Science Unit: ***Aquatic Ecosystems***

Lesson 3: ***Marine Field Trip to Whytecliff Park***

School year:	2006/2007
Developed for:	Collingwood Neighbourhood Elementary School, Vancouver School District
Developed by:	Catriona Gordon (scientist), Lisa Evans and Sean Hughes (teachers)
Grade level:	Presented to grades K and 3; appropriate for grades K-7 with appropriate modifications.
Duration of lesson:	4 hours
Notes:	This lesson requires 1 adult per group of 3-5 students.
	Well in advance of the fieldtrip, consult tide tables to choose a date and time with a very low tide (1' or less). http://www.waterlevels.gc.ca

Objectives

1. Experience first-hand, the local seashore environment.
2. Learn about the intertidal habitat with its four distinct zones.
3. Learn about the different plants and animals that inhabit each zone and their special adaptations.
4. Learn about tidal pools and the organisms that live in them.

Background Information

At low tide local beaches provide a fabulous opportunity to view marine flora and fauna. Whytecliff Park in West Vancouver, near Horseshoe Bay, is a marine park and protected area with an abundance of seashore animals, including seastars, sea urchins, barnacles, mussels, limpets, seaweed, shore birds and seals. There are also several large tide pools, which provide good viewing of sculpins and other sea animals at low tide. The intertidal region of a beach is the area that is underwater at high tide and exposed at low tide. Within the intertidal region are four distinct zones: the low tide zone (which is only exposed at low tides), the mid zone, the upper tide zone (which is exposed for much of the time and only covered with water at high tides) and finally the splash zone which is wetted occasionally with waves but is never fully submerged. Highly adapted marine plants and animals have evolved to survive in each of these distinct beach zones. At Whytecliff Park, the rock walls clearly show the different intertidal zones and the plants and animals that inhabit them.

Vocabulary

Habitat: the place where a plant or animal lives (its home).

Adaptations: a trait (body part, behaviour, etc) that helps a plant or animal survive in its environment.

Tide: the daily rise and fall of sea level along a shore.

Tidal Pool: a natural pool of water left along the seashore as the tide level falls.

Intertidal Zone: area of shore between the highest and lowest tide levels.

Splash Zone: uppermost part of the beach, splashed by waves, but never covered by the sea.

Mollusks: a group of diverse animals with soft bodies, a mantle, and usually a protective shell (eg. Clams, oysters, squid, snails).

Bivalves: a subgroup of mollusks with a shell divided into two halves, hinged at one side (eg. Clams, oysters, mussels, scallops).

Gastropods: a subgroup of mollusks, usually with a single, spiraled shell (snails, limpets, whelks).

Crustaceans: a group of animals with jointed limbs, a hard outer skeleton and a pair of feelers (eg. Lobsters, crabs, shrimp, barnacles).

Seaweed: includes all plants of the sea, mostly algae with a few flowering plants (represented by a some grass-like sea plants).

Algae: plants with no true roots, stems or leaves, living in water or moist environments (includes seaweeds).

Materials

- Magnifying glasses
- Bug jars with magnification
- Small transparent plastic tubs (eg. Salad tubs work well)
- Ziplock bags with strings attached to hang around students' necks to keep their hands free while providing a place to put their pencils, magnifying glasses, and mini-first aid kits
- Bandaids/first aid kit
- Plastic bags to collect beach garbage
- Pencils
- Paper
- Trowels or small shovels if visiting a sandy beach
- 2-3 Sticks to show movement of tides

Field Trip Site

Whytecliff Park is equipped with bathrooms, a covered picnic area, a large grassy area and a children's playground. The beach is easily accessible by ramp or stairs and has a good diversity of marine organisms, visible at low tide. Whytecliff Park is a beautiful setting, but can get windy at times. It is best to have students wear layers of clothing which can be added/removed depending on the conditions. Hats and sunscreen are also important. **Use extreme caution when walking on rocks exposed at low tide. They are very slippery. All students should wear hiking boots, or close-toed, non-fabric shoes with good gripping soles. Walk slowly and carefully!**

Before arranging a trip to Whytecliff Park, check for the times of Low tides. As this is a park, taking samples or harming plant or animal life is not permitted.

Introductory Discussion

Before the field trip, divide classes into groups of 3-5 students. Let students come up with a name for their group (eg. The sculpins, the barnacles, the seastars etc.).

Ask students to describe a beach. What is special about a beach? What animals might we see here?

What is a tide pool? What animals might live in a tide pool?

Remind students of safety rules and conservation practices:

- Outline safety rules. Stay with your adult leader. Always walk, no running as the rocks and logs are very slippery at low tide.
- Outline the 3-L Rule: Look at it, Learn from it and Leave it. Remind students that this is a marine park and protected area. Nothing can be taken from the park, other than themselves and their garbage.
- When looking at an animal or plant, you can carefully pick it up, use a magnifying glass for a closer look, and then make sure you return it to its original home.

Science Activity

Before breaking into groups, use a large stone to hammer a stick into the beach where the tide is at that moment. With a felt pen, write the time on the stick. Break into small groups with adult helpers and begin beach exploration. Tell students to look under rocks for crabs and gunnels, but always replacing animals and rocks to their original places. The underside of boulders are good hiding places for animals too.

Start the nature scavenger hunt. Remind students that the items on the scavenger hunt are for observing, and ticking off the list. They are not for collecting.

Find a tidal pool (best seen out on the island) and examine the inhabitants. Look for tide pool sculpins, anemones and limpets.

Reconvene groups at the picnic shelter for lunch and free play.

After lunch return to tide stick and see how much the tide has moved. Place a second stick where the water is at that moment. Write the time on the stick. Continue beach exploration or play marine charades or have crab races on the grassy area.

Closure Discussion

Make a circle and ask students to share their observations. What interesting animals/plants did they find? What did they like best/least? Review what adaptations seashore animals and plants have to survive and thrive in their particular environments. What new things did they learn about plants and animals that live in the sea or seashore? What surprised them about the seashore, tides or the sea?

References

Whytecliff Park Website. http://www.greatervancouverparks.com/Whytecliff01.html

http://www.lawrencehallofscience.org/mare/oiresources/curriculum/rocky/overview.html

Niesen, Thomas, M. 1997. Beachcomber's Guide to Marine Life of the Pacific Northwest. Gulf Publishing Co. Houston. 160pp.

Sheldon, Ian. 1998. Seashore of British Columbia. Lone Pine Publishing. Vancouver.

Harbo, Rick. 2003. Pacific Reef and Shore: A Photo Guide to Northwest Marine Life. Harbour Publishing. Madeira Park, B.C.

Hickman, Pamela. 1996. At the Seashore: Exploring, Discovering, Observing, Playing, Crafts. Harbour Publishing. Madeira Park. B.C.

Swanson, Diane. 1997. The Central School Seashore Detectives. Nature Detectives- The Living World Science Series. Pacific Edge Publishing. Gabriola Island. B.C.

Extensions

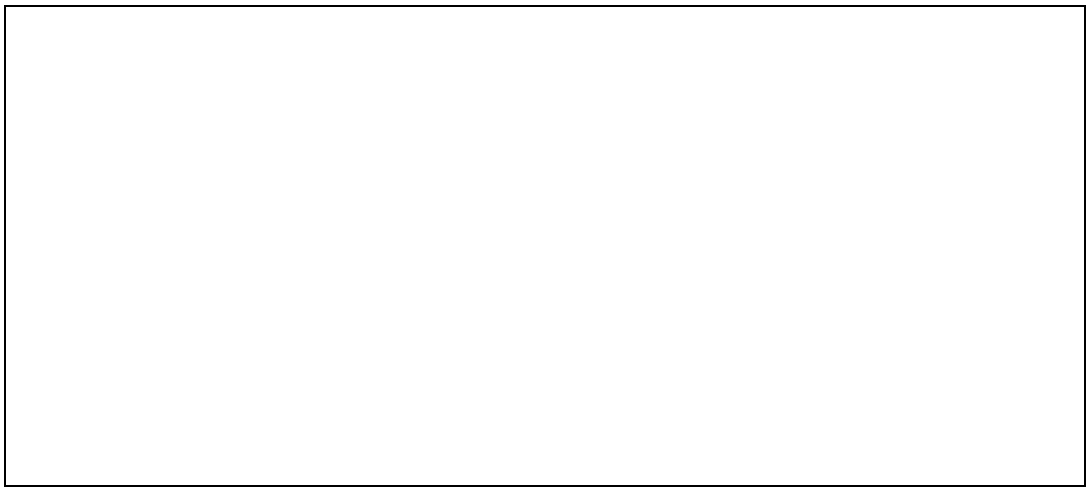
Have students record the animals and plants they found in each tide zone using the Tide Zones activity sheet.

Have students record the animals and plants they found by sorting them into the different marine animal and plant groups (ie. crustaceans, gastropods, bivalves, echinoderms, plants).

Tide Zones and Marine Plants & Animals

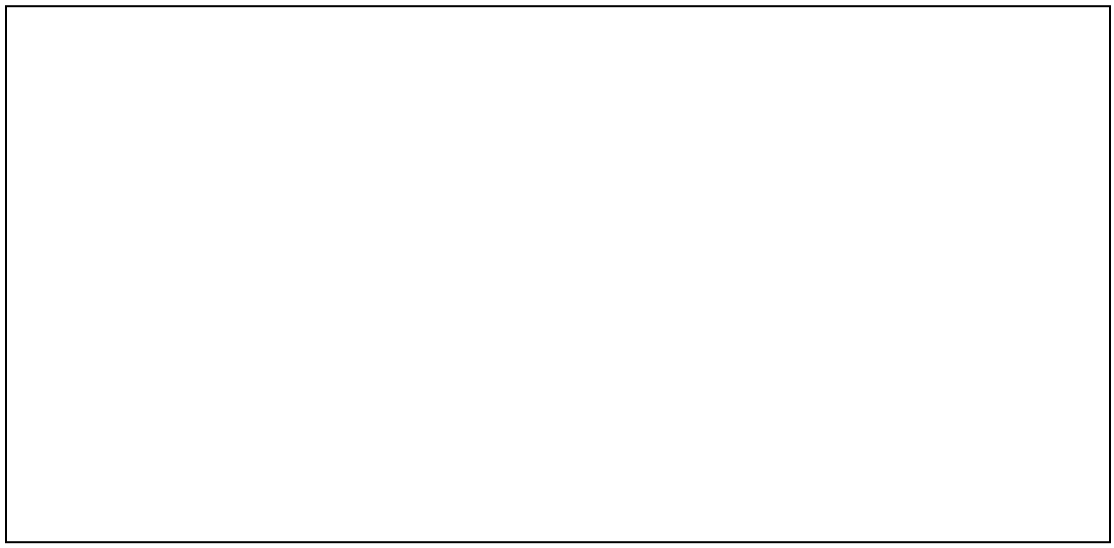
Name of Scientist_____

1



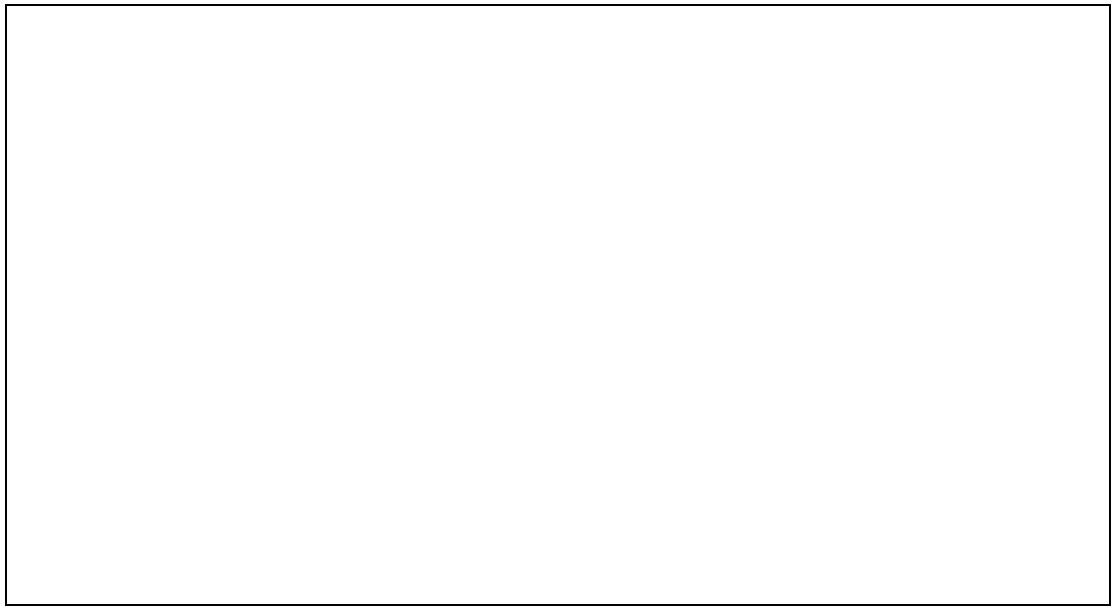
I live in the splash zone. I am a _____

2



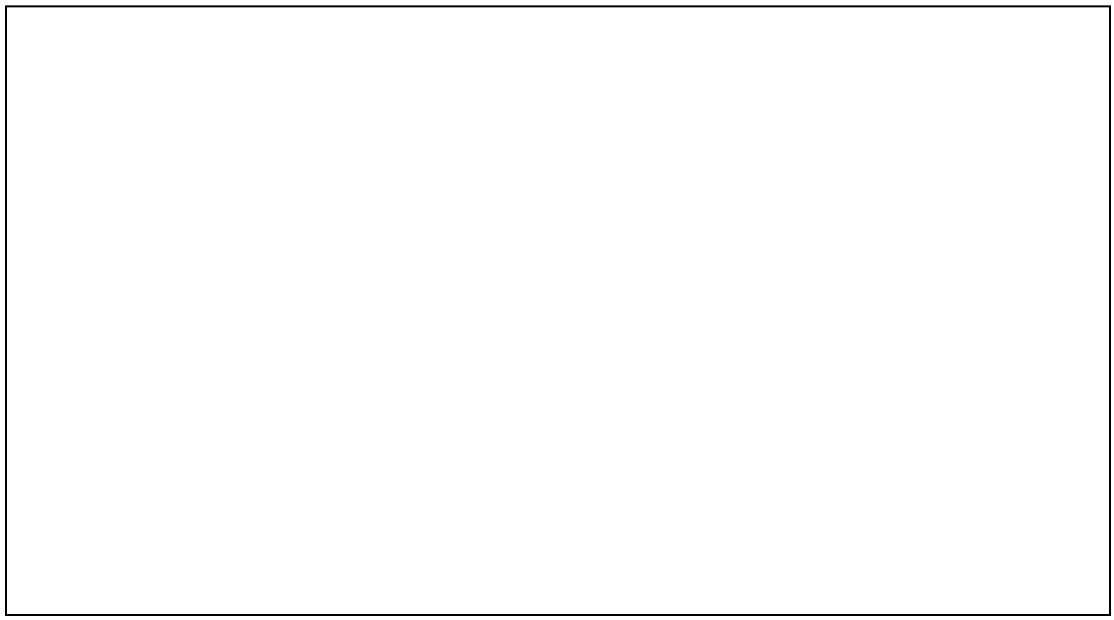
I live in the high tide zone. I am a _____

3



I live in the mid tide zone. I am a _____

4



I live in the low tide zone. I am a _____