THE MARINE MAMMAL CENTER

The Trash Troll

Activity Guide

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The Trash Troll is a 13 minute video produced by Stuart Perkin.
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Background Information onTrash in our Seas - Marine Debris

Trash on our streets, beaches, or in our oceans is an eyesore and can also be dangerous and even life threatening to many forms of wildlife. Two of the most common dangers of trash to wildlife are **ingestion** and **entanglement**. Certain forms of pollution may be mistaken as food and eaten, or ingested. Sea turtles have been known to eat a floating plastic bag, mistaking it for a jelly fish. Shore birds have been seen feeding their young small plastic debris. This mistaken ingestion may give an animal a false feeling of being full, so they do not feed and thus may starve. The debris has the potential to block an animal's digestive system or airway and hurt the animal internally. Entanglement is defined as the act of becoming tangled, wrapped or ensnared in an object so that escape is difficult. Entanglement due to **marine debris**, or trash in our seas and lost or disregarded fishing gear, is unfortunately a common problem.

Fishing nets are designed with the very purpose of catching or entangling. Unfortunately, during some fishing activities, it's not always just the target species that is caught in the nets. This is referred to as **incidental catch**. Fishing gear can also be lost or left behind as **ghost nets**, catching anything in their path. Fishing lines and nets are not the sole culprits of entanglement. Many other forms of **marine debris** are also at fault. Everything from six pack rings or plastic packing material to soda can pull tabs, may end up in our waterways and oceans and entangle marine life. Pollution in our oceans is not a new problem. Many people have probably found an old weathered piece of sea glass on the beach. Today, plastic is the choice packaging material. It is light weight, durable and long lasting. Some soda pack rings are said to last up to 400 years in our oceans. An unfortunate entanglement victim who dies and may then sink to the ocean floor, where the natural process of decay takes place. The durable, long lasting debris may then rise again to the ocean surface, where the whole sad process will begin again.

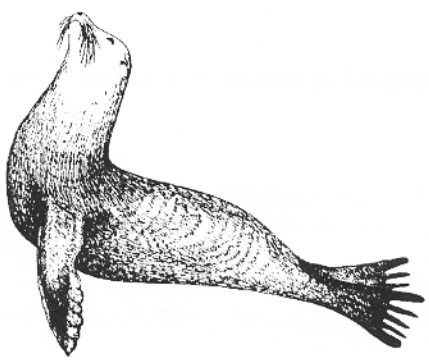
The Marine Mammal Center, located just north of San Francisco, California, is a hospital for stranded, sick, or injured marine mammals. The goals of The Center are to rescue, rehabilitate and release the wild marine mammals back to their ocean world. From 1986 to 1992, 169 live stranded seals and sea lions were rescued by The Center with injuries due to entanglement in fishing nets, fishing tackle (hooks) and ingestion of or entanglement in marine debris.

The most unfortunate aspect of the problem of marine debris is that it is caused by the carelessness of people. People seem genuinely sorry when they hear of its effects on the environment and wildlife. That is where there is hope. We can all get the word out about the problem of marine debris, thus raising consciousness and ultimately helping protect the life in our seas.

What can we do to help?

Reduce - Reuse - Recycle!

Be careful with your trash, and fishing gear so it does not get loose accidentally. If you see any trash, such as a six pack ring on the beach or on the streets, pick it up. Reuse it if you can, possibly in your art work. Find out what plastics are recycled in you area, and recycle it if you can. If you are unable to reuse or recycle the trash, be sure to cut any up that could entangle anything and put it in its place, in the trash can!



Mistaken Munchies!

Objective:

Students will be able to experience the negative and often deadly effects that **marine debris**, in particular plastic, can have on marine life if it is eaten or ingested.

Background:

Mistaken munchies, or the accidental ingestion of marine debris is one way that marine debris can have negative effects on marine life. Certain marine animals may mistake trash, in particular plastic as their food. This ingestion may cause clogging of their digestive system or airway or give them the false feeling of being full, causing malnutrition or starvation. Birds may mistake plastic pellets as fish eggs and sea turtles have been known to mistake plastic bags for jelly fish, their prefered prey item. These mistaken munchies can be life threatening.

Materials:

A tray or shoe box per child; plastic foam pieces (marine debris) - 1/2 cup per tray; bird seed, beans, or popcorn kernals (representing food) - 1 1/2 cups per tray; and a spoon and paper cup per child.

Procedure:

Part 1: Introduce who is found in the marine environment, and discuss who eats whom or what (the food chain or web). Enhance with photos or pictures of various animals.

Part 2:

1. The object of this activity is for the students to "eat" or collect as much food as possible in a given period of time.
2. In each tray or shoe box, mix the "food"/seeds with the plastic debris. Have three students "feed" per tray for 30 seconds. Have the students use their spoons as "mouths" and cups as "stomachs".
3. When the time is up, have the children examine their cups for any mistaken munchies or plastic pieces.
4. Discuss with the students what they think may happen to an animal that ingests plastic or other marine debris.
5. Discuss what we can do as individuals to help prevent the ingestion of marine debris.

Reduce! Reuse! Recycle!

Extensions:

*Have the children make up data sheets, recording the ingested pieces in two columns, plastic and natural. Collect the data sheets and add up the totals of each of the columns. Have the students compare their individual results.

*Study of marine food chains and food webs, and the interconnection of all wildlife. Discuss where in the food chain a particular marine debris may cause damage.

Entanglement Activity
Rubber Band Hand

Objective: Students will be able to experience what it may be like to be entangled in marine debris.

Background: Entanglement in marine debris is a serious threat to all forms of marine life.
Please read the background information provided at the beginning of this activity guide.

Materials: One rubber band per student. Use smaller rubber bands that will be taut around students hands. For your discussion with the students, have on hand if possible a six pack ring, fishing line or net, pictures of entanglement victims or trash on the beach.

Discussion: After watching The Trash Troll, discuss the term **entanglement**, its causes and effects.(Decreased mobility, open wounds, infection, strangulation or drowning). Discuss what kinds of trash might be potentially dangerous to wildlife, and what the effect might be. What would it be like be to be caught in something, or to have a net or plastic strap around your neck, flipper or body? Share some photos of wildlife entangled in marine debris. Pass around a six pack ring. Now have each of the students experience what it might be like to be entangled in trash, or **marine debris.**

Procedure:

1. Demonstrate to the students how to place the rubber band on their hand for this activity.
2. Pass out one rubber band to each student.
3. The students should hook the rubber band around their "baby finger", around the back of their hand, and hook it over their thumb. (The rubber band should be taut, resting below the knuckles of their hand.)
4. Without using their other hand, teeth, face, or other body parts, the students should try to get free.

Concluding Discussion:

*Some students may free themselves, but most will have trouble and will struggle. Discuss what it might be like for a sea lion or shore bird to be in a similar situation. A animal without any hands or other tools to free itself, could be in a life threatening situation.
*Discuss the struggle that the animals must go through, and how stressful it would be for them.
*How much energy is used up in the struggle? What if the animal is unable to feed and weakens? (It may possibly die or become easy prey to its predators.)
*Discuss what we can do to help prevent such problems as entanglement due to marine debris.
If you see any trash on the streets or on the beach, pick it up, cut up any trash that may entangle wildlife and throw it away.

Reduce, Reuse, and Recycle!

The Delicate Balance of Marine Food Webs

Objective: While learning about food chains and food webs, students will be able to see the interconnection of a marine community and understand its delicate balance.

Background: A **food chain** is a sequence of organisms in a community in which each member feeds on the member below it. (fish, seal, shark) A **food web** represents all of the interconnected food chains within a **community**. There exists a delicate balance within these food webs. If as little as one member of a food chain is polluted, disturbed or missing, the whole web may be affected. The marine environment represents a good example of a long food chain and of an intricate food web. The marine food chain begins with the **producers**, the marine plants that get their energy directly from the sun. The largest group of marine plants are **phytoplankton**, small floating plants. These producers are then fed upon by the the **primary consumers**, or **herbivores** such as snails or other small floating animals such as shrimp or **krill**. Small floating animals are called **zooplankton**. These small animals then become **prey** to or may be eaten by **secondary consumers** such as herring, sea otters or baleen whales. Herring may then be eaten by seals, dolphins or humans. The seals may then be prey to sharks or orca whales, reaching the top of the food chain.

Materials: Pictures (drawings or photos) of wildlife representing a food chain and web. Have enough pictures for each student. A long (approximately 35 ft) piece of rope or yarn. This activity is set up for a group of approximately 30 students, representing different members of the food web. (7 plants, 5 krill, 2 snails, 2 sea stars, 4 herring, 3 seals, 2 sea otters, 2 whales, 2 sharks.)

Discussion: Begin by showing the students the different pictures of wildlife. Ask the students what the different animals eat. Who eats whom or what? Discuss the terms producers, consumers, herbivore and carnivore.

Procedure:

1. Give or have the students draw an example of a food chain (plant, snail, sea star, sea otter).
2. Distribute this simple food chain of pictures among small groups of students.
3. In order to illustrate this simple food chain have the students hold hands forming a line or "food chain" in order of who eats whom (plant, snail, sea star, sea otter).
4. Break up the groups, start again this time distributing all the food web pictures to the students. 5. Have the students try to form a "food chain". The group of students will become an interconnected group of food chains as they form a "food web".
6. Use a rope or a piece of yarn to connect the students, demonstrating the food web.
7. While the students remain as a "food web", tell the students that there has been an unusual weather phenomenon, a warming of the seas, and as a result there is very little production in the seas and thus very few plants. Have 4 of the 7 plants, the producers and the base of the food chain, drop out. How is the rest of the food web affected?
8. This is a natural weather change, the following year, the waters are even more productive. Have the 4 plants join the group again to create a healthy "food web".
9. Nearly all of the seals have been hunted by people. They are now an **endangered species**, they are close to becoming extinct. Have 2 of the 3 seals drop their piece of string and step back from the group.
10. Discuss how the entire "food web" is affected when one species is disturbed.
11. People want to save the seals, all marine mammals are protected by The Marine Mammal Protection Act. It is now illegal to hunt marine mammals, and the population grows again. Add the 2 seals back into the web.
12. Much of the herring **population** has been caught by fishermen. Have 2 of the 4 herring leave the web, drop the string and step back.

13. Discuss how fragile the web becomes when disturbed. There is an environmental disaster, an oil spill. The sea otters' insulating fur coats are destroyed and many, 1 of the 2 sea otters, freeze to death. Discuss what a great impact people can have on wildlife food webs.

Concluding Discussion:

Sit down as a group and discuss how people can help protect the delicate balance of wildlife.

HOW YOU CAN HELP MARINE ANIMALS

Today marine animals as well as other life on our earth are facing a tremendous range of problems, including death due to entanglement in fishing nets and plastic, sickness from exposure to pollution and toxins, depleted populations of food animals, and loss of habitat or places to live. These problems are reflected in the rate of extinction of life which has greatly accelerated in recent times. These problems are complex, but there are things that each and every one of us can do to help.

1. Become informed about marine life and endangered animals. You can do this by reading books or magazines that address these problems, by joining an environmental organization and receiving their newsletter, or by attending classes on this subject.

2. Use less plastic which, when disposed of, is dangerous to animals that can get caught or entangled in the plastic or accidentally eat it. Avoid buying products that are packaged in plastic and are excessively packaged. Also avoid styrofoam, which is not only dangerous as trash, but in its production emits gases which are destroying the ozone layer of our earth.

3. Recycle newspapers, paper bags, cardboard, aluminum, glass and tin cans. Recycling saves energy and resources, saves space in our landfills, and prevents the possibility of that trash ending up in the ocean.

4. Support local and/or national groups that are fighting to preserve animal habitats (or homes) and the animals themselves. Each group helps in various ways; some might rehabilitate sick animals, others educate the public, some organize letter writing campaigns or other political action. Most groups need donations.

5. If you have time, many groups need volunteers to help with aspects of their program. Volunteer jobs may range from office work to education or animal care.

6. Organize your own letter writing campaign. Write letters to government officials (local, national and international) or companies that have an impact on the survival of marine animals and in paricular endangered animals.

7. **Share The Trash Troll Video and its message with your friends.**

Ultimately the health of our planet depends upon the health of the ocean (which covers over 70% of the earth's surface), and on the continuing diversity of life on our planet.

THE MARINE MAMMAL CENTER

Trash Troll Activity Guide Glossary

Awareness - To be familiar with an issue or fact.

Biodegradable - Capable of being broken down naturally.

Carnivore - Any animal or plant that consumes other animals.

Community - Populations of all species living and interacting in an area at a particular time.

Consumer - An organism that cannot create the organic nutrients it needs and feeds on plants or animals to get its organic nutrients.

Endangered species - A species that is in immediate danger of becoming extinct.

Entanglement - The act of becoming tangled, wrapped or ensnared in an object so that escape is difficult. Entanglement may make swimming or feeding more difficult, cause suffocation, cause open wounds, or weaken an animal's ability to avoid a predator.

Food chain - A sequence (like fish, seal, shark) of organisms in a community in which each member of the food chain feeds on the member below it.

Food web - All the interconnected individual food chains in a community.

Ghost nets - Abandoned or lost nets no longer collected by a fisher person.

Habitat - The home or place in which a particular species can be found (tide pool, deep ocean).

Herbivore - An animal that consumes plants.

Incidental catch - Occurs during fishing activities, when species other than the target species are caught in the nets.

Ingestion - The eating of marine debris by an animal. Ingestion may block the digestive tract, cause suffocation or the false feeling of being full that may lead to malnutrition or starvation.

Krill - Small floating shrimplike animals, the main food source of baleen whales such as blue and humpback whales.

Marine - Relating or referring to the ocean or salt water.

Marine Debris - Trash found in the ocean or marine environment.

Organism - Any living creature, either unicellular or multicellular.

Plankton - Small, drifting aquatic and marine organisms that are found in the upper levels of the water where light is abundant. Phytoplankton are plants and zooplankton are animals.

Population - A group of individual organisms of the same species living in a particular area.

Prey - An animal animal hunted or killed for food by another animal, its predator.

Producer - Organisms that use the energy from the sun to create the organic nutrients it needs to survive.

Recycling - The collection and processing of materials so that they can be used again.

Reduce - To make less in quantity

Reuse - To use over again.

Threatened species- A species that is rare and may become an endangered species in the near future.

Trash Troll Activity Guide
Resource and Book lists

EDUCATION RESOURCES

Adopt-A-Beach Program, General Land Office, Stephen F. Austin Building, Rm 620, 1700 N. Congress, Austin, TX, 78701. (512)463-5052.

California Coastal Commision, 45 Freemont ST., Suite 2000, SanFrancisco, CA 94105. (415) 904-5200

Center for Marine Conservation, 312 Sutter St, Suite 606, San Francisco, CA 94108. (415) 391-6204 or 1725 DeSales St., NW, Suite 500, Washington, DC 20036. (202) 429-5609

Marine Entanglement Network, c/o Defenders of Wildlife 1244 19th St., NW, Washington, DC 20036. (202) 659-9510.

National Wildlife Federation, Fisheries and Wildlife Section, 1400 16th St., NW, Washington, DC 20036. (800) 432-6564.

NOAA/National Marine Fisheries Service, marine Entanglement Research Program, 7600 Sand Point Way, NE, Seattle, WA 98115. (206) 526-4009

The Marine Mammal Center, Marin Headlands - GGNRA, Sausalito, CA 94965.

U.S. Environmental Protection Agency, Public Information Center, PM-211B, 401 M St., SW, Washington, DC, 20460.

MARINE DEBRIS PUBLICATIONS

50 Simple Things Kids can do to Save the Earth. John Javan, The Earth Works Group. Andrew and McMeel, A Universal Press Syndicate Company, Kansas City , MO.

A Citizens Guide to Plastics in the Ocean: More Than a Litter Problem. Center for Marine Conservation.

Kids Heroes of the Environment. Edited by Catherine Dee, The Earth Works Group. Earth Works Press, Berkeley, CA.

Save the Earth: An Action Handbook for Kids. Betty Miles. Alfred A. Knopf, New York, NY.

MARINE MAMMAL EDUCATION SOURCES

Marine Mammal Activity and Curriculum Guide. The Marine Mammal Center, Sausalito, CA, 1989.

A Coloring Book of Marine Mammals. Bellerophon Books; Santa Barbara CA, 1983.

Discovering Marine Mammals. Nancy Field and Sally Machlis, Dog-Eared Publications, Corvallis OR, 1987.

The Ocean Book. Center for Marine Conservation, John Wiley and Sons, Washington DC, 1989.

Wet and Wild. A Multidisciplinary Marine Education Teacher Guide. University of Southern California Sea Grant Program, Los Angeles, CA, 1983.

Zoobooks. Wildlife Education Limited, San Diego, CA.

MARINE MAMMAL PUBLICATIONS

Marine Mammals. Delphine Haley editor, Pacific Search Press, 1986.

Handbook of Marine Mammals (3 volumes). Sam H. Ridgeway and Richard J. Harrison eds., Academic Press, 1981.

The Pinnipeds. Marianne Reidman, University of California Press, Berkeley, 1990.

The Sierra Club Handbook of Whales and Dolphins. Stephen Leatherwood and Randall R. Reeves, Sierra Club, San Francisco, 1983.

The Sierra Club Handbook of Seals and Sirenians. Randall R. Reeves, Brent S. Stewart, and Stephen Leatherwood, Sierra Club, San Francisco, 1992.

Sea Otters. Marianne Riedman, Monterey Bay Aquarium, Monterey, 1990.

The Sea Otter: Saved or Doomed? John Woolfenden, The Boxwood Press, Pacific Grove, CA, 1979.

Seals of the World. Judith King, British Museum of Natural History and Cornell University Press, Ithaca, NY, 1983.

The World's Whales. Stanley Minasian, Kenneth Balcomb and Larry Foster, Smithsonian Books, Washington DC, 1984.

The Marine Mammal Center is a non-profit organization that rescues and rehabilitates marine mammals that strand along the California Coast. Since 1975 The Center has released hundreds of recovered marine mammals back to their ocean home. The Center is 95% volunteer run and is funded by grants, donations and our members from around the world. For more information please call or write:

The Marine Mammal Center
Marin Headlands, GGNRA
Sausalito, CA 94965
Attn: Education Department
415-289-7325

Related Videos available from Bullfrog Films:

Same issue for older audiences –

Troubled Waters: Plastic in The Marine Environment. 29 min. Grades 7-Adult

Also See – Estuary; The Intertidal Zone; The Great Horseshoe Crab Field Trip; Secrets of the Salt Marsh; The Shoreline Doesn't Stop Here Anymore; The Wasting of aWetland; Where The Bay Becomes The Sea.