Science Unit: ***Biodiversity & Extreme Environments***

Lesson 4: ***Intertidal Field Trip***

School Year:	2009/2010
Developed for:	Lord Kitchener Elementary School, Vancouver School District
Developed by:	Jean Marcus (scientist); Shelly Steer and Barbara Langmuir (teachers)
Grade level:	Presented to grade 5/6/7; appropriate for grades 4 – 8 with age appropriate modifications
Duration of lesson:	6 hours

Objectives

1. Explore a real intertidal zone.
2. Discover how ecologists collect species data in the field.
3. Practice identification of local intertidal species.

Background Information

In this lesson students travel to a local intertidal zone to learn how ecologists collect species data in the field. Students will analyze the data they collect during this field trip in lesson 5 – they will use the information to build species accumulation curves, rank abundance curves and to calculate species diversity indices.

A great intertidal zone close to Vancouver is Whytecliff Park in West Vancouver. At low tide the southwest section of the beach is full of loose rocks that provide habitat for a variety of intertidal animals and plants. Common species include gunnels, periwinkles, mussels, barnacles, chitons, sea stars (4 species!), sea urchins, shore crabs, sea lettuce, rockweed and kelp. Be sure to take enough field guides so that each group of students (ideally 4 students per 1 adult) can identify the species they are discovering. Be sure to pick a day/time with a good low tide as this will make the sampling much easier.

Students will work in groups with one adult to identify and count the animals and plants in their quadrat (a square frame of known area (1m x 1 m) used by ecologists to subsample a community. After their quadrat survey is complete, encourage the students to explore the rest of the beach.

Materials

- Quadrats (1 per group of 4 students)
- Worksheet #1 - data collection sheets (1 per group) on clipboards
- Species identification guides (1 per group)
- Pens, pencils, paper for drawing
- Measuring tape (4 total)

In the Field

Introductory Discussion

Before students begin their survey, be sure to review the safety and conservation protocols for working in a beach intertidal ecosystem. Key messages include:

1. Leave living animals and plants where you found them.

2. Replace rocks to their original position.

3. Avoid walking on animals.

4. Leave the beach cleaner than you found it. (It's always a good idea to take a few garbage bags with you).

5. Be safe – don't run or go into the ocean and keep on eye on each other.

Field Work

Provide each group of 4 students and 1 adult with the following: clip board with worksheet #1, a few sheets of blank paper for notes/drawings, pencils, 1 field guide, 1 quadrat. The groups can choose the location to place their quadrat – it can be anywhere within the intertidal zone. Before students begin collecting the species data within their quadrat they need to fill out the background information on Worksheet #1 (student names, weather, quadrat distance from shore, draw a rough sketch of the animals and plants in the quadrat etc.). Once the students have completed identifying and counting all the species in their quadrat, they are free to explore the rest of the beach!

Closure Discussion

1. What was their favorite discovery today?
2. Did they experience anything that was unexpected? What surprised them?
3. Did they find more or fewer species than they expected?
4. What new species names did they learn? What interesting facts did they learn about the intertidal community?

References

1. Sheldon, Ian. 1998. Seahorse of British Columbia. Lone Pine Publishing.
2. Sept, Duane J. 1999. The Beachcomber's Guide to Seahorse Life in the Pacific Northwest. Harbour Publishing.
3. http://www.greatervancouverparks.com/Whytecliff01.html Whytecliff Park overview. Accessed March 2010.
4. http://www.waterlevels.gc.ca/english/Canada.shtml Fisheries and Oceans Canada – Tides, Currents and Water Levels [use this site to determine a good low tide for intertidal field trips]. Accessed March 2010.
5. http://www.georgiastrait.org/?q=node/96 Beach Etiquette, Georgia Straight Alliance. [good background information for introductory talk on beach etiquette]. Accessed March 2010.

Extension of Lesson Plan

1. Continue to explore and read the field guides to learn about fascinating animals and plants discovered on the field trip.

WHYTECLIFF PARK:
INTERTIDAL DATA COLLECTION SHEET

Leader's name:	
Student names:	
Date:	
Time:	
Weather:	
Quadrat location:	Estimate distance from water's edge:
Quadrat description: Draw the big rocks, major clumps of animals and plants, and label the drawing! The area on the right represents your quadrat	

ANIMALS

Species name	Number of individuals

PLANTS

Seaweed Type	% cover

NON-LIVING SUBSTRATE

Substrate Type	% cover

What is the species richness of your quadrat? (Hint: remember to include your seaweed species in your count!)

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