

# WATERDROPS

## Estuaries

Welcome to the estuaries issue of WaterDrops! As part of the Splash! Water Resources Education program, the Southwest Florida Water Management District (SWFWMD) offers this water resources newsletter for elementary students. The newsletter is correlated to grades 3–5 of the Sunshine State Standards and provides an interesting way for students to increase their awareness and respect for watersheds and the water resources within them. To better prepare your students for testing, we have included WaterDrops Challenge, which contains items similar to those that may appear on the Florida Comprehensive Assessment Test (FCAT).

This issue of WaterDrops focuses on estuaries. It includes fiction, nonfiction, writing, problem-solving activities, a word search and web sites to explore. All information and activities are designed to teach students about estuaries. Let WaterDrops make a splash in your classroom today!

Many other free materials are available from the SWFWMD and can be ordered online at [WaterMatters.org/publications/](http://WaterMatters.org/publications/). We also offer water resources workshops for teachers. Please contact us if you have any questions or suggestions about our water resources education programs.

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## Teacher's Guide

### Page 1

### Water Drips & Drops

It's fun to learn facts about our estuaries. Discuss the difference between fresh and salty water. Ask students to give examples of bodies of water that contain fresh water (such as lakes, rivers and ponds) and salt water (Gulf of Mexico, Atlantic Ocean, Pacific Ocean, etc.). Ask students to explain where brackish water may be found.

*Sunshine State Standards: SC.D.1.2.4, SC.G.1.2.2*

### Pages 2 & 3

### Feature Story

Read the story together. Ask students to share any experiences they may have had related to estuaries. Emphasize the productive role estuaries play in our natural environment. Then ask students to complete the writing activity.

*Sunshine State Standards: LA.A.2.2.5, LA.B.2.2.3, LA.B.2.2.5, SC.D.1.2.4, SC.D.2.2.1, SC.G.2.2.2, SC.G.2.2.3*

### Page 4

### Take It Home

Prepare your students for the activity they will do at home. You may want to demonstrate the experiment in the classroom. Discuss the concept of evaporation. Ask students to read the directions for making water evaporate and encourage them to try the experiment at home. Ask students to share their evaporation record and responses to the questions.

*Sunshine State Standards: MA.A.4.2.1, MA.B.1.2.2, SC.D.1.2.3*

### Page 1

### Hello Readers!

Estuaries play an important role in the environment. Discuss the concept of an estuary. To provide additional background for students, use a map of Florida and identify areas where estuaries may exist. Using the map, ask students to locate a river and follow its path leading to the sea. Repeat this activity for several rivers. The National Estuary Program's web site at [epa.gov/owow/estuaries/list.htm](http://epa.gov/owow/estuaries/list.htm) features three important estuaries within the SWFWMD: Charlotte Harbor, Sarasota Bay and Tampa Bay.

*Sunshine State Standards: SC.D.1.2.4, SC.D.2.2.1, SC.G.1.2.2, SC.H.2.2.1*

### Page 4

### Ask Water Cycle Wanda

Ask students to describe any estuaries they may have visited in Florida. Then select two students to play the roles of Carlos and Water Cycle Wanda. Ask the students to read their parts.

*Sunshine State Standards: SC.D.1.2.4, SC.D.2.2.1*

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Ask students to give several examples of living and nonliving things. Read about estuaries and complete the activity together. The things that do not belong in an estuary are the following: **pig, trash, cactus** and **bicycle tire**.

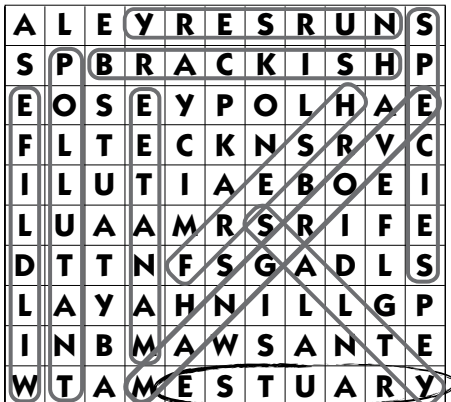
*Sunshine State Standards: SC.G.1.2.1, SC.G.1.2.2, SC.G.1.2.4, SC.G.1.2.5, SC.G.1.2.7, SC.G.2.2.2, SC.G.2.2.3*

Ask students if they have ever seen mangroves on TV, in videos, at an aquarium, at a nature center or along the coast. Read the information about mangroves together and complete the sentences at the bottom of the page. For an extra activity, ask students to draw a picture of mangrove trees and write a poem about them.

**Fill-in-the-Blank Answer Key:** walking tree, species, salt

*Sunshine State Standards: SC.D.1.2.4, SC.G.1.2.1, SC.G.1.2.2*

**Word Search Answer Key:**



**Water Words Answer Key:** brackish, estuary, erosion, salty, fresh, mangrove

Encourage your students to go to the educational web sites of the Southwest Florida Water Management District, *WaterMatters.org*. Ask students to summarize what they learned about each site they visited.

Discuss the importance of estuaries and ask students to suggest ways to maintain and protect the quality of estuaries for the twenty-first century. Encourage students to sign the pledge and send us a copy.

## WATERDROPS Extended Activities

(See page 3 of this Teacher's Guide)

### Number 1: A Floating Experiment

Measurements will vary. The bottle will float higher in the salty water.

### Number 2: Use Your Senses

Responses will vary.

### Number 3: Let's Learn More

A wealth of information about estuaries is available on the Internet. Encourage your students to research various topics using their search engines.

### Number 4: Welcome to Our Estuary!

To prepare students for this activity, help them make a list of living and nonliving things they would expect to find in an estuary.

## WATERDROPS Challenge

(See page 7 of this Teacher's Guide)

Items included in the Challenge are similar to those presented on the Florida Comprehensive Assessment Test (FCAT). Make copies of the Challenge and explain to students that this provides good practice for preparing for the FCAT. Students should be allowed to use the *WaterDrops* issue, if necessary.

**Answers to multiple-choice items:** 1-b, 2-d, 3-c, 4-d

### Answers to extended-response items:

**Question 1.** Responses will vary. Students should be able to demonstrate a basic understanding of estuaries.

**Score 2 points if . . .** The response indicates the student has a basic understanding of the ways estuaries are important to the environment. The student has provided a response that is accurate and complete.

**Score 1 point if . . .** The response indicates the student has a partial understanding of the ways estuaries are important to the environment. The student has provided a response that is essentially correct, but the information is too general or too simplistic.

**Score 0 points if . . .** The response is inaccurate, confused and/or irrelevant.

**Question 2.** Responses will vary. Students should be able to demonstrate a basic understanding of estuaries and why they need to be protected.

**Score 2 points if . . .** The response indicates the student has a basic understanding of estuaries and why they need protection. The student has provided a response that is accurate and complete.

**Score 1 point if . . .** The response indicates the student has a partial understanding of estuaries and why they need protection. The student has provided a response that is essentially correct, but the information is too general or too simplistic.

**Score 0 points if . . .** The response is inaccurate, confused and/or irrelevant.

*Sunshine State Standards: LA.A.2.2.5, LA.B.2.2.3, LA.B.2.2.6, SC.D.2.2.1, SC.G.1.2.2, SC.G.2.2.1*

### *A Floating Experiment*

You learned that an estuary contains a mixture of fresh water and salty water. Do you think things float better in fresh water or salty water? Try this experiment and find out!



#### **Materials:**

- 2-liter plastic soda bottle
- 2 buckets
- 2 cups salt
- 1 cup sand
- stick for stirring
- 2 colored markers
- ruler
- water

#### **Directions:**

1. Fill both buckets with the same amount of water. The water level should be within 6 inches of the top of each bucket.
2. Remove the cap of the soda bottle. Pour 1 cup of sand into the bottom.
3. Place the soda bottle in the first bucket. Use a colored marker to draw a line on the soda bottle to show the water level.
4. Pour 2 cups of salt in the second bucket and stir the water until the salt is completely dissolved. Then place the bottle in the bucket with salty water.
5. Use a different-colored marker to draw a line on the soda bottle to show the salty water level.
6. Use a ruler to compare the water levels on the bottle.

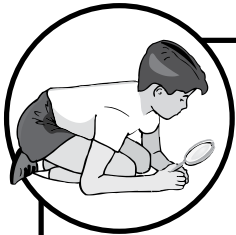
#### **Think About It**

1. Did the bottle float higher or lower in the salty water?
2. What do you think would happen if you floated other objects?

### Use Your Senses

**Directions:**

Review the adventure Raymond and Kelly had while paddling through a nearby estuary (pages 2–3 of newsletter). Pretend you were invited to join them on their canoe trip. Use different senses to describe some special moments of your trip in this natural setting. Be sure to use complete sentences. Be creative!



Describe three interesting things you saw.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

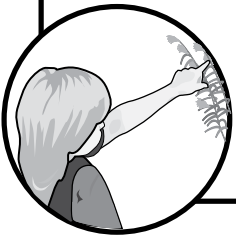


Describe three sounds you heard.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Describe how two things felt when you touched them.

1. \_\_\_\_\_
2. \_\_\_\_\_



Describe how two different areas of the estuary smelled.

1. \_\_\_\_\_
2. \_\_\_\_\_



**Extra Challenge**

Try to describe something you experienced on your canoe trip that used ALL four of these senses.

### Let's Learn More



Water Cycle Wanda told us that Tampa Bay is Florida's largest open-water estuary. You can learn more about this special ecosystem by visiting the following web site of the Tampa Bay Estuary Program:

[www.tbep.org/estuary.html](http://www.tbep.org/estuary.html)

When you visit the site, click on the link called "Fast Facts about Tampa Bay." Then use what you learned to help teach others about the estuary.

## TRUE or FALSE?

### Is It True or False?

Create a set of five statements about Tampa Bay. Each statement may be either true or false. Read each statement aloud to a friend or relative. Ask the person to decide whether each statement is true or false. Then tell the correct answer for each statement.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

### Extra Challenge

You can learn a lot more about estuaries by surfing the Internet. Use your search engines and type in a few of the terms listed below.

*estuaries*

*Florida estuaries*

*estuaries for kids*

*estuary habitats*

### *Welcome to Our Estuary!*

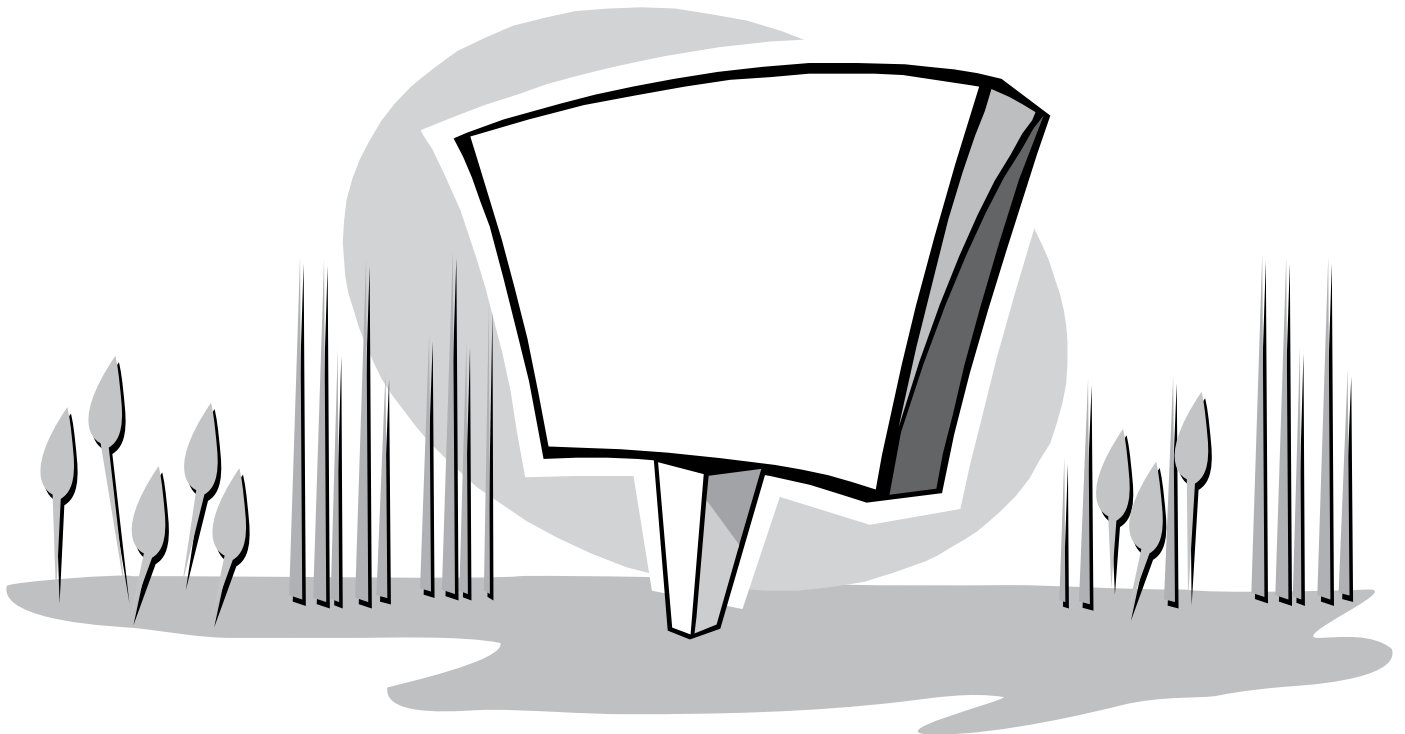
It is important that we keep our estuaries clean and healthy. On page 5 of the newsletter, you decided which things do not belong in this special environment. You also decided which things do belong here.

For this activity, you will create a welcome sign that could be posted alongside an estuary. The sign may tell people the name of the estuary and a few things about it. It may also let people know how important it is that we protect them. Use the space below to plan what you want to write on your sign and how you want to decorate it. Then use your own paper and markers to create the sign.

**Name of the estuary:** \_\_\_\_\_

**Features of the estuary:** \_\_\_\_\_

**A message about the estuary:** \_\_\_\_\_



# **WATERDROPS** Challenge

**Directions:**

Let's see how much you have learned about estuaries. Do your best and meet the challenge!

*Choose the best answer.*

1. Florida is fortunate to have several estuaries. What is an estuary?

- a. a special pond that contains only fresh water**
- b. an area where a river meets the sea**
- c. an inland body of water that contains only salty water**
- d. an area of land completely surrounded by water**

2. Estuaries contain brackish water. What is brackish water?

- a. fresh water that contains a lot of sand**
- b. salty water that is polluted**
- c. fresh water that is polluted**
- d. a mixture of salty water and fresh water**

3. Estuaries contain many forms of wildlife. Which one below would you probably NOT find in an estuary?

- a. a brown pelican**
- b. a manatee**
- c. a tiger**
- d. an alligator**

4. Why are estuaries important to our environment?

- a. They provide homes for many species of wildlife.**
- b. They are important nursery areas for a variety of marine life.**
- c. They help to filter pollutants from the water.**
- d. all of the above**

