. After several responses, ask how much water is used during these types of processes. To help students answer this question, place the following math problem from the handout "*Home Water Use: A Family Survey*" on the board or on an overhead.

Water Use Activity:

Toothbrushing: 3gal/per min. (x) minutes or uses per day (=) total water use per day

Strategy I: Teachers may then use the complete home use survey or visit "Water Science for Schools" at <http://ga.water.usgs.gov/edu/sc4.html> to explore more activities that involve water use and solving water use problems.

Strategy II: Students can then go on a field walk through their school identifying and highlighting water use problem areas and develop a plan for conserving water. This should also be homework! Students should receive the pamphlet "Retro Fit It" to assist in retrofitting their homes and schools. This pamphlet teaches students to look for leaky faucets and suggest what they should do for repairs, such as making toilets low flow; and how to read meters to solve how much water is used in the home.

Culminating activity: Invite a speaker from the local/regional utility company to explain how to better conserve water at home and school. Students can then describe their conservation plans to the guest speaker. While this is taking place, the teacher should be checking the students' ability to explain water usage, how it can be modified, and if they can define the word retrofitting. Students should also create

an inventory of home use before completing the survey and what the changes were after completing the survey and making the necessary changes.

Evaluation: Completion of the home inventory and home conservation plans, and students should develop 2-3 questions to ask the guest speakers.

National Geography Standards:

Standard 14: Student knows and understands how human actions modify the physical environment.

Sunshine State Standards:

LA.A.1.3: the student uses the reading process effectively.

LA.B.2.3: the student writes to communicate ideas and information effectively.

MA.A.3.3: the student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.

MA.B.1.3: the student measures quantities in the real world and uses the measures to solve problems.

SC.D.2.3: the student understands the need for protection of the natural systems on Earth.

SC.G.2.3: the student understands the consequences of using limited natural resources.

SS.B.2.3: the student understands the interactions of people and the physical environment.

Resources:

To receive the “Home Water Use: A Family Survey” handout, please contact the St. John’s River Water Management District, P.O. Box 1429, Palatka, FL 32178-1429, (904) 329-4540.

To receive the “Retro Fit It’ handout, please contact the Northwest Florida Water Management District, 81 Water Management Drive, Havana, FL 32333, (850)-539-5999.

Who Uses Waterways & Why: Case Study of Alexander Springs

Grade level: 6-12

Time: 1-2 class periods depending upon depth teacher goes into unit

Concept:

Social Studies: migration, biogeographic interaction

Science: karst landscape (aquifer and caverns), interaction of plants and animals

Math: measurement

English: metaphor

Generalization: This lesson uses literature to introduce student to the case study of Alexander Springs by examining the physical and cultural characteristics of Florida.

Objectives: Students will be able to:

- 1) interpret descriptive information about Florida's physical and cultural character by reading and discussing the story.
- 2) write an essay that is either persuasive, explanatory or narrative in style.
- 3) incorporate vocabulary associated with the natural environment of Florida's springs in discussion and essay.
- 4) demonstrate ability to read a map.

Materials:

Conserving Florida's Water poster

"Nature's Euphoria" by Jon Harrington, from Atlas of Florida on CD-ROM (included at end of lesson plan)

Other materials the teacher may garner from weblists

FCAT and Florida Writes rubrics and forms

Procedure:

1. Have students read story. If this is for 6-7th graders you may want to introduce vocabulary, or have them work in groups.
2. Uses guided discussion for the questions below:
 - a. Locate Alexander Springs Run. Measure the distance that a mullet would have to travel to get to Alexander Springs from the ocean. Why do mullet make this journey? What other types of fish migrate?
 - b. What is a "boil"? Why does water flow from the boil? Where does the water come from that flows into the springs? Why is this water a constant 72 degrees? (Can be used to introduce karst topography)
 - c. Often when we think of water we think of all the things we can do with it. Name some plants and animals that must live in on or along shore of a river or run. What are their interactions with this body of water?

d. What is the metaphor the author uses? Do you think this euphoria is caused by the place or by the activity? Are activities and places always linked? Write a short story about an activity that is related to one of Florida's waterways.

Evaluation:

1. Use the short response rubrics and answer forms for F-CAT style questions.
2. Write a persuasive/explanatory/narrative essay in Florida Writes format. Have students exchange papers for correction and to brainstorm ideas.

National Geography Standards:

Standard 1: Students know and understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Standard 2: Students know and understand how to analyze the spatial organization of people, places, and environments on the Earth's surface.

Standard 4: Students know and understand the physical and human characteristics of places.

Standard 15: Students know and understand how physical systems affect human systems.

Sunshine State Standards:

SS.B.1.4.5: understands how various factors affect people's mental maps.

SS.B.2.1.1: identifies some physical and human characteristics of places.

SS.B.2.3.3: understands how cultures differ in their use of similar environments and resources.

Glossary:

Adjacent: next to, close by

Aquifer: an underground layer of porous rock

Boil: the site where groundwater enters a stream

Euphoria: a feeling of well-being

Generation: all the people born and living at the same time

Limestone cavern: a large cave in an aquifer system

Migration: the moving together of a group of animals to another region

Remnant: what is left over

Sprawl: to spread out unevenly

Upstream: against the current of a river

Native's Euphoria
By Jonathan Harrington

I sit on the porch swing sipping sweet iced tea from a tall glass. The aroma of orange blossoms lingers in the breeze that rattles the palm fronds in the trees behind my house. I watch a kingfisher diving for fish in the placid lake, and remember my years of exile.

It took five years of living in the cold cities of the North to realize that the Florida I call home and the images of Florida conjured by most snow-bound residents of the northern latitudes are two very different places. When I would describe my home in Central Florida—ten acres on a lake near the edge of the Ocala National Forest—to Northern Friends, they were incredulous. Most of them had been to Florida. But what they had seen—suburban sprawl, gaudy tourist attractions, plastic, neon and asphalt—was nothing like the Florida that I described.

Florida, where I was born and raised, the home I fled from and returned to, is an area of lakes, rivers, springs, creeks, orange groves, and jungle. The Ocala National Forest, the only subtropical forest in America, is alive with wildlife: deer, turkeys, black bears, alligators, wild hogs, bobcats. It is a land of slow, hot evenings when frogs, crickets, and other creatures create a tremendous racket. A rural area in a mostly urban state, it is a land of pickup trucks, Bar-B-Q stands, crackers, blacks, retirees, and the remains of a crippled citrus industry.

While many people in Florida are relatively recent arrivals to the state, I grew up with people who have lived in Florida for generations. Their grandparents homesteaded vast tracts of land from which they hacked out citrus groves. Here the Old South meets the tropics and the values of the South still linger. Yet it is not the South. It is Florida. And Florida has always been and always will be, I hope, a different kind of place.

There is one special place near my home that is among the most beautiful spots in our state. Located approximately an hour and a half north of Orlando off State Road 19, Alexander Springs is one of numerous springs in the Ocala National Forest. Adjacent to the springs are facilities for camping, picnicking, swimming, and hiking.

Although most visitors come by car and park at the national park entrance, I like to put my canoe in at the bridge on Country Road 445 near Astor and paddle upriver to the spring. There is nothing so peaceful as this quiet creek just before dawn. A mist hangs over the water as the sun peeks through the lush shoreline of pine trees and sabal palms. The aroma of pine needles wafts across the stream, and the splash of an alligator slipping off the bank into the water scares up a blue heron that wings its way into the rising sun. This is a scene I have witnessed hundreds of times and of which I never tire.

The creek originates in the “boil” of Alexander Springs, a thirty-foot-deep cavity from which the water bubbles. Alexander is classified as a “first magnitude” spring which pumps over 80 million gallons of water a day from the underground aquifer. This water remains a constant 72 degrees throughout the year.

In the area around the spring the Timucuan Indians followed a traditional way of life, gathering shells, hunting, and fishing. Remnants of their culture in the form of arrowheads and shell mounds can still be

found along the Timucuan Indian Trail that leads off into the dense forest. The trail is posted with interpretive markers that give the names of various plants and explain their significance in the lives of the Timucuan people.

I land my canoe near the spring and swim over the boil with a mask and snorkel. Through the incredibly clear water, I see schools of mullet (which come up-stream from the ocean), bass, bream, and many other fish. The boil is aquamarine, and the white, sandy bottom of the spring glows as if it were phosphorescent.

The boil is popular among scuba divers. On the bottom of the boil are limestone caverns that lure curious divers into their recesses. Some of the divers have never returned to the surface. I am told that they develop a condition known as nitrogen narcosis, in which the diver becomes disoriented and loses consciousness. But other people say that the divers experience a euphoria down deep. Awed by the beauty that surrounds them, they find themselves unable, or unwilling, to return to the surface.

Such has been my love affair with the subtropical latitudes of Florida.

As a child, I daydreamed of the world outside the confines of these lakes and hammocks, sand hills, and forests. At the first opportunity, I left to find that world. But I carried the images of my home with me, through the frozen reaches of the Midwest, and the industrial sprawl of the Northeast, and I knew that one day I would come home. Now I am back, living on the same ten acres where my father planted his roots half a century ago. Now that I am here again, I find myself struck with the diver's euphoria.

I do not know if I will ever surface.

Agriculture and Commercial Water Use

Grade Level: Grades 6-8 and can be adapted to secondary

Time: 3-4 weeks

Concept: Renewable and Non Renewable Resources

Generalization: Water is a valuable nonrenewable resource. This lesson will help students develop an understanding of their environment. Students will learn about the connection between the business community, water issues and our environment. Students will research information, write note cards, and use the information to write a research paper.

Objective: Students will:

- 1) gather and correlate information using a variety of resources.
- 2) organize information into an outline form.
- 3) acknowledge resources and prepare a research paper.

Materials:

index cards
paper
pencils
research material using a media center
internet
envelopes and stamps for letter writing

Procedures:

Initiating Activity:

1. Discuss the importance of water as a nonrenewable resource.
2. Use the water poster to get discussion information about agricultural and/or commercial water usage.

Strategies:

1. Students will decide on the commercial or agricultural company that they are interested in researching.
2. Students will discuss what it is about the company's water usage that they are interested in learning about and brainstorm ways to acquire the needed information.
3. Hand out the research information sheet and have a question and answer time to clarify any concerns.
4. Students will write to the company of their choice to gain insight to the water issues and concerns of that company.
5. Once topics have been chosen, brainstorm ways that information can be found. As the topic is researched, students will want to copy important facts to use in their report. Teach the guidelines for making note cards:
 - a. Use a separate 3 x 5 note card for each fact or idea.
 - b. Take notes in your own words. Do not copy sentences directly from the source. It is not

acceptable to use another writer's work word for word unless it is properly documented. If you want to use an author's words exactly, use quotation marks. Write the page number from where you took the notes .

c. Make a separate "source card" for each source you use. On this card, write down the following information when you list your sources :

Book:

Author's last name, first name. Title. Place of publication: Publisher, date published.

Driver, Raymond L. Bone Valley Comes to Life. Mulberry, FL: Raymond L. Driver, Publisher, 1992.

Magazine:

Author's last name, first name. "Title of article." Title of magazine. Date: page number(s).

Parfit, Michael. "Australia - A Harsh Awakening ." National Geographic. July 2000:2-31.

Encyclopedia:

"Title of article." Title of Encyclopedia. Volume number. Place of publication: Publisher, date.

"Birds." Grolier's Encyclopedia. Vol. 3. New York: Penguin, 1988.

Online Computer:

Follow the format recommended by the online computer information service.

"The Real Price of Water." Britannica's Online Encyclopedia. Download from America Online. 5 May 1998

Culminating activity:

Students will orally present finished paper to the class. Papers will be placed in a viewing area, for example, the media center, for other students to look at. Invite people from the business community to listen to presentations and give feedback. This event could be set up as a community forum or as a debate. Invite the media.

Evaluation: Teacher observation, note cards, written report will be orally presented.

Final grade will include a combination of scores from written and oral work, and teacher observation.

National Geography Standards:

Standard 2: Students know and understand how to use mental maps to organize information about people, places and environments in a spatial context.

Standard 16: Students know and understand the changes that occur in the meaning, use, distribution and importance of resources.

Sunshine State Standards:

SS.B.1.3.2: uses mental maps to organize information about people, places, and environment.

SS.B.1.3.5: knows ways in which the spatial organization of a society changes over time.

SS.B.1.3.6: understands ways in which the regional systems are interconnected.

SS.A.2.3.3: understands important technological developments and how they influenced human society.

SS.A.1.3.2: knows the relative value of primary and secondary sources and uses this information to draw conclusions from historical sources such as data in charts, tables and graphs.

SC.D.2.3.2: knows the positive and negative consequences of human action on the Earth's systems.

- SC.G.2.3.1: learning that some resources are renewable and some are nonrenewable.
- LA.A.2.3.5: locates, organizes, and interprets written information for a variety of purposes, including classroom research, collaborative decision making and performing a school or real world task.
- LA.A.2.3.6: uses a variety of reference materials, including indexes, magazines, newspapers, and journals; and tools, including card catalogs and computer catalogs, to gather information for research topics.
- LA.B.1.3.1: organizes information before writing according to the type and purpose of writing.
- LA.B.1.3.3: produces a final edited document.
- LA.B.2.3.1: writes text, notes, outlines, comments, and observations that demonstrate comprehension of content and experiences from a variety of media.

Resources:

Most companies have educational outreach programs that provide speakers.

Books:

- Boehm, Richard, Armstrong, David, Hunkins, Francis: Geography: The World and Its People, New York, Glencoe/McGraw-Hill, 1998.
- Fernald, Edward, Purdum, Elizabeth. Water Resources Atlas of Florida, Florida State University: Institute of Science and Public Affairs, 1998.

Web sites:

- <http://www.dogpile.com>
<http://www.askjeeves.com>
 good geography and science search sites

National Geographic Society
<http://nationalgeographic.com/gaw>
 lesson plans for Geography Awareness Week

Southwest Florida Water Management District
 2379 Broad Street
 Brooksville, Fl. 34609
 800-423-1476
<http://www.swfwmd.state.fl.us>
 virtual watershed excursion, free teacher materials, Splash (intermediate lesson plans)
 excellent educational outreach program

South Florida Water Management District
<http://www.sfwmd.gov>
 student corner, free materials, great environmental information

St. John's Water Management District
<http://sjr.state.fl.us>
 general information/water resource education, free materials

US Geological Survey
<http://www.usgs.gov>
great posters, information on maps, water monitoring stations data

Where is your company?
Check it out on <http://www.terraserver.com>

Florida Department of Environmental Protection (DEP)
Bureau of Aquatic Plant Management
3917 Commonwealth Blvd. MS# 710
Tallahassee, Fl. 32399-3000
<http://www.dep.state.fl.us>
current environmental issues, park information, water data

Florida Institute of Phosphate Research
1855 W. Main St.
Bartow, FL 33830
Telephone: 863-534-7160
<http://www.fipr.state.fl.us>
excellent educational outreach program, information on all phosphate companies, free materials,
speakers, lesson plans available

Florida Citrus Research
<http://www.fl-citrus-mutual.com>
links to newspaper articles and industry links
Florida agricultural links from this site

<http://www.floridaplants.com>
information on sustainable agriculture and an online search
brittanica.com search from this site

Florida Department of Citrus
PO Box 148
Lakeland, Fl. 33802
<http://www.floridajuce.com>
citrus related links, market and research information, scientific research, news and information

Research Paper Outline

I. Introduction

A. Hook sentence (An interesting quote, fact, or statement that grabs the interest of the reader)

B. Thesis statement (A general statement that gives an overview of the paper.)

Ex: Everyone needs water, but the phosphate industry has some unique usages for this important natural resource. DO NOT write, "I am going to tell you about..." or "in this paper I will write about..."

C. Map sentence (State the three topics you have chosen to write about in the body of paper)

II. Body (For each paragraph follow the TREEES format. Do not write complete sentences for the outline. Use abbreviations and fragments.)

A. Write topic

1. Topic sentence _____

2. Reason _____

3. Elaboration/Explanation _____

4. Example _____

5. Elaboration of example _____

6. Summary statement _____

B. Write topic

1. Topic sentence _____

2. Reason _____

3. Elaboration/Explanation _____

4. Example _____

5. Elaboration of example _____

6. Summary statement _____

C. Write topic

1. Topic sentence _____

2. Reason _____

3. Elaboration/Explanation _____
4. Example _____
5. Elaboration of example _____
6. Summary statement _____

III. Conclusion (Suggested endings: personal reflection, recapping of thesis statement or quote) _____

Research Paper Directions

1. Choose a company to research.

2. Research the company and its use of water, for example, the amount of water it uses, methods of conserving water, is water usage a top priority of the company, etc.

Due date _____

3. Complete the outline - use format given by teacher.

Due Date _____

4. Write a draft.

Due Date _____

5. Peer editing - use form given by teacher.

Due Date _____

6. Rewrite the paper making changes based on your peer editing. Use blue/black ink or type using double spacing. Write on one side of the paper only.

7. Turn in the outline, draft, and final copy. Put a cover sheet on top that has the following elements:

Due Date _____

Title:

Student Name:

Date:

Block:

Interpreting Florida Water Use

Grade Level: 6-9

Time: 90 to 180 minutes

Generalization: Interpreting charts and graphs to gain an understanding of Florida's utilization of water.

Objectives: Students will:

- 1) collect, interpret, and analyze data from a graphic source to solve problems in the real world.
- 2) compare and contrast two sets of data and draw a conclusion.

Materials:

Water Poster
Calculators
Paper and pencil,
Worksheet
Overhead projector

Procedures:

Initiating Activity:

1. Review and discuss the graphs from the poster pointing out the meaning of the percents.
2. Pass out the worksheet.
3. Discuss in small table groups how to complete Exercise 1.
4. Brainstorm ideas and mutually decide how to proceed.
5. Review and discuss the graphs from the poster pointing out the meaning of the percents.

Strategies:

1. Review worksheet with class.
2. Show water use pie charts and bar charts transparency.
3. Ask students to rank the districts from highest to least use of water for Public Supply in 1995.
Does anything change in the 2020 projection?
4. Hand out worksheets.
5. Discuss procedures for solving the problems on the worksheet.

Culminating activity:

Work as table groups to complete the task. Use calculators where appropriate.

Evaluation:

Worksheet

National Geography Standards:

Standard 16: Students know and understand the changes that occur in the meaning, use distribution, and importance of resources.

Standard 18: Students know and understand how to apply geography to interpret the present and plan for the future.

Sunshine State Standards:

- MA.A.1.3.1: The students associate verbal names, written word names and standard numerals with integers, fractions, decimals, numbers expressed as percents, numbers with exponents; numbers in scientific notation, radicals, absolute value; and ratios.
- MA.A.1.3.2: The student understands the relative size of integers, fractions, and decimals; numbers expressed as percents, numbers with exponents numbers in scientific notation; radicals; absolute value; and ratios.
- MA.A.3.3.2: The student selects the appropriate operation to solve problems involving addition, subtraction, multiplication, and division of rational numbers, ratios, proportions, and percents, including the approximate application of the algebraic order of operation.
- MA.A.3.3.3: The student adds, subtracts, multiplies, and divides whole numbers, decimals, and fractions, including mixed numbers, to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.
- MA.A.4.3.1: The student uses estimation strategies to predict results, and to check the reasonableness of results.
- MA.D.1.3.2: The student creates and interprets tables, graphs, equations, and verbal descriptions to explain cause-and-effect relationships.
- MA.E.1.3.1: The student collects, organizes, and displays data in a variety of forms, including tables, line graphs, charts, bar graphs, to determine how different ways of presenting data can lead to different interpretations.
- SS.B.1.3.5: The student knows ways in which the spatial organization of a society changes over time.
- SS.B.1.4.1.b: The student develops maps, tables, graphs, charts, to depict the geographic implications of current world events.
- SS.B.2.3.8: The students knows world patterns of resource distribution and utilization.

WATER USE IN FLORIDA

Directions: Change the percentages in the Pie Chart into decimals to discover the number of gallons we use in a day.

WATER USE CATEGORIES PER DAY	1995	2020	INCREASE IN GALLONS PER DAY
Thermoelectric Power			
Public Supply			
Domestic and other small public supply			
Agricultural Irrigation			
Recreational Irrigation			
Commercial, Industrial or Institutional			
TOTALS			

1. In the State of Florida, what industry uses the greatest amount of water? _____
2. Which industry uses the least amount of water? _____
3. According to the 2020 projections, how many more gallons of water will be used for Public Supply than in 1995? _____
4. How much more water was used in Public Supply than on Commercial/Institutional for 1995?

5. What is the combined amount of water use for Domestic and other Small Public Supply and Recreational Irrigation for 1995? _____
6. Does this number increase or decrease for the 2020 projection? _____
7. How many more gallons of water a day will we use if the 2020 projection is correct?

8. What do you think the demand for water will continue to increase? _____

WATER USE IN FLORIDA

Directions: Change the percentages in the Pie Chart into decimals to discover the number of gallons we use in a day.

WATER USE CATEGORIES PER DAY	1995	2020	INCREASE IN GALLONS PER DAY
Thermoelectric Power	42.70	99.35	56.65
Public Supply	1992.76	3034.75	1041.99
Domestic and other small public supply	306.03	397.40	91.37
Agricultural Irrigation	3672.37	4109.56	437.19
Recreational Irrigation	448.37	7135.2	265.15
Commercial, Industrial or Institutional	654.76	677.40	22.64
TOTALS	7117	9032	1915

1. In the State of Florida, what industry uses the greatest amount of water? ***Agriculture***
2. Which industry uses the least amount of water? ***Thermoelectric Power***
3. According to the 2020 projections, how many more gallons of water will be used for Public Supply than in 1995? ***1,041.99 million gallons.***
4. How much more water was used in Public Supply than on Commercial/Institutional for 1995?
1,338 million gallons.
5. What is the combined amount of water use for Domestic and other Small Public Supply and Recreational Irrigation for 1995? ***3,978.4 million gallons***
6. Does this number increase or decrease for the 2020 projection? ***The number increases.***
7. How many more gallons of water a day will we use if the 2020 projection is correct? ***1,915 million gallons more a day.***
8. Why do you think the demand for water will continue to increase? ***The population of Florida will more than likely increase.***

Time Line

Grade Level: Intermediate/Secondary

Time: One to two weeks (longer if a more in-depth study is expected)

Concept: Water Conservation Issues in Florida

Generalization: Conservation is so much a part of our lives in the 21st century. How has the state of Florida been involved in conserving our water supply?

Objectives: Students will investigate the history of water conservation issues and relate them to the status of water.

Materials/Resources:

paper and pencils/pens
poster board
markers
chart paper
overhead transparencies
vis-à-vis markers
computer with presentation software
props for dramatic presentations

Procedures:

Initiating Activity:

1. Brainstorm ways in which we, as individuals, conserve water and ways our community conserves water. Teacher may need to start with a discussion highlighting what conservation is.
2. Create a KWL chart with students and keep posted throughout the project time. Newspaper articles may be shared with students or students may bring in current articles they find (<http://www.newspaperlinks.com/>).
3. Invite a speaker to come in from the local water department, water management district (see list under references) or check with your school district's speaker list.

Strategies:

1. Depending on the age and abilities of the students, either the teacher or the students will choose a date from the time line and investigate the event.
2. From the following list, the teacher will select items to include in the student's research presentation. A report will be presented to the class that could include: a map of the area being researched, where the information was obtained, actual dates of the event, who made decisions that caused the event to happen or if a natural event, who made decisions after the event that would have affected the environment or people who lived there, personal interview with someone involved in the event, how is this event evident today, has this event caused other events to occur.

Culminating Activity: Students may present the material with technology, visuals, a speaking format or dramatically.

Evaluation: Teachers may create a rubric for students to refer to, of elements they want to see included in a presentation. The rubric should be appropriate for the student’s style of presentation.

National Geography Standards:

Standard 1: Students know and understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Standard 4: Students know and understand the physical and human characteristics of places.

Standard 14: Students know and understand how human actions modify the physical environment.

Standard 16: Students know and understand the changes that occur in the meaning, use, distribution and importance of resources.

Sunshine State Standards:

SS.A.1.1.1: Compares everyday life in different places and times and understands that people, places, and things change over time.

SS.A.1.2.1: Understands how individuals, ideas, decisions, and events can influence history.

SS.A.1.2.2: Uses a variety of methods and sources to understand history (such as interpreting diaries, letters, newspapers; and reading maps and graphs) and knows the difference between primary and secondary sources.

SS.D.1.2.2: Understands that scarcity of resources requires choices on many levels, from the individual to societal.

SS.C.2.3.6: Understands the importance of participation in community service, civic improvement, and political activities.

SS.B.2.4.7: Understands the concept of sustainable development.

SS.B.2.4.5: Knows how humans overcome “limits to growth” imposed by physical systems.

SS.B.2.4.1: Understands how social, cultural, economic, and environmental factors contribute to the dynamic nature of regions.

References:

Atlas of Florida, editors, Edward A. Fernald and Elizabeth D. Purdum, Institute of Science & Public Affairs, Florida State University.

Water Resources Atlas of Florida, editors, Edward A. Fernald and Elizabeth D. Purdum, Institute of Science & Public Affairs, Florida State University.

local Water Management Districts

history of local communities through local libraries

there are many websites that offer information (be cautious about current and accurate information).

Websites:

Southwest Florida Water Management District

2379 Broad Street

Brooksville, Fl. 34609-6899

352/796-7211

<http://www.swfwmd.state.fl.us>

Northwest Florida Water Management District
81 Water Management Drive
Havana, FL 32333
850/539-5999
<http://sun6.dms.state.fl.us/nwfwmd>

Suwannee River Water Management District
9225 CR 49
Live Oak, Fl. 32060
904/362/1001
<http://www.srwmd.state.fl.us>

St. Johns River Water Management District
P.O. Box 1429
Palatka, Fl. 32178-1429
904/329-4500
<http://sjr.state.fl.us>

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Fl. 33416-4680
561/686-8800
<http://www.sfwmd.gov/>

Xeriscape

Grade Level: adaptable for all grade levels

Time: four – 90 min. blocks

Concept: Conservation of natural resources

Generalization: Saving water is an important issue in Florida. Learning to landscape in a way that conserves water and protects the environment is called xeriscape (zeer eh scape). This lesson plan will help students to practice problem solving, learn about the 7 principles of xeriscape, and design a basic landscape project.

Objectives: Students will:

- 1) work in groups to research the xeriscape methods of planting.
- 2) design a yard using the information learned.

Material/Resources:

pencils
erasers
colored pencils and pens
xeriscape pamphlets
websites
xeriscape landscapers

Procedures:

Initiating Activity: At least one month in advance of your lesson, line up a speaker from a Water Management District or a landscaping firm, have students write letters requesting xeriscape information using the resources listed, check out and bookmark appropriate websites.

Opening Activity:

1. brainstorm student's knowledge of xeriscape through the use of a KWL chart.
2. introduce the word "xeriscape" (Xeriscape combines the Greek word xeric (meaning dry) with the word landscape to form a term for a planted area that doesn't need much water.

Strategies:

1. Students will work in groups of four (recorder, researcher, material gatherer and reporter).
2. Groups will know that their job is to create on paper an environmentally friendly landscape.
3. Groups will have paper, plain and grid, markers, crayons, pamphlets and books available for their use, and have appropriate websites bookmarked.
4. Set up a schedule for use of computer and a time line for project completion.
5. Discuss expectations for completed project and set up a rubric for grading.
6. Speaker will be scheduled for one block.
7. Brainstorm various ways that project can be compiled. For example: diorama, collage, graphs and plotting, cutting and pasting pictures into a yard scene, booklets of usable xeriscape plants and shrubs.

Culminating Activities:

1. Students will present their final xeriscape project to the class.
2. Projects and reports can be put on display in media center.
3. Students can put their newfound knowledge into practice by creating a xeriscape landscape project for their school grounds or their home.
4. These activities can be recorded through the use of journals.

Evaluation: Students will receive a combination grade using the established rubric, a presentation grade from the teacher and from their peers and teacher observation.

National Geography Standards:

Standard 1: Students know and understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Standard 2: Students know and understand how to use mental maps to organize information about people, places, and environments in a spatial context.

Standard 16: Students know and understand the changes that occur in the meaning, use, distribution and importance of resources.

Sunshine State Standards:

SS.B.1.3.1: The students use various map forms and other geographic representation, tools and technologies to acquire, process, and report geographic information.

SS.B.2.3.6: The student understands the environment in various world locations.

SS.B.2.3.4: The student understands how the landscape and society change as a consequence of shifting from a dispersed to a concentrated settlement form.

LA.A.2.3.5: The student locates, organizes, and interprets written information for a variety of purposes, including classroom research, collaborative decision making, and performing a school or real-world task

LA.B.1.3.1: The student organizes information to the type and purpose of writing.

SC.G.2.3.1: The students learn that some resources are renewable and others are nonrenewable.

SC.G.1.3.4: The student knows that the interactions of organisms with each other and the non-living parts of their environments result in the flow of energy and the cycling of matter throughout the system.

SC.H.1.2.5: The student knows that a model is different from the real thing, but can be used to learn something about the real thing.

Resources:

Speakers:

University of Florida Extension Services – master gardeners get points for volunteer hours

Home Depot or Lowes

Local gardening clubs and nurseries

Pamphlets:

- ~ A guide to Environmentally Friendly Landscaping
- ~ New and Revised Xeriscape - plant guide (intermediate and up)
- ~ Let's Design a Xeriscape (elementary)

St. Johns River Water Management District

<http://sjr.state.fl.us>

~ Xeric Landscaping with Florida Native Plants

Florida Native Plant Society

PO Box 6116

Spring Hill, Fl. 34606

813-856-8202

Florida Nurserymen and Growers Association

5401 Kirkman Road, Suite 650

Orlando, Fl. 32810

407-345-8137

Web sites:

National Geographic Society

<http://nationalgeographic.com/gaw>

lesson plans for Geography Awareness Week

Southwest Florida Water Management District

2379 Broad Street

Brooksville, Fl. 34609

800-423-1476

<http://www.swfwmd.state.fl.us>

virtual watershed excursion, xeriscape information, free teacher materials, Splash (intermediate lesson plans)

South Florida Water Management District

<http://www.sfwmd.gov>

student corner, free materials, great environmental information

St. John's Water Management District

<http://sjr.state.fl.us>

general information/water resource education, free materials, information on xeriscape

US Geological Survey

<http://www.usgs.gov>

great posters, information on maps, volcanoes, earthquakes, and research projects

Where in the world are you?

Check it out on www.terraserver.com

Florida Department of Environmental Protection (DEP)

Bureau of Aquatic Plant Management

3917 Commonwealth Blvd. MS# 710

Tallahassee, Fl. 32399-3000

www.dep.state.fl.us

current environmental issues, park information

Sarasota Bay NEP

5333 N. Tamiami Trail #103

Sarasota, Fl. 34234

Brochures, pamphlets

Florida Yards & Neighborhoods

program of the Florida Cooperative Extension Service of the University of Florida

<http://hammock.ifas.ufl.edu>

Hiking in Florida's Natural Environment

Grade Level: Middle/Secondary

Time: 90 minute block or two 45 minute periods

Concept: Planning recreational activities using the natural environment as a tourist destination.

Objectives: Students will:

- 1) use the internet to research hiking trails in Florida.
- 2) compile information into a report on a project board complete with a map of the trail, directions to the trailhead, list of materials and supplies needed for each hiker, estimate the time to hike the trail, and an estimate of the total cost of the trip.
- 3) demonstrate ability to work cooperatively within a team.

Materials:

Highway map of Florida - FL DOT can make these available
A computer with internet access
Project display boards
scissors
glue
markers

Background Information:

Florida is a tourist destination for much of the Eastern United States, Canada, and South America. Often we think that recreation is limited to the major tourist attractions. Florida's natural environment is peaceful, quiet and free of the noise and glitz of the "other Florida." We who live here often overlook the local water related recreational facilities that are free or available at a nominal cost. We have great fresh and saltwater fishing, SCUBA diving, hiking, sailing, and canoeing.

Hiking is a low impact and low cost recreational activity. Hiking can be as long and as strenuous as the individual hiker cares to make it. Florida is known for its relatively flat terrain. This can make hiking for first timers a pleasant experience. The diversity of plant and animal life here makes hiking an enjoyable learning experience.

Procedures:

Initiating Activity:

1. Have teams look at the poster from Geography Awareness Week and see if they can identify items that would be related to recreational activities in Florida.
2. Brainstorm a list of items and discuss why they are related to recreation.
3. Using a highway map of Florida, have teams locate national, state, and county parks in your vicinity.

Strategies:

1. Using the internet, have teams search using the key words hiking Florida.
2. Teams will research the sites and determine if any are appropriate to their area.

3. Copy the appropriate material and determine if the trail is worth traveling. Begin building the display to present to the class.
4. The display should include the map of the trail or a terraserver (see web links) photo or topo of the trail, description of the area, estimate of the time and distance to be hiked, gear that should be carried by each hikers, and estimate of the cost of transportation to and from the trail.

Culminating Activity:

1. Each team will present their plan to the class. Class will then vote on the hiking trip they would like to take.
2. If the hike is practical, take the trip on a Saturday. Teams will use a digital camera to record the trip and produce a travel brochure when they return to school.

Evaluation:

Creative use and display of materials

Map of the trail

Pictures of the trail and scenery

List of equipment needed by each hiker

Transportation requirements

Projected cost of the trip

National Geography Standards:

Standard 1: Students know and understand how to use maps and other geographic representations, tools, and technologies to acquire, process and report information from a spatial perspective.

Standard 15: Students know and understand how physical systems affect human systems.

Sunshine State Standards:

SS.B.1.3.1: The student uses various map forms and other geographic representations.

SS.B.1.4.1: The student uses a variety of maps and geographic technologies including geographic information systems and satellite-produced imagery

SS.B.2.3.6: The student understands the environmental consequences of people changing the physical environment in various world locations.

Web Sites:

http://www.swfwmd.state.fl.us/recguide/files/green_swp_hiking.pdf

<http://www.florida-trail.org/>

<http://www.trailwalker.fl-ag.com/>

<http://www.trailwalker.fl-ag.com/explore.htm>

<http://www.trailwalker.fl-ag.com/log.htm>

<http://www.trailwalker.fl-ag.com/get.htm>

<http://www.trailwalker.fl-ag.com/trail.htm>

<http://www.fl-dof.com/Fm/stforest/index.html>

<http://www.wildernet.com/>

<http://www.terraserver.com>

Recreational Irrigation

Grade Level: Secondary

Time: 90 minute block or two 45 minute blocks

Concept: Do we have ample water to use for recreational irrigation?

Generalization: The term recreational irrigation is limited to the water used to irrigate golf courses, nonresidential lawns, cemeteries and playing fields.

Objectives: Students will:

- 1) research the issue of recreational irrigation and to debate the issue.
- 2) demonstrate ability to work cooperatively within a team.

Materials:

Background Information: from ***Water Resources Atlas of Florida***, 1998, pg 125
Water Management District materials on water usage
Florida DEP water usage materials

Background Information:

Recreational irrigation water use includes withdrawals for the artificial application of water on lands to assist in the growing of turf grass or shrubbery. Turf grass includes golf courses, nonresidential lawns, cemeteries, and parks or playing fields. Water withdrawal amounts for this category are estimated based on acreage irrigated multiplied by a crop coefficient generated by selected irrigation models. A small percentage of the water use estimates for this category were derived directly from measured (metered) data.

Recreational irrigation is a new water use category for 1995. In previous years, recreational irrigation was accounted for under the agricultural self-supplied category. Prior to 1985 water withdrawals and acres irrigated for turf grass were included under other crops, but for 1985 and 1990 turf grass values were specifically identified under agricultural self-supplied.

In 1995, 281 mgd (million gallons per day) of freshwater was withdrawn for recreational irrigation with an additional 154 mgd being obtained from reclaimed water. Withdrawals increased 54 percent from 1985, but decreased 9 percent from 1990. Nearly 70 percent of the water withdrawn for recreational irrigation was groundwater, while 30 percent was surface water.

An estimated 93,000 acres were irrigated at nearly 1,100 golf courses throughout Florida in 1995. This is an increase in acreage of about 26 percent from the 74,000 acres irrigated in 1985. The average 18-hole golf course in Florida irrigated about 80 acres or about 4.5 acres per hole in 1995.

Golf course irrigation is the largest user of water in this category, accounting for 67 percent of the withdrawals and 64 percent of the reclaimed wastewater used.

The largest amount of water withdrawn for recreational irrigation in 1995 was in Palm Beach (67 mgd) and Broward (53 mgd) counties. Pinellas County used 40 mgd of reclaimed water for recreational irrigation purposes in 1995.

Monthly withdrawals for recreational irrigation had a large seasonal variation in 1995. Withdrawals were greatest in March through October and lowest in December through February.

Procedure:

Initiating Activity:

1. Introduce the concept of recreational irrigation.
2. Select a student who likes to golf and is in favor of building a new golf course for a new upscale development in your town.
3. Select one student who is the mayor of your town who has worked hard to encouraged the developer to choose your town.
4. Select one student who is from the local water management district.
5. Finally, select one student who is an ardent conservationist/environmentalist.
6. Assign them to research the topic and discuss the need for this development with a golf course.

Strategies:

1. Students will create the rubric to determine the grade for the participants in the discussion/ debate.
2. Students will have access to water management district and Florida DEP information regarding water usage rates in your area.
3. Students will research and plan for a debate/discussion where they will put forth their proposals and defend them from opposing views.

Culminating Activity:

Students will present their portion of the discussion, and defend their views.

Evaluation:

Class will vote on the most persuasive presentation and grade the participants using the rubric created by the class.

National Geography Standards:

Standard 1: The student knows how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Standard 2: The student knows how to use mental maps to organize information about people, places, and environments in a spatial context.

Standard 12: The student knows the process, patterns, and functions of human settlement.

Standard 14: The student knows how human actions modify the physical environment.

Standard 18: The student knows how to apply geography to interpret the present and plan for the future.

Sunshine State Standards:

SS.B.2.4.1: The student understands how social, cultural, economic and environmental factors contribute to the dynamic nature of regions.

SS.B.2.4.5: The student knows how humans overcome “limits to growth” imposed by physical systems.

SS.B.2.4.6: The student understands the concept of suitable development.

Canoeing in Florida's Natural Environment

Grade Level: Middle/Secondary

Time: 90 minute block or two 45 minute periods

Concept:

Planning recreational activities using the natural environment as a tourist destination.

Objectives: Students will:

- 1) use the internet to research rivers or streams in their immediate area.
- 2) determine if they are navigable by canoe, canoe availability, the cost of canoe rental, distance of the trip, extra items needed that are not provided by an outfitter, and distance to the launch site or outfitter.
- 3) compile information into a report on a project board complete with a topographic map or aerial photo of the river, pictures of the expected scenery, a list of materials needed for the trip, and an estimate of the total cost of the trip.
- 4) demonstrate ability to work cooperatively within a team.

Materials:

highway map of Florida
a computer with access to the internet
Project display boards
scissors
glue
markers

Background Information:

Florida is a tourist destination for much of the Eastern United States, Canada, and South America. Often we think that recreation is limited to the major tourist attractions. Florida's environment is peaceful, quiet and free of the noise and glitz of the "other Florida". We who live here often overlook the local water related recreational facilities that are free or available at a nominal cost. We have great fresh and saltwater fishing, SCUBA diving, hiking, sailing, and canoeing.

Canoeing is a low impact activity. Canoe outfitters are available throughout Florida along the many small streams and meandering rivers.

Procedures:

Initiating Activity:

1. Have teams look at the poster from Geography Awareness Week and see if they can identify items that would be related to recreational activities in Florida.
2. Brainstorm a list of items and discuss why they are related to recreation.
3. Using a highway map of Florida, have teams locate the rivers and streams in their vicinity.
4. Locate any national, state, county, or city parks adjacent to the rivers and streams.

Strategies:

1. Using the internet, search using the keywords canoe Florida.
2. Research the sites and determine if any are convenient to your area.
3. Copy the appropriate material and determine if the river is worth traveling. Begin building the display to present to the class.
4. In the display include cost of the trip, transportation to the canoe outfitter, items needed that are not supplied by the outfitter, and personal requirements for the individuals included in the trip.

Culminating Activity:

1. Each team will present their plan to the class. Class will then vote on the canoe trip they would like to take.
2. If the trip is practical, take the trip on a Saturday. Use a digital camera to record the trip and produce a travel brochure when they return to school.

Evaluation:

Creative use and display of materials

Map or aerial photo of the river

Pictures of the river scenery

Transportation requirements

Extra items needed for the trip

Projected itemized cost of the trip

National Geography Standards:

Standard 1: Students know and understand how to use maps and other geographic representations, tools and technologies to acquire, process, and report information from a spatial perspective.

Standard 15: Students know and understand how physical systems affect human systems.

Sunshine State Standards:

SS.B.1.3.1: The student uses various map forms and other geographic representations.

SS.B.1.4.1: The student uses a variety of maps and geographic technologies including geographic information systems and satellite-produced imagery.

SS.B.2.3.6: The student understands the environmental consequences of people changing the physical environment in various world locations.

Web sites:

<http://www.abfla.com/1toct/natf/canu/ecoadv.html>

<http://www.abfla.com/1toct/natf/cano3.html>

<http://www.canoeoutpost.com/>

<http://www.canoeoutpost.com/LittleManatee.html>

<http://www.canoeoutpost.com/peace.html>

<http://www.findaguide.com/cgi-bin/htmlscript?page.hts+FL+CANOERING>

<http://www.nsis.org/books/books-cano.html>

<http://www.paddlefl.com/>

<http://www.paddleflausa.com/>

<http://paddling.net/Outfitters/FL/>

Aquifer Recharge

Grade Level: Adaptable for all grades

Time: one week

Concept: Aquifers, groundwater, recharge

Generalization: A clean environment is an important factor for a healthy community.

Objectives: Students will:

- 1) examine and understand what an aquifer is, how it works, and how Floridians receive fresh water.
- 2) analyze problems that affect water quality.

Materials:

computers with internet access
pictures and diagrams of the aquifers in Florida and of sinkholes
maps of Florida
glossary of terms
maps of your community, neighborhood, city, and county
Rain Gauge materials: class set of tall jars, tape, funnels, pens, and rulers
Graphic organizer for rainfall data

Procedures:

Initiating Activity:

1. Write the word “aquifer” on the board and ask students if they are familiar with the word; check for definition of term. A good diagram of an aquifer can be found on the St. Johns Water Management District website: sjr.state.fl.us/technical/rm/gwp/Images/geohydronew.gra.gif
2. Students will also read the background information provided below that describes aquifers, groundwater, and sinkholes.

Background Information: taken from the *Atlas of Florida*, published in 1994 by the University Press of Florida.

An aquifer is a body of rock or sediment that is sufficiently permeable to yield important quantities of groundwater from springs or wells. Most potable water is located within 50-200 meters of the surface. Beneath this supply of potable water, rock pores are filled with salt water.

The water supply in the aquifers of the state comes from rain that falls directly on the state or on adjacent states within a short distance of the state line. Rainwater that moves slowly downward past the soil zone and into the uppermost aquifer is said to recharge that aquifer. If water withdrawn through wells and springs exceeds the recharge, the aquifer will be depleted.

In artesian aquifers water rises above the top of the aquifer. This rise shows that the aquifer is being recharged in some adjacent, higher area and that the water is under pressure as a result. Areas of recharge are shown on the map. In areas where artesian aquifers discharge to the surface, there is no recharge.

Along the coast where wells pump large quantities of water, saltwater intrusion may occur. Groundwater may acquire undesirable properties in other ways; where soluble minerals are present in the rocks, they may dissolve into the groundwater.

Strategies:

1. Pass out the five scenarios provided to students in cooperative groups. Students are to read and discuss the scenarios assigned to their group.
2. Using maps of their neighborhood, community, city, county, and state, students are to develop alternatives to the situation described in the scenario. Students should pay special attention to areas of high recharge for the aquifers.

Scenario#1: Find a location for a new mall with a large theater complex.

Things to think about: access roads, will it be external to a large metropolitan area, will it be located near a residential section, cost of land.

Scenario #2: Plan a new high school. Be aware that high school students need a large parking lot with space left for staff and faculty.

Things to think about: is it in the path of an airport, has it been EPA approved, sports/recreational facilities, advantages/disadvantages of building near a residential area.

Scenario #3: Find a location for a new amusement park. Remember that amusement rides and lawn care are high priority for these types of parks.

Things to think about: is it away from residential neighborhoods, easy access, is it near major transportation areas.

Scenario #4: Plan a site that can sustain a condominium and a golf course.

Things to think about: will it be located near a large amount of freshwater or a coastal region, what sector of the population is being persuaded to live there (old or young), will there be tax breaks for these people.

Scenario #5: Locate a new cloverleaf interchange for south Florida.

Things to think about: advantages/disadvantages of urbanization, problems associated with urban growth, the infrastructure.

Culminating activity:

To help determine the amount of rainfall in your region, students will build their own measuring system, a rain gauge, to complete this lesson. Remember, rainfall is needed to recharge the aquifers. Students can measure rainfall, or lack of, for one to two weeks. A graphic organizer for recording the rainfall is provided.

To build the rain gauge, students should take a piece of tape and mark every 1/2 inch measurements on the tape with a permanent pen. Then place this piece of tape vertically along the jar. Students should then tape the funnel to the jar and place outside of their homes or school. At the end of the week, have students discuss the amount of rainfall and what the consequences are for human dependency on the aquifers.

Extension activity: Invite a city planner, representatives from the Department of Environmental

Protection and the regional water management district to guest lecture on aquifers and recharge in your classroom.

Evaluation: During the cooperative groups discussion check for the students' ability to explain and describe what an aquifer is and how aquifers are recharged. Also, check for completion of rain gauge graphs and have students explain their findings.

Glossary of Terms:

taken from Merriam-Webster's Collegiate Dictionary-10th edition

Aquifer: a water bearing stratum of permeable rock, sand, or gravel.

Artesian Well: a well in which water is under pressure; especially one in which the water flows to the surface naturally.

Depleted: to empty of a principal substance.

Dissolve: to cause to disperse or disappear.

Exceeds: to extend outside of.

Groundwater: water within the earth that supplies wells and springs.

Intrusion: the act of intruding or the state of being intruded.

Potable: a liquid that is suitable for drinking.

Recharge: to charge again.

Soluble: capable of being loosened or dissolved.

Undesirable: not desired; or unwanted.

National Geography Standards:

Standard 7: Students know and understand the physical processes that shape the patterns of the Earth's surface.

Standard 14: Students know and understand how human actions modify the physical environment.

Sunshine State Standards:

LA.C.1.3- the student uses listening strategies effectively.

LA.C.3.3- the student uses speaking strategies effectively.

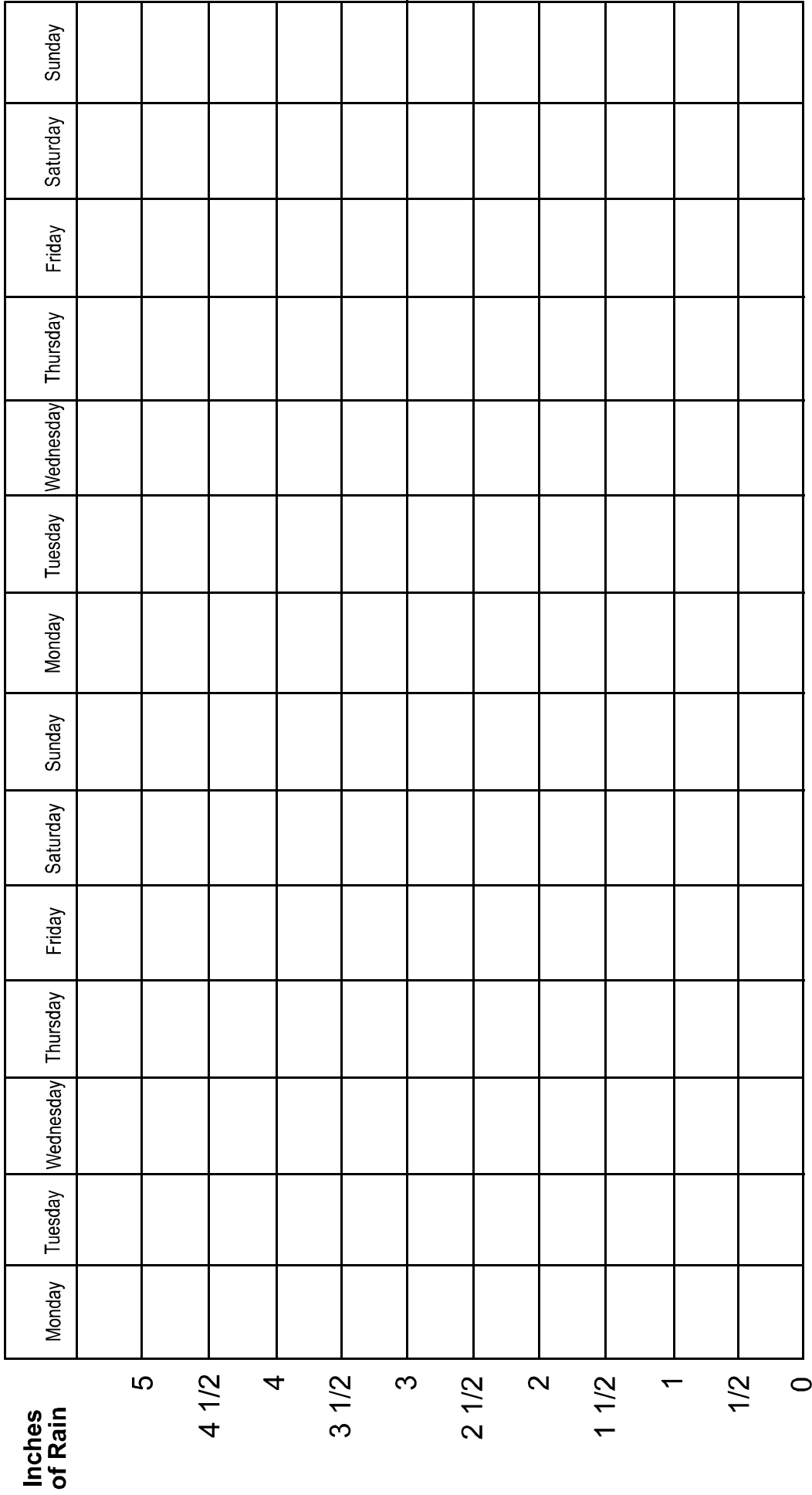
MA.B.1.3- the student measures quantities in the real world and uses the measures to solve problems.

SC.D.2.3- the student understands the need for protection of the natural systems on Earth.

SC.G.2.3- the student understands the consequences of using limited natural resources.

SS.B.2.3- the student understands the interactions of people and the physical environment.

Rain Bar Graph



The Water Cycle

Here Today, Here Tomorrow

Grade Level: Middle & High School

Time: 2 hours

Generalization: The Hydrologic Cycle is a closed system powered by the sun. The water we use now has been around for millions of years. Since “what does up, must come down” it is important not to pollute the water we may end up drinking someday.

Objectives: Students will:

- 1) describe the hydrologic cycle.
- 2) compare and contrast evaporation and transpiration.
- 3) describe the different types of precipitation.
- 4) observe and identify the different parts of the hydrologic cycle.
- 5) evaluate the consequences of hazardous waste on our water supply.

Materials:

Two clear bottles or glasses of water; one clean, one dirty
Transparencies of clean and contaminated hydrologic cycles (transparency masters included at end of lesson plans)
TV/VCR
Hydrologic Cycle Crossword Puzzle
Non-lined 8 1/2 x 11 paper for each student
Color pencils, markers or crayons

Procedures:

Initiating Activity:

Do: Have a bottle of clean water in your hand and drink from it.

Say: What do we have in common with Socrates, Caesar, Joan of Arc, Abraham Lincoln and Martin Luther King? Believe it or not, it is possible that we are drinking the same water they drank! How can this be true?

Strategies

Show: Visual of hydrologic cycle.

Explain: Water is always on the move. This process is called the hydrologic cycle. How does the cycle work? Water is transported into the air from the ground, trees, lakes and the ocean . To complete the cycle, it finds its way back down to earth in the form of rain, sleet, and snow. This is a continuous cycle that has been going since the formation of our earth. Lets look more closely at this process.

Song & Hand Movements: Now in order to get you used to the terminology you will be using, we are going to do the.....“The Water Cycle Boogie”. Have class stand. (Yes this works with freshman!) For the younger students, you can use the melody of “Wheels on The Bus”. For the older students, you can use a rap or chant. Another option would be to give the terms to the students and let them create their own rap. You could also use this as an evaluation.

Teach the Song:

“The Water Cycle Boogie”

Evaporation,
Transpiration,
Condensation,
Precipitation,
Infiltration,

And the water cycle boogie goes ‘round and ‘round,
And the water cycle boogie goes up and down.

(Water Cycle Boogie taken from Water: A Never-Ending Story)

Repeat a couple of times, have a little competition, i.e. odds and evens, left side of room vs. right side. Have fun with it! (You could drop the last two lines with the older students in order to get a faster groove going)

Activity: Now, what do these terms all mean? Tell them that activity they are about to begin will help them to make sense of the hydrologic cycle. (This can be an individual or paired activity. Make sure everyone has a textbook or dictionary before you begin. Pass out the crossword puzzles but make sure they are all face down.) Tell them that the first three individuals/pairs to complete the crossword will win a prize, i.e. candy, bookmarks, stickers, homework pass, etc... (May use as homework)

Discussion: The terms you have been working with are all significant parts of the hydrologic cycle. Show the Hydrologic Cycle visual. Use the crossword puzzle you have just completed to help you to follow our discussion on the Hydrologic Cycle. You can also use the puzzle to help you answer questions.

Evaporation: The sun’s energy powers the hydrologic cycle. Invisible light rays are absorbed by the earth’s atmosphere and surface and converted into heat. As water heats, it begins to evaporate. What is evaporation? A process in which water goes from a liquid form to a vapor form and lifts into the atmosphere. Where could you find evaporation? Water evaporates from rivers streams, lakes and oceans. Which would evaporate first, the water in a small pool under the shade of a large tree or the water in a small pool out in the open? Explain your answer. Students should respond that the water from the pool out in the open would evaporate first given the fact that it would heat faster than the pool in the shade.

Transpiration: How is transpiration different from evaporation? It is a process by which water is released from plants and animals. That means water that evaporates from our own bodies is part of the Hydrologic Cycle! Can you think of examples?

Evapotranspiration: What does this word mean? The process by which water is evaporating from the ground and transpiring from plants and animals....Evapotranspiration.

Condensation: We said before that the hydrologic cycle is a closed system. What do we mean by this? A process contained entirely within itself. Where does all that water vapor go? It doesn't go into outer space. The vapor reaches cooler layers of our atmosphere. Then it clings to particles in the air and begins to change. What is condensation? The process of changing vapor into liquid. Think of clouds or fog. Have you ever observed a nice cold bottle of soda? What happens to the outside of your soda bottle? Why?

Precipitation: How does this liquid form of water get back down to us? What is precipitation? The process in which water falls to the Earth. What types of precipitation are there? Precipitation can fall in forms of rain, snow, sleet or hail. What determines what form it will take? The form it will take is based on temperature. Where does the water go once it comes down?

Infiltration: What is infiltration? The process by which water is absorbed into the ground. This water becomes part of our ground water supply. What is it called if the water is not absorbed into the ground? This is called runoff. Can you think of where the water could go from here? Water could go into roots of trees and plants, rivers, streams, oceans, our drinking water. (Bring home the point by drinking from a bottle of clean water.)

Culminating Activity:

Show: Video that demonstrates the Hydrologic Cycle or NASA's Observatorium Hydrologic Cycle website, observe.ivv.nasa.gov/nasa/earth/hydrocycle/hydro1.htm

Sing/Chant: "The Water Cycle Boogie"

Activity: Have students draw a diagram of the Hydrologic Cycle labeling each step with arrows. Instruct them to make it as detailed as possible. Display their work on the walls.

Concluding Activity:

Do: Have a bottle of dirty water in your hand and start to drink it. Very dramatically, notice that the water is dirty. Ask the students how this could have happened?

Show: Visual of contaminated hydrologic cycle.

Discuss: Discuss all the things that could contaminate the water during the hydrologic process. Since this process is a closed system, where do all the chemicals and waste go that is deposited into our water system? Discuss the impact of mining, farming, sewage, and underground oil drums on our environment. Ask: Did you know that 2/3 of our planet is made of water? But only 1% is drinkable. How can we protect and conserve this most valuable resource?

Evaluation: Have students write a press release or news article using the facts generated in this lesson that highlight the importance of protecting and conserving our water resource. After the students have completed this assignment, have a few students share their papers with the class or have them share their papers in small teams and discuss.

National Geography Standards:

Standard 7: Students know and understand the physical processes that shape the patterns of the Earth's surface.

Standard 8: Students know and understand the characteristics and spatial distribution of ecosystems on the Earth's surface.

Sunshine State Standards:

SS.B.2.3.9: Understand how the interaction between physical and human systems affects current conditions on Earth.

SS.B.2.4.4: Understand the global impact of human changes in the physical environment.

SC.D.2.3.2: Knows the positive and negative consequences of human action on the Earth's systems.

SC.G.2.4.6: Knows the ways in which humans today are placing their environmental support systems at risk.

FCAT: Lesson provides practice in using graphics and in identifying patterns and making predictions, inferences, and valid conclusions.

Resources:

Water Resources Atlas of Florida, Edward A. Fernald & Elizabeth D. Purdum, Chapter 1

Splash, Water Resource Education: Hydro-Cycle Works, Southwest Florida Water Management District.

Florida Geology Unearthed Video, Dr. Jonathan D. Arthur, Part 4
(ordering information: Florida Geological Survey, Librarian -Phone: 850-488-9380)

Web Sites:

NASA's Observatorium Hydrologic Cycle (Fantastic graphics!)
observe.ivv.nasa.gov/nasa/earth/hydrocycle/hydro1.html (Need Flash, download from:
www.macromedia.com/shockwave/download)

Water: A Never-Ending Story (grades 4-5)
www-k12.atmos.washington.edu/k12/pilot/water_cycle/teacherpage.html (lots of hands on activities!)

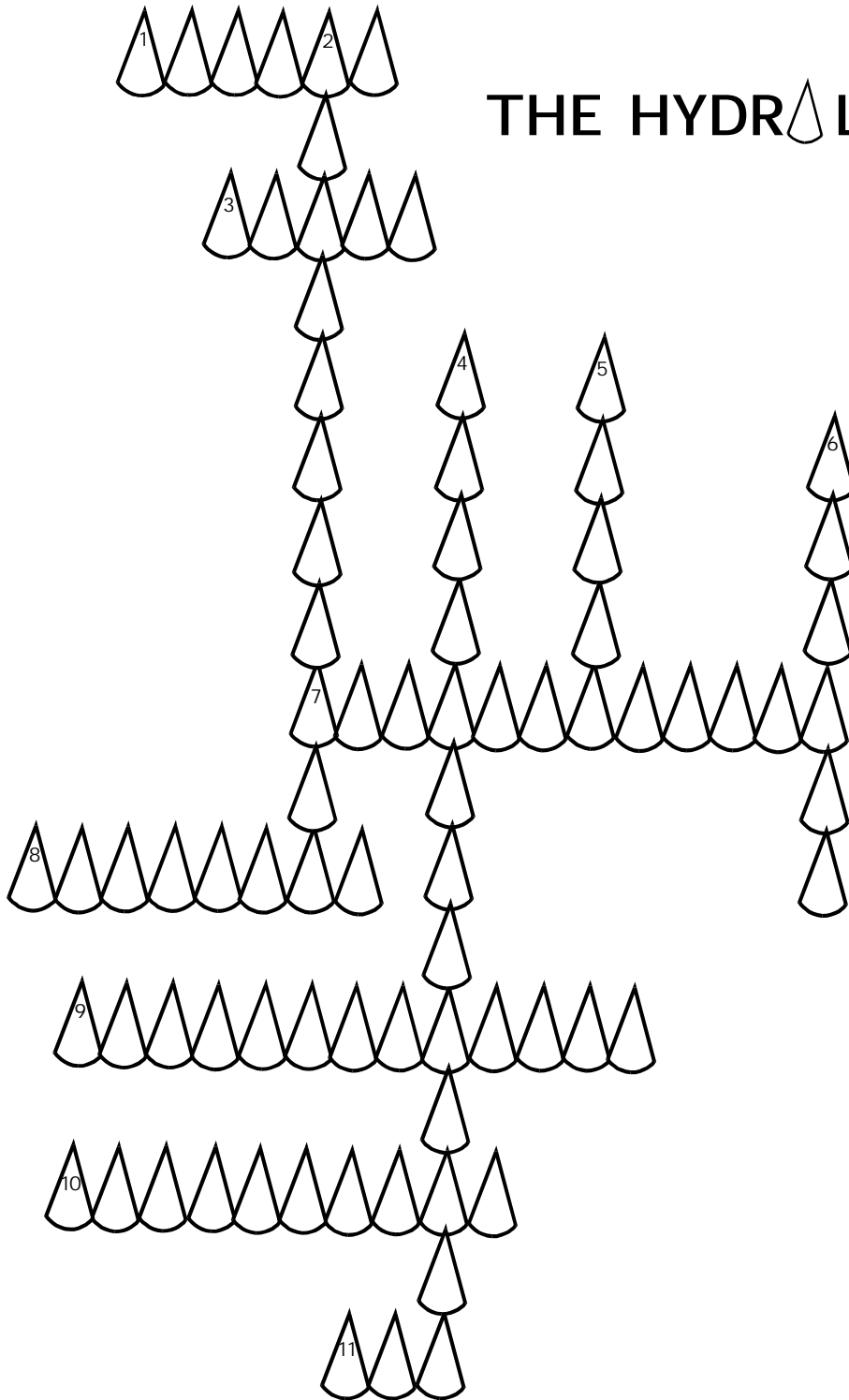
Orcas Watershed Education Alliance (Middle & High School)
www.pacificrim.net/~stop/know.html

Environment Canada: Water - Forever on the Move (Middle & High School)
www.ec.gc.ca/water/en/info/pubs/primer/e_prim01.htm

Southwest Florida Water Management District
www.swfwmd.state.fl.us

Solar Energy, An Encarta Encyclopedia Article
Encarta.msn.com/find/concise.asp?ti=00D1A000

THE HYDROLOGIC CYCLE



Across:

1. A process contained entirely with itself is called a _____ system.
3. Evaporation occurs when the sun's energy _____ the water.
7. A process by which water is absorbed into the ground.
8. The water we drink today has been around for _____ of years.
9. A process by which water is released from plants and animals.
10. Continuous cycle in which water travels is called the _____ cycle.
11. Water that reaches the surface but does not infiltrate the soil is called _____

Down:

2. A process by which water goes from liquid to vapor.
4. Rain is a type of _____.
5. Condensation is the process by which water goes from _____ to liquid.
6. Evapotranspiration is the process in which water is evaporating from the ground and transpiring from the _____.

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THE HYDROLOGIC CYCLE

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Across:

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Conservation Lands in Florida

Grade Level: K-12

Time: 1 week

Concept: My State/Careers

Generalization: Many of the federal and state owned properties in our state have programs or activities that people can participate in and interact with. If an appreciation of these areas are taken by the students, it will initiate a need to conserve them for the future.

Objectives: Students will:

- 1) use research skills and materials to learn facts and information about state and federally owned properties in our state.
- 2) use map and writing skills to write directions on how to get to a federal and state owned property.

Materials:

paper/pencil/pen
computers
word processing
map software
internet connection
state maps and atlases
overhead and transparencies
digital camera

Procedures:

Initiating Activity:

1. Introduce or review a map legend. Depending on the knowledge of the students, you may use a very simple or more complicated map legend.
2. Share with students brochures produced for parks. You may want to use this activity as a tie-in to a Career Unit (outdoor careers).
3. Brainstorm with the students what types of careers can you choose that would allow you to work outdoors.

Strategies:

1. After looking at a map, discuss land cover. Ask what types of activities could you do on certain types of land.
2. At this point make sure that the map you are using has state and federally owned property identified (you may refer to the accompanying FGA poster). Students will choose one state and one federally owned location from the map to:
 - a. identify.
 - b. locate the county
 - c. using a road map, write the directions to get there

- d. find out what visitors can do there or what is happening there if visitors are not allowed.
3. If it's feasible, a class trip could be planned to one of these locations. Students could conduct science experiments, make journal entries about what they see, hear and experience, participate in a project that is underway, clean-up, etc., while they are there. If it is not feasible, use the Web World Wonders web site (<http://webworldwonders.firn.edu>).

Culminating Activity: Create a brochure about the place they researched. These final projects would be shared with the manager of the located properties. The field trip could also be a culminating activity.

Evaluation: A template could be created to guide the information you want the students to include in the brochure. The written directions could be evaluated on grammar, punctuation, spelling for technical writing.

National Geography Standards:

- Standard 1: Students know and understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.
- Standard 4: Students know and understand the physical and human characteristics of places.
- Standard 5: Students know and understand that people create regions to interpret earth's complexity.
- Standard 14: Students know and understand how human actions modify the physical environment.

Sunshine State Standards:

- SS.B.1.1.1: determines the absolute and relative location of people, places, and things.
- SS.B.1.1.2: uses simple maps, globes and other three dimensional models to identify and locate places.
- SS.B.1.2.1: uses maps, globes, charts, graphs, and other geographic tools including map keys and symbols to gather and interpret data and to draw conclusions about physical patterns.
- SS.B.1.4.2: understands the advantages and disadvantages of using maps from different sources and different points of view.
- LA.B.2.2.5: The student creates expository responses in which ideas and details follow an organizational pattern and are relevant to the purpose.
- LA.B.2.2.1 and LA.B.2.3.1: The student writes text, notes, outlines, comments, and observations that demonstrate comprehension of content and experiences from a variety of media.

Modeling The Formation of a River

Grade Level: 6-10

Time: Two class periods. The minimum time required to generate a suitable stream is about three hours. Water that moves too fast tends to create gorges rather than meandering streams. Best results occur if the stream is generated overnight.

Concept: The dynamics of fluvial stream construction and shapes.

Generalization: The processes that form the characteristics that we associate with many large geologic systems can be duplicated in the laboratory on a much smaller scale. One such system is the formation of a river. Using a stream table to duplicate the processes that are at work in the real world, educators can demonstrate how a stream develops the characteristics that we associate with the shape of rivers. Using a minimum of preparation time and inexpensive equipment, a stream table can be constructed that will reveal examples of cut-banks, meandering, terraces, channeling, alluvial fans and deltas.

Objectives: Student will:

- 1) be able to understand the dynamics of how a stream develops.
- 2) be able to use the terminology that is associated with the infrastructure of a stream or river.
- 3) be able to look at a stream or river on a map and be able to identify and discuss the various characteristics that are present.

Materials:

- Stream table - See attached directions for building a workable table for less than \$100.00.
- Water connection for hose.
- An area for operating the stream table. A greenhouse or outside is best.
- Detailed map showing a river.

Procedure:

Initiating Activity:

Starting at the headwater end of the stream table fill it with wet sand for four or five feet. A general slope of approximately 20 degrees should be constructed at the terminal end of the sand. Wet sand allows you to shape and smooth your contour. Students should observe the stream table set-up. Ask them to write a description of the sand as well as drawing a pre-experimental diagram. (If you have a digital camera and a computer program, sequential pictures of the experiment will document the changes that occur.)

Elevate the stream table to a height of five degrees. Later you may wish to raise the table at various angles to study the effect of slope. Now turn on your source of water. **Remember that the faster the water flows the faster the erosion.** Best results are obtained when the water runs slow and you proceed for at least three hours. The results should mimic the formation of the real thing with the basic exception that water leaks out of the system at the headwaters and this causes some stream channels to dry up and to be abandoned. In the real world rain-water would continue to fill the abandoned channels as well. By the time the experiment has run its course, sand should be distributed the length of the stream table. The terminal end should be fanned to represent a delta.

Analysis:

Several characteristics can appear in your stream. Below are listed a few of the characteristics you should find.

1. Meandering - the snake like appearance of a stream.
2. Old channels - places where the stream changed course.
3. Cutbanks - high steep banks along the edge of the channel.
4. Terraces - areas running parallel with the stream where water overflowed a channel and created a flood plain.
5. Braided streams - where the stream is broken into many smaller streams.
6. Headwater retreat - this is where the stream floor is cut down (deepened) and is moving toward the headwaters. This is the same as what you would expect from a rapids or a waterfall.
7. Alluvial fan (Delta) - at the terminal end the sand spreads out across the width of the stream table.
8. Lobes - rounded edges of the terminal end where deltas are forming.
9. Active Areas - dynamic areas where water is running out of the alluvial fan as opposed to inactive areas where the fan is static.
10. Ox Bows - This characteristic usually does not form, possibly from the short length of the stream and from channel leaking.

Evaluation:

1. Have the students draw and label the stream at several intervals of formation.
2. They can answer questions about the terminology that is associated with stream characteristics and the process of change. (Examples: Which characteristic appeared first? How did the stream change over time? Did the stream continue to flow in approximately the same area or did it move to the right or the left? What would cause a stream to move?)
3. Give students a map of a large river. Have the students identify places on the map that show stream characteristics that were witnessed from the stream table.

National Geography Standards:

Standard 1: Students know and understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Standard 7: Students know and understand the physical processes that shape the patterns of Earth's surface.

Standard 8: Students know and understand the characteristics and spatial distribution of ecosystems on Earth's surface.

Sunshine State Standards:

SS.B.1.3.2: The student uses mental maps to organize information about people, places and environment.

SS.B.1.4.1: The student uses a variety of maps, geographic technologies including geographic information systems (GIS) and satellite-produced imagery, and other advanced graphic representations to depict geographic problems.

MA.A.3.3.2: The student selects the appropriate operation to solve problems involving addition, subtraction, multiplication, and division of rational numbers, ratios, proportions, and percents, including the approximate application of the algebraic order of operation.

MA.A.3.3.3: The student adds, subtracts, multiplies, and divides whole numbers, decimals, and fractions, including mixed numbers, to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

MA.A.4.3.1: The student uses estimation strategies to predict results, and to check the reasonableness of results.

Resources:

The University of Nebraska at Omaha has a great web site for displaying the results of a stream table experiment. It is found in one of their on-line geology courses taught by Dr. George Maher.

The web address is: ***<http://maps.unomaha.edu/Maher/geo101/tablea.html>***

Building a Stream Table

Materials :

4 x 8 sheet of 5/8 exterior grade plywood if it is to be painted. (Marine grade can be used if you decide not to paint it.)

3 eight foot 2 x 4s (Again you can use treated lumber if you do not wish to paint.)

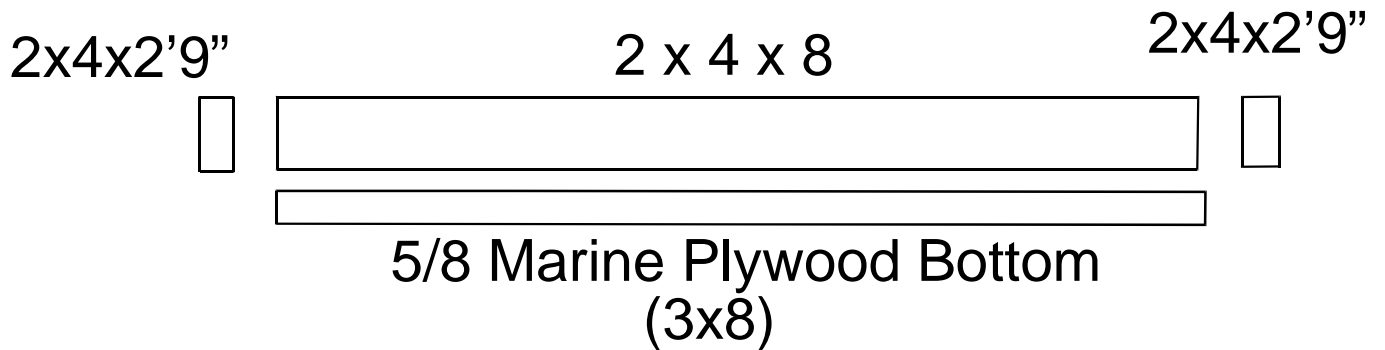
Metal Strapping

3" galvanized sinkers or 2 1/2" deck screws. (When the stream table is moved while containing the sand, it is very heavy.)

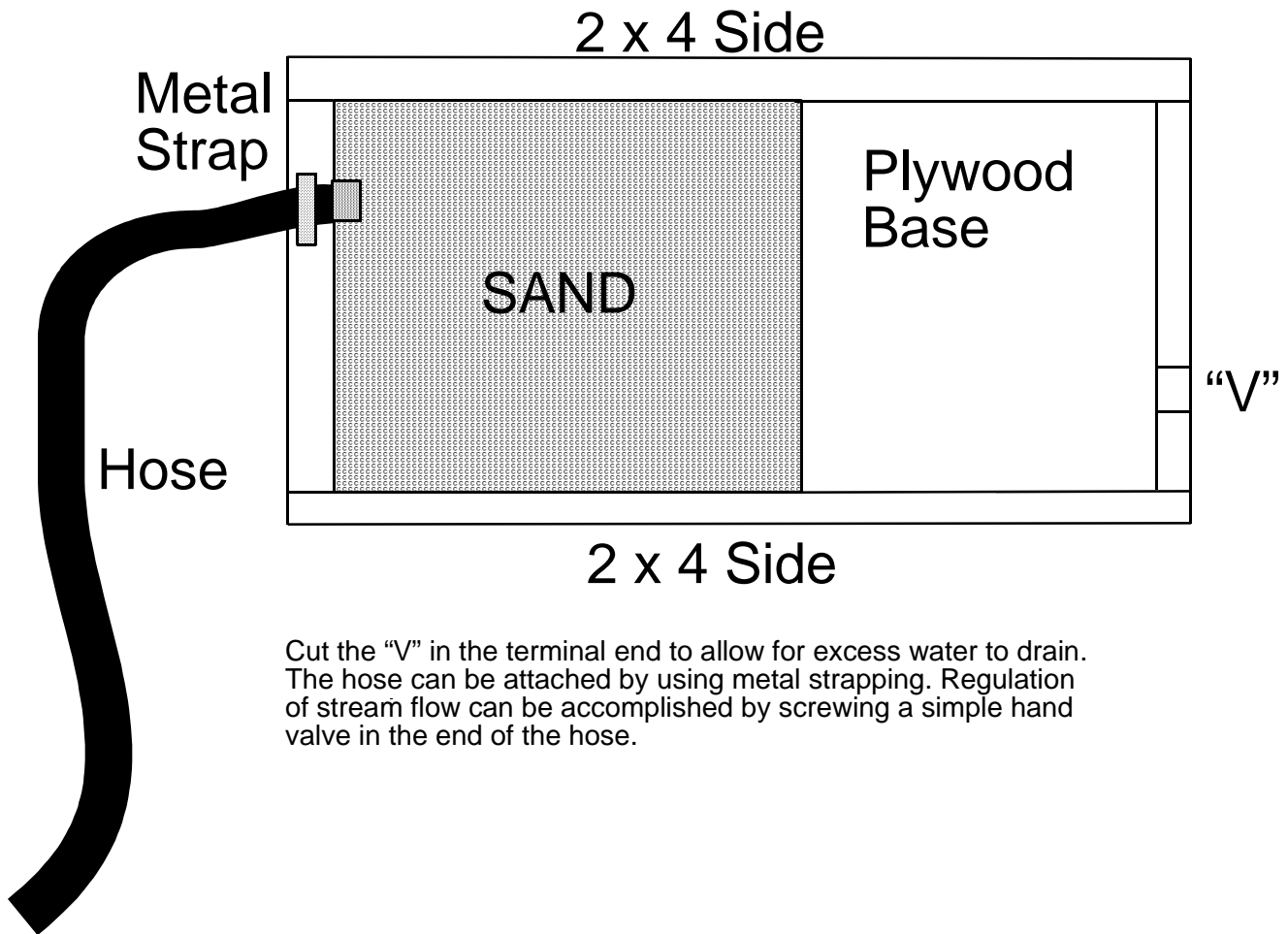
Procedure:

1. Trim the plywood to a width of 3 feet.
2. Two of the 2 x 4s are to be used for the sides of the stream table.
3. Cut the third 2 x 4 so that you have 2 sections for the ends. They should be 2' 9" long as they will sit inside the side walls.
4. On the terminal of the board cut a "V" into the wall about 12" from a side. The depth of the "V" should be about 1.5".
5. On the headwater end of the stream table use some type of metal strapping as a place where you will tie your hose into place. The hose must be secure so that it does not move during the experiment.

Constructing a Stream Table



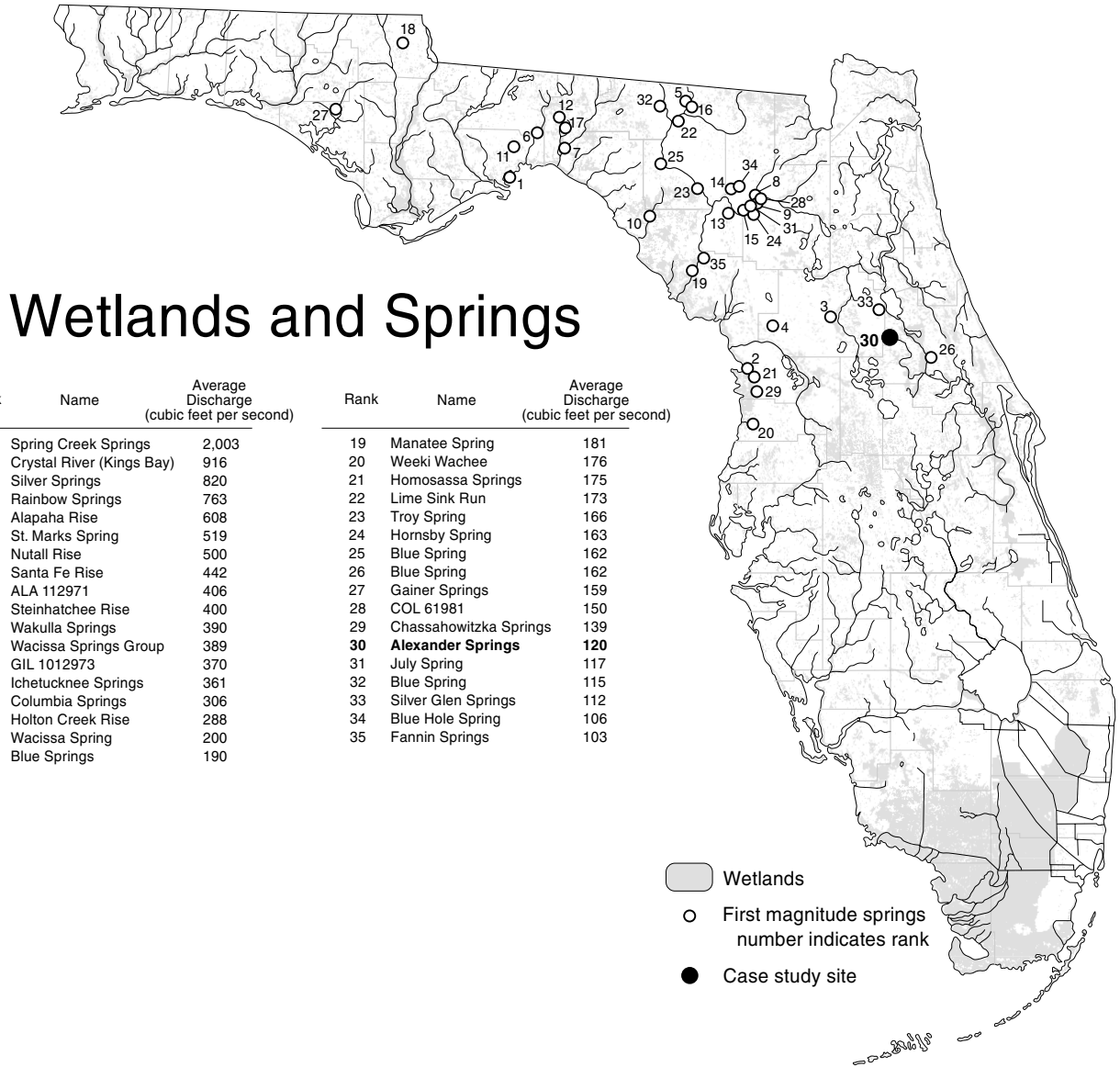
Use 2 1/2" deck screws to attach the base to the 2x4s. There is a lot of weight on the base when the sand is placed on the table.



Cut the "V" in the terminal end to allow for excess water to drain. The hose can be attached by using metal strapping. Regulation of stream flow can be accomplished by screwing a simple hand valve in the end of the hose.

Poster Blackline Masters

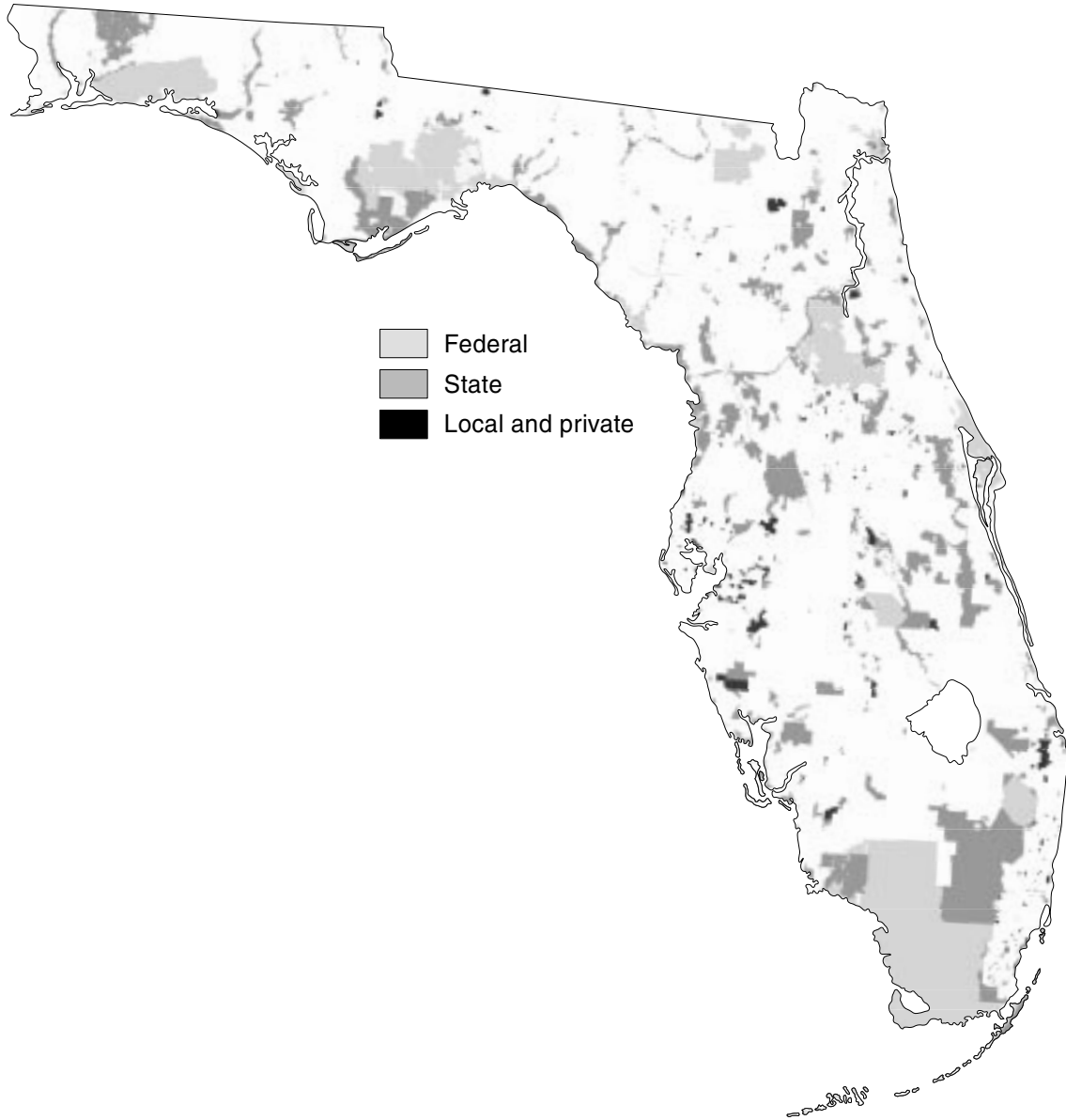
Wetlands and Springs



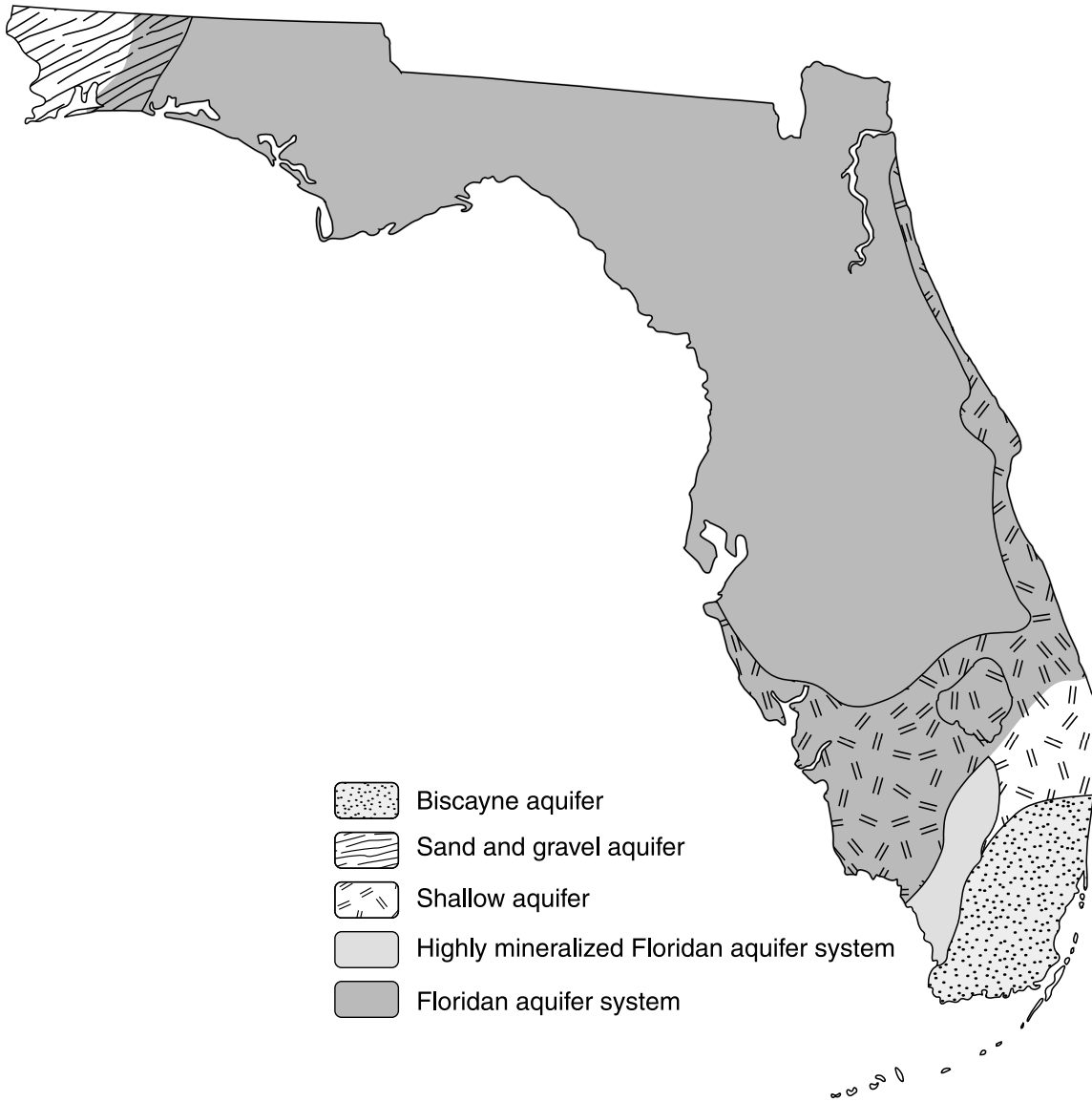
Wetlands and Springs

Rank	Name	Average Discharge (cubic feet per second)	Rank	Name	Average Discharge (cubic feet per second)
1	Spring Creek Springs	2,003	19	Manatee Spring	181
2	Crystal River (Kings Bay)	916	20	Weeki Wachee	176
3	Silver Springs	820	21	Homosassa Springs	175
4	Rainbow Springs	763	22	Lime Sink Run	173
5	Alapaha Rise	608	23	Troy Spring	166
6	St. Marks Spring	519	24	Hornsby Spring	163
7	Nutall Rise	500	25	Blue Spring	162
8	Santa Fe Rise	442	26	Blue Spring	162
9	ALA 112971	406	27	Gainer Springs	159
10	Steinhatchee Rise	400	28	COL 61981	150
11	Wakulla Springs	390	29	Chassahowitzka Springs	139
12	Wacissa Springs Group	389	30	Alexander Springs	120
13	GIL 1012973	370	31	July Spring	117
14	Ichetucknee Springs	361	32	Blue Spring	115
15	Columbia Springs	306	33	Silver Glen Springs	112
16	Holton Creek Rise	288	34	Blue Hole Spring	106
17	Wacissa Spring	200	35	Fannin Springs	103
18	Blue Springs	190			

Conservation Lands

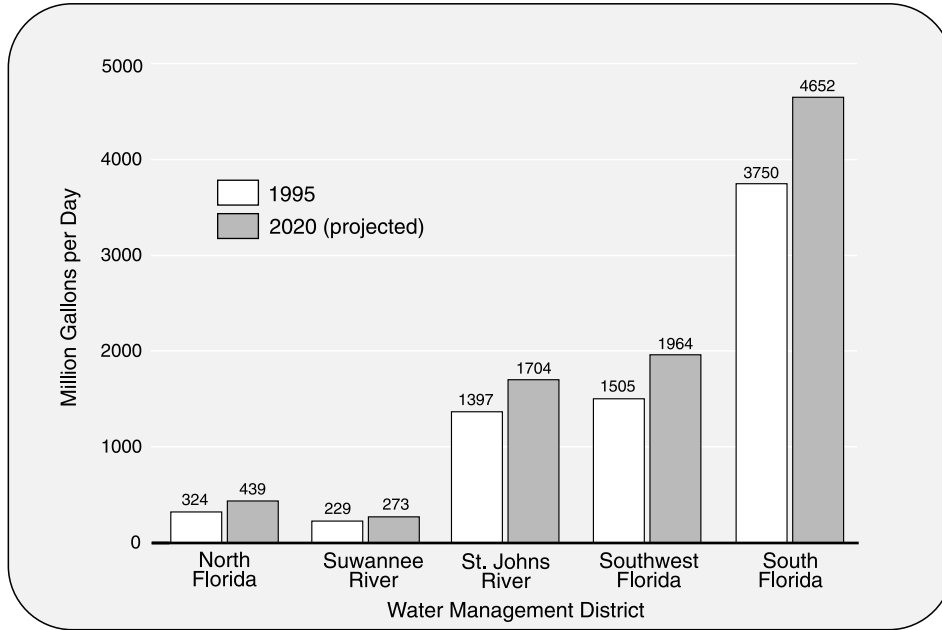


Aquifers

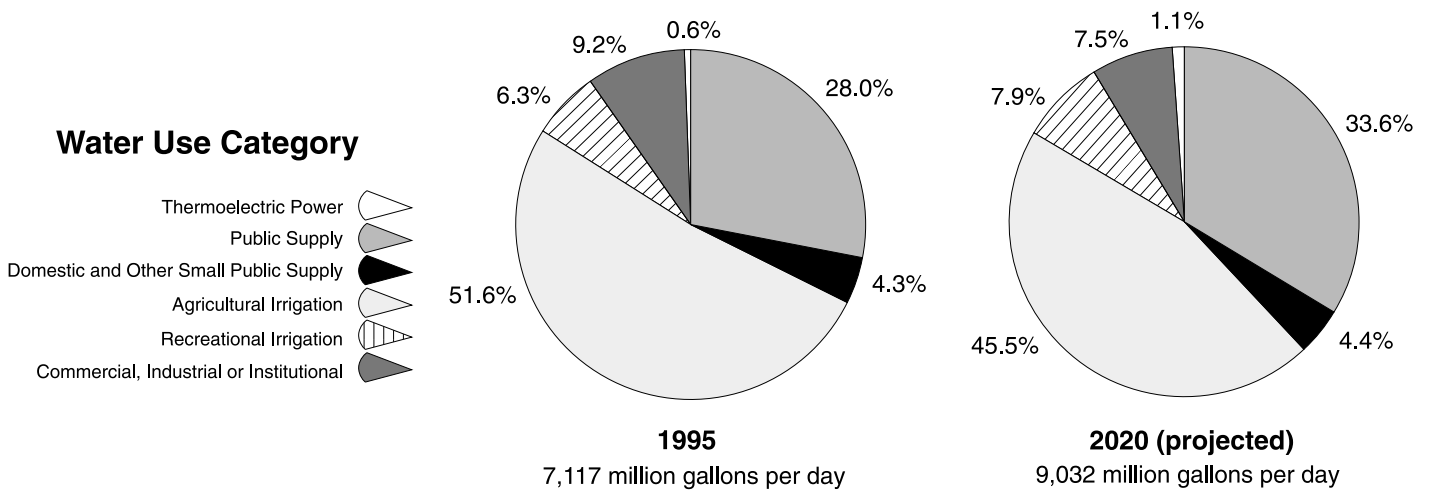


Water Use

Fresh Water Demand 1995 and 2020

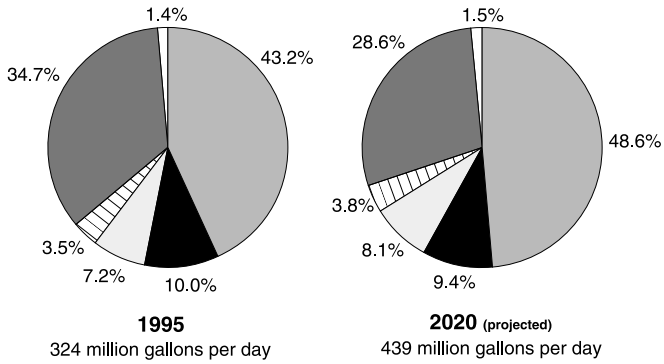


Statewide Water Use

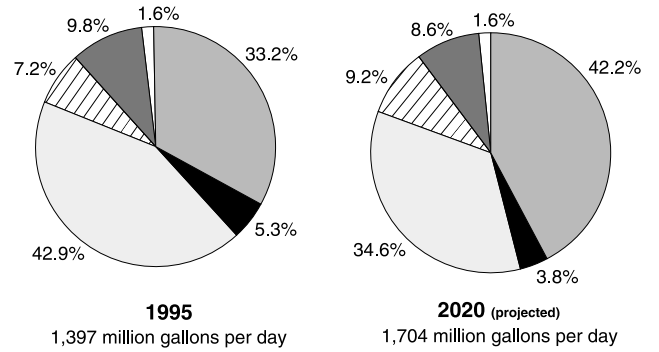


Water Use by District

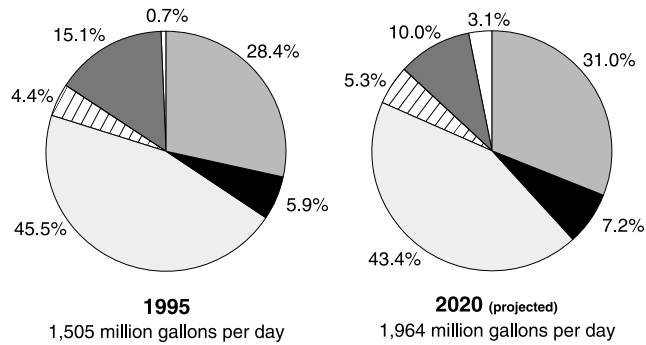
**Northwest Florida Water Management District
Water Use**



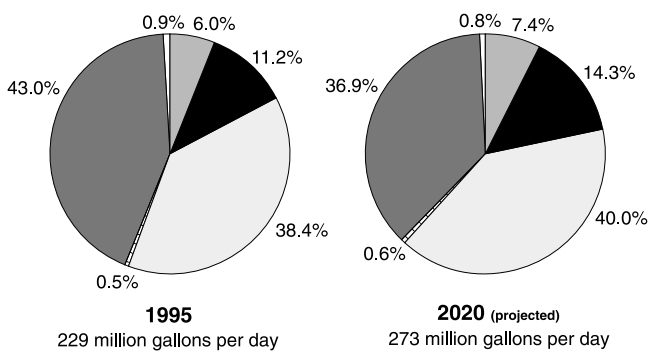
**St. Johns River Water Management District
Water Use**



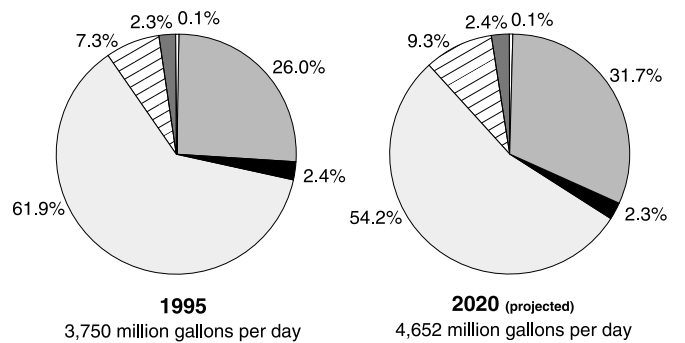
**Southwest Florida Water Management District
Water Use**



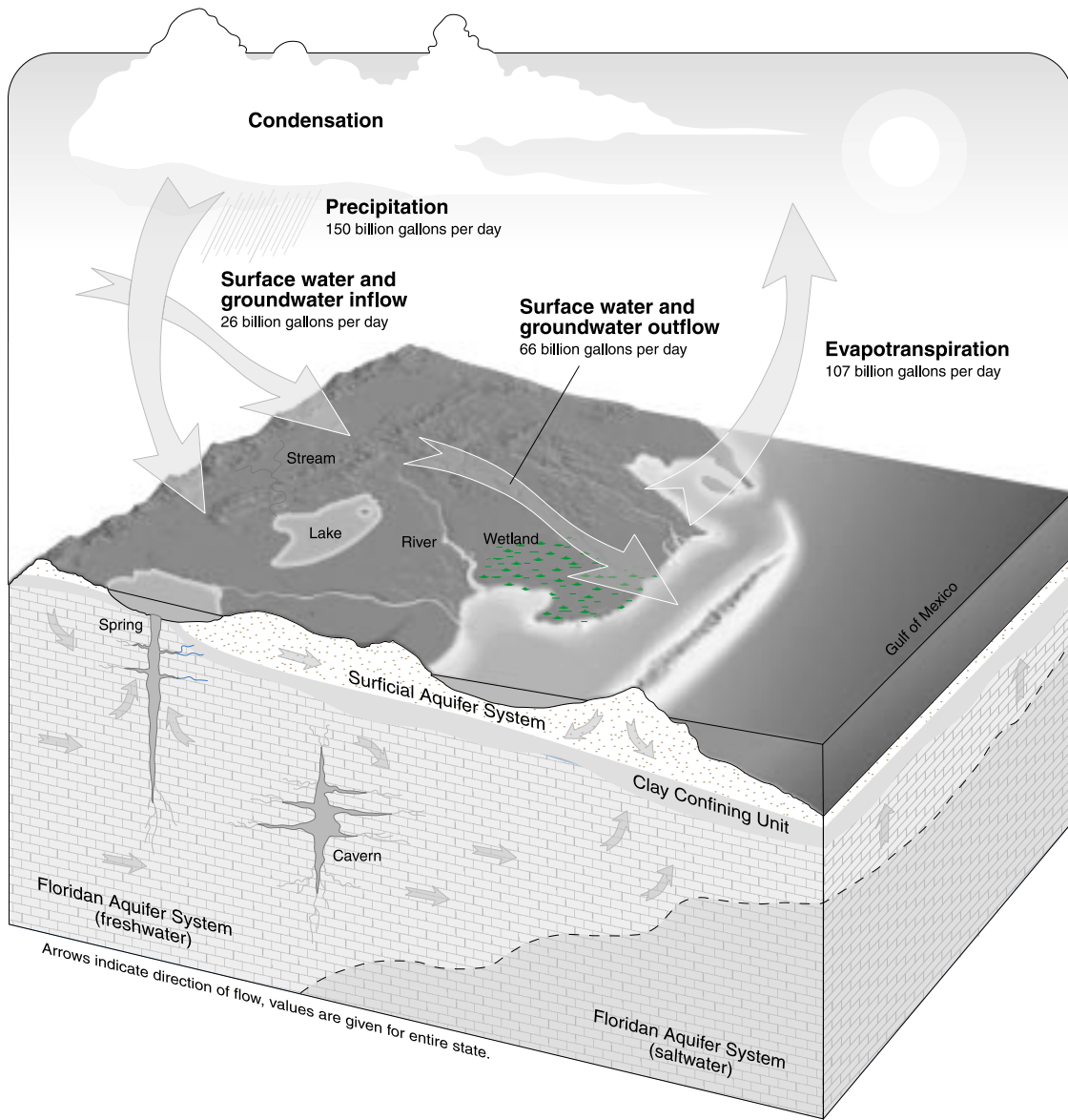
**Suwannee River Water Management District
Water Use**



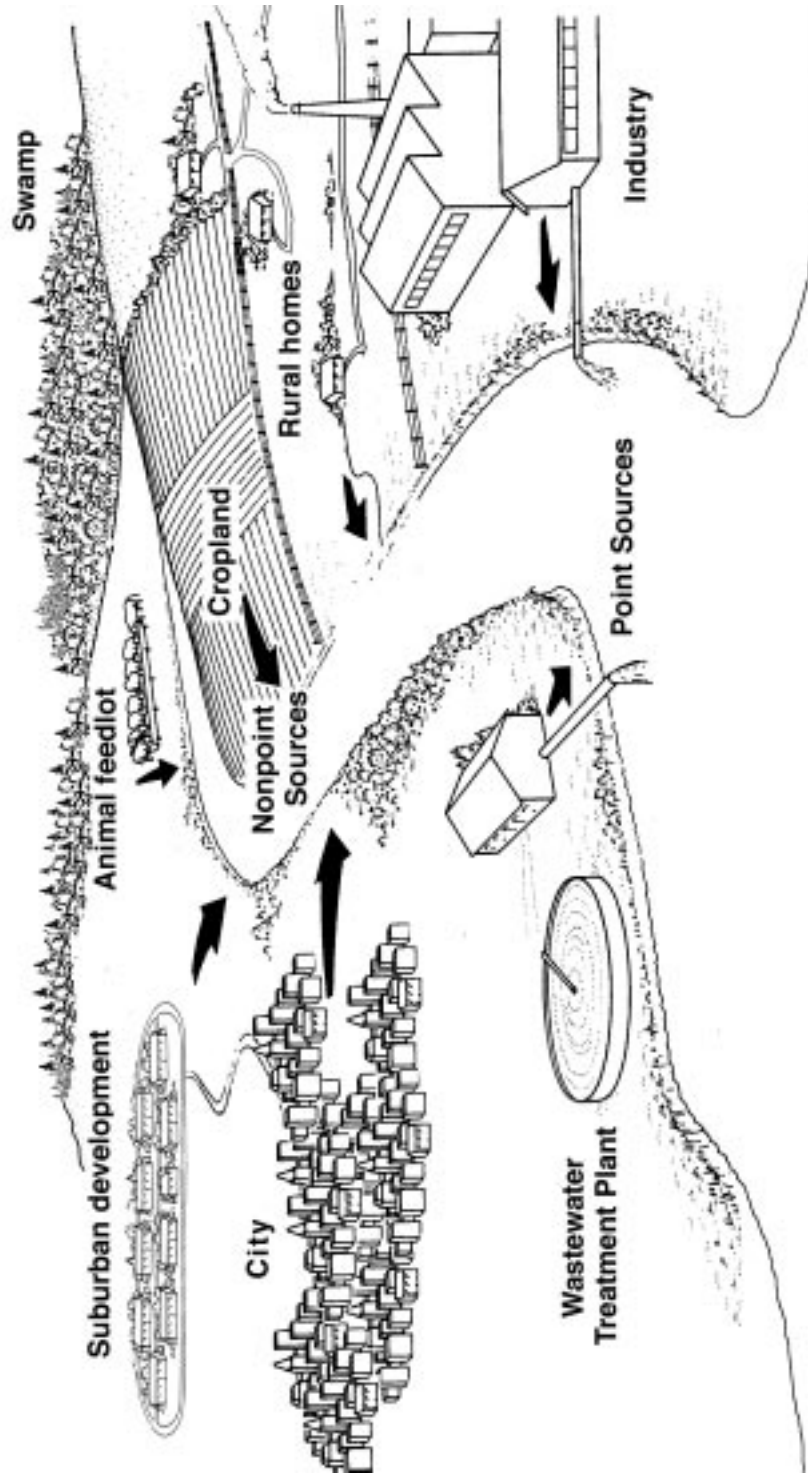
**South Florida Water Management District
Water Use**



Water Cycle



Point and nonpoint sources of water pollution



**Reference Materials:
Book List, Daily Activities, Resources**

Geography Awareness Week (GAW) 2000 Book List

Here Today, Here Tomorrow
A Geographic Focus On Conservation

The GAW 2000 theme highlights the importance of preserving and restoring ecosystems and managing resources. The following books include one or more of the four topics for Geography Awareness Week: Biodiversity, Population, Oceans, and Freshwater. For hands-on exploration of conservation, visit: www.nationalgeographic.com/gaw.

The list was compiled by:

Harriet Garrison, Jackson Public School District
Catherine Thomas, Jackson Public School District
Shelley Williams, South Pike School District
Mississippi Geographic Alliance Teacher Consultants

NF=Nonfiction FIC=Fiction

TITLE	CATEGORY	AUTHOR
Elementary Books		
Aani and the Tree Huggers	FIC	Jeannie Atkins
Acting for Nature	NF	Sneed B. Collard III
Amazon Adventure (Widget)	FIC	Larry Bishof
Amazon Alphabet	NF	Martin and Tanis Jordon
An American Safari: Adventures on the North American Prairie	NF	Jim Braundenburg
And Still the Turtle Watched	FIC	Sheila MacGill Callahan
And Then There Was One	NF	Margaret Facklam
Baby Whale's Journey	NF	Jonathan London
Beneath the Waves	NF	Norbert Wu
Berenstain Bears Don't Pollute	FIC	Stan Berenstain
Betting on Forever	FIC	Billy Aronson
Brother Eagle, Sister Sky	NF	Chief Seattle
Cactus Poems	NF	Frank Asch
Call It Courage	FIC	Armstrong Perry
Can We Save Them?	NF	David Dobson
The Caribbean Sea: Life in the Sea	NF	Norbert Wu
Changing Climate	NF	Sally Morgan
A City Under the Sea: Life in a Coral Reef	NF	Norbert Wu
Compost Critters	NF	Bianca Lavies
Creeps from the Deep: Life in the Deep Sea	NF	Norbert Wu
Come Back, Salmon	NF	Molly Cone
Compost: Growing Gardens From Your Garbage	NF	Linda Glaser

Condor's Egg	NF	Jonathan London
Dear Children of the Earth	NF	Schim Schimmel
A Desert Scrapbook	NF	Virginia Wright Frierson
Dinosaurs to the Rescue!	NF	Laurie Krasny Brown
Disaster at Parson's Point	FIC	Susan Saunders
The Dragon and the Unicorn	FIC	Lynn Cherry
Drop in My Drink	NF	Meredith Hooper
Earth Care (World Folktales to Talk About)	FIC	Margaret Read MacDonald
Earth Day	NF	Linda Lowery
Earthsong	NF	Sally Rogers
Education of Little Tree	NF	Forrest Carter
The Empty Lot	FIC	Dale H. Fife
Energy and Power	NF	Sally Morgan & Rosie Harlow
Energy and Resources	NF	Paul Brown
Everglades	NF	Jean Craighead George
The Extinct Alphabet Book	NF	Jerry Pallotta
Eyes of Gray Wolf	NF	Jonathan London
Falcons Nest on Skyscrapers	NF	Priscilla Belz Jenkins
Farewell to Shady Glade	FIC	Bill Peet
Flute's Journey	FIC	Lynne Cherry
For the Love of Our Earth	FIC	P.K. Hallinan
Fourth Grade Loser (Making the Grade)	FIC	Ellen Kahaner
Frightful's Mountain	FIC	Jean Craighead George
Give Me Five	FIC	Charlene H. Klima
The Giving Tree	FIC	Shel Silverstein
Gone Forever	NF	Sandra & William Markle
The Great Kapok Tree	FIC	Lynn Cherry
Grouper Moon	FIC	Cynthia Shaw
How the Forest Grew	NF	William Japersohn
Humphrey the Lost Whale	NF	Wendy Tokuda & Richard Hall
The Hunter	FIC	Paul Geraghty
Into the A, B, Sea: An Ocean Alphabet	NF	Deborah Lee Rose
Just a Dream	FIC	Chris Van Allsburg
Kofi and the Butterflies	FIC	Sandra Horn
Kylie's Concert	FIC	Patty Sheehan
Likable Recyclables	NF	Linda Schwartz
Letting Swift River	FIC	Jane Yolen
The Little House	FIC	Virginia Lee Burton
A Log's Life	NF	Wendy Pfeffer

The Lorax	FIC	Dr. Seuss
Magic School Bus at the Waterworks	NF	Joanna Cole
Magic School Bus Goes Upstream	NF	Scholastic Editors
Magic School Bus In the Rain Forest	NF	Scholastic Editors
Magic School Bus On the Ocean Floor	NF	Joanna Cole
Magic School Bus Takes a Dive	NF	Scholastic Editors
Magic School Bus Wet All Over	NF	Scholastic Editors
Man Who Planted Trees	FIC	Jean Giono
Maui-Maui	FIC	Stephen Cosgrove
The Missing Gator of Gumbolimbo	FIC	Jean Craighead George
Monarchs	NF	Kathryn Lasky
Mowing	FIC	Jessie Haas
My life with the Chimpanzees	NF	Jane Goodall
Nature's Green Umbrella: Tropical Rain Forests	NF	Gail Gibbons
Ocean Girl	FIC	Peter Hepworth
On the Brink of Extinction: California Condor	NF	Caroline Arnold
Once a Wolf	NF	Stephen R. Swinburne
One Day in the Alpine Tundra	NF	Jean Craighead George
One Day in the Desert	NF	Jean Craighead George
One Day in the Prairie	NF	Jean Craighead George
One Day in the Tropical Rain Forest	NF	Jean Craighead George
One Day in the Woods	NF	Jean Craighead George
Out of the Dust	FIC	Karen Heese
The Ozone Hole (Closer Look At)	NF	Alex Edmonds
The People Who Hugged Trees: An Environmental Folktale	FIC	Deborah Lee Rose
Prince William	FIC	Gloria Rand
Ranger Rick's Naturescope: Diving Into Oceans	NF	National Wildlife Federation
Ranger Rick's Naturescope: Pollution Problems & Solutions	NF	National Wildlife Federation
Ranger Rick's Naturescope: Wading into Wetlands	NF	National Wildlife Federation
Ranger Rick's Naturescope: Endangered Species	NF	National Wildlife Federation
Ranger Rick's Naturescope: Rain Forests: Tropical Treasures	NF	National Wildlife Federation
Recycle: A Handbook for Kids	NF	Gail Gibbons

Red Wolf Country	FIC	Jonathan London
Rising Sun	FIC	Tricia Garwood
A River Ran Wild	NF	Lynne Cherry
Save the Earth Maze Book	NF	Roger Moreau
Sawgrass Poems: A View of the Everglades	NF	Frank Asch
The Shaman's Apprentice	FIC	Lynne Cherry
She's Wearing a Dead Bird on her Head	FIC	Deborah Lee Rose
Spots: Counting Creatures from Sky to Sea	NF	Carolyn Lesser
Someday a Tree	FIC	Eve Bunting
Squish: A Wetlands Walk	NF	Nancy Luenn
Swift as the Wind: The Cheetah	NF	Barbara J. Esbensen
The Symphony of Whales	NF	Steve Schuch
Taking Care of the Earth: Kids in Action	NF	Laurence Pringle
Talking Earth	FIC	Jean Craighead George
The Last Bit-Bear: A Fable	FIC	Sandra Chisholm Robinson
There's Still Time	NF	Mark Galan & Bruce Babbitt
Three Panda's Planting	NF	Megan Halsey
A Walk in the Rainforest	NF	Kristin Joy Pratt
Washing the Willow Tree Loon	FIC	Jacqueline Briggs Martin
Water Dance	NF	Thomas Locker
Water Music	NF	Jane Yolen
Water	NF	Frank Asch
The Water's Journey	NF	Eleonore Schmid
What the Parrot Told Alice	FIC	Dale Smith
When the Wolves Return	NF	Ron Hirschi
Where Does the Garbage Go?	NF	Paul Showers
Where Once There Was a Wood	NF	Denise Fleming
Where the Forest Meets the Sea	NF	Jeannie Baker
Where the River Begins	FIC	Thomas Locker
Who Eats What?: Food Chains and Food Webs	NF	Patricia Lauber
Will We Miss Them?	NF	Alexandra Wright
The Wolves	NF	Brian J. Heinz
The Wump World	FIC	Bill Peet
You are the Earth	NF	David Suzuki & Kathy
Vanderlinden		

Middle and High School Books

Acting for Nature	NF	Sneed B. Collard III
The Ancient One	FIC	Thomas A. Barron
And Then There Was One	NF	Margaret Facklam
Beneath the Waves	NF	Norbert Wu

Betting on Forever	FIC	Billy Aronson
Blue Skin of the Sea	FIC	Graham Salisbury
The Caribbean Sea: Life in the Sea	NF	Norbert Wu
A City Under the Sea: Life in a Coral Reef	NF	Norbert Wu
Creeps from the Deep: Life in the Deep Sea	NF	Norbert Wu
Compost Critters	NF	Bianca Lavies
Disaster at Parson's Point	FIC	Susan Saunders
Earth Care (World Folktales to Talk About)	FIC	Margaret Read MacDonald
Earthways, Earthwise: Poems on Conservation	NF	Judith Nicholls
The Edge of the Sea	NF	Rachel Carson
Energy and Power	NF	Sally Morgan & Rosie Harlow
Energy and Resources	NF	Paul Brown
Fourth Grade Loser (Making the Grade)	FIC	Ellen Kahaner
Give Me Five	FIC	Charlene H. Klima
Grouper Moon	FIC	Cynthia Shaw
The Last Bit-Bear: A Fable	FIC	Sandra Chisholm Robinson
Likable Recyclables	NF	Linda Schwartz
Man Who Planted Trees	FIC	Jean Giono
Monarchs	NF	Kathryn Lasky
My Life with the Chimpanzees	NF	Jane Goodall
Ocean Girl	FIC	Peter Hepworth
On the Brink of Extinction: The California Condor	NF	Caroline Arnold
Once a Wolf	NF	Stephen R. Swinburne
The Ozone Hole (Closer Look At)	NF	Alex Edmonds
The People Who Hugged Trees: An Environmental Folktale	FIC	Deborah Lee Rose
The Sea Around Us	NF	Rachel Carson
Taking Care of the Earth: Kids in Action	NF	Laurence Pringle
Under the Sea Wind	NF	Rachel Carson
A Walk in the Rainforest	NF	Kristin Joy Pratt
What the Parrot Told Alice	FIC	Dale Smith
Will We Miss Them?	NF	Alexandra Wright
You Are the Earth	NF	David Suzuki & Kathy
Vanderlinden		

**Management Monday Activity:
Locate a City per Water Management District**

Locate the county and Water Management District for each city below:

Altamonte Springs
Cape Canaveral
Cedar Key
Cinco Bayou
Clearwater
Coral Springs
Crystal River
Defuniak Springs
Everglades City
Fanning Springs
Fellsmere
Frostproof
Gulf Stream
High Springs
Indian Creek
Live Oak
Lighthouse Point
Okeechobee
Otter Creek
Sweetwater
Weeki Wachee
Wewahitchka
Zephyrhills
Zolfo Springs

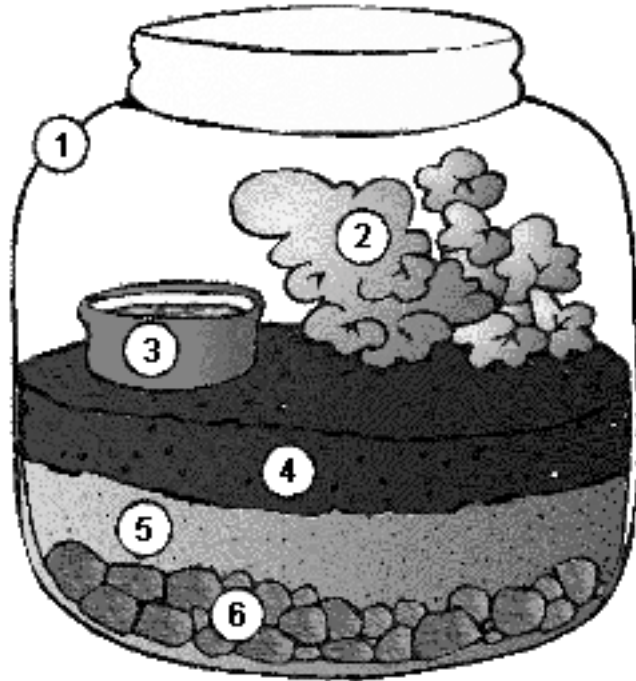
Locate a Water Management District Activity Answers

<i>City</i>	<i>County</i>	<i>Water Management Districts</i>
Altamonte Springs	Seminole	St. Johns
Cape Canaveral	Brevard	St. Johns
Cedar Key	Levy	Suwannee
Cinco Bayou	Okaloosa	Northwest
Clearwater	Pinellas	Southwest
Coral Springs	Broward	South
Crystal River	Citrus	Southwest
Defuniak Springs	Walton	Northwest
Everglades City	Collier	South
Fanning Springs	Gilchrist	Suwannee
Fellsmere	Indian River	St. Johns
Frostproof	Polk	Southwest
Gulf Stream	Palm Beach	South
High Springs	Alachua	Suwannee
Indian Creek	Dade	South
Live Oak	Suwannee	Suwannee
Lighthouse Point	Broward	South
Okeechobee	Okeechobee	South
Otter Creek	Levy	Suwannee
Sweetwater	Dade	South
Weeki Wachee	Hernando	Southwest
Wewahitchka	Gulf	Northwest
Zephyrhills	Pasco	Southwest
Zolfo Springs	Hardee	Southwest

Traveling Tuesday Activity: Make A Water Cycle Model

Make a simple water cycle model to explore this system in your classroom. You will need:

1. jar
2. plants
3. bottle cap of water
4. soil
5. sand
6. small rocks



Fill the jar as in the picture and put the lid on. Put the jar in a sunny place and see how the water cycle works.

GIS Wednesday Activity:
www.esri.com/gis

ESRI supports Geography Awareness Week and GIS Day with activities and lessons that can be found at their web site listed above.

Thirsty Thursday Activity:
How Much H₂O on Campus?

Florida has an average of over 50 inches of rain each year. How many square inches of rain falls on our campus in an average year?

Example: Lake Alfred Middle School covers 37.5 acres.

1 acre = 43560 square feet

1 sq ft = 144 square inches

so 1 acre = 6272640 square inches of land

this means that Lake Alfred Middle School has:

$6272640 \times 37.5 \text{ acres} = 235224000 \text{ square inches of land}$

$235224000 \times 50 \text{ inches of rain} = 11761200000$

The amount of rain that falls on Lake Alfred Middle School in an average year is 11761200000 square inches.

Once students have calculated the amount of rain, they can discuss where it all goes, supporting their ideas with details.

**Fact-filled Friday Activity:
Water Word Search**

R	K	E	L	B	G	C	I	P	D	M	Y	I	D	E
B	E	E	P	L	M	W	I	R	P	H	R	E	N	V
N	O	S	R	A	Q	K	I	C	P	H	S	E	O	A
I	O	A	T	P	C	N	W	A	J	A	V	C	I	P
N	I	I	V	O	K	S	R	H	L	V	E	O	T	O
G	P	S	T	A	R	G	I	I	P	O	L	T	A	T
K	V	X	B	A	O	A	N	R	Z	K	B	O	V	R
A	U	L	E	T	V	I	T	V	E	G	A	U	R	A
W	E	X	R	Q	Z	R	Z	I	S	X	T	R	E	N
N	O	A	B	A	U	J	E	S	O	C	O	I	S	S
R	C	W	T	Z	D	F	I	S	N	N	P	S	E	P
I	J	I	Z	C	H	G	R	P	N	Q	M	M	R	I
W	O	C	J	E	O	V	A	S	L	O	B	B	P	R
N	V	S	M	I	Q	T	E	R	K	F	C	T	K	A
A	Z	R	E	E	T	I	L	L	E	T	A	S	L	T
N	O	I	T	A	R	I	P	S	N	A	R	T	W	I
Y	Z	K	C	A	O	N	N	X	Y	M	M	O	I	O
E	V	A	P	O	R	A	T	I	O	N	Q	R	O	N
A	Q	L	Y	Y	R	A	L	D	N	P	S	N	C	W
C	B	K	O	P	B	G	P	T	U	U	G	H	E	X

Find the following words in the puzzle above

CARTOGRAPHY	CONSERVATION	DESALIZATION
DRINKABLE	ECOTOURISM	EVAPORATION
EVAPOTRANSPIRATION	GIS	GPS
POTABLE	PRESERVATION	RESTORATION
SATELLITE	TRANSPIRATION	XERISCAPE

Background Material and Study Questions

Background materials for the topics in the lesson plans in this curriculum guide are available on the FGA Geography Awareness Week web site located at <http://getp.freac.fsu.edu/gaw>. This material is from the *Water Resources Atlas of Florida*, edited by Edward A. Fernald and Elizabeth Purdum, 1998, Institute of Science and Public Affairs, Florida State University.

Following are study questions for use with the background materials.

Hydrologic Cycle

1. Why are the areas of highest evaporation of water not found at the equator?
2. The subtropical regions of the earth have the highest evaporation rates. They are areas identified as latitudes 20.5 N and 10 S. These areas are characteristically blessed with high pressure and trade winds. Explain why high pressure and wind accelerate evaporation.
3. Using a dictionary, define water-table. Is groundwater found above or below the water-table?
4. What is connate water?
5. What is juvenile water?
6. Connate water and juvenile water are added to the hydrologic cycle every year, but accumulations are balanced through the removal of hydrologic water by what process?
7. Using only your words and arrows, draw the hydrologic cycle.

Climate and Weather

1. States that border on the Gulf Coast from Louisiana to Florida receive some of the highest amounts of annual rainfall in the United States. Can you think of another area in the conterminous United States that is known for its high amounts of annual rainfall?
2. What is the criteria used by the Koppen Climate Type model?
3. What is the criteria used by the Thornthwaite Climate Control model?
4. Look at the map of "Average Annual Rainfall." Which of the models is most like the annual rainfall map? Explain your answer.

Groundwater

1. What is meant by the term "potable water?"
2. If 93% of Floridians depend on groundwater for drinking water, where do the other 7% get their drinking water?
3. What is dolomite? How was it formed?
4. What is a hydrologist?
5. Where does Florida get most of its groundwater?
6. What is meant by "recharging the groundwater?"
7. What is an aquifer?
8. What is the difference between an aquifer and an aquifer-system?

9. Florida has three aquifer-system. Name them in order from shallow to deep.
10. In order to understand the explanation in the reading of how an aquifer works, you need to understand the terms that are used in the text. Define the following words or phrases.
 - A. Sedimentary Rock
 - B. Depositional History
 - C. Sediment Heterogeneity
 - D. Stratigraphic
 - E. Lithostratigraphic
 - F. Petrographic
 - G. Unconsolidated Sediments
 - H. Transmissivity
11. What aquifer-system has the highest transmissivity? Which one has the lowest?

Surficial Aquifer System

1. What is an unconfined aquifer?
2. Where is the Surficial Aquifer-System most prevalent in Florida?
3. What is the main human use of this aquifer?
4. Because the Surficial Aquifer-System is very shallow, it usually takes the shape of the terrain. Look at the map “Water Table Level and Flow.” What do the lines with the numbers attached to them signify?
5. What are these lines called?
6. What is the relationship between these lines and the arrows?

Sand and Gravel Aquifer

1. What is an artesian well?
2. What is a confined aquifer?
3. What is the relationship between an artesian well and a confined aquifer?
4. Why is an unconfined surficial aquifer easily contaminated?

Biscayne Aquifer

1. Why is the Biscayne Aquifer so very important to certain people of Florida?
2. Define permeable?
3. The Biscayne Aquifer is highly permeable and has historically been subject to rising water levels from rainfall. Since 1900 the water level of the aquifer has fallen. Why has this happened and what has happened to aquifer flow?
4. Why have canal control structures been built in southeastern Florida?
5. Why do you think Dade County (Miami) is interested in some of the larger springs way up in the western panhandle of Florida?

Intermediate Aquifer System

1. Define the term “potentiometric?”
2. Where is the Intermediate Aquifer-System located and is it confined or unconfined?
3. Why is the Intermediate Aquifer-System used as a water source in southeastern Florida?

4. Does the Intermediate Aquifer get thicker from north to south or from south to north? How do you know?

Floridan Aquifer System

1. The Floridan Aquifer-System has three divisions, the Upper Floridan Aquifer, the middle confining unit, and the Lower Floridan Aquifer. What does the middle confining unit prevent?
2. Name the three different types of materials that are found in the middle confining unit.
3. What is meant by the term “anhydrite?”
4. Do you think dolomite that contains anhydrite is permeable?
5. Why do you think the way you do?
6. Why don't we sink wells into the Lower Floridan Aquifer, especially south of Lake Okeechobee?
7. What is an injection well?
8. What are the pros and cons of using an injection well?

Groundwater and Surface-Water Interaction

1. What are the two ways that streams interact with aquifers?
2. What is karst topography?
3. Geographically, where is the major karst area located in Florida?

Springs

1. Define a “spring.”
2. What is a first-magnitude spring? How many does Florida have?
3. Where are most of the springs located in Florida?
4. How does the location of the springs compare to the location of the karst areas? Why is this true?

Sinkholes

1. Define a sinkhole?
2. Name the three types of sinkholes found in Florida and describe how each is formed.

Groundwater Use and Effects on Water Levels

1. What aquifers are used by 93% of Florida's population?
2. How do State scientists monitor the supply of groundwater?
3. What is a real danger that can occur by pumping large amounts of groundwater from areas near a coast?
4. What are five sources of contaminants that can pollute an aquifer?
5. What are the characteristics that make an aquifer susceptible to groundwater pollution?

Resources

Web Resources:

California State University Northridge Online Social Studies activities
www.csun.edu/~hcedu013/onlineactivities.html

Poster Education
www.ioa.com/~poster_ed/

New York Times Learning Network
www.nytimes.com/learning/teachers/lessons/

U.S. Census Bureau - Florida Profiles
www.census.gov/datamap/www/12.html

U.S. Census Bureau Geography Topics
<http://www.census.gov/geo/www/index.html>

Teaching Current Events Via Newspapers, Magazines, and Television
www.csun.edu/~hcedu013/cevents.html

Air Quality Lessons
www.tnrcc.state.tx.us/air/monops/lessons/lesson_plans.html

National Geographic Geography Lessons & Activities
www.nationalgeographic.com/resources/ngo/education/ideas.html

The Academy Curriculum Exchange
ofcn.org/cyber.serv/academy/ace/

The Academy Curriculum Exchange - Social Studies
ofcn.org/cyber.serv/academy/ace/soc/inter.html

St. Johns River Water Management District Xeriscape landscaping information
sjr.state.fl.us/info/xeriscape/index.html

U.S. WaterNews Online
www.uswaternews.com/homepage.html

Recreational Opportunities on Federal Lands
www.recreation.gov/

EPA Kid's Explorer Club
www.epa.gov/kids

Environmental News Network
www.enn.com

Community Classroom Consortium
dlis.dos.state.fl.us/barm/ccc/

National Wildlife Federation Interactive Games
www.nwf.org/wildlifeweek/games/index.html

Florida Today News
www.floridatoday.com/

History Channel Homepage
www.historychannel.com/

EPA Office of Water search engine
www.epa.gov/ow/search.html

Florida Department of Environmental Protection
www.dep.state.fl.us

About.com - The Human Internet
about.com/

EPA EnviroMapper
www.epa.gov/enviro/html/em/index.html

GeoCommunity GIS data and information
www.geocomm.com

Additional Resources:

Florida Geographic Alliance
C2200 University Center
Florida State University
Tallahassee, FL 32306-2641

Zero Population Growth
1400 16th Street NW, Suite 320
Washington, D.C. 20036

Educational Resources
1550 Executive Drive, P.O. Box 1900
Elgin, IL 60121-1900
Population Reference Bureau
1875 Connecticut Ave., Suite 520
Washington, D.C. 20009-5728

Books and Magazines:

Adventures on Earth: Exploring Our Global Lengths
50-page interactive and reproducible lessons - \$10.00
Kim Crews and Cheryl Lynn Stauffer
Available from Population Reference Bureau

Disappearing Faces: Florida's Animals in Danger
Carol A. Wallin, Cardinal Enterprises of Florida, Miami, FL

National Geographic Traveler (available on newsstands)

The Young Naturalist's Guide to Florida
Pineapple Press, Sarasota, FL

Guide to Florida Vanishing Wildlife
Robert Anderson, Winter Enterprises, Altamonte Springs, FL

Atlas of Florida
Institute of Science and Public Affairs, Florida State University

Planet 3: A Kid's Environmental Magazine
P.O. Box 52, Montgomery, VT 05470

CD-ROMs, Videodiscs, Games:

GeoSafari and GeoSafari Talking Globe

Postcards - A writer's view of Mexico, Ghana, Japan, and Turkey.
CD-ROM available from Curriculum Associates

Marcopolo - Internet Content for the Classroom. Details available at
www.mciworld.com/marcopolo

Earth Systems, An Odyssey of Discovery, CD-ROM
Pierian Spring Software
5200 SW Macadam Ave, Suite 570
Portland, OR

Maptitude Game
Resource Games
P.O. Box 151
Redmond, VA 98052

GTV: Biodiversity Videodisc
GTV: Planetary Manager Videodisc

Atlas of Florida on CD-ROM
Institute of Science and Public Affairs, Florida State University

