



Recycle



Recycle everything you can.



Recycle

TEACHER

What is Recycling?

Recycling means to use something again. Newspapers are used to make new newspapers. Aluminum cans are used to make new aluminum cans. Glass jars are used to make new glass jars. There are many reasons why recycling makes sense.

Recycling saves landfill space. Americans make more trash each year. Most of the trash is buried in landfills. Recycling is one way to reduce the amount of trash that is buried.

Recycling saves money. Getting rid of trash isn't free. Garbage trucks must pay to dump their loads at landfills. Recycling reduces landfill costs because less waste is buried.

Recycling saves energy. It almost always takes less energy to make a product from recycled materials than it does to make it from new materials. Recycling aluminum cans, for example, uses 95 percent less energy than making aluminum cans from new materials. One exception to the rule is plastics. Sometimes it takes more energy to recycle plastics than it does to use new materials.

Recycling saves natural resources. Natural resources are valuable. Natural resources include land, plants, minerals, and water. By using materials more than once, we conserve natural resources. In the case of paper, recycling saves trees, water, and energy. Preventing one ton of paper waste saves 15-17 mature trees. Recycling that ton of paper saves 7,000 gallons of water.

Recycling reduces air and water pollution. Using old cans instead of raw materials to make new aluminum cans reduces air and water pollution by 95 percent.

Discussion Questions

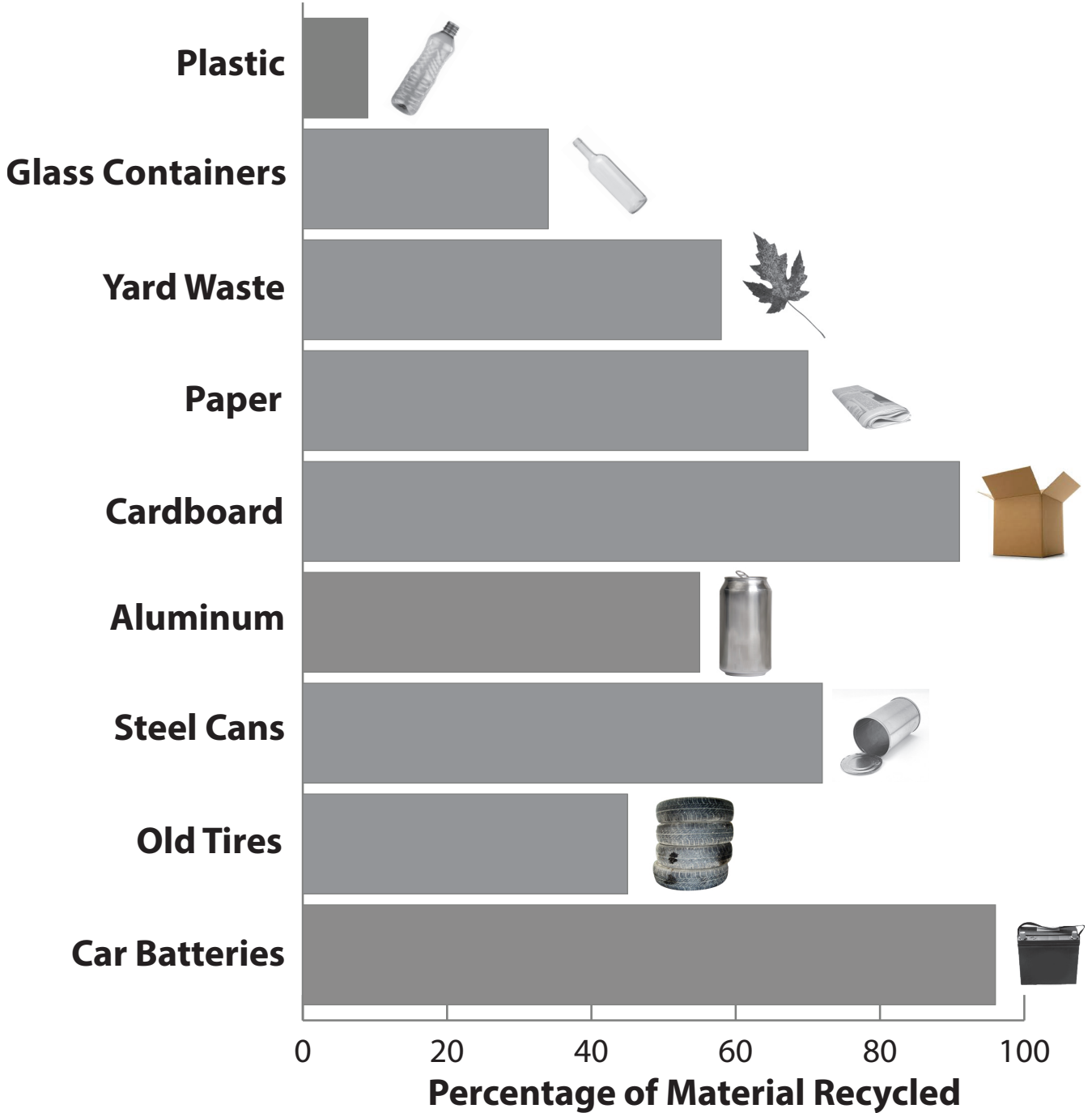
1. Do you recycle at home? What kinds of things do you recycle?
2. Do you recycle at school?

Activity

Make a poster or write a song to remind people to recycle at home and at school.



Things We Recycle



Data: Environmental Protection Agency



Things We Recycle

TEACHER

Discussion Questions

1. Why do you think we recycle so many car batteries and so few old tires?

(Service stations are required by law to recycle batteries. Lots of people change their own tires, so they don't have a simple way to recycle them. You can't put them in your recycling bin.)

2. Why are so few glass containers recycled?

(In many places, people must clean and sort glass by color. When people have to do work to recycle, they don't recycle as much.)

3. Why is so little plastic recycled?

(Sometimes it costs too much for plastics to be recycled and used in the creation of new materials.)

Activity

With the help of adults, have the students count the number of aluminum, steel, glass, and plastic containers thrown away in a week at their homes. Have them count how many could have been recycled. Or, if students are good recyclers, have them make a list of the items they recycle with a tally.



Recycling Glass

YES



We can recycle some kinds of glass.



Recycling Glass

TEACHER

Recycling Glass

Glass is used to package many foods: juices, jellies, baby food, and more. Glass makes up about five percent of all trash by weight, and five percent of the space in a landfill. The best way to deal with glass trash is to recycle it.

Burning glass in waste-to-energy plants is not a good choice. Glass does not provide any heat energy. Burying glass recovers none of its value either. So, recycling is usually the best choice.

Recycling glass is a good energy saver. Using recycled glass to make new products uses less energy than making it from new materials. It saves energy because crushed glass melts at a lower temperature than the raw materials used to make glass. New glass is made from sand, soda ash, and limestone.

Old glass is easily made into new glass jars and bottles. Glass jars and bottles can be recycled over and over again. The glass doesn't wear out.

Discussion Questions

1. Do you recycle glass at home?
2. Does the school recycle glass?



Recycling Glass

NO



Some glass cannot be recycled.



Recycling Glass

TEACHER

How to Recycle Glass

Preparing glass containers for recycling is easy. All you need to do is remove the lids or caps and rinse the containers in water. You don't need to scrub off the labels, since they will burn up when the glass is melted.

Recyclers sort glass containers by color—clear, green, and amber (golden brown). Once glass has been colored, the color cannot be removed. That means a maker of clear glass jars cannot use colored glass.

You cannot recycle all glass products. Light bulbs, ceramics, mirrors, windows, and dishes are not made with the same materials as glass jars and bottles. Still, it's the containers that we throw away every day, not the light bulbs and dishes, that make up most of our trash.

Discussion Questions

1. What glass objects in the classroom could be recycled?
2. What glass objects could not be recycled?

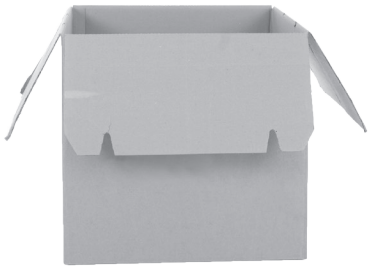
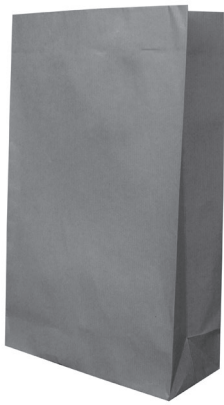
Activity

Make an exhibit of glass objects that can and cannot be recycled.



Recycling Paper

YES



We can recycle some kinds of paper.



Recycling Paper

TEACHER

Recycling Paper

What is the number one material in trash? Look around your classroom. What do you see? Posters? Notebooks? Cardboard boxes? Textbooks? Bulletin boards decorated with construction paper? You get the picture. Paper is everywhere!

Paper is the number one material that we throw away. Of every 100 pounds of trash we throw away, 27 pounds is paper. Paper and paper products are 15% of all the trash sent to landfills.

There are many kinds of paper. It can be glossy or ragged, thin or thick. It can be for newspapers or stuffing diapers. Most paper products are made from trees, though paper can also be made from old cloth or grass.

According to the American Forest and Paper Association, nearly 80 percent of America's paper mills are designed to use paper collected in recycling programs. They depend on paper recycling to supply the raw materials they need to make new paper. Manufacturing new paper products from recycled paper uses 40 percent less energy than making paper from new wood pulp.

How Paper is Made

Papermaking uses a renewable resource—trees! The first step is cutting down the trees. Paper companies plant trees just for papermaking, like an apple farmer plants apple trees. If one tree is cut down, another is planted.

After the trees are cut, they are taken to a paper mill. Paper mills use every part of the tree, so nothing is wasted. The bark and roots are burned and used for energy to run the paper mill.

The rest of the tree is chopped into small chips to be made into paper. The raw paper is the color of grocery bags. Good papers are whitened with bleach and sometimes coated with clay to make them shiny.

Pulp, paper, and wood product mills need a lot of energy to make paper. They generate, on average, 65 percent of their average needs on site by burning wood scraps they cannot use to make paper. They buy the rest of the energy they need.

Discussion Questions

1. Do you recycle paper at home?
2. Does the school recycle paper?

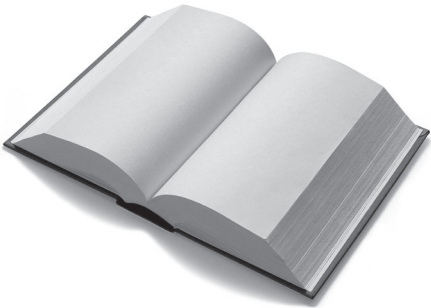
Activity

Make recycled paper. Try different types of paper as the feedstock.



Recycling Paper

NO



Paper with glue or wax cannot be recycled.



Recycling Paper

TEACHER

Recycled Paper

Recycled paper is made from waste paper, usually mixed with new materials. Almost all paper can be recycled today, but some types are harder to recycle than others. Papers that have wax, paste, or gum—or papers that are coated with plastic or aluminum foil—are usually not recycled because the process is too expensive.

Even papers that are recycled are not usually recycled together. Waste papers must be sorted. Newspapers and cardboard boxes can't be mixed together for recycling. Today, about 70 percent of new paper and 90 percent of cardboard boxes are recycled.

Not Always Recyclable

Paper cannot be recycled over and over again. After a few times, the paper becomes too weak to be used again. That is why new paper fiber is usually mixed with recycled paper. Most cardboard boxes contain 35 percent recycled content.

Saving Energy

Paper recycling saves energy. Making recycled paper also uses fewer chemicals and bleaches than making all-new paper. Paper recycling means fewer trees are used to make paper. All-new paper is almost always made from trees grown just for papermaking. A tree harvested for papermaking is soon replaced by another tree, so the cycle continues.

Discussion Questions

1. What kinds of paper in the classroom could be recycled?
2. What kinds of paper could not be recycled?

Activity

Make an exhibit of paper that can and cannot be recycled.



Recycling Aluminum



All aluminum can be recycled.



Recycling Aluminum

TEACHER

Recycling Metals

In the U.S., the metals we recycle are mainly aluminum and steel. Some other metals—like gold, silver, brass, and copper—are so valuable that we rarely throw them away. They do not create a trash problem.

We use a lot of aluminum and steel. Americans use 100 million steel cans and 200 million aluminum cans every day. Recycling is the best way to deal with aluminum and steel waste.

Burning metal trash is not good because metals do not provide any heat energy. Aluminum melts and steel just gets very hot. Burying is usually not a good idea either. Aluminum, especially, is so valuable that it does not make sense to bury it.

Recycling Aluminum

Like most metals, aluminum is an ore. An ore is a mineral that is mined for a valuable material in it. Bauxite, a reddish clay-like ore, is rich in aluminum. To get the aluminum out, though, takes a huge amount of energy.

That is why recycling aluminum makes sense. It saves energy—a lot of energy. Recycling just four aluminum cans saves as much energy as the energy in one cup of gasoline. Companies save energy and money by using recycled aluminum, so they will pay you for your old cans—about a penny for every can.

After you have put your old aluminum cans in a recycling bin, what happens next?

The old aluminum cans are taken to an aluminum plant. The cans are shredded into potato chip sized pieces and put into a furnace. The melted aluminum is made into thin sheets.

The sheets are usually made into new aluminum cans. This is called closed-loop recycling because the old cans are turned into the same thing again. Aluminum cans are recycled into new cans and put back onto store shelves within 60 days!

Aluminum can be recycled over and over again. It does not lose its quality, and recycling it saves money, energy, and natural resources every time.

Discussion Questions

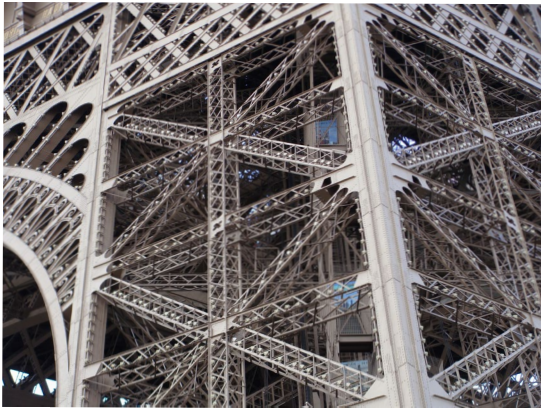
1. Do you recycle aluminum at home?
2. Does the school recycle aluminum?

Activity

Make an exhibit of aluminum items that can be recycled.



Recycling Steel



All steel can be recycled.



Recycling Steel

TEACHER

Steel Recycling

Steel is the most recycled metal. We recycle huge amounts of steel from cars, appliances, old buildings, and bridges. Today, all steel products are made with some recycled steel.

The cans with your soup, your dog's food, and Mom's coffee are made of steel. In fact, about 90 percent of all metal food containers are made of steel. You have probably heard people call a steel can a tin can. Steel cans are sometimes called tin cans because the inside is coated with a thin layer of tin. Tin protects the food in the can.

Steel and aluminum are both mined from ores, and are made in a similar way. Steel recycling saves a lot of energy. It takes about 75 percent less energy to make steel from recycled materials than it does from iron ore. That's why today's steel makers always use some steel scrap to make new steel products.

Steel is the easiest material to separate from the rest of the trash. Steel is attracted to magnets. If you're not sure which cans are steel and which are aluminum, use a magnet to separate them. Steel will stick to the magnet; aluminum will not. Recycling your used steel cans at home is easy, too. All you need to do is rinse the food from the cans. That's it.

Steel can recycling is like aluminum can recycling. Steel is melted in a furnace and then flattened into sheets. Recycled steel cans can be made into new cars, girders for buildings, or new food cans. Like aluminum, steel can also be recycled again and again. It does not lose any of its strength or quality in the recycling process. It can be a never-ending process that continues to save energy and resources.

Discussion Questions

1. Do you recycle steel at home?
2. Does the school recycle steel?

Activities

- Make an exhibit of steel items that can be recycled.
- Use a magnet to determine whether metals are aluminum or steel.



Recycling Plastics



There are many kinds of plastics.



Recycling Plastics

TEACHER

Plastics Recycling

We use plastic products more all the time. We cover our food in plastic wrap, drink hot chocolate from Styrofoam® cups, wear clothes made from nylon, polyester, and rayon, and even buy our plastic things with plastic credit cards! We use plastic hundreds of times every day.

The basic raw materials for plastic are petroleum and/or natural gas. These fossil fuels are sometimes combined with other elements, such as oxygen or chlorine, to make different types of plastic. Plastic can be soft or hard, clear or colored. It can look like leather, wood, or silk. It can be made into toys or heart valves. There are more than 10,000 different kinds of plastics.

Plastics are energy efficient. It takes less energy to make a plastic ketchup bottle than a glass ketchup bottle. And since plastics are lightweight, it takes less energy to ship a truckload of plastic bottles than a truckload of glass bottles.

Disposing of Plastic

Is plastic trash choking the Earth with Styrofoam® cups and fast-food plates? Not really. By weight, plastics make up about 13 percent of America's trash. Plastics are generally very lightweight. They make up 18% of everything buried in a landfill.

Burying plastics is not always the best thing to do. There are other choices—recycling and burning. Recycling recovers the raw material, which can be used to make new plastic products. Burning recovers the energy, which can be used to make electricity. Burying plastics does neither of these things. The value of the plastic is buried forever.

Discussion Questions

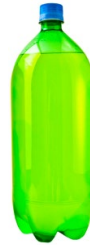
1. Do you recycle plastics at home?
2. Does the school recycle plastics?



Recycling Plastics



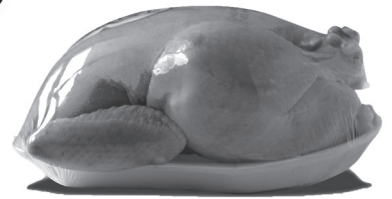
PET Two-liter beverage bottles



HDPE Trash Bags



PVC Packing around meat



LDPE Food bags



PP Straws



PS Hot beverage cups



Other Mixed plastics



Some plastics can be recycled. They are coded with numbers 1 - 7.



Recycling Plastics

TEACHER

Recycling Plastics

Recycling plastics is easy. You need to know what types of plastics can be recycled. Every plastic container has a code on it to tell you what kind it is. Plastics are made of different materials and should be sorted before they are recycled. Mixed plastics can be recycled, but they are not as valuable as sorted plastics.

Once you know what kinds of plastics you can recycle, you should rinse the container and squash it. You can leave the paper labels on the containers, but throw away the plastic caps. Plastic caps are made from a different plastic than the container and cannot be easily recycled.

Energy to Burn

Plastics are made from fossil fuels. Pound for pound, plastics contain as much energy as petroleum or natural gas. That is much more energy than other types of trash. This makes plastic a good fuel for waste-to-energy plants. Waste-to-energy plants turn trash into electricity.

Should we burn or recycle plastics? It depends. Sometimes it takes more energy to recycle plastics than it does to use new materials. In that case, it's better to burn the plastics at a waste-to-energy plant than to recycle them.

Discussion Question

1. Have you ever noticed the triangles with the numbers on plastic objects?

Activities

- Look at plastic objects in the classroom to see if you can find a recycle code, then sort them by code.
- Make an exhibit of plastic items that can be recycled. See if you can find a plastic object with each number from 1 - 7.