



# RETHINKING WORLD WIDE WASTE

## NEW INVENTIONS AND HUGE MISTAKES

AMAZING FACTS FOR HOME AND SCHOOL



**World Wide Waste...it's just astounding what we can do with it all....**

### What's for Dinner? Nature's Garbage Dwellers.

In our amazing world, there are a whole host of tiny critters who just love eating your garbage. I'm talking about munching microbes and bacteria.

Microbes are tiny, invisible critters also called organisms, thought by some scientists to be the oldest life-forms on the planet.

The reason they are so popular and have been able to survive for so long is that they are always hungry and therefore very happy to munch on anything that's biodegradable or able to be broken down by living things.

All your discarded food and paper and even some chemicals, can be broken down by microbes.

How do they do that? Microbes release enzymes and digestive proteins that help break down their food into chemicals such as nitrates, phosphorus, and potassium- all of which are nutrients that are essential to plant life.

One of the smallest microbes that loves to eat waste is called bacteria. Although bacteria consist of only a single cell, they are an incredible powerful force when it comes to eating and they don't mind how hot or cold the temperatures are outside.

Perhaps this explains their strange taste at meal times? There are some bacteria whose favourite food is oil and petrol which makes them very popular cleaning up polluted lakes and rivers. Others prefer to "eat" on dry land – anything from sugar and starch to sunlight, sulphur and iron.

But bacteria aren't the only critters who love to eat waste. A host of other garbage-eaters, or decomposers, join in, including hundreds of species of insects and worms.

Under proper conditions, these creatures can reduce a pile of waste to almost nothing and transform some of it into fertile soil.

Compost worms, for example, can eat their weight in waste a day. Everything they eat, they excrete or poo.

What comes out is called vermicast or worm poo and is rich dirt that plants love. Can you imagine an elephant doing that?

**Around the world, some very clever scientists are inventing new ways to reduce the waste we create.**

**Here are just a few examples. Perhaps you could invent some more:**

### 1: Turning Plastic into Steel

Plastic bags could one day be used to make your next car.

Instead of being discarded as waste, polyethylene plastic - the type used in plastic shopping bags, soft packaging and some drink containers - potentially can be recycled as both a raw material and a source of energy for making iron and steel.

Plastic is just another form of carbon. When it comes to making iron and steel there's essentially no difference between polyethylene and natural resources such as coal.

In the future, the plastic bags which at the moment are a litter problem, a disposal problem as well as harmful to wildlife on land and in our water-ways could significantly cutting the steel industry's use of coal and its production of greenhouse gases, as well as stopping thousands of tonnes of plastic waste from being discarded every year in landfill dumps.

### Some Interesting Facts

- Up to 60% of the rubbish that ends up in the dustbin could be recycled.
- The unreleased energy contained in the average dustbin each year could power a television for 5,000 hours.
- The largest lake in the Britain could rubbish from the UK in 8 months.
- On average, 16% of the money you spend on a product pays for the packaging, which ultimately ends up as rubbish.
- As much as 50% of waste in the average dustbin could be composted.
- Up to 80% of a vehicle can be recycled.
- 9 out of 10 people would recycle more if it were made easier.





## Turning Mobile Phones into Gold

The mobile telephone industry's recycling program has made a real difference to the environment. In Australia alone, it has prevented 100 tonnes of batteries, including 46 tonnes of batteries containing cadmium, being dumped in landfill.

The batteries are ground into small pieces and fed into a special furnace, which is able to process the material at rates of up to 170kg an hour. The batteries are then burned at 1200 degrees Celsius, which consumes the plastic and allows the various metals to be collected and cooled.

Marketable products from the recycling process include:

- Nickel - used in the production of stainless steel;
- Cadmium - a component used in new batteries;
- Small amounts of gold and copper.

This recycling process is efficient, has high productivity and provides a breakdown of chemical compounds. It is suitable for all phones and batteries, including the newer Lithium Ion and Nickel-Metal Hydride types.

The recycling process is also successful in preventing the reformation of environmentally damaging compounds such as dioxins and furans in the exhaust gas stream.

## In the Supermarket

- Battery-maker **Duracell** built its new international headquarters using materials from its own waste. More than half of the building materials contained waste material from the company's own manufacturing process. This included flooring made from crushed glass and broken light bulbs, ceiling tiles made from recycled newspapers and roofing from recycled aluminium.
- Look on the bottom of your cereal box to see if it's made from recycled paper. **Kellogg's Froot Loops** come in a box made from 100 percent recycled paperboard. How many other cereals are packed in recycled paper?
- You can also get cereal, often for less money, in bags that have no box. **Quaker Oats**, for example, sells its bagged cereals for 35-40 percent below the price of boxed cereals.

[www.planetkids.biz](http://www.planetkids.biz)

## City Planning using Bioluminescence

Daan Roosegaarde is interested in lighting streets without using electricity and is working with scientists at the State University of New York and a company called Bioglow to create glowing trees.



They would be made up of a large number of genetically-modified glowing plants to save electricity for street lighting.

Alexander Krichevsky, of Bioglow, has already developed the plants by splicing genes from bioluminescent bacteria with the chloroplast genome from a common pot plant to create 'Starlight Avater'. A project called Glowing Nature is designed to make 'normal' trees glow without using genetic modification. It would use a fine coating of 'biological paint' to make the trees glow at night.

Engineering and design consultancy, Arup, believes the cities of the future will be covered in 'glow-in-the-dark dust' and fed by 'urban farms' growing both on and inside buildings.

Spray-on light absorbing dust would give public buildings, roads and pathways a phosphorescent shine at night, helping to improve the safety of parks and alleyways. Even trees could be made to glow in the dark by splicing bioluminescent genes into their trunks and branches, they said

## What a waste... All Earth's Electricity Mustered to Destroy an Aluminium Can

A government test site in Nevada scientists generated a brief electrical pulse four times as powerful as all the electricity on Earth. It was all over in a few millionths of a second. And you should have seen the can. This is important, because the device is meant to eventually help scientists better understand what happens in a nuclear weapons explosion (right ... you might have hoped they had a handle on that one). The Atlas machine cost \$48 million to build and stores electrical energy slowly, then releases it all at once.

The rather overmatched can was accelerated in an instant to 27,000 mph, roughly the velocity needed to escape Earth's gravity. The pressure in there was similar to that at the [centre of the Earth](#).

*There must be easier ways to destroy an aluminium can! What a waste of electricity!!*