



Teacher's Guide
April 2000

Dear Teacher:

Welcome to Watershed Excursion! The teacher's guide has been developed to use in conjunction with the Water Resources Education Week tabloid, Watershed Excursion. The purpose of this year's tabloid is to educate students, residents and visitors about watersheds and water resources issues, and to encourage protection of our water resources.

Watershed Excursion is targeted for students in grades 4-7 to increase their awareness and respect for Florida's precious water resources. The tabloid is correlated to grades 3-5 and 6-8 of the Sunshine State Standards. It includes a variety of nonfiction articles, checkpoints, investigations, games, activities, side trips, factoids and Web sites to explore. All of the information and activities are designed to teach students about watersheds. In addition, we have included an Excursion Challenge, which contains items similar to those that students could expect to find on the Florida Comprehensive Assessment Test.

Many other free materials are available from the Southwest Florida Water Management District. We also offer water resources workshops for teachers in your county. For additional information, please contact the Communications and Community Affairs Department of the Southwest Florida Water Management District at 1-800-423-1476 (Florida only), or (352) 796-7211, extension 4757. You can also visit the Educator's section of the District's Web site at www.swfwmd.state.fl.us.

Watershed Excursion Guide

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Background

During the course of Watershed Excursion, your students will learn that regardless of where they live, they live in a watershed. A watershed can be defined as an area that water flows across as it moves toward a stream, river, wetland, estuary, lake or the coast. Although Florida is considered to have a relatively flat land surface, variations in elevation separate the different watersheds. There are 11 major watersheds that can be found within the boundaries of the Southwest Florida Water Management District (District). The District is the regional agency responsible for managing water resources and maintaining a balance between the water needs of current and future water users without damaging the environment. The Comprehensive Watershed Management (CWM) program was created to help improve and protect the watersheds within the District. The future of our watersheds depends on all of us working together.

As a teacher, you have a very important role in preparing students to become guardians of their watersheds. Teaching students how to protect Florida's precious water resources will help ensure that as adults they will be actively involved in maintaining clean and healthy watersheds. In turn, they will take on the role of preparing the next generation to continue this important mission.

The following tips are provided to help you guide your students through Watershed Excursion and the teacher's guide. Be sure to read the entire tabloid and teacher's guide in preparation for use with your students.

For each station:

- Make copies of the Watershed Activity found in the teacher's guide.
- Read and discuss with your students the station presented in the tabloid.
- Assign one or two of the Watershed Investigations. Be sure to have copies of the newspaper available for completing the second investigation.
- Complete the Activity and the Excursion Side Trip with your students. Share the Watershed Factoid.
- Ask students to complete the Excursion Checkpoint and check their answers before moving on to the next station.

Other activities:

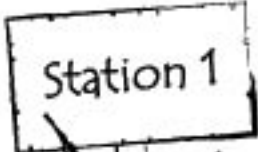
- As a class, review the vocabulary listed on page 15 of the tabloid.
- Encourage students to use the Internet to surf the Web sites included on page 15 of the tabloid.
- Read and discuss the center-spread poster of the tabloid called "Watersheds Within Our District." Display the poster in your classroom.
- Have students complete the activities presented on page 14 of the tabloid and check their answers, which are included on page 15.
- Encourage students to complete the "Create a Watershed Excursion Sign!" activity presented on the back of the tabloid.
- Make copies and administer the "Watershed Challenge" on pages 14-15 of the teacher's guide.
- Encourage students to visit the virtual Watershed Excursion at www.swfwmd.state.fl.us.

Watershed Challenge Items included in the Watershed Challenge are similar to those presented on the Florida Comprehensive Assessment Test (FCAT).

Multiple choice answers: 1-d, 2-b, 3-a, 4-d, 5-a, 6-b, 7-c, 8-b, 9-c, 10-d

Extended Response Items: First item: Students should be able to demonstrate an understanding that all things within a watershed are important to the health of a watershed.

Second item: Using the tabloid, students should be able to assimilate information about protecting watersheds.



Watershed Basics

Watershed Activity: The Watershed and Community Connection

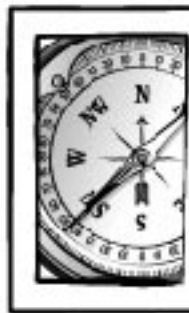
Directions:

You have learned that a watershed is like a community. Think about ways to describe your watershed. List these words or phrases in the column under "My Watershed." Then do the same for "My Community." Next, write a few sentences that tell about how your watershed and community are alike. When you finish, you will have made the watershed and community connection!

My Watershed

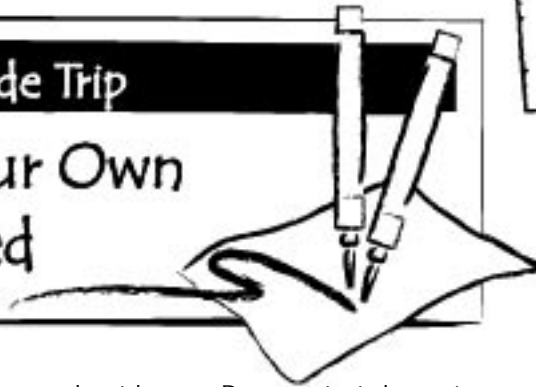
My Community

Use the lines below to describe how your watershed and community are alike.



Excursion Side Trip

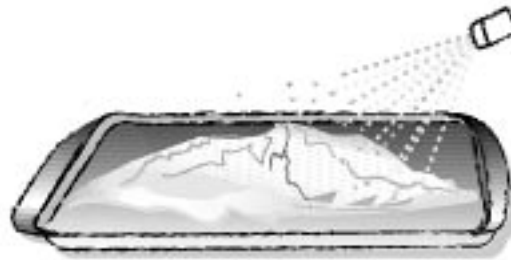
Make Your Own Watershed



This is a fun and easy activity that you can do at home. Be sure to take notes on what you observe during the activity. You can use this activity to teach others about how important it is to keep watersheds clean and healthy.

Materials:

- sheet of white paper
- shallow pan
- water-based colored markers
- spray bottle of water



Directions:

1. Take the sheet of paper and crumple it. Next, partially smooth it out, leaving some ridges.
2. Use the markers to color along the edge of the creases. You may want to use different colors to represent a variety of pollutants, such as fertilizer, oil, pesticides, litter, etc.
3. Lay the paper out on the shallow pan and shape it so that it looks like a watershed. Use the creased lines to show elevated land areas.
4. Use the bottle of water and gently spray the top of the watershed. Keep spraying the paper until the colors begin to flow.
5. Describe what happened at the lowest point of the watershed. Did the different pollutants mix together? If so, where did this happen in the watershed?
6. This is an example of a watershed in action, so let's keep it clean!

Watershed Factoid

Did you know that ...

if you viewed a watershed from an airplane, you would most likely see a very interesting sight below? The drainage patterns of the watershed may look like the branches of a tree, a complex road system or even the human nervous system.



Station 2



All About Water

Watershed Activity: The Never-Ending Water Cycle

Directions:

You have learned that the water in our environment recycles itself over and over again. Study the illustration of the hydrologic cycle below and label each of the parts. Use the chart of the hydrologic cycle on page 4 of the tabloid to help you identify the correct parts of this never-ending cycle. To create a poster, you can color the picture, cut it out and display it on a wall.





Excursion Side Trip

Make Your Own Water Cycle Wristband

Station 2



The water cycle is a never-ending process within our environment. The Earth's water supply continuously moves from the atmosphere down into the Earth's surface and back. By making the wristband, you can gain an even greater appreciation of this wondrous cycle in action.

Materials:

- Piece of string or thin elastic cord about 9 inches in length
- Six beads representing different features of the cycle
 - yellow solar energy
 - clear evaporation
 - green transpiration
 - white condensation
 - blue precipitation
 - brown percolation

Directions:

1. Using the string or elastic cord, thread the beads to represent the different parts of the cycle. You may place them in any order you like, but here is the order most commonly used: yellow, clear, green, white, blue and brown.
2. Place the string around your wrist and tie it.
3. Rotate the beads around your wrist to see the cycle in action.
4. Describe the water cycle to your family so that they can learn about it, too.



Watershed Factoid

Did you know that ...

in one year a large oak tree will transpire about 40,000 gallons of water (152,200 liters)? That's a lot of water!

Station 3

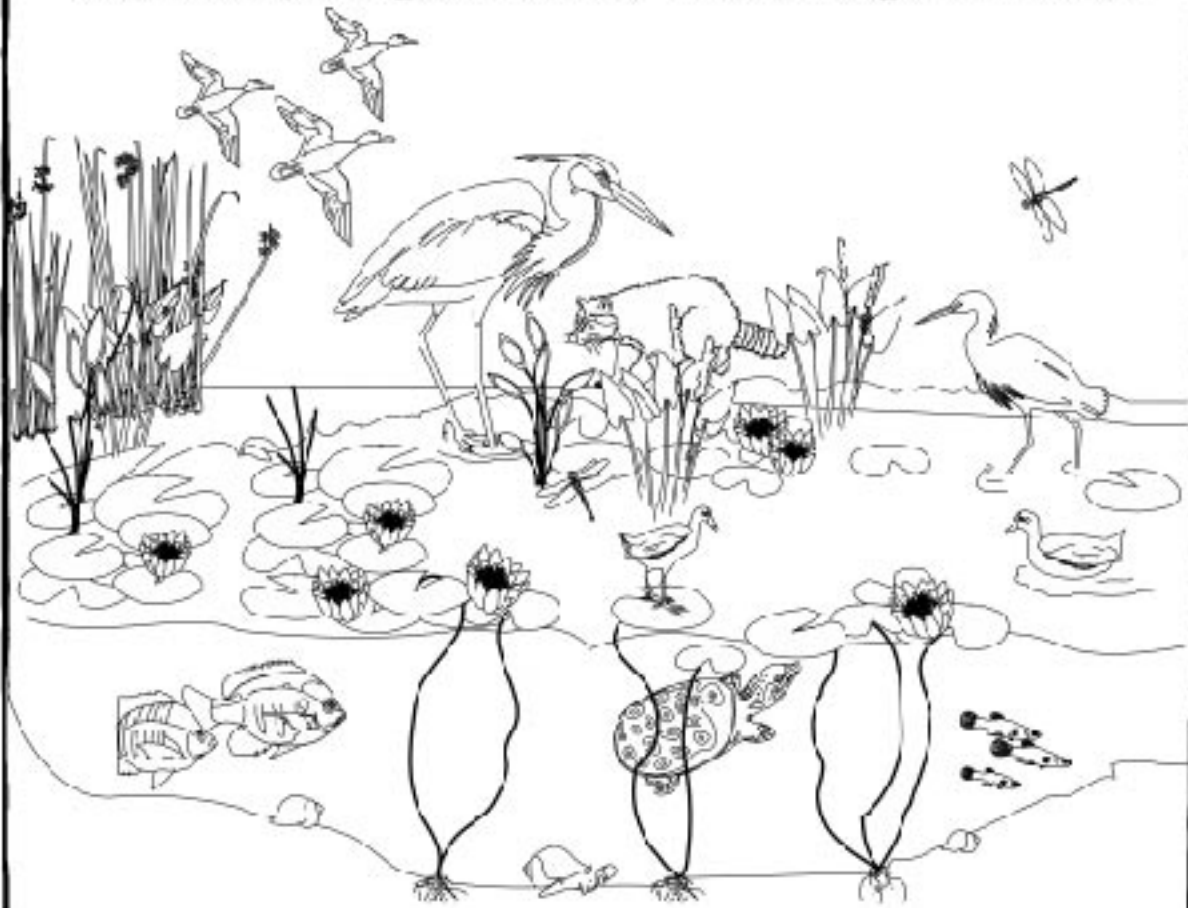
Watersheds in Our Area

Watershed Activity: Wetlands Are Wonderful

Directions:

You have learned that wetlands play a very important role in maintaining a healthy watershed. Use colored pencils or crayons to color the illustration of wetlands. Cut out and display the poster to emphasize how important wetlands are for protecting the quality of our watersheds.

Wetlands Are Wonderful!



Wetlands truly are wonderful!



Excursion Side Trip

Get Your Watershed Profile



Station 3

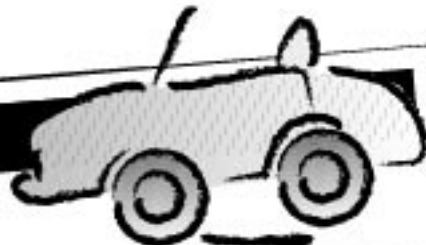
A lot of information about watersheds is available on the Internet. To locate your watershed and get a profile of it, simply follow these steps:

1. Go to the United States Environmental Protection Agency (EPA) Web site at www.epa.gov/surf/states/FL.
2. Click on the area labeled "Locate Your Watershed."
3. Locate your watershed by entering your zip code in the space labeled "Your Entry."
4. Review the information about your watershed that includes an environmental profile, water, land, people and air.
5. To learn more about watersheds, click on the Web site links that are underlined.

Watershed Factoid

Did you know that ...

one quart of motor oil can pollute 250,000 gallons of water?
Help preserve the quality of our water and the natural beauty of a watershed by taking used automobile fluids, such as oil, to a gas station or auto parts store that recycles.





Protecting Our Watersheds

Watershed Activity: Challenges in My Watershed

Directions:


Study the list of challenges facing the area's watersheds. Then write a letter describing a few challenges you think may exist in your watershed. Describe actions that could be taken to meet these challenges. Mail the letter to us and we will send you a free "Protect Your Watershed" pencil.

Watershed Manager
c/o In-School Education
Communications and Community Affairs Department
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34609


Dear Watershed Manager:

Sincerely,

(Your Name)



Excursion Side Trip
Water Users





Use the following information to create a pie chart that illustrates the different categories of total water withdrawal within the boundaries of the Southwest Florida Water Management District, based on data for 1998. These estimates have been rounded for easier use. Draw conclusions based on the information.

Percent %	Category of Water User
41	Drinking Water
39	Farms & Groves
6	Factories
7	Mining
7	Golf Courses & Parks

Watershed Factoid

Did you know that ...

an average family of four in our area uses 520 gallons of water a day! If each family member cut their water use by just 10 percent, the family could save almost 19,000 gallons a year. You can make a difference!





Citizens Get Involved

Watershed Activity: Keep My Neighborhood Clean

Directions:

Take the following survey to find out if you are helping to prevent water pollution in your watershed. For each question, answer Yes or No.

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Do you flush household chemicals down the drain?
<input type="checkbox"/>	<input type="checkbox"/>	If you have a pet, do you leave pet wastes on your yard instead of disposing of them properly?
<input type="checkbox"/>	<input type="checkbox"/>	Do you use a lot of fertilizers and pesticides on your yard?
<input type="checkbox"/>	<input type="checkbox"/>	Do you litter your neighborhood?
<input type="checkbox"/>	<input type="checkbox"/>	Do you use a lot of aerosol spray containers?
<input type="checkbox"/>	<input type="checkbox"/>	Do you apply chemicals near wells and water bodies?
<input type="checkbox"/>	<input type="checkbox"/>	Do you burn or bury leftover chemicals or their containers?
<input type="checkbox"/>	<input type="checkbox"/>	Do you wash the car with a running hose instead of using a hose with a shut-off nozzle or going to a commercial car wash?
<input type="checkbox"/>	<input type="checkbox"/>	Do you have grass, shrubs and trees that need a lot of water?
<input type="checkbox"/>	<input type="checkbox"/>	How many questions did you answer Yes? _____
<input type="checkbox"/>	<input type="checkbox"/>	How many questions did you answer No? _____

If you answered No to all of the questions, you are helping to prevent pollution in your watershed. For each question that you answered Yes, describe how you could improve the situation. Remember, it is up to all of us to keep our watershed clean.

Correlation with Sunshine State Standards

The activities presented in the five stations of Watershed Excursion and the Teacher's Guide have been correlated to the Sunshine State Standards.

Station 1: Watershed Basics

Watershed Investigations

Elementary School (3-5). Science: SC.G.1.2, SC.G.2.2; Language Arts: LA.A.1.2, LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.B.2.2.

Middle School (6-8). Science: SC.G.1.3, SC.G.2.3; Language Arts: LA.A.1.3, LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.B.2.3.

Excursion Checkpoint

Elementary School (3-5). Science: SC.G.1.2, SC.G.2.2; Language Arts: LA.A.1.2, LA.A.2.2.

Middle School (6-8). Science: SC.G.1.3, SC.G.2.3; Language Arts: LA.A.1.3, LA.A.2.3.

Watershed Activity

Elementary School (3-5). Science: SC.G.1.2, SC.G.2.2; Language Arts: LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.B.2.2;

Middle School (6-8). Science: SC.G.1.3, SC.G.2.3; Language Arts: LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.B.2.3.

Watershed Side Trip

Elementary School (3-5). Science: SC.D.1.2, SC.D.2.2, SC.H.1.2, SC.H.2.2; Language Arts: LA.A.2.2; Social Studies: SS.B.2.2; Visual Arts: VA.A.1.2.

Middle School (6-8). Science: SC.D.1.3, SC.D.2.3, SC.H.1.3, SC.H.2.3; Language Arts: LA.A.2.3; Social Studies: SS.B.2.3; Visual Arts: VA.A.1.3.

Station 2: All About Water

Watershed Investigations

Elementary School (3-5). Science: SC.B.2.2, SC.D.1.2, SC.D.2.2; Language Arts: LA.A.1.2, LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.B.2.2.

Middle School (6-8). Science: SC.B.2.3, SC.D.1.3, SC.D.2.3; Language Arts: LA.A.1.3, LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.B.2.3.

Excursion Checkpoint

Elementary School (3-5). Science: SC.B.2.2, SC.D.1.2, SC.D.2.2; Language Arts: LA.A.1.2, LA.A.2.2.

Middle School (6-8). Science: SC.B.2.3, SC.D.1.3, SC.D.2.3; Language Arts: LA.A.1.3, LA.A.2.3.

Watershed Activity

Elementary School (3-5). Science: SC.D.1.2, SC.H.2.2; Language Arts: LA.A.2.2.

Middle School (6-8). Science: SC.D.1.3, SC.H.2.3; Language Arts: LA.A.2.3.

Watershed Side Trip

Elementary School (3-5). Science: SC.D.1.2, SC.H.2.2; Language Arts: LA.A.2.2; Social Studies: SS.B.1.2; Visual Arts: VA.A.1.2.

Middle School (6-8). Science: SC.D.1.3, SC.H.2.3; Language Arts: LA.A.2.3; Social Studies: SS.B.1.3; Visual Arts: VA.A.1.3.

Station 3: Watersheds in Our Area

Watershed Investigations

Elementary School (3-5). Science: SC.D.1.2, SC.D.2.2, SC.G.1.2; Language Arts: LA.A.1.2, LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.B.1.2, SS.B.2.2.

Middle School (6-8). Science: SC.D.1.3, SC.D.2.3, SC.G.1.3; Language Arts: LA.A.1.3, LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.B.1.3, SS.B.2.3.

Excursion Checkpoint

Elementary School (3-5). Science: SC.D.1.2, SC.D.2.2, SC.G.1.2; Language Arts: LA.A.1.2, LA.A.2.2.

Middle School (6-8). Science: SC.D.1.3, SC.D.2.3, SC.G.1.3; Language Arts: LA.A.1.3, LA.A.2.3.

Watershed Activity

Elementary School (3-5). Science: SC.D.1.2, SC.D.2.2, SC.G.1.2, SC.G.2.2; Language Arts: LA.A.2.2.

Middle School (6-8). Science: SC.D.1.3, SC.D.2.3, SC.G.1.3, SC.G.2.3; Language Arts: LA.A.2.3.

Watershed Side Trip

Elementary School (3-5). Language Arts: LA.A.1.2, LA.A.2.2; Social Studies: SS.B.1.2.

Middle School (6-8). Language Arts: LA.A.1.3, LA.A.2.3; Social Studies: SS.B.1.3.

Station 4: Protecting Our Watersheds

Watershed Investigations

Elementary School (3-5). Science: SC.D.2.2, SC.G.1.2; Language Arts: LA.A.1.2, LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.B.2.2, SS.C.1.2, SS.C.2.2, SS.D.1.2.

Middle School (6-8). Science: SC.D.2.3, SC.G.1.3; Language Arts: LA.A.1.3, LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.B.2.3, SS.C.1.3, SS.C.2.3, SS.D.1.3.

Excursion Checkpoint

Elementary School (3-5). Science: SC.D.2.2, SC.G.1.2; Language Arts: LA.A.1.2, LA.A.2.2; Social Studies: SS.C.1.2, SS.C.2.2, SS.D.1.2.

Middle School (6-8). Science: SC.D.2.3, SC.G.1.3; Language Arts: LA.A.1.3, LA.A.2.3; Social Studies: SS.C.1.3, SS.C.2.3, SS.D.1.3.

Watershed Activity

Elementary School (3-5). Language Arts: LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.C.2.2.

Middle School (6-8). Language Arts: LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.C.2.3.

Watershed Side Trip

Elementary School (3-5). Mathematics: MA.A.1.2, MA.A.2.2, MA.B.1.2, MA.C.1.2.

Middle School (6-8). Mathematics: MA.A.1.3, MA.A.4.3, MA.B.1.3, MA.C.1.3.

Station 5: Citizens Get Involved

Watershed Investigations

Elementary School (3-5). Science: SC.D.2.2, SC.G.1.2; Language Arts: LA.A.1.2, LA.A.2.2, LA.B.1.2, LA.B.2.2; Social Studies: SS.B.2.2, SS.C.2.2.

Middle School (6-8). Science: SC.D.2.3, SC.G.1.3; Language Arts: LA.A.1.3, LA.A.2.3, LA.B.1.3, LA.B.2.3; Social Studies: SS.B.2.3, SS.C.2.3.

Excursion Checkpoint

Elementary School (3-5). Science: SC.D.2.2, SC.G.1.2; Language Arts: LA.A.1.2, LA.A.2.2.

Middle School (6-8). Science: SC.D.2.3, SC.G.1.3; Language Arts: LA.A.1.3, LA.A.2.3.

Watershed Activity

Elementary School (3-5). Science: SC.D.2.2, SC.G.1.2, SC.G.2.2; Language Arts: LA.A.2.2; Social Studies: SS.C.2.2, SS.D.1.2.

Middle School (6-8). Science: SC.D.2.3, SC.G.1.3, SC.G.2.3; Language Arts: LA.A.2.3; Social Studies: SS.C.2.3, SS.D.1.3.

Watershed Side Trip

Elementary School (3-5). Language Arts: LA.A.1.2, LA.A.2.2; Social Studies: SS.C.2.2, SS.D.1.2.

Middle School (6-8). Language Arts: LA.A.1.3, LA.A.2.3; Social Studies: SS.C.2.3, SS.D.1.3.

Watershed Excursion Challenge

Directions: This is your opportunity to demonstrate what you have learned about watersheds. It is also an opportunity for you to practice answering questions similar to those found on the FCAT. Do your best and meet the challenge!

For each multiple-choice item, select the best answer

1. During your excursion, you have learned a lot about living in a watershed. What is a watershed?
 - a. area of land that water flows across as it moves toward a larger water body
 - b. area of land from which water drains to a particular water body
 - c. moisture released from clouds in the form of rain, snow, hail, etc.
 - d. both a and b
2. Much of Florida's landscape is "karst" terrain. Which one below does NOT belong in a list of its features?
 - a. sinkholes
 - b. mountains
 - c. springs
 - d. caves
3. What is surface water?
 - a. water that has not seeped into the ground and is exposed to the air
 - b. water that is under the ground in the Floridan aquifer
 - c. water that runs through the pipes in our homes
 - d. water that is at the bottom of a well
4. Which one below is NOT an example of a freshwater body of water?
 - a. lakes
 - b. rivers
 - c. ponds
 - d. oceans
5. Wetlands play an important role in watersheds. What is a wetland?
 - a. an area of land that is wet at least part of the year
 - b. an area of land where few plants and animals can live
 - c. an area of salt water where whales can be found
 - d. a very dry area of land
6. Which one below does NOT belong in a list of characteristics about a wetland?
 - a. It acts as a reservoir for stormwater runoff.
 - b. It contributes to flooding.
 - c. It helps to filter pollution from water.
 - d. It may include ponds, marshes and swamps.
7. Which statement is TRUE about the hydrologic cycle?
 - a. The hydrologic cycle occurs only once each year.
 - b. Evaporation is the downward movement of water through the ground.
 - c. All the water in our environment recycles itself over and over again.
 - d. The moon is the energy source that causes the water to move through the cycle.
8. Choose the BEST reason for protecting the health and well-being of our watersheds?
 - a. So that more sinkholes can be formed.
 - b. So that our children and our children's children can live in a healthy watershed.
 - c. So that residential and industrial areas are no longer developed.
 - d. So that there are fewer plants and animals living in an area.
9. Which of the following statements does NOT belong in a list about water pollution?
 - a. Most water pollution is caused by the activities of humans.
 - b. Pollution that flows from pipes is an example of point source pollution.
 - c. Water pollution is rarely caused by the activities of humans.
 - d. Trash, pesticides and fertilizers are examples of pollutants.
10. The future of our watersheds depends on all of us working together. How can citizens get involved?
 - a. by volunteering their time on environmental projects
 - b. by helping to organize a neighborhood cleanup
 - c. by teaching others about the importance of keeping their watershed healthy
 - d. all of the above

