



KIDS ENVIRONMENTAL LESSON PLANS

This lesson 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



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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 litter or plastic trash that is found on beaches and throughout the oceans. Plastic pollution comes from people littering, not recycling, and bad waste management.
- Plastic pollution is an important environmental concern to local communities and in communities around the world.
- Plastic pollution can harm aquatic fish, marine mammals and birds through indigestion, entanglement, and possible biological effects. Plastic pollution can also make a beach dirty and ugly.
- Beach research that documents 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 plastic is plastic 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.
- In order to reduce plastic pollution in our oceans, people need to use less single-use plastic and recycle in their daily lives, communities should encourage cities to ban plastic bags and other single-use plastic items, and students need to spread the word about the problems related to plastic pollution.

Activity:

1. Select a local beach in community. Depending on how many students are involved, select

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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 exact 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 perfect 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. Brush them off and throw them away. We don’t need them in this study.
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.
11. Email marcus@5gyers.com and carolynn@5gyers.com all results, pictures, data sheets and any questions.





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<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:	



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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.)		