

# **PLASTIC BEACH**

This lesson plan developed by:



#### **Overview:**

This activity will educate students on plastic pollution/trash found in our oceans and on our beaches. Students will learn the negative environmental effects of plastic pollution, along with solutions. The students will carry out beach research to document how much plastic pollution is on a local beach by analyzing plastic pollution in multiple 1-meter by 1-meter quadrants.

#### Materials:

- One square meter wooden frame or four meter rope
- 5-gallon bucket to hold sediment from meter section
- Metal scoop or hand shovel
- 2 Tyler sieves (5mm and 1mm) or a normal kitchen sieve (if not being scientific)
- Container to collect microplastics
- Data sheet
- Scale (digital or handheld)
- Pencil

#### **Duration**:

1-2 hours

**Physical Activity:** 

Moderate

### **Background:**

Plastic pollution is plastic trash that is found on beaches and throughout our oceans and waterways. Plastic pollution comes from people littering, not recycling, and poor waste

## Plastic Beach (cont.)



management. Plastic pollution is an important environmental concern to local and global communities. Single-use plastics are items that are only used for a few minutes and then thrown away. A lot of single-use plastic items cannot be recycled and end up in landfills or our ocean. Plastics can harm aquatic fish, marine mammals and birds through ingestion, entanglement, and possible biological effects.

Plastic pollution moves from one country to another through ocean currents. A lot of plastic pollution can be found in wrack line (last high tide mark) on beach. Waves push the plastic to the beach from the center of the oceans. Documenting plastic pollution will help strengthen laws that keep beaches and waterways cleaner.



#### **Activity:**

- 1. Select a local sandy beach. Depending on how many students are involved, determine the number of quadrants to carry out. Three to four students should be assigned to each quadrant. Quadrant locations should be spread out along the high tide debris deposit line, also known as the "wrack line." The wrack line is often full of seaweed and driftwood. At least four 1-meter by 1-meter quadrants will be carried out at each beach. Please make a detailed map of the site with the location identified by landmarks and GPS for each quadrant.
- 2. At each collection site, take the 1-meter by 1-meter wood frame, or rope stretched to make a 1-meter by 1-meter square, over the high tide wrack-line. If using a rope use stakes to hold the corners.
- 3. Remove big pieces of natural debris, like seaweed, leaves and wood.
- 4. Mark the 10-liter level, usually the halfway point on a 5-gallon bucket, on the large plastic

## Plastic Beach (cont.)

SAILORS ESEA

bucket.

- 5. Using a small shovel, scoop the surface of the grid evenly until the 10-liter level is reached. This is approximately 3cm. of the surface. Scrape the surface EVENLY! Do not dig a hole in the sand.
- 6. Sieve all of the sand through the stacked Tyler sieves. If the sand is wet you will likely need to flush the sand through the sieves with water. This works very well if you bring a second bucket with you and fill it with water.
- 7. If you do not have Tyler sieves, a wire mesh colander can be used. Please note the size of sieve/s used.
- 8. Transfer the contents of the colander to the collection bag or box.
- 9. Fill out the sample identification (below). Label and place it with the sample.
- 10. Empty each sample into a pan and sort items (and weigh) into the categories listed on the data sheet titled "Microplastic Debris Data Card." Fill out data sheet for each sample that is taken.



## Additional Resources:

To learn more about the activity, check out our <u>Plastic Beach "how to" video</u>.

## **Ocean Literacy Principles:**

Ocean literacy is an understanding of the ocean's influence on us, and our impact on the ocean. There are seven <u>Ocean Literacy Essential Principles</u> that all people of our blue planet should have an opportunity to learn and understand. This activity touches upon the following Essential Principles:

6. The ocean and humans are inextricably interconnected

## Further Your Impact with Sailors for the Sea Powered by Oceana:

As sailors and water-lovers, you are among the first to notice changes to our seas such as fewer marine animals, more pollution and damaged marine habitat. Through our Green Boating initiative, Sailors for the Sea Powered by Oceana provides opportunities for you and your community to address pressing ocean health issues. As a Green Boater, you will be provided with the information, resources and access to combat marine plastic pollution, prevent habitat destruction, source responsible seafood and protect marine animals. From demanding plastic-free alternatives to choosing sustainable seafood, your voice and actions are an important part of restoring the abundance of our oceans and protecting marine habitats. Join our growing Green Boating Community today.



Sample Identification			
Detailed Location			
of sample			
collection site			
Date			
Collected by:			

Sample Identification			
Detailed Location			
of sample			
collection site			
Date			
Collected by:			

Sample Identification		
Detailed Location		
of sample		
collection site		
Date		
Collected by:		



5 GYRES MICRO-DEBRIS DATA CARD					
Quadrant #:					
Beach Name:					
GPS Coordinates:					
	Quantity	DESCRIPTION: Can the object be			
		identified by type or product?			
PLASTIC					
Fragment Pieces of hard plastic debris that is					
Ecom					
Expanded polystyrene used for insulation or					
Film					
Flat and flexible plastic debris, such as pieces of					
Food wrappers.					
Pellets					
Pre-production plastic pellets, also known as "nurdles."					
Filament					
Examples of filament include: fishing line, rope, synthetic cloth.					
Other jugs or containers					
Bottle or container caps					
Cigar tips					
Cigarettes					
Personal care products					
Other:					
TOTAL PLASTIC WEIGHT (kg.)					
PAPER and METAL					
Paper and cardboard					
Metal (aluminum foil, etc)					
Other:					
TOTAL PAPER AND METAL WEIGHT (kg.)					
OTHER					
Balloons					
Glass					
Rubber bands					
Tires					
Tar					
Other: (Describe in detail)					
TOTAL OTHER DEBRIS WEIGHT (kg.)					
TOTAL WEIGHT OF ALL CATEGORIES (kg.)					