



Trash Can Quiz

Fun Facts About Trash and Recycling

Adapted from the clickable garbage can developed
by Environmental Defense

Have your students take the "Trash Can Quiz" and see how much you know about the treasures we throw away. This activity helps students understand the "materials flow" of many products we use, from the natural resource through manufacturing and disposal. Happy reducing, re-using, recycling, and rotting! And remember, we cannot consume our way to sustainability - reducing and re-using are crucial, not just recycling.

How to do the Activity

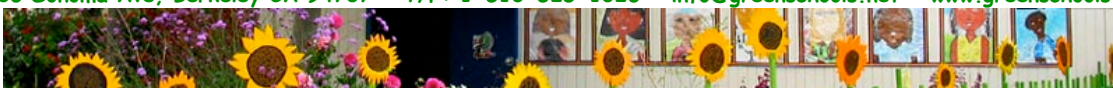
Bring in a small garbage can filled with typical items thrown away: plastic water bottle, soda can, office paper, banana peel, tin can, leaves or grass clippings, newspaper. Call on students one at a time to come up, close their eyes (or blindfold), reach in and pick out a treasure.... then surprise them with these amazing statistics (below) by asking a series of questions about how much we throw away in the U.S., how much recycling could save, and what can be made from recycled materials. These statistics are national for the U.S. and are from a variety of years (1990's and beyond). You can often go to your local waste management authority's website and get localized statistics and information for your area.

Sample Script

For each item chosen by a student from the trash can, ask questions like the following:

- What is it? (a can, a bottle, a piece of paper, etc.)
- What is it made of? (glass, metal, etc.)
- What resources are used to make this? (glass is made from sand, paper is made from trees, plastic is made from oil, cans are made from aluminum that is made from bauxite, etc.)
- Where does this resource come from? (sand comes from desert, rivers; trees for paper come from forests in US, Canada, Indonesia, Amazon; oil comes from Alaska, South America, Africa, Texas, Middle East; etc.)
- How much of this item do you think Americans use? (see the statistics below)
- Can this item be re-used? Can it be recycled? Can it be rotted?
- Can you make the same thing out of the recycled item - is it a closed loop? (a new bottle can be made from recycled glass; a new soda-can can be made from recycled aluminum; a new plastic bottle CANNOT be made from recycled plastic, but other plastic items like carpet, fleece jackets, or plastic lumber can be made from recycled plastic bottles; new paper can be made from recycled paper; new soil can be made from composted banana, etc.)
- How much could we save if this item were recycled, re-used, or rotted? (see statistics below)

Have fun with this! Express amazement about the amount of resources we use and how much we can save. Ask students if they can imagine these amounts. Ask if they know how to express some of these very large numbers. Ask them what they think.



GLASS BOTTLES

We throw away enough glass bottles and jars to fill two TransAmerica (the pyramid building in San Francisco) buildings *every two weeks*.

Glass never wears out -- it can be recycled forever. We save more than a ton of resources for every ton of glass recycled -- 1,330 pounds of sand, 433 pounds of soda ash, 433 pounds of limestone, and 151 pounds of feldspar. A ton of glass produced from raw materials created 384 pounds of mining waste. Using 50% recycled glass cuts it by about 75%.

ALUMINUM CANS

American consumers and industry throw away enough aluminum to rebuild our entire commercial airfleet *every three months*.

Aluminum smelting requires A LOT of energy. Making a new can from recycled aluminum can save up to 95% of the energy required compared to "virgin" aluminum (made from all new resources).

Aluminum recycling rates have dropped from a high of 65% and are now about 63%. Americans use about 350 aluminum cans per person per year. In 2001, Americans *did not* recycle 51 billion cans.

Recycling 1 aluminum can saves enough energy to run a laptop computer for 4 hours. In the U.S., we throw away cans representing about 200 billion hours of electricity - that's a lot of power plants!

PLASTIC BOTTLES AND PLASTIC BAGS

Americans go through 2.5 million plastic bottles *every hour*, only a small percentage of which are recycled.

In 2002, 4-5 *trillion* plastic bags were used globally.

Americans throw out 100 billion plastic bags per year, only about 0.6% of the bags are recycled.

Plastic can be recycled to make fleece fabric, carpet, sleeping bags, artificial lumber, and other products. The City of San Francisco passed a law banning the use of plastic grocery bags, to be phased in over the next few years.

PAPER

Every week more than 500,000 trees are used to produce the *two-thirds* of newspapers that are never recycled.

In the U.S. on average, we use 730 pounds of paper per person per year. In Japan the average is 500 lbs/person/year; in India the average is about 10 lbs/person/year. In the U.S., this amounts to about 31.5 million tons of printing and writing paper per year, requiring about 535 million trees (most from virgin fibr) and 12 billion gallons of oil for its manufacturing.

The U.S. Declaration of Independence was written on hemp paper.

In the last year, logging in the Southeastern U.S. resulted in a loss of land about the size of New Jersey (5 million acres). In fact, the area of natural pine forest there has declined in size from 72 million acres in 1953 to 33 million acres in 1999. This is where most of the trees used to make paper come from (an astonishing 26% of the world's supply, to be exact), and it's clearly in critical danger. As if this doesn't sound doomsday-ish enough, global production in the paper sector is expected to increase by 77% between 1995 and 2020.

In the landfill, where 80% of discarded paper ends up, the decomposition of paper produces methane, a greenhouse gas with 21 times the heat-trapping power of carbon dioxide. The EPA cites landfills as the single largest source of methane emissions to the atmosphere, with paper representing about 38% of the municipal solid waste stream. Within schools the percentage of paper in the waste stream is even higher, almost 50%! According to the California Integrated Waste Management Board, which analyzes schools' waste on a district-by-district basis, Alameda County schools alone dispose of more than 11,700 tons of paper waste every year. San Diego runs through more than 24,000 tons, and Los Angeles schools go through a whopping 75,600 tons of paper annually.

Using 1 ton (40 cases) of 30% Post-Consumer Waste Copy Paper saves the equivalent of:

- * 7.2 trees [forty feet in height and 6-8 inches in diameter] (Conservatree, www.conservatree.org)
- * 2,100 gallons of water, 1,230 kw hours of electricity, and 18 pounds of air pollution (Californians Against Waste, www.cawrecycles.org)

Using 1 ton (40 cases) of 100% Post-Consumer Waste Copy Paper saves the equivalent of:

- * 24 trees,
- * 17 million BTUs of energy
- * 2,108 pounds carbon/yr (for comparison, emissions from 1 car = 11,000 lbs/yr);
- * 8,750 gals water (<1 swimming pool);
- * 1,124 lbs garbage (Environmental Defense Paper Calculator)

YARD WASTE AND FOOD WASTE

Every year we dispose of *24 million tons* of leaves and grass clippings, which could be composted to conserve landfill space.

Americans throw away about 10% of the food we buy, equivalent to 21 million shopping bags full of food going to the landfill. In 1995, we threw away 48 million tons of food. On average, Americans generate about 106 pounds of food waste per person per year. Less than 3% of the food waste is composted. Meanwhile, more than 27 million Americans are considered "food insecure" without enough to eat.

IRON AND STEEL

We throw away enough iron and steel to *continuously* supply all the nation's automakers.

Recycled steel cans are used to make new steel products including cars, bridges, lawnmowers, stoves, and construction materials. Over 5400 BTU's of energy are conserved for every pound of steel recycled. The steel industry's annual recycling saves the equivalent energy to electrically power about 18 million households for a year. Every time a ton of steel is recycled, 2500 pounds of iron ore, 1000 pounds of coal and 40 pounds of limestones are preserved.

SOURCES AND RESOURCES

1. Environmental Defense, clickable garbage can, www.environmentaldefense.org
2. The World Watch Institute, *Good Stuff: A Behind-the-Scenes Guide to the Things We Buy*, <http://www.worldwatch.org/pubs/goodstuff/>
3. Thomas Recycling Companies, *Kids' Page*, <http://www.thomasrecycling.com/facts.htm>
4. EarthWorks Group. 1990. *The Recycler's Handbook*. Berkeley, CA: The EarthWorks Press.
5. Paper saving estimates, www.papercalculator.org, published by Environmental Defense.
6. California Integrated Waste Management Board, <http://www.ciwmb.ca.gov/Schools/WasteReduce/default.htm>
7. San Mateo County, Recycle Works Program, http://www.recycleworks.org/schools/s_audits.html
8. Earth Team's *School/Neutral Carbon Calculator*, <http://www.earthteam.net/GWCampaign/calculate.html>
9. NRDC's *Green Squad*, a virtual school tour and environmental assessment, www.nrdc.org/greensquad/
10. Redefining Progress' Ecological Footprint Quiz, www.myfootprint.org