Science Unit: Marine Critters and Communities
Lesson 10: Intertidal Field Trip to Jericho Beach

School Year: 2011/2012

Developed for: Tecumseh Elementary School, Vancouver School District

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(teachers)

Grade level: Presented to grade 7; appropriate for grades 4 - 7 with age appropriate

modifications

Duration of lesson: All day field trip (follow up Extension Lesson on comparing Jericho Beach with

Stanley Park to be done during a science class at school)

Notes: This lesson is similar to Lesson 4, Intertidal Field Trip, in the Biodiversity and

Extreme Environments science unit, Scientist in Residence Program.

http://scientistinresidence.ca/science-lesson-plans/biodiversity-and-extreme-environments/
It is also linked with Lesson 11 Intertidal Field Trip to Stanley Park, in the Marine Critters and Communities science unit, Scientist in Residence

communities/

Data collected from both field trips will be compared as a Lesson Extension

Program, http://scientistinresidence.ca/science-lesson-plans/marine-critters-

Exercise.

This lesson uses circular plots of 1 m<sup>2</sup> area.

Waterproof paper for the worksheets can be purchased at Western Technical

Supply in North Vancouver. Other sources can be found at

<www.riteintherain.com>. When it is raining, pencils must be used to write on

waterproof paper.

Staples is a source of plastic sleeves that can be used to enclose the Spring Beach Walk field guide pages. These sleeves have a flap at the top that keep the pages inside and do not allow rain to enter. The pages of each copy of the field guide can be secured together using paper clips.

The location of the survey is near the rehabilitated salmon stream at Spanish Bank

Creek.

The 1 m $^2$  study circle-plots are made of  $\frac{1}{2}$  inch poly line and the ends are secured with zap straps- supplies that are readily available at most hardware stores.

### **Objectives**

- 1. Explore a real intertidal zone.
- 2. Replicate how ecologists collect ecological data in the field.
- 3. Practice species identification of intertidal organisms.

### **Background Information**

The field trips should be timed to take advantage of the lowest part of the tidal cycles in the spring. On site, students will work in groups of 3-4 students to apply what they learned in lessons 9 and 10 to collect ecological data that will help them to appreciate the differences between two different intertidal areas in the Vancouver area: Jericho Beach and Stanley Park. Ideally there will be at least one adult per two groups. At Tecumseh Elementary School, this trip coincided with a school-wide trip where students were able to release salmon smolts to the rehabilitated Spanish Bank Creek.

### **Materials**

- Study plots (1 per group of 3-4 students)
- Field Guide: 'Explore the Rocky Shore at Stanley Park' (1 per group)
- Clipboards (2 per group)
- Worksheets- Intertidal Data Collection Sheets (2 pages, 1 per group) printed on waterproof paper
- Buckets to put specimens in, to share with the class
- Garbage bags for beach clean-up if necessary
- Field Guide: Spring Beach Walks-Quick Reference Identification Guide
- Magnifying glasses

### In the Field

Before the students begin, once again review intertidal etiquette.

- Leave animals where you found them.
- Carefully return rocks to their original position.
- Avoid walking on animals and plants whenever possible.
- · Leave the beach cleaner than you found it.
- Safety Concern: Step carefully and don't run. Barnacles are sharp!

Each group of 3-4 should have 1-1m<sup>2</sup> study plot rope, one Stanley Park field guide, one Spring Beach Walk field guide, two clipboards, a magnifying glass, copies of the 2 page intertidal data collection sheets (printed one side only), 1 copy per person of the Observational Skills worksheet.

Allow the students to choose their study plot. Suggest that they move low enough down the intertidal to observe as many different creatures as possible, but high enough that their plot won't be covered by a rising tide. Estimate the distance from shore in meters. Ask one student to sketch the study plot while the other students are making species observations.

### **Closure Discussion**

- 1. Were you surprised at the number of species you saw today?
- 2. What intertidal predators did you observe?
- 3. What was the most interesting thing you saw today?
- 4. Do you think we left the area better or worse than we found it?



### **Extension of Lesson Plan**

1. In class, take up the results of the study plots as a group, using the Excel spreadsheet 'Recording our Results'. These results will later be compared with the results from those obtained from Lesson 11, Intertidal Field trip to Stanley Park, in the Marine Critters and Communities science unit.

### References.

- 1. Sheldon, Ian. 1998. Seashore life of British Columbia. Lone Pine Publishing.
- 2. Sept, Duane J. 1999. The Beachcomber's Guide to Seashore Life in the Pacific Northwest. Harbour Publishing.
- <a href="http://naturevancouver.ca/sites/naturevancouver.ca/VNHS%20files/4/Nature Vancouver Intertidal\_Pamphlet.pdf">http://naturevancouver.ca/sites/naturevancouver.ca/VNHS%20files/4/Nature Vancouver Intertidal\_Pamphlet.pdf</a> Explore the Rocky Shore at Stanley Park. Nature Vancouver. Accessed May 30 2012.
- 4. Harbo, R. 2011. Whelks to Whales: Coastal Marine Life of the Pacific Northwest. Harbour Publishing.
- 5. Harbo, R. 1988. Guide to the Western Seashore: Introductory Marinelife Guide to the Pacific Coast. Harbour Publishing.



### Intertidal Data Collection Sheet

Students:				
Location:		Date:		
Survey Start Time:	Tides for the day:	m @	m @	m @
Weather:				
Study Plot Location: (Dista	nce to shore)			
Study Plot Description: Sko animals and plants below.			big rocks, and ma	ijor clumps of



						_
А	N	ı	IV	IΑ	П	5

ANIIVIALS	<u></u>
Species name	Number of individuals (estimate if
	necessary)
PLANTS	
Seaweed type	% cover (estimate)
- Seaweed type	75 GOVER (Communication)
NON LIVING SUDSTDATE	
NON-LIVING SUBSTRATE	0/ cover (estimate)
Substrate type (solid rock, cobble, sand, mud, etc.)	% cover (estimate)
Other cheer ations	
Other observations:	
	<del></del>

# Teacher's Worksheet: Species list for field trips to intertidal sites around Vancouver

The following marine animals and marine plants/seaweeds can be found in intertidal locations around Vancouver. A representative from each of the 7 student groups will need to fill in the number of each species that their group found in their study plots. As a group you can then calculate estimates of species richness and total community abundance.

	Tides- (high or low in metres @ time of day)
Location:	Date

### **MARINE ANIMALS**

### **Student Groups**

Group	Scientific Name	Common Name	1	2	8	5	9	7	Total	Rank	Found outside the plot
Annelid	Nexis vexillosa	Banner Sea-nymph									
Arthropod	Idotea wosnesenskii	Rockweed Isopod									
Arthropod	Hemigrapsus										
	oregonensis	Green Shore Crab									
Arthropod		Thatched Acorn									
	Semibalanus cariosus	Barnacle									
Arthropod	Amphithoe valida	Square-tooth Sea Flea									
Arthropod	Cancer productus	Red Rock Crab									
Arthropod	Balanus glandula	Common Acorn Barnacle									
Arthropod	Pandalus danae	Coonstripe Shrimp									
Arthropod	Oregonia gracialis	Decorator Crab									
Arthropod	Cancer magister	Dungeness Crab									
Arthropod	Pugettia producta	Northern Kelp Crab									
Arthropod	Paguridae spp.	Hermit Crab									

Group	Scientific Name	Common Name	1	7	4	ī.	9	7	Total	Rank	Found outside the plot
Bird	Ardea herodias	Great Blue Heron									
Bird	Corvus caurinus	Northwestern Crow									
Bird	Larus glaucescens	Glaucous Winged Gull									
Bryzoan	Membranipora										
	serrilanmella	Kelp-encrusting Bryzoan									
Echinoderm	Evasterias troschelii	Mottled Star									
Echinoderm	Dermasteris imbricata	Leather Star									
Echinoderm		Orange or Red Sea									
	Cucumaria miniata	Cucumber									
Echinoderm	Pisaster ochraceus	Purple Star									
Echinoderm	Strongylocentrotus	2000 0000									
	druebacrilensis	Gleen sea Olcinii				1					
Echinoderm	Strongylocentrotus										
	purpuratus	Purple Sea Urchin									
Echinoderm	Pycnopodia										
	helianthoides	Sunflower Star									
Echinoderm	Ophiopholis spp.	Brittle Star									
Echinoderm		Armoured Sea									
Fish	Psolus critonolaes Anoplurchus	cucumber									
	purpurescens	High Cockscomb									
Mollusc	Mytilus trossulus	Pacific Blue Mussel									
Mollusc		Barnacle-eating									
	Onchidoris bimallata	Nudibranch									
Mollusc	Protothaca staminea	Pacific Littleneck Clam									
Mollusc	Clinocardium nuttallii	Nuttal's cockle									
Mollusc	Saxidomus gigantea	Washington Butter Clam									

Group	Scientific Name	Common Name	1	2	8	4	2 6	5 7	Total Ra	Rank	Found outside
										-	the plot
Mollusc	Mopalia mucosa	Mossy Chiton									
Mollusc	Tresas capax	Fat Gaper									
Mollusc	Tectura persona	Mask Limpet									
Mollusc	Lottia digitalis	Ribbed Limpet									
Mollusc	Littorina scutulata	Checkered Periwinkle									
Mollusc	Euspira lewisii	Lewis Moon Snail									
Mollusc	Fusitriton oregonensis	Oregon Triton									
Mollusc	Cerastomata foliatum	Leafy Hornmouth									
Mollusc	Nucella lamellosa	Frilled Dogwinkle									
Mollusc	Callistoma ligatum	Blue Topsail									
Mollusc		Shaggy Mouse									
	Aeolida papillosa	Nudibranch									
Mollusc	Hermissenda crassicornis	Opalescent Nudibranch									
Mollusc	Anisdoris nobilis	Sea Lemon									
Mollusc	Archidoris odhneri	Giant White Dorid									
Nemertean											
(ribbon											
worms)	Paranemertes peregrina	Mud Nemertean									
Polychaete		Vancouver feather-									
	Eudistylia vancouveri	duster									
MAR	MARINE ANIMAIS	<b>Species Richness</b>									
		Total Community									
		Abundance				-					

### **SEAWEEDS and MARINE PLANTS**

## Student groups record % cover within the study plot

Group	Scientific Name	Common Name	1	2 3	4	2	9	7	Total	Rank	Found
									%		outside the
									cover		plot (yes or
									÷7		no)
Seaweed	Sargassum muticum	Wireweed									
Seaweed	Chondracanthus										
	exasperatus	Turkish Towel									
Seaweed	Saccharina latissima	Sugar Wrack Kelp									
Seaweed	Mazzoella splendens	Iridescent Seaweed									
Seaweed	Alaria marginata	Broad-winged Kelp									
Seaweed	Nereocystis luetkeana	Bull Kelp									
Seaweed	Costaria costata	Seersucker kelp									
Seaweed	Fucus gardneri	Rockweed									
Seaweed	Mastocarpus	1 + -   - 1 1 + 1 1 + 1 1 1									
	papillatus	i urkish washcioth									
Seaweed	Cladophora sp.	Sea Moss									
Seaweed	Pterosiphonia										
	bipinnata	Filamentous Red Seaweed									
Seaweed	Ulva lactuca	Sea Lettuce									
Seaweed	Lithothamnium spp.	Coraline Algae									
Marine											
Plant	Zostera marina	Eelgrass									
SEAWEED	SEAWEEDS AND MARINE										
PLANTS		Species Richness									