Next Generation Sunshine State Standards

- SC.1.E.6.3 - Recognize that some things in the world around us happen fast and some happen slowly.
- SC.2.E.7.1 - Compare and describe changing patterns in nature that repeat themselves, such as weather conditions including temperature and precipitation, day to day and season to season.

Program Overview

Discover the rhythms and cycles of our coastal seas. From seasonal weather to daily tides, students will use data to determine how ocean creatures change their ways to go with the ebb and flow of our oceans.

Learning Objectives

Students will be able to:
1. Understand concepts including daily tides, dry season vs. wet season, changing salinities, changing temperature.
2. Recognize environmental phenomena that happen fast (such tidal change, hurricanes, storms, etc.) and those that can happen slow (beach erosion, changing climate, etc.)
3. Recognize how animals respond and are adapted for both seasonal and daily changes in their environments.

Lessons:

- Pre-Activity 1: Salty Scenes and Songs (p. 2-3)
- Pre-Activity 2: Beaks and Treats! (p. 4)
- Post-Activity 1: Shifting Seasons (p. 5)
- Post-Activity 2: Create a Creature (p. 6)
Pre-Program Activity 1: Salty Scenes and Songs

Modified from activities found in Project WILD’s Growing Up Wild curriculum “The Deep Blue Sea”

Duration of Activity: ~45 minutes

To prepare for the Ebb and Flow program, students will become more familiar with wildlife at the beach during these interactive activities of art, song, and dance. The goal is to have students learn what animals live at the beach, and some ways they are built to survive.

Materials: Ocean Animal cards (pp. 7-10), white paper, crayons, blue food-coloring, salt, optional – inflatable globe

Background: The Earth’s oceans cover 75% of the Earth surface. The ocean is salty with dissolved salts and minerals that have eroded from the Earth’s crust, wash into the ocean, and concentrate over time. 97% of Earth water is salty for this reason. Most animals in land and people cannot drink salty water, but there are thousands of species adapted to thrive in salty waters. There is a huge variety of life in our oceans. From the microscopic to 100-foot whales, the ocean has so much diversity. Ocean creatures can live in the open ocean, in mud or on rock bottoms, coral reefs, tidal pools, sea grass beds, kelp forests, the deep dark sea, and more! We also value the ocean. It provides materials used to create everyday products or desired items such as jewelry, oils, building materials, and more! The ocean and its life have also provided opportunities to mimic how these animals thrive in the ocean towards the advancement of technology, medicine, and engineering!

Directions:

Warm-up: Ask students if they have been to the ocean. What animals did they see? Did they play in the waves? What do they know about the ocean? Next, discuss some fun facts and background on the ocean with the students. Optional – use an inflatable globe in order to connect students with how big our oceans are.

Ocean Animal Cards:
1. Use cards to chat with students about ocean animals. Focus with students on what each animal is called, what it looks like, how it survives, and where it lives in the ocean. Use sets of cards and split the students in groups. Direct students to sort animals by their adaptations, behaviors, and where they live in the ocean. Options below:
   a. Sort animals by their features - Which animals have eyes? Which animals have a shell? Which animals have legs? Which animals have a beak? Which animals have fins?
   b. Sort animals by where they live - those that fly in the sky, that swim or float in the ocean, that attach to rocks on the bottom, and those that live in the mud on the bottom.

Salty Scene Painting:
1. Have students draw an underwater or beachside ocean scene with crayons on white paper.
2. Create a solution of 1 cup warm water, 1/3 cup table salt, and blue food coloring. Have students use it to paint a wash over their creation. The water will evaporate and leave behind the blue color with dried sparkly salt crystals.
Ocean Songs: Dance to and sing these ocean songs to close the lesson. Use your Ocean Animal Cards for “Who Lives in the Ocean.”

| **Did You Ever See a Sea Animal?**  
**_(to the tune of “Did you Ever See a Lassie?”)*** |
<table>
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<tbody>
<tr>
<td>Did you ever see a fishy, a fishy, a fishy,</td>
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</table>
| did you ever see a fishy  
swim this way and that? |
| *(Children move like a fish swimming)*  |
| Swim this way and that way, and that way and this way?  
Did you ever see a fishy swim this way and that? |
| Did you ever see a crab, a crab, a crab,  |
| did you ever see a crab  
crawl this way and that? |
| *(Children crawl like a crab)*  |
| Crawl this way and that way, and that way and this way?  
Did you ever see a crab crawl this way and that? |
| *(Continue with other ocean animals and actions: Jellyfish – float, lobster – pinch, clam – snap, gull – fly, and so on)* |

| **Who Lives in the Ocean?**  
**_(to the tune of “The Farmer in the Dell”)*** |
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<tbody>
<tr>
<td>Start with everyone in a big circle. Each child draws an ocean animal card. As an animal is named in a verse, the child moves to the middle of the circle, holding hands with others there.)</td>
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</tbody>
</table>
| A sea sponge lives in the ocean.  
A sea sponge lives in the ocean.  
Hi ho, did you know,  
A sea sponge lives in the ocean? |
| A jellyfish finds the sponge.  
A jellyfish finds the sponge.  
Hi ho, did you know,  
A jellyfish finds the sponge? |
| *(Add other ocean animals in the same way, ending with the diver.)*  |
| A diver finds them all.  
A diver finds them all.  
Hi ho, did you know,  
A diver finds them all? |
Pre-Program Activity 2: Beaks and Treats!

Duration of Activity: 30 - 45 min.

Materials: variety of food items (beads, shells, poms poms, etc.), variety of “beaks” (clothespins, spoons, chopsticks or pencils, etc.), hula-hoops or carpet squares, open indoor or outdoor space, pictures of shore and sea birds (p. 11-21), Optional – Pixar short Piper

Background: Birds found near our shores different types of beaks depending on what they eat. Some beaks scoop, some tear, and strain, and some spear, and each is best fit to catch what that animal eats. Students will learn through living life as a bird that some food items may work better than others for them and their beak in this relay game!

Directions: This is a great game to play outside or in a larger indoor space. Students will break into 2 or more teams to participate in a relay.

1. Set-up: using carpet squares or hula-hoops set up feeding areas at the end of the relay race (or turning around point for teams). Place in hula-hoops the same numbers of different “food items’” (beads, shells, pompoms, etc.) for each team. Set-up a starting line for the relay (use tape, a jump rope, etc.). Pull other materials list above.

2. Start with a brief lesson on birds near the shore. Use pictures with this lesson plan to show students the variety of beak types that exist for birds living near the beach.

3. Optional: Show the Disney Pixar short Piper, if available to you. This sets the stage to show how some birds feed at the beach during the ebb and flow of tides and wave action near shore. Explain to students the concept of tides in simple terms of water coming in further in to shore or back out into the ocean. Ask them if they have ever built a mote or sand castle at the beach and experienced the water coming closer and closer to their creation. This is the tide! It ebbs and flows or washes in and out.

4. Split your students into two or more groups for the relay. Explain to them that they will become different kinds of birds at the beach, and will have varying type of beaks. Pass out beaks giving each team the same types of beaks (clothespins, spoons, chopsticks or pencils, etc.). They can only feed at low tide in order to access animal buried at low tide. When you yell “high tide” during the game, students currently feeding for their team will need to retreat to their team until “low tide” is announced. Each student will go one at a time for their team, leaving from the starting point, picking up one food item with their beak, and then tagging the next student in line. When a team finishes all the feeding on all the “food” in their area, they can sit down signifying they have completed the race.

5. Play as many rounds of the game as you wish, feel free to have students switch beaks so they can experience a new type, and discover an easier or more difficult time collecting certain food items.

6. Wrap-up with a discussion, about birds and their beak designs and the challenge of the changing tides and weather conditions at the beach.
Post-Program Activity 1: Shifting Seasons

Duration of Activity: ~45 min.

Materials: Shifting Seasons Worksheet - 4 season or 2 season options (p. 22-23)

Background: In order to prepare for our Ebb and Flow program, students can think about changes in nature. Some change occurs rapidly and some over longer periods. These changes can affect how wildlife behave and are built to survive in their homes.

Directions: Begin by taking students outside if available. An alternative can be to show them a picture of an outdoor space. This could be a beach, a park, their schoolyard, swamp, lake, etc. Have students imagine this place changing throughout the seasons. They can picture this place changing through winter, spring, summer, and fall or here in Florida – wet season and dry season (especially if looking at an aquatic environment or wetland outside). Begin with students observing certain characteristics of the current season. What is the weather like this time of year? Is there rain? What is happening with the wildlife? Are there flowers blooming? Next, have students imagine how this place changes answering similar questions through each of the other three seasons or one other season (depending on which season system you decide to use). After walking through an example, have the students use the provided worksheet to draw or write changes during seasons using either the same location or having chosen a new one. After students complete their worksheets, discuss how changes throughout the seasons affect the behaviors and life of the wildlife. Do some wildlife move in or out of this area? Do certain plants grow or produce flowers or fruit depending on the season? How do the seasons affect the animals and their sources of food, water, and shelter? Is there a certain time they tend to have babies and raise their young? What changes affect the timing of their behaviors?
Post-Program Activity 2: Create a Creature

Duration of Activity: ~1 hour

Materials: modeling clay, Ocean Animal Cards (pp. 7-9)

Background: Students can use their knowledge of daily and seasonal changes in habitats in Florida to create a creature built to survive at the beach. Where does your creature spend time at the beach? How does it eat? What does it eat? How does it avoid or protect itself from predators? Where does it raise its young?

Directions:
1. Chat with students about their program with Conservancy. Review some of the animals they were able to meet or were introduced to through the program, and some ways they survive well at the beach.
2. Next, have students create their own creature who lives at the beach using modeling clay. Tell students they must design a creature built to survive, and be prepared to share the following about their creature:
   a. Where their animal spends time at the beach?
   b. How and what does it eat?
   c. How does it protect itself?
   d. Does your creature change its behavior throughout the seasons or the day to adapt to changes in its environment?
   e. Students can also name their creature.
3. Have students present final creature to the class, and share the above information.
4. Hold a wrap-up discussion about challenges at the beach, especially through the changing seasons.
The Deep Blue Sea

Directions: Make a copy of the Ocean Animal Cards below. You may wish to color and laminate them for durability. You may also wish to enlarge and cut out the figures for use in the ocean mural or use them to guide your creation of your own sea animal shapes.

Note: The symbols to the right indicate in what part of the ocean each animal spends most of its time:

- in or on sand/mud on the ocean bottom
- on rocks on the ocean bottom
- swimming or floating in the water
- in the air above the ocean.
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Sea Snail
Octopus
Sea Star
Shrimp
Sea Turtle
Gull
Whale
Scuba Diver
Black Skimmer
Roseate Spoonbill
White Pelican
Brown Pelican
Double-Crested Cormorant
Laughing Gull

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Yellow-Crowned Night Heron
Sandpiper
Black Skimmer Facts:
- Lower beak longer than upper; flies with its lower beak in the water, when it feels a fish the top part of the beak snaps down
- Diet: small fish (silversides, anchovies, mullets), sometimes insects

Roseate Spoonbill Facts:
- Long, flat, wide bill with circular ends; puts bill in water and moves head from side to side with mouth slightly open to feel for prey
- Diet: small fish (minnows and killifish), shrimp, crayfish, crabs, water beetles

White Pelican Facts:
- Large, long bill with a pouch; puts head under water and scoops up fish with its bill
- Diet: usually small schooling fish (minnows, carp, suckers) but sometimes larger fish, salamanders, crayfish

Brown Pelican Facts:
- Large, long bill with a pouch; dives under water and hits its prey, then scoops it up with its bill
- Diet: usually small schooling fish (mullet, anchovies, herring) but sometimes larger fish, prawns

Double Crested Cormorant Facts:
- Heavy bills with a hooked tip; dives and chases fish underwater, catches prey with the help of its hooked bill
- Diet: mostly fish (whatever is close and easy to catch), also crabs, crayfish, shrimp, frogs

Laughing Gull Facts:
- Stout, long bills; eats whatever it can find that is easy to catch- picks up food while walking on the shore or in the water, sometimes will swim for food
- Diet: snails, crabs, crab eggs, small fish, earthworms, insects, eggs of other birds, garbage

Yellow Crowned Night Heron Facts:
- Thick, kind of short bill; hunts in shallow water, grabs prey and shakes it apart or eats it whole
- Diet: crabs, mussels, small fish, crayfish, snails

Sandpiper Facts:
- Long, thin, curved bill; hunts in very shallow water, pokes bill in sand or mud and grabs prey
- Diet: shrimp, crayfish, small snails, worms, seeds, beetles and other insects
References:

Black Skimmer pictures

https://www4.swfwmd.state.fl.us/alafia/birds.php
http://nathistorc.bio.uci.edu/birds/charadriiformes/Rynchops%20niger/

Roseate Spoonbill pictures:

http://fieldnotes-steve.blogspot.com/2013/04/roseate-spoonbill-plataea-ajaja.html
http://anaturalnester.blogspot.com/2010/07/summer-school-water-birds.html

White Pelican pictures:

http://iheartfloridabirds.blogspot.com/2013/03/coming-going.html
https://naturetime.wordpress.com/2014/01/07/beautiful-white-pelicans/white-pelican-pouch/

Brown Pelican pictures:

https://www.captainjacksairboattours.com/the-brown-pelican-a-year-round-everglades-resident/
http://iheartfloridabirds.blogspot.com/2012/01/brown-pelicans.html

Double-Crested Cormorant pictures

https://bobbyharrison.blogspot.com/2010_03_26_archive.html
http://nathistorc.bio.uci.edu/birds/pelecaniformes/Phalacrocorax%20auritus/index.htm

Laughing Gull pictures:

http://iheartfloridabirds.blogspot.com/2012_09_01_archive.html
Yellow Crowned Night Heron pictures:

https://www.onthewingphotography.com/wings/yellow-crowned-night-heron-images/

https://commons.wikimedia.org/wiki/File:Yellow-crowned_Night_Heron_-_Nyctanassa_violacea,_Mrazek_Pond,_Everglades_National_Park,_Homestead,_Florida.jpg

Sandpiper pictures:

http://fieldnotes-steve.blogspot.com/2016/12/dunlin-or-curlew-sandpiper.html

http://pembsbirds.blogspot.com/2016/08/angle-bay.html
## SHIFTING SEASONS

<table>
<thead>
<tr>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
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Name 3 changes that occur throughout the seasons:
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