did you know...

aluminum is a lightweight, silver-white metal that makes up approximately 7 percent of the Earth's crust. Virgin (new) aluminum comes from bauxite ore which is the mineral containing the aluminum. Bauxite must be mined and this is an energy intense activity; however, once made, aluminum is easilty recycled over and over again saving energy and valuable resources. One of the most common uses of aluminum is for soft drink cans.

- Aluminum cans can be recycled in most communities.
- Typically, the aluminum gets recycled into new cans.
- It takes between100-500 years for an aluminum can to decompose but it takes less the 60 days for an aluminum can to be recycled and end up back on the grocery shelf.
- Aluminum was discovered in the 1820s, and is the most abundant metal on earth.
- The empty aluminum can is worth about 1 cent.
- Currently about two out of three cans consumed in the US are recycled – so about 62% (an average of 113,204 aluminum cans every minute of everyday). The goal of the aluminum industry is to recycle over 75%.
- Making new aluminum cans from used cans takes 95% less energy, and 20 recycled cans be made with the energy needed to produce one can using virgin ore.
- Recycling one aluminum can saves enough energy to keep a 100-watt bulb burning for almost four hours or run your television for three hours.

how is it recycled?

In the USA, aluminum cans begin the recycling process either at local recycling centers, community drop-offs, charity collections, reverse vending machines or at curbside pick-up. The cans from these sources are collected at large, regional scrap processing companies. They condense the cans into highly dense, 30-pound briquettes or 1,200-pound bales (a large closely pressed package of merchandise bound and usually wrapped) and ship them to aluminum companies for melting. At the aluminum companies, the condensed cans are shredded or crushed and their coatings and outside decorations are burned off. Then the potato chip-sized pieces of cans are loaded into melting furnaces, where the recycled metal is blended with new, virgin aluminum. The molten aluminum is poured into 25-foot long ingots (molds) that weigh over 30,000 pounds. The ingots are fed into rolling mills that reduce the metal thickness from 20+ inches to sheet that is about 10/1000 of an inch thick. This metal is coiled and shipped to can makers, who produce can bodies (the side of a can is the same thickness as a human hair!) and lids. They in turn deliver cans to beverage companies for filling. The new cans return to the store shelves or vending machines in as few as 60 days. Then the process starts all over again.

what is it made into?

The three main areas where aluminum is used include cars, soda cans and other packaging, and building construction products. In 2000, aluminum passed plastic--with average content of 257 lbs per vehicle--to become the third most-used material in automobiles. Packaging includes food containers and aluminum foil. Aluminum building construction products are used in homes, industry, commercial businesses, farms, and in highway projects.

activity

In this activity, students will explore some of the properties of aluminum and steel cans through observations and measurements.

What You Will Need

- Aluminum and Steel Cans (cleaned rinsed and dry)
- Magnets
- Scale
- Flexible Measuring Tapes
- Pencils and Paper for Taking Notes

Procedure

First have the students make observations about the aluminum and steel cans and record these on their papers. Next have them take measurements of the sizes, weights and magnetic properties of the cans and record their observations on their papers. You may wish to have them set up a table (as seen at right). Discuss the observations as a class.

Next, read this statement:
In 1972, it took about 22 empty, aluminum cans to weigh one pound. With advanced technology making it possible to use less material and increase durability of aluminum cans, it now only takes about 34 empty aluminum cans to weigh one pound.

Discuss as a class:
- How many steel cans are in one pound by comparison?
- What might be the advantage(s) of having lighter or heavier packaging?
- What items can you think of that are made from aluminum and from steel?
- What would be the advantage/disadvantage of using each of the different materials for each use.

For the younger student you may wish to simply have them hold the different cans and let you know if they think one feels heavier than another, and see if they can squeeze one of the cans more than another, and explore which ones the magnets stick to.

For Further exploration you may wish to visit your local recyclery or have your local Recycling Coordinator come and speak with the class. Be sure to ask about your community's aluminum and steel recycling rates!

	Aluminum Can	Steel Can
Description		
Weight		
Circumference		
Diameter		
Height		
Magnetic? (Ferrous/Non-Ferrous)		

for more info...

The Aluminum Association, http://www.aluminum.org
Can Manufacturers Institute, http://www.cancentral.com/environ5.htm
The Steel Recycling Institute, http://www.recycleroom.org
The Environmental Protection Agency's "Explorers' Club", http://www.epa.gov/kids/
The Earth 911 Handy Kid's Section, http://www.earth911.org/handy

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DEPARTMENT OF ENVIRONMENTAL PROTECTION FLORIDA

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