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Paper or Plastic?

Shoppers have the opportunity to make a choice every time they make a trip to the grocery store: paper or plastic? Many consumers may wonder which type of bag is better for the environment. To assess the comparative environmental impacts of each material is not a simple matter; it requires consideration of the inputs of matter and energy throughout each stage of the life cycle of each product.

Plastics are produced from the waste products of oil refining. An analysis of the life cycle of plastic bags includes consideration of the environmental impacts associated with the extraction of oil, the separation of products in the refining process, and the manufacturing of plastics. The total environmental impact depends upon the efficiency of operations at each stage and the effectiveness of their environmental protection measures. Paper is produced from trees; environmental impacts include those associated with extracting timber and processing it for paper products. Again, the environmental impacts depend on whether the timber was obtained from a sustainably **managed forest** - most industrial timber products in the U.S. come from plantations - and the environmental management of the paper processing plant. Comparatively, plastic bags require less energy to produce.

Both paper and plastic bags have to be transported to stores, which requires energy and creates emissions. In this comparison, plastic is preferable because plastic bags are lighter in weight and more compact than paper bags. It would take approximately seven trucks to transport the same number of paper bags as can be transported by a single truck full of plastic bags.

The disposal of bags entails additional environmental impacts. If landfilled, plastic bags are more environmentally benign than paper, as they require less space; paper occupies approximately half of overall landfill volume. Plastics (not just bags) generate 14 to 28 percent of the volume of trash in general, but because much of it can be compressed, only 9 to 12 percent of the volume of waste in landfills. Although plastics do not biodegrade, modern landfills are designed in such a way that *nothing* biodegrades, because the waste is isolated from air and water in order to prevent groundwater contamination and air pollution. As manufacturers have continued to make their plastic packaging thinner and lighter to save materials, the percentage of landfill volume taken up by plastics has remained steady since 1970 even as plastics have become more widely used.

Not all trash ends up in landfills; in the U.S. about 80 percent does. Stray plastic bags, which have been estimated at one to three percent of the hundreds of billions that are produced each year, are now found almost everywhere on the planet. Although littering and trash laws in developing countries have significantly reduced the amount of improperly disposed trash, many developing countries have fewer trash receptacles, landfills, and programs to handle the increasing amount of trash.

Plastic bags pose a threat to marine life, because, if ingested, the bags can block the stomach and cause starvation. Sea turtles, for example, mistake plastic bags for jellyfish. In 2002 a minke whale that washed up on a beach at Normandy was found to have 800

Did you know?

It is estimated that somewhere between 500 billion and one trillion plastic bags are consumed throughout the world each year. In 1977, supermarkets began to offer plastic grocery bags as an alternative to paper bags. By 1996, four out of every five grocery bags used were plastic.

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grams of plastic and other packaging in its stomach. Stray plastic bags can also clog sewer pipes, leading to stagnant, standing water and associated health hazards. In 2002, Bangladesh banned plastic bags after drains blocked by bags contributed to widespread monsoon flooding in 1988 and 1998. Ireland has decreased plastic bag consumption by placing a consumer tax on plastic bags. Perhaps the most strict plastic bag regulations are found in the Indian province of Himachal Pradesh, where people caught with plastic bags are **fined \$2000**. To see how many plastic bags your household uses in a week, download Environment Australia's [Household Plastic Bag Survey](#).

Recommended Resources

More Than Meets the Eye: Paper or Plastic?

The Washington Post collated data from across the web to create this informative chart comparing paper and plastic bags by consumer choice, resources used during production, pollution, recycling methods and rate, and biodegradability.



Australian Department of the Environment and Heritage: The Impacts of Degradable Plastic Bags in Australia

This 2004 report on the possible impact of introducing degradable plastics for mass consumer use in Australia, builds on two previous reports summarizing the country's plastic bag use and corresponding environmental impacts.

FOR THE CLASSROOM

Michigan Department of Environmental Quality: Life Cycle Analysis of Paper and Plastic Bags

Part of the Michigan Environmental Education Curriculum, this interactive lesson walks students through the life cycles of both paper and plastic bags.

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