



MORE THAN MEETS THE EYE

An occasional feature that digs deeper into things you've been wondering about

Paper or Plastic?

We hear the question almost every time we go grocery shopping. Some shoppers answer automatically: plastic — convinced that they are making a better choice for the environment. Others ask for paper, believing the very same thing. The reality is that both paper and plastic bags gobble up natural resources and cause significant pollution. When you weigh all the costs to the environment, **you might just choose to reuse:**



PAPER

CONSUMPTION

Americans consume more than **10 billion paper bags** each year. Some **14 million trees** are cut down annually for paper bag production.

Four out of five grocery bags in this country are plastic. The U.S. uses 100 billion plastic bags annually, made from an estimated 12 million barrels of oil.



PLASTIC

Worldwide, an estimated 4 billion plastic bags end up as litter each year. Tied end to end, **the bags could circle the Earth 63 times.**



PRODUCTION

Paper, of course, comes from trees. Trees are grown or found, then marked and felled.

1. Logs are moved from the forest to a mill, where there is a three-year wait for the logs to dry before they can be used.
2. Logs are stripped of bark and chipped into one-inch squares. The chips are "cooked" with tremendous heat and pressure.
3. Then, they are "digested" with limestone and sulfuric acid until the wood becomes pulp.
4. The pulp is washed, requiring thousands of gallons of fresh water and bleach, then pressed into finished paper.
5. Cutting, printing, packaging and shipping to make paper bags require additional time, labor and energy.

It takes more than four times as much energy to manufacture a paper bag as it does a plastic bag.

Energy to produce bags:

Plastic **594 BTUs***
Paper **2,511 BTUs**

7 in 10 Americans do not know that plastic is made from petroleum products, primarily oil, according to a recent nationwide online survey.

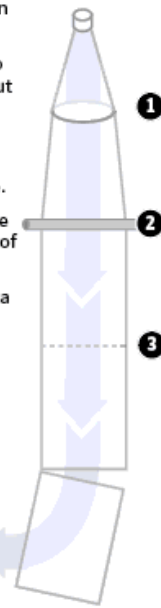


* BTU = British thermal unit

Plastic is a by-product of oil refining. Plastic bags are made from polyethylene, which comes from oil refineries as small resin pellets.

1. A machine heats the pellet to about 340 degrees and pulls out from it a long, thin tube of cooling plastic.
2. A hot bar is dropped on the tube at intervals, melting a line.
3. Each melted line becomes the bottom of one bag and the top of another.
4. The sections are cut out and a hole for the bag's handles is stamped in each piece.

Pellet (Approx. size)



POLLUTION

The use of toxic chemicals during the production of paper for bags contributes to air pollution, such as acid rain, and water pollution.

The production of paper bags generates 70 percent more air and 50 times more water pollutants than production of plastic bags.

Air pollutants

Plastic **1**
Paper **70**

Water pollutants

Plastic **1**
Paper **50**

Plastics production requires toxic chemicals. In an EPA ranking of chemicals that generate the most hazardous waste, five of the top six were commonly used by the plastics industry.

Hundreds of thousands of marine mammals die every year after eating discarded plastic bags. Turtles think the bags are jellyfish, their primary food source. Bags choke animals or block their intestines.



RECYCLING

Paper must be returned to pulp by using many chemicals to bleach and disperse the fibers. Although paper bags have a higher recycling rate than plastic, each new paper grocery bag you use is made from mostly virgin pulp for better strength and elasticity. Bags that are recycled are often turned into corrugated cardboard, not new paper bags.

It takes 98% less energy to recycle a pound of plastic than it takes to recycle a pound of paper.

Energy used to recycle bags:

Plastic | 17 BTUs

Paper | 1,444 BTUs

But recycling rates of both types of bags are extremely low.

Percentage of bags recycled:

1-3%

Plastic

10-15%

Paper

Recycling almost any kind of plastic involves remelting and re-forming it. Because bags must first be separated by the type of plastic they were made from, the process is time-consuming and expensive. For example, it can cost \$4,000 to process and recycle 1 ton of plastic bags. This can then be sold on the commodities market for about \$32. More often than not, bags collected for recycling never get recycled. A growing trend is to ship them to countries such as India and China, where they are cheaply incinerated under more lax environmental laws.

BIODEGRADABLE?

Paper is degradable, but it cannot completely break down in modern landfills because of the lack of water, light, oxygen and other necessary elements. About 95 percent of garbage is buried beneath layers of soil that make it difficult for air and sunlight to reach it.

Even though petroleum-based plastic will never biodegrade, nearly 4 in 10 believe plastic will biodegrade underground, in landfills or in the ocean.



Petroleum-based plastics are not biodegradable, meaning they will not decompose over time. But they do take up less space than paper in a landfill: 2,000 plastic bags weigh 30 pounds; 2,000 paper bags weigh 280 pounds.



WHAT YOU CAN DO

▶ **Invest in high-quality reusable bags**, each of which has the potential to eliminate an average of 1,000 plastic bags over its lifetime. The bag will pay for itself if your grocery store offers a 5- or 10-cent credit per bag.

▶ **Buy collapsible plastic crates** ▶ and keep them in your car. At checkout, food goes into the crates, making it easy to bring food into the house in one or two trips.



▶ **No bag at all?** Think twice about requesting a plastic bag if your purchase is small and easy to carry.

▶ **Reuse the bags you have.** Line your litter box with them; crumple them and use them for packing; cut the handles off, add some string and make a toy parachute; use them for an impromptu diaper pail; line your trash cans with them; be creative.

▶ **Keep reusable bags in your home, office or car** so they are available when you go shopping.

SOURCES: American Chemistry Council; American Forest and Paper Association; "Comparison of the Effects on the Environment of Polyethylene and Paper Carrier Bags," Federal Office of the Environment, August 1988; Institute for Lifecycle Environmental Assessment; Paper Industry Association Council; "Resources and Environmental Profile Analysis of Polyethylene and Unbleached Paper Grocery Sacks," Franklin Group, 1990; Reusablebags.com; Society of Plastics Industry; U.S. Environmental Protection Agency; Worldwatch Institute; GRAPHIC: Brenna Maloney and Laura Stanton - The Washington Post