

Protect Our Planet!



# EARTH PATROL

**DO YOU  
Recycle Right?**

Find Out!

Put **Hazardous  
Waste** In  
Its Place

The **POWER**  
of Trash!

An Inside  
Look At

The  
**Wonderful World  
of Waste**



## RESOURCE RECOVERY SYSTEM PARTNER CITIES

Coconut Creek, Cooper City, Coral Springs, Davie, Deerfield Beach, Fort Lauderdale, Hillsboro Beach, Hollywood, Lauderdale-By-The-Sea, Lauderdale Lakes, Lauderhill, Lazy Lake, Lighthouse Point, Margate, Miramar, North Lauderdale, Oakland Park, Pembroke Park, Plantation, Sea Ranch Lakes, Southwest Ranches, Sunrise, Tamarac, Unincorporated Broward County, Weston, West Park, Wilton Manors



## WHERE DOES ALL THIS STUFF GO?...

If you're like most people, you only think about garbage when it gets dragged out to the curb or dumpster. Then like magic, it's gone. Well... not so fast! Once the garbage leaves your house, the real work starts. Garbage has to be handled carefully so it doesn't become pollution. In Earth Patrol, you'll learn the difference between garbage, trash, yard waste, recyclables and household hazardous waste—and where it all goes. But first, there are some key words that you need to know.

### MRF (MURF)

"MRF" stands for Materials Recovery Facility. This is where recyclable items that are collected go to be separated and processed. Then, they are bundled and sent to the manufacturing plants where they are made into new products.



### POLLUTION (POL-loo-SHUN)

The contamination of our environment. Pollution can have many sources, but in the waste industry, the biggest cause is the illegal dumping of waste.

### RECYCLE

To process used materials into new products.

### GARBAGE

Common household waste is called "garbage." Most anything that you put into your garbage can from inside your home is considered to be garbage. Included is non-recyclable product packaging, used paper towels and any other items that are not recyclable.

### TRASH TRANSFER STATIONS

Buildings that are used as collection points for the waste picked up by waste haulers in your neighborhood. The smaller trucks go into the Trash Transfer Station and unload the garbage and trash into much larger trucks. The larger trucks then take the loads to the waste-to-energy plants, landfill or Materials Recovery Facility (MRF).

### LANDFILL

An area that has been prepared for disposal of garbage or trash. Broward County landfills are specially lined and monitored to keep pollutants from seeping into groundwater.

### TRASH

Large, bulky items that are not thrown out very often are called trash. Examples of trash include old carpets, and appliances like refrigerators.

### BIODEGRADABLE (BI-o-dee-GRAY-duh-bull)

An object that will break down or rot and return to the earth as a natural part of it.

### CORROSIVE (cor-OH-siv)

Causes a chemical action that eats away materials, living tissue and metals.

### ELECTRONICS RECYCLING AND HOUSEHOLD HAZARDOUS WASTE

Special kinds of waste that can cause great harm to our environment if they are not handled carefully. Examples include used motor oil, pesticides, pool chemicals, paint and old car batteries.

### ENVIRONMENT

(en-VI-ron-ment)

The natural surroundings in which we live.

### INCINERATE (in-SIN-er-ate)

To burn anything at a very high temperature. In the waste industry, incineration is done to reduce the volume of garbage that has to be put into a landfill. In Broward County, two waste-to-energy plants burn garbage to make electricity for local homes and businesses.

## ...FOLLOW



### LEACHATE (LEECH-ate)

A liquid that is produced when rain water sinks into the landfill and mixes with garbage.

### LITTER

Garbage that is thrown in places other than a garbage can.

# EARTH KEEP IT CLEAN!

Littering may seem like a quick way to get rid of something, but it doesn't really go away. It just becomes unsightly, and creates big problems for animals and people. Litter cleanup costs the U.S. almost \$11.5 billion each year. It decreases property values by 7%, according to Keep America Beautiful. And it can do widespread damage to the environment. Traveling by land, storm drains and waterways, some litter is mistaken for food by birds who choke on it; some winds up in the ocean, where an estimated million sea creatures a year swallow or get tangled up in it.

## So Why Do People Litter?

- They don't feel a sense of ownership of the property
- They think someone else will clean up after them
- They see others doing it, or they see trash already piled up in an area

## A Lot of Litter

Write a paragraph describing what your yard would look like if all the drivers passing by your house littered your yard.

- On a separate sheet of paper, list at least 10 items you think they might throw away
- How would you clean up your yard?
- How would you stop the drivers from littering again tomorrow?



## Use The News

Based on the "A Lot of Litter" paragraph that you wrote, create an advertisement persuading people not to pollute or litter. Cut out words, headlines and pictures from the Sun Sentinel for your ad. Paste your ad on a piece of paper or make a poster.

Now think of yourself as someone making an advertisement for television. You have been chosen to create an ad urging people not to litter. Write a brief summary for your ad. Look through the TV listings in today's Sun Sentinel and decide on what show you would want your ad to run. Write a sentence explaining why you chose that show.

## Hold a Cleanup Contest

Take a field trip to a beach, park or school grounds. Divide into teams and do a "cleanup" along a section of it. See which team can collect the most garbage. Make sure you use protective gear such as rubber work gloves, and use extra-strength trash bags. Make sure adults are along to alert authorities of any medical or potentially hazardous waste your group encounters.

**Broward County has a three-part integrated system for managing solid waste: recycling, waste-to-energy, and landfilling.**



# THE WONDERFUL WORLD OF WASTE!



## Recycling

**It's easy to recycle with Broward County's "All-In-One" system!**

Most Broward County cities use an "All-in-One" recycling system (known as single-stream recycling). That means recyclable items don't have to be sorted.

Instead of placing items into two separate containers, the following can all be placed in the same container (whether it is a recycling bin, two bins, or a recycling cart):



**Place these items in your recycling cart or bin(s):**

- Newspapers, inserts, catalogs, magazines, junk mail, office paper, soft-covered books, file folders, soda cartons and crushed boxes from items such as cereal, tissues, rice and pasta
- Plastic containers (narrow necks only) such as bottles and milk, water, detergent and shampoo containers
- Glass food and beverage containers; milk/juice cartons and drink boxes
- Aluminum and steel food and beverage containers
- Cardboard from non-food items such as shipping boxes

Find out if your city is participating in the "single-stream" recycling program. Visit [www.broward.org/waste](http://www.broward.org/waste)

## Waste-to-Energy

**Items that can't be recycled are sent to waste-to-energy plants.**

Broward County's two waste-to-energy plants are capable of processing up to 4,500 tons of waste per day. When they arrive, trucks are weighed, then they empty their garbage onto a "tipping floor." Cranes move and mix the delivered waste, and bulky, unprocessable items are removed. The cranes feed the garbage into furnace hoppers where it is burned indoors at a minimum temperature of 1800 degrees F. Hot gases from the burning waste rise through a multi-story boiler where steam is created. The steam creates energy that powers turbine generators, and electricity is produced. Some of the electricity created is used to power the waste-to-energy plant, but about 90% of it is used to power homes and businesses in Broward County.



*Above: Waste-to-energy plants help reduce the amount of waste. Here, a crane operator moves trash toward a furnace on the tipping floor about six stories below.*

*Top left: After being picked up, recyclables are taken to the Materials Recovery Facility (MRF) where they are sorted. Top of Page: The Southwest Regional landfill.*

*Below: Vista View Park in Davie was once a landfill, but is now a beautiful park.*



## Landfills

**Waste that cannot be recycled or burned is put into landfills.**

The state-of-the-art Southwest Regional Landfill is the final piece in the County's three-part integrated waste disposal system. The landfill is used for the small percentage of waste that cannot be burned or recycled, such as concrete, metal furniture and appliances, and items too large to fit in a furnace such as couches and beds. These items are safely buried and covered with soil. The landfill has a special double-liner system to prevent leaks into our groundwater, and it is continuously monitored by state-certified personnel.

Once a landfill is closed, it can be transformed into a valuable community resource. The Davie landfill was closed in 1987, then opened in 2003 as a scenic public park which received the Environmental Protection Agency (EPA) award for "Excellence in Site Reuse."



# WHY PRACTICE THE 3 R'S?

The average American generates about 4.3 pounds of waste each day. So how do we get rid of it all in an environmentally safe way? A good starting point is to **reduce** the amount of waste we generate. We can also **reuse** what we have instead of throwing it away. Finally, we can **recycle** so new things can be made out of used materials. When you reduce, reuse and recycle, you contribute to a healthier environment.

## REDUCE

Try to cut down on the amount of garbage or waste you produce. Buy items with the least amount of packaging, like loose tomatoes instead of packaged ones. Choose reusable products instead of throwaway items. Not buying things you don't really need also helps. Can you think of a few ways to reduce the amount of waste you produce?

### Take Five

From the list below, choose no less than five items and bring them from home. Create an invention reusing the items in a way not related to their original purpose. Give yourself bonus points if you use all five of your items for one invention.

- |                     |                   |
|---------------------|-------------------|
| Aluminum Foil       | Shoe Box          |
| Cereal Box          | Soda Can          |
| Egg Carton          | Tissue Box        |
| Plastic Deli Lid    | Toilet Paper Roll |
| Plastic Soda Bottle | Ziploc Bag        |



Photo courtesy of seaturtles.org

*Make a picture frame out of popsicle sticks. Leave them natural or paint them.*

*Save a sea turtle! Use reusable bags. Plastic bags often end up in the ocean where sea turtles mistake them for jellyfish and eat them. About 100,000 sea turtles are harmed or killed each year by ingesting plastic.*

## REUSE

Do you know what "reuse" is? Sometimes it means taking something that was used for one purpose and using it again, for the same purpose or a new purpose.

Make a diagram: Before you trash items at home, decide whether they must be disposed of, can be reused, or fall into both categories. Make a diagram showing which items go into each category. Then try to answer these questions:

- How will you decrease the number of items that must be thrown away?
- How will you reuse the items that fall into the "reuse" group?
- How will you help make sure that items that can be disposed of get recycled instead?

Share your plan with your family, explaining why reuse is important to help preserve our environment.

## RECYCLE

Review page 4 to learn about how easy it is to recycle. Find all the items that you can mix together in one cart, bin or bins. Make a chart showing the items that can all be mixed together. Then make another chart showing the items that should never be mixed in with your recycling. Design a poster educating others about the new way to recycle by showing all of the acceptable items mixed together (**all-in-one**) and telling why recycling is good for the environment.

*It may seem like a small thing, but when everyone does their part, it adds up to a big difference for the environment.*

## Reduce, Reuse, Recycle!



### Be a Voice for Recycling

Read several letters to the editor in today's Sun Sentinel to see how they are written. On a separate piece of paper, write your own letter to the editor expressing your view on the subject of recycling. Remember to use the correct format for writing a letter.

### Professional Organizations

Solid Waste Association of North America (SWANA)  
1100 Wayne Avenue, Suite 700  
Silver Spring, MD 20910

National Association for PET Container Resources (NAPCOR)  
P.O. Box 1327  
Sonoma, CA 95476

National Recycling Coalition (NRC)  
1220 L Street NW, Suite 100-155  
Washington, DC 20005

Steel Recycling Institute (SRI)  
Foster Plaza, 680 Anderson Drive  
Pittsburgh, PA 15220-2700

### Express Your Concern

Write a letter to your local supermarket and/or a specific manufacturer explaining why it is important to package goods in containers that can be reused or recycled.

### The Good and the Bad

With a partner, look through the Sun Sentinel for pictures of items that are acceptable in your local recycling program. (The Food section is a good place to start.) Cut them out and paste them on a piece of poster board titled "Recyclable." Then find items that are not acceptable and paste them on a piece of poster board titled "Non-Recyclable."

## Activity: How To Make Recycled Paper

People have been making paper for thousands of years. Here's what you will need and how you can make your own:

- Blender
- 5 cups of water
- Large square baking pan at least 3" deep
- 2-1/2 pages of Sun Sentinel
- Piece of wood about the same size as your baking pan
- Piece of window screen that fits inside your pan
- Whole section of the Sun Sentinel

1. Tear the 2-1/2 pages of newspaper into small pieces and put them into the blender.
2. Pour in 5 cups of water. Then cover the blender and turn it on until the mixture is turned into pulp. This is called "slurry."
3. Pour about one inch of water into your pan and put your screen in the water.
4. Pour about one cup of the slurry over the screen and spread it out evenly with your hand.
5. Lift the screen and let the excess water drain.

6. Open up the **Sun Sentinel** section to the middle and place the screen with the slurry into it.
7. Close the newspaper section. Now, carefully flip your paper over so that the screen is on top of the slurry.
8. Place the board on top of the newspaper section and press to squeeze out any excess water.
9. Open up the newspaper and lift the screen off of the slurry.
10. Leave the paper open and let the slurry dry for a day. Once it has dried, you should be able to peel a sheet of usable paper off your **SUN SENTINEL** sheet.

# KEEP TOXINS OUT OF THE WASTE STREAM

## Household Hazardous Waste

## Electronics Recycling

### What is a Waste Stream, and can I swim in it?



Sorry, you won't want to swim in this stream because it isn't water. The "waste stream" is the name used to describe the total "flow" of solid waste from homes, businesses, institutions, and manufacturing plants. At the end of the waste stream, the garbage is either recycled, burned at a waste-to-energy plant, or put into a landfill.

### Recyclables:

- 1 **Paints**  
Re-blended into exterior paint
- 2 **Fluorescent Tubes**  
Aluminum, glass, mercury
- 3 **Motor Oil**  
Recycled for industrial use
- 4 **Auto Batteries**  
Lead and plastic recycled into new batteries
- 5 **Cell Phones/ Rechargeable Batteries**  
Cadmium, nickel and iron
- 6 **Fire Extinguishers**  
Steel recycled
- 7 **Televisions**  
Glass, lead
- 8 **Computer Monitors**  
Glass, lead, copper, gold, plastic
- 9 **Computer CPU (Central Processing Unit)**  
Steel, plastic, gold, mercury, copper
- 10 **Mercury Thermometer/ Thermostats**  
Recovered and recycled mercury
- 11 **Propane Tanks**  
Refurbished or recycled tanks

### Toxins:

Safely disposed of in a permitted facility:

- A **Flares**
- B **Pesticides/Herbicides**
- C **Turpentine/Solvents**
- D **Household Cleansers**
- E **Pool Chemicals**

### Household Hazardous Waste

There are many household items that should be kept out of the waste stream because they contain toxins such as chemicals and mercury. There are special places where these items can be taken so they don't pollute the environment. That way, the air and the places where you go swimming will be clean!

### Put Hazardous Waste in the Right Place!

Broward County has a FREE program that helps you safely dispose of household hazardous waste and non-working and obsolete electronics, so they don't pollute the environment. Some of these items contain chemicals that, if not properly disposed of, can leach out into our air and water. Valuable metals such as copper and gold are taken out for "reuse."

### What HHW Items Can I Bring?

Any household chemical such as paint, turpentine, oil, pesticides, household cleansers, lawn and pool chemicals and auto fluids. Also, items such as mercury thermometers, rechargeable batteries, auto batteries, tires, fire extinguishers, propane tanks and fluorescent bulbs and tubes may be disposed of for free.

### Why Recycle Electronics?

Electronics are made with valuable resources such as precious metals, copper, lead and aluminum, all of which require energy to process and manufacture. When you recycle electronics instead of sending them to landfills, valuable materials can be recovered—and won't have to be mined from the earth. That helps reduce greenhouse gas emissions, reduce pollution, save energy and resources. Recycling one million laptops saves an amount of energy equivalent to the electricity used by 3,657 homes in the U.S. in a year.\*

### Reduce Toxins

TVs and computers may contain an average of four pounds of lead and other potentially toxic materials such as chromium, cadmium, mercury, zinc and brominated flame retardant. These materials require special handling for environmentally safe disposal. Don't send your computers, TVs or cell phones to the trash. Recycle and help protect the earth, our natural resources, and your health.

### Recycling Pays!

Current electronics recycling programs recover more than 112 million pounds of materials each year, including steel, glass, plastic, and precious metals such as copper and gold.

**Did you know that nearly 250 million computers will become obsolete in the next five years?**

## Free Drop-Off Sites For Household Hazardous Waste and Electronics Recycling

**Sites are open Friday and Saturday, 8 a.m.-4 p.m.**

North Site: **2780 N. Powerline Rd., Pompano Beach**

South Site: **5601 W. Hallandale Beach Blvd., West Park**

\*Free electronics recycling is available to Broward County residents only. Proof of residency is required.

**For information, call 954-765-4999 or visit [www.broward.org/waste](http://www.broward.org/waste)**



### Hazardous Terms

P C H L O R I N E E N C L  
P E R E A D I G Z C H E M  
R P S Q F C D E K E B O L  
O O Y T T O E C M A M V H  
P L T O I R G I L E C C R  
A I Y S F C C G R A A P C  
N S O I R A I C E E T A A  
E H T I L I U D L R H I D  
B N A S L R F B E N E N M  
A I B Q Y B A I T S B T I  
T S C I N O R T C E L E U  
V A R N I S H I D T U P M  
Y C S R E N A E L C W C T

propane  
antifreeze  
baits  
bleach  
chemicals  
chlorine  
cleaners  
varnish  
electronics  
fogger  
mercury  
oil  
paint  
pesticides  
cadmium

**On the letter grid above, find and circle the listed words.**  
Answers on page 11.



# THE POWER OF TRASH!

## A LOOK AT LANDFILLS

Since Broward County has a recycling program and waste-to-energy plants to handle its garbage, very few things end up in the landfill. Only big, bulky items like rocks and tile, concrete, metal furniture and appliances, and other items too big to fit in the waste-to-energy furnace, like couches and beds, go to the landfill.

The garbage that does end up at the landfill is buried in an environmentally sound manner. Every day, the garbage is covered with a layer of dirt. As rain falls and passes into the earth, it can pick up contaminants when it mixes with the garbage in the landfill. This resulting liquid is called "leachate." To prevent leachate from getting into the water table, where our drinking water comes from, it is collected in special underground pipes. State-certified workers continuously monitor leachate production and disposal for environmental safety.

As the garbage decays, it produces methane gas. A gas treatment system collects the methane gas and routes it above ground where it is collected and "flared," or burned off, with no harm to the environment.

In many parts of the country, landfills that have been properly closed have been converted into recreation areas like parks, ski slopes and golf courses. The former landfill located in the Town of Davie has been converted to a beautiful public park called Vista View Park, that comes complete with picnic areas, horse-riding trails, bike trails and more.

### Did you know...

**Broward County's Southwest Regional Landfill has more than 150 acres of self-sustaining wetlands.**

PC H L O R I N E E N C L  
 P E R E A D I G Z C H E M  
 R P S Q F C D E K E B O L  
 O O Y T T O E C M A M V H  
 P L T O I R G I L E C C R  
 A I Y S F C C G R A A P C  
 N S O I R A I C E E T A A  
 E H T I L L U D L R H I D  
 B N A S L R F B E N E N M  
 A I B Q Y B A I T S B T I  
 T S C I N O R T C E L E U  
 V A R N I S H I D T U P M  
 Y C S R E N A E L C W C T

>> **Hazardous Terms Answer Key**  
(from page 9)

## City Recycling Coordinators

City	Phone
Coconut Creek	954-973-6780
Cooper City	954-434-4400
Coral Springs	954-344-1165
Dania Beach	954-924-3742
Davie	954-797-1042
Deerfield Beach	954-480-4454
Ft. Lauderdale	954-828-8000
Hallandale Beach	954-457-1639
Hillsboro Beach	954-427-4011
Hollywood	954-967-4320
Lauderdale-By-The-Sea	954-623-6231
Lauderdale Lakes	954-535-2815
Lauderhill	954-583-1830
Lazy Lake	954-974-7500
Lighthouse Point	954-946-7386
Margate	954-972-0828
Miramar	954-602-4357
North Lauderdale	954-724-7070
Oakland Park	954-630-4452
Parkland	954-757-4153
Pembroke Park	954-966-4600 Ext. 238
Pembroke Pines	954-450-6900
Plantation	954-452-2540
Pompano Beach	954-786-4030
Sea Ranch Lakes	954-943-8862
Southwest Ranches	954-434-0008
Sunrise	954-746-3232
Tamarac	954-597-3718
Unincorporated Broward County	954-765-4222
Weston	954-385-2600
West Park	954-266-6477
Wilton Manors	954-390-2190

### Getting Green Energy From Garbage

At Broward County's two Waste-to-Energy (WTE) plants, the most advanced technology is used to burn garbage and turn it into electricity. In one year, these waste-to-energy plants burn enough garbage to fill up a football field with a pile of trash 3-1/2 miles high. The garbage is burned indoors, and state-of-the-art pollution controls prevent odors. This method of incineration reduces the the amount of garbage that has to be put in a landfill by about 90%. It also generates enough energy to supply the electrical needs of 75,000 homes, and conserve millions of barrels of oil each year. Even the water used in the furnaces is recycled, saving one million gallons of water each day.

At Broward County's two waste-to-energy plants, trucks dump the loads of garbage they have picked up. Large cranes lift it onto moving floors that feed the garbage into a very hot fire. The fire also boils water inside a boiler, which creates steam. The steam creates energy that powers turbine generators, and electricity is generated.

Pollution prevention is also a big part of waste-to-energy plants. In some plants, people work to spot items that shouldn't be burned, like old car batteries and chemical drums. These are separated and sent to the proper recycling or disposal facilities.

Some plants use dry scrubbers and electrostatic precipitators (ee-LEK-tro-STAT-ik pre-SIP-eh-TAY-tors) to clean up and pull pollutants out of the smoke after the garbage is burned. That way, most of what comes out of the smokestack is just steam.

### Drop A Line

Write to at least two professional organizations listed on page 7 and request information about:

- Jobs related to recycling that will be available when you finish high school or college
- New technology that is being used in the process of recycling or handling waste
- Strategies to reduce the amount of waste we create

Post the response on a bulletin board for the class to read.

### Use The News

Science is very important to recycling, trash disposal and pollution control. Look at the Sun Sentinel for a story on one of the above topics.

- What kind of science is being discussed in the story?
- What other science might be involved if solutions are not found?

### Transform A Landfill

Read about landfills on page 11, then on a separate sheet of paper, use your imagination to design a park, recreation area, playground or garden that you would like to see created from a closed landfill area. Include any sports areas, equipment, nature trails, fountains or plants you would like to see in your landfill. Share your design with your classmates.

# EXPLORE MORE...



Two museums house environmental exhibits funded by Broward County Waste and Recycling Services and Partner Cities.



[www.mods.org](http://www.mods.org)

At the Museum of Discovery and Science in downtown Fort Lauderdale, children learn how ordinary garbage is used to create electricity. Check out the interactive Wonderful World of Waste (WWOW) exhibit, a fun-filled, hands-on exhibit that allows kids to discover how garbage is used to generate electricity.



At the Young at Art Children's Museum in Davie, children learn the value of recycling. At the popular Earthworks exhibit, kids climb aboard a giant recycling truck; learn how to recycle, minimize waste, and reduce the need for landfills.

[www.youngatartmuseum.org](http://www.youngatartmuseum.org)

For more information:

[www.broward.org/waste](http://www.broward.org/waste)  
954-765-4999



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COUNTY  
FLORIDA  
Solid Waste and Recycling  
Services and Partner Cities

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[www.SunSentinel.com/nie](http://www.SunSentinel.com/nie)

This public document was promulgated at a cost of \$18,000.00, or \$0.206 per copy, to educate students about Broward County's resource recovery system and their role in protecting the environment.