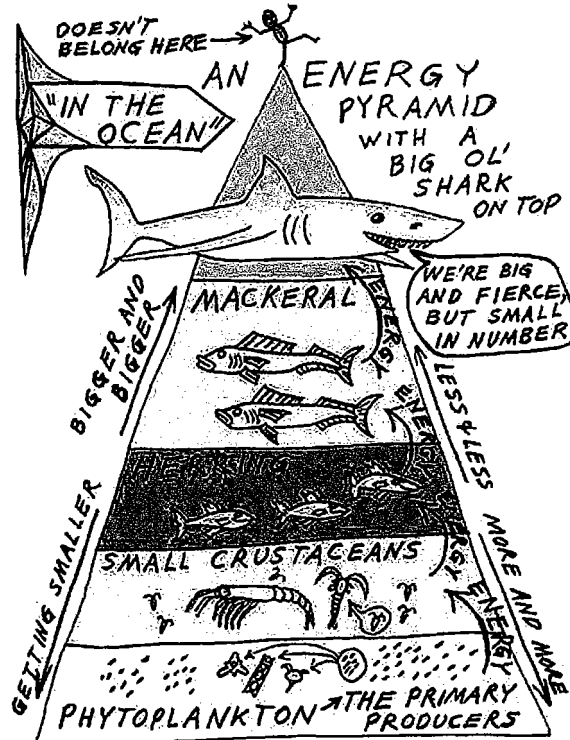


National Marine Educators Association
National Convention
Tampa, Florida
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Credit graphic:
<http://www.ftexploring.com/me/pyramid.html>

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**PLEASE
RECYCLE!**



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Taking out the Trash: A Natural-Resources-Management Game

Objectives:

To encourage thought about how Earth sustains life, and how we, as humans, affect life on our planet. To introduce ways in which we can lessen the negative impact we have on natural environments. To provide an opportunity to apply this knowledge while making everyday decisions.

Materials Needed (for 6 groups):

felt board and pieces (sun, plants, herbivore, carnivore, omnivore, water, oxygen, shelter)

6 laminated grocery lists	6 empty spaghetti sauce jars
12 plastic tomatoes in a basket	6 empty tomato cans
12 tomatoes wrapped 2/Styrofoam tray in plastic wrap	6 6-pk. juice boxes
3 Styrofoam egg cartons (cut in halves)	6 empty juice concentrate cans
3 paper egg cartons (cut in halves)	6 large juice bottles
36 plastic Easter eggs (ping pong balls)	6 margarine tubs
2 large cardboard boxes (recycling and compost)	6 butter boxes
6 small garbage cans	6 empty pasta boxes
masking tape	6 empty pasta bags
assortment of paper and plastic grocery bags	

Introduction:

Let's think about our planet, which is, in the largest sense, our environment. What things about Earth allow organisms to live? What do animals need for survival? [food, water, oxygen, shelter, space/area to exist, sunlight] Let's start with sunlight. [place sun on felt board] What kinds of living things need sunlight to grow? That's right: plants! [put plants on board] What kinds of living things need plants to grow? Plant-eaters! Or herbivores. [put herbivores on board] What kinds of animals eat other animals? Carnivores. [put carnivores on board] Do you eat meat or plants? You eat both? Then you are . . . an omnivore. [put omnivore on board] So all living things need the . . . sun for food. Our planet Earth is just the right distance from the sun. We're not so close that we burn or bake, and not so far away that we freeze.

Another very special characteristic of Earth is that our planet has lots of water. [put water on the board] Nothing on Earth can live without water. Over half of your body is water. When you hear about people exploring other planets, you might notice that they look for water. Water is so essential to life here on Earth that scientists believe that if they find water on a different planet, they might also find life.

The air we breathe is essential to animal survival. [put oxygen on board] What produces oxygen? Plants. Did you know that over half the world's oxygen is made by phytoplankton? Phytoplankton are the plant-like organisms that live near the surface of water, drifting with currents.

In trees and rocks and hills and soil and in many other places we find shelter and space to exist. [put shelter on board] Earth is very special for its ability to support living things,

and we are all connected in many ways. [point out connections on board] Because of all of those connections, Man can have a very great impact on the Earth. If we chop down the rainforests and pollute the oceans, we have fewer plants to produce what for us air-breathers? Oxygen. If we pollute our streams and rivers, we have less what to drink? Water. If we kill plants, that takes food away from whom? The herbivores and omnivores. And there is a chain of life that is affected by all of the things we do. Let's think about some of the ways people can try to lessen the negative impacts we have on our planet. Has anyone heard of the three R.'s? Reduce, Reuse, Recycle. To what do they refer? Waste. We want to reduce the amount of waste that we produce and reuse what we can so that it's not wasted. What we can't reuse, we try to recycle. If we think about these things and apply them in our everyday lives, we can greatly reduce the amount of garbage we throw out. Now, we're going to play a game: Taking out the Trash. You will work in groups; each group will be given a grocery list (all identical) and sent to the "store." As you shop, remember that your goal is to throw out the least amount of trash possible.

Activity

Materials Needed: See above.

Here's What You Do:

Each group is now assigned a domicile: each domicile has a trash can and a storage space (tape off with masking tape). Each group is given a list (might designate a shopper). Participants must obtain everything on the list, but items will be offered in different packaging choices. After selections have been made, the grocer bags groceries. Groups "eat" food. Produce can be collected (so it's not in trash, as it's been "eaten"), but each group must decide what to do with leftovers (dinner, tomato scraps, egg shells). They must then decide what is to be done with the packaging. There will be a recycling center and a compost pile. With younger participants, a discussion about recycling and composting would be appropriate. With older participants, the presenter might lead less and allow the students the opportunity to inquire about disposal choices. After the domiciles are in order, compare the contents of the groups' trash cans. Show an example of a trash can with the least possible trash and one with the most trash/most harmful trash. Talk about options participants have within their own homes and communities for the Three R.'s.

Grocery List

Spaghetti sauce supplies

Butter

Juice

Eggs

Spaghetti noodles

Every week, more than 500,000 trees are used to produce the two-thirds of newspapers that are never recycled.

We throw away enough glass bottles and jars to fill the 1,350-foot twin towers New York's World Trade Center every two weeks.

American consumers and industry throw away enough aluminum to rebuild our entire commercial airfleet every three months.



We throw away enough office and writing paper annually to build a wall twelve feet high stretching from Los Angeles to New York City.

Americans go through 2.5 million plastic bottles every hour only a small percentage of which are now recycled.

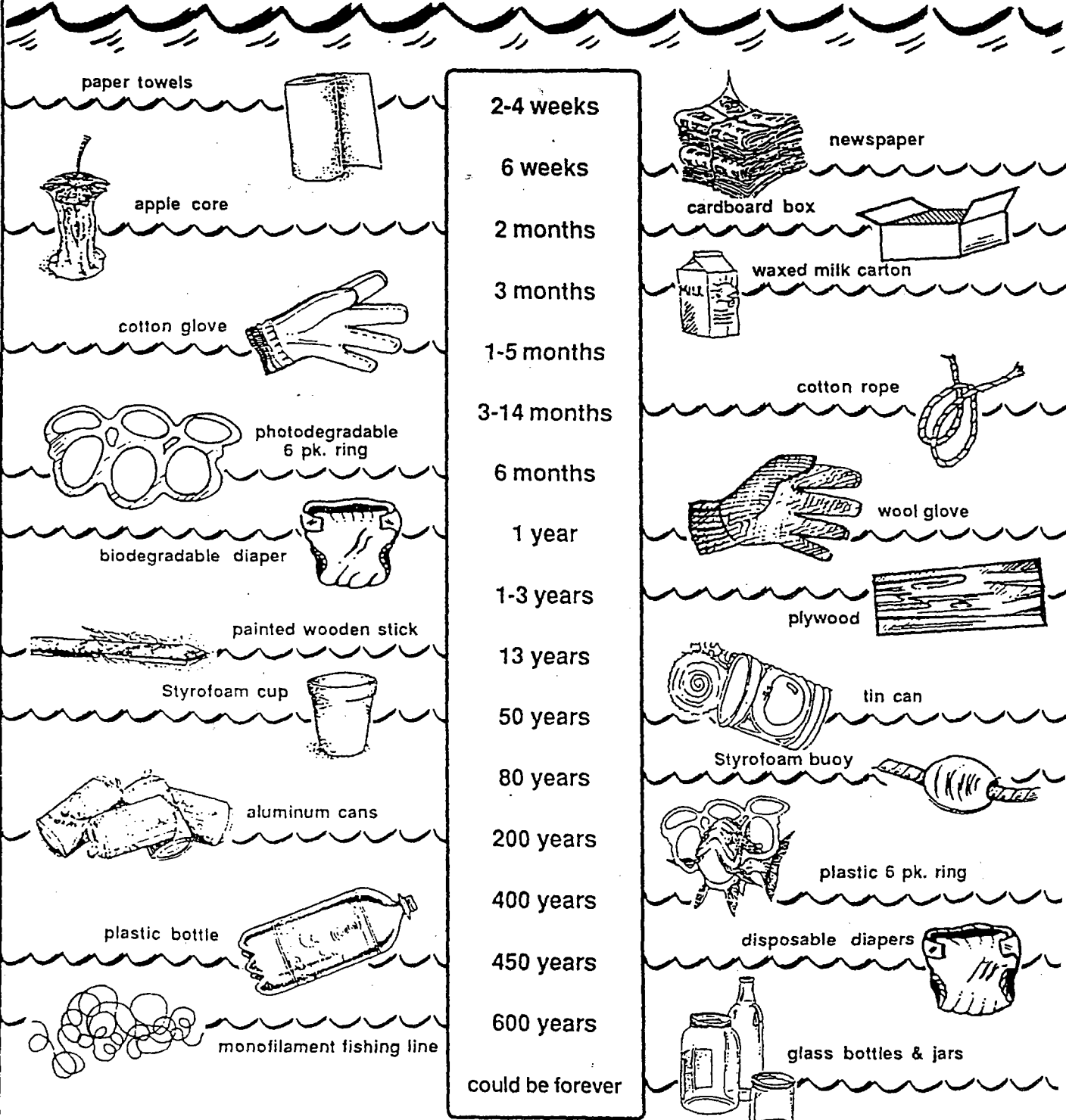
Every year we dispose of 24 million tons of leaves and grass clippings, which could be composted to conserve landfill space.

We throw away enough iron and steel to continuously supply all the nation's automakers.

Keep it 'above board'

Please don't throw your trash overboard

It takes a long time for litter and debris to "disappear" from the deep.



Source: Escambia County Extension Service, Sea Grant/Marine Extension

Let's keep our waterways clean... and our sea creatures safe



A message on behalf of the environment from
Waste Management of North America, Inc.
 Southeast Region

Trash or Food?

Eating is essential to an animal's survival. Humans (usually ☺) have the ability to decipher what we pick up as food or nonfood. Animals, on the other hand, often aren't as skilled. With us putting more trash into the waterways and onto the land, animals are finding unfamiliar, unnatural options, some of which are edible and some of which may be trash disguised as food. Animals might "test" unfamiliar items with fatal results.

The following activity helps participants realize similarity between items we know as food and common pieces of trash that might be found in the waterways and on roadsides.

Materials:

Paper sack (small)

Gummi worms

Styrofoam peanuts

Candy Laces (like Twizzlers)

Rice Cakes/Corn Cakes

Fishing worms

Puff Corn (Golden Flake brand)/Cheese Puffs, etc.

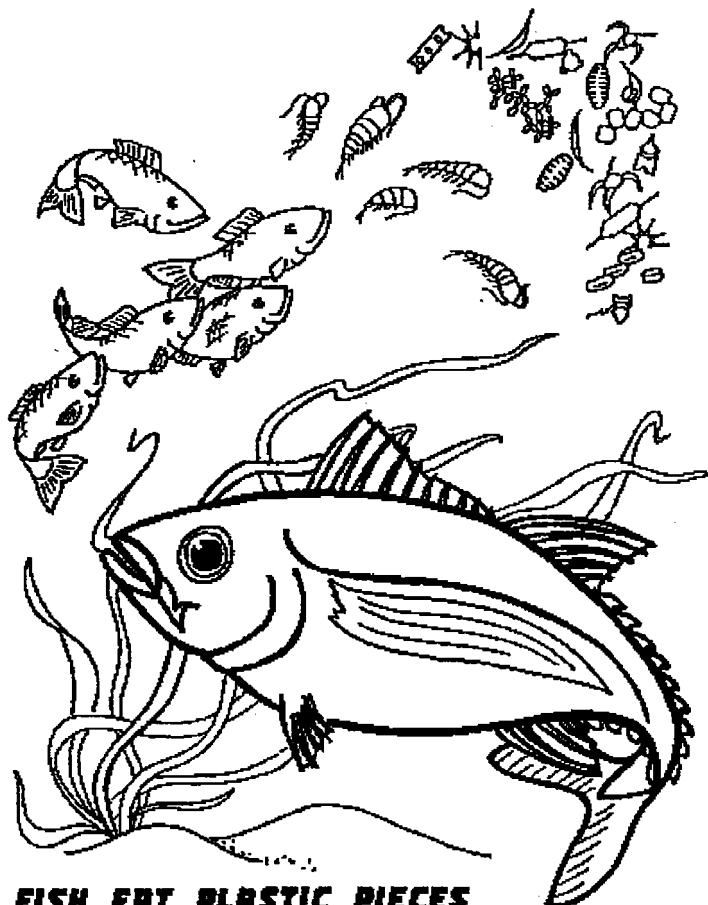
Gimp (Craft string)

Styrofoam pieces

Procedure:

Place paired items into paper sacks. Have participants reach into each sack without looking and feel both items. Then participant should pull the food item out of each one. Discuss.

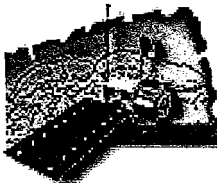
www.yoto98.noaa.gov/books/debris/bcolor04.gif



FISH EAT PLASTIC PIECES

WITH THEIR NATURAL FOOD.

PLASTIC HARMS FISH!!



Visit to an Ocean Planet



PLASTIC IN THE OCEAN

OVERVIEW

Students will monitor the *plastic* waste production in their own households, research its effect on freshwater and marine life, and propose various ways to lessen the problem.

CONCEPTS

- Plastic waste production has potential negative impacts on wildlife in both the marine and freshwater environments.

MATERIALS

- Plastic waste from home

PREPARATION

The major purpose of this activity is to enhance students' awareness of the hazards of plastic waste for wildlife in aquatic environments. There are a lot of different places that you can collect useful information about plastic *litter* and its impacts on wildlife. You might wish to contact the Center for Environmental Education in Washington D.C. for more information.

Have the students collect and save every piece of plastic waste produced in their homes over a two day period.

PROCEDURE

Engagement

In both marine and fresh water environments, plastic waste has major potential negative impacts on the wildlife. How much plastic trash does a household produce in two days? What happens to all of this plastic? How can it harm animals? What, if anything, can we do about it?

Activity

1. Collect every piece of plastic waste produced in your home over a two day period. Make sure that you rinse them before you bring them to school. If you have too much trash, you might wish to bring a representative sample.
2. Separate your plastic into different categories. Classify them in terms of how you think they might be perceived as food for animals: "Very Likely To Be Perceived As Food," "Not Very Likely To Be Perceived As Food," etc. Can you think of any animals in the ocean that might attempt to eat the plastic (e.g., animals that eat jellyfish might confuse a plastic bag as a food source.)? Also classify the plastic according to the likelihood of animals becoming entangled with them.
3. Hypothesize about how these materials might affect aquatic animals. Research current literature and check your hypothesis against your research. Summarize what you have learned about the potential hazards to aquatic life from plastic waste.
4. How might plastic end up in the ocean? List possible mechanisms. Research what others have found on this issue.



Visit to an Ocean Planet



5. Survey your school grounds or your community for plastic litter. Where did you find most of it? See if you can develop an action plan for your community to increase the awareness of the problem.

Explanation

Experts estimate that over 6 million tons of litter enter the sea each year. A significant portion of this comes from merchant ships and the practice of dumping garbage at sea. Among the most damaging of the solid wastes that are dumped are non-*biodegradable* plastics. This is because plastics do not readily decay. Moreover, plastics float and accumulate on or near the ocean surface, unlike most other trash components. It is estimated that commercial fishing fleets have lost nearly 300 million pounds of plastic in a single year. It is this plastic netting material that may be the greatest hazard to marine life. Once entangled in these nets, nearly all animals die.

Scientists estimate that over one million seabirds and over 100,000 marine mammals are killed each year by plastic trash. Plastics have been found in the stomachs of whales, dolphins, fish, birds, and manatees. Leatherback turtles often mistake plastic bags for jellyfish, one of their favorite foods. Plastics that accumulate in the intestines of these animals cause them to starve to death.

There are positive steps that are being made in the area of plastic *pollution*. Regulations to control pollution near the coasts and to protect marine animals can be very effective. There are new laws being developed to restrict dumping of plastic at sea in certain areas. Also, recycling is important—the more that we recycle, the less garbage we generate.

On another level, researchers are working on some new approaches to help solve ocean problems. Biodegradable plastic is being tested. Some wildlife specialists are experimenting with ways to use plastics to provide anchoring sites for organisms in lakes where grasses no longer grow. Some are using plastic bottles and jugs to provide a microhabitat for certain fish.

EXTENSION

Have your students contact environmental, conservation, animal welfare, and wildlife groups to see what is being done about the impact of litter on local wildlife and set up a mechanism for volunteering.

Find out if there are any laws in place in your city, county, or state that attempt to solve the problem of plastic pollution. Are there any national or international laws? Are there any bills before the legislature that deal with plastic pollution?

Contact a local recycling center to discover the types and amounts of plastic that they are helping to recycle. If you find out the approximate number of households the center serves, then you can estimate the amount of recycled material per household and compare with that of your own household. You might ask your contact person at the recycling center if he or she has noticed an increase in the volume of recycled plastics over time.

VOCABULARY

biodegradable

litter

plastic

pollution

SOURCE

Adapted from Plastic Jellyfish. 1987 Western Regional Environmental Council. Pg. 158 - 161.