



What You Otter Know

Grade Level: 1-5
Class Size: 30-45
Class Length: 30 min-1hr

Class Summary:

Students will understand Asian Small-clawed Otter adaptations, training and conservation.

Students will:

- Observe adaptations
- Demonstrate training techniques
- Recognize importance of species conservation

Concepts:

- Adaptations
- Animal Training and Enrichment
- Conservation



Background:

Otters have been swimming in the waterways of the world for thousands of years.

Otters are mammals and are the most amphibious members of the weasel family.

There are 14 known species of otter in the world. The **Maxwell's Otter**, once found in Iraq, however, is believed to have become extinct during the 1960's due to marshland draining.

There are currently **13 different species** of otter inhabiting five of the continents in the world:

Giant Otter, Sea Otter, Spotted-Neck Otter, North American River Otter, South American River Otter, Asian Small-clawed Otter, African Clawless Otter, Congo Clawless Otter, Marine Otter, Neotropical Otter, Eurasian Otter, Hairy-Nosed Otter and Smooth-Coated Otter.

Of these 13 species, 9 are listed by the World Conservation Union as endangered.

WAVE FOUNDATION:

The WAVE Foundation is an independent, educational foundation at the Newport Aquarium created to further the Newport Aquarium's efforts in educating communities and students about marine life and the conservation of natural resources and habitats. The WAVE Foundation is designated as a 501(c)(3) organization and encompasses and embraces conservation, education, and volunteerism.

What You Otter Know

PRE-LESSON ASSESSMENT

1. Otters are mammals.

True False

2. There is only one species of otter.

True False

3. Training is a form of enrichment for otters living in zoos and aquariums.

True False

4. Otters are found all over the world.

True False

5. Otters are poor swimmers.

True False



6. Name 3 things that threaten otters in the wild.

7. Name 1 thing you already know about otters.

8. Name one thing you would like to learn about otters.

What You Otter Know

VOCABULARY

Adaptation - Something an animal has or can do that helps them survive.

Amphibious - Living or able to live both on land and in water.

Biodiversity - The number and variety of organisms found within a specified geographic region.

Conservation - The protection, preservation, management, or restoration of wildlife and of natural resources.

Ecosystem - An ecological community together with its environment, functioning as a unit.

Enrichment - The act of making a captive animal's life fuller, more meaningful, or more rewarding.

Extinction - No longer in existence.

Habitat - An animals home.

Insulation - A material that reduces or prevents the transmission of heat.

Invasive Species - Any new species that does not belong in an environment and may cause harm.

Mammal - Any of various warm-blooded vertebrate animals characterized by a covering of hair on the skin and, milk-producing glands to nourish young.

Rainforest - A dense forest with heavy annual rainfall.

Streamlined - Designed to offer the least resistance while swimming in water.

Threatened - Likely in the near future to become in danger of extinction.

What You Otter Know

SCAVENGER HUNT

1. The Giant Otter lives in the rainforest of South America around the Rio Negro River. Find another animal that lives in the Rio Negro River.

2. Otters breathe air when they swim. Find another animal that breathes air.

3. Otters are warm-blooded. Find another animal with warm blood.

4. The North American River Otter can be found in the Ohio River. Find another animal that lives in the Ohio River. _____

5. Their streamlined bodies help otters swim fast. What other animal has a streamlined body? _____

6. Otters are vertebrates-have backbones. Name 3 other vertebrates.

7. The Asian Small-clawed Otter lives in the rainforest exhibit. Find another animal that lives in the rainforest exhibit. _____

8. All otters have webbed feet. Some have fully-webbed feet and some have partially-webbed feet. What other animals in the aquarium have webbed feet?

9. Otters like to play. What do you think they are learning while they play?

10. Asian Small-clawed Otters have long tails that help them steer when swimming. What other animals use their long tails for swimming?

What You Otter Know

SCAVENGER HUNT

(Answer Key)

1. Angelfish, Cardinal Tetras,
2. Turtles, Lorikeets, Alligators, Penguins, Porcupines, Snakes, some Frog species
3. Penguins, Lorikeets, Porcupines
4. Sturgeon, Ruddy Duck, Soft-shelled Turtles, Long-Nose Gar, Bluegill, Drum, Sunfish, Spotted Bass, White Sucker, Bigmouth Buffalo
5. Sharks, some Fish species, Eels
6. Fish, Sharks, Penguins, Lorikeets, Turtles, Frogs, Porcupines, Snakes, Alligators
7. Burmese Pythons, Lorikeets, Porcupines, some Turtle species, some Fish species
8. Ducks, Penguins, some Frog species, some Turtle species, Alligators
9. Otters are learning to hunt, defend themselves, swim, run, catch prey, etc.
10. Sharks, some Fish species, some Turtle species, Alligators
Eels and Snakes (use their whole bodies)

What You Otter Know

POST-LESSON ASSESSMENT

1. Otters are mammals.

True False

2. There is only one species of otter.

True False

3. Training is a form of enrichment for otters living in zoos and aquariums.

True False

4. Otters are found all over the world.

True False

5. Otters are poor swimmers.

True False



6. Name 3 things that threaten Asian Small-clawed Otters in the wild.

7. Name 1 thing you already know about otters.

8. Name one thing you would like to learn about otters.

What You Otter Know

POST-LESSON ASSESSMENT

(Answer Key)

1. Otters are mammals. **True**

True False

2. There is only one species of otter. **False. There are 13 species.**

True False

3. Training is a form of enrichment for otters living in zoos and aquariums. **True**

True False

4. Otters are found all over the world. **False. Otters do not live in Antarctica.**

True False

5. Otters are poor swimmers. **False. Otters are great swimmers!!**

True False

6. Name 3 things that threaten Asian Small-clawed Otters in the wild.

Habitat Destruction, Pollution, Poaching

Classroom Extension Activities

(Use/adapt to suit your classroom and age of students)

BUILD AN OTTER

By making a simple puppet, your students will learn about the adaptations of Asian Small-clawed Otters and Sea Otters.

Objective: Students will make a model of an Asian Small-clawed Otter and Sea Otter to compare and contrast the adaptations of both species.

Background:

Body:

Otters have streamlined bodies making them excellent aquatic hunters. Otters use their thick tails as rudders for steering in the water. The tail is also useful for balance when they stand on their hind legs on land.

Head:

Otters have flattened heads and short, thick necks. The eyes are located on the front of the face indicating a predatory lifestyle; ears are small and located on the side of the head and can be closed when swimming underwater. Otter noses are always flat, but some are covered in fur while others are furless. Otters can also close their nostrils when swimming underwater.

Whiskers:

The numerous stiff whiskers, **vibrissae**, around the nose and snout along with the tufts of fur on their elbows are extremely sensitive to water movement. These whiskers help otters locate prey in murky waters.

Legs:

Otters have short legs that enable them to swim, walk, groom and catch prey. Paws are padded with the exception of the Sea Otter and all species have non-retractable claws. Feet are webbed or partially webbed depending on species.

Materials:

For each student: Copies of "Sea Otter Puppet Parts" and "Asian Small-clawed Otter Puppet Parts", paper lunch bag

- Crayons or markers
- Scissors
- Glue

Procedure:

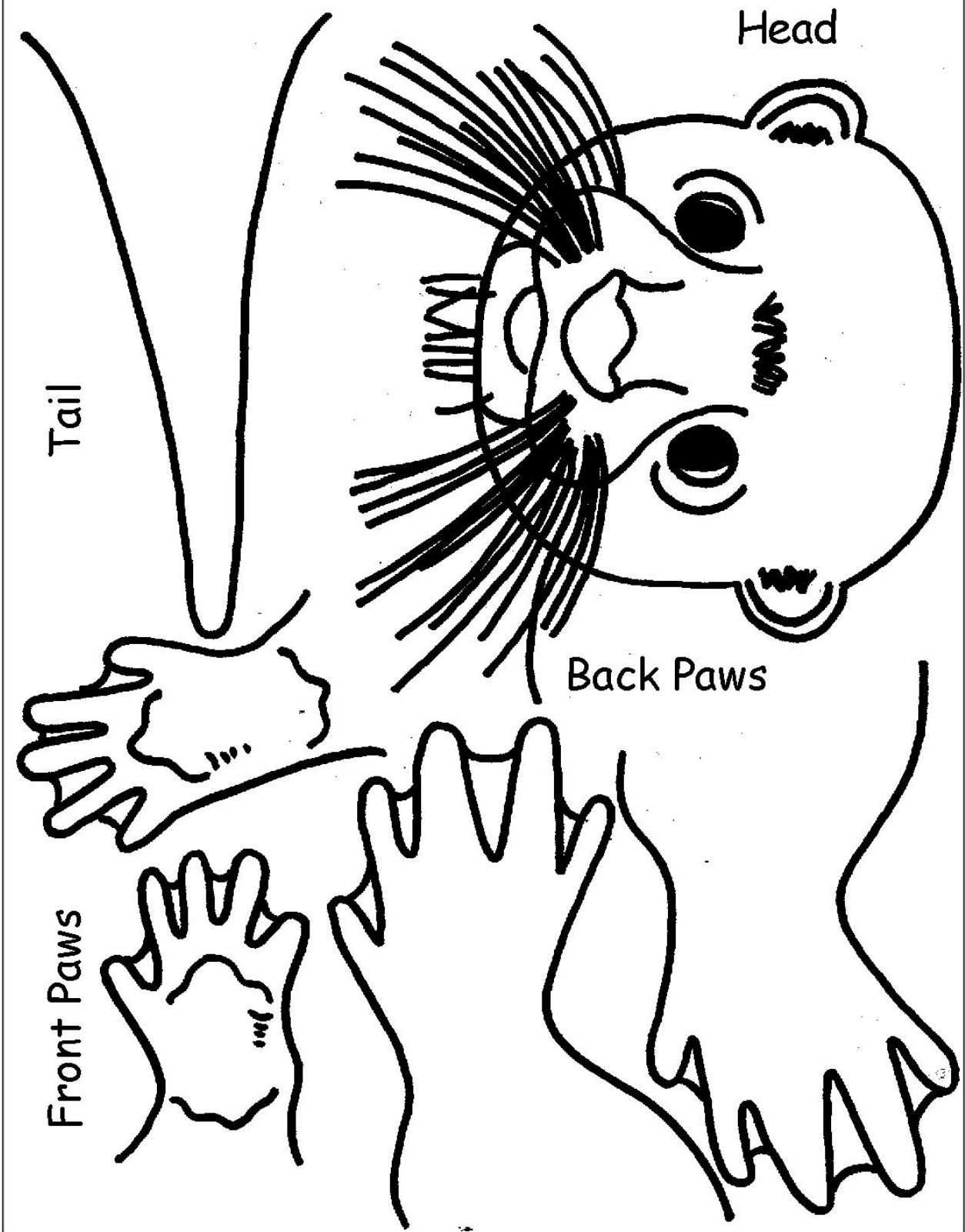
1. Give every student a paper lunch bag.
2. Give half of the class "Sea Otter Puppet Parts" and the other half "Asian Small-clawed Otter Puppet Parts". (Give every student both if you have enough time).
3. Allow the students to color and cut out their pieces.
4. Glue the otter's head to the bottom of the bag.
5. Glue the tail to the back outside edge at the bag's opening.
6. Glue the hind paws to the back inside edge of the bag's opening.
7. Glue the front paws to the middle of the front of the bag.
8. (Optional) Use pipe cleaners to add dimension to the whiskers.

Discussion:

Using the puppets as references:

1. What are some otter adaptations?
2. What are differences between Sea Otters and Asian Small-clawed Otters?
Why?
3. What are similarities?
Why?

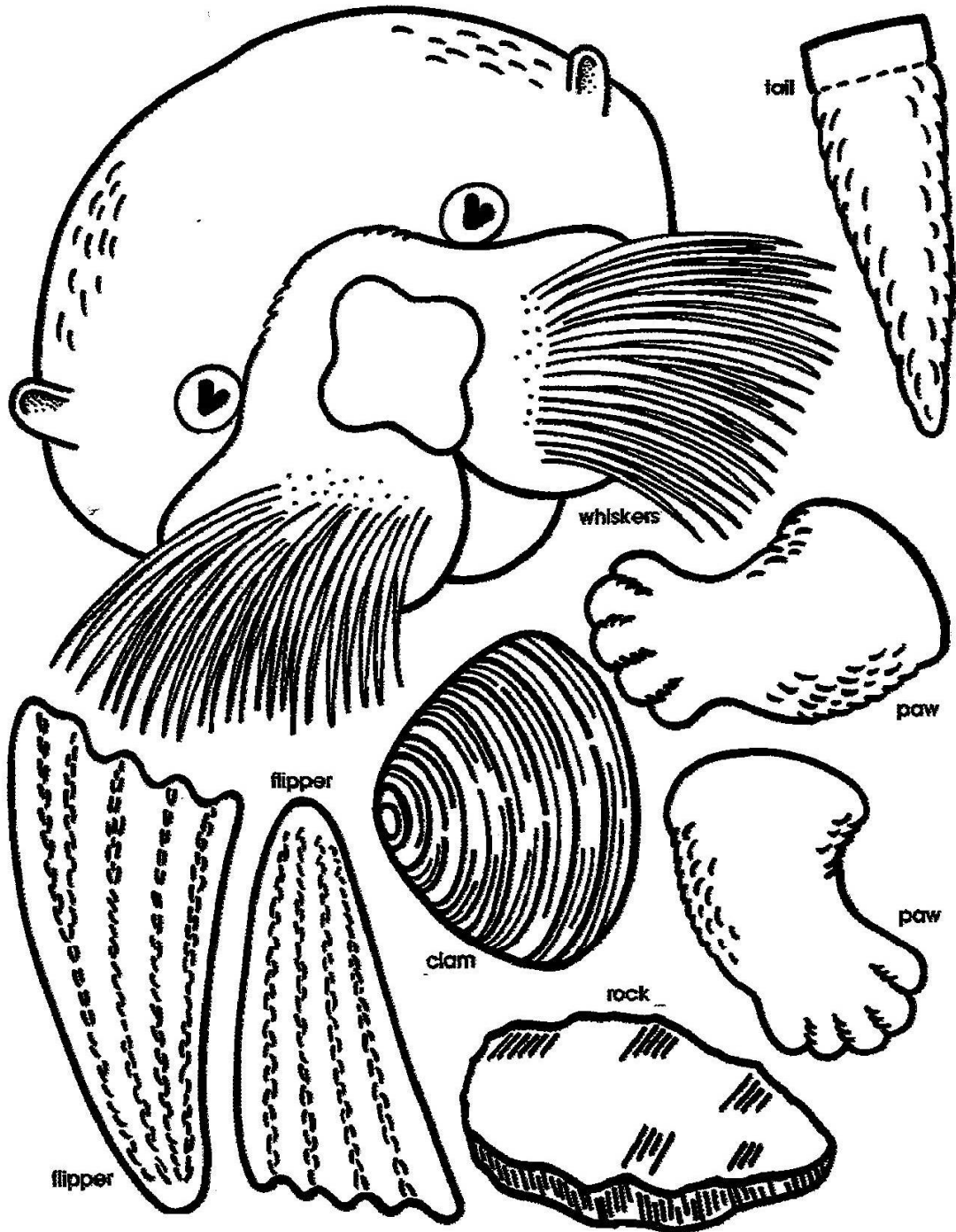
Asian Small-clawed Otter Puppet Parts



Adapted from Monterey Bay Aquarium's "Sea Otter Puppet". www.montereybayaquarium.org

WAVE
FOUNDATION

Sea Otter Puppet Parts



What You Otter Know

Otter Observations

Objective: Students will observe Asian Small-clawed Otters and record behaviors.

Background: Common otter behaviors include:

Grooming

Otters spend a lot of their time grooming themselves and each other. Grooming helps them to reinforce the insulating abilities of their fur.

Swimming

Otters swim all of the time. They swim to have fun, cool down and hunt for food.

Playing

Otters "play" for many reasons. Otters develop coordination, hunting and fighting skills during play.

Eating

Otters eat a variety of foods. In the wild, Asian Small-clawed Otters eat fish, mollusks, crustaceans, and insects. Here at the Aquarium, the otters are fed different species of fish, crickets, mollusks and even cat food.

Sleeping

Otters need lots of sleep. They groom and play all day long!

Materials:

For each student: Copy of "Otter Observations" sheet and a pencil.

Procedure:

1. Review possible otter behaviors with students before the visit.
2. Give each student a copy of "Otter Observations" sheet. Sit and observe the Asian Small-clawed Otters in the "Hidden Treasures of the Rainforest" exhibit.
3. When the students see an otter perform any of the behaviors on the sheet, they can make a mark in the box under the behavior they saw.
4. You may sit and observe the otters for as long (or as short) as you decide.

Discussion:

1. Using the students' data, make a chart of otter behavior and discuss frequency of certain behaviors.
2. Ask the students why they may have seen those particular behaviors instead of others.

Otter Observations

Observe the Asian Small-clawed Otters in the Hidden Treasures of the Rainforest exhibit at the Newport Aquarium. Make a tally mark in the box when you see a specific behavior.

Grooming

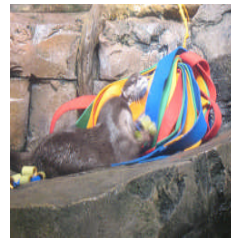


www.flickr.com/photos/cliff1066/53109

Swimming

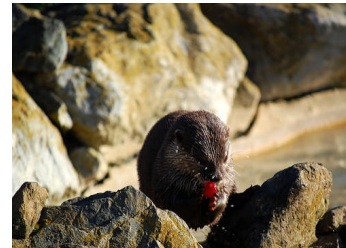


Playing



www.flickr.com/photos/hoyasmeg/11208

Eating



www.flickr.com/photos/timparkinson/123107

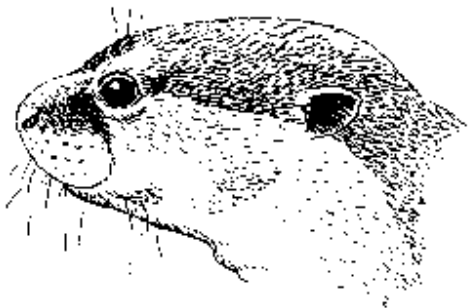
Sleeping



www.flickr.com/photos/cliff1066/92708

The 13 different otter species live in different parts of the world. Each species is specially adapted to life in its own ecosystem. At the Newport Aquarium's Hidden Treasures of the Rainforest Islands, you will have the chance to experience what wildlife is like in an Indonesian rainforest. The otters that live here are Asian Small Clawed Otters. You may call them cute, but – whatever you do – do not call them Sea Otters! Asian Small Clawed Otters and Sea Otters may be related, but they are two completely different animal species. Study the table below to learn the differences between Asian Small Clawed Otters and Sea Otters.

Know Your Otters!



vs.



Asian Small Clawed Otters (<i>Aonyx cinerea</i>)	Sea Otters (<i>Enhydra lutris</i>)
Asian Small Clawed Otters spend more time on land than any other otter species.	Sea Otters are true ocean-dwelling mammals. They are perfectly capable of spending their entire lives out at sea.
Asian Small Clawed Otters move easily on land. Their short legs make walking easy and they move to and from their dens in the forest.	Sea Otters have a long outer toe that makes them very clumsy on land.
Asian Small Clawed Otters usually swim belly down and expose little of their backs	At the surface, Sea Otters swim belly up and float high in the water due to their air-filled fur.
Asian Small Clawed Otters have small, partially webbed feet. Both front and hind paws are circular in shape because they are adapted for land travel.	A Sea Otter's hind paws are more flipper-like and are webbed right to the tips of their toes. Their longest toe is on the outside to help with swimming.
Asian Small Clawed Otters have longer, thicker tails that aid in swimming in water and balancing on land	Sea Otter have shorter tails.
Asian Small Clawed Otters are the smallest of all otter species.	Sea otters may be 2 to 3 times larger than Asian Small Clawed Otters.
Asian Small Clawed Otters may give birth to up to 6 pups at a time.	When Sea Otters give birth, it is usually to a single pup.

Staying Warm

Objective: Students will experience the insulating properties of various materials and discuss ways otters stay warm.

Background:

Otters have a very thick fur coat with two layers: a thick, waterproof outer coat made up of long, coarse fur, **guard hair**, helps protect the otter's skin and keeps the otter waterproof while swimming. The insulating inner layer, **underfur**, is made up of fine, soft fur and keeps the otter warm even while swimming. Asian Small-Clawed Otters have 40,000 hairs per square inch of their body; Sea Otters have 100,000 hairs per square inch of their body. Humans have 90,000 -100,000 hairs per square inch on their head.

Materials:

For each group: 2 ice cubes, 1 zipper lock sandwich bags, insulating materials (e.g., sweatshirt or jacket, mitten or sock, fake fur or thick fabric, folded paper towel or newspaper, foam rubber or Styrofoam, oven mitt or ski glove, bubble wrap)

Procedure:

1. Divide the class into groups of 2 to 3 students.
2. Discuss with the students why we wear jackets and sweatshirts on a cold day. Why is it important to stay warm?
3. Introduce the word **insulation**. Insulation is a material that blocks the flow of heat. Sweatshirts act as insulators because they keep the heat your body makes from flowing out into the air around you and that helps keep you warm.
4. Provide each group of students with two or three different insulating materials.
5. Have the students seal two ice cubes in a zipper lock bag.
6. Have them start counting as soon as the bag is placed on the palm of their hand. Have them stop counting as soon as they feel the cold of the ice. Record their findings.
7. Repeat the experiment, with a piece of insulating material on their palm and the bag of ice on top. Count again. How long does it take to feel the cold?
8. Investigate with the different kinds of insulating materials. Record their findings.
9. Discuss which one keeps you warmest. How do otters stay warm? How do other animals stay warm?

What You Otter Know

SPECIES LIST

Otters are mammals and the most amphibious members of the weasel family which also includes badgers, skunks, and ferrets.

There are 13 different species of otters.

African Clawless Otter:



22-46 pounds and 4-5 feet in length

Partially webbed hind feet

Found in savannahs, lowland forests and coastal plains

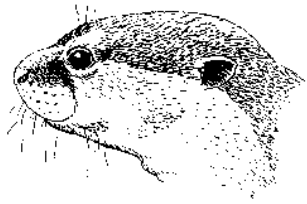
South Africa

Eat crustaceans and large fish

Endangered Status: Least Concern

Threats: Habitat alteration and pollution

Asian Small-clawed Otter:



Smallest of the world's otters-11 pounds and 3 feet in length

Partially webbed hind feet

Found in marshlands

Peninsular Malaysia and Thailand

Eat mollusks, crustaceans, and fish

Endangered Status: Vulnerable to extinction

Threats: Habitat destruction, pollution

Congo Clawless Otter:



44 pounds and 5 feet in length

Partially webbed hind feet

Found in rivers, streams and swamps

Congo River basin (Africa)

Eat crabs and giant earthworms

Endangered Status: Least concern

Threats: Killed as competitors for fish

Eurasian Otter:



17.5 pounds and 3 feet in length

Fully webbed feet

Found in rivers, lakes and sheltered coasts

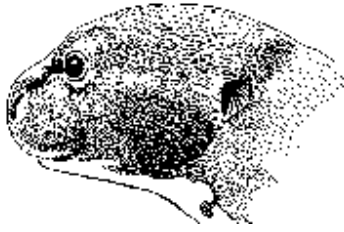
From the Europe, North Africa and Asia

Eat fish, water birds, crayfish, frogs and some rabbits

Endangered Status: Near-threatened

Threats: Water pollution

Giant Otter:



Largest of the world's otters- 48.5-70.5 pounds
5 feet in length
Fully webbed feet
Found in lowland rainforests
South America
Eat fish and crabs
Endangered Status: Endangered
Threats: Habitat destruction, poaching

Hairy-Nosed Otter:



15 pounds and 4 feet in length
Fully webbed feet
Found in peat swamp forests
Southern Asia
Eat fish and crustaceans
Endangered Status: Endangered
Threats: Habitat destruction

Marine Otter:



11 pounds and 3 feet in length
Partially webbed feet
Found along rocky coasts
Southwestern South America
Eat mollusks, crustaceans and fish
Endangered Status: Endangered
Threats: Poaching and pollution

Neo-Tropical Otter



33-37 pounds and 5 feet in length
Fully webbed feet
Found in rivers, streams and evergreen forests
South America
Eat fish and crustaceans
Endangered Status: Data Deficient
Threats: Habitat destruction and water pollution

North American River Otter:



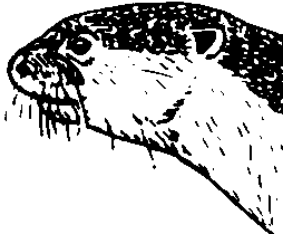
33 pounds and 5 feet in length
Fully webbed feet
Found in lakes, rivers, wetlands, marshes, and estuaries
North America
Eat fish, frogs, muskrats, birds, crayfish and mussels
Endangered Status: Least Concern
Threats: Water pollution

Sea Otter:



40-88 pounds and 4.5 feet in length
Fully webbed feet
Found in rocky shores, coastal wetlands, and kelp forests
North Pacific Rim
Eat clams, urchins and crabs
Endangered Status: Endangered
Threats: Oil spills and boat strikes

Smooth-Coated Otter:



24 pounds and 4 feet in length
Partially webbed feet
Found in peat swamps, wetlands, rivers and lakes
India and surrounding islands
Eat fish, crustaceans, frogs, insects, birds and rats
Endangered Status: Vulnerable to extinction
Threats: Habitat destruction and pollution

South American River Otter:



22-44 pounds and 3 feet in length
Fully webbed feet
Found in rivers and lakes
South America
Eat fish, amphibians, crustaceans and mollusks
Endangered Status: Endangered
Threats: Habitat destruction

Spotted-Necked Otter:



12 pounds and 3.5 feet in length
Fully webbed feet
Found in rivers, lakes and swamps
Central Africa
Eat fish, crabs and frogs
Endangered Status: Least concern
Threats: Habitat destruction and pollution

Photos provided by www.otternet.com

Otters Around the World

Otters face many problems around the world in different habitats. Your students will discuss these problems and look for any patterns in this geography activity.

Objective: Students will investigate patterns between geographical location and habitat then determine potential reasons for current otter declines around the world.

Vocabulary: Urbanization, Habitat Fragmentation, Deforestation, Pollution

Background:

9 of the 13 species of otter in the world are listed on the World Conservation Union's Redlist of Threatened species.

Otters around the world are vulnerable to:

- Habitat Destruction
- Water Pollution-pesticides, oil spills
- Poaching-Fur Trade
- Killed as nuisance species-compete for valuable seafood
- Disease
- Predators

Materials:

Otter Species sheets (one for each student), large world map, area for students to form groups

Procedure:

1. Distribute Otter Species Sheets to students. There should be enough for each student in the class.
2. Discuss the information provided on the sheets (e.g., name of species, region, habitat, etc). Give the students a few minutes to look at their sheets.
3. Have the students arrange themselves according to Region of the world: Australia, Asia, North America, South America, Europe, Central America, and the Caribbean.
4. Next, within the Regions, have the students separate further into Habitats: Mountain Forests, Rain Forests, Wooded areas, Streams or Rivers, Ponds or Lakes, Wetlands, Caves or Underground. Record/Chart/Graph how many species (students) are declining in each Habitat.
5. Finally, within the Habitats, the students may begin discussing the possible threats to their species and why their species are declining. Allow each group to share their findings with the entire class, then open discussion to the entire class.

6. What conclusions can the class draw? Do similar habitats have similar problems? Do certain regions of the world have certain problems? Using a large world map, ask the students to locate their species' home region.

7. Worldwide otter species decline seems to be caused by a variety of issues, and scientists from every region are studying local populations to pinpoint problems. It is an on-going issue with no clear answers. Your students may wish to follow up this exercise with additional research on the Internet, using the websites listed in the Resources section of this curriculum.

Otter Conservation

What Can I Do?

Some things you can do everyday for otters:

- Pick up Litter
- Visit a zoo or an aquarium
- Visit your library
- Conserve water, gas and electricity at home and school
- **LEARN** about otters and their importance in our world

Otter References

<http://www.otter.org>-International Otter Survival Fund

<http://www.otternet.com>-Source for Otter Fun, Facts and Faces

<http://www.montereybayaquarium.org>-Monterey Bay Aquarium

<http://www.iucnredlist.org>-International Union for Conservation of Nature and Natural Resources Redlist of Threatened Species 2010

<http://www.otterspecialistgroup.org>- International Union for Conservation of Nature and Natural Resources Otter Specialist Group

What You Otter Know

National Science Standards (Grades 1-5)

Below is a list of National Science Standards discussed during the teaching of **What You Otter Know**.

Science as Inquiry K-4

Content Standard A: As a result of activities in grades K-4, all students should develop:

- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Life Science K-4

Content Standard C: As a result of activities in grades K-4, all students should develop an understanding of:

- The characteristics of organisms
- Life cycles of organisms
- Organisms and environments

Science in Personal and Social Perspectives

Content Standard F: As a result of activities in grades K-4, all students should develop an understanding of:

- Types of resources
- Changes in environments

History and Nature of Science

Content Standard G: As a result of activities in grades K-4, all students should develop an understanding of:

- Science as a human endeavor

Life Science 5-8

Content Standard C: As a result of their activities in grades 5-8, all students should develop an understanding of:

- Structure and Function in living systems
- Reproduction and heredity
- Regulation and behavior
- Populations and ecosystems
- Diversity and adaptations of organisms

Science in Personal and Social Perspectives 5-8

Content Standard F: As a result in activities in grades 5-8, all students should develop an understanding of:

- Populations, resources and environments
- Natural Hazards
- Risks and Benefits

The NSES publication (ISBN 0-309-05326-9) can be viewed at <http://books.nap.edu/html/nses/html/index.html>.

A bound, paperback copy can be purchased from the [National Academy Press](#), 2101 Constitution Avenue, N.W., Washington, D.C. 20418; tel. (202) 334-3313 or 1-800-624-6242.

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