

Down Under

SUBMERSED PLANTS

SKILLS: categorizing, using prefixes and roots as clues to meaning

COMMON CORE STANDARDS/FLORIDA STANDARDS:

L.4.4b; L.5.5b; W.4.8; W.5.

NEXT GENERATION SUNSHINE STATE STANDARDS:

SC.5.L.14.2; SC.5.L.17.1

NEXT GENERATION SCIENCE STANDARDS: 4-LS1-1; 5-LS1-1

MATERIALS:

chalkboard or whiteboard

student copies of the reproducibles on pages 7 and 8, copied front to back

student supply of file folders (or large folded sheets of construction paper)

scissors



Note: The graphic organizer on pages 7 and 8 will also be used in the activities on pages 9–18.

STEPS:

- 1 Write the words *emergent* and *submersed* on the board. Ask students what they notice about these words. Guide them to notice that both words have the same root (*mers*) and begin with prefixes (*em-* and *sub-*). Add the meanings below to the board and help students use them to determine the meanings of *emergent* (in the water) and *submersed* (under the water).
 - *em-* : prefix meaning “in, into”
 - *sub-* : prefix meaning “under, put under”
 - *mers*: Latin root meaning “dip, dive”
- 2 Give each student a copy of the graphic organizer on pages 7 and 8 and a folder in which to store it. Point out that the organizer lists three different types of aquatic plants that live in Florida’s waters, including the St. Johns River watershed: submersed plants, emergent plants, and free floating and floating-leaved plants.
- 3 Explain to students that submersed plants live their entire life cycle beneath the surface of the water. Most are rooted to the bottom sediments. Their stems and leaves grow entirely underwater, although some may have floating leaves. The flowers and seeds of some submersed plants may extend above the water.

AQUATIC PLANTS OF THE ST. JOHNS RIVER PART 1

Submersed Plants	Emergent Plants	Free Floating and Floating-Leaved Plants
Description:	Description:	Description:
Examples:	Examples:	Examples:

AQUATIC PLANTS OF THE ST. JOHNS RIVER PART 2

Submersed Plants	Emergent Plants	Free Floating and Floating-Leaved Plants
Functions:	Functions:	Functions:
Potential problems:	Potential problems:	Potential problems:

Down Under

SUBMERSED PLANTS

- 4** Have six students come to the board. Explain that the board's tray is the water line, everything beneath it is underwater, the area above it is the air, and the floor is the bottom sediment. To show that some submersed plants are rooted to the sediments, direct the six students to squat so that their heads are below the tray. Have students observe that the students' feet are on the floor to show that they have embedded roots. Then have one student raise his hands so that they are lying on or touching the board's tray to indicate a submersed plant with floating leaves. Finally, have one of the students raise his hands so they are just barely above the tray to indicate a submersed plant that extends a little bit above the water. Repeat if desired until every student has had a chance to take part in the demonstration.
- 5** Display photos of several submersed plants from the website in the box below, such as these that call the St. Johns River home: eelgrass, spikerush, pickerel weed, southern naiad, Illinois pondweed, horned pondweed, small pondweed, widgeon grass, and hydrilla. (For more information on the hydrilla, see the reproducible activity on page 21.) This website also features short two- to three-minute videos on selected plants. With students, identify which plants you view are considered to be problem plants or invasive species.

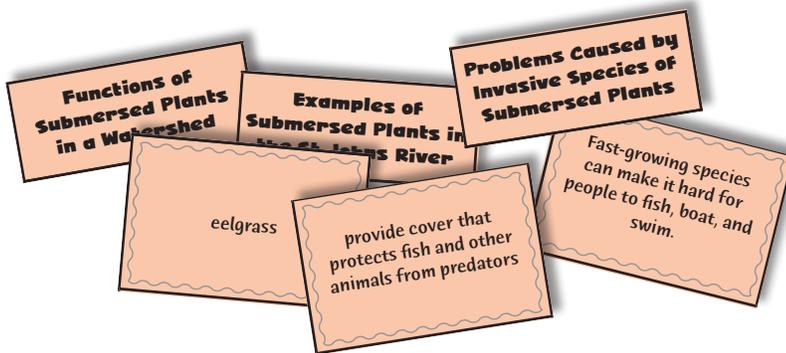
<http://plants.ifas.ufl.edu/manage/why-manage-plants/aquatic-and-wetland-plants-in-florida>



Down Under

SUBMERSED PLANTS

- 6** Distribute a copy of the cards on page 5 to each group of three to four students. Direct each group to cut out the cards and then sort them under the three heading cards. When each group has sorted the cards, discuss their sorts using the answer key. Provide time for groups to make any corrections to their sorts. Then have them use the corrected sorts to complete the submersed plants portions of the graphic organizer.



Extensions for Grades 2-3:

Have students draw simple illustrations that show the things plants need to grow: sunlight, nutrients, air, and water. After students share their pictures in small groups, display photos of several submersed plants from the website on page 2. After discussing the common characteristics these plants seem to have, explain that submersed plants grow primarily below the water's surface. Ask, "Do you think submersed plants need oxygen and nutrients?" Guide students to see that these plants have adaptations that allow them to get oxygen and, in the case of free floating submersed plants, nutrients from the water they live in. *Common Core Standards/Florida Standards SL.2.1; SL.3.1; Next Generation Sunshine State Science Standards SC.2.L.17.1; SC.2.L.17.2; SC.3.L.14.1; SC.3.L.17.2; Next Generation Science Standard 2-LS4-1*

Down Under

SUBMERSED PLANTS

Extensions for Grades 6-8:

Have students research to identify a food web that includes submersed plants. Also have them research to find out what might happen if the population of one member of the web either increases or decreases significantly. Direct students to create posters to display their findings. *Common Core Standards/Florida Standards W.6.7; W.7.7; W.8.7; Next Generation Science Standards MS-LS1-5; MS-LS1-6*

For more information on submersed plants, check out these resources:

- <http://plants.ifas.ufl.edu/manage/why-manage-plants/aquatic-and-wetland-plants-in-florida>
- http://forestandrang.org/new_wetlands/wetland_plants.htm
- http://www.dnr.state.mn.us/aquatic_plants/submerged_plants/index.html

For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://www.theriverreturns.org/>
- <http://dep.state.fl.us/Northeast/stjohns/>

Submersed Plants Heading and Characteristic Cards

Use with the activity on page 1.

Functions of Submersed Plants in a Watershed	Examples of Submersed Plants in the St. Johns River	Problems Caused by Invasive Species of Submersed Plants
<p>provide oxygen and food for fish</p>	<p>can grow too fast and clog waterways</p>	<p>eelgrass</p>
<p>provide food for water birds and other animals</p>	<p>contribute to accumulation of muck, or decaying plant matter</p>	<p>hydrilla</p>
<p>pondweed</p>	<p>overgrowth can cause flooding</p>	<p>provide cover that protects fish and other animals from predators</p>
<p>provide "nursery" areas for the young of many species</p>	<p>help make water cleaner by absorbing nutrients and slowing the water to allow sediments to settle</p>	<p>widgeon grass</p>
<p>southern naiad</p>	<p>Fast-growing species can make it hard for people to fish, boat, and swim.</p>	<p>if they clog waterways, can slow down flow of water and cause flooding along rivers and canals</p>

DOWN UNDER

ANSWER KEY

Functions of Submersed Plants in a Watershed

- provide oxygen and food for fish
- provide food for water birds and other animals
- provide cover that protects fish and other animals from predators
- help make water cleaner by absorbing nutrients and slowing the water to allow sediments to settle
- provide “nursery” areas for the young of many species

Examples of Submersed Plants in the St. Johns River

- eelgrass
- hydrilla
- pondweed
- widgeon grass
- southern naiad

Problems Caused by Invasive Species of Submersed Plants

- can grow too fast and clog waterways
- contribute to accumulation of muck, or decaying plant matter
- overgrowth can cause flooding
- Fast-growing species can make it hard for people to fish, boat, and swim.
- if they clog waterways, can slow down flow of water and cause flooding along rivers and canals

AQUATIC PLANTS OF THE ST. JOHNS RIVER

PART 1

Submersed Plants

Description:

Examples:

Emergent Plants

Description:

Examples:

Free Floating and Floating-Leaved Plants

Description:

Examples:



AQUATIC PLANTS OF THE ST. JOHNS RIVER

PART 2

Submersed Plants

Functions:

Potential problems:

Emergent Plants

Functions:

Potential problems:

Free Floating and Floating-Leaved Plants

Functions:

Potential problems:



Above the Water Line

EMERGENT PLANTS

SKILLS: main idea and details, categorizing information

COMMON CORE STANDARDS/FLORIDA STANDARDS: RI.4.1;

RI.5.1; W.4.6; W.5.8

NEXT GENERATION SUNSHINE STATE STANDARDS:

SC.5.L.14.2; SC.5.L.17.1

NEXT GENERATION SCIENCE STANDARDS: 4-LS1-1; 5-LS1-1

MATERIALS:

- student copies of page 12
- scissors
- glue sticks
- student supply of construction paper
- graphic organizers from the activity on page 1



STEPS:

- 1 Using the graphic organizer students started in the “Down Under” activity on page 1, review the characteristics of submersed plants.
- 2 Point out the middle section of the graphic organizer, which highlights another category of aquatic plants: emergent plants. Review the meaning of *emergent* as discussed in Step 1 on page 1. Explain to students that emergent plants are typically rooted in submersed soil or water-saturated soil near the edge of the water. The leaves, stems, and reproductive organs grow above the water line. Cattails and rushes are examples of emergent plants.
- 3 Have six students come to the board. Remind students that the board’s tray is the water line, everything beneath it is underwater, the area above it is air, and the floor is the bottom sediment. Ask three students to demonstrate submersed plants as described in Step 4 on page 2. Then direct the other three students to stand in front of the board and stretch their arms overhead to demonstrate that their roots grow in the soil near the water’s edge and their leaves and stems grow above the water line. Repeat the demonstration if desired with another group of students.



Above the Water Line

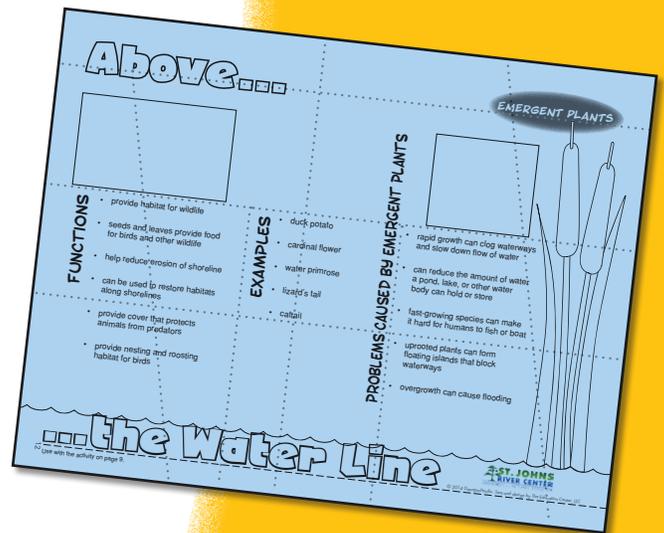
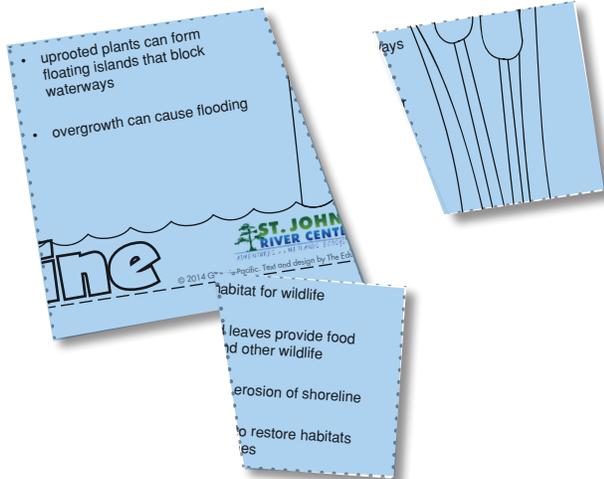
EMERGENT PLANTS

4 Display photos of emergent plants from the website in the box below, such as these that call the St. Johns River home: common buttonbush, water primrose, lizard's tail, cardinal flower, duck potato, salt-marsh bulrush, and cattail. This website also features short two- to three-minute videos on selected plants. With students, identify which plants you view are considered problem plants or invasive species.

<http://plants.ifas.ufl.edu/manage/why-manage-plants/aquatic-and-wetland-plants-in-florida>



5 Give each student (or pair of students) a copy of the puzzle on page 12, scissors, a glue stick, and a sheet of construction paper. Direct the student to cut out the puzzle pieces, assemble the puzzle on the construction paper, and then glue the pieces in place. When students have completed the puzzle, discuss the information on it. Then have students use the puzzle to complete the emergent plants portion of the graphic organizer.



Above the Water Line

EMERGENT PLANTS

Extensions for Grades 2-3:

Have each pair of students draw a large Venn diagram on a sheet of light-colored construction paper. Then have the students demonstrate what they've learned about submersed and emergent plants by using the diagram to compare and contrast them. Encourage students to include information about the basic needs of both plants in their diagrams. *Next Generation Sunshine State Science Standards SC.2.L.17.1; SC.2.L.17.2; Next Generation Science Standard 2-LS4-1*

Extensions for Grades 6-8:

Have students work in small research groups to identify competitive and mutually beneficial relationships that involve emergent plants in a wetland or river ecosystem. Have each group write and perform a short skit that creatively shares its information with the class. *Common Core Standards/Florida Standards SL.6.4; SL.7.4; SL.8.4; Next Generation Sunshine State Science Standards SC.7.L.17.1; SC.7.L.17.2; SC.7.L.17.3; Next Generation Science Standards MS-LS2-1; MS-LS2-2*

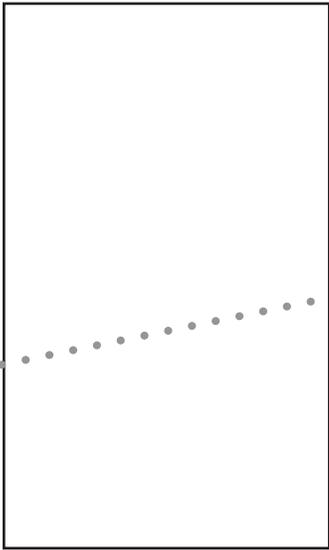
For more information about emergent plants, take a look at these resources:

- <http://plants.ifas.ufl.edu/manage/why-manage-plants/aquatic-and-wetland-plants-in-florida>
- <http://aquaplant.tamu.edu/plant-identification/alphabetical-index/waterstargrass/>

For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://www.theriverreturns.org/>
- <http://dep.state.fl.us/Northeast/stjohns/>

Above



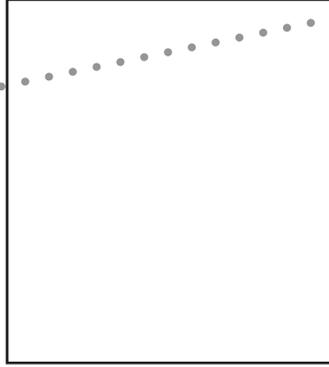
FUNCTIONS

- provide habitat for wildlife
- seeds and leaves provide food for birds and other wildlife
- help reduce erosion of shoreline
- can be used to restore habitats along shorelines
- provide cover that protects animals from predators
- provide nesting and roosting habitat for birds

EXAMPLES

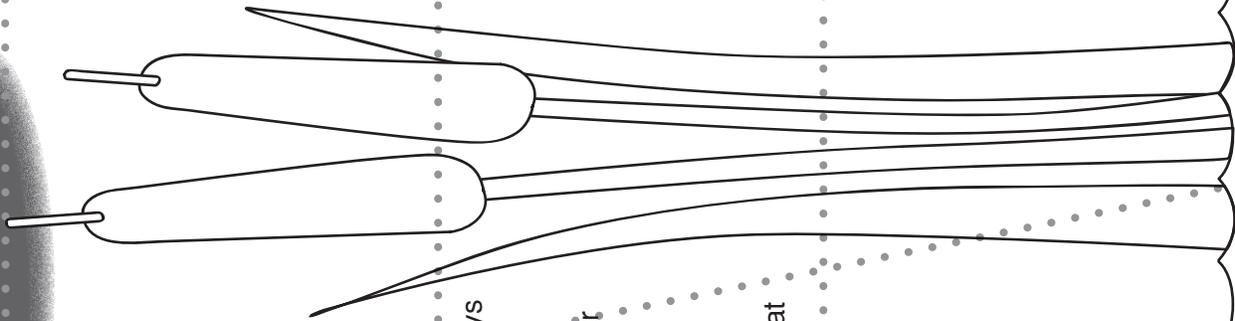
- duck potato
- cardinal flower
- water primrose
- lizard's tail
- cattail

PROBLEMS CAUSED BY EMERGENT PLANTS



- rapid growth can clog waterways and slow down flow of water
- can reduce the amount of water a pond, lake, or other water body can hold or store
- fast-growing species can make it hard for humans to fish or boat
- uprooted plants can form floating islands that block waterways
- overgrowth can cause flooding

EMERGENT PLANTS



the Water Line



ADVENTURES IN WETLANDS ECOSYSTEMS

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ABOVE THE WATER LINE

ANSWER KEY

FUNCTIONS

- provide habitat for wildlife
- seeds and leaves provide food for birds and other wildlife
- help reduce erosion of shoreline
- can be used to restore habitats along shorelines
- provide cover that protects animals from predators
- provide nesting and roosting habitat for birds

EXAMPLES

- duck potato
- cardinal flower
- water primrose
- lizard's tail
- cattail

PROBLEMS CAUSED BY EMERGENT PLANTS

- rapid growth can clog waterways and slow down flow of water
- can reduce the amount of water a pond, lake, or other water body can hold or store
- fast-growing species can make it hard for humans to fish or boat
- uprooted plants can form floating islands that block waterways
- overgrowth can cause flooding

Fab Floaters

FREE FLOATING AND FLOATING-LEAVED PLANTS

SKILLS: main idea and details, categorizing information

COMMON CORE STANDARDS/FLORIDA STANDARDS:

RI.4.1; RI.5.1; W.4.6; W.5.8

NEXT GENERATION SUNSHINE STATE STANDARDS:

SC.5.L.14.2; SC.5.L.17.1

NEXT GENERATION SCIENCE STANDARDS: 4-LS1-1; 5-LS1-1

MATERIALS:

- copy of page 18 for each group of four students
- piece of 9 x 12 tagboard for each group of students
- glue
- scissors

SETUP:

Glue each copy of page 18 on a piece of tagboard. Place a chair directly beside your classroom's board.

STEPS:

- 1 Using the graphic organizers students started in the “Down Under” activity on page 1, review the characteristics of submersed and emergent plants.
- 2 Point out the far right section of the graphic organizer, which highlights a third category of aquatic plants: free floating and floating-leaved plants. Explain to students that the roots of free floating plants are not anchored in sediment. Instead of getting nutrients from the soil, these plants obtain their nutrients from the water. Water hyacinth is an example of a free floating plant. (For more information on water hyacinth, see the reproducible activity on page 14 of the unit “St. Johns River Watershed”.) Further explain that floating-leaved plants are usually rooted in sediment but have leaves that float on the water's surface. Water lilies are an example of a floating-leaved plant.



Fab Floaters

FREE FLOATING AND FLOATING-LEAVED PLANTS

3 Have six students come to the board. Remind students that the board's tray is the water line, everything beneath it is underwater, the area above it is air, and the floor is the bottom sediment. Ask two students to demonstrate submersed plants as described in Step 1 on page 1. Direct two other students to demonstrate emergent plants as described in Step 3 on page 9. Next, have one of the remaining students squat so his head is below the board's tray and place one hand on the tray to represent a floating-leaved plant. Finally, ask the last student to sit in the chair beside the board, raise his legs from the floor, and lay his hand on the tray to demonstrate a free floating plant. Repeat the demonstration if desired with another group of students.



4 Display photos of free floating and floating-leaved plants from the website in the box below, such as these that call the St. Johns River home: water hyacinth, mosquito fern, small duckweed, giant salvinia, water spangles, spatterdock, water lettuce, and water lily. This website also features short two- to three-minute videos on selected plants. With students, identify the plants you view that are considered to be problem plants or invasives.

<http://plants.ifas.ufl.edu/manage/why-manage-plants/aquatic-and-wetland-plants-in-florida>

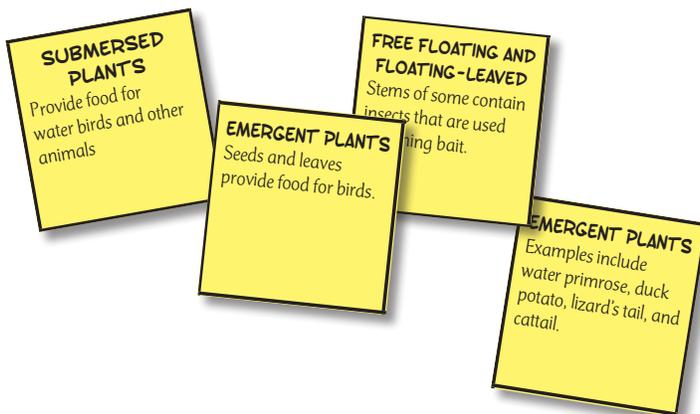
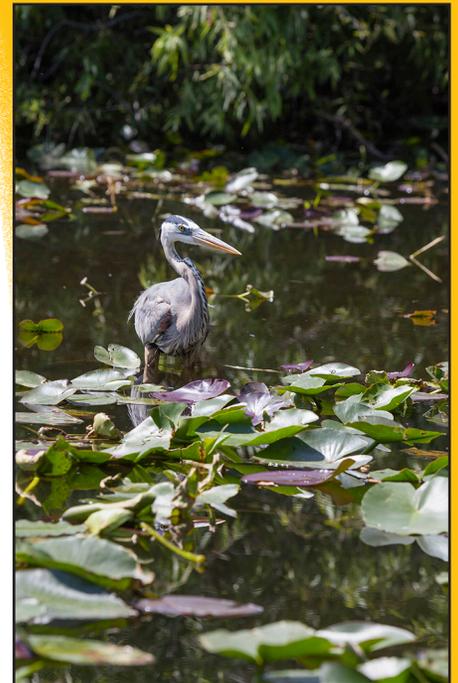


Fab Floaters

FREE FLOATING AND FLOATING-LEAVED PLANTS

5 Give each group of four students one of the tagboard sheets on which you've glued a copy of page 18. Have students cut out the cards and shuffle them. Then, to review all three types of aquatic plants that are found in the St. Johns River watershed, have each group play the following game. The object of the game is to be the first to collect five different cards for the same plant type. Have students play according to these rules:

- The dealer deals five cards to each player and places the remaining ten cards facedown in a stack.
- The dealer draws the stack's top card and decides whether to keep it. If he doesn't want the card, he places it faceup next to the stack. If he wants the card, he takes it and discards a different card from his hand, placing it faceup next to the stack.
- The next player to the right chooses the faceup card or draws a card from the stack and discards one from his hand.
- If all cards from the stack are drawn, flip over the pile of faceup cards to start a new stack.
- Players continue until one player has five matching cards.



6 After students have played the game for at least two rounds, have them use the cards for free floating and floating-leaved plants to complete the graphic organizer on pages 7 and 8.

Fab Floaters

FREE FLOATING AND FLOATING-LEAVED PLANTS

Extensions for Grades 2-3:

Review with students the major differences between submersed, emergent, and free floating and floating-leaved plants. Then have each student pretend that she has spent a day at a local wetland and has seen examples of each type of plant firsthand. Have her write a diary entry from that perspective, including specific facts about the plants' basic needs, where the plants live, and what makes them different from each other. *Common Core Standards/Florida Standards W.2.2; W.3.2; Next Generation Sunshine State Science Standards SC.2.L.17.1; SC.2.L.17.2; SC.3.L.14.1; SC.3.L.17.2; Next Generation Science Standards 2-LS4-1; 3-LS4-3*

Extensions for Grades 6-8:

Write the word *phytoplankton* on the board. After students predict what this word means, explain that phytoplankton is microscopic plant life that floats in the upper sunlit layer of almost all bodies of water. Review with students the role that plants play in an ecosystem food web, including the importance of photosynthesis. Then, have pairs of students research to find out more about these organisms and their role in an ecosystem like the St. Johns River watershed. Direct students to include information on how a lack of or an overabundance of phytoplankton may affect the St. Johns River ecosystem. Provide time for students to share their findings in small groups. *Common Core Standards/Florida Standards W.6.7; W.7.7; W.8.7; Next Generation Sunshine State Science Standards SC.7.L.17.1; SC.7.L.17.2; SC.8.L.18.1; Next Generation Science Standards MS-LS2-1; MS-LS2-3*

Wrap It Up!

Shine a spotlight on the three types of aquatic plants with a great wrap-up activity. Divide the class into teams of three or four students each. Then assign each team a type of aquatic plant—submersed, emergent, or Free Floating and floating-leaved—to research. Encourage students to find information on where the plants live, how they get their needs met, the functions they play in the ecosystem in which they live, and potential problems they can present for humans and/or other members of the ecosystem. Then have each team illustrate its findings on a large yellow circle cutout, or "spotlight." After each team shares its project, mount the cutouts on a bulletin board or wall area titled "Spotlighting Aquatic Plants."

For more information about free floating and floating-leaved plants, see these resources:

- <http://plants.ifas.ufl.edu/manage/why-manage-plants/aquatic-and-wetland-plants-in-florida>
- <http://aquaplant.tamu.edu/plant-identification/alphabetical-index/waterstargrass/>

For more information about the St. Johns River, check out these resources:

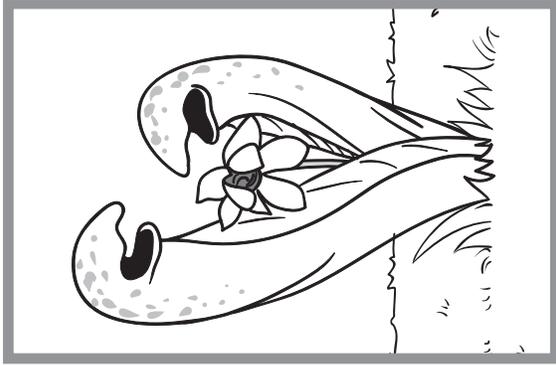
- <http://www.sjrwmd.com/stjohnsriver/>
- <http://www.riverreturns.org/>
- <http://dep.state.fl.us/Northeast/stjohns>

Game Cards

Use with the activity on page 14.

<p>SUBMERSED PLANTS</p> <p>Provide food for water birds and other animals</p>	<p>SUBMERSED PLANTS</p> <p>Provide cover that protects fish and other animals from predators</p>	<p>SUBMERSED PLANTS</p> <p>Slow down water flow, which helps make water cleaner</p>	<p>SUBMERSED PLANTS</p> <p>Can curb algae overgrowth by using up nutrients algae feed on</p>	<p>SUBMERSED PLANTS</p> <p>Include eelgrass, hydrilla, and widgeon grass</p>
<p>SUBMERSED PLANTS</p> <p>Invasive species can grow too fast and clog waterways.</p>	<p>SUBMERSED PLANTS</p> <p>Fast-growing species can harm fish and bird populations.</p>	<p>SUBMERSED PLANTS</p> <p>Includes pondweed and southern naiad</p>	<p>SUBMERSED PLANTS</p> <p>Fast-growing species can make it hard to fish, boat, and swim.</p>	<p>SUBMERSED PLANTS</p> <p>Can clog waterways and slow down flow of water</p>
<p>EMERGENT PLANTS</p> <p>Provide a habitat for wildlife</p>	<p>EMERGENT PLANTS</p> <p>Seeds and leaves provide food for birds.</p>	<p>EMERGENT PLANTS</p> <p>Help reduce erosion of shoreline</p>	<p>EMERGENT PLANTS</p> <p>Provide cover that protects animals from predators</p>	<p>EMERGENT PLANTS</p> <p>Provide a nesting and roosting habitat for birds</p>
<p>EMERGENT PLANTS</p> <p>Examples include water primrose, duck potato, lizard's tail, and cattail.</p>	<p>EMERGENT PLANTS</p> <p>Rapid growth can clog waterways and slow down flow of water.</p>	<p>EMERGENT PLANTS</p> <p>Fast-growing species can make it hard to boat or fish.</p>	<p>EMERGENT PLANTS</p> <p>Uprooted plants can form floating islands that block waterways.</p>	<p>EMERGENT PLANTS</p> <p>Overgrowth may cause flooding.</p>
<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Provide food and habitat for fish and wildlife</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Help reduce erosion of shoreline</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Stems of some contain insects that are used for fishing bait.</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Provide shade and oxygen for fish</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Examples include mosquito fern, water lettuce, and water lily.</p>
<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Floating-leaved plant debris can make a water body shallower.</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>May shade submerged oxygen-producing plants below them</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Can provide a breeding habitat for mosquitoes</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Roots of dead plants can cover water's surface and block access.</p>	<p>FREE FLOATING AND FLOATING-LEAVED</p> <p>Some may cover water's surface and harm fish and wildlife.</p>

PERILS OF THE HOODED PITCHER PLANT



One day, you are minding your own business. You gather nectar and enjoy buzzing in the sun. You tingle when you sense nectar in a strange-looking plant close to the ground. As a bee, you are delighted. The smell of nectar is strong! But as you enter this plant, you find yourself slipping. Down, down you go into a long tube. You can't get your footing. The smell of nectar gets stronger, but you're scared. You're slipping downward! It's getting darker. Sharp hairs pointing down the tube keep you from flying out. And then...

Bees, ants, flies, and wasps are the most common victims of the hooded pitcher plant. The hooded pitcher plant is part of a unique genus of plants called *Sarracenia*. These plants are *carnivorous*, or meat eaters. Hooded pitcher plants capture their prey and digest them for their nitrogen. This is because nitrogen is usually not easy to find in the soil where the plant lives.

Hooded pitcher plants are shaped like narrow tubes. They grow to between 15 and 27½ inches tall. At the top, the tube turns into a curved pink hood that forms a sort of lid. Unlike another carnivorous plant, the Venus flytrap, the hooded pitcher plant does not close on its prey. The captured insect slips down into the tube and cannot get out. It is too slippery inside. There are lots of small hairs that point downward in the tube, too. And once a victim falls in all the way, it is quickly eaten by digestive enzymes.

Life as a hooded pitcher plant isn't easy, however. While the plant's habitat once stretched from Florida to North Carolina, it is now threatened. Along the Gulf Coastal plain of Florida, less than 3% of the hooded pitcher plant's original habitat remains

intact. Urban development and other man-made environmental changes have had a negative effect on hooded pitcher plants and other types of pitcher plants. Where pitcher plant habitat remains untouched by humans, the feral (or wild) hog now represents the biggest danger. These animals root up the plants and disturb the soil.

Hooded pitcher plants can live in pots in your house. They are fun to observe. If you do get one, be sure it was not taken from the wild. It's time to preserve these amazing plants—although some insects may disagree.

Read the article; then write your answers on your own paper.

1. How did the author use the first paragraph to draw a reader in and catch the reader's interest?
2. Which word in the second paragraph means "an animal that is hunted or killed for food"?
3. How does the pitcher plant's structure help it capture its prey? Underline portions of the text that support your answer.
4. True or false: The hooded pitcher plant's natural habitat in Florida has shrunk in size.
5. How do you know your answer to number 4 is correct?
6. What is the best definition of the word *preserve* in the last paragraph: to save for personal use, to can or pickle, or to protect?



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Common Core Standards/Florida Standards *RI.4.1-4; RI.5.1-4*
 Next Generation Sunshine State Standards *SC.4.L.16.2; SC.5.L.17.1*
 Next Generation Science Standard *4-LS1-1*

Note to the teacher: Read the article aloud to students in grades 2–3; then have them work together to research and compare the meanings of *carnivorous*, *herbivorous*, and *omnivorous*. *Common Core Standards/Florida Standards RI.2.4, RI.3.4, RI.3.4; Next Generation Sunshine State Standard SC.3.N.3.1*. Have students in grades 6–8 research and identify other carnivorous plants in the St. Johns River watershed. *Common Core Standards/Florida Standards W.6.7, W.7.7, W.8.7; Next Generation Science Standard MS-LS1-4*

PERILS OF THE HOODED PITCHER PLANT

ANSWER KEY

1. Answers will vary but should include putting the reader in the perspective of a bee that has been trapped by a pitcher plant.
2. prey
3. Answers will vary. Students should underline sentences 3, 5, 6, and 7 of the third paragraph.
4. true
5. Answers will vary. Students should include references to text found in the fourth paragraph.
6. to protect

For more information on carnivorous plants, see these resources:

- <http://edis.ifas.ufl.edu/uw378>
- http://botany.org/Carnivorous_Plants/
- http://www.life.illinois.edu/plantbio/greenhouse/vt_carnivorous.html
- <http://www.brainpop.com/science/diversityoflife/carnivorousplants/preview.weml>

For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://www.theriverreturns.org/>
- <http://dep.state.fl.us/Northeast/stjohns/>

INVADERS!

Read the paragraphs about a plant “invader” called hydrilla. Then write a heading for each paragraph.

1. _____

Hydrilla is a submersed plant that is found in Florida. A submersed plant grows mostly below the water’s surface. The slender stem of a hydrilla plant can be more than 35 feet tall! Hydrilla have small leaves with pointed tips. These leaves have teeth-like edges. Underneath each leaf are one or more bumps along the vein or rib. Hydrilla grow little white flowers that float at the water’s surface. The underwater roots of hydrilla spread out from growths called tubers.

2. _____

Hydrilla are invasive plants. An invasive plant grows quickly and in great numbers. The rapid growth of an invasive plant can harm the habitat in which it lives. One hydrilla plant can grow an inch or more a day! Hydrilla produce thick mats that can cover the entire surface of a water body in as little as a year or two. They will choke out other plants. Hydrilla will also lower the amount of oxygen in the water which can harm other wildlife in the habitat. The dense mats of hydrilla block sunlight from reaching other underwater plants. Without sunlight these other plants will die. The animals that eat these plants will also die or move somewhere else. The thick mats of hydrilla can make it hard to boat, fish, or swim. Hydrilla can also slow the movement of water. This can cause flooding along rivers and canals.



3. _____

Hydrilla cause a lot of damage to Florida’s waterways, including the St. Johns River. People have several ways of managing hydrilla. One way is by partially draining a water area. The hydrilla will lay exposed to the sun, die, and decompose. Florida spends millions of dollars each year on chemicals to try to kill hydrilla. The state also uses machines that cut out the hydrilla. But if the machines do not get to the hydrilla root, the plant will grow right back again. Officials have also introduced other plant and animal species—such as bugs, fungi, and bacteria—that eat hydrilla. Managing the spread of hydrilla is important to the health of Florida’s waterways.

Bonus: On another sheet of paper, draw a poster that illustrates how hydrilla has impacted the environment in which it grows. Or draw a poster that shows how the hydrilla’s structures help it survive.

Common Core Standards/Florida Standards RI.4.1-3; RI.5.1-3; L.4.6; L.5.6
 Next Generation Sunshine State Standards SC.4.L.17.4; SC.5.L.17.1
 Next Generation Science Standards 4-LS1-1; 5-LS1-1



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Note to the teacher: Read the paragraphs aloud to students in grades 2–3. Then have them work in small groups to develop a list of ways in which an invasive plant can create problems for humans. *Common Core Standards/Florida Standards RI.2.1; RI.2.2; RI.3.1; RI.3.2; Next Generation Sunshine State Standards SC.2.L.17.2; SC.3.L.17.2; Next Generation Science Standards 2-LS4-1, 3-LS4-3.* Have students in grades 6–8 debate potential problems when a new species is introduced in order to get rid of an invasive species. *Common Core Standards/Florida Standards SL.6.4; SL.7.4; SL.8.4; Next Generation Sunshine State Standard SC.7.L.17.3; Next Generation Science Standards MS-LS2-2; MS-LS2-5*

INVADERS!

ANSWER KEY

Answers will vary.

For more information about hydrilla, see these resources:

- <http://plants.ifas.ufl.edu/manage/why-manage-plants/floridas-most-invasive-plants/hydrilla>
- http://myfwc.com/media/226471/InvasivePlants_Hydrilla.pdf
- http://www.protectyourwaters.net/hitchhikers/plants_hydrilla.php
- <http://aquaplant.tamu.edu/plant-identification/alphabetical-index/hydrilla/>

For more information about the St. Johns River, check out these resources:

- <http://www.sjrwmd.com/stjohnsriver/>
- <http://www.theriverreturns.org/>
- <http://dep.state.fl.us/Northeast/stjohns/>