

Underwater Photography
Spring 1998

Observation Skills:
Hidden Pictures in the Intertidal Zone

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Observation Skills: ***Hidden Pictures in the Intertidal Zone***

GRADE LEVEL

This lesson is designed for Grade 5. It may be modified for use in Grades 3-12.

GOAL

The purpose of this lesson is to exercise student observation skills. As a result, general awareness and appreciation of the science all around us everyday will hopefully increase.

OBJECTIVE

The student will be able to:

- recognize common coastal flora/fauna
- identify the native habitat of common coastal flora/fauna
- define the consequences of man's impact on the environment

DURATION

This lesson may be presented in 20-30 minutes, depending on the level of interaction, or completed as an individual exercise using printed images.

INSTRUCTIONAL STRATEGY

The lesson consists of a set of images depicting typical views along the intertidal zone, followed by a sample script of possible discussion items. Please feel free to customize the lesson with respect to a nearby or relevant locale, or use it in a generic sense.

The photographs were taken on a university field trip to the Sea of Cortez (Gulf of California) in March 1998. There are many resources about this area, particularly man's impact, if you would like to use it as the type locale for expanded lessons.

PREREQUISITE

As the focus of the lesson is on observation skills, there are few requirements other than interest and inquiry. You may want to use this as an introduction, highlighting the surprising things to come. It serves as a fun closing/intermediary activity for a study of the intertidal environment and associated beach flora/fauna. It is equally appropriate as a Friday afternoon "game show" or Monday morning brain "warm-up" exercise! Use one-a-day during your oceanography unit to get things started.

ASSESSMENT/EVALUATION

Students will be evaluated on the basis of participation and performance. For example, supplemental lesson assessment/evaluation ideas may include:

- Locate habitats/identify items on a beach diagram
- Write an essay about man's impact on the beach system
- List differences/similarities between species, i.e. *Is an anemone a plant or animal? What are the differences between sharks and fish? Sea lions and seals?*

OTHER PROJECTS

This lesson can be used independently or in conjunction with other activities concerning the scientific method, biology, habitat, environmental geology, or beach processes.

MATERIALS NEEDED BY THE TEACHER

- overhead/electronic projector
- color overheads/electronic version
- optional: reference materials (library resources, field guides, Internet access, etc.)
- other misc. items, like a pointer, depending on how the lesson is presented

TEACHER NOTES

Observation is the first step of the scientific method. It is a learned skill for most, especially at a detailed level. Many people "see" things, but rarely "notice" the important differences within each scene. This exercise is meant to be fun, encouraging students to open their eyes and increase awareness of their surroundings.

Imagine you're walking along the beach. You can visualize almost any beach, anywhere, at any time. Take mental snapshots of what you see on your casual stroll. There's a crab scrambling across the beach slope. A pelican is patiently waiting for his dinner to swim past. You just stepped on some beautiful kelp washed in by the last tide. If you look to the horizon only, you might miss the porpoise breaching a few yards to your left. You get the idea.

STUDENT ACTIVITIES

This lesson has deliberately been designed with an open structure to allow/encourage teachers to use the images in the most appropriate manner for their classes. Possible ideas are suggested below:

- Make up a game to match graphics with text
- Design a wall-size collage showing the relative habitats typically observed
- Set the stage for role-playing - spend a day at the beach as the 'critter(s)' you identified!
- Discuss the system balance using a "What If" approach, i.e. *What if an oil tanker was grounded near the beach?*

APPLICABLE TEKS

The following Seventh Grade Science TEKS apply to this lesson.

Scientific processes:

(7.2) The student uses scientific inquiry methods during field and laboratory investigations.

(7.3) The student uses critical thinking and scientific problem solving to make informed decisions.

(7.4) The student knows how to use tools and methods to conduct science inquiry.

Science concepts:

(7.5) The student knows that an equilibrium of a system may change.

(7.9) The student knows the relationship between structure and function in living systems.

(7.11) The student knows that the responses of organisms are caused by internal or external stimuli.

(7.12) The student knows that there is a relationship between organisms and the environment.

(7.14) The student knows that natural events and human activity can alter Earth systems.

Source: The provisions of this §112.24 adopted to be effective September 1, 1998, 22 TexReg 7647.

Slide Descriptions

The following notes summarize key elements of the slides. You and your students may find a whole lot more than is listed! Slides are presented in alphabetical order; mix and match as appropriate.



Setting: General Overview

The ocean can be overwhelming. Waves mesmerize and relax the most astute. The scene may seem quite plain; however, on closer observation, the area is teeming with unique and diverse flora and fauna.



Setting: Intertidal Zone

You may not have taken the time to actually stoop down and turn over one of those green-looking rocks exposed at low tide. Believe it or not, they are covered with living plants and animals - barnacles, algae, chiton, kelp, snails and many more - that color the wave-beaten anchors. It's amazing what lives in this extreme, high-energy environment.



Bird: Nest

This giant cactus (cardon) towers nearly 20 feet above the mangrove swamp in the background. It's only a few tens of feet from the beachfront.

Notice the bird's nest crouched within the protective arms of the cardon. This is probably an osprey nest. Why do you think the bird picked this spot out of all the options on the uninhabited island?



Bird: Tracks

There is evidence of life all over the beach - but it doesn't last for long with wind and waves to wash it away. There are actually two sets of tracks printed in the sand. A small mammal probably left the larger, oval set. The fine, straight set was most likely left by a sandpiper. Which came first?



Bird: Seagulls

This photo was taken looking down from a steep cliff, several hundred feet above, onto the rocky shore. It is rare to have a birds-eye view of a seagull! There are several resting on the larger boulders.



Bird: Shearwater

In the center of the frame, just below the water line, a fast-flying shearwater is looking for its lunch. The white underside reflects the turquoise sea causing it to virtually disappear into both the sky and water.



Bird: Wren

See the bird who has stopped to see what we're doing way up on the ridge? This friendly little bird, who looks a lot like a sparrow, is a saguero wren. The sea breeze is strong and storm winds can be treacherous.



Crab: Blue

A large (6-7 inch wide) blue crab, caked with sand and salt, slowly makes its way across the beach.



Crab: Fiddler

At least five (probably more) fiddler crabs scurry across a small intertidal pool. They're no more than 3 inches wide - and that's mostly pinchers! You would hardly even notice them except that the entire surface seemed to be moving...



Crab: Red

These large red crabs are a favorite meal for sea lions. This couple was hiding out on a magnificent formation. A herd of sea lions rested a few feet away.



Dolphin

If you look real close you'll eventually see the dorsal fin of a dolphin or porpoise near the edge of the frame in the middle of the sea. There were actually about 10-15 swimming toward the yacht, surfacing a few at a time. You could barely catch a glimpse as the sun reflected off their shimmering skin.



Fish: Flying

No kidding, if you look in the lower right corner of this slide you'll see a "flying fish"! It danced its way along the surface for several minutes. Was it simply enjoying the beautiful day or was it trying to avoid becoming someone else's lunch?



Fish: Trumpet fish

It looks like a log or a strand of seaweed, but it's a fish! This needle fish, also called trumpet fish, watched us walk along the beach... They were quite common around the marina and near the shore. See his eye? This guy is about 2.5 feet long.



Fish: Tail

Mangrove roots are home to a variety of sealife in the saltwater estuary - nature's nursery. Between all the seaweed and anemones clinging to the 6+ foot roots, do you see the fish tail? All shapes and sizes darted in and out trying to catch a glimpse of us! We were a sight in all our snorkel gear!



Fish: Black & Puffer

We don't often get to look beneath the surface of the sea. There is a lot going on down there. Even snorkeling it is hard to see everything. You probably found the black fish swimming toward the left. Did you notice the puffer fish peeking out from below the rocks in the very middle of the slide? You can just make out his eyes. A recent storm has draped everything with more sand than usual.



Flower

This miniature yellow wildflower was blooming in the middle of this rocky trail. It was the only we saw the entire trip! It was quite a sight in this harsh, rugged terrain. It would have been easy to miss...



Jellyfish: *cassiopea*, swimming

It looks like lace dancing without gravity. This floating item is really a swimming jellyfish! *Cassiopea* is unique in that it feeds upside-down.



Jellyfish: *cassiopea*, resting

The floor of the estuary was literally carpeted with *cassiopea*. Do you think they are resting or feeding? I watched one swim over to a sunken mangrove leaf and proceed to eat it! Maybe that one was doing a bit of both - feeding while it was resting! Why would an estuary be such a great place to grow up?



Lizard

Look out! He went that way; no, now he's over there! These little guys are fast and blend in with the sand so well that you hardly know what speeding past...



Manta Ray, shadows

See the dark shadows in the shallow water? They're moving as a group... a group of manta rays! As we left shore in the dinghy we could only see their dusty trails as they took off from their posts on the bottom.



Sea Cucumber

What is that mound of mess in the middle of the picture? It's a sea cucumber! Sounds like it ought to be a plant, but it's another interesting marine animal. Look that one up in the marine science field books!



Sea Lions

We're approaching Los Isoletes, the Isolated Islands. We can't land here because it's an area that's protected by the Mexican government. Can you see why? There are close to a hundred sea lions napping and playing on the rocky shore! What a sight - and what a sound! They bark like dogs. These are the guys that are trained for shows at amusement parks.



Sky: Moonrise

Yes, there's a yacht in the picture. There's also a beautiful moon rising near the top center. We could see from horizon to horizon almost. It was a thrill to watch the sun set over the bow and the full moon rise over the stern. You can't imagine the stars!



Sky: Sunset, spectrum

This is an unusual shot in that the setting sun's ray is broken into the complete spectrum. I don't recall seeing it in "real life". It highlights the complexity of nature and the different levels on which it may be enjoyed. Our perceptions as humans are indeed limited to a significant extent.



Snails

A common sight in the intertidal zone is some sort of gastropod, or snail. They come in a variety of shapes and sizes and are interesting to watch. Their existence in such a habitat is truly amazing.



Starfish: *leiaSTER*

A rare find on the beach, the delicate starfish is a sight to behold in its natural state. They are surprisingly strong and a dreaded pest for fishermen as they consume a great amount of their potential harvest.



Starfish: *crown of thorns*

What's this? A lovely bush growing in the desert? No, it's another starfish! This kind is called the *crown of thorns*. Starfish arms are always multiples of five.