

## Activity for All Grades



### Science skills

- Identifying
- Classifying
- Hypothesizing
- Cataloging
- Graphing

### Concepts

- Humans affect ocean ecosystems and marine wildlife.
- Through our efforts, we can make a difference in the amount of trash that enters the oceans.

### Objectives

- Students will demonstrate the role they can play in marine conservation by participating in a shoreline cleanup.
- Students conduct the shoreline cleanup according to a scientific method.

### Time to complete

Field trip to the beach, river, lake site:  
2-3 hours at the site

### Mode of instruction

Classroom discussion and preparation for field trip, then field trip to shoreline followed by data analysis in the classroom.

**If you would like to do your cleanup on California Coastal Cleanup Day, it is held on the third Saturday in September. Begin planning as soon as school starts in the fall!**



## Activity CA3 Clean Shorelines, Clean Oceans: Shoreline Cleanup

Tons of marine debris are picked up each year off California's beaches, river banks, and lake shores. Be a part of the solution—do a shoreline cleanup with your class. You never know what you may find!

### Background

If your students have completed the activities CA1: *Marine Debris—It's Everywhere!* and CA2: *Searching Out Nonpoint Sources of Pollution*, they will have an understanding of the many types of marine debris and its hazardous effects on wildlife. Now is the time to put this newfound awareness into action with a shoreline cleanup. The shoreline cleanup allows the students to participate in an immediate solution to the problem of marine debris; simultaneously, the students employ scientific methodology to analyze the problem of marine debris. They will form a hypothesis, decide on their purpose, follow a particular method, summarize their results, and make a final conclusion.

Picking up trash from beaches and waterways so it doesn't enter the oceans and harm marine life is clearly an important job. Why collect data on what you find? By collecting data, students can begin to understand the types and amount of trash littering the beach. From this information, students can also determine some possible sources of the debris. By determining what type of trash is littering the shore and how it might have arrived there, students will discover that marine debris is caused by human behavior. We all use and discard products that can become part of the problem, and by understanding this connection, we can begin to develop solutions to the problem. There are actions that we can take every day that can reduce marine debris.

### Activity

Follow instructions under "Outline" (in the sidebar, p. 134) for preparation for field trip.

1. The day before the field trip, discuss these steps of scientific methodology with your students:

**Purpose:** Students will come up with a purpose for their scientific study. A likely purpose might be, "I want to understand where marine debris comes from."

**Hypothesis:** Have your students come up with hypotheses they can test by collecting data during the cleanup. Possible hypotheses might include: "There is more marine debris farther up the beach than closer to the water." Or, "There is more plastic debris than any other type of debris."

**Method:** Students will break into teams to comb two different sections of the beach. One team will clean near the water line, another will clean the upland portion of the shore. Within each team, students will break into groups of 3-4 students to cover a segment of their section. In each group, one student will be the recorder, one student will hold the trash

## Materials

1. Separate bags for trash and recyclable debris
2. "Shoreline Cleanup Data Card"  
(There are two options available. *Option A* groups debris by its substance. This card allows for a reflection activity in which students determine what human actions led to the debris ending up on the shore, and allows them to understand which materials are most abundant. *Option B* is used by volunteers throughout the world during the International Coastal Cleanup. With this card, students organize the debris into source categories as they collect it.)
3. Clipboard and pencil for each small group (3-4 students)
4. School parental consent form
5. Adopt-a-Beach waiver form (if applicable)
6. First aid kit
7. Gloves (two for each small group)
8. Tide chart



and recycle bags, and two students with gloves will pick up the trash. Students will switch jobs half way through, so all students have an opportunity to pick up trash. Every item that is picked up is recorded on the data sheet. The groups will discuss and agree to which "category" each piece of debris belongs. If there is a question, the student should ask the teacher or adult supervisor (i.e., some debris will include both plastic and metal).

2. The morning of the cleanup, check weather conditions at the cleanup site and review the following safety information with the students:

- Do not go near any large metal drums.
- Do not pick up any sharp objects – inform an adult where the sharp object is located.
- Notify an adult if you find a syringe.
- Debris collectors wear gloves.
- Stay out of dunes and any protected areas.
- Watch out for wildlife and do not approach any animals you encounter.
- Don't lift anything too heavy.
- If you begin to feel very hot, dizzy or tired, drink some water and notify an adult.
- If you are walking near the surf, never turn your back to the ocean.

3. At the site, select a stretch of shoreline that the teams will cover. Make sure you have adequate supervision of the teams if the stretch is a wide one (choose the stretch according to the age of your class, cover a wide stretch with older children, or a shorter one with younger).

4. Instruct students to keep their eyes open to possible clues as to debris sources, e.g. are there adequate trash cans, is there a nearby storm outfall, does the site get heavy use, do people fish in the area?



## Preparation

Select a public site for the cleanup and a field trip date. For locations on the coast, San Francisco Bay, and some inland waterways, call (800) Coast-4U or visit [www.coastforyou.org](http://www.coastforyou.org) to find a local Adopt-A-Beach manager. (If you wish to hold your cleanup on Coastal Cleanup Day, the third Saturday in September, use the same phone number and webpage to obtain local participation information.) The beach manager will assist you in selecting a clean up location and will supply you with bags, gloves, and waivers for your students. Arrange with the beach manager to have the trash and recycling collected after your cleanup.

If you would like to do a shoreline cleanup and are in an inland area that is not covered by the Adopt-A-Beach program, try contacting your local city or county public works department for assistance with supplies or find a local citizens' group that holds cleanups in your area. (Check the on-line "Marine, Coastal & Watershed Resource Directory" at [www.coastforyou.org](http://www.coastforyou.org).)



5. Have students assemble into their two teams (waterline and upper shore). Within their teams, have students break up into groups of four students:

1. Data writer
2. Debris bag holder
3. Debris collector
4. Debris collector

6. Within each group of four, distribute one trash bag, one recycling bag, two gloves (one for each of the two people who will pick up debris) and one data card with clipboard and pencil.

7. Define the boundaries of the project for the students and adult volunteers so no one strays away. Set a time for the completion of the cleanup and a meeting place, and identify a way of telling students when it is time to return (e.g., three blows on a whistle, a special classroom signal or call, etc.). Remind the students to only work in their designated area (water line or upper shore).

8. After the cleanup, pile the bags in two designated areas: one for recyclables, and one for nonrecyclables. Collect the clip boards and data cards. Have lunch and congratulate yourselves on a job well done. Be sure not to leave any trash from your lunches behind! You may place your trash in your bags.

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## Results and reflection

Back in the classroom, analyze the data collected at the cleanup:

1. Individually or in groups, provide students with copies of all the data cards. Have them tabulate the data card totals onto two new data cards—one for the water line and one for the upper shore. (This may be done as a homework assignment or it may be assigned to a designated two students if you prefer.)
2. Break the students into their small groups of four. Photocopy the two data cards that contain the totals from the beach cleanup and give each small group a copy of the card for the area that they cleaned up.
3. If Data Card Option A was used, the class (or each small group) will choose a method for organizing the data. Some ideas include keeping it organized by material (plastic, glass...), or organizing it by the source activity (fishing, littering, dumping...), or by the manner in which they think the debris reached the beach (from boats, from beach-goers, through storm drains...). You may choose to have students transfer their data to Data Card Option B to help guide them to possible conclusions as to the source of the debris.
4. Each small group will choose a method for displaying the data from their cleanup area: pie charts, line graphs, and/or bar graphs.
5. Have each team share their visual presentation of the data with the class. Did the results confirm the hypotheses that were made before the cleanup? Which was the most effective method of presenting the data? Which was most visually appealing? Which was the easiest to understand? Did they tell different stories?

## Outline

### Before class

Two weeks to one month before cleanup:

1. Select a cleanup site. The shoreline should be sand or gravel and known to collect litter.
2. Begin assembling the materials and support you need. (Decide whether to use Data Card *Option A* or *Option B*. Page 2 backside will be the same for either option.)
3. Arrange transportation to the site.
4. If using the Adopt-A-Beach Program, send the school's parental consent form and the Adopt-A-Beach waiver form home with the students to be signed and returned.
5. You may wish to obtain a SHARPS container for syringes the students may discover. Your local fire department can assist you.


### Day before cleanup

1. Collect parental consent forms.
2. Break the class up into two teams. One team will be responsible for the upland portion of the shoreline (if there are dunes at the beach, this team will clean up the beach-side of the dunes). The other team will be responsible for the water line. Within each team, students will break out into small groups of four students.
3. As a group, predict the type of debris that each group will find. Will there be a difference? Why?
4. Discuss the purpose of the cleanup.
5. Go over the data cards with the students.
6. Remind the students to wear appropriate clothing for the cleanup: layers, closed-toed shoes, hats and sun screen. Suggest that they bring a bottle of drinking water for their own use during the field trip as well as a bag lunch. (You may want to encourage the students to try to create a "trash-free" lunch, using recyclable and reusable containers.)
7. Photocopy data cards (*Option A* or *Option B*), one per each group of four students.

### Day of cleanup

Follow activity instructions.

### Day after cleanup

Data analysis and classroom discussion. 

6. After the presentations, conduct a whole class discussion that touches on relevant questions, such as:

- Where is the trash coming from?
- Do certain items indicate specific sources of debris? (For example, fishing nets represent the fishing industry and are an ocean-based source of marine debris.)
- How can the information that was collected be used by the students and others to reduce marine debris? (Perform Activity CA4 to delve further into this topic.)
- Why is it important to know the location of the debris and the date of the sampling? Where does most of the trash accumulate? Which items of debris do they think are the most dangerous to marine wildlife?
- How does it make them feel to see the trash along the beach?
- How does it make them feel to see the beach clean after their work?

## Conclusions

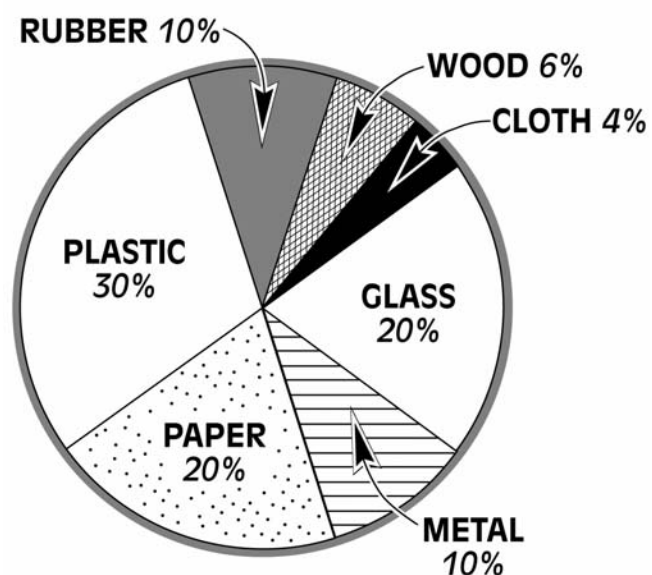
A cleanup helps us care for our shorelines and oceans, and tells us about what types of debris builds up on the shore. Knowing this, we can make some lifestyle choices to reduce marine debris.

## Extensions and applications

1. Ask students to bring a "trashless" lunch to the cleanup, using reusable containers. Discuss alternatives to plastic sandwich bags, paper lunch sacks, disposable drink containers, etc.
2. Make a display of the trash collected.
3. Write an article about your beach cleanup for school or local newspaper (See Appendix D, *Make Your Views Known*).

## Adapted from

*Save Our Seas*, A Curriculum for Kindergarten through Twelfth grades. The Ocean Conservancy (formerly known as Center for Marine Conservation) and California Coastal Commission, 1993.



# Shoreline Cleanup Data Card

## Option A, page 1

- ✓ Count items in groups of five and record the total. For example: ~~||||~~|||| || = 12
- ✓ Do not write the words "lots" or "many." Please count each item.
- ✓ Please leave natural items such as driftwood and seaweed on the beach.
- ✓ Avoid stepping on dune grass and plants. They hold the sand and prevent erosion.
- ✓ Work with a few people—have one person record the numbers while others collect and bag the trash.

### PLASTIC

	# of items (        )	Total # of items		# of items (        )	Total # of items
Bags:			Cups, utensils, plates, straws		
food bags/wrappers		<input type="text"/>	Diapers		<input type="text"/>
other bags		<input type="text"/>	Fast food containers		<input type="text"/>
Bottles:		<input type="text"/>	Fishing line, nets, lures, floats		<input type="text"/>
beverage bottles		<input type="text"/>	Foam peanuts		<input type="text"/>
motor oil/lube bottles		<input type="text"/>	Six-pack holders		<input type="text"/>
other plastic bottles		<input type="text"/>	Syringes		<input type="text"/>
Caps, lids		<input type="text"/>	Tampon applicators		<input type="text"/>
Cigarette filters		<input type="text"/>	Toys		<input type="text"/>
Cigarette lighters		<input type="text"/>	Other plastic		<input type="text"/>
Cigar tips		<input type="text"/>			

### GLASS

Beverage bottles	<input type="text"/>	Other glass	<input type="text"/>
Other bottles/jars	<input type="text"/>		

### METAL

Bottle caps, pull tabs	<input type="text"/>	Nails	<input type="text"/>
Beverage cans	<input type="text"/>	Other metal	<input type="text"/>
Other cans	<input type="text"/>		

### RUBBER

Balloons	<input type="text"/>	Tires	<input type="text"/>
Condoms	<input type="text"/>	Other rubber	<input type="text"/>

### PAPER

Bags	<input type="text"/>	Cups/plates	<input type="text"/>
Cardboard	<input type="text"/>	Newspapers/magazines	<input type="text"/>
Cartons	<input type="text"/>	Other paper	<input type="text"/>

### WOOD

Lumber pieces	<input type="text"/>	Other wood	<input type="text"/>
Pallets	<input type="text"/>		

### CLOTH

Clothing	<input type="text"/>	Other cloth	<input type="text"/>
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# ITEMS COLLECTED



The Ocean Conservancy  
www.oceanconservancy.org

### Human-made debris, trash and litter...

- ◆ Harms the environment & wildlife
- ◆ Threatens human health & safety
- ◆ Causes communities to lose money
- ◆ Looks bad!

Think about where all this debris comes from and how **we** can prevent it!

Please pick up **all** debris found on the beach. Record information on **only** the items listed below.

Keep a count of your items using tick marks and enter the item total in the box. **Example:** 8 Beverage Cans | | | | |

### SHORELINE AND RECREATIONAL ACTIVITIES

(Debris from beach-goers, sports/games, festivals, litter from streets/storm drains, etc.)

<table border="0" style="width: 100%;"> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Bags</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Balloons</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Beverage Bottles (plastic) 2 liters or less</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;"> </td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Beverage Bottles (glass)</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Beverage Cans</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Caps, Lids</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Clothing, Shoes</td></tr> </table>		Bags		Balloons		Beverage Bottles (plastic) 2 liters or less				Beverage Bottles (glass)		Beverage Cans		Caps, Lids		Clothing, Shoes	<table border="0" style="width: 100%;"> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Cups, Plates, Forks, Knives, Spoons</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Food Wrappers/Containers</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;"> </td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Pull Tabs</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">6-Pack Holders</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Shotgun Shells/Wadding</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Straws, Stirrers</td></tr> <tr><td style="border: 1px solid black; width: 30px; height: 20px;"></td><td style="border-bottom: 1px solid black;">Toys</td></tr> </table>		Cups, Plates, Forks, Knives, Spoons		Food Wrappers/Containers				Pull Tabs		6-Pack Holders		Shotgun Shells/Wadding		Straws, Stirrers		Toys
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### OCEAN/WATERWAY ACTIVITIES

(Debris from recreational/commercial fishing and boat/vessel operations)

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### SMOKING-RELATED ACTIVITIES

	Cigarettes/Cigarette Filters
	Cigarette Lighters
	Cigar Tips
	Tobacco Packaging/Wrappers

### DUMPING ACTIVITIES

	Appliances (refrigerators, washers, etc.)
	Batteries
	Building Materials
	Cars/Car Parts
	55-Gal. Drums
	Tires

### MEDICAL/PERSONAL HYGIENE

	Condoms
	Diapers
	Syringes
	Tampons/Tampon Applicators

### DEBRIS ITEMS OF LOCAL CONCERN

(Identify and count 3 other items found that concern you)


**Page 2, Options A and B**  
**Shoreline Cleanup Data Card**

Beach Section (circle one):                      Water line                      Upper shore

Name(s) \_\_\_\_\_

School \_\_\_\_\_

Teacher \_\_\_\_\_

Age \_\_\_\_\_ Today's Date \_\_\_\_\_

Shoreline cleaned \_\_\_\_\_

City/Location \_\_\_\_\_

Number of people working on this data card \_\_\_\_\_

Number of trash bags filled \_\_\_\_\_ Number of recycling bags filled \_\_\_\_\_

**SAFETY TIPS**

1. Do not go near any large metal drums.
2. Do not pick up any sharp objects (inform your teacher where the sharp object is located).
3. Notify an adult if you find a syringe.
4. Wear gloves.
5. Stay out of dunes and any protected areas.
6. Watch out for wildlife and do not approach any animals you encounter.
7. Don't lift anything too heavy.
8. If you begin to feel very hot, dizzy or tired, drink some water and notify an adult.
9. If you are walking near the surf, never turn your back to the ocean.

What is the most peculiar item you collected? \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_