



KIDS ENVIRONMENTAL LESSON PLANS

This lesson plan developed by:



Plastic Beach



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.

Ocean Literacy Principles:

- 6. The ocean and humans are inextricably interconnected



Plastic Beach (cont.)

Key Concepts:

Students analyze 1-meter by 1-meter quadrants in wrack line (last high tide) to examine plastic pollution within the quadrant. Students learn that plastic pollution (micro and macro particles) is an environmental issue. Students will discuss how the plastic pollution made it to the beach and what solutions exist to reduce plastic pollution.

Materials:

- one square meter defined by a wooden frame or 4-meter rope loop
- one 5-gallon bucket to hold sediment from meter section
- metal scoop (or any sort of hand shovel)
- two sieves (5mm and 1mm) or a normal kitchen sieve (if not being scientific)
- data sheet (attached)
- scale (digital or handheld)

Duration:

1-2 hours (or longer depending on how many sites the students explore)

Physical Activity:

Moderate

Background:

- Plastic pollution is plastic trash that is found on beaches and throughout the oceans. Plastic pollution comes from people littering, not recycling, and poor waste management.
- Plastic pollution is an important environmental concern to local and global communities.
- Plastic pollution can harm aquatic fish, marine mammals and birds through ingestion, entanglement, and possible biological effects.
- Documenting plastic pollution will help strengthen laws that keep beaches cleaner.
- 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.
- 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.

Activity:

1. Select a local beach. Depending on how many students are involved, determine the number of quadrants to carry out. 3-4 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.

Plastic Beach (cont.)



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 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.

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.](#)





Plastic Beach (cont.)

<i>Sample Identification</i>	
Detailed Location of sample collection site	
Date	
Collected by:	

<i>Sample Identification</i>	
Detailed Location of sample collection site	
Date	
Collected by:	

<i>Sample Identification</i>	
Detailed Location of sample collection site	
Date	
Collected by:	



Plastic Beach (cont.)

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 unrecognizable.		
Foam Expanded polystyrene used for insulation or packaging, sometimes called "Styrofoam"		
Film Flat and flexible plastic debris, such as pieces of bags or wrappers. Food wrappers (chip, candy, etc..)		
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.)		