



## Welcome to Recycle City!

Just a few years ago, this place was called Dumptown. For years, the folks living here hadn't thought much about where their food, toys and other possessions came from – or where they went when they threw them out. And, eventually, that became a very BIG problem...

Because Dumptowners didn't know what happened to waste after it was thrown away, they thought nothing of dropping empty soda cans here and there or putting cans of leftover paint right into their trash cans. They bought and dumped more and more every year.

Things that easily could have been reused or recycled were tossed in the trash,

because nobody knew recycling made a difference. At the dump, they threw dangerous chemicals and poisons (hazardous waste) into the regular garbage (solid waste).

The garbage heap grew and began to smell. Sometimes it caught fire, sending toxic smoke into the air and making it hard for everyone to breathe. Dumptowners tried moving away from the mess, but wherever they moved, the problem was still there—on the ground and in the air. They knew they had to fix it.

They learned to reduce the amount of waste they threw away. For example, they bought items at the store that weren't wrapped in extra packaging, so there would be less to throw away, and they bought products in larger containers. They learned to reuse other things—like washing out empty containers to store food in instead of throwing them away. And, they learned to recycle. They set up bins around town to collect glass, paper, plastics, and aluminum that could be converted back into raw materials, then made into new products. They turned their food scraps and yard trimmings into rich compost to grow their gardens.

Dumptowners paid special attention to reducing the toxic materials they bought, such as trying safer pest control products or household cleaners. For the hazardous products they did buy, Dumptown set up special collection points where people could drop off used chemicals, paints, and cleansers for safe handling and proper disposal.

Finally, they closed the old city dump and built a new solid waste landfill outside of town. With the town's new image, it needed a new name, and Recycle City was born. Travel around Recycle City and find out what folks here are doing to reduce waste and make the environment better.

# Recycle City Neighborhoods

Inside many parts of Recycle City, you'll find information on recycling, reuse, and waste reduction. Find out what's being done to improve the environment for everybody!

## *Northwest Neighborhood*

- [Wrecker](#)
- [City Hall](#)
- [Hazardous Waste Center](#)
- [Church](#)
- [Home - Kitchen and Bath Supplies](#)

## *Northeast Neighborhood*

- [Community Warehouse](#)
- [Landfill](#)
- [Materials Recovery Center](#)
- [Businesses \(Rerun Theatre, Pets, Cafe\)](#)

## *Southeast Neighborhood*

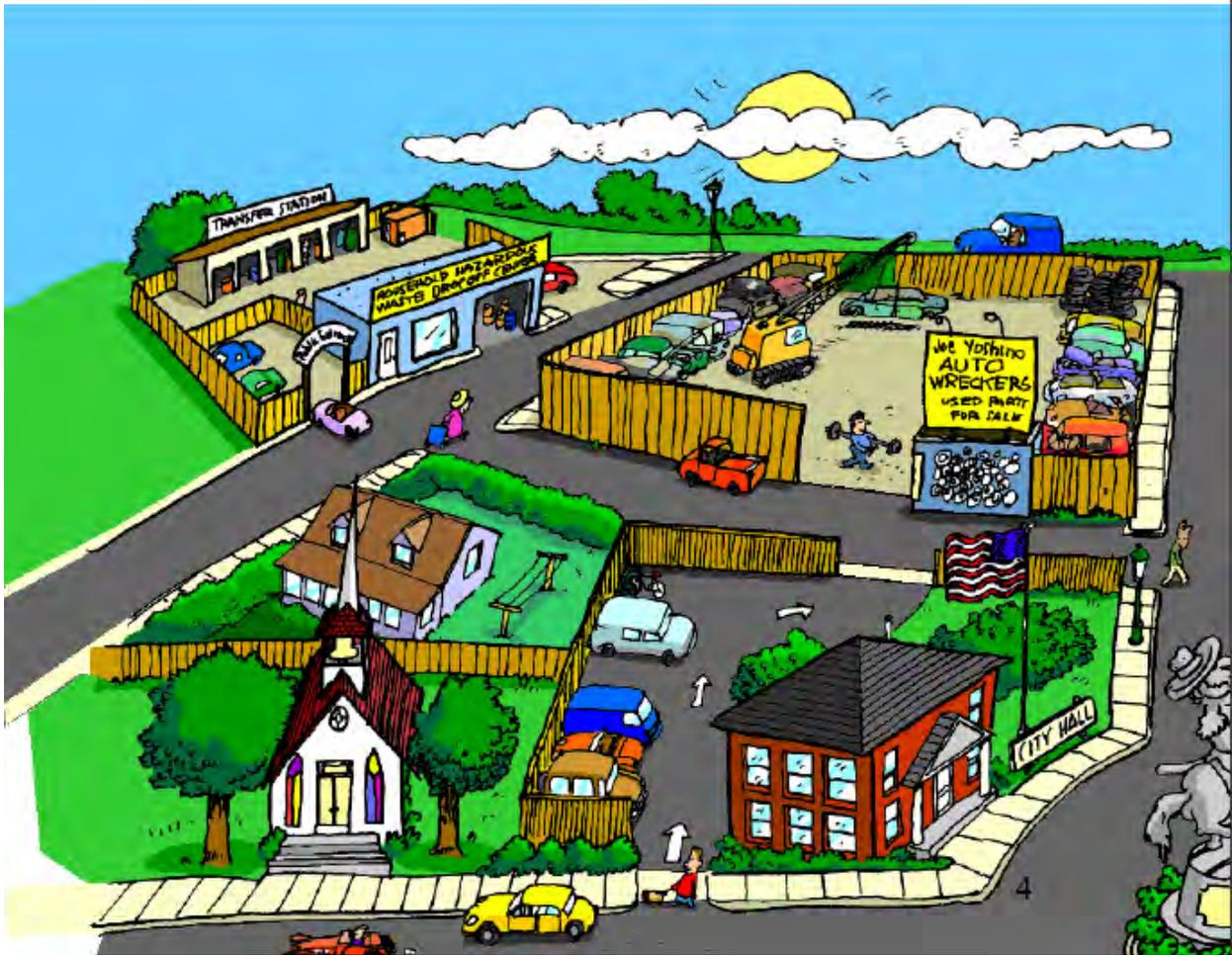
- [Factory](#)
- [Service Station](#)
- [Supermarket](#)

## *Southwest Neighborhood*

- [The Savemor home](#) (including home cleaning & household supplies, home garage & garden supplies, home paint & hobby supplies)
- [School](#)

## *On the Road*

- Cars, trucks and scooters



**Recycle City – Northwest Neighborhood**



## *Recycle City: Auto Wreckers*

There comes a time when even the best-loved cars must go. In Recycle City, they go to Joe Yoshino's Auto Wreckers.

Before Joe set up shop, many folks just left their old cars to rust in a field or yard. Joe knew that almost every part of these abandoned wrecks was recyclable, and that making good use of them was an important part of pollution prevention.

Kick around the junkyard to see what Joe does with the auto parts he gets.



### **Joe Yoshino**

When Joe gets another old car at the junkyard, he looks at more than just the parts of the car he can sell again. He also pays attention to parts that need special treatment,

such as old tires that can be retreaded or recycled. And, he captures used motor oil and antifreeze, and removes oil filters and batteries for recycling.

## Flattened Cars

Joe removes all reusable parts before the stripped cars are crushed flat and loaded by the crane into a shredder.



Then, Joe separates the shredded material into three parts: iron and steel (called ferrous metals); other metals; and materials that are not metallic, such as shredded plastic, glass, rubber, or fabric. Steel and other metals go to a steel mill or foundry where they are melted down and used again. Leftover non-metallic parts that can't be recycled go into the landfill.

## Old Tires

Worn-out tires don't need to be thrown away. Joe does two things to keep old tires going:



He sells tires that are still safe for use on the road, as well as tires that can be reconditioned. These tires, called retreads, can be put back on the car and driven safely for many more miles.

When old tires can't be put back into shape, Joe sells them to companies that reuse or reprocess them. Some are used to make ground-rubber products, such as rubberized asphalt to pave roads or playground covers that are safe and easy to maintain. Many are burned as fuel to make cement and other products – but only when proper air pollution controls are in place.

When the tires on your car wear out, don't just toss them into the nearest ditch or garbage can! Take them to your local service station.

## Reusable Parts

In Recycle City, whenever a vehicle needs repair, the locals know they can go to Joe's for replacement parts at good prices. Some of the reusable things they can find at Joe's are:

- Engines
- Carburetors
- Fenders
- Seats
- Hoods
- Bumpers
- Doors
- Wheel covers and vintage hub caps
- Catalytic converters for emission control
- Tires

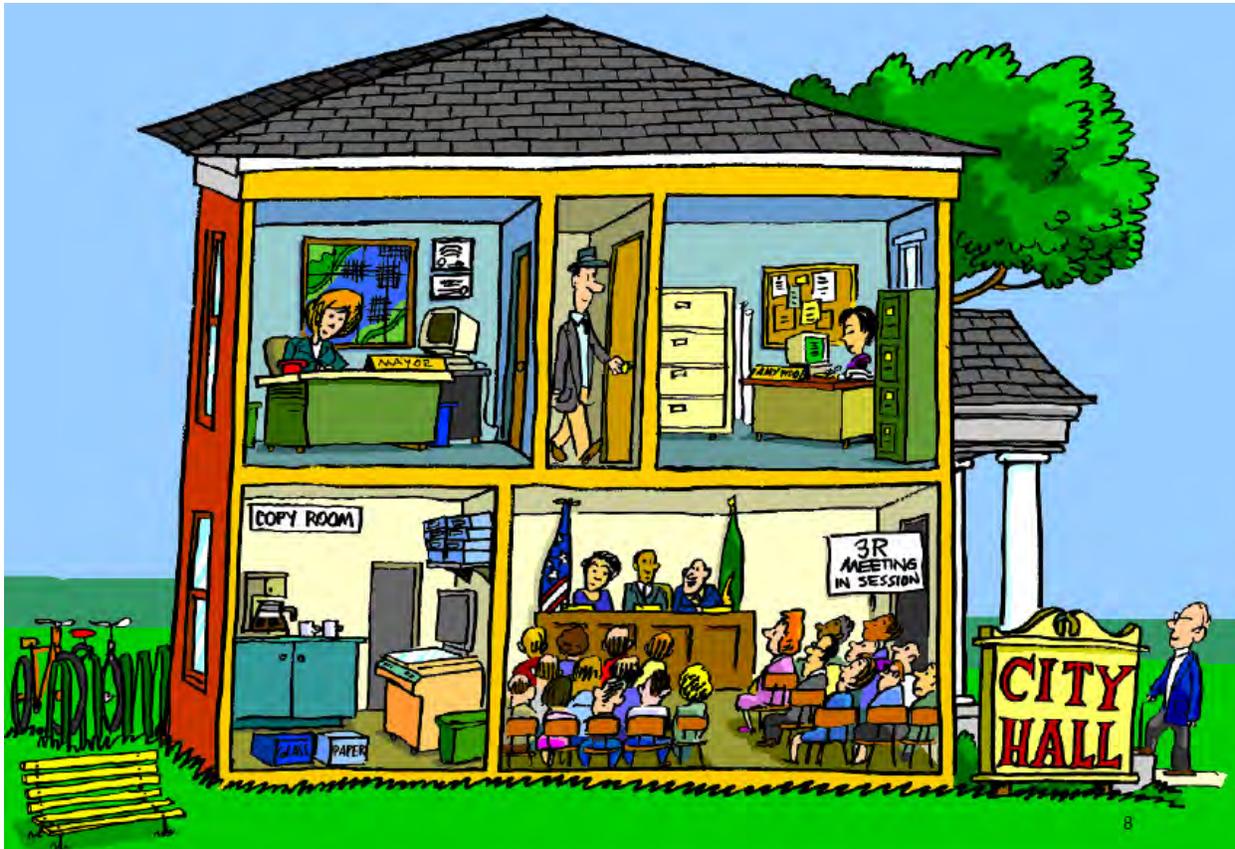


## Old Batteries

Disposal of old batteries is an environmental problem because they contain lead acid. An average car battery has 18-20 pounds of lead acid, a toxic substance that can cause serious health problems if not disposed of properly. These batteries make up almost 65 percent of the lead in the solid waste from cities and towns. (That's over 138,000 tons of lead in the U.S!)



At the junkyard, Joe recycles any batteries that cannot be reused. Both the lead and the battery's plastic casing are recyclable. Joe removes old batteries, and delivers them to scrap lead dealers and battery manufacturers, who properly dispose of the acid and melt the lead and plastic down for reuse.



## *Recycle City: City Hall*

City Hall is where Recycle City residents plan local policies about sustainability and waste management. It is also a model office for reducing, reusing and recycling.

Everyone is welcome at City Hall. Drop in and see what the city's mayor, Ima Rae Turner, and the citizens are planning next...

### **Town Meetings**

The 3R Committee meets at City Hall on a regular basis to share information about how to reduce waste and encourage reuse and recycling.



A city government official attends these meetings and reports the results to Mayor Turner. The 3R Committee works with local government and businesses to create

better, more profitable markets for reused and recycled materials. (By buying and selling these materials in larger quantities, everyone gets better prices).

The 3R Committee conducts email and letter-writing campaigns to encourage companies to reduce unnecessary packaging and the use of hazardous ingredients in their products. 3R members let companies know when they are pleased with changes and recommend these businesses to Mayor Turner for special awards.

Some members monitor state government debates for proposed laws that could improve waste management and the environment.

### **Mayor's Office**

Once a month, Mayor Turner hosts a special town meeting to honor citizens and businesses that have made an extra effort to reduce, reuse, and recycle. At the meeting, she presents a special plaque made from recycled materials, a cash award, and issues a proclamation that is publicized in the local newspapers.



Mayor Turner studies model programs in other cities and introduces successful ideas to the Recycle City Council. She also checks city government offices to determine the amount and types of waste they produce and makes sure that reuse and recycling policies are followed. Mayor Turner also monitors the town's Environmentally Preferable Purchasing (EPP) Policy, which requires city agencies to buy safer products that generate less waste.

City representatives work closely with federal, state, and county health departments and environmental agencies, including the U.S. Environmental Protection Agency, to make sure local policies work to support other regulations that protect the environment.

To encourage even greater participation in waste reduction efforts, Mayor Turner and the Recycle City Council are creating economic incentives for local businesses and waste companies. So far, they plan to:

- Link the cost of garbage pick-up to the amount being thrown away, so that people who reduce waste and recycle will pay lower fees
- Give tax savings to waste haulers who pick up and recycle used equipment from local businesses

- Reward "green companies" that reduce the amount of waste they generate and manage their wastes responsibly
- Pass laws requiring businesses and city institutions to recover more materials for recycling or composting (including a law to require yard trimmings to be composted)
- Support local recycling efforts by keeping businesses up-to-date on recycling services and drop-off points
- Find new markets for recovered materials and inform local businesses about them

## Office

Recycle City's office workers, like Amy Woo, use computers to reduce the amount of paper they use. Office workers send email to each other, which requires no paper at all. Many city documents are available on the Internet, to reduce the need for printing and mailing paper copies.



At Recycle City Hall, they always print on both sides of the paper. (If all offices in the U.S. increased their two-sided copying to 60 percent, we would save over 15 million trees, or 890,000 tons of paper a year!) When paper can't be used again, workers put it into a recycling bin.

When the Recycle City government buys office supplies, it purchases recycled paper and other products that use less packaging or are made from recycled material. When it's time to buy office equipment, computers and lighting supplies, the city purchases energy-saving models with "Energy Star" or "EPEAT" labels on them.

Here are some ideas for any office:

- Use central bulletin boards to post flyers
- Use email rather than paper for announcements and internal memos
- Circulate documents electronically among several people
- Fax directly from the computer, or scan documents to fax Edit and proofread on the computer before printing
- Print drafts on paper that's already been used on one side
- Use single spacing in documents
- Store files on electronic media such as CDs, memory sticks, or on the network
- Reuse file folders and envelopes

## Copy Room

To reduce the amount of paper they use, Recycle City employees use recycled paper and copy on both sides. They scan documents to send electronically instead of faxing or mailing them.

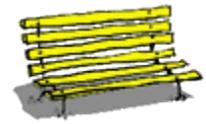


For coffee breaks, they use mugs that can be washed and reused. By using re-usable cups, the workers don't have to throw away foam or paper cups—saving resources and energy, and helping decrease the amount of waste that goes into the landfill.

Everyone brings their refillable water bottles rather than buying bottled water, and they put empty soda cans and bottles in collection bins for recycling.

## Plastic Bench

The benches outside City Hall are made from recycled high-density polyethylene (HDPE) plastic. Before the plastic in this bench was recycled and processed, it stored milk in gallon jugs at the local grocery store.



Recycle City has wooden benches, too. When they need repainting, the city saves money and reduces waste by using recycled paint that was dropped off at the Hazardous Waste Disposal Center.



## *Recycle City: Hazardous Waste Center*

Under the watchful eye of its manager, Harlin Hazzard, the Recycle City Hazardous Waste Center handles the treatment and disposal of waste that can harm people or the environment.

Put on your protective goggles and gloves and tour the Center with Harlin. That's him in the middle, pointing...

### **Harlin Hazzard**

Hazardous waste comes in several forms: liquid, solid, or sludge, which is a combination of both. Most hazardous wastes that Harlin handles are produced as by-products of manufacturing.



Harlin considers waste to be hazardous if it is:

- Ignitable (it can catch fire)
- Corrosive (it can eat through metal)
- Reactive (it can explode)
- Toxic (it is harmful or fatal to living things)

To help Recycle City businesses, Harlin keeps a list of the U.S. Environmental Protection Agency's recommended ways to prevent pollution from hazardous waste:

- Reduce—Find safer substitutes for hazardous materials, such as solvents made from naturally acidic ingredients like lemon juice or vinegar.
- Recycle—Clean and reuse materials that contain hazardous ingredients, such as motor oil.
- Treat—Combine hazardous waste with other chemicals that make the hazardous ingredient safer. (Some hazardous wastes can be safely destroyed by burning them at very high temperatures.)
- Dispose—Dispose of hazardous waste in approved hazardous waste landfills after treatment. (Liquid hazardous wastes can be combined with other substances, like glass or concrete, to make them solid, so they won't move or leak when buried in a landfill.)

### **Household Hazardous Waste Drop-Off Center**

Household hazardous wastes are leftovers from toxic products used at home. Since these wastes can be dangerous, they should never be thrown into the regular trash. Why? Certain kinds of waste can release toxic gases or explode when they are combined. They can contaminate septic tanks and wastewater treatment systems if they are poured down drains or toilets. And, they can be hazardous to small children and pets if left around the house.



As part of his hazardous waste manager's job, Harlin runs a drop-off center where Recycle City residents can bring used household items such as cleansers, cleaning fluids, insect sprays, paint, batteries and battery acid, motor oil, or old medicines. He also provides information to residents on how to find safer alternatives.

If residents bring unopened products or ones that are in good, reusable condition, Harlin puts them in a waste exchange bin. He gives them away for free to other residents who can use them.

## Hazardous Waste Treatment & Disposal Building



When hazardous materials are brought into the Hazardous Waste Center, Harlin makes sure they are carefully separated according to how they can be safely reused, treated, or disposed of. Then they're transferred to places that specialize in handling each type of hazardous waste.

## Paint Remixing & Reuse Area



Almost all latex paint that is brought to the Center is remixed with a special electric mixer. Harlin sorts paints into off-white and other colors, and repackages them into five gallon pails. He then resells it or puts it in a waste exchange bin for reuse. People from around the city use the remixed paint to paint their homes or cover graffiti.

## Fuel Blending Transfer Area



Harlin sends oil-based paints, paint thinners, solvents, and tar for roofing to a licensed facility that blends them into a fuel.

These wastes can be burned as fuel because they contain petroleum-based chemicals. This fuel is shipped to companies that burn it in kilns used to manufacture cement. (These kilns must have special equipment to minimize air pollution.)

## Treatment & Neutralization Loading Station



Neutralization is a way to combine a hazardous material with another substance to create a non-hazardous material.

Certain acids, non-flammable poisons, and other types of chemicals can be treated this way. Harlin ships these kinds of waste to a special treatment facility where this is done.

## Hazardous Waste Landfill

Only about one percent of Recycle City's hazardous waste has to be buried in this special landfill, located about 20 miles outside of town. The landfill is carefully constructed with barriers to prevent the soil or groundwater from being contaminated. Liquid hazardous wastes are combined with other materials to make them solid, so they don't leak out.



## Incineration Transfer Area

Aerosol cans, pesticides, certain acids, and some kinds of chemicals can be safely burned at high temperatures. At high heat, these materials usually change into a non-hazardous form. If the resulting ash is still hazardous, it is safely buried in the hazardous waste landfill.



## Recycling & Recovery Loading Station

Harlin collects motor oil, all kinds of batteries, and antifreeze, and sends them to other facilities to be recycled. Chemicals used in film photography contain silver, so Harlin sends those to a licensed recycling facility where the silver can be extracted and used again.



## Contamination and the Superfund

If hazardous waste is not properly disposed of in a landfill built especially to handle hazardous waste, it can leak into groundwater. Leaking is a big problem because the hazardous waste contaminates both the soil around the leak and the underground water.



If soil and water become contaminated by hazardous waste, it is very expensive to clean up. People have to actually "clean" the soil and water to make it safe again. That kind of cleaning is very expensive.

In the past, when people didn't handle hazardous waste properly and just dumped it (like they sometimes did in Dumptown years ago), some areas of the country became very. Some of this contamination continues to cause problems for nearby communities.

To help clean up hazardous waste sites in the United States, Congress created Superfund, a law that lets government find those responsible for creating the hazardous waste and make sure they clean it up. Superfund is also a name for the money that the U.S. Environmental Protection Agency can use to clean up pollution from hazardous waste if they can't find who caused the contamination, or if those responsible don't have enough money to pay for the cleanup.

### **Recycle City Church**



The Recycle City church gets into the spirit of recycling by holding regular used clothing and toy drives. Members contribute clothing and toys they no longer use, and the Recycling Committee delivers those items to families in need.



**Recycle City - Northeast Neighborhood**



## *Recycle City: Community Warehouse*

With all of the second-hand things it has to offer, the Community Warehouse is a great resource for Recycle City residents. Lots of people bring things they can no longer use to the warehouse, so they can be resold.

There is some cool stuff in here.

### **First Apartment**

Miguel is picking out things for his first apartment. He already bought a set of funky dinnerware from the Fifties, a lamp, chair, and green plaid sofa. In the clothing section he found a cool cap, and a great jacket. On his way to the register, he noticed there's some great music in the used record and CD piles.



## Computers

The Community Warehouse sells older, working computer systems that have been donated by residents. Latifah bought an entire computer system and a printer really cheaply to use for her college classes.



Mr. Fix-It rebuilds computers that aren't in good working order. Rebuilding and selling these computers helps reduce the number that are destined for recycling.

Many states don't allow computer terminals to be thrown away as garbage, because of the environmentally harmful cathode ray tubes (CRTs) inside. CRTs should be disposed of at a hazardous waste facility.

## Appliances

Many appliances that are thrown out just need a new wire or a simple adjustment. The Community Warehouse sends these appliances to Mr. Fix-It who fixes them and returns them to the warehouse to be sold.



## Recovered Building Materials

Just outside the warehouse, builders and people who are renovating their houses can find good materials that have been saved from torn-down buildings. People can buy used building materials and fixtures that are still in really good shape—such as bricks, iron gates, molding, light fixtures, bathtubs, cabinets, hardwood from floors, marble, and even garden statues.



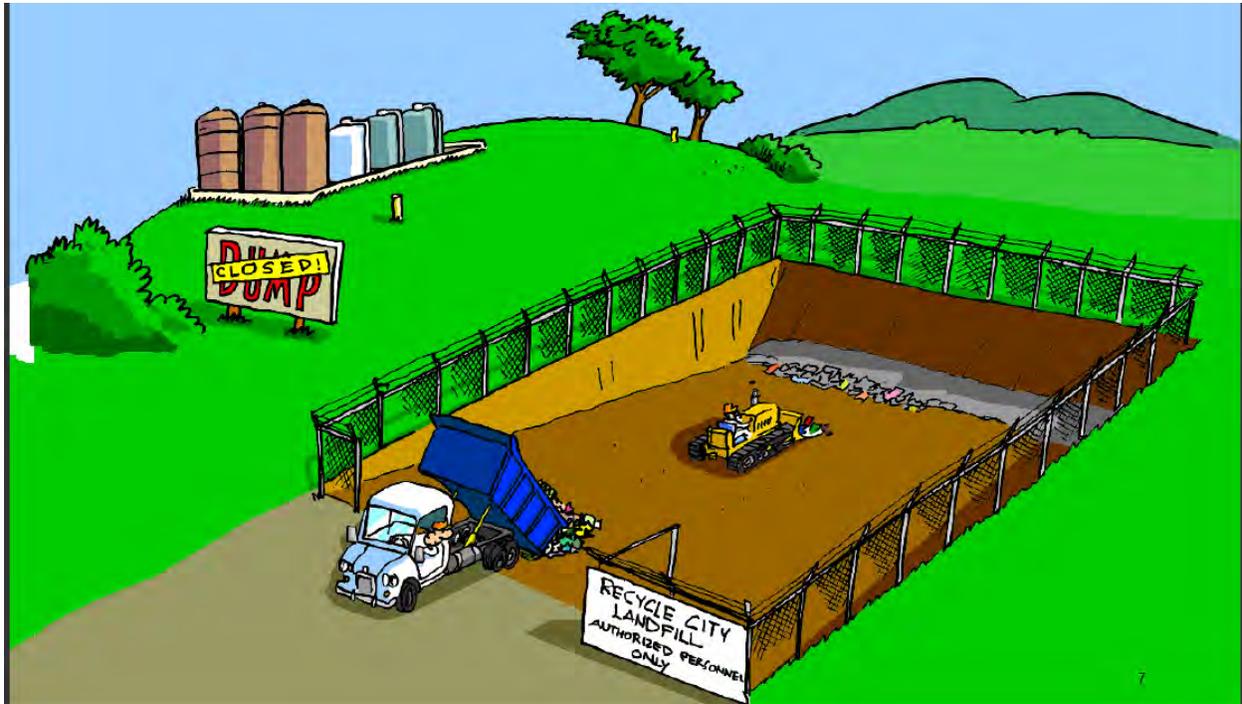
## Mr. Fix-It

Mr. Fix-It repairs and refurbishes almost anything. He fixes small appliances, like toasters, small ovens, and automatic coffeepots. He also repairs clothes and shoes.



To rebuild computers, he finds college students who know about electronics, and provides them with part-time jobs while turning worn-out systems into computers that people can use.

People from all over Recycle City as well as the Community Warehouse rely on him to extend the life of lots of different items.



## *Recycle City: Landfill*

Recycle City has two landfills—a solid waste (or sanitary) landfill for safe disposal of regular household garbage, and a hazardous waste landfill outside of town that was built with extra safeguards to handle more dangerous industrial wastes.

When Recycle City was called Dumptown, everyone threw everything into the same big hole in the ground. The hole soon became a big mound of trash. Hazardous material in the dump would seep into the soil and even into the groundwater under the earth's surface. The contamination was so bad, it required an expensive clean-up effort. But now, there's a much better way...

### **Old Landfill**

The old Dumptown landfill is all covered over now. But because it was just a hole in the ground where residents and businesses threw away everything—including hazardous waste—it caused a big problem. Poisonous liquids seeped through the soil into the groundwater beneath



the earth's surface and contaminated it. This underground plume of contamination started spreading toward even larger underground water supplies.

With some help from federal and state agencies, the new Recycle City government started cleaning up the problem. Using money from the businesses that had been most responsible for the contamination, a "pump-and-treat" system was built to remove the contaminated groundwater and clean it up. This system pumps water out of the ground, purifies it by filtering out all the pollutants, and sends it to nearby farms to water crops.

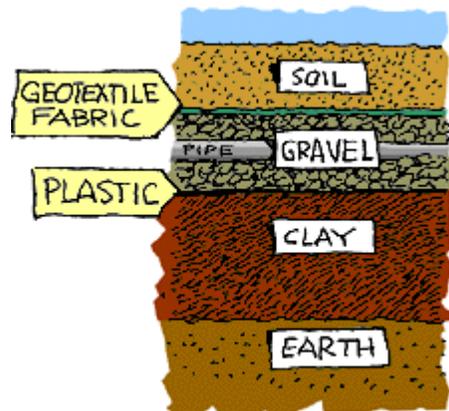
The system was very expensive to build and run, and it taught everyone a valuable lesson: It's much cheaper to prevent pollution in the first place than to clean it up later!

Unfortunately, there are many contaminated places in the United States. To help clean up these hazardous waste sites, Congress created Superfund. This is a law that lets the government find those who are responsible for creating the hazardous waste and make sure they clean it up. Superfund is also a name for the money the U.S. Environmental Protection Agency can use to clean up pollution from hazardous waste if they can't find who caused the contamination, or if those responsible don't have enough money to pay for the cleanup.

## New Landfill

After reusable and recyclable materials have been removed at the Materials Recovery Facility, the remaining household waste is trucked here to the solid waste landfill.

This landfill is a large pit with a liner along the sides and bottom that keeps the waste from touching the earth. When it rains, water drips through the garbage in the landfill and dissolves various chemicals in the waste, producing contaminated water. The landfill liner system keeps the contaminated water (called leachate) from seeping into the earth and eventually into rivers or drinking water wells.



The liner has five layers made of different kinds of materials:

1. The bottom layer next to the earth is made of at least two feet of clay that has been pounded until it is very compact.

2. Next is a layer of strong, flexible, very thick plastic, called high density polyethylene (HDPE).
3. On top of the plastic is a one-foot layer of gravel with pipes running through it. The leachate collects in these pipes and is pumped out of the landfill and filtered.
4. Above the gravel is a layer of very tough fabric, called geotextile fabric, to protect the gravel layer and pipes.
5. Finally, the top layer is about one foot of compacted soil to separate the entire liner system from the waste and to protect the liner from being damaged by the waste or landfill equipment.

Each evening bulldozers roll over the landfill to crush the day's garbage and then spread dirt to cover it with six inches of soil so the waste doesn't smell or attract flies and rats.

When an area of the landfill is completely full, the workers cover it with more layers of clay and plastic and soil. This final landfill cover helps keep rainwater out of the waste and reduces the amount of leachate that forms.



## *Recycle City: Materials Recovery Center*

The Materials Recovery Facility is really important. It acts as the traffic control center for all of the waste in Recycle City. The city's garbage and recycling trucks bring the waste from all of the houses, schools, businesses, and office buildings to the facility for sorting.

Step inside and see how much of Recycle City's waste can be put to use again.

### **Sorting**

Here, materials from recycling bins are loaded onto a conveyor belt and separated by type of material. Hazardous waste, such as poisons, paints, or chemicals, shouldn't be thrown into the recycling stream, but rather



taken to the Recycle City Hazardous Waste Center.

Reusable or recyclable waste is sorted into separate bins—newspaper, office paper and cardboard, aluminum cans, tin and steel cans, glass, and plastic. After everything's sorted, the materials are compacted and baled. These bales are transported by truck, train or container ship and sold to different companies to make them into new products.

In addition to recyclables, Recycle City separately collects yard trimmings and food waste for recycling. This organic waste is processed separately to be made into compost, which can be added to soil to help grow fruits and vegetables in gardens.

### **Paper, Newspaper & Cardboard**

Even though paper and paper products can be easily recycled, they still make up about 15 percent of the waste stream.

So which kinds of paper are recyclable? Cardboard, newspaper, and high-quality papers (like paper for notebooks, copiers, computers, letterheads, and envelopes) can all be recycled. Different kinds of paper—like newsprint and high-quality white paper—are sorted into separate piles because they are processed differently. Recycle City collects just about everything made out of paper that hasn't been coated with plastic, printed with metallic ink, or soiled by food. Paper towels and food-soiled paper can be placed with food scraps and yard trimmings in the organic-material recycling bin and turned into compost.



Paper is recycled by shredding it into small pieces and mixing it with water. The mixture is beaten into mush, called pulp, that flows onto a moving screen where most of the water is taken out. Wood or paper fibers remain and the fiber is pressed through rollers that squeeze out more water. It is then dried in a steam-heated dryer. The result is recycled paper.

### **Glass**

You can recycle many types of glass. Glass bottles and jars can be reused and recycled an infinite number of times. (In fact, only light bulbs, ceramic glass, dishes, and window glass can't be recycled. Dishes and



ceramic glass can be sold at garage sales, given to someone else, or donated to charity or a community warehouse.)

Glass is made from soda ash, sand, and lime. If it's thrown away, it stays there indefinitely because glass never breaks down into its original ingredients. To be recycled, glass is sorted by color, crushed into small pieces, and melted down into a liquid. Then, it is molded into new glass containers. Sometimes recycled glass is used to make insulation and road-construction materials.

## Aluminum

In many parts of the country, recycling aluminum cans is a profitable activity. There is an established market for recycling them, making it easy for most people to participate. And, because they house some of the country's most popular drinks, you can find them almost everywhere.



Aluminum is made from bauxite, an ore that must be mined from the earth. It doesn't decompose or break down, so an aluminum can will always be an aluminum can—until someone recycles it! When recycled, aluminum is melted down and reshaped into new cans and other items. Making new aluminum cans from old ones requires only five percent as much electricity as making new cans from bauxite, so recycling them saves a lot of energy!

## Other Metals

It makes good sense to recycle valuable resources such as metals. Why? Metals are easier for people to recover and reuse than to mine from the earth.



Tin-coated steel cans, such as soup and fruit cans, are made of iron ore and tin, which are limited resources. They are the product of geological processes that take millions of years to complete. Once these metals are gone, they are gone forever.

These cans require a different recycling process than aluminum cans. As a result, steel cans may not be accepted by some recycling companies. If they're not recycled, cans

made of these metals eventually rust and break down, but throwing them away is a waste of valuable resources.

To be recycled, these cans are put into a huge container with holes in the bottom and then dunked in a caustic (acid-like) solution to dissolve the tin from the cans. Then, the steel cans are washed and sold as high-grade steel. The dissolved tin is made into bars that are sold to companies that need tin to make more cans or other products.

## Plastic

Plastic is made of petroleum, a limited (or “non-renewable”) resource. It makes up more than 12 percent of all waste by weight, but takes up almost 20 percent of its space (or volume). About half of plastic waste comes from packaging. The rest comes from all kinds of goods, such as computers, radios, disposable razors, and toys.



A piece of plastic that is thrown away will stay the same for many, many years. Today, only about seven percent of plastic is being recycled – mostly plastic soft drink bottles and milk jugs.

In your house, you can probably find two types of easily recyclable plastics.

The plastics from soft drink containers (Plastic #1, known as polyethylene terephthalate, or PET, for short) are used to make fiber, structural molding, and more containers.

Milk jug plastics (Plastic #2, called high-density polyethylene, or HDPE) can make bottles, toys, pipes, crates, and other products.

A mixture of these plastics goes into making garbage cans, park benches, plastic "lumber," manhole covers, and even railroad ties.

Separating plastic by type for recycling helps manufacturers produce higher quality recycled products. (An easy way to tell which plastic a container is made of is to look on the bottom for a number inside the chasing arrows.)



To be recycled, plastics are either shredded or melted down and then used to make new plastic products.

Although #1 and #2 plastics are the easiest ones to recycle, there are other types of plastics that will be more commonly recycled in the future – and are already recycled in some cities.

## Wood

Almost all wood can be reused in some way. The best way to reuse or recycle it depends on its condition. Wood that's in good condition or is especially valuable, like oak, can be resold at places like Recycle City's Community Warehouse.



About 40 percent of wood recovered from buildings that are torn down can be reused. Wood that is in pretty bad shape can be remilled and remanufactured into things like furniture and flooring. Even wood that's in terrible condition can be recycled by chopping it into small pieces and making it into things like particle board.

However, painted wood is hard to recycle because old paint often contains lead, which is a toxic metal. Sometimes painted wood is chopped into a fine mulch and used as filler in construction. Researchers are looking for other ways to reuse it, so it doesn't have to go into a landfill.

## Yard Trimmings & Food Waste

When you mow the lawn, prune your trees, or rake up leaves, the yard trimmings may not look like much, but they make up about 13 percent of the U.S. waste stream by weight.

At the Recycle City Materials Recovery Facility, yard trimmings are separated out for large-scale recycling. Some yard trimmings are made into mulch or wood chips. The rest is turned into a natural soil additive, called compost, that is used in landscaping, gardening, or farming.



Yard waste can be collected and composted by an entire community, as a school project, or at home in your own backyard.

When you add compost to your garden, you can improve soil texture, keep weeds from growing, increase soil's ability to absorb air and water for better plant growth, and

decrease erosion. With compost, you also reduce the need to use chemical fertilizers and pesticides.

Food waste can also be recycled into compost. In the U.S., food waste makes up over 34 percent of what goes into landfills. Residents, businesses, and restaurants separate their food waste and put it in a separate bin with yard trimmings.



## *Recycle City: Businesses*

### **Rerun Theatre**

The Rerun Theatre shows some great old movies that the people in Recycle City love to see. The owner, Sam Spade, used to run first-time movies until he realized that most of the plots had been recycled from classics anyway.

### **Pets**

The Recycle City pet shop is a little different from other pet shops. They help give animals a new, loving home when their former owners can no longer care for them. When litters of puppies or kittens arrive, they get to play in shredded newspaper in their pens -- giving newspaper another use before going into the waste stream.



## *Recycle City: Café*

Moonbeam runs the Recycle City cafe and used bookstore. Her business is very environmentally friendly and is a comfortable place for the locals to sit and read used books while sipping something to drink.

Order a double decaf latte and see what Moonbeam does to help the environment.

### **Glasses & Mugs**

Moonbeam stocks the snack bar and coffee area with real glasses and mugs instead of foam cups. Mugs and glasses can be washed and used time after time.

To cut down on the amount of paper and plastic going into the waste stream, Moonbeam sells refillable mugs. Her regular customers buy them



and bring them in whenever they want something to go.

Using reusable mugs saves natural resources. It also saves Moonbeam and her customers money because she doesn't have to buy or throw away disposable cups. (Moonbeam even offers a small discount to customers who bring their own mugs from home).

## Used Books

There is a great supply of used books of all kinds in the bookstore that were sold or donated by their original owners. Customers can buy the books to take home, or just borrow them from the shelves to read while they hang out at the cafe.



## Newspapers

Although Moonbeam sells newspapers to customers who get coffee to go, she encourages customers who stay to reuse the free papers she makes available. (Moonbeam keeps a stack of today's papers and some of the latest magazines in a box. Her customers can pick out what they want to read and return it when they leave the cafe.)



## Coffee Grounds

Since a coffee house can use up a lot of coffee, Moonbeam called the Recycle City school to see if some students wanted to come by to pick up the coffee grounds for the school's compost bin. They did. Now, Moonbeam puts all the grounds into a single bin, so the students can collect them once a week. She also buys produce grown with the compost in the school's garden to make the best sandwiches and salads in town.





**Recycle City – Southeast Neighborhood**



## *Recycle City: Factory*

Widget Manufacturing Co. is a model business for waste reduction. Plant managers Tyrone Jones and Rosy Littlefeather give bonuses to Widget workers who come up with new ways to reduce, reuse, or recycle. By reducing waste, the company helps the environment and saves money, too.

You might be wondering what a widget is. It's hard to describe, but it's really important—kinda like a doodad. Now that you know, grab a hard hat and come inside to find out more...

## Recycled Metal

Because metal is a non-renewable resource (when it's gone, it's gone), Rosy makes sure Widget Manufacturing buys recycled metal to produce its widgets. She buys it from the company that recycles metal items for the Recycle City Materials Recovery Facility. She also uses scrap metal that Joe's Auto Wreckers helped collect.



## Washing Widgets

In trying to reduce the amount of toxic chemicals Widget Manufacturing uses, Tyrone found a safer substitute for the harmful cleanser used to clean off newly manufactured widgets. Now, Tyrone uses cleansers with ingredients like lemon juice and vinegar (which are naturally acidic). The new cleansers do the job as well as the old toxic chemicals, but they don't harm the environment.



## Packing Widgets

When Rosy's crew packs widgets for shipping, they use a popcorn-like packing material made from corn starch. In the old days, they used "peanuts" made from plastic foam, but many people just threw them away (instead of reusing them) and contributed to filling up the local landfill. The new material, made from corn starch, can be dissolved in water when it's no longer needed. (Real popcorn can be used as packing material, too, but hold the butter.)



## Reduced Packaging

Tyrone and a team of Widget workers experimented with several ways to reduce the packaging used to ship widgets.



Corrugated boxes are a major source of waste in industry. Willie, one of the Widget workers, found that boxes returned from customers could be reused and repackaged up to five times before recycling them. Now, Widget Manufacturing offers to pay for shipping if its customers return the packaging. So far, Willie's idea has saved the company \$95,000.

With the combined efforts of Widget plants across the country, Widget workers saved 2.9 million pounds of wood by collecting wooden shipping pallets. They either returned pallets to suppliers, sold them, or repaired broken pallets so they could be used again.

### **Fixing Widgets**

Rosy and Tyrone set up a widget repair station for fixing broken or worn-down widgets. Now, customers bring in worn widgets for replacement parts and leave with a widget that's good as new. Widget fixing not only saves energy and resources by extending the life of a widget, it also keeps customers happy.



### **Smokestack Scrubbers**

Laws designed to protect public health and the environment require factories, such as Widget Manufacturing Co., to reduce their contribution to air pollution as much as possible by using the latest pollution control technology.

The company uses a scrubber system to "scrub out" unwanted pollutants before releasing emissions through its smokestack. Scrubbers can remove harmful pollutants like particles, acid gases and sulfur gases. If acid gases are released into the environment, they can harm forests, soils, lakes, and living organisms, including people.



With the right kind of air pollution controls at Widget Manufacturing,, everyone in Recycle City breathes a little easier.

### **Commuting**

Widget Manufacturing Co. encourages its employees to get to and from work in the most environmentally-responsible way. Here are some of the things that Widget Manufacturing has done to encourage this.



### **Bicycling**

Bicycling to work has many benefits – like less pollution and traffic, and more exercise! Working with local bicycle advocates, Widget Manufacturing

recently set up bike lockers and racks behind their building. That way nearby workers can bike to work and know their ride is safely locked up during their shift. Rosy and Tyrone are even considering offering employees a subsidy for biking to work.

## **Transit**

Rosy and Tyrone asked Mayor Turner to include a bus stop right in front of the factory, so workers could inexpensively reach their jobs on time. City Hall quickly responded with a nearby bus stop. Workers riding the bus more than 10 miles are each responsible for emitting about 6 pounds of carbon dioxide into the atmosphere – much less than the nearly 10 pounds they would release by driving their car alone.

## **Carpooling**

The Widget factory office maintains a bulletin board so workers can find available carpools, locations, and times of departure to share rides to work. The factory also set up special parking areas close to the building for those who carpool.

Some distant workers have set up their own vanpool. The employees who vanpool 20 miles are each responsible for emitting only about 4 pounds of carbon dioxide instead of the 20 pounds they would put into the atmosphere by driving their car alone.

## **Telework**

Widgets don't make themselves at the Widget factory without workers, but Rosy and Tyrone quickly realized that some of the employees in the accounting office can complete their work from home with a secure Internet connection. With careful scheduling, they can shut down the accounting office one day each week and avoid paying for all that electricity.



### *Recycle City: Service Station*

Garage owner Shaq is an environmental hero – he knows how many toxic and hazardous materials are used in car repair, and does a great job in finding ways to reduce, recycle and properly manage those wastes. He also provides regular tune-ups for Recycle City's vehicles, helping them run better and pollute less.

Explore the gas station to find out more about how Shaq's shop helps Recycle City run clean.

## Toxic Solvents

To clean parts, auto shops use a lot of solvents – liquids that dissolve other substances, like grease. Used solvents are the largest source of hazardous waste from auto repair. They also can harm workers if used improperly.

Shaq has made great strides to reduce his solvent use. He uses safer water-based solvents, and makes sure these are recycled or managed by a fully-qualified waste hauler. He reads the ingredients of the products he buys and tries to avoid the most toxic chemicals. He has also replaced many spray cans for brake cleaning with a roll-around brake washer.

## Used Motor Oil

Used motor oil contains lots of toxic materials. Shaq knows that recycling it is the best way to handle this kind of hazardous waste. Whenever a car needs an oil change, he collects the oil in this drum. When it's full, the truck from the oil recycling program picks it up to be "cleaned" and reused.



Shaq also accepts used motor oil from people who change their own oil. By doing this, he knows that the used oil will be disposed of properly and won't be poured down the drain, on the ground, or into Recycle City's storm sewers, which empty into a nearby creek.

If someone in your family changes the car's oil at home, make sure the used oil is taken to a local gas station, oil-change shop, or hazardous waste drop-off center. Never pour used motor oil down the sewer or into a drain, because it can flow into a creek, river or lake and poison fish, plants, and animals.

## At the Pump

What does proper car operation and maintenance have to do with the environment? Plenty. What you drive, how you drive, how you care for your vehicle, and how you dispose of used fluids and parts affects our air and water, the safety of landfills, and even the ozone layer above the Earth that protects everyone from ultraviolet radiation. Here are some things you can do:



- Use the right octane level—Using higher-octane gas may not increase the engine's performance, so don't buy a higher grade than the car engine needs. (Making fuels with higher octane uses more crude oil than lower-octane gas. Also, making higher-

- octane fuel often involves the addition of toxic chemicals.)
- Don't overfill or spill—Stop filling the tank when the pump automatically shuts off. Going past the pump's cutoff increases the chance of spilling gas and releasing harmful gas vapors.
  - Put the gas cap on tightly—The gas cap prevents the escape of gas vapors from the fuel tank, reducing air pollution, and protects the engine by keeping water out of the fuel.
  - Use cleaner fuels—If available in your area, use alternative fuels that can reduce air pollution. These fuels burn more completely than gasoline or are less likely to evaporate.

### Used Oil Filters

Oil filters are made from high-quality steel and can be recycled. Because an average used oil filter retains as much as 6 to 8 ounces of engine oil after it is removed, Shaq makes sure all the leftover oil is drained from a filter before he puts it into the bin that goes to the Materials Recovery Facility.



Like the rest of the country, about 45 percent of Recycle City car owners change their own oil. When they do, they drain the oil from the used filter into a plastic milk jug and then put the filter into a plastic bag for collection. (Not all cities collect used oil filters, but you can still help the environment by taking the used filter and oil to the proper collection facility.)

At the Materials Recovery Facility, used oil filters are set aside to go to a processing center, where the last drops of oil are drained and captured for recycling. Then, the steel is pressed into cubes. The cubes are sold to steel mills to be made into something new.

### Maintenance

Shaq helps his customers maintain their cars in tip-top condition, and gives maintenance tips that can help their cars run better *and* help the environment.

- Get regular maintenance—Follow the recommended maintenance guidelines for your car to keep it in top running condition and minimize damage to the environment. Things that need regular



maintenance include air filters, oil, oil filters, vacuum and coolant hoses, spark plugs, oxygen sensors, and emission systems.

- Recycle used oil—The oil from just one oil change is enough to contaminate one million gallons of fresh water. Americans who change their own oil throw away 120 million gallons of reusable oil every year. Much of it contains toxic substances such as lead and benzene. Oil dumped on the ground can pollute drinking water sources underground. If you or someone in your house changes the oil, don't dump it—take it to a service station or a collection center!
- Check your tire pressure once a month. An underinflated tire can reduce gas mileage by two percent.
- Use the recommended oil viscosity (thickness)—Using the lowest recommended viscosity for the lowest expected outdoor temperatures gives you the best gas mileage, easy starts, and cold-engine protection.
- Use energy-conserving oils—Oil containers marked with "EC" numbers on the labels can improve gas mileage by one to two percent.

## Used CFCs

What are CFCs and why does Shaq's Garage collect them? For many years, car air conditioners and home refrigerators used chemical compounds called chlorofluorocarbons, or CFCs for short, to help produce cool air. (New cars and refrigerators don't use them.)



CFCs become a big problem if they escape into the air. They float up into the stratospheric ozone layer—about 10 to 30 miles above the earth—which blocks the sun's most dangerous ultraviolet [UV] rays.

Once CFCs are up in the stratosphere where it's freezing cold, they destroy ozone molecules, reducing the protective ozone layer and allowing more UV rays to reach the earth, where they can cause severe sunburn, eye damage, skin cancer, kill crops and other plants, and even destroy sea life.

Fortunately, CFCs can be recycled. In the Recycle City garage, Shaq uses special equipment to capture the cooling liquids that contain CFCs from the car's air conditioner. That way, the CFCs don't escape into the air and can be used again in older cars.

(Since new car air conditioners use different chemicals that don't hurt the ozone layer,

CFCs will gradually become less of a problem).

## Vapor Recovery

Shaq's Garage has special nozzles on its gas pumps to prevent gas fumes from escaping when people fill their gas tanks. Why does Shaq bother?



Because pollution from gas fumes is even more concentrated than exhaust that comes out of a car's tailpipe. (So it's more harmful.)

Gas fumes contain things like volatile organic compounds, called VOCs, and other pollutants and dangerous chemicals, like benzene, that can cause cancer. The nozzles help prevent gas fumes from getting into the air. That's important because when gas fumes mix with sunlight, smog forms. Smog, or ground-level ozone pollution, makes it harder for people to breathe. It can irritate the eyes, throat and lungs, and can make problems like asthma worse.

Air pollution from cars and other motor vehicles goes everywhere. In cities, at least half of the air pollutants that become smog are caused by gas-powered vehicles or equipment. By putting a vapor recovery nozzle on the gas pump, Shaq helps reduce toxic emissions that contribute to unhealthy air.

Did you know that ground-level ozone—the main ingredient in smog—has the same chemical makeup as stratospheric ozone? The difference is that the ozone layer up in the stratosphere protects life on earth from harmful ultraviolet rays, but ozone in the air we breathe is bad for our health.

## Underground Storage Tanks

The gasoline that Shaq sells to his customers is stored in tanks under the ground. When his station was built, Shaq used double-walled tanks with secondary containment to protect the environment from tank leaks.



Secondary containment means that there are two walls of metal or fiberglass-reinforced plastic between the gasoline and the soil, so there is less chance that a leak would contaminate the soil and groundwater beneath the earth's surface. Any gasoline that leaks out of the tank will collect between these walls, where it can be detected, so the problem can be fixed before any gasoline

leaks into the environment.

What's a UST LDS anyway? The sign marks the location of Shaq's Underground Storage Tank Leak Detection System. The system monitors the tanks and piping so that Shaq knows right away if there's a problem. That way, he can call the experts to fix the leak before it becomes a big problem—one that could contaminate drinking water wells.

## Old Tires

Worn-out tires don't need to be thrown away. Shaq does two things to keep old tires going.



- First, he sends good tires that are still safe for use to a tire company to be reconditioned. These retreads can be put back on the car and driven safely for many more miles.
- When old tires can't be put back into shape, Shaq collects them and passes them on to companies that reprocess them. Old tires can be shredded or melted down and used to make other materials, such as asphalt to pave roads, or playground surfaces.

When the tires on your car wear out, don't just throw them away. If your local gas station doesn't do what Shaq's Garage does, call your local solid waste management department.

Whatever you do, don't toss them into the nearest ditch or garbage can. When dumped, they can cause safety hazards, catch fire, or provide disease-carrying mosquitoes a place to breed.

We have made significant progress – today 83 percent of all tires are reused, recycled, or recovered in useful ways. But thousands are still going into shrinking landfill spaces, added to rapidly growing stockpiles of tires, or dumped into creeks or empty lots.

The first way to prevent generating old tires is to regularly check them to make sure they have the appropriate tire pressure; this will allow them to perform well and extend their life. If we all do this, we'll generate less old tires.

## **Electric Cars**

This is one of the new electric cars purchased by a couple of Recycle City residents. These forward-looking folks know that in the future more car owners will be driving up to "charging stations" to refuel their vehicles with electricity.



These first electric cars can't go as fast or as far as gasoline-powered cars, but they are good for people who want them for driving short distances. Scientists and engineers are working on better batteries that will let electric cars perform just as well as gas-powered ones.

Electric cars will mean less pollution because nothing comes out of the tailpipe, so people will breathe cleaner air. (Fuel-burning power plants that make the electricity to charge the batteries create some pollution, but much less than gas-powered cars.)

## **Protecting Water Quality**

Waste water and storm water from auto shops can pollute waterways and put toxics, oil and grease into the sewer.

Shaq prevents water pollution by minimizing spills of oil, antifreeze, solvents and gasoline. He uses shop towels to clean up small spills, and has a spill kit with special mops and absorbents to clean up bigger spills. He doesn't hose down his shop floor into the sewer, but keeps it clean with mops.



### *Recycle City: Supermarket*

Maria's Market is the main supermarket in Recycle City. Maria tries to stock items and provide services in her store that reduce the amount of material going into the waste stream and encourage reuse and recycling.

When the clean-up of old Dumptown began, Maria realized that the first and best thing she should do was to reduce the amount of waste her customers had to throw away after they bought products at her market.

Shop around and find out what else Maria's Market does to help.

## **Maria**

To reduce the amount of waste and its impact on the environment, Maria began to stock items in the store that contained fewer harmful ingredients and used less packaging. To reduce packaging and wasted food, she created a section in the store where shoppers could buy food in bulk, measuring out the exact amounts they needed.



In her produce section, Maria struck a deal with area farmers. As she sells their seasonal fruit and vegetables, Maria uses their plastic and wood crates right on the refrigerated shelves, returning them to the farmers with the next delivery. That way, Maria and the farmers avoid creating wasteful and expensive packaging long before the customers ever have to choose between paper or plastic.

Maria also set up a program to reuse those things that could be reused, such as cardboard boxes that shoppers could use to carry their purchases and bring back to the store on their next visit. She also gave customers discounts for returning their plastic bags the next time they shopped and for bringing their own cloth sacks to carry groceries home.

Finally, Maria made sure that many of the items in the store could be easily recycled. She set up well-marked collection containers to make it easy for shoppers to participate in the market's recycling program. Maria knows that recycling keeps useful materials from going into landfills, helping to preserve the land in and around Recycle City for other uses, like parks and schools.

## **Paper or Plastic?**

Should you ask for a paper or plastic bag at the checkout counter? There's no easy answer. The materials needed to make either bag come from our natural resources.



- Paper comes from wood, which is made from trees, which grow in the earth's soil.
- Plastic is made from petroleum, also known as fossil fuel. Petroleum is made by the decomposition (breaking down) of ancient plants and animals inside the earth.

The trees needed to make paper are considered renewable resources. That means more trees can be planted to take the place of trees that are cut down to make paper and other products. However, trees take many years to replace because they grow slowly. Once paper is made, it can be recycled and used to create more paper goods. Making it into new paper, however, uses water and energy.

Petroleum needed to make plastic is considered a non-renewable resource. Like aluminum, tin, and steel, petroleum is not renewable because it is the result of geological processes that take millions of years. When used up, the earth's petroleum reserves will be gone for a long, long time. While plastic bags are easy to reuse, they're seldom recycled, and lots and lots of them get dumped into landfills.

The best solution is to use a sturdy reusable bag for shopping, or to bring your old plastic or paper bag back to the store when you shop again. (Some stores, like Maria's Market in Recycle City, credit your grocery bill for reusing old bags because they don't have to buy as many new ones.) If you only purchase one or two items, you might not need a bag at all.

## Recycling Igloos



In many parts of the country, supermarkets place recycling containers near the store to encourage their customers to recycle. (They can be any shape, really - they can even be automated, like vending machines -- but Recycle City uses these brightly colored igloos because they're fun.)

These igloos are used to collect bottles, cans, and plastic from Maria's Market shoppers. Twice a week, trucks from the local Materials Recovery Facility come by to empty the igloos and take the items for recycling.

## Cardboard Boxes



The cardboard boxes used to ship food to Maria's Market can be put to a variety of other uses once the food has been unpacked. The folks at the market let Recycle City residents come by and pick up cartons for storing things or moving to a new home. Any cartons that aren't claimed by the residents are broken down and put into a pile so they can be collected, recycled, and made into other things, like new boxes, paper bags, building insulation, animal bedding, or packaging materials.

## Reduced Packaging

When the buyers at Maria's Market place orders to restock the store, they try to order items with very little packaging, or that use ecological packaging (requiring as little energy and as few resources as possible to produce).



Maria's buyers also try to stock products that come in refillable containers. Products that don't harm the environment and come in ecologically friendly packages are called "green" products.

Packaging that isn't environmentally friendly includes products that are wrapped in several layers of plastic, use plastic foam, or have individually wrapped packages inside of a larger wrapped package.

Maria's buyers let the makers of these products know that they and their Recycle City customers would rather buy products wrapped in environmentally friendly packages than ones that aren't. Using this kind of packaging is good for the manufacturer's business.

## Bulk and Fresh Foods

Packaging materials make up more than 30 percent of all consumer waste. Maria's Market offers shoppers many fresh foods and bulk foods to help reduce the amount of waste from too much packaging.



Fresh foods, such as bananas, oranges, and nuts come in their own natural packaging and are excellent sources of nutrition.

Bulk items and food purchased in bulk quantities allow Maria's shoppers to decide exactly how much they want to buy. For small needs, folks measure out the exact quantity they want, helping to reduce food waste. For larger needs, they can buy much more, without lots more packaging.

When purchasing fresh foods or buying in bulk, shoppers can put their purchases into refillable containers they bring to the store or into the recyclable or reusable bags Maria provides.

## Paper Towels & Other Paper Items

When you shop, look for products that can be recycled—or have been recycled already! Read the label, and look for the highest percentage of “post-consumer recycled content.” That means your new paper product was made using a certain amount of previously used paper products.



Many paper products on the shelves today have already been recycled. By buying recycled products, you help save valuable natural resources and help to create a market for those materials. When manufacturers know that shoppers want recycled goods, they will make more of them.



In Maria's Market, the popularity of paper towels and toilet paper made from recycled materials ensures that fewer new trees have to be cut down to produce new products.



**Recycle City – Southwest Neighborhood**



## *Recycle City: Home*

Recycle City residents realize that it's up to them to help protect the environment. In this house, the Savemor family tries to reduce, reuse, and recycle as much as possible. Sue and Seymour Savemor and their kids, Sidney and Sheila, also try to reduce their energy use and avoid buying hazardous substances.

Visit them and see if you can pick up any ideas to use in your home.

## *The Savemor Home*

### **Guidelines**

The Savemors use some simple guidelines to reduce waste:

- To reduce waste, make less garbage.



- Buy only what you need. Rent, borrow, or share items that aren't used much.
- Sell or donate goods instead of throwing them out.
- Buy non-toxic or the least toxic products available.
- Buy products that use little or no packaging. Buy individually wrapped packages only when there is no alternative.
- Buy reusable products, such as re-chargeable batteries.
- Buy products made from recycled materials.
- Buy one general housecleaner rather than a variety of products for different purposes.
- Use all of the product containing toxic ingredients so there is no hazardous waste left.
- When you can't use something, find someone who can. Give extra paints to theatre or civic groups, and offer extra house cleaning or gardening supplies to neighbors.
- Take used motor oil, brake and transmission fluids, and antifreeze to the local gas station for recycling. Take old tires to the gas station or to the local auto wrecker.

### Solar Panels



The Savemor home has solar panels to generate electricity. The panels help heat water and power the home appliances. Solar energy is a great source of clean, non-polluting energy.

### Clothesline



When the weather is clear, the Savemors hang clothes on the line to dry. It saves energy and makes the clothes smell great.



### Tire Swing

Sue and Seymour rigged a tire swing from the tree for the kids, keeping one more tire from becoming waste and providing a great time for anybody who uses it.

## Attic Insulation

Every house in Recycle City has an insulated attic to reduce the need for energy and to conserve heat in the winter. Insulation also keeps homes cooler during the hot summer months. The Recycle City Power Co. gives home owners a rebate for insulating their houses.



## Air Sealing

Every house in Recycle City has been weatherized by sealing all of the air leaks around doors and windows, ceiling lights, attic hatches, and pipe and wire penetrations with caulk. Sealing these air leaks saves energy by keeping heat inside the house during the winter and cool indoor air from escaping during the summer. It also makes the house more comfortable and less drafty.

## Lighting

Every light bulb in Recycle City has been replaced with a more energy efficient fluorescent or LED light bulb. Citizens are saving thousands of dollars using less electricity to light their homes, streets and city buildings.

## Appliances

The Savemors keep all home appliances, like the refrigerator, in good working order. They follow the manufacturer's suggestions for proper operation and maintenance.



When old appliances need to be replaced, Sue and Seymour always check the energy efficiency on the new appliance. They also buy appliances that offer a longer life span and a good warranty or repair policy. The longer the appliances last, the more the Savemors save.

When an old appliance has to go, they call local recyclers who pick it up and use it for scrap.

## Source Reduction

The Savemor family knows that the best way to manage waste is to reduce it at the source. If you don't buy it, you won't have to throw it away. Here are some things the Savemors do to reduce waste:



- They contact companies to let them know they don't want to receive unwanted advertising mail. They ask companies not to share their names with other mailers. They also can request to be removed from mailing lists by visiting [www.dmachoice.org](http://www.dmachoice.org) or [www.catalogchoice.org](http://www.catalogchoice.org).
- They rent, borrow, or share items that they use infrequently, such as rug shampoos, ladders, chain saws, floor buffers, or garden tillers.
- They contact manufacturers to encourage them to reduce unnecessary packaging.
- They find safer alternatives to potentially hazardous household materials, such as oven cleaners and polishes.
- They buy the products they use a lot in bulk instead of in smaller quantities.

## Reusable Items



The Savemors hold a garage sale twice a year to sell usable things that they no longer want or need. That way, they not only help the environment, they make money, too!

In addition, they know that many everyday items—such as bags, plastic containers, and coffee cans—can be used more than once. As part of a project for Miss Redux at school, Sheila and Sidney came up with ideas for how some things can be reused at home:

- Paper and plastic bags can be saved and used to clean up around the house or taken to the store on the next shopping trip. Brown paper bags are great for wrapping packages to be shipped.
- Paper and envelopes can be reused to write notes or make lists before being recycled.
- Gift boxes can be used again as well as larger pieces of wrapping paper, tissue paper, ribbons and bows.
- Packaging, colored paper, egg cartons and other items can be used for arts and crafts projects at school, day care or senior citizen centers.
- Newspaper, packaging "peanuts," and bubble wrap can be reused to ship packages.

- Glass and plastic jars, milk jugs, coffee cans and other kinds of containers can be washed and used to store leftovers, buttons, nails, or thumbtacks. Empty coffee cans can be turned into flower pots.
- Used wood can be made into birdhouses, mailboxes, compost bins, garden borders or other woodworking projects.

BUT motor oil cans or pesticide containers CANNOT be reused because they contain harmful residues. They must be discarded following the manufacturers' instructions on the label.

### Recycling Bins

The Savemors keep recycling bins in the kitchen so no one accidentally forgets and throws something into the trash that could be recycled. They recycle plastic, glass, paper, and aluminum and other metal cans.



### Compost bin

Sidney and Sheila built a compost bin in the yard after hearing about how to do it in school. They use the bin to recycle grass and yard trimmings, and also add coffee grounds, egg shells, and vegetable trimmings from the kitchen. As the waste degrades and turns into compost, they use it to help their garden grow.



### Grasscycling

Whenever the Savemors cut the grass, they leave the grass clippings on the lawn instead of raking them up and putting them in bags. It's called grasscycling. It's good for the lawn because the grass breaks down and all the nutrients from the clippings go right back into the soil.

Because the lawn is receiving these nutrients, it doesn't need chemical fertilizers or even as much water. So, the Savemors save money, time, and energy—and keep all those bags of grass clippings out of the Recycle City landfill!



## Homemade Cleansers

Although sometimes they can't find a safe substitute for a toxic cleanser, the Savemors have found a number of ways to use safer alternatives. (When they can't find a safe substitute, they use as little of the toxic substance as possible to do the job.) Some alternatives they use are:



- Natural biodegradable cleaners, or 4 tsp. of baking soda in warm water instead of general-purpose cleaners
- Vinegar and salt instead of heavy-duty cleaners for surfaces
- One-half cup of white vinegar followed by one handful of baking soda instead of drain cleaners
- Biodegradable cleaners instead of harsh oven cleaners (for fresh spills, wet and sprinkle baking soda and scrub with soft nylon scrubber)
- Vinegar and water to clean walls, floors and glass instead of special cleaners
- One teaspoon of olive oil mixed with juice of one lemon and one teaspoon of water instead of furniture polish
- Opening the windows or setting out an open box of baking soda instead of using air fresheners.... or simmering cloves and cinnamon in boiling water

## Bicycles

While they sometimes need to use their car, the Savemor family tries as much as possible to use bicycles to get from place to place. Bikes don't pollute or use non-renewable fuels—and they're good exercise.



## Fireplace

This fireplace was made from old bricks that the family recovered from a building that was torn down.

The Savemors burn logs made from pressed wood. Pressed wood, made from recycled wood scraps and sawdust, burns cleaner than most other wood-based fuels. (Open fireplaces can add pollution to the air indoors. An enclosed wood stove that burns sawdust pellets can heat a home and cut down on the amount of pollution in the air.)



The Savemors listen to Recycle City air pollution control reports on the radio and stop using the fireplace when air quality warnings are issued, such as on cold nights when the temperature keeps smoke close to the ground.

### **Entertainment Room**

Of course, when the Savemors are done recycling at the end of the day, there are always reruns to watch on TV.



## *Home Kitchen & Bathroom Supplies*

There are some items found in kitchens and bathrooms that are dangerous if they are just thrown away with the regular garbage. These items can damage the environment and injure plant and animal life.

- Ammonia cleaners
- Hair straightener solutions
- Chlorine bleach
- Liquid medicine
- Cuticle remover
- Lye
- Hair remover
- Needles and syringes
- Disinfectants
- Oven cleaners
- Drain openers
- Prescription medicine
- Hair permanent solutions
- Rubbing alcohol
- Tub, tile, shower cleaners

Your local waste management agency has information on how to properly dispose of these items. Learn more about safer alternatives to some household products by visiting the Savemors' house next to the school!

## *Home Cleaning & Household Supplies*

There are some items around the house that are dangerous if they are just thrown away with the regular garbage. These items can damage the environment and injure plant and animal life.

### **Cleaning Supplies**

- Dry cleaning fluid
- Moth balls and flakes
- Furniture or floor polish
- Rug cleaners
- Household cleansers
- Spot removers
- Metal polish

### **Household Supplies**

- Aerosol cans
- Lighter fluid
- Batteries
- Mercury thermometers
- Butane lighters
- Pet shampoo
- Prescription Drugs
- Shampoo for lice
- Flea powder
- Shoe dye and polish
- Fluorescent lamp tubes

Your local waste management agency has information on how to properly dispose of these items. Learn more about safer alternatives to some household products by visiting the Savemors' house next to the school!

## *Home Garage & Garden Supplies*

There are some items around the house that are dangerous if they are just thrown away with the regular garbage. These items found in garages and gardens can damage the environment and injure plant and animal life.

- Garage Supplies
- Antifreeze
- Chrome polish
- Automotive cleaner
- Diesel fuel
- Auto body filler
- Engine degreaser
- Automatic transmission fluid
- Gasoline
- Brake fluid
- Kerosene, lamp oil or camp stove fuel
- Carburetor cleaner
- Lubricating oil
- Car batteries
- Motor oil
- Car wax

### **Garden Supplies**

- Fungicides
- Soil fumigants
- Herbicides
- Snail and slug poison
- Insecticides
- Vegetation killer
- Rat, mouse, gopher poison
- Weed killer

Your local waste management agency has information on how to properly dispose of these items. Learn more about safer alternatives to some household products by visiting the Savemors' house next to the school!

## ***Paint & Hobby Supplies***

There are some items around the house that are dangerous if they are just thrown away with the regular garbage. These items can damage the environment and injure plant and animal life.

- Painting Supplies
- Acrylic paint
- Oil-based paint
- Latex paint
- Paint stripper
- Model airplane paint
- Paint thinner
- Turpentine
- Mineral spirits
- Artists thinners, mediums

### **Hobby Supplies**

- Chemistry sets
- Resins, fiberglass, epoxy
- Glues and cements
- Rubber cement thinner
- Photographic chemicals
- Wood preservatives and solutions

Your local waste management agency has information on how to properly dispose of these items.



## *Recycle City: School*

As a regular part of the school day, Recycle City students learn about the three R's—reduce, reuse, and recycle—from Miss Redux.

Pop inside the classroom to learn more. Then, go around the school to see what else they're doing to help.

### **Miss Redux**

In her lessons, Miss Redux always teaches the three R's in the same order: reduce, reuse, and recycle.



**Reduce** always comes first because reducing what we use and what we waste means using fewer natural resources and less energy. Less waste also means less land is needed for burying waste in landfills. Ways to reduce waste include purchasing goods

that use less packaging, sharing or renting things (like carpet cleaners) that aren't needed regularly instead of buying them, and buying household cleansers that do not contain hazardous ingredients.

**Reuse** comes second because reusing items—using them twice or many times instead of just once—keeps them from becoming waste. Some ideas for reuse include using glass or plastic containers after they're empty, or taking a cloth sack to the store when you shop (you don't need a bag, and you can use the sack again the next time).

Here at the school, many kids bring their lunches in plastic containers, which they can wash and use over and over again, instead of wrapping their food in plastic wrap that they throw away every day. Meanwhile, some businesses have donated their old computers to the school for reuse, and the local theatre company donates its used sets and costumes to the Drama Club.

**Recycle** comes third, but not last. Recycling—converting used items back into raw materials, then making new products with them—conserves our valuable natural resources and reduces the need to put so much waste into our landfills. Many schools have started recycling programs that help raise money for needed items. And many items they buy can be made from recycled materials—such as paper, notebooks, playground equipment, furniture, and carpet.

## Playground

The Recycle City playground uses recyclable materials for play equipment and to make the playground safe. Old rubber tires (the kind without steel belts inside) were made into a recreation area where kids can crawl in and out and test their agility on an obstacle course. The safety mat covering of the playground itself was made from tires that were shredded and melted down. Today many products, including athletic, sports, and recreational rubber ground covers, are made from old tires.



## Recycling Drive

Recycle City students are holding a paper recycling drive to pay for a class trip. (For every ton of paper they recycle, the students save 17 trees from being cut down to make new paper.) Besides bringing used paper



from home, they turn in the writing, drawing, and computer paper they use at school.

To kick off the drive, students set up receptacles in the back of every classroom to collect used white paper from homework or computer printouts. At the end of the day, the paper is collected and put in a large, covered bin in the schoolyard. When the bin is full, students take the paper to a high-grade paper buyer who recycles it.

The students are collecting old sneakers in another bin. Really old sneakers are sent to a sneaker maker so the rubber can be removed and melted down for reuse. Shoes that are still in good condition are donated to kids who need them.

Recycle City students also operate an ongoing recycling program that collects cans and glass bottles used at lunch time. In addition to regular collection sites inside, they set up an easy drop-off point in the school parking lot to collect donations from parents and the community. The money collected from this program helped pay for the computers in the school library.

## **Compost Bin**

A compost bin returns plant and some food materials to the soil through decomposition, so it can be used as a natural soil additive, called compost. Compost improves soil texture, increases the ability of soil to absorb air and water, suppresses weed growth, and reduces the need to add chemicals and pesticides to plants.



Recycle City students have set up a compost bin to reuse leaves, grass clippings, and even some kinds of food from the cafeteria. They put it on a level area of the schoolyard that doesn't get a lot of sunlight. Then they started the pile with about a four-inch layer of leaves, loose soil, and grass clippings. They decided to include food scraps as part of the project, so they added things like vegetables, egg shells and coffee grounds.

Students take turns tending the bin. They've found out that many kinds of foods can be composted, including vegetable trimmings, tea bags, apple and potato peels, even old bread (no mayonnaise!). They make sure no one throws in meat scraps, dairy foods, or fats and greases (like mayonnaise), because those things attract pests, like mice and rats.

In dry weather, they sprinkle the pile with some water, but not enough to get it too soggy. Then, every few weeks, one of them turns the pile with a pitchfork to let the air

circulate and distribute the moisture. Sometimes the compost pile heats up, and some students have found worms in the pile—both are part of the decomposition process.

After about six months, the compost looks dark and crumbly with an even texture. When it looks like that, it's ready to be spread in the school garden and around shrubbery in the schoolyard. A couple of biology classes also use the compost for potting soil to grow plants.

## **Library**

The school library is the best place to learn about reuse, because that's what a library is all about. Because these books can be borrowed, read, and returned, their reuse saves thousands of trees.



Rebuilt computers, purchased from the local Mr. Fix-it Shop with money raised from the students' recycling drives, also help preserve our natural resources. Many students use the computers to do their schoolwork, saving paper by making all of their changes before printing out the final copy.

With computers, students can also use the Internet to read the local newspaper and search for information from universities, research centers and databases around the world. Getting information online saves paper, and reduces energy consumption and pollution by eliminating the need to drive from place to place to get what they need.

## **School Bus**

By taking the bus to school instead of cars, students help save fuel and reduce both traffic and air pollution. (When the weather is good, students who don't live too far away ride their bikes, which is a fun, healthy, and very cool way to get to school.)



The Recycle City school district is pioneering the use of natural gas in its school buses. Natural gas (which is also used to heat homes) is one of a number of alternatives to gasoline for powering vehicles. Others include propane, ethanol, methanol, biodiesel and electricity.

Each alternative fuel has advantages and disadvantages over gasoline, but all of them can be made from energy resources available nearby, such as natural gas, farm

products, or even fats, oil and grease from restaurants. (Using alternative fuels can also help reduce our dependence on oil, a non-renewable resource.)

The school district is also planning to invest in electric buses. These battery-powered buses can run up to 90 miles on a single charge, and the Recycle City school bus drivers drive much less than this each day.

# Recycle City: On the Road

## Avoid Potholes & Rough Spots



They wear out tires and can throw the wheels out of alignment, resulting in faster wear and reducing gas mileage.

## Decrease Wind Resistance

For better gas mileage, decrease the amount of "drag" on the car. (For example, a roof-mounted bike rack increases drag by almost 40 percent.) Carrying heavy items in the car and even driving with the windows open reduces gas mileage.



## Keep Tires at the Right Pressure

When your tire pressure is too low, the tire wears out faster and gas mileage decreases. Tire pressure changes with the temperature. Check tire pressure about once every two weeks and adjust it to the correct level.

## Avoid High Speeds

For every mile-per-hour over 55 mph, the average car or truck loses almost two percent in gas mileage, wasting billions of gallons of gasoline in the U.S. each year.



## Rotate Tires Every 5,000 Miles

Tires do not wear evenly on all sides, and the condition of your tires affects gas mileage. By choosing the proper tires for the car and rotating them every 5,000 miles, you can help reduce the number of old tires that get thrown away every year.

