

Pollution Percentages

OBJECTIVE

Given a sample of marine debris, the student will be able to sort the debris into four groups. The students will be able to gather and interpret data from the debris and solve real-life problems involving percentages.

Given examples of trash, the student will be able to predict and test how it would degrade in the ocean and discuss its impact on the marine ecosystem. After demonstrating how some materials degrade in water, better than others, the student will be able to predict the impact of various human activities on the marine ecosystem.

MATERIALS

- debris gathered from a beach, streambed, or roadside
- scale
- pencils and paper
- calculator (optional)
- a tub large enough to completely submerge trash
- water

BACKGROUND

Today, more and more manufactured items are made of plastics. Why are plastics in such high demand? Plastic materials are lightweight, strong, and durable. Unfortunately, the same characteristics have made plastics a problem in the ocean. Unlike wood, paper, metals, and glass, most plastics don't degrade (break down into simpler compounds), or they degrade very slowly. This means that a piece of discarded plastic discarded today will still be here in 500 years! Some plastic manufacturers continue to explore the possibility of manufacturing degradable plastics.

Some plastics can be recycled. One common end product of PET (polyethylene terephthalate) plastic is fiberfill. Just 36 two-liter PET soft drink bottles can make enough fiberfill for a sleeping bag.



ACTION

PART ONE:

1. Take a field trip to a local beach, stream, or roadside and collect debris you find there.
2. Separate the debris into four groups: plastic, wood products (including paper), metal, and glass.
3. By weighing each group, find its percentage of total weight.
 - What type of debris is most prevalent by weight?
 - What type of debris is most prevalent by number of pieces?
4. Discuss the possible origins of the debris you recovered.

PART TWO:

5. Assign students to work in cooperative learning groups. Each student group selects one item of trash from each of the four categories. Ask them to predict which items will degrade fastest and slowest when submerged in water.
6. Have students submerge their items in a large tub of water.
7. Once a week, have each group remove and examine each piece of their "trash" and record changes in its appearance.
8. At the end of the semester, have students chart which items degraded

fastest and which degraded slowest.

9. Discuss the potential impact each type of trash might have on the marine ecosystem. Brainstorm ways to decrease the percentage of waste, being sure to discuss consumer choices, recycling, legislation, and habitat clean-ups.

DEEPER DEPTHS

Have students research bioplastics (i.e. biodegradable knives, forks, dishes, and cups) online. Students can then discuss whether or not bioplastics are a good solution to decreasing the amount of plastics in landfills. What are some other options for decreasing the high percentage of plastics in landfills?



Beach clean-up volunteers sort trash. Such efforts do more than just keep beaches clean: they also help prevent marine animals from ingesting or becoming entangled in trash.