



SCIENTIST IN RESIDENCE PROGRAM™

helping children and teachers discover
the world through hands-on science

Science Unit: *Meet Me at the Beach!*

Lesson # 1 *What's at the Beach?*

Summary: Students learn some of the differences between a medical doctor and a scientist with a Ph.D. They are also introduced the intertidal ecosystem at Stanley Park in preparation for an upcoming field trip.

School Year: 2014/2015

Developed for: Elsie Roy Elementary School, Vancouver School District

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

Grade level: Presented to grade K; appropriate for grades K – 3 with age appropriate modifications

Duration of lesson: 1 hour (revise as needed)

Objectives

1. Introduce what it means to be a scientist and a doctor who does not practice medicine.
2. Introduce the zones of the beach and describe the flora and fauna that live in each zone.
3. Define and describe key terms: camouflage, diversity, adaptation, predator, prey
4. Prepare students for the trip to the intertidal the following week

Background Information

The presentation began with an introduction of what it means to be a scientist and a doctor, but not a medical doctor. Then, in preparation for taking students to the rocky intertidal during the second week of the unit, this lesson prepares the students for the types of plants and animals that they will see at the beach with a presentation of parts of the beach, examples of the six phyla that might be encountered, and what the plan is for the first trip to the beach. At the end of the lesson, students examine photos to practice looking at animals on the beach.

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

- Powerpoint presentation
- 8" x 8" photos of animals that might be seen at the beach (1 per 2-3 students)



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In the Classroom

Introductory Discussion

1. Short description of 'hook' to capture student's attention.
 - Who has been to the doctor? What does it mean to be a doctor? What does it mean to be a scientist?
 - Who has been to the beach? What is your favorite beach? What do you see at the beach?
2. Short description of other items to discuss or review.
 - Include some photos of people that are scientists/doctors when they are not looking like scientists/doctors. This as a way to challenge misconceptions that all doctors give shots or medicine.
 - Include a background of yourself as an individual so the students may see you as more than a scientist.
3. Briefly describe science experiment/activity.
 - This activity is an introduction to the beach and exposes students to the different types of plants and animals that they will see during their first field trip to the beach.
4. Briefly describe the processes of science that the students will focus on (prediction/hypothesis, observations, recording results, conclusions.)
 - This activity focuses on observations of the animals and does not ask the students to explore other processes of science.

Science Activity/Experiment

This lesson is entirely discussion based with the students.

1. Begin with a discussion of what it means to be a scientist and a doctor and explain to the students that being a doctor simply means that you have gone to school for many years to learn more about a given topic than most other people in the world. To be a scientist simply means that you have a curiosity to understand the world around you and that you follow a process to establish that understanding. Misconceptions of students were challenged when photos were shown of scientists when they were in a social situation, then shown another picture when they were conducting research.
2. Next, introduce students to the tides. Using a picture of the Stanley Park mermaid at high and low tide, students were introduced to the zones of the beach and the vertical zones of the intertidal.
3. Students were then introduced to the adaptations that are necessary to survive life in the upper intertidal vs lower intertidal (how long can the animal survive exposure to air).
4. Introduce students to the fauna that they might see on Vancouver area beaches covering examples from crustaceans (crabs, shrimp, barnacles), mollusks (clams, snails, chitons, limpets), cnidarians (anemones, jellies), echinoderms (sea stars, sea cucumbers, sand dollars), sculpins, and algae (brown, red, and green).



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5. With the introduction of each type of animal, we talked about the adaptations that each animal has for its environment to help it survive. When possible, fun animal facts were used to engage students in discussion:
 - Limpet teeth are the hardest substance known on the planet
 - Sea stars have photo and chemical receptors (eyes and nose) on the tips of each arm
 - Sea stars can regenerate arms when necessary
 - Anemones have nematocysts, or tiny harpoons, to capture their prey.
6. Students also discussed who eats who at the beach and were introduced to different methods of locomotion.
7. Finally, students were told what to pack when going to the beach so they would be prepared for the day.

Closure Discussion

- Students were then shown large (8" x 8") photos where they could try to identify various animals that they might see.
- What animals do you hope to see at the beach?
- What animals have you seen on the beach in the past?

References

1. Zones and Adaptations PPT, *Rocky Shores – First Grade, Oregon Institute of Marine Biology* <http://oimb.uoregon.edu/k-6/curricula/rocky-shores-first-grade/>. Accessed 20 April 2015.