

TURNING THE TIDE ON TRASH

A LEARNING GUIDE ON MARINE DEBRIS



LESSON SIX

Sources of Marine Debris: From Street to Surf, From Hand to Sand

Grade Level:

Grades 5 – 9

Subjects:

Science, Social Studies, Language Arts,

Overview:

Many of us do not “see” litter in our surrounding environments. This exercise will increase students’ awareness of litter problems, and guide them towards understanding how litter becomes marine debris, with potentially harmful effects on human health and safety, wildlife, and habitats. Students will observe and record litter they see in their neighborhood, reflect on how the litter came to be there, then make predictions on how the littered items might make their way to the ocean. Students will compare the litter they have observed with data collected during the International Coastal Cleanup.

Objectives:

- Discover where marine debris typically comes from and how it commonly finds its way into the marine environment.
- Learn how trash that is not properly handled or disposed of on land can become marine debris.

Vocabulary:

landfill, trash, waste, litter, marine debris, source, stormwater runoff, storm drain (storm sewer)

Materials:

- “Data Collection Form—Litter in Our Neighborhood” handout
- “Top Ten” Most Frequently Collected Marine Debris Items handout

Learning Skills:

Analyzing, Hypothesizing, Visualizing, Working in Small Groups

Duration:

20 minutes to assign the project and provided background information
Three days for students to collect data
40 minutes to discuss results of data collection

SAFETY PRECAUTIONS

In this lesson, students should not be picking up the litter they see, but instead, they should just record what they observe.

Activity

1. If the students have not learned about marine debris prior to this lesson, begin the lesson by reviewing the impacts of marine debris. Highlight how most debris found in our oceans is preventable through proper handling and disposal of waste items. Ask students where they are most likely to find litter in their community.

LESSON SIX

2. Distribute the “Data Collection Form – Litter in Our Neighborhood” handouts to the class. Instruct the students to use the form to record the number of pieces of litter they see during the next three days. For example, if a student sees three beverage cans, he or she should write “3” in the total box for that item.

3. After three days of data collection, have the students bring their Data Collection forms to class. Ask each student to identify the three types of litter they found most frequently. Ask a few students to share their “top three” items with the class. Discuss how these items came to be litter. Point out that waste and trash become **litter only after** they have been disposed of improperly.

4. Ask two students to volunteer to compile the data from all the Data Collection Forms, and identify the “Top Ten” most frequently littered items in your community. Depending on class size, students might need a day or two to complete this compilation exercise.

5. Write the “Top Ten” most frequently littered items in your community on the board, and then distribute the “Top Ten Most Frequently Collected Marine Debris Items” handouts to the class. Inform the students that the Ocean Conservancy coordinates annual beach cleanup events all over the country. Explain that volunteers record the items they find when they clean up beaches and the shores of rivers and send this information to the Ocean Conservancy, which compiles these lists every year.

6. Compare and contrast the two “Top Ten” lists.

- What litter items are on both lists?

- In what ways does your community’s “Top Ten” list differ from the US “Top Ten” list?
- Does your state have a “Bottle Bill” that requires a deposit on each bottle and can? If so, are bottles and cans on your community’s “Top Ten” list? If your state does not have a bottle bill, are bottles and cans on your community’s “Top Ten” list?
- Does your state have a curbside recycling program where citizens place recyclables in containers that are picked up for recycling? If so, are bottles and cans on your community’s “Top Ten” list? If your state does not have a curbside recycling program, are bottles and cans on your community’s “Top Ten” list?
- Ask students to share what surprised them about the two “Top Ten” lists.

Note: If you do this lesson every year, you can also have your class compare their “Top Ten” list with previous years in your community.

7. As a class, discuss how the different sources of debris contribute to the marine debris problem. Ask the students the following questions:

- What kinds of items become marine debris?
- How could the litter found in their community find its way to the ocean and become marine debris? It is important that the students understand what stormwater runoff is and that stormwater drains deposit rain water into streams and other waterways.
- What can the community do to prevent the generation of marine debris?
- What can each of your students do to prevent the generation of marine debris?

LESSON SIX

EXTENSIONS

Have students draw a scene that shows where marine debris comes from and how it finds its way into the environment.

Ask students to write a paragraph about one source of marine debris explaining what kinds of debris are generated by the source and how these items could enter the marine environment.

Have the students imagine they are an animal that lives in a marine or aquatic environment, like a fish, a crab, or a turtle. Ask them to write a story about what they would feel as they watched debris and litter enter their “home.” You can ask the following types of questions to help the students imagine the situation: How would you react to people throwing trash out of a car or onto the street? How would you react to people throwing trash into the water from boats or from the shore? What would you think about a piece of net floating in the water? How would you feel about cans and bottles blocking the entrance to your favorite cave?

If there is a storm drain (sometimes called storm sewer) nearby, show the students what it looks like. Tell them the name of the stream or river that the drain empties into. (If you do not know the name of the stream, see the US Geological Survey web site for maps that will help: www.usgs.gov and www.nationalatlas.gov) Ask students to count all the pieces of trash they find within about 25 feet of the storm drain. Also have them look into the storm drain to see if there is any trash inside. Ask the students what they think might happen to the trash around the drain. Observe the

trash around the storm drain before and after a heavy rain.

Ask the students to write a story, poem, or song about the “travels” of a piece of marine debris. The story, poem, or song should discuss where the marine debris began its journey, how it traveled, where it traveled, and where it ended up. Another option is to write, stage, and perform a play or puppet show that illustrates the travels of one or more pieces of marine debris.

Storm drains can be labeled with a stenciled message, “Don’t dump...this drains to the ocean” or other message so people can better understand that storm drains should be kept free of pollutants. Learn if a state agency or local nonprofit group has materials your students can use to apply this message to your community’s stormdrains. Be sure to get permission before applying paint or signs.



LESSON SIX



Beach in Hawaii.

The Northwestern Hawaiian Islands became an American National Monument in 2006, and are now the world's largest protected marine area. Rich in diversity and beauty, these islands also suffer from marine debris that comes from thousands of miles away. Using the following web sites, explore the Northwestern Hawaiian Islands and the impact marine debris is having on the birds, seals, and other animals that call them home.

Voyage to Kure

On this website you will take a fascinating voyage to Kure, one of the Northwestern Hawaiian Islands, with Jean-Michel Cousteau and 20 experienced divers and scientists. Through pod casts, expedition diaries and games, you will explore an

exciting part of our world, and learn how we can all help to protect it.

www.pbs.org/kqed/oceanadventures/episodes/kure

Northwestern Hawaiian Islands Marine National Monument

www.hawaiiireef.noaa.gov

NWHI National Marine Sanctuary Encyclopedia

This resource includes natural history, video clips, images, and fact sheets about the marine life of the Northwestern Hawaiian Islands.

www8.nos.noaa.gov/onms/park/Parks/?pID=12

HANDOUT

Data Collection Form – Litter in Our Neighborhood

Student Name: _____

Shoreline and Recreational Activities	Tally (H)	Total
Bags		
Balloons		
Beverage Bottles (Glass)		
Beverage Bottles (Plastic) ≤ 2 liters		
Beverage Cans		
Caps/Lids		
Clothing, Shoes		
Cups/Plates/Utensils		
Food Wrappers & Containers		
Pull Tabs		
Shotgun Shells/Wadding		
Six-Pack Holders		
Straws/Stirrers		
Toys		
Ocean and Waterway Activities	Tally (H)	Total
Bait Containers/Packaging		
Bleach/Cleaner Bottles		
Buoys/Floats		
Crab/Lobster/Fish Traps		
Crates		
Fishing Line		
Fishing Lures/Light Sticks		

LESSON SIX

HANDOUT

Ocean and Waterway Activities	Tally (III)	Total
Fishing Nets		
Light Bulbs/Tubes		
Oil/Lube Bottles		
Pallets		
Plastic Sheeting/Tarps		
Rope		
Strapping Bands		
Smoking-Related Activities	Tally (III)	Total
Cigar Tips		
Cigarette Lighters		
Cigarettes/Cigarette Filters		
Tobacco Packaging/Wrappers		
Dumping Activities	Tally (III)	Total
55-Gallon Drums		
Appliances		
Batteries		
Building Materials		
Cars/Car Parts		
Tires		
Other Items Found	Tally (III)	Total
Total Number of Litter Objects Collected in Our Neighborhood		<input type="text"/>

“Top Ten” Most Frequently Collected Marine Debris Items

*Data collected by volunteers in the United States
during the International Coastal Cleanup (1986-2010)*

Item	25 Year Totals
Cigarettes/Cigarette Filters	52,907,756
Food Wrappers/Containers	14,766,533
Caps/Lids	13,585,425
Cups/Plates/Utensils	10,112,038
Beverage Bottles (Plastic)	9,549,156
Bags (Plastic)	7,825,319
Beverage Bottles (Glass)	7,062,199
Beverage Cans	6,753,260
Straws/Stirrers	6,263,453
Rope	3,251,948
Total	132,077,087

The International Coastal Cleanup is
organized annually by the Ocean Conservancy.
www.oceanconservancy.org/our-work/marine-debris