GEORGIA
BURTON 4-H CENTER ON TYBEE ISLAND

# Beach Ecology
# Pre-Post Trip Activities

## Activity 1. The Animals that Made the Shells

The shells on the beach come from mollusks. Using photos or collected shells, have students identify the shell and research the animal that created the shell. How many species did you find? Discuss why the shells are washed up on the beach and why there are so many.

## Activity 2. Create Your Own Tidepool

Using paper plates, have students create tidepools and the animals that live there. Have students paint one plate blue, like the water at the bottom of the pools. With the other plate, have students cut out the center so there is just the ridged edge of the plate is left. Paint the edge with glue and dip in sand to resemble the beach that surrounds the pools. Super glue the two plates together to have a 3-D tidepool model. Have students draw and color animals that they have seen or learned about that live here, and then write about why the animals they chose.

## Activity 3. Life Cycle of a Grain of Sand

Like other ecological cycles, sand goes through a cycle which forms the beach, but is the result of the destruction of large mountains and formations. Using arts and crafts such as drawing or clay, students will create a collage of where sand starts, how it might flow or travel to the beach and ultimately wash away. Where does it go from there? Students can present their interpretations in a science fair format or as individual presentations, with other staff or students grading them.

## Activity 4. Beach Encounters

Create stories with your students by using the story strips found on page 3. Explore the different ways humans and animals use the beach and discuss how they are able to coexist. Discuss the ways in which our actions can affect wildlife and have students share their stories.

## Activity 5. Wave Jumping

Who doesn't love to jump over the waves as they come in? Take a long piece of rope and have everyone stand around one central person. Have the person spin around so the rope swings out. Everyone can try to jump the rope as it swings around. Have fun practicing wave jumping!

## Activity 6. A Look at Lifestyle

The Savannah River is one of the largest ports in the United States, and cargo ships use this port to bring various materials and supplies to the country. The Savannah River is being dredged so these ships can pass through. Dredging affects the deposition and erosion of sand on Tybee. With this in mind, ask students to create a personal list of things they need to live. Afterwards ask the student to label each item as the following:

S- if the item is absolutely needed for the survival of all living things
M- if the item is needed to maintain their personal lifestyle
L- if you don't need the item but you like to have it because it makes life easier or nice

Now, create a class list with items in each category S, M, and L, and go through the list eliminating the items that are non-essential. Conclude by asking the students, how can limiting the use of non-essential items impact dredging and people's lifestyles?

## Activity 7. Dune Protection Proposal

Discuss the importance of dunes with students and then have them either in groups or with a partner create a proposal that will help protect our dunes. Students can then present their proposals to the class and possibly send it to their government. (More instructions can be found on page 3).

## Activity 8. Exploring Erosion, Sediment, and Jetties

Ocean waves erode the coastline. The sand they remove is shifted to another location. This paradoxical effect can strip beaches in one location and create them in another. Have students create a model of the shoreline and observe how erosion occurs with waves. As an added activity, add rocks and replicate the experiment to observe how jetties limit the amount of erosion on the coast. Discuss other methods used for preventing erosion. (More instructions can be found on page 4).

# Additional Instructions

## Activity 4. Beach Encounters

As more and more people move to and visit the coast, resource management conflicts arise between preservation and recreation. This activity explores the different ways that humans and wildlife both need coastal areas, and encourages critical thinking about how to manage an area to allow for both to coexist. The writing portion of this activity encourages students to think about how their choices and small actions have big impacts on living organisms and habitats. It is important for humans to be good stewards who protect these fragile natural resources for the future.

Pass out a story strip to each kid that talks about how humans use the beach. Give them 5 minutes to write their short story. Next, generate story strips about how animals use the beach. Give one to each kid and give them 5 minutes to write another short story. Then choose a couple kids to share their stories. Discuss the ways in which our actions can affect wildlife.

Example story strips to ask kids (how humans use the beach):

- I was walking on the ocean's edge when I spot the biggest, most beautiful snail shell I have ever seen! I run over to pick it up, but when I flip it over I see the legs of a live hermit crab and then...
    - What happens? How do you feel? What do you do?

- I was walking down the beach, when I see a big flock of resting birds and then...
    - What happens? How do you feel? What do you do?

- I was walking down the beach with my family at night, when we saw something strange coming out of the water and up the beach. “It’s a sea turtle!” I exclaimed, and then ....
  What happens? How do you feel? What do you do?

Example story strips to ask kids (how animals use the beach):

- I am a hermit crab that lives in a tidepool on the beach . I had just molted and moved into the only empty snail shell that was just my size, when a human scoops me up off the beach and then....
    - What happens? How do you feel? What do you do?

- I am a shore bird that just flew in from Argentina! What a journey! It’s not over yet. I was resting on the beach (because it’s important I save my energy to fly to my next destination) when a human being with a barking dog ran towards me and then...
    - What happens? How do feel? What do you do?

- I am a female sea turtle ready to lay my eggs. Finally the night has come, and I am ready to start my slow journey up the beach. I was looking for a good spot to lay my eggs in the dunes when a human with a flashlight runs toward me and then....
    - What happens? How do feel? What do you do?

# Activity 8. Exploring Erosion, Sediment, and Jetties

In this experiment, students will create a model of a shoreline, observe erosion and examine how jetties prevent erosion.

Materials:

- Permanent marker
- Plastic box at least 6" x 12" x 8" (bigger boxes work better – an "under bed" plastic storage contain is ideal)
- Ruler
- Two gallons of sand
- Water
- Small plastic toy that represents a house (can be made from Legos)
- 10 to 20 pieces of gravel and/or 10 to 20 one-inch stones (if you use a larger box, they you can use two-inch stones
- Big spoon

Procedure:

- Working out of doors, use your permanent marker to mark the bottom of the container into nine rectangles. There should be three lines running vertically and three lines running horizontally.
- Fill the container with water so that it is 1/3 full.
- Add sand to the container. Mix the sand and the water. Pour off any cloudy water. Keep adding water, stirring and pouring off the water until the water is clear. Dump out all the water. At this point, you know your sand is clean.
- Pile up all the sand so that it covers the bottom three squares of the container. Pack it down firmly. Put your plastic toy on the sand, and scatter the gravel pebbles across the sand. This is your beach.
- Add water, pouring very carefully into the squares that do not have sand. Make sure that the water level is not so high that the top of the beach is covered with water.
- In your lab book, draw a box that is proportional to your plastic container. Divide it into nine sections, just as you did your plastic container. Make three copies of this diagram. Label two of them "With Jetties" and two of them "Without Jetties." This will be used to make a cross section of the distribution of the sand in the box.
- Gently rock the container back and forth ten times to imitate wave action. Sketch a cross section of the sand levels on the first sheet labeled "Without Jetties."
- Repeat step 7, rocking more vigorously to imitate storm waves. Sketch your results.
- Re-pile the sand as you had it originally in step 4. Pack it down firmly.
- Add a row of the bigger stones so that they are parallel to the beach. They should be located at the second line across the plastic container.
- Repeat steps 7 and 8. Sketch your results on the sheets labeled "With Jetties." Consider what effect the jetties may have on beach erosion.