

Field Trip Activities for Grades K—8

Lesson 1: Coastal Watersheds

- Activity Grades K-2 none
- Activity Grades 3-5 Field, Forest, Lagoon
- Activity Grades 3-5 Pass the Jug
- Activity Grades 6-8 Sarasota Bay Inhabitants

Lesson 2: Coastal Habitats

- Activity Grades K-2 Consider the Crab
- Activity Grades K-2 Mangrove Forest Walk
- Activity Grades 3-5 Field, Forest, Lagoon
- Activity Grades 3-5 Mangrove Forest Walk
- Activity Grades 3-5 Osprey Game
- Activity Grades 6-8 Sarasota Bay Inhabitants
- Activity Grades 6-8 Scavenger Hunt
- Activity Grades 6-8 Sarasota Bay Nature Search

Lesson 3: Coastal Wildlife

- Activity Grades K-2 Consider the Crab
- Activity Grades K-2 Mangrove Forest Walk
- Activity Grades 3-5 Field, Forest, Lagoon
- Activity Grades 3-5 Mangrove Forest Walk
- Activity Grades 3-5 Osprey Game
- Activity Grades 6-8 Sarasota Bay Inhabitants
- Activity Grades 6-8 Scavenger Hunt
- Activity Grades 6-8 Sarasota Bay Nature Search

Lesson 4: Native and non-Native Plants

- Activity Grades K-2 Mangrove Forest Walk
- Activity Grades 3-5 Field, Forest, Lagoon
- Activity Grades 3-5 Pass the Jug
- Activity Grades 3-5 Mangrove Forest Walk
- Activity Grades 6-8 Scavenger Hunt
- Activity Grades 6-8 Sarasota Bay Nature Search

Lesson 5: Stormwater Run-off/ Pollution

- Activity Grades 3-5 Mangrove Forest Walk
- Activity Grades 6-8 Sarasota Bay Inhabitants
- Activity Grades 6-8 Sarasota Bay Nature Search



SARASOTA Bay COASTAL HABITATS

Consider the Crab;
Grades k–2

Field Study: Consider the Crab

Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Grade Level: Kindergarten, 1st and 2nd Grades

Subject: Science, Language Arts

Duration: 35 Minutes

Materials: Pre-caught fiddler crabs in cage, small containers with lids

Skills: Observation, classification, analysis, description, and listening

FL State Standards: SC.A.1.1, SC.D.1.2, SC.D.2.1, SC.F.1.1, SC.F.1.2, SC.F.1.3, SC.F.1.4, SC.F.2.1, SC.F.2.2, SC.G.1.2, SC.G.1.4, SC.G.2.1, SC.G.2.2, L.A.C.1.1, L.A.C.3.2, L.A.C.3.3

Objectives:

- Students will understand that crabs are wildlife and wildlife comes in a variety of forms - small to large.
- Students will understand that this place is home to wildlife, including crabs.
- Students will learn about crab anatomy and animal adaptations.
- Students will learn that they are responsible for their actions affecting this wildlife.

Overview: In this inquiry-based activity, students are told a story about "Why the Crab has No Head". Observations are made with live crabs and potentially the group may collect their own crabs for observation and release.

Background: Fiddler crabs are invertebrates. Male fiddler crabs have one claw that is much larger than the other claw. The female's claws are equal in size. If a male fiddler crab loses his large claw, his remaining claw gets bigger. A new, smaller claw then grows to replace the lost one. The big claw is used for attracting a female fiddler. Small claws are used to pick up food (the female has an advantage here, she has two small claws and the male only has one). Crabs breathe through gills, have eyes on long stalks and move sideways. Fiddlers live in burrows that may go down more than three feet. Hundreds travel together in groups called herds. Fiddler crabs are active by day and eat mainly bacteria, minute algae and rotting marsh plants filtered from the sand. The sand that remains after feeding is left on the ground in the form of small sandballs.

Suggested Procedure:

- 1) Have the children sit in a circle on the deck of the pavilion.
- 2) Explain to the children that you will read a fable to them called, "Why the Crab has No Head."
- 3) Tell them that there will be a show-and-tell session after the story.



- 4) Sit between two children in the circle. This way you are facing all of them and you don't have your back to any child.
- 5) Read the story. Try to animate your voice and even do hand gestures where possible.
- 6) Show them the horseshoe crab shell. Ask them if they know who its relatives are? Explain to them that the horseshoe crab is related to lobster, shrimp, other crabs and even spiders.
- 7) Explain to the children that the horseshoe crab shell is from a crab that has shed his shell (molted) rather than the shell from a dead crab. This will help ease the site of all of the shells that they will see while on the mangrove walk. I don't want the children to think that all of the shells belong to dead crabs.
- 8) Pass the horseshoe crab shell around the circle. Ask that they be gentle and hold it with two hands.
- 9) Show the children the plastic model of the MALE fiddler crab. Explain to them that the male fiddler crab has 1 large claw and 1 small claw, where as the female has 2 small claws. Explain to them that the male crab uses his large claw to attract a mate and to defend himself. He uses his small claw to gather food. The female has an advantage over the male because she has 2 small claws and can therefore gather twice as much food.
- 10) Put the plastic fiddler crab in the magnifying critter container and pass the container around the circle. Tell the children to leave the crab in the container and to look through the top lens and side lens.
- 11) Scoop the FEMALE blue crab out of the bucket. (It won't pinch.) Hold it up for the children to see. Point out all of its legs, the pincher claws, and the swimmerettes (back paddles) that are used for swimming. Explain/show that the female has an apron on her belly that is shaped like a triangle. This is where she stores her eggs when she is pregnant. Put the female blue crab into a clear plastic berry container and pass the container around the circle.
- 12) Do the same as above with the MALE fiddler crab. Explain that the male fiddler crab doesn't have a triangle-shaped apron but has a long narrow apron on its belly. It looks a little bit like a spaceship or rocket.
- 13) When you are done with the activity, switch groups and repeat steps 1 - 12.



SARASOTA
Bay COASTAL HABITATS

Consider the Crab;
Grades k-2

Questions for the students to consider:

Legs: How many?
Alike or different?
Notice where they attach to the body.

Claws: How many?
Is one large? (male Fiddler)
Notice where they attach to the body.

Eyes: How many?
How do they attach to the body? (stalks)
Where do they attach to the body? (the crab has no head!)

Mouth: Can you find it?
Does it have lips?
Describe the mouth parts.

Motion: Describe it (scuttle)
What direction? (sideways)
Place it on ground or bench and watch it. (observe)
Does it seem to get tired? Why do you think so?

Noise: Does the crab make noise?
How? (mouth or other body parts?)

Color: Is your crab the same color all over?
Are the colors, shapes, and sizes the same on both sides (symmetrical)?
What is attractive about your crab?
Is it clean?

Habitat: Where does the crab live?
Do they live here year-round?

Conclusions:
Did you think there were so many interesting things about crabs?
Do you think other marine creatures might be as interesting?
What other things might you like to learn about?

*** By studying the fiddler crab, you have done what some scientists do.
Observation. Scientists study something very carefully to learn more about it. ***



Why the Crab Has No Head

- ∞ It was Nzambi Mpungu who made the earth and the sky.
- ∞ And after that, my children, she made the Brown Duck and the Alligator, the Turtle and the Deer, the Panther and the Anole Lizard.
- ∞ And still she was not finished.
- ∞ She took one whole day to make the Manatee, and that was big work!
- ∞ "I will call this little one Crab" she decided, shaping a tough shell for the body and each many-jointed leg. She made two pincer claws and not two, not four, but eight legs!
- ∞ Ai, but she was tired by the time she finished the last leg!
- ∞ "Little Crab" she said to the new creature, "I will finish you tomorrow. Come back in the morning and I will give you a fine head." And Nzambi Mpungu went to lie down on her sleeping mat.
- ∞ Crab was so excited! "Tomorrow! A fine head!" he whispered to himself. "It took Nzambi only one day to make Manatee, but it takes her two days to make me."
- ∞ Which was not exactly true, my children. You can see that, and I can see that, but little Crab was too proud to see truth that day.
- ∞ He told each animal he met to come and see him get his head the next morning.
- ∞ "Wild Boar! Black Bear! Come tomorrow morning to the house of Nzambi and see the fine head she will give me. She is taking all night to prepare it."
- ∞ Which is not exactly true, my children. You can see that, and I can see that, but Crab was too proud to see truth that day.
- ∞ "Gopher Tortoise! Wood Stork! Come tomorrow morning to the house of Nzambi and see the fine head she will give me. No doubt I will have a mane like Lion's, antlers like Deer, and surely a long, graceful neck like Great Blue Heron. How grand I'm going to look!"
- ∞ He scurried away importantly, walking almost sideways with pride.
- ∞ The next morning at sunrise, there was a great crowd at the house of Nzambi Mpungu.



- ∞ The whole Scrub Jay family was there, because they are always very curious.
- ∞ The Laughing Gulls came ready to laugh at Crab, no matter how grand he was going to look.
- ∞ Lion came because he had heard that Crab dared to compare his new head to Lion's own magnificent head.
- ∞ Vulture showed up in case there might be food.
- ∞ All these animals made so much noise, scuffling and stamping and snorting that Nzambi soon woke up and came outside.
- ∞ "Ai! Why are you all here?" She asked when she saw the crowd.
- ∞ "Crab invited us!" squeaked the youngest Armadillo, who was quite thrilled by the whole occasion. "Where is the marvelous head you have made for him?"
- ∞ "And where is Crab?" rumbled Nzambi in return.
- ∞ "Make way, make way!" cried Crab as he scuttled through the legs of the other animals, still feeling so important he could scarcely walk straight. "I have come for my fine head, Nzambi."
- ∞ But Nzambi Mpungu looked down sternly at Crab. This little creature was not even completed yet, and already he thought he was more important than all the others in the whole brand-new world.
- ∞ She frowned and folded her strong arms. Then she slowly shook her head.
- ∞ "No Crab," said Nzambi at last. "I think you are fine just the way you are."
- ∞ Now that was perfectly true, my children. And Nzambi went back to her hut to think about what color she would make the Spoonbill that day.
- ∞ So Crab never did get a head. To this day, whenever he wants to see, he has to poke his eyes out from his body.
- ∞ And he still walks sideways, only now it is from embarrassment instead of pride.



Field Study: Mangrove Forest Walk Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Grade Level: Kindergarten, 1st, 2nd Grades

Lesson 4: Native and Non-

Subject: Science, Language Arts

Native Plants

Duration: 35 Minutes

Materials: None

Skills: observation, classification, analysis, description, and listening.

FL Sunshine State Standards: SC.B.1.3, SC.D.1.1, SC.D.1.2, SC.D.2.1, SC.F.1.5, SC.G.1.1, SC.G.1.2, SC.G.2.2, SC.H.1.1, (OPTIONAL: LA.B.2.1, LA.B.2.2, LA.C.1.1, LA.C.2.1)

Objectives:

- Students will understand what makes a plant a mangrove
- Students will learn the three types of mangroves in this forest
- Students will understand that this park is part of an estuary and home to wild-life, which makes it a habitat.

Overview: A guided walk through the mangrove forest.

Background: An estuary is a rich ecosystem where fresh water and salt water mix. All of Sarasota Bay is an estuary. Along its low-energy shorelines, where waves are not present, the mangrove forests provide a unique environment. Mangroves have special adaptations that allow them to grow in salt water. This ability to grow in salt water is what makes a plant a mangrove. Mangroves are able to grow in fresh water, but in a freshwater system other plants compete with the mangrove.

A habitat is the home of a plant or animal. A successful habitat provides food, water, shelter and space for its inhabitants. Mangrove forests are rich in life, providing food and a safe haven for coastal and marine animals. Mangrove roots, particularly the red and black, provide hiding places for young fish and marine animals. The upper branches of the mangroves are important nesting sites for many types of birds. For these reasons, the mangrove forest habitat can be considered the nursery of the estuary.

On Sarasota Bay we have 3 mangroves: Red, Black and White. The Buttonwood is not considered a mangrove because it grows behind the high tide line, but they are commonly found beside the mangroves. Florida law protects mangroves, and trimming of branches must follow strict rules and requires a permit.



Diagram here of hands symbolizing 3 mangroves:

Red (hand down - fingers crooked & spread - re: prop roots); Black (index finger pointed up - re: pneumatophores: breathing tubes or reverse roots); White (touch thumb & index making rounded leaf w/2 salt glands rep by tips)

Suggested Procedure:

As you walk through the mangroves with students engage them in "inquiry-based" learning. (Leading questions are asked so that they come up with a desired correct answer)

What makes a plant a mangrove? (It lives in salt water) - to arrive at this answer ask these questions (or others to arrive at answer desired):

- Where does it live? (in the water)
- What kind of water? (salt)

Point out the Red Mangrove *Rhizophora mangle*. This tree has prop roots that form a dense tangle. Under water, these roots are great hiding places for small fish and marine animals. The upper branches are important nesting sites for many types of birds.

Point out the Black Mangrove *Avicennia germinans*. The specialized roots that come out of the soil in large numbers around the tree are called "pneumatophores"; they are breathing tubes to allow the roots to get oxygen when the tide covers the ground with saltwater.

⇒ Have students choose a black mangrove leaf that they can reach from the boardwalk (do not pick the leaves!). Let each student lick a leaf and taste the salt that is excreted through the leaves. This is the way the black mangrove gets rid of salt so it can use the water for growth.

Point out a White Mangrove *Laguncularia racemosa*. Notice the pair of nodes on the center of the leaf stalk and the rounded leaf tips. When you hold a white mangrove leaf up to the light, you will see black dots (glands) along the leaf margin.

Point out a Buttonwood *Conocarpus erectus*. The leaves of this tree are not as fleshy as the mangroves and they are pointed. They have a pair of nodes located at the base of the leaf stalk. The bark of the buttonwood is furrowed (deeply grooved) and an important host for epiphytes (air plants).

Point out any invasive exotics (non-native plants) that may be growing in the forest. In particular look for Brazilian Pepper, Australian Pine, Maleluca (Punk Tree) and Carrotwood. Explain that these plants were introduced without thought for the consequences of their invasion. These plants reproduce without human assistance and often create a monoculture where nothing else can grow. When this happens, habitat for wildlife is often lost. Food, water, shelter and



space are no longer available to sustain life.

Why Mangroves are important to the bay:

1. Mangrove roots provide a place for little fish to hide from bigger fish.
2. The upper branches of mangrove trees are important nesting sites for many types of birds.
3. The dead leaves of mangroves fall off and break down to become *detritus*. This detritus is food for the tiniest creatures in the bay. These animals become food for bigger creatures, etc. The detritus formed from decaying mangrove leaves is the basis of the food chain in Sarasota Bay.
4. The mangrove root systems protect the shoreline from storms & erosion.
5. Mangrove root systems filter pollutants that run-off from roadways and yards around the bay.

Animals you may encounter on your walk:

Fiddler Crab
 Marsh Rabbit
 Raccoon
 Great Blue Heron
 Little Blue Heron
 Green Heron
 Snowy Egret
 Great Egret (American Egret)
 Reddish Egret
 Yellow Crown Night Heron
 Black Crown Night Heron
 Osprey
 Turkey Vulture
 Black Vulture
 White Ibis
 White Pelican (winter)
 Brown Pelican
 Double-Crested Cormorant
 Roseate Spoonbill
 Woodstork
 Tri-colored Heron
 Green Heron (Louisiana Heron)

Plants you may encounter on your walk:

Sea Oxeye Daisy
 Christmas Berry
 Florida Privet or wild olive
 Sea Purslane
 Dune Sunflower
 Cordgrass
 Sea Grape
 Southern Red Cedar
 Wax Myrtle
 Moon Vine
 Arrow Leaf Morning Glory
 Cabbage Palm (Sabal Palm)
 Marsh Elder



Field, Forest, Lagoon;
Field Sampling Activity

Lesson 1: Coastal Watershed

Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Lesson 4: Native/NonNative
Plants

Grade Level: All Levels

Subject: Science, Language Arts

Duration: 15 minutes

Materials: Clipboard, pencil and data sheet, 3 sample stations, 3 thermometers

Skills: observation, information organization, analysis, interpretation, and identification of relationships and patterns.

FL Sunshine State Standards: SC.A.1.1, SC.B.1.6, SC.F.1.2, SC.G.1.2, SC.G.1.7, SC.H.1.1, SC.H.1.2, SC.H.3.2

Objectives:

- Students will investigate and measure components in three different ecosystems.
- Students will describe similarities and differences they observe among three different ecosystems
- Students will identify ways that the non-living (abiotic) components of an ecosystem affect the biotic components.

Overview: In a local environment, physical factors such as sunlight, moisture, temperature, and wind influence the suitability of an area for particular organisms. Students will assess field conditions at three (3) sampling stations throughout the park. Soil moisture, temperature, light, wind, and evidence of plant and animal life will be recorded. By comparing different environments, students will begin to consider how non-living elements (abiotic) influence living conditions in an ecosystem. Teachers will keep the data sheet for further classroom study.

At each sample station, about 10 minutes will be spent making the observations, and another 25 minutes will be available for an activity:

Field: Pass the Jug

Forest: Mangrove Walk

Lagoon: Osprey Game

Background: An ecosystem is a community of different species interacting with each other and with the chemical and physical factors making up its non-living environment. It is a system of inter-relationships among organisms, and between organisms and the physical environment.



Plants and animals in the Sarasota Bay environment interact with each other in various ways. For example, plants may depend on insects or birds to pollinate flowers and on earthworms to aerate the soil; animals may depend on plants for food or shelter. However, plants and animals also interact with the nonliving elements of their environment. In a local environment such as Sarasota Bay, physical factors such as sunlight, moisture, temperature, and wind influence the suitability of an area for particular organisms. These factors determine the kinds of plants and animals that live here. Physical factors may be determined by the environment's geography, such as its proximity to water, its elevation, or its terrain. In addition, the resident organisms (particularly plants) may affect the sunlight, moisture, temperature, and wind of the area. For example, the trees in a mangrove forest tend to block sunlight and thus create a dark, moist environment, or microclimate on the forest floor that is suitable for shade-loving plants, but is too shady for others. Microclimate refers to special conditions of light, moisture, and temperature that occur in a narrowly restricted area within an ecosystem, for example, under a bush or in a small woodland opening.

Suggested Procedure:

1. Divide group into 3 teams. Each team will rotate through three sampling stations.
2. Complete the data sheet at each station by making observations and recording soil moisture, sunlight, wind direction and strength, temperature at ground level, soil temperature, air temperature, plant life, and animal life.
3. After sample data is collected, complete the appropriate field activity with your guide:
 - Field -> Pass the Jug
 - Forest -> Mangrove Walk
 - Lagoon -> Osprey Game



Field, Forest and Lagoon Data Sheet

Date: _____ Teacher: _____ Group: _____

TIME:	<u>Field</u>	<u>Forest</u>	<u>Lagoon</u>
Soil moisture (moist soil will stick together)			
Sunlight sunny, shady bright, overcast			
Wind direction light, strong			
Temp.			
@ ground			
1-inch deep			
3-feet above			
Plant Life trees (size), shrubs, herbs			
Animals look for evidence scat, tracks, bur- rows, chewed leaves			



Field Activity: Pass the Jug

Lesson 1: Coastal Watershed

Adapted for Southwest Florida

Lesson 4: Native/NonNative
Plants

Lesson 5: Stormwater Run-off

Pass the Jug is used with permission from Project WET/Montana State University from the *Project WET Curriculum and Activity Guide*. For further information about Project WET (Water Education for Teachers), contact the Southwest Florida Water Management District, 2379 Broad Street, Brooksville, FL 34604 Phone: (800) 423-1476, ext. 4774, Fax: (352) 754-6883

Grade Level: 3rd, 4th, and 5th Grades

Subject: Science, History, Language Arts

Duration: 35 Minutes

Materials: 3 - 1 gallon jugs containing approx. 110 ounces of water, 11 Pass the Jug scenario cards, 30 - 5oz. paper cups

Skills: observation, analysis (problem solving), description, and listening.

FL Sunshine State Standards: LA.B.2.2, LA.C.1.2, LA.C.3.2, SS.A.1.1, SS.B.2.2, SS.B.2.3, SC.G.1.2, SC.H.1.2

Objectives:

- Students investigate various ways to make a jug of water last among all members of the community.
- Students will understand that water is a resource needed by everyone: plants, animals, and humans.
- Students will learn historical water uses in southwest Florida

Overview: In this role-playing game students run out of water and must determine how to allocate this finite resource.

Background: Water rights provide an organized and systematic manner for allocating water. A water right allows a person, business, community or other group to use a specified amount of water. People receive only the right to use the water; they do not own the water.

The history of water rights is related closely to settlement and land ownership. Settlers in the East of the Mississippi River adapted a water rights policy similar to what is used in England. The Riparian Rights or Common-Law Doctrine gives people who own land bordering a water source the right to use that water however they choose. A more recent version of the doctrine requires people to justify their uses as reasonable. They must also ensure that landowners downstream have their fair share of water.

East of the Mississippi River, average annual rainfall is more plentiful than



west of the Mississippi River. This is apparent from a geographical view. From about the 98th meridian of longitude west to the Pacific coast, average annual rainfall dips significantly below the 20 inches that normally sustain non-irrigated crops in the East.

Scarcity generates westerners' preoccupation and concern with water and water rights. Western water rights were developed for the needs of 19th century settlers. They evolved from the customs and practices of miners, who developed systems for protecting their claims to land and minerals. In many parts of the West, the Prior Appropriation Doctrine regulates water rights. This doctrine maintains "first come, first served" or "first in time is first in right." In other words, whoever uses the water first has the "prior" or first right to the supply of available water. If all the water in a stream is allocated, no new users are allowed.

In the last 20 years, many changes have added new dimensions to water rights and water allocation programs. Irrigated agriculture is a large consumer of water. Individuals and corporations invest millions of dollars in irrigation systems to grow crops for people and for livestock. Cities also need water to meet the needs of residents, businesses, and industries. Water for recreation and for fish and wildlife is receiving growing attention. The challenge of meeting today's growing demand for water will involve nontraditional allocation strategies. Several methods, such as water rights transfers, water rights changes, water marketing, and water leasing, have evolved as considerations to satisfy 21st century needs.

Suggested Procedure:

1. Have students sit in a circle and pass out the eleven Pass the Jug Scenario Cards (pair students if necessary).
2. Pass one cup to each student (additional cups will be passed out later as needed in each scenario).
3. **Discussion:** "Who needs water?" (desired answer: plants, animals, people... everything). Water is a resource needed by everyone. People have invested time, energy, and money to ensure that they have a plentiful supply of water. Sometimes demands on the resource require that water be allocated (**allocate: to distribute according to a plan**).
4. "Where does our water come from?" (Get them to say Lake Manatee, Peace River, and Floridan Aquifer, sometimes someone knows this, usually they do not)
5. While this discussion is going on introduce the water cycle very simply - water starts as rain, then becomes a puddle which might evaporate, or it goes into the ground - etc.



6. Introduce the Floridan Aquifer, a huge lake 400 - 500 feet under Florida.
7. All the water here on earth today is the same water that was here when the earth formed.
8. Did you know we may be drinking the same water the dinosaurs drank?
9. Now show them the jug of water - this is all we have.
10. "Imagine you have just bought a bag of candy and have 6 friends who want some. How are you going to divide it up? Do you give everyone an equal amount? Do you give some to the 1st person who asks? Or do you give your best friend more?"
11. Have the students read the cards in order.
 - #1 reads and you expand on the idea as you pour the allotted amount of water. Be sure they understand each concept.
 - #2 reads and so on...
12. At the end you should run out of water - then discuss who might be able to share.
 - Remember Grandpa may not want to change his ways.
 - Ask the students how they use water in their homes and yards - get a good list.
 - Then ask everyone to suggest ways they might use less water at home (not drinking as much and not taking baths are not an option!)
 - **Hint/Tip:** Usually the town with 5 cups gives one or two to the cattle rancher.

Following are the scenarios for each participant. If you have more participants than scenarios, double up the participants or form teams for each scenario. The 2nd page is the comparisons of water use for each scenario. Print the scenarios and the water use comparisons and then cut the scenarios into strips. Match each scenario with its coordinating water use comparison. Place the coordinating strips back to back and laminate them.

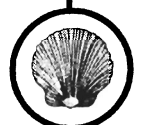


Water Use Scenarios

- #1 My grandparents moved to Manatee County a long time ago and built a cattle ranch. My parents still own the ranch where we raise cattle and grow strawberries.
- #2 My Uncle George was picking wildflowers in Manatee County in the year 1900 when he found a mineral and began a mine. My family runs this small mine on the banks of the Manatee River.
- #3 My great-great grandmother was Electa Lee, the first school teacher in Manatee County. My parents and I still live in her house and we farm the land around the house.
- #4 I live in a neighborhood where everyone drives to the city to work. Everyone in the neighborhood uses water in their homes and to water their yards. We will need more water as people move into our neighborhood.
- #5 Fifty years ago my grandparents left their farm in Iowa to start a farm in Florida. My Grandpa is still alive and will not use modern farming methods. My parents and I live on the farm and we grow and sell vegetables.
- #6 Five years ago my father moved our family to Florida so that he could run his bicycle factory. The factory provides jobs for people in our town; this is a good thing.
- #7 My mother works at Mote Marine Laboratory in a fish hatchery where they raise baby fish in big fish tanks. The tanks use lots of water that comes from Sarasota Bay. The water passes through the fish tanks, is filtered, and reused for aquarium displays.
- #8 I live in a small town in the countryside. The town grew bigger as people moved to my town. Now my town is a city. All the people living in my town use water for their homes and to water their yards.
- #9 I live on a farm. My parents run the farm and use modern water-saving methods of farming. We supply vegetables and fruit to the nearby towns and cities.
- #10 Two years ago, my parents decided to start a company. They make beach toys.
- #11 My parents own a cattle ranch. The land also has pine trees and an orange grove. My parents earn income from selling cattle, timber and oranges.



- #1 Need 2 cups of water, which is equal to 20,000 gallons of water.
- #2 Need 2 cups of water, which is equal to 20,000 gallons of water everyday.
- #3 Need 1 cup of water, which is equal to 10,000 gallons of water everyday.
- #4 Need 3 cups of water, which is equal to 30,000 of water everyday.
- #5 Need 5 cups of water, which is equal to 50,000 gallons of water everyday.
- #6 Need 2 cups of water, which is equal to 20,000 gallons of water everyday.
- #7 Need 4 cups of water, which is equal to 40,000 gallons of water everyday, but pour 3 cups of water back into the jug.
- #8 Need 5 cups of water, which is equal to 50,000 gallons of water everyday.
- #9 Need 3 cups of water, which is equal to 30,000 gallons of water everyday.
- #10 Need 2 cups of water, which is equal to 20,000 gallons of water everyday.
- #11 Need 2 cups of water, which is equal to 20,000 gallons of water everyday.



Field Study: Mangrove Forest Walk Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Grade Level: 3rd, 4th and 5th Grades

Lesson 4: Native and Non-

Subject: Science, Language Arts

Native Plants

Duration: 35 Minutes

Materials: None

Skills: observation, classification, analysis, description, and listening.

FL Sunshine State Standards: SC.B.1.3, SC.D.1.1, SC.D.1.2, SC.D.2.1, SC.F.1.5, SC.G.1.1, SC.G.1.2, SC.G.2.2, SC.H.1.1, LA.B.2.1, LA.B.2.2, LA.C.1.1, LA.C.2.1

Objectives:

- Students will understand what makes a plant a mangrove
- Students will learn the three types of mangroves in this forest
- Students will understand that this park is part of an estuary and home to wildlife, which makes it a habitat.
- Students will understand that mangroves filter pollution from run-off into the bay.
- Students will understand that non-native, invasive plants can harm an ecosystem.

Overview: This walk through a created lagoon system and forested mangrove wetlands will emphasize the use of native plants as a means to conserve our precious water resources as well as attract native wildlife to this coastal habitat.

Background: An estuary is a rich ecosystem where fresh water and salt water mix. All of Sarasota Bay is an estuary. Along its low-energy shorelines, where waves are not present, the mangrove forests provide a unique environment. Mangroves have special adaptations that allow them to grow in salt water. This ability to grow in salt water is what makes a plant a mangrove. Mangroves are able to grow in fresh water, but in a freshwater system other plants compete with the mangrove.

A habitat is the home of a plant or animal. A successful habitat provides food, water, shelter and space for its inhabitants. Mangrove forests are rich in life, providing food and a safe haven for coastal and marine animals. Mangrove roots, particularly the red and black, provide hiding places for young fish and marine animals. The upper branches of the mangroves are important nesting sites for many types of birds. For these reasons, the mangrove forest habitat can be considered the nursery of the estuary.



On Sarasota Bay we have 3 mangroves: Red, Black and White. The Buttonwood is not considered a mangrove because it grows behind the high tide line, but they are commonly found beside the mangroves. Florida law protects mangroves, and trimming of branches must follow strict rules and requires a permit.

Diagram here of hands symbolizing 3 mangroves:

Red (hand down - fingers crooked & spread - re: prop roots); Black (index finger pointed up - re: pneumatophores: breathing tubes or reverse roots); White (touch thumb & index making rounded leaf w/2 salt glands rep by tips)

Suggested Procedure:

As you walk through the mangroves with students engage them in "inquiry-based" learning. (Leading questions are asked so that they come up with a desired correct answer)

What makes a plant a mangrove? (It lives in salt water) - to arrive at this answer ask these questions (or others to arrive at answer desired):

- Where does it live? (in the water)
- What kind of water? (salt)

Point out the Red Mangrove *Rhizophora mangle*. This tree has prop roots that form a dense tangle. Under water, these roots are great hiding places for small fish and marine animals. The upper branches are important nesting sites for many types of birds.

Point out the Black Mangrove *Avicennia germinans*. The specialized roots that come out of the soil in large numbers around the tree are called "pneumatophores"; they are breathing tubes to allow the roots to get oxygen when the tide covers the ground with saltwater.

⇒ Have students choose a black mangrove leaf that they can reach from the boardwalk (do not pick the leaves!). Let each student lick a leaf and taste the salt that is excreted through the leaves. This is the way the black mangrove gets rid of salt so it can use the water for growth.

Point out a White Mangrove *Laguncularia racemosa*. Notice the pair of nodes on the center of the leaf stalk and the rounded leaf tips. When you hold a white mangrove leaf up to the light, you will see black dots (glands) along the leaf margin.

Point out a Buttonwood *Conocarpus erectus*. The leaves of this tree are not as fleshy as the mangroves and they are pointed. They have a pair of nodes located at the base of the leaf stalk. The bark of the buttonwood is furrowed (deeply grooved) and an important host for epiphytes (air plants).



Point out any invasive exotics (non-native plants) that may be growing in the forest. In particular look for Brazilian Pepper, Australian Pine, Maleluca (Punk Tree) and Carrotwood. Explain that these plants were introduced without thought for the consequences of their invasion. These plants reproduce without human assistance and often create a monoculture where nothing else can grow. When this happens, habitat for wildlife is often lost. Food, water, shelter and space are no longer available to sustain life.

Why Mangroves are important to the bay:

1. Mangrove roots provide a place for little fish to hide from bigger fish.
2. The upper branches of mangrove trees are important nesting sites for many types of birds.
3. The dead leaves of mangroves fall off and break down to become *detritus*. This detritus is food for the tiniest creatures in the bay. These animals become food for bigger creatures, etc. The detritus formed from decaying mangrove leaves is the basis of the food chain in Sarasota Bay.
4. The mangrove root systems protect the shoreline from storms & erosion.
5. Mangrove root systems filter pollutants that run-off from roadways and yards around the bay.

Animals you may encounter on your walk:

Fiddler Crab
 Marsh Rabbit
 Raccoon
 Great Blue Heron
 Little Blue Heron
 Green Heron
 Snowy Egret
 Great Egret (American Egret)
 Reddish Egret
 Yellow Crown Night Heron
 Black Crown Night Heron
 Osprey
 Turkey Vulture
 Black Vulture
 White Ibis
 White Pelican (winter)
 Brown Pelican
 Double-Crested Cormorant
 Roseate Spoonbill
 Woodstork
 Tri-colored Heron
 Green Heron (Louisiana Heron)

Plants you may encounter on your walk:

Sea Oxeye Daisy
 Christmas Berry
 Florida Privet or wild olive
 Sea Purslane
 Dune Sunflower
 Cordgrass
 Sea Grape
 Southern Red Cedar
 Wax Myrtle
 Moon Vine
 Arrow Leaf Morning Glory
 Cabbage Palm (Sabal Palm)
 Marsh Elder



Lagoon Activity: Osprey Game

Lesson 2: Coastal Habitats

Role-playing Activity

Lesson 3: Coastal Wildlife

An Adaptation of Project WILD's "How Many Bears Can Live in this Forest?"
Created by the Staff at the Pelotes Island Nature Preserve, Jacksonville, Florida: <http://pelotes.jea.com>

Grade Level: All Levels

Subject: Science, Language Arts

Duration: 35 Minutes

Materials: One set of Fish Cards*, Bandana, Bandana with feather, 35 Sea Grape leaves (nests/home base) (Do not let students pick leaves).

Skills: observation, classification, analysis, description, and listening.

FL State Sunshine Standards: SC.F.1.3, SC.G.1.2, SC.G.1.5, SC.G.2.1, SC.G.2.2, SC.G.2.3

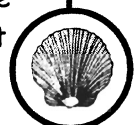
Objectives:

- Students will discover how difficult it is to survive as an osprey
- Students will learn that the osprey diet consists only of fish
- Students will understand that some ospreys have a difficult time surviving due to man-made obstacles

Overview: The osprey, a fish hawk, was at one time a common sight along rivers and shores, but pesticides, hunting, and loss of habitat have reduced its number to the point where it is now protected throughout Florida. The purpose of this game is to give the players a better understanding and appreciation for the life and struggles of this unique and rare bird. It will also show them the role man plays in this struggle. The players, in effect, become ospreys and compete with man for their living space, see the effects of eating contaminated food, and deal with other man-made obstacles. By offering these students a better appreciation and understanding of the osprey, we also give them a chance to brighten the osprey's future. The first step in preserving something is realizing that you can lose it.

Background:

FLIGHT AND HUNTING: Ospreys are fish hawks that have brown and white markings on their feathers. They can soar on wind currents, but most of their flight is active (with wings flapping). Ospreys hunt alone, flying over the water looking for fish, then plunging in feet-first, and grabbing the fish with powerful talons (claws.) Ospreys need to catch about 1-3 fish a day. A father osprey, which must fish for 2-3 babies and a mate, has to catch 6-8 fish a day. Ospreys are specially built to be fish-hunters. The bottoms of their feet have many short spines, which help them to hang onto a slimy fish. Many birds have three



toes and a thumb, but the osprey can turn his third toe around, so he can have an extra-strong grip with two fingers and two thumbs. Ospreys have extremely sharp talons and a strong hooked beak for tearing fish into bite-sized pieces. They also have oily feathers that help keep them dry when they splash into the water.

NESTING and RAISING BABIES: Ospreys like to make their nests in dead trees because there are no leaves to get in the way of their wings. It is also harder for predators (dangerous carnivorous animals) to climb a dead tree without the osprey seeing it. Many ospreys build nests on power poles when there aren't enough dead trees around. Ospreys are able to mate (have babies) at 3 years of age. When a male is ready to court (date) a female, he performs the "Sky Dance" by flying around with a fresh caught fish or nesting material. Ospreys mate for life, and mated pairs come back to the same nest year after year. If the pair has no nest, they both collect sticks and grasses. Sometimes they also pick up plastic bags and fishing line (which can kill the babies). Year after year, ospreys make their nests bigger and stronger. An osprey nest can weigh up to 1000 pounds, but it is not very deep inside and probably could not hold a person. Florida ospreys stay in Florida year round and lay their eggs between December and February. (North of Florida, ospreys migrate south each year.) The eggs are about the same size as a chicken's egg, and are cream-colored with spots. Both parents sit on the eggs. The female does most of the sitting, while the male feeds her. Ospreys usually lay 3 eggs. When there isn't much food, the smallest baby often does not survive. Ten to fifteen days before fledging (flying) the young ospreys practice flapping their wings. They jump up and down in the nest until a wind gust carries them over the edge on their first flight. Osprey parents will fly past the nest with a fish and drop it into the water to help the babies catch their first fish. Young ospreys begin to hunt 2-3 days after fledging, but the parents still bring them fish for a few weeks.

HISTORY AND FUTURE: Man has caused some problems for the ospreys. Fertilizers and other pollution can run off the land and into the water and kill the fish (this means the ospreys won't have enough fish to eat.) Timber harvesting (cutting down trees) makes it harder for them to find a place for their nests. Cutting down trees in the rain forest destroys the ospreys' wintering grounds (where they stay in the winter if they migrated south). Some ospreys get shot even though it is against the law to hunt them. People also put some dangerous chemicals into the environment, like the pesticide, DDT. Fish soak up DDT from the water. Since ospreys only eat fish, they get a lot of this DDT. This hurts them in two ways. First, it makes their eggshells thin, so the eggs crack when the mother sits on them. Second, since DDT impregnated eggshells don't let much air through, the baby may not be able to breathe inside the shell. In



the 1970's, after people stopped using DDT, many more osprey babies survived. Today, these fish hawks are a "threatened species" (protected by law) in Florida. Now, people are trying NOT to pollute the water, NOT to shoot ospreys, and NOT to leave fishing line out for them to get tangled in.

Interesting Fact: Girl ospreys are bigger than boy ospreys.

Resources:

Poole, Allen. Ospreys: A Natural and Unnatural History. Cambridge: Cambridge University Press., 1989.

Terres, John K. The Audubon Society Encyclopedia of N. American Birds. New York: Alfred A. Knopf, Inc., 1987.

Suggested Procedure:

SETTING UP THE GAME:

1. Select one student to play an osprey that has been accidentally shot by careless hunters. This works well if you try to find students who like to hunt. Discuss how most hunters are very careful to hunt only what is in season and what is legal. However, a careless hunter shot this osprey. It is illegal to shoot any type of raptor (bird of prey). An osprey that is shot and recovers may not be able to fly well, so the students must hop around on one leg when hunting.
2. Select another student to play an osprey that has become tangled in fishing line. Discuss how most fisherman are very careful and remove any tangled lines from the water, trees, and shrubs. However, this osprey was injured when a careless fisherman did not remove his tangled line. The line became wrapped around the bird's head, blinding it. This student must hunt with his or her eyes closed. Be sure to have an adult helper lead the child around so that the student is not injured!
3. Match two ospreys as a mated pair. They must get enough food for three ospreys in order to keep their babies alive OR they must have at least one fish for each of their two babies. The mated pair share a nest and must tag-team to find food. One must be at the nest at all times or the babies may be attacked by a predator or die of exposure. The mated pair are the only ospreys in this game that may run.
4. Choose one student to be an eagle. Eagles are much larger than ospreys and often steal fish from them by beginning an aerial attack, which frightens the osprey into dropping its fish. In the game, this thievery will be represented by the eagle being allowed to take one fish from each nest during the game. After stealing from a nest, the eagle may never return to that nest again. The eagle may hunt or he can steal fish. The eagle may not run, only the mated pair of osprey can do this.



TO BEGIN: Place the sea grape leaves in a large circle on the ground. Students should choose one leaf to be their perch tree. Scatter the fish cards inside the circle. Students will walk out into the middle and collect one fish at a time. Each time they pick up one fish they must return it to their perch before collecting the next one. Discuss how ospreys are only able to catch one fish at a time in their rough talons. The eagle may only hunt or steal only one fish at a time as well. The mated pair may only collect one fish per turn, but they may run.

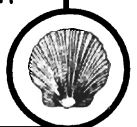
GOAL: Each bird player must collect enough fish to survive.

RULES:

1. Ospreys and the eagle must walk - with the exception of the mated pair of osprey; they may run.
2. Ospreys and eagles may only collect one fish at a time.
3. No one may steal, except for the eagle.

FINISHING THE GAME: After all of the fish cards have been collected (45 seconds-2 minutes), each player will take inventory of the fish cards he or she has collected.

1. Ask students to find any fish cards that say "ESCAPE". These are fish that got away. Collect the "ESCAPE" cards.
2. Have students check their fish cards for "DDT". Explain how some pesticides run off into the water and poison fish. When the osprey eats poisoned fish they may become sick or their eggs will become very thin. When the mother osprey sits on her eggs they will crack and the babies will die. If the mated pair has "DDT" fish cards, they lose one baby per card. If they have two or more "DDT" fish cards, all the young die. If any other osprey have a "DDT" fish card, ignore it, as the other osprey are all younger than three years old, and are not reproductively mature.
3. Have students check for "H" fish cards. "H" stands for loss of "habitat". Discuss how ospreys make their nests at the top of tall dead trees. What do most people do to dead trees? (Cut them down.) If we cut down all the dead trees, the osprey has no place to make his home. If a player has two or more "H" fish cards, he must turn them in. The osprey had to spend time looking for a new living-hunting ground, so he spent less time fishing.
4. One student will have a fish card with a "G" on it. This stands for "Gunshot". A careless hunter injured this osprey. This osprey loses all but the "G" card (the student is left with only one card).
5. Two students have a fish card with "LINE" on it. "LINE" stands for fishing line. These ospreys were injured when careless fisherman did not remove their tangled fishing lines from the water. These students lose all but the "LINE" fish card (leaving them with only one card each).



6. Now have students count all of their remaining fish cards, no matter what the letter/blank status. The number of fish cards required to complete the game varies based on the number of players. Do a quick survey by raise of hands
- The top $\frac{1}{4}$ will be in the **"Fat and Happy"** group. They have more than enough fish to survive. They'll all be 4-years-old next year, and old enough and healthy enough to find a mate.
 - The middle 50% will be in the **"Healthy"** group. They're not as "fat and happy" as the other guys, but are certainly doing well.
 - The lower $\frac{1}{4}$ is in the **"Hungry"** group. (Remember, best not to kill the players.) Discuss who is in what group.
- Where did the eagles fall? (usually in the healthy group).
 - Where did the injured ospreys fall and the parents? (usually in the hungry group).
 - If the injured ospreys do better, did other ospreys help by giving them food? Congratulate the group on teamwork. How many of the ospreys in the hungry group are there because of something people did to them?

WHAT WE LEARN: Some of the ospreys will always be hungry, and it is especially difficult for injured ospreys and mated pairs to get enough food. Students will see that the strongest are best able to compete successfully for enough fish to survive. Also, they will see that man-made obstacles are very dangerous to these beautiful birds.

Have each group ("Fat and Happy", "Healthy", and "Hungry") come up with one way we can help ospreys. Help them come to these suggestions:

We can pick up litter around waterways.

We can make sure we don't leave fishing lines tangled in the water or shrubs.

We can not shoot animals that are illegal to hunt (like raptors).

We can not cut down dead trees, which provide the primary nesting spots.

We can put up poles for ospreys to nest on.

WHAT WE LEARN: Some ospreys have a difficult time surviving because of man-made obstacles. It is especially difficult for injured ospreys and mated pairs to get enough food. What can we do to protect these birds and help maintain their habitat?

- 1) Don't illegally hunt them.
- 2) Don't put trash and pollution in the water.
- 3) Use less pesticides.
- 4) Don't cut down the dead trees they need for nesting and perching.

* Total number of cards: 108 for about 25 players. Set of Fish Cards includes:

- 72 Good and tasty fish (fish with name),
- 24 fish escape cards (Escape),
- 8 DDT pesticide cards (DDT),
- 2 habitat loss cards (H),
- 1 fishing line card (LINE),
- 1 gun shot card (G).



SARASOTA bay COASTAL HABITATS

Sarasota Bay
Inhabitants;
Grades 6–8

Field Study: Sarasota Bay
Inhabitants

Lesson 1: Coastal Watershed

Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Lesson 5: Stormwater Run-off

Grade Level: 6th, 7th and 8th Grades

Subject: Science, Language Arts

Duration: 60 Minutes

Materials: Clipboards, pencil and data sheet, sample station, thermometer, hydrometer, pH kit, 2 5-gallon buckets, seine net, ID guides or reference books

Skills: observation, classification, analysis, recording, description, and listening.

FL Sunshine State Standards: SC. A.1.1, SC.B.1.6, SC.F.1.2, SC.G.1.2, SC.G.1.7, SC.H.1.1, SC.H.1.2, SC.H.3.2.

Objectives:

- Students will investigate and measure water quality and living components in the Sarasota Bay ecosystem.
- Students will describe similarities and differences they observe between two different habitats.
- Students will identify ways that the non-living (abiotic) components of an ecosystem affect the biotic components.

Overview: Students will assess field conditions and water quality at two sampling stations within the park. Using dip nets, students collect specimens from the lagoon and bay for observation. Soil moisture, soil and water temperature, light, wind, salinity, pH, and evidence of plant and animal life will be recorded. By comparing different environments, students will begin to consider how non-living elements (abiotic) influence living conditions in an ecosystem. Teachers will keep the data sheets for further classroom study.

Background: An ecosystem is a community of different species interacting with each other and with the chemical and physical factors making up its non-living environment. It is a system of inter-relationships among organisms, and between organisms and the physical environment.

Plants and animals in the Sarasota Bay environment interact with each other in various ways. For example, plants may depend on insects or birds to pollinate flowers and on earthworms to aerate the soil; animals may depend on plants for food or shelter. However, plants and animals also interact with the non-living elements of their environment. In a local environment such as Sarasota Bay, physical factors such as sunlight, moisture, temperature,



and wind influence the suitability of an area for particular organisms. These factors determine the kinds of plants and animals that live here. Physical factors may be determined by the environment's geography, such as its proximity to water, its elevation, or its terrain. In addition, the resident organisms (particularly plants) may affect the sunlight, moisture, temperature and wind of the area. For example, the trees in a mangrove forest tend to block sunlight and thus create a dark, moist environment, or microclimate on the forest floor that is suitable for shade-loving plants and animals, but is too shady for others. Microclimate refers to special conditions of light, moisture, and temperature that occur in a narrowly restricted area within an ecosystem, for example, under a bush or in a small woodland opening.

In water bodies the presence or absence of certain organisms, called indicator species, reveals much about water quality. These creatures comprise a biotic index, or number of living organisms found in an ecosystem. The absence or presence of these organisms is an indicator of water quality.

Environments with numerous marine species are usually healthy, whereas environments with just a few different species or many of one species and few of others usually indicates conditions that are less than healthy. The word *healthy* is used to indicate an environment supportive of life. Pollution generally reduces the quality of the environment, and in turn the diversity of life forms.

The quality of water changes as it flows over the land. These changes in water quality may be due to natural factors or human activities. When water is degraded to a point that affects its use for a particular purpose, it has become polluted. Water pollution originates from two very different sources: point sources and non-point sources. Point source pollution come from a discrete source such as a pipe, ditch or wastewater treatment plant. Non-point source means that the pollution come from a broad area, such as a large field that has been covered with fertilizers and pesticides. Excessive application of fertilizer or pesticides on lawns and gardens (such as various "chem.-lawn" companies promote) can create non-point sources. People who use fertilizers and pesticides must read labels to ensure that they are applying the materials properly.

Suggested Procedure:

1. Advise students to dress appropriately for the setting. Closed shoes such as old sneakers are a must. **No flip-flops or sandals without heel straps are allowed in the water under any circumstances.** Sharp rocks and shells will cut feet and in this environment cuts may become infected.
2. Emphasize that all wildlife will be returned to its habitat unharmed. We are visiting the plants and animals in their home and will respect that.



3. Sample data will be taken at two sites 1) Lagoon and 2) bay front.
4. Begin the activity by observing the water. Using the sampling equipment (nets, 5-gallon buckets, seine net, etc.) have the students collect as many different forms of animal life as possible. Ask them to be alert to differing micro-habitats near rocks, pilings and mangrove roots. Place the animals to be observed in 5-gallon buckets for viewing and drawing.
5. Keep an adequate amount of water in the 5-gallon buckets and place in a cool, shady spot if possible. Change or add more water often to provide more oxygen and keep the animals cool.
6. On Sarasota Bay Inhabitants worksheet, have students the animals they observe. Have each student record at least three animal observations. Ask them to fill in the number of each kind found, and describe the actual location/habitat where the animal was found. Once observations are complete, carefully return the animals to their natural habitat.
7. Encourage the students to discuss their observations. How diverse were the marine organisms? Introduce the concept of diversity, or that a variety of different kinds of plants and animals is usually an indication of a healthy ecosystem.
8. Complete the Sarasota Bay Water Quality data sheet a each station by making observations and recording all parameters.
9. Upon returning to your classroom, identify the animals that were found and discuss the results and differences among habitats.



SARASOTA
bay COASTAL HABITATS

**Water Quality
 Data Sheet**

Water Quality Data Sheet

Date: _____ Teacher: _____ Group: _____

	<u>Bayfront</u>	<u>Lagoon</u>
TIME:		
Soil moisture (moist soil will stick together)		
Sunlight sunny, shady bright, overcast		
Wind direction light, strong		
Temp.		
Plant Life trees (size), shrubs, herbs		
Animals look for evidence scat, tracks, bur- rows, chewed leaves		
Water Temp.		
Salinity		
pH		



SARASOTA bay COASTAL HABITATS

Sarasota Bay Inhabitants Sheet

Sarasota Bay Inhabitants Worksheet

Date: _____ Teacher: _____ Group: _____

Location	Sketch of Organism	Number Found



SARASOTA bay COASTAL HABITATS

Sarasota Bay Scavenger Hunt

Field Study: Sarasota Bay
Scavenger Hunt

Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Grade Level: 6th, 7th and 8th Grades

Lesson 4: Native and

Subject: Science

Non-Native Plants

Duration: 35 Minutes

Materials: Clipboards, pencil, and ID guides or reference books

Skills: observation, classification, recording, and description

Objectives:

- Students will investigate the habitats within the restoration site on Sarasota Bay.
- Students will identify wildlife.
- Students will identify native and non-native plants.
- Students will identify man-made structures or other evidence of human presence.

Overview: A walk through a restoration site on Sarasota Bay is facilitated by a scavenger hunt photo guide. The major purpose of this activity is for students to recognize that all environments have characteristic life forms and can co-exist in the same habitat. Teachers will keep the scavenger hunt photo guide for reference and further classroom study.

Suggested Procedure:

1. Advise students to dress appropriately for the setting. Closed shoes such as old sneakers are a must. **No flip-flops or sandals without heel straps are allowed in the water under any circumstances.** Sharp rocks and shells will cut feet and in this environment cuts may become infected.
2. Emphasize that all wildlife will be observed and NOT touched, chased or harassed in any way. We are visiting the plants and animals in their home and will respect that.
3. Review the list of items on the scavenger hunt photo guide with the students prior to the start of the scavenger hunt,
4. Once the scavenger hunt has begun, as you find items on the photo guide check the appropriate box above each item on the scavenger hunt photo guide.
5. If you find and identify unique items NOT on the scavenger hunt photo guide, please write and/or draw the item in the provided space.



SARASOTA bay COASTAL HABITATS

Sarasota Bay Scavenger Hunt

Bird—

Great Egret

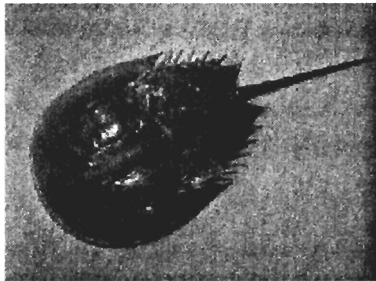


Mangrove Trees (salt tolerant)



Crustacean—

Horseshoe crab molt



Red Mangrove prop roots



Crustacean—

Black mangrove crab



Seagrape tree

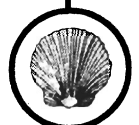
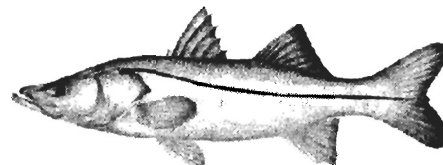


Palm tree



Fish—

Common Snook

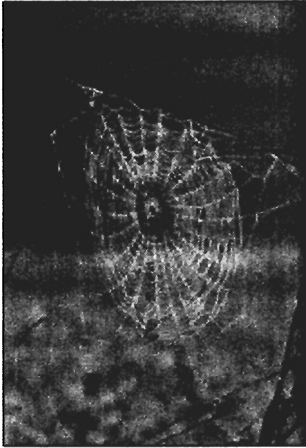


SARASOTA bay COASTAL HABITATS

Sarasota Bay Scavenger Hunt

Home—

- Crab spider web



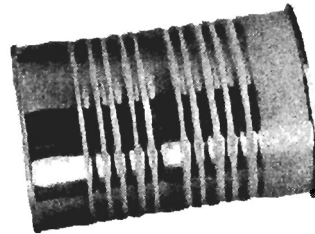
Mammal -

- Raccoon



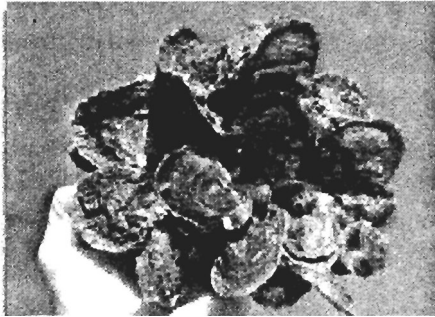
Human presence—

- Trash



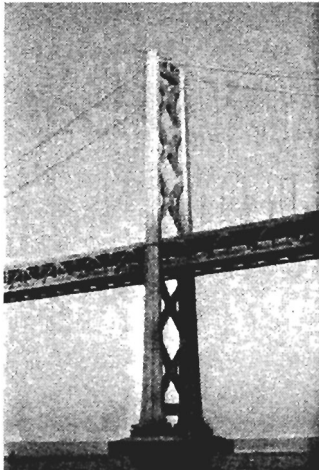
Mollusk—

- Oysters

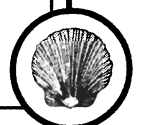


Human presence—

- Bridge



Please provide any additional observations in this box:



SARASOTA bay COASTAL HABITATS

Sarasota Bay
Nature Search;
Grades 6–8

Field Study: Sarasota Bay Nature Search

Lesson 2: Coastal Habitats

Lesson 3: Coastal Wildlife

Lesson 4: Native/Non-Native
Plants

Grade Level: 6th, 7th and 8th Grades

Subject: Science, Art, Language Arts

Duration: 15 Minutes

Materials: Clipboards, pencil and nature sheet

Skills: observation, classification, analysis, recording, description, and listening.

FL Sunshine State Standards: SC. A.1.1, SC.B.1.6, SC.F.1.2, SC.G.1.2, SC.G.1.7, SC.H.1.1, SC.H.1.2, SC.H.3.2.

Objectives:

- Students will investigate the habitats within the restoration site on Sarasota Bay.
- Students will generalize that each habitat has characteristic life forms.
- Students will suggest ways that the environment affects the life forms that occupy it.
- Students will identify native and non-native plants.

Overview: A walk through a restoration site on Sarasota Bay is facilitated by students completing a nature search worksheet. The major purpose of this activity is for students to recognize that all environments have characteristic life forms and to acquaint students with the distinction between native and non-native plants. Teachers will keep the worksheet for further classroom study.

Background: For most people, wild birds and other animals are valued and appreciated residents of the Sarasota Bay watershed. Unlike the soil, waterways, or other ecological components of the environment, wild animals do not create; but rather reflect environmental quality. They are an indicator of a diverse and healthy ecological community, and the positive values they impart to Sarasota Bay must be emphasized through public awareness and education of both old and young concerning the potential richness and quality of their environment.

Every environment has its characteristic organisms, both plant and animal. Many organisms have adjusted as their habitat has changed from undeveloped to urban. Not only have people altered the environment; the human environment has been shaped by the ecologies within which people live.



Fossil remains indicate that even in prehistoric times plant and animal populations had migrated to different geographic regions in response to climatic and other conditions (for instance wind blows seed to Florida from the Caribbean.). These migrations took place over long periods of time. In some cases, original inhabitants of an area would die out, having moved away or become extinct.

Natural land and water barriers have prevented some species from spreading to certain areas. But people, with their sophisticated transport systems, have changed the plant and wildlife populations of islands and continents. Many plants and animals that we take for granted as native residents of Sarasota Bay actually were not on this continent when the first European settlers came, while other original species have been removed or destroyed.

Botanists determine whether a plant is native if it was here "pre-Columbian" (before the entrance of Christopher Columbus into the "New World" and the resulting European explorations). A non-native or exotic plant came here from someplace else. Some plants migrated here naturally as explained above, but others were brought here by humans. There are two reasons why people bring plants into an area: 1) for food or agricultural use, and 2) for landscape or ornamental use. Both agricultural and ornamental horticulture are important industries in Florida.

Background:

1. Discuss the diversity of wildlife. Make sure students understand that wildlife includes insects, spiders and other invertebrates as well as birds, fish, reptiles, mammals and amphibians.
2. Explain native and non-native plants and tell students you will be pointing out various plants on the walk and they should make note of these on their worksheets.
3. Ask students to point out wildlife that they may see along the way. Explain that in order to view wildlife, the class must be as quiet as possible on the trail.
4. Complete the nature search worksheet by making observations and recording what you see including plant life and animal life.



SARASOTA
bay COASTAL HABITATS

Sarasota Bay
 Nature Search;
 Grades 6–8

Sarasota Bay Nature Search

Date: _____ Teacher: _____ Group: _____

Plants

Draw at least one:

Native		
Exotic		

Animals

Draw at least one:

Bird		
Fish		
Mammal		
Reptile & Amphibian		
Insect & Arachnid		

Habitat

Draw at least one:

Food		
Water		
Shelter		
Space		



