Ponds

WaterWeb

current water info for middle school students

A publication of the Southwest Florida Water Management District

The WaterWeb Query

QUESTION:
Many detention and retention ponds can be found throughout our area. How are these ponds similar and how are they different?

ANSWER:
Both retention and detention ponds collect stormwater runoff. A detention pond slowly releases water downstream to lakes, rivers or streams and may keep some water in it permanently. A retention pond collects stormwater and allows the water to soak into the soil and surrounding ground, which helps to recharge groundwater.

Inside this issue

Ponds

Imagine yourself experiencing a peaceful pond where the water is still and silent. At the edge of the water, a large bird stands motionless as it seeks out a fish for its next meal. Two turtles rest on a large log that juts out along the shore, and a family of frogs relaxes on several floating lily pads. A dragonfly hovers over a few insects that sit gently on the filmy surface of the water. A variety of plants surround this small, shallow body of fresh water. Of course, these are only a few images that come to mind when we think about healthy ponds. Although we often take these areas for granted, we should realize a pond can be one of the most fascinating places found in nature.

Ponds exist in many shapes and sizes. A pond is a small, shallow body of fresh water completely surrounded by land. Natural ponds are depressions in the earth's surface formed by forces of nature, such as sinkholes. Constructed ponds are designed by humans. Both types of ponds are important to our environment because they store and clean water. The soil at the bottom of both natural and constructed ponds is made up of clay, which allows the water stored in the pond to seep slowly down into the aquifer. As water moves slowly through the layers of clay and rock beneath the pond, it is naturally cleaned. Wetland plants living in and around the pond also filter out pollutants in stormwater runoff. The cleaner water can then percolate down into the soil or move along the surface into rivers, lakes and estuaries. Ponds also provide a place for floodwaters, wildlife, outdoor activities and storing excess rainwater.

Managing our neighborhood ponds requires all citizens to become actively involved in safeguarding the water that flows into the ponds. There are several easy steps people can take to ensure the health of their community ponds. As the human population continues to increase and more development occurs within our region, it becomes especially important for all of us to help manage and protect our ponds.

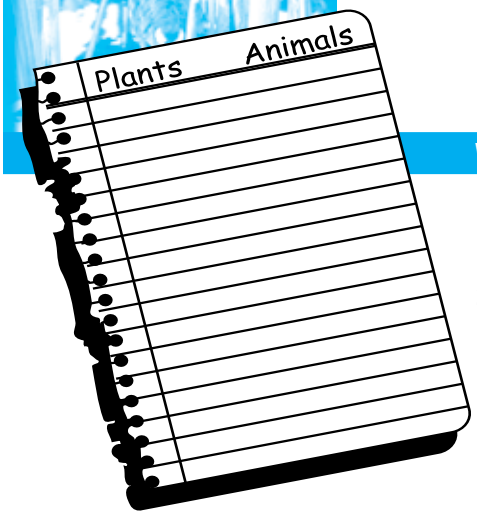
This issue of *WaterWeb* focuses on ponds. All articles and activities are designed to help you learn more about ponds and the importance of protecting our natural resources.

All About Ponds

No matter where you live, you live in a watershed—and ponds play an important role in your watershed. A watershed is an area of land water flows across as it moves toward a common body of water such as a pond, stream, river, lake or coast. Keeping your watershed healthy has a direct and positive impact on the quality of your pond. Following are a few important points about ponds to help you learn more about your watershed and pond connection.

- Healthy ponds encourage an increase in wildlife habitat.
- The number and types of plants and animals in or near a pond are always changing.
- Stormwater runoff is a major source of pollutants in our ponds, but improved stormwater management can help reduce the amount of pollutants.
- Materials that create pollution in ponds include sediments, organic matter, nitrogen, phosphorus, metals, oils, greases, viruses and coliform bacteria.
- Since 1982, subdivisions, industrial parks and shopping centers constructed in Florida are required to have stormwater ponds to collect and treat water generated from runoff at the site.
- A stormwater pond can be made to look like a natural pond by adding native plants and trees and by attracting birds.
- Except for sunlight, a pond contains or produces everything necessary for the survival of the plants and animals that make up the pond community.
- The green plants in ponds serve as the primary food producers for plant-eating (herbivorous) animals who, in turn, become food for flesh-eating (carnivorous) animals. The food webs, chains and pyramids in a pond may be complex.

At first glance, it may not seem like much is going on in a pond. But with further exploration, it becomes obvious that much is happening in this special environment.



WHAT ABOUT YOUR POND?

1. How would you describe the pond closest to your home? List the plants and animals that live in or near the pond.
2. Would you characterize the pond as healthy or unhealthy? Why?

Polluting Florida's Waters

A little pollution here. A little pollution there. An old oil can tossed aside. Solvents rinsed down the drain. A dead car battery set outside. Individually, it may not sound like much. But combined with all the other items improperly thrown away every day, these discarded chemicals and other hazardous wastes add up to one of the biggest causes of water pollution in Florida.

With a little knowledge and planning, you can become part of the solution. Let's start by clarifying "hazardous household products."

Typically, these are chemicals found in products labeled *combustible, corrosive, flammable, ignitable* or *toxic*. They are usually common products used in the home daily. Oftentimes, people do not realize that these everyday materials may be hazardous to humans, animals or plants if spilled or not disposed of properly.

Learning about these products and how to dispose of them correctly will help ensure your health and, at the same time, protect Florida's water resources.

Use these suggestions for working with hazardous household products:

- Reduce your dependence on these potentially hazardous substances by using environmentally friendly or "green" substitutes.
- Always read and follow use and disposal instructions for all chemical products.
- Buy only what you need. Use what you buy. If you have leftovers, give them to someone who can use them.
- Dispose of unused hazardous household waste properly.

Your community has a collection and waste management program that offers a safe and free way to dispose of or recycle "household hazardous waste." For a list of collection centers within the Southwest Florida Water Management District, view or order our *Hazardous Chemicals!* brochure at *WaterMatters.org/publications/*. This service is for county residents only and does not apply to the disposal of waste generated by businesses. Contact your local waste management facility to receive information on collection dates and times.

It is illegal to dump toxic chemicals or waste into storm drains or anywhere else that may expose waste in the environment. To report illegal dumping, call your local stormwater or environmental management department or the Florida Department of Environmental Protection Waste Management Division.

POINTS TO PONDer

1. What are examples of pollutants that can harm ponds, lakes, rivers, streams and other water bodies?
2. What should you do if you see neighbors who make a habit of dumping waste and toxic chemicals into storm drains?
3. Why is it important to take special precautions when using hazardous household products?

Career Focus

This column provides insight into the many career opportunities that exist in the field of environmental education. For this issue, we interviewed John McGee, an environmental scientist with the Adopt-A-Pond Program in Hillsborough County.

WATERWEB:
Thank you for agreeing to give us this interview for the *WaterWeb*. Please tell us what an environmental scientist does.

MR. MCGEE:
An environmental scientist does many things—from sampling and testing to project review and permitting. In my case, I am mainly responsible for public education. It's my job to run the Adopt-A-Pond Program and teach people about stormwater and pollution prevention.

WATERWEB:
How would you describe a typical day of work?

MR. MCGEE:
I do many things, so my days vary a lot. Some days I am out visiting ponds, talking with citizens and coordinating cleanups with our pond excavator. Other days I speak at schools. And sometimes I'm in the office writing our newsletter, working on educational materials or organizing our events.

WATERWEB:
The theme of this issue of *WaterWeb* is ponds. How does your role help increase awareness and appreciation of ponds?

MR. MCGEE:
Adopt-A-Pond is a program that provides resources and expertise that enable citizens to restore and maintain their stormwater ponds. We help them clean their ponds, provide them with plants to restore the ponds into functioning wetlands and teach them how to maintain their ponds. We're all about ponds!

WATERWEB:
What do you enjoy most about your job?

MR. MCGEE:
I like the teaching aspect because people often don't understand how stormwater ponds and freshwater wetlands work. It's great to see that understanding begin to dawn on them. It's rewarding to know that I had something to do with their education, especially when a pond turns out to be beautiful.

WATERWEB:
If a student showed an interest in pursuing a career related to ponds, what advice would you give this person?

MR. MCGEE:
Get involved now. There are plenty of opportunities in our Adopt-A-Pond Program, as well as others, that will allow you to get involved in a pond and really see what it's like. If something strikes you as interesting, you can focus your education on that. This is a great way to gain experience and know that you're working toward a job you'll enjoy.

WATERWEB:
What kind of background training or education does a person in your field need?

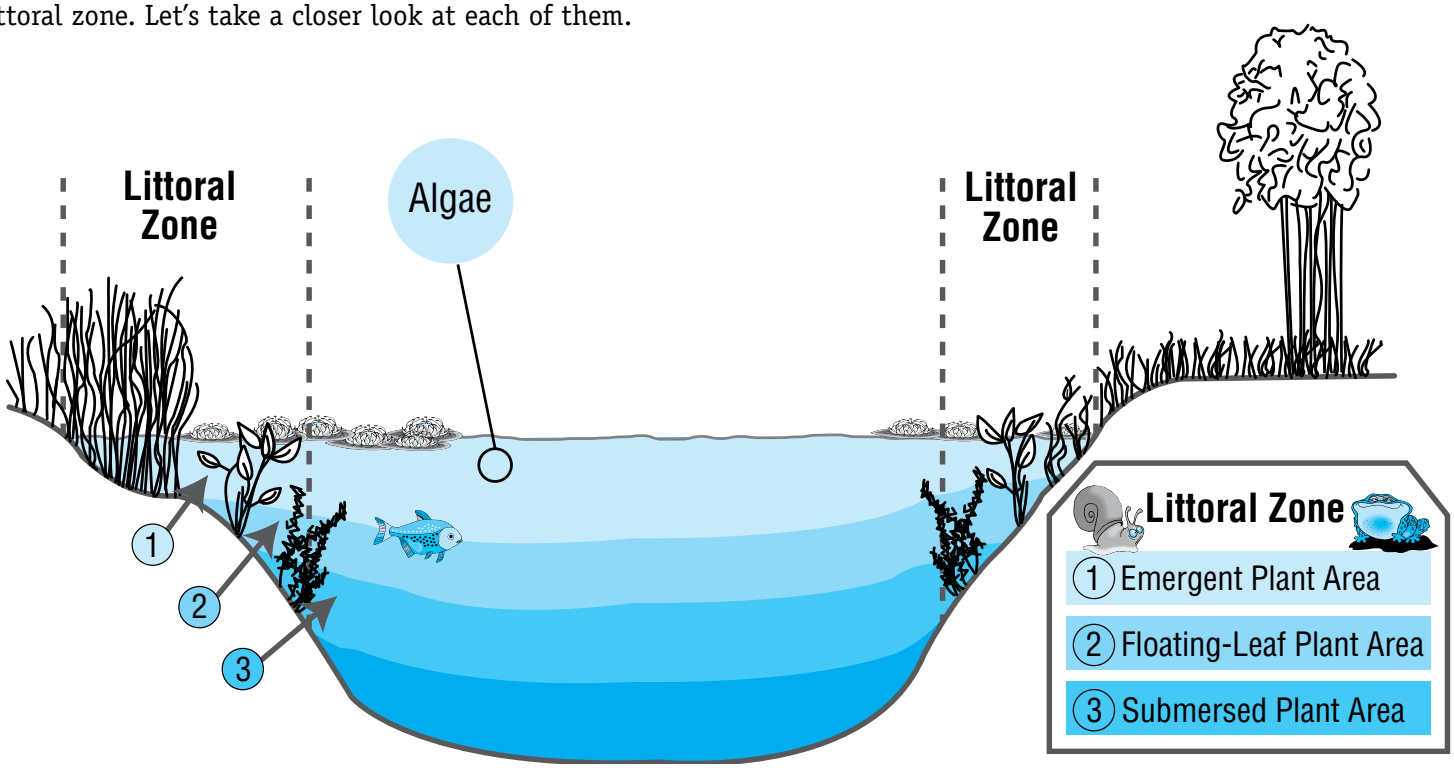
MR. MCGEE:
There are many opportunities to work with ponds. Some jobs require college degrees in environmental fields or natural sciences, while others require specialized technical training. But it isn't all science. My degree is in environmental studies. It's interdisciplinary, which means I've studied everything, such as biology, politics, economics, even the arts and philosophy, all from an environmental perspective. This interdisciplinary background helps me understand all sides of an issue.

WATERWEB:
Is there anything you would like to share with us about the importance of protecting our water resources?

MR. MCGEE:
Yes. An old saying, "You can only pull so many threads out of a rug before it falls apart," can apply to water resources. If we don't protect our water resources, we'll not only lose them but many other natural services they support, such as pestilence control, temperature regulation and flood control. Because these natural systems sustain us, it's more than just protecting something pretty. The time is gone when people thought we could do anything and nature would absorb it. We now know that we have to work within the natural system.

Life in the Littoral Zone

The "littoral zone" is the shallow zone within a pond or lake. This shallowness allows sufficient sunlight to penetrate through the water, supporting the growth of rooted, emergent aquatic plants. The littoral zone extends from the water's edge outward as far as rooted plants grow. There are three distinct bordering areas of flowering plants that grow in the littoral zone. Let's take a closer look at each of them.



1. Emergent Plant Area
Closest to the shore of the pond is the emergent plant area. Here, the plants are rooted to the bottom with their stems, and leaves grow above the surface of the water. A few of the plants found in this area are grasses, sedges, rushes and algae. Mammals, birds and frogs often use this area for food and shelter. Protozoans, snails, insects, worms and small fish may be observed beneath the water's surface.

2. Floating-Leaf Plant Area
The next border of vegetation is called the floating-leaf plant area. Broad, flat-leaved water lilies, duckweed and water ferns may be found in abundance in this area of the pond, as well as many kinds of algae. Snails, mayflies and bugs use the leaves for egg-laying. Water animals use this area for breeding and nesting.

3. Submersed Plant Area
The innermost band of vegetation that surrounds the center of a pond is called the submersed plant area. The plants in this area have leaves that are either long and slender or bushy and very branched. Some of the flowering plants that grow in this area are waterweeds, hornworts and pondweed.

EXTENDED ACTIVITY

Visit a pond near your home and try to identify the three different areas of the littoral zone. Then search the Internet or use identification guides to learn more about the plants and animals that make up your pond's community.

Mapping a Pond

By mapping your pond, you will be able to learn more about the plants and animals that live there. Repeat this project at different times of the year to illustrate the changes that occur over time. You may be very surprised to discover how much has happened!

Learning Goals

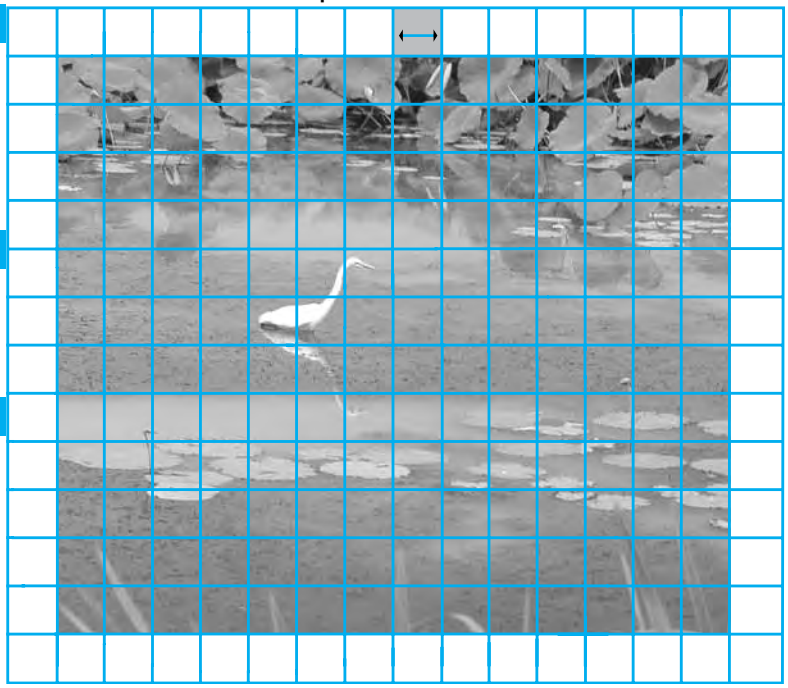
- To learn more about the features of a pond
- To stimulate thought about pond habitats

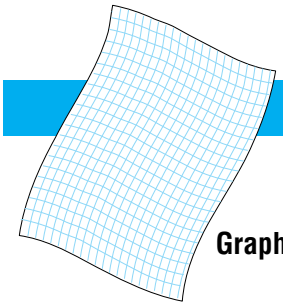
Subjects

- Science
- Mathematics

Materials

- Graph paper with inch squares
- Large ball of string
- Colored pens and markers
- Tape measure

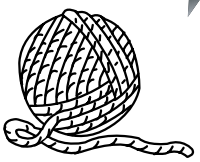




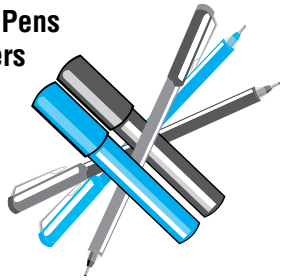
Graph Paper

Tape Measure

String



Colored Pens & Markers



ACTIVITY

1. On the graph paper, establish a scale of distance to be used for measuring. For example, one square may equal 10 feet. Depending on the size of the pond, a square may equal a larger or smaller amount. Write the scale on the paper and label it.
2. Using a large ball of string and a pen, mark off increments representing the length of the square. If a square represents 10 feet, then mark off increments of 10 feet on the string.
3. Stand near the edge of the pond and use the string to determine the greatest length. Do the same for the area of the pond where the greatest width exists.
4. Use a pencil and lightly draw these distances on the graph paper according to your scale of distance.
5. Now, estimate the distances for shorter areas of the pond and record them on the graph paper.
6. Using a darker pen, draw the final shape of the pond on the graph paper.
7. Using other colors, identify the three areas of the littoral zone and label them as follows: emergent plant area, floating-leaf plant area, submersed plant area.
8. Sketch various plants and animals found in these areas and label them.
9. Make a list of the plants and animals observed at the pond.
10. Be sure to write the date on which the drawing was completed.

WaterWeb Crossword Puzzle

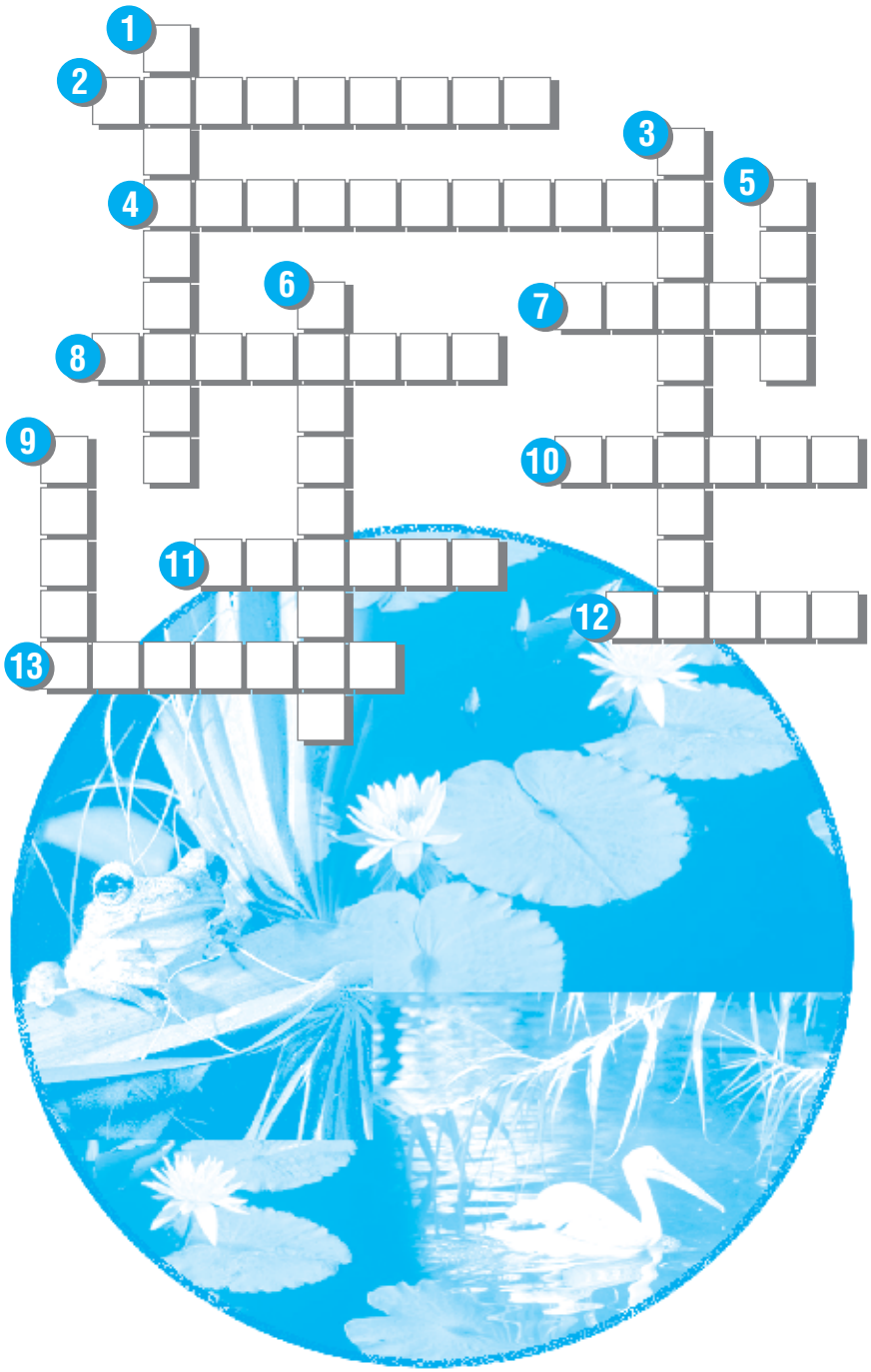
Sharpen your pencils. Complete each sentence with the correct word that fits in the puzzle.

Across:

2. A _____ pond slowly releases water downstream to lakes, rivers or streams.
4. There are many career opportunities for working in the _____.
7. Many species of _____ may be found near healthy ponds.
8. The _____ zone of a pond extends from the water's edge outward as far as rooted plants grow.
10. A healthy pond provides habitat for a variety of _____ and animals.
11. Natural ponds are caused by forces in _____.
12. Ponds contain _____ water rather than salty water.
13. A pond can be defined as a small, _____ body of water that is completely surrounded by land.

Down:

1. A _____ pond collects stormwater and allows the water to soak into the soil and surrounding ground.
3. A major source of pollutants to our ponds is _____ runoff.
5. A healthy pond may include many kinds of _____.
6. Improved stormwater management can reduce the degree of _____ in a pond.
9. Stormwater _____ can be made to look like natural ponds.



WaterWeb Scramble

Unscramble the letters to form words. Then use these words to complete the paragraph.

thhyeal _____

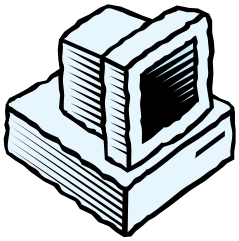
turnae _____

vmentdeloep _____

ollutpanst _____

Ponds can be some of the most fascinating places found in _____. Keeping our ponds _____ means everyone being actively involved. By taking a few easy steps, we can prevent _____ from flowing into our ponds. Increased growth and _____ make it especially important for all of us to help manage and protect our ponds.

Sites for WaterWeb Readers to Explore



There is a lot of information about ponds available on the Internet. Check out the two sites listed below to learn more about ponds and our water resources.

edis.ifas.ufl.edu/FA037

42explore.com/pond.htm

Protect Our Ponds

Help protect your neighborhood ponds by becoming "water smart"! Recognize the importance of water to all living things. Protect it and don't waste it. Wasteful water use is as harmful as activities that directly lower the quality of our water. Look at the following tips to guide you in your water quality quest:

- Use mulch around your plants. It's attractive, helps prevent runoff from your lawn and holds moisture in the soil.
- Storm drains are only for rainwater. They are not containers for grass clippings, tree limbs, used oil, leftover chemicals or other garbage. Always remember these drains carry pollution to nearby ponds, lakes or rivers.
- Plant, don't pave! Any type of natural ground cover, such as plants or grasses, reduces runoff and is prettier than concrete.
- Educate your friends and neighbors! Working together, you and your neighbors can improve water quality, provide valuable wildlife habitat and maintain an attractive environment for your community.
- Reduce the amount of lawn chemicals you use. If you or your parents are going to use pesticides and herbicides, use them sparingly and always follow the label directions.
- Take used automobile fluids, such as oil, to a gas station that recycles. A single quart of motor oil can foul the taste of 250,000 gallons of water.
- Don't pour gasoline on cracks in concrete to get rid of weeds and grass. Manually pull out weeds and other plants.
- Support protection and improvement projects in wetland areas. Wetlands help keep our water clean.
- If you have a septic system for your home, your parents should have it inspected every two to three years and pumped out as needed.

Credits

Southwest Florida Water Management District

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