

Friends of the Sea Otter

Sea Otter Curriculum Materials

Friends of the Sea Otter (FSO) is a nonprofit organization entrusted with the sole mission of protecting sea otters and all otter habitat throughout their north Pacific range.

To that end, FSO has developed these educational materials for students and teachers, in order to introduce young people to the natural history, ecology, and biological make-up of sea otters and current threats to their environment.

FSO's objective is to awaken in students and teachers around the country, the understanding that sea otters, in their role as a keystone species, are a unique and valuable mammal in real need of ongoing protective measures.



Classroom Activities for Teaching Kids About Sea Otters

Activity One: The Insulating Properties of Various Materials

The southern sea otter spends virtually all of its life in very cold waters averaging about 45 degrees Fahrenheit. Humans would succumb to hypothermia within a very short time (20-40 minutes) without protection in water that cold. How does a sea otter survive? Well, a sea otter's dense undercoat traps air. The air acts as a warm, insulating barrier between the sea otter's skin and the frigid waters of its environment.

Have your students experiment with a variety of materials to see which ones protect a human finger dipped into a glass of very cold water (tap water with a few ice cubes will do). You may wish to try the following insulation materials:

- ◆ One or two fingers cut from a woolen glove
- ◆ Crisco or butter (in a baggy wrapped around a child's finger)
- ◆ Bubble wrap (fastened around a finger with a rubber band)

You may want to test the insulation properties of various materials to determine which one keeps a finger warmest the longest, or, which one allows the cold to penetrate first. You may wish to determine which materials would work best on dry land as opposed to the water. You may also wish to experiment to determine which materials are the most durable and which are the most fragile.

Activity Two: A Sea Otter's Awesome Metabolism

Each day, a sea otter in the wild must consume, on average, food totaling 25% of its body weight just to stay alive. If a sea otter doesn't eat, it will lose weight and starve very quickly. You may wish to tell students about Axel, the rehab pup who went AWOL on a Thursday night at 14.5 pounds; when it was found Sunday morning (alive thank goodness!), it weighed only 10.5 pounds. It had lost 28% of its body weight in only 60 hours! You may want to have your students do this calculation using their own weight. To understand just how much a sea otter really has to eat to survive, ask your students to calculate 25% of their body weight. Now, have students translate that amount into an equivalent amount of a favorite food item.

Example:

- ◆ Student weighs 80 pounds
- ◆ 25 % of 80 pounds is 20 pounds
- ◆ 1 pound = 16 oz, 20 pounds = 320 oz
- ◆ Favorite food item is pizza (average 6 oz per slice)
- ◆ 320 oz, divided by 6 oz = 53 slices of pizza, or, 18 slices of pizza for breakfast, lunch and dinner!



You might want to take the exercise one step further and calculate calories consumed and estimate the activity level of a sea otter in the wild.

Example:

- ◆ One slice of pizza has an average of 300 calories
- ◆ 53 slices times 300 calories = 15,900 calories per day



Estimate how many calories your students burn each day to maintain a stable body weight (harder to do for kids than for adults because kids are still growing). Compare the daily maintenance number of calories for students with the caloric equivalent of consuming 25% of their body weight in a favorite food item. Have children draw their own conclusions about the metabolism and activity levels of a sea otter.

Activity Three: See Otter Moms Are Great!

The bond that exists between a sea otter mom and her pup is one of the strongest and most tender that exists in nature. For the first few months of the pup's life, it is completely dependent upon mom for survival. A sea otter pup rides on its moms' belly like a little prince on a royal barge. A sea otter mom grooms her pup's fur constantly, nurses it and leaves it anchored in kelp for the brief periods during which she forages to feed herself and replenish her milk supply.

Have a student or students volunteer to be sea otter moms for an hour and a half. Other students will be assigned to be "mom and pup watchers." Anchor a toy (our pup) to mom's chest or tummy with a bungee cord or similar fastener. Provide your volunteer sea otter moms with a small brush for grooming and a small (4-oz.) baby bottle or doll's baby bottle for feeding. The "rules" are that during a 90 minute period, mom must feed her baby for about 10 minutes and groom him for about one hour. During the 20 minutes in which mom is not grooming or nursing, she must try to find food, groom herself and get some rest. "Mom and pup watchers" will remind moms to "stay with it" if their attention wanders. Sea otter moms will report back to the class what it felt like to care for a baby sea otter for one feeding, resting and grooming cycle.

Discussion topics and questions:

- ◆ How does it feel to be a sea otter mom?
- ◆ What does mom do if she gets tired? For example, is there anyone to help her?
- ◆ How many times a day would a sea otter mom have to repeat this 90 min. cycle?
- ◆ How would you like to do that?

Why do sea otter moms have only one pup at a time? (twins happen but they are rare –mom can't raise both so one is usually abandoned)



Activity Four: The Sea Otter and Me

Have students combine the letters in their first name with information they have learned about sea otters to create and illustrate a *Sea Otter and Me* poster.

Example:

- ◆ Soft and gentle, my mother's touch.
- ◆ Her heartbeat against my tummy.
- ◆ Everywhere together.
- ◆ Isn't it amazing.
- ◆ Love a baby, love a pup.
- ◆ All moms should be like her.

For example, illustrate a poster with a picture of a pup snoozing happily on its mom's furry belly.

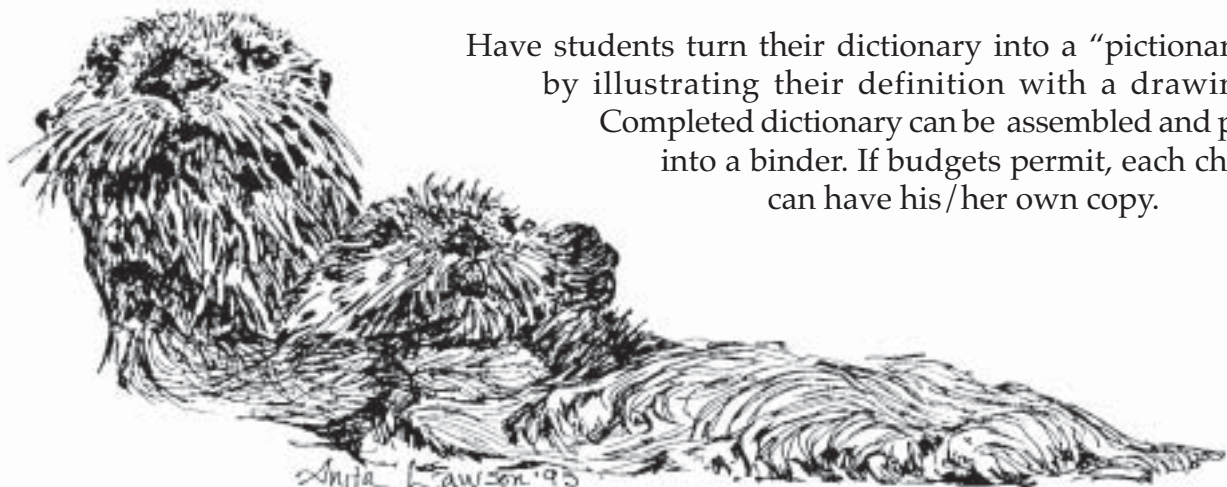
Activity Five: Sea Otter Dictionary

Start a file (an alphabetical accordion-type file from a stationery store is ideal) of words that are related to sea otters. This activity can be initiated with a group brainstorming activity or it can be an on-going individual effort. As students come across words and ideas that are related to otters, they write them down on index cards and drop them into the alpha file under the letter with which they begin. For a classroom activity, have all words dropped into the alpha file written on the black/white board so that students can see them. Work together to "flesh out" missing letters.

You can decide how many words you want to have in your dictionary. Assign a word or a few words to each student (or to a student group if you want a cooperative learning activity). The task is to write a definition for each word.

Example:

Sea Urchin *n.* Spiny red or purple pin-cushion-like creature, related to sea stars. Sea otters love to eat them so much that their teeth and bones can turn purple.



Have students turn their dictionary into a "pictionary" by illustrating their definition with a drawing. Completed dictionary can be assembled and put into a binder. If budgets permit, each child can have his/her own copy.

Activity Six: Sea Otter Formula-A Tasty Treat!

This is a unique and unforgettable experience for kids! Start a discussion about mammals and nursing. Share with them some facts and ideas about milk.

Example:

- ◆ Is all milk alike?
- ◆ Does it all taste alike?
- ◆ Would a cow drink milk from a cat?
- ◆ Could you raise a kitten on milk from a cow?
- ◆ Why is it best for a puppy to have dog milk and a kitten to have cat milk?
- ◆ What do you think whale milk or seal milk is like? Why?
- ◆ What do you think sea otter milk might be like?
- ◆ How would you go about making formula for an orphaned baby sea otter?

Sea otter pups nurse from their mothers for the first several weeks of their lives. Gradually, mom begins to introduce solid food. Pups will try to nurse until mom finally says, "Enough!" At the Monterey Bay Aquarium, formula is deleted gradually over a two to three week period, usually beginning when the pup is about 12-13 weeks old.

For additional classroom activities, we highly recommend *Sea Otter, River Otter* by Sandra Chisholm Robinson

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SEA OTTER BOOKS & REFERENCE MATERIAL

Fiction:

- ◆ *Annixter, Jane and Paul - Sea Otter . Holiday House, Inc.; New York, NY; 1972.*
- ◆ *Barber-Starkey, Joe - Jason and the Sea Otter . Harbour Publ.; Madeira Park, BC Canada; 1989.*
- ◆ *Craft, Mary - Little Orphan Otter . 1989.*
- ◆ *Howard, Jean G. - Tuk, the Timid . The Tidal Press; Carnberry Isles, Maine; 1984.*
- ◆ *Hurk Edith Thacher - Song of the Sea Otter . Sierra Club Books/Little, Brown and Co.; 1983.*
- ◆ *Laycock, George and Ellen - The Flying Sea Otters . Grossett & Dunlap, Inc. New York, NY; 1970.*
- ◆ *Maxwell, Gavin - Ring of Bright Water . E.P. Dutoon & Co., Inc.; 1960.*
- ◆ *Montgomery, Rutherford G. - Amikuk . The World Publ. Co.; Cleveland and Network; 1955.*
- ◆ *Shaw, Evelyn - Sea Otters . Harper & Row; New York, NY; 1980.*

Non-fiction:

- ◆ *Ashby, Ruth - Sea Otters . Antheneum; 1990.*
- ◆ *Bailey, Jane H. - Sea Otter a Core of Conflict: Loved or Loathed . El Moro Publ. Morro Bay, CA; 1979.*
- ◆ *Bailey, Jane H. - The Sea Otter's Struggle . El Morro Publidcations; Morro Bay, CA; 1973.*
- ◆ *Brownwell, M. Barbara - Amazing Otters . National Geographic; 1989.*
- ◆ *Harris, C.J. - Otters, A Study of the Recent Lutrinae . Weidenfeld and Nicolson; London, England; 1968.*
- ◆ *Holyer, Ernie M. - The Southern Sea Otter . Steck-Vaughn Company; Austin, TX; 1975.*
- ◆ *Hurd, Edith Thatcher - Song of the Sea Otter . Sierra Club; 1983.*
- ◆ *Johnson, William Weber - The Story of Sea Otters . Random House; New York, NY; 1973.*
- ◆ *Lauber, Patricia - Sea Otters and Seaweed . Garrard Publishing Company; Champaign, IL; 1976.*
- ◆ *McDearmon, Kay - A Day in the Life of a Sea Otter . Dodd, Mead, & Company; New York, NY; 1973.*
- ◆ *Nickerson, Roy - Sea Otters: A Natural History and Guide . Chronicle Books; San Francisco, CA; 1984.*
- ◆ *Ogden, Adele - The California Sea Otter Trade á 1784-1848 . Univ. of CA Press; Berkeley, CA; 1941.*
- ◆ *Orr, Robert T. - Marine Mammals of California . University of California Press; Berkeley, CA; 1972.*
- ◆ *Riedman, Marianne - Sea Otters . Monterey Bay Aquarium; Monterey, CA; 1997 (Revised & Updated).*
- ◆ *Scammon, Charles M. - The Marine Mammals of the Northwestern Coast of North America . Dover Publ., Inc.; New York, NY; 1968.*
- ◆ *Scheffer, Victor B. - A Natural History of Marine Mammals . Charles Scribner's Sons, New York; 1976.*
- ◆ *Scheffer, Victor B. - The Amazine Sea Otter ; Charles Scribner's Sons. New York, NY; 1981.*
- ◆ *Steinhart, Peter - California's Wild Heritage: Threatened and Endangered Animals in the Golden State . California Department of Fish and Game, California Academy of Sciences, Sierra Club Books; 1990.*
- ◆ *VanBlaricom, G.R. and Estes, J.A. - The Community Ecology of Sea Otters . Springer-Verlag Berlin Heidelberg; 1988.*
- ◆ *Waters, John F. - Some Mammals Live in the Sea . Dodd, Mead & Company; New York, NY; 1972.*
- ◆ *Woolfenden, John - The California Sea Otter: Saved or Doomed . Boxwood Press; Pacific Grove, CA; 1979.*
- ◆ *Wynne, Kate - Guide to marine Mammals of Alaska . Alaska Sea Grant College Program; 1993.*



LINKS TO INTERESTING WEB SITES:

American Cetacean Society: Monterey Bay Chapter
www.starrsites.com/acsmc/

BAY NET: Monterey Bay National Marine Sanctuary
www.mbay.net/~baynet/

Birch Aquarium
www.aquarium.ucsd.edu/

Defenders of Wildlife
www.defenders.org/

Discovery of Sound in the Sea
omp.gso.uri.edu/dosits/dosits.htm

Elkhorn Slough
www.elkhornslough.org/

Elkhorn Slough Safari Nature Tours
www.elkhornslough.com/

International Otter Survival Fund
www.otter.org/

Mammalian Physiology: Dr. Terrie M. Williams Lab
www.biology.ucsc.edu/people/williams/

The Marine Mammal Center
www.tmmc.org/

Monterey Bay Aquarium
www.mbayaq.org/

Monterey Bay Aquarium Research Institute
www.mbari.org/

Monterey Bay National Marine Sanctuary
bonita.mbnms.nos.noaa.gov/

Monterey Bay Whale Watch
www.montereybaywhalewatch.com/

Monterey Bay Youth, Inc.
www.montereybayyouth.org/

Moss Landing Marine Laboratories
color.mlml.calstate.edu/

National Geographic: Monterey Bay
www.nationalgeographic.com/monterey/

National Marine Fisheries Service
www.nmfs.noaa.gov/

National Marine Mammal Laboratory
nmml.afsc.noaa.gov/

The Ocean Conservancy
www.oceanconservancy.org/

Ocean Futures Society
www.oceanfutures.com/

Oregon Coast Aquarium
www.aquarium.org/

The Otter Project
www.otterproject.org/

Otternet
www.otternet.com/index.htm

Pacific Cetacean Group
www.pacificcetaceangroup.org/

Ranger Rick's Go Wild! - National Wildlife Federation
www.nwf.org/kids/kzPage.cfm?siteId=3

Save our Shores
www.saveourshores.org/

Save the Whales
www.savethewhales.org/

The Scripps Research Institute
www.scripps.edu/

Sea Otter Research and Conservation
www.mbayaq.org/cr/sorac.asp

Seymour Center at Long Marine Lab
seymourcenter.ucsc.edu/

SIMoN — Monterey Bay National Marine Sanctuary
www.mbnms-simon.org/

Tethys Research Institute
www.tethys.org/

The Society for Marine Mammalogy
www.marinemammalogy.org/

Ventura Fish and Wildlife Office
ventura.fws.gov/

WhaleNet
whale.wheelock.edu/Welcome.html

Whales-online
www.whales-online.org/

Woods Hole Oceanographic Institution (WHOI)
www.whoi.edu/