



# SCIENTIST IN RESIDENCE PROGRAM™

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**Science Unit:** *Meet Me at the Beach!*

**Lesson # 2** *Primary Intertidal Field Trip # 1 - Exploration*

**Summary:** During this lesson, students explored the intertidal zone on the north shore of Stanley Park. The first of two visits to this site, this lesson included time for free exploration, a quadrat study (using hula hoops), and an animal scavenger hunt. Printable worksheets are included below.

**School Year:** 2014/2015

**Developed for:** Elsie Roy Elementary School, Vancouver School District

**Developed by:** Jonathan Kellogg (scientist); Saira Devji and Carolyn Fanning (teachers)

**Grade level:** Presented to grade K; appropriate for grades K – 5 with age appropriate modifications

**Duration of lesson:** 4.5 hours

**Notes:**

- Parent volunteers are required for successful day
- Plan field trip for a day with a “low low” tide (check tide tables - usually best in May and June)
- Students must wear sturdy footwear suitable for slippery, barnacle-covered rocks (i.e., no flip flops or sandals)
- Students must be dressed for the elements with appropriate hats and layers (sun, wind, rain)
- Bring first aid kit and fresh water
- Animal welfare is important. Please prepare students to handle animals with extreme care.
- Young children should not move large rocks covered with animals. Adults can help lift rocks straight up and replace them gently exactly as they were found.

## **Objectives**

1. Explore the rocky intertidal areas of Stanley Park.
2. Observe live animals in their natural habitat.
3. Discover the diversity of the intertidal environment.
4. Learn about adaptations that intertidal creatures have developed to survive their environment.

## **Background Information**

A follow-up to lesson 1, this lesson takes students to the intertidal and has them focus on various locations of the beach to understand the diversity that is present in the intertidal zone. After some free exploration time, students were expected to use quadrats (hula hoop) to focus their attention and draw what they see within their hoop. Students were then directed on a scavenger hunt where they were tasked with finding various animals that may be present in Vancouver’s intertidal areas.

**NOTE: This activity can only occur on days with lower low tides that are most common in May and June. Check tide tables to determine the best date and time to visit the beach.**



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## Vocabulary

Diversity	A range of different things
Camouflage	Use of color or shape that protects an animal from attack by making the animal difficult to see in the area around it
Adaptation	A change in a plant or animal that makes it better able to live in a particular place or situation
Predator	An animal that lives by killing and eating other animals, an animal that preys on other animals
Prey	An animal that is hunted or killed by another animal for food

## Materials

- Clipboard
- Scavenger hunt worksheet
- Larger intertidal field guide (Whelks to Whales or like)
- Laminated intertidal field guide
- Quadrat drawing worksheet
- String (to divide the hula hoop into 4)
- Sharpies
- Quadrats (or hula hoops)
- Rite in the Rain paper

## In the Classroom

### Introductory Discussion

1. Short description of 'hook' to capture student's attention.
  - Who's ready to go to the beach today?
  - What do you think we're going to see at the beach today?
2. Short description of other items to discuss or review.
  - May be a good idea to briefly review some of the likely animals that will be seen at the beach.
3. Briefly describe science experiment/activity.
  - Arrive at the Stanley Park beach (We focused on the beach north of the Empress of Japan figurehead, parking for a bus is available just south of the spray park just to the west.)
  - Carefully make way down to the beach. Allow for some free exploration, and then make way to the rocky intertidal below the Empress of Japan figurehead.
  - Disperse quadrats over locations of interest, group students with their chaperones, have them spend 20-30 minutes drawing one animal in each quarter of the hula hoop using the field guide to identify species that are present.
  - When drawing is complete, have students attempt scavenger hunt for 20-30 minutes before returning to the bus area.
  - Both the drawing and scavenger hunt pages should be photocopied onto waterproof paper in the event of students dropping their clipboards onto the beach or into the water.
4. Briefly describe the processes of science that the students will focus on:
  - This lesson focuses on the process of observations that scientists undertake when first arriving at a new beach and determining basic species diversity by looking at the presence or absence of key species.



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## 5. Briefly describe safety guidelines.

- Review beach safety: No running, rocks are slippery, no flipping rocks because it may crush marine creatures, no throwing rocks, do not touch large crabs.
- Review of safety is also important for crossing the road and staying together throughout Stanley Park and when riding the bus.
- Bring a first aid kit to the beach to care for any cuts that may occur due to slips on the rocks and cuts by barnacles.

## Science Activity

The two main components of this activity are the drawing/observation phase and the scavenger hunt phase.

Scientists regularly use quadrats, or square PVC piping that is 0.5 m on a side, as a unit of area to observe the species diversity in an area. If funds are not available to construct quadrats, hula hoops may be substituted if they are divided into quarters using yarn or string to make the area smaller. Accurate drawings of animals within each quarter would take considerably longer than the time permitted by the low tide, so students were asked to draw one animal in each quarter with at least 4-5 details so the organism could be recognized. Upon arriving at their quadrat, students should look at the area as a whole, and then take turns focusing on an organism in each quarter of the whole system. Allowing ~20-30 minutes for this activity allows students to focus on one of the quadrats and identify the flora and fauna that are present.

When drawing is complete, students completed a scavenger hunt with various flora and fauna that may be found in the intertidal of the lower mainland. The purpose of this exercise is to allow the students to have some directed exploration of the beach to look at the presence or absence of various animals. Not all of the animals will be found, but that is part of the point.

Both before and after these components, students are allowed to freely explore the beach and examine the diversity that is present. We also used the large grassy area across from the spray park to allow the students to eat their lunch and to have a discussion with them about what they saw on the beach.

## Closure Discussion

1. What did you notice at the beach?
2. What did you wonder about that you observed?
3. What surprised you that you didn't expect to see?
4. Why do you think certain animals were located in the locations where they were found?

**References** (examples of the format to use for different types of references are below)

Species Identification Guide, *Seattle Aquarium*.

<http://www.seattleaquarium.org/document.doc?id=1960>. Accessed 1 May 2015. (Print in color and laminate both pages together to create field guides.)

## Extension of Lesson Plan

For older students, this lesson can be made more quantitative by asking students to estimate the numbers of each organism within the quadrant or each area of the quadrant. These data may then be used in the classroom to generate graphs of the total diversity present on the beach.