

MANUFACTURING

# Paper Recycling

*A look at our most recycled product*



EDUCATIONAL IN NATURE®

# Paper Recycling

Each person in the United States uses approximately 749 pounds of paper a year. Where does it all go? Some of it goes into books or is used in other permanent applications like insulation or roofing shingles for your home.

Today, however, more Americans are recycling paper products than ever before – 63.4% of paper consumed is recovered. More paper is now recovered in the United States than goes to landfills. Paper recovery now averages 325 pounds of paper per person.

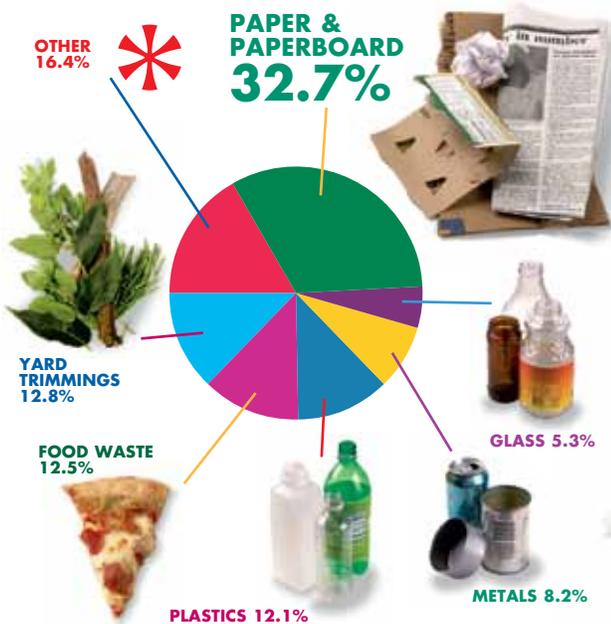
## Even Chemicals and Energy are Recycled

Today, U.S. pulp and paper mills recover about 98% of all chemicals used to produce pulp from wood chips.

In addition, water is reused throughout the papermaking process.

Even the energy used to run a paper mill can be converted and reused.

## What's in our waste?



Recycling paper makes sense because it makes our resources go farther. Paper is also easy to recycle because it is made from wood, and it separates back into fibers when soaked in water. The recycling process produces a new paper or paperboard product out of materials that might otherwise have ended up in a landfill. Recycling is one way to help manage the solid waste we generate each year.



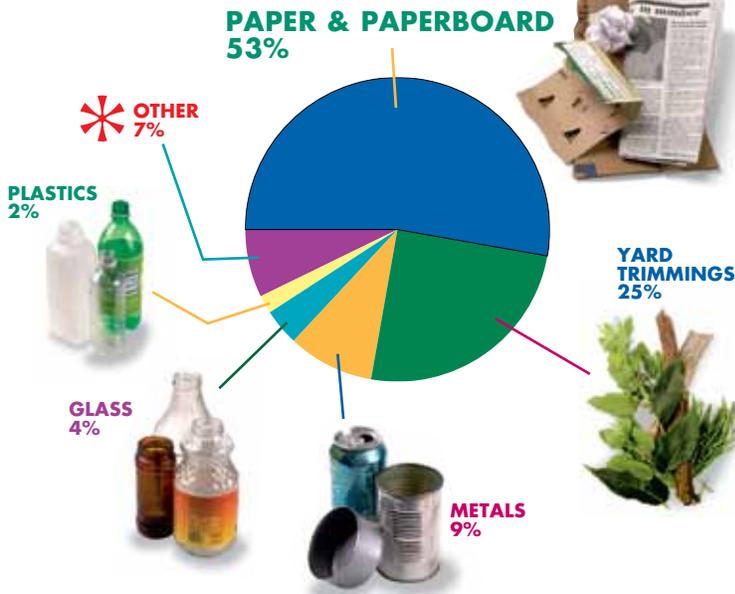
Source: <http://www.epa.gov/epawaste/nonhaz/municipal/pubs/msw07rpt.pdf>

WOOD, RUBBER AND LEATHER.



# The Wood that “Woodn’t” Quit!

## What’s in our recovered material?



Paper is the most recycled product in the U.S. today.

**MORE THAN 6 OUT OF 10 PAPER AND PAPERBOARD PACKAGES ...**

**ALMOST 9 OUT OF EVERY 10 NEWSPAPERS ...**

**MORE THAN 8 OF EVERY 10 CORRUGATED BOXES ...**

**ARE BEING RECOVERED**



## What happens to the paper we recycle?

Almost 37% of paper recovered in the United States is recycled into new paper and paperboard products. The remaining amount is exported to other countries or reused to make products like compost, which is used as a fertilizer in gardening.

### NEWS YOU CAN REUSE

Yesterday’s newspapers become today’s news as most old newspapers are recycled into new newsprint.



### WHERE DO ALL THE BOXES GO?

More than 70 percent of all old corrugated boxes are recycled back into new containerboard and paperboard products.

### FROM HOMEWORK TO ...

Printing and writing papers that you use to do your homework and that people in offices use for stationery and copy paper are recycled into:

- printing and writing paper
- paperboard
- tissue



# The Recycling Process

**THERE ARE SIX MAJOR STEPS IN THE RECYCLING PROCESS:**



## 1. PICK UP

Different types – or grades – of paper are recycled into different types of new products. Most cities have a single stream collection system, but for cities that don't it is important to pre-sort your recoverable paper. For example, separate newspapers from magazines for the people who pick it up.

## 2. SORTING

At the recycling center, the paper is sorted to remove contaminants – plastics, paper clips, sticky notes and other waste materials that cannot be recycled.

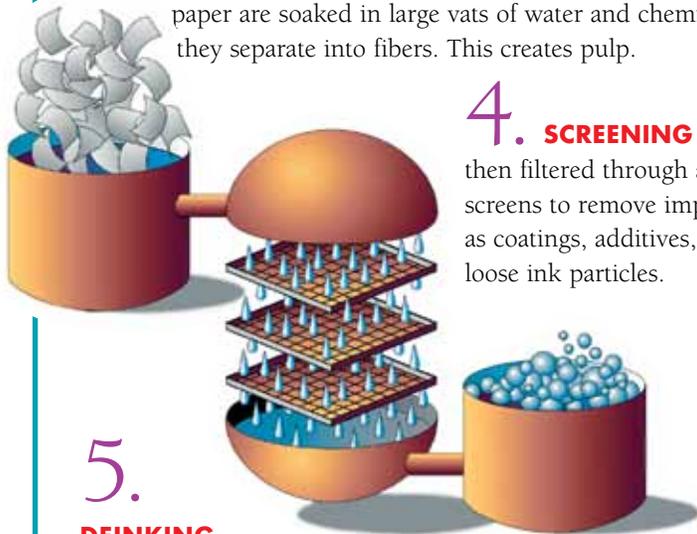
Then the paper is baled and sent to the mill. Bales can weigh around 1,000 pounds each!

## 3. REPULPING

At the mill, the bales of sorted recovered paper are soaked in large vats of water and chemicals, where they separate into fibers. This creates pulp.

## 4. SCREENING

The pulp is then filtered through a number of screens to remove impurities such as coatings, additives, fillers and loose ink particles.



## 5. DEINKING

Paper that had ink on it – such as newspapers and magazines – must have the ink removed before it can be used to make a new paper product.

The pulp enters a flotation device. Soapy chemicals are added to help the ink separate from the pulp. Air bubbles are blown into the mixture. The ink attaches to the bubbles and rises to the top. The inky bubbles are then skimmed off, leaving the pulp ink-free.

## 6. NEW PRODUCTS

The cleaned and deinked recycled pulp often is mixed with new pulp to be made into paper products.

## A Limit to Recycling

### RECYCLING REUSES — AND USES UP — RESOURCES

Recycling can make our resources go farther, but when communities have to go a long way to collect those recyclables, they end up using even more resources.

They have to use fuel for the collection trucks, and they need equipment and people to sort the materials.

### ALL PAPER IS NOT EQUAL

Not all paper can be recycled into new paper products.

Some papers have too many contaminants to recycle. Used paper plates and pizza boxes are not made into new paper products because food cannot be removed during processing. Other contaminants include carbon paper or plastic tape.

There is also a limit to the number of times a piece of paper, a corrugated box or other paper product can be recycled.

Each time paper is reprocessed, the wood fibers break down. They eventually get so small that they slip through the screens during the screening process and become waste that goes to a landfill.



# Paper Recycling Throughout History

Paper recycling has been around as long as paper itself

## Right from the start

Around 2,000 years ago, the Chinese discovered that they could use a thin paste of mulberry bark, hemp and rags to make the very first piece of paper.

**MOSES JOHNSON** informs all little misses and his other customers that he receives all kinds of **COTTON OR LINEN RAGS**. Two POUNDS OF RAGS will buy a primer or a storybook or one yard of ribbon, two thimbles, two rings, twelve good needles, two strings of beads, one penknife, nine rows of pins.

## From rags to paper

Recycling was important in colonial America. Back then, people did not know how to make paper from wood. They used cloth rags instead. Rags were so scarce that some mills advertised in the newspapers to urge the colonists to save rags for use in the paper mills.

## A recycling pioneer

Mathias Koops was among the first to investigate whether he could make paper from cheaper, more plentiful materials. He received three papermaking patents in 1800 and 1801. One was for the removal of printing and writing ink from wastepaper before it was reused. The other two patents were for the manufacture of paper from straw, hay, thistles, hemp, flax and different kinds of wood and bark.

## Ask your mummy

During the Civil War, rags became scarce. To get an additional supply of cloth to make paper, Augustus Stanwick imported mummies from Egypt to the United States. The mills made paper out of their linen wrappings. (Don't try this with your mummies at home.)

## A paperless school

Until people learned how to make paper from wood, paper was so rare and expensive that students used chalk and slates in school to do their lessons.

## PAPER FASHIONS & ART

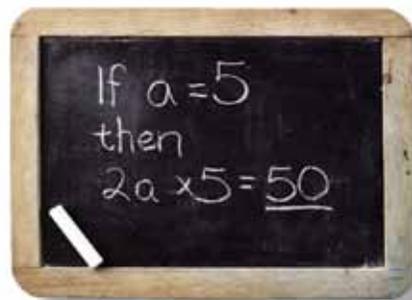
Not all recycled paper comes back as paper or paper products

**Walk on old magazines.** One company makes shoes from recycled materials, including fiber from old magazines.

**News you can wear.** Peruvian women make rolled paper necklaces out of coiled strips of paper cut from magazines.

**Art or Trash?** Many artists use scrap material in their work. Henri Matisse used different types of found paper and printed material to make collages.

Pablo Picasso sculpted three-dimensional heads from cardboard and collage materials.



# Paper Recycling

## ACTIVITIES & Extras

You can make paper!

### WHAT YOU NEED:

- A large square pan, about three inches deep
- Three cups of warm water
- Enough water to fill one-third of the pan
- One and one-half sheets of newspaper
- Fine mesh wire screen (like a window screen) to fit into the pan
- A rolling pin
- A whole section of a newspaper
- A blender (you'll need an adult to help you)



**One:** Tear the newspaper into tiny pieces.

**Two:** Put the newspaper pieces and all three cups of water into the blender, cover it and turn it on medium speed for about five seconds. You've just made pulp!

**Three:** Place the screen on the bottom of the pan and cover it with one inch of water.

**Four:** Pour about one cup of the pulp over the screen and spread it around evenly with your fingers.

**Five:** Lift the screen and let the water drain.

**Six:** Put the screen, pulp side up, on the section of newspaper. Close the newspaper and flip it over so that the pulp is now face down.

**Seven:** Take a rolling pin and roll out the excess water. Open the newspaper and remove the screen.

**Eight:** Leave the newspaper open and let the pulp dry overnight. In the morning, peel the "recycled paper" away from the newspaper. Congratulations! You've just recycled newspaper into a new piece of paper!



### WORDS TO KNOW

**collage** – a piece of artwork made by cutting materials such as colored paper and old magazines and pasting them onto a surface to create a pattern or picture

**deinking** – removing ink and other finishing materials, like coatings, sizings and adhesives, from printed paper

**fibers** – the long, thick-walled cells that give strength and support to plants

**landfill** – a site where garbage is taken

**paperboard** – a thick, strong paper primarily used for food packaging and other containers

**pulp** – a mixture of fibers and water from which paper is made

**recycling** – a process where used materials are sorted, cleaned and made into new products