

E.T. - A LOCAL WAY OF LEARNING

**Title:** SANDY SHORE ECOSYSTEM

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**Grade Level:** K-12

**Concepts:**

1. Energy
2. Ecosystem
3. Carrying Capacity
4. Water
7. Land Use
10. Economics
12. Stewardship

**Disciplines:**

1. Social Studies
2. Science
3. Language Arts
4. Art

**Objectives:**  
Student shall be able to "read the landscape" and tell how high the water has come and how recently. You may find turtle tracks and can tell where it came on the beach and where it left and probably where the nest is located. Students shall identify the animals that live there, the food chains on the beach and the plants that stabilize the sand.

**Rationale:**  
Sandy shores are in constant change, now depositing and now eroding. No vegetation holds the beach (or foreshore) at the water's edge. On the high beach (backshore or berm) the goat's foot vine, purslane and bay bean stabilize the sand. This is a very delicate area where plant roots struggle to keep the sand from blowing away. The high storm water mark is identified by dead syringodium masses in which many dead shells are to be found. At the lower wave line, in another row of dead grass washed up by the sea, is the home of a great number of copepods and other decomposers who are busy breaking down the grass to recycle. (Tar is also caught up in this mass of debris.) Seagrass, cocoplums, manchineel, beach Maho, coconut palm, and other littoral, salt tolerant plants grow behind the open beach. The turtles are protected and any form of harassment is subject to a fine, imprisonment, or both.

**Materials Needed:**  
Swimsuit or beach clothing. A bag for shelling and one for grass for microscopic examination.  
Hand lens. Binoculars.

**References:**  
LSIM Movies: XLS1 115 Birds of the Sandy Beach  
XLSI 341 The Green Sea Turtle

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### **Activities:**

NOTE: Prepare an activity guide from these suggestions, excluding the answers provided. These may be apportioned to team investigations.

Dig a hole in the sand where it is dry. How deep do you have to dig to get to wet sand? Where does the wetness come from?

At the water line watch for the wave to go out and try to find the white crustacean about the size and appearance of a roach. . The water washes it out but it can dig in faster than you. What do the sandpipers and long beaked birds hunt for as they run along the wave line? (this crustacean, *Hippa cubensis*).

Notice the holes all over the dry sand. Who lives in these holes? After about 3:00 p.m. the ghost crabs go to work. They must clean out the dry sand that shifted down the shaft. What do they eat? They are scavengers. Notice the crabs' eyes. Can they see in a 360 degree radius? What advantage is it to have eyes that fold in? (Protection when the crab goes into his hole).

At the waters edge you might find a worm that looks something like an anemone. When disturbed it will turn itself inside out (the way you pull off a sock) and try to dig deeper into the sand.

Look for small pink clam shells which make a beautiful necklace when strung on a fish line. You will find they already have a hole in them, made by a univalve who ate the clam. This drill hole makes it handy to string the flowerlike shells.

Pull apart the dead seaweed at the water line. Do you find a lot of little shrimp-like animals hidden in the grass? They are the detritus feeders, who will recycle the dead grass and release its nutrients again. Take a small sample for study, or look with a hand lens on the spot.

If you find turtle tracks, measure the width from flipper tip to flipper tip. The leatherback (or trunk) turtle has a span of about seven feet. What makes the uninterrupted line half way between? (The tail). Can you tell which track came onto the beach and which is the track by which the turtle left?

Measure carefully the length of a bay bean vine. They grow to be 50 feet long. On the high beach watch for sandpiper nests. Do they build a fancy nest? (no). What is it made of? (A rim of a few shells or stones). Stay away if there are nests and use your binoculars. The adults will be dive bombing you if there are eggs in the nests.