

## You Otta See This!

### Activity Information

**Grade Appropriate Level:** 8

**Duration:** 1 hour for Introductory Activity, 3-5 45 minute periods for project OR assign for homework

**Materials: Introductory Activity** – small hand-held magnifying lenses, specimens of fur (if available sea otter fur may be used on loan from local Marine Science Centres at a cost, or fur can be purchased from fishing tackle shops), paper & pencil

**Materials: Lesson** – map of the Pacific Coast, shoebox for each student, various materials to make the biome-in-a-box projects

### Objectives

These lessons are designed to compare human skin and sea otter fur. The students will observe finer details of the sea otter fur. The students will discover the function (the why) of the fur that help sea otters survive its environment. They will then apply this information to create a diagrammatic representation of the sea otters' habitat either before the fur trade or an oil spill. As an extension the students will examine how human activity has damaged the ecosystem of the sea otter population on the Pacific Coast.

### Prescribed Learning Outcomes

#### Science, Language Arts, Social Studies

Students will be able to:

- Use information and conclusions as a basis for further comparisons, investigations, or analyses
- Compare and contrast how various organisms have adapted to the conditions in each biome and how these organisms interact with each other
- Critique the hypothesis that the earth is like a living organism
- Evaluate how major natural events and human activity can affect local and global environments and climate change



### Skills

- observing, inferring, communicating, creating a model, critical thinking

### Suggested Links

<http://www.vanaqua.org>

<http://www.discoverlearning.com/webjourneys/otters/>

<http://www.britishcolumbia.com/ParksAndTrails/Parks/details/?ID=329>

<http://www.oceanlink.island.net/ask/seals.html>

[http://www.mnh.si.edu/arctic/html/sea\\_otter.html](http://www.mnh.si.edu/arctic/html/sea_otter.html)

<http://www.seaotters.org/Otters/index.cfm?DocID=24>

### Introductory Activity

- Equip each pair of students with small magnifying lenses and ask the following questions: What is skin? What is it made of? How does it protect an animal's body?
- Discuss the importance of hair to mammals, especially sea otters (see accompanying information on sea otters).
- Show the students the different samples of sea otter fur and let them view it through the magnifying lenses.
- Using paper & pencil, students will draw a close-up section of the pelt.
- Compare the difference between the skin of a human hand and the fur of the sea otter. Discuss these differences within partner groups and then share as a class.

### Suggested Instructional Strategies

- Start a discussion on how sea otters were hunted to near extinction because of their fur and the importance of sea otters on the ecology of kelp forests. As well discuss some of the disasters attributed to oil spills near the habitats of sea otters.
- Students will create a 'before & after' biome-in-a-box of the sea otter's habitat. They can choose either before an oil spill or before the fur trade. They must research the topic and present in a shoebox a 3-D representation of the sea otter's habitat along with a written explanation. They can use whatever materials they wish (for example: plasticine, play-dough, plastic toys, paper maché, and construction paper). Everything in the box must be glued down and appear as realistic as possible.

### Suggested Assessment Strategies

- Student participation
- Cooperation with partner
- Following timeline for handing in assignment
- Use the following rubric for marking the biome-in-a-box project.

### Cross-Curricular Interests

Science-Technology-Society  
Environment & Sustainability



Name: \_\_\_\_\_  
Grade 8 Science

## BIOME-IN-A-BOX SEA OTTER RESEARCH PROJECT

5-outstanding                      4-very capable, competent  
3-satisfactory                      2-developing                      1-limited

**Demonstrates Biodiversity** 5   4   3   2   1

- ⇒ At least 4 animal species evident
- ⇒ At least 4 plant species evident

**Authentic & Realistic** 5   4   3   2   1                      weighting x2

- ⇒ Background gives context of setting
- ⇒ Landscape features
- ⇒ Relative scale of items
- ⇒ Visual WOW factor

**Construction & Design** 5   4   3   2   1

- ⇒ Meets size restrictions
- ⇒ Securely fastened
- ⇒ Outer layer of protection in place

**Written explanation** 5   4   3   2   1                      weighting x2

- ⇒ Environment accurately & thoroughly explained
- ⇒ Animals identified
- ⇒ Plants identified
- ⇒ Specific location identified
- ⇒ Descriptive writing aids understanding
- ⇒ Ecology accurately & thoroughly explained    total

**TOTAL MARKS**     /30

**Comments:**

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## Background Information on Sea Otters (*Enhydra lutris*) \*

### What do they look like?

The colour may be dark brown through to blonde. The colour of their fur lightens as they get older.

### Where do sea otters live?

They inhabit coastal marine waters, specifically the Pacific Coast from California to Alaska. They do not migrate but have excellent homing instincts and may travel up to several hundred kilometers in a few weeks to get back to familiar water if transported out of their home range. They usually remain within 15 kilometers of a particular stretch of coast.

### What is the difference between a sea otter and a river otter?

Sea otters are often confused with river otters who may be found either in rivers, oceans and often on the seashore. River otters are bigger.

### What do sea otters eat?

The daily activities include foraging for food, grooming and resting. Otters dive frequently for food, a typical dive may be to depths of 60 meters (maximum dive is 100m). Sea otters will eat up to 25% of their body weight every day. They have a varied diet including clams, prawns, crabs, abalone, sea urchins, squid, sea star legs, and several fish species. Sea otters use rocks to break open shells (tool users). Food is chosen by sense of touch because underwater eyesight is poor. They will remain living in the same range until the area is essentially depleted of food or until over crowding occurs.

### Are sea otters always in the water?

They are much more comfortable in the water than on land: They mate, sleep, groom, hunt, give birth, rest and play in the ocean. Sea otters float on their backs when they are resting and eating.

### What do you call a group of sea otters?

Sea otters are relatively independent animals but will gather in groups called 'rafts' to rest. The males and females live separately from each other all year except during brief mating episodes. Mating may occur throughout the year as will the birth of pups, but each population has peak pupping periods. The females are usually ready to mate within one week of previous years pup becoming independent (typically, 5-6 months after its birth). A male may court a female for nearly two weeks before her pup leaves to ensure he is present when she is ready to mate. Males are likely to mate with more than one female throughout the year. They defend territories, the quality of which can determine their mating success; females are attracted to males with larger territories that contain plenty of shelter and high quality food. Females are also attracted to males who at least appear older; this may be why males fur turns lighter than that of females.

### How thick is the fur of a sea otter?

An adult pelt contains 800 million to 1 billion individual hairs. Per square inch this translates to 650,000 or 108,000/cm<sup>2</sup>. It is one of the thickest fur coats in the animal kingdom. It is the main source of heat retention for the animal because otters do not have an insulating blubber layer. The adults may spend 15% or more of their day grooming to keep their fur clean and their skin dry. This grooming keeps a layer of air trapped between the skin and fur for added insulation. The pups, although born in water, can not swim for several weeks. The newborn's coat, *lanugo*, acts like a life preserver to keep the pup at the water surface. It is two months or more before the *lanugo* is fully shed. Only at this point can the pup learn to dive. Typically only one pup is born to one female per year because she must spend so much of her day feeding, protecting, teaching, and grooming it.

### Interesting tid-bits

Sea otters skin never gets wet because the fur is so thick. They are the smallest marine mammal; related to river otters, minks, weasels, badgers and skunks.

### Sea otters and the fur trade

This plush fur attracted hunters from around the world in the 1700's and 1800's and led to the extinction of sea otters along the B.C. coast. Because of the disappearance of the sea otters around Vancouver Island there was a population explosion of sea urchins. This increase in sea urchins caused the destruction of many kelp forests. In the early 1970's 89 sea otters were relocated from Alaska to the West Coast of Vancouver Island. There are now approx. 1100 sea otters in that colony now.

### Sea otters and oil spills

The Exxon Valdez oil spill dumped 400 million liters of crude oil into Prince William Sound in Alaska. Of the 463 otters brought to rehabilitation centers, 120 died. It is not sure how many sea otters sank and drowned or crawled off to die. Since sea otters rely on their thick fur to keep them warm they are seriously affected by oil spills. The oil causes the fur to lose its insulating ability. Oil is also toxic. There are many scientists who wonder if sea otters suffer from permanent kidney or liver damage when exposed to a spill.

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\*Information supplied by the Vancouver Aquarium.

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