

Virginia's Waste Management and Pollution Prevention

Waste management is “how we handle our trash.” Most communities use an integrated approach to waste management, meaning they use a variety of ways to manage the garbage produced by their residents. Some of these methods include pollution prevention, landfiling, recycling, composting, waste-to-energy plants, hazardous waste disposal and litter prevention and control.

Landfills

Landfilling is the most common waste disposal method. It has also been around for the longest time. The ancient Greeks began landfilling when they required citizens to take their trash outside the city gates to dispose of it. Dumps—large holes in the ground where trash was dumped—began this way.

Today, we do not use dumps, although some people still use that name. Instead, we use sanitary landfills. Landfills differ because they are lined on the bottom with clay, special plastic, or a combination of both to protect against leakage called leachate. Leachate is any liquid that collects potentially hazardous materials that could pollute the water or land. Modern landfills have leachate management systems built into them and gas management systems to handle the methane gas produced as the waste decays. Every day, the garbage is crushed and covered by a layer of soil or other material, such as crushed glass to keep out pests and to reduce bugs and odors. These facilities are regulated by state and federal laws and must meet certain criteria or face closure.

Deciding where to put a new landfill is often very hard and environmental managers use an integrated approach to waste management to extend the life span of existing landfills. This approach includes source reduction, recycling, energy recovery and waste combustion. We are making progress, though: The amount of waste going to landfills in the U.S. in 2017 was actually lower than the amount in 1990, despite the fact that the population has grown.



Recycling

Recycling is an excellent way to reduce the amount of trash going into a landfill and, at the same time, conserve natural resources. To recycle something, each type of material (e.g. paper) must be collected and taken to the appropriate facility, where it is broken down into smaller pieces. The reprocessed material is sold to manufacturers to make new products. Successful recycling depends upon demand—vendors that will buy and use the materials.

Newspaper, glass, metal and plastic are the most common materials that are collected and recycled. While some recyclables are used to create the same product again, others are transformed into different items than their original use. For example, plastic soda bottles may be made into plastic toys, carpeting, or even clothing. A steel car body may end up in its “second life” as a steel bridge.

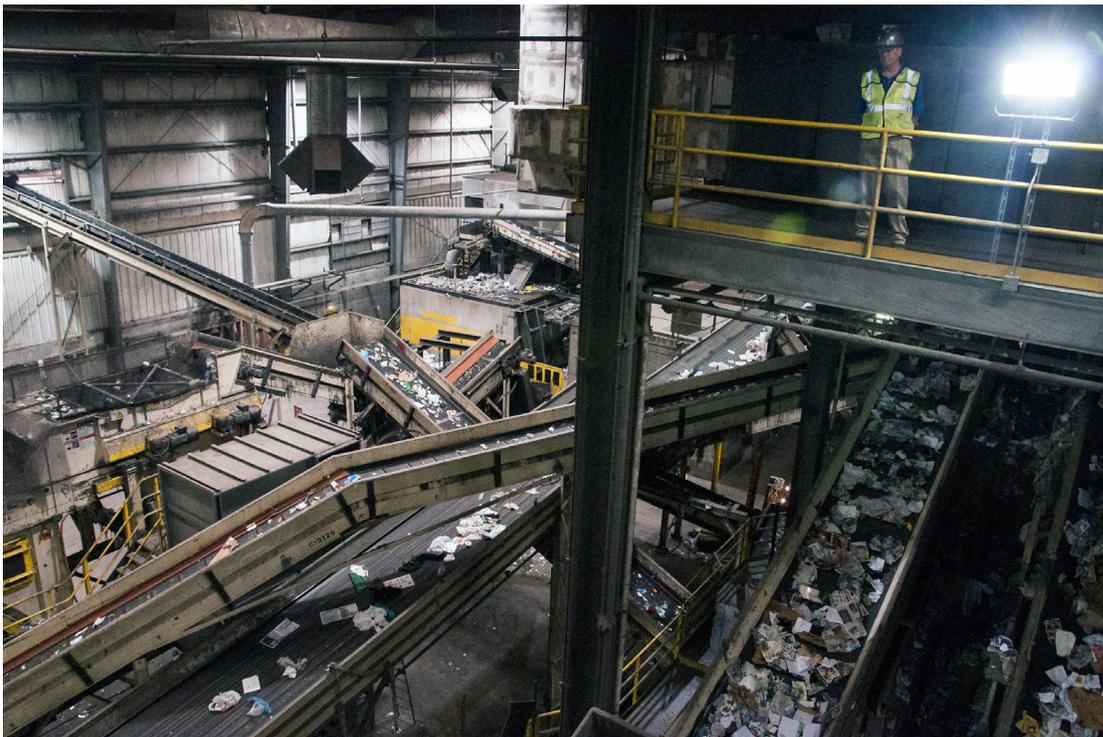
Item	Recycled By
Appliances	Local Convenience/Transfer Stations
Batteries	Some Battery Retailers
Books	Used Book Stores
Computers	Some Computer Retailers
Clothing, Household Goods	Consignment Shops and Thrift Stores
Metals	Salvage Yards
Motor Oil/Filters	Many Auto Parts Stores/Garages
Music CDs	Some Music Retailers
Packing Supplies	Mail Centers, Packaging Stores
Photography Equipment	Some Camera Retailers
Plastic	Regional Recycling Centers
Tires	County Transfer Stations
Toner Cartridges	Cartridge Remanufacturers
Video Games	Many Video Rental Stores

In addition to these items, communities have learned the importance of recycling things, like motor oil, anti-freeze, scrap metal (from appliances), tires, all sorts of paper and magazines, and other forms of plastic, which can cause problems in landfills and incinerators.

Virginians recycle an average of about 370 pounds per household each year. Most communities in Virginia have recycling programs and work to meet the state’s required recycling rate (25 percent for urban areas and 15 percent for smaller, rural localities). While most counties and towns have exceeded the 25 or 15 percent goal, others are close to achieving it. Since 2005, Virginia’s recycling rate has grown from 32.2 percent to a high of 46 percent.

You can help conserve Virginia’s natural resources by becoming an active recycler and purchasing recycled products. Recycling requires a little effort and attention to local rules. Ask for a copy of your [community’s recycling program](#) rules before you get started so you can “recycle right.”

When purchasing, look at product labels in the store to see if they have recycled content. For your efforts, you will be rewarded with the knowledge that you truly are making a difference in your community’s future.



Many communities use single-stream recycling, where materials are sorted at the recycling facility, shown here. However, because so much garbage is put into recycling bins, many recycling facilities can’t properly sort recyclables, and sometimes have to take large amounts of them to landfills. Some communities have stopped recycling altogether.

Are you a “wishcycler?”

Have you ever thrown something in the recycling bin when you weren't sure if it was actually supposed to be recycled? That is called “wishcycling,” and it's a big problem. On average, one in four items in recycling bins can't actually be recycled. These items can contaminate the rest of the recycling load and damage processing machinery. In Virginia, recycling trucks have caught on fire because someone threw rechargeable batteries in the recycling bin. Plastic wrap regularly gets caught in machinery at sorting facilities.

Previously, China purchased half of all of the recycled paper and plastic in the world, but stopped in 2017 because of the high levels of contaminated materials. Because of this, many communities no longer have recycling services, and many more are cutting back on what they recycle because disposing waste in landfills can be cheaper than the cost to recycle. However, recycling is still good for the planet. Making soda cans from recycled aluminum uses 95 percent less energy than mining and using raw ore. Recycling also helps keep toxic materials out of landfills. To find out what can be recycled in your community, check your recycling vendor, but if in doubt, throw it out!

Composting

Another way to help avoid waste going into landfills is by composting. Composting is as easy as separating leaves, grass clippings, and other organic materials from your garbage, and placing them in a separate area to decompose. Alternate layers of organic materials with a sprinkle of soil and turn the pile occasionally to aerate and accelerate decomposition. Once decomposed, the mixture of organic materials becomes a rich soil additive that you can use in flower and vegetable gardens or in planting beds. It gives plants the boost they would receive from fertilizer, but in a natural way (see Soil chapter).

Some counties, cities and towns have a special composting facility or have a contract with a private firm to accept and compost organic materials, especially leaves. Since organic material makes up about 21 percent of a community's average waste stream, composting will help extend the lifetime of landfills.



Compost organic matters by alternating layers of kitchen scraps with other green and brown materials.

Pollution Prevention is the Key

Pollution prevention, or waste reduction, is more environmentally friendly than recycling. It means reducing single use items and reusing items to cut back on the amount of waste produced. It means planning ahead and purchasing only what is needed so the amount of wastes generated is minimized. When shopping, consumers can request and purchase items with less packaging, or buy reusable products that create less disposable material. Buying in bulk whenever possible is one method to reduce packaging. Buying fewer single use items, such as paper plates and plastic wrap, is another example. Think of how much waste would be reduced if everyone brought a reusable cup to the cafeteria or mug to the coffee shop. Examples of creative reuse of products are coffee containers used to store nails; baby food jars used for crafts and hobbies; and clothes given away to charitable organizations or people in need. When you begin to focus on what you're throwing away, you'll discover all sorts of uses for items that were formerly considered trash.

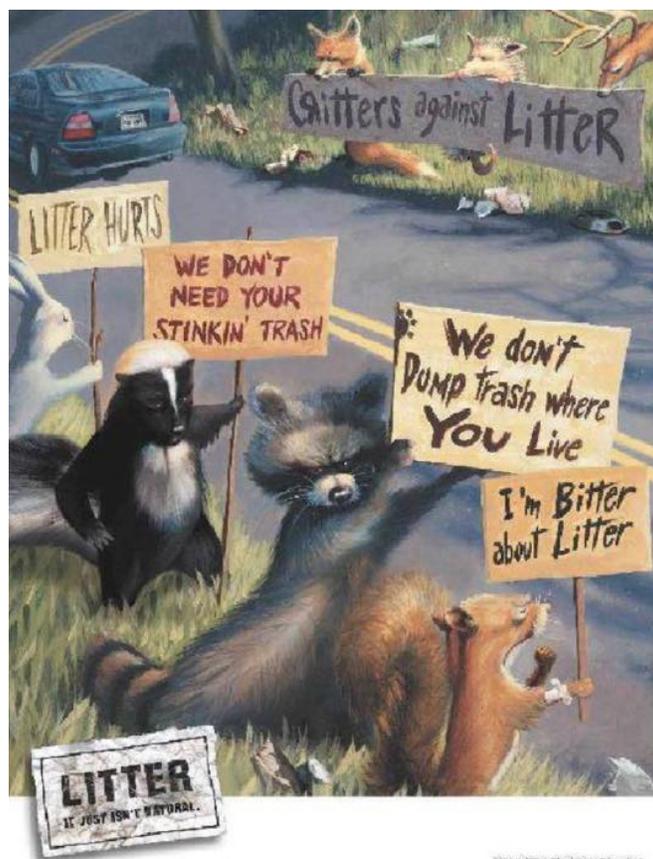
All of these ideas can be neatly summed up as the “5 R’s:” reduce, reuse, recycle, reject and respond. We’ve covered the first three.

- Reject means to consider: “Do I really need this item?” “Can I buy it used instead of new?” “Can I buy it with less packaging?” “Can I buy a refill instead of a new container each time?” Leave it on the shelf if you don’t really need it or it wastes resources.
- Respond means to write or call companies that put out products creating more trash than necessary. You can make a difference. In a nutshell, waste reduction calls upon each of us to become wise, environmentally sensitive shoppers.

Litter Prevention

Litter prevention and control is another difficult aspect of waste management for local and state agencies. Littering is illegal and it hurts community pride. Litter along roadsides is ugly, dangerous and expensive. Clean-up projects are costly and many communities include education efforts and encourage voluntary clean-ups. Educators can help prevent litter pollution by explaining the negative impacts on animals, humans and communities.

Local governments use funds from a tax on soft drinks and fast food to provide [local litter and recycling programs](#) to schools and neighborhoods. The Virginia Department of Transportation works with Keep Virginia Beautiful to keep roadsides litter-free through the [Adopt-A-Highway](#) program.



The Role of Industry

Just as the waste reduction movement has made us wiser shoppers, many industries in Virginia have found innovative ways to reprocess their waste into less toxic alternatives.

Waste-to-energy, or resource recovery, plants are facilities that burn trash in order to produce steam or electricity. They are expensive to build, but reap important benefits, processing about 2.3 million tons of waste annually in Virginia. They are not without waste of their own, however, as the incineration process produces ash, which must be sent to a landfill.

Resource recovery facilities, such as Covanta in Arlington, have numerous air pollution controls in place and are heavily regulated, but many people still have concerns about the resulting ash. The steam or electricity is usually sold to a nearby company to keep operating costs down. The northeastern states have more plants than other areas of the country, partly because the region has limited landfill space.

Household hazardous waste disposal has received much more public attention over the last few years. People are becoming more aware of how much we produce and dispose of, whether in a typical landfill, or down the drain into a septic or sewage system. Much of this waste should be taken to a special facility equipped to handle hazardous materials or one offering a household hazardous waste collection program. Such landfills have double liners and strict safety procedures. Continued education about household hazardous waste is needed to encourage people to use safer products and dispose of hazardous materials in the appropriate manner.

Waste management is a complex issue and presents challenges for any community. Improper waste disposal can result in serious health problems, unnecessary and hazardous filling of landfill space, and unwise use of our natural resources. As Virginia citizens, you will benefit from knowing basic facts about waste management so you can make informed personal and community-wide decisions.



Waste is carefully placed in lined landfills to control leakage of odors, gas and contaminated water.

Additional Resources

Websites:

- [DEQ Office of Pollution Prevention](#)
- [DEQ Office of Litter Prevention and Recycling](#)
- [U.S. Environmental Protection Agency Reduce, Reuse, and Recycle Resources for Students and Teachers](#)
- [Virginia brownfields success stories interactive map](#)
- [“Pollution Solutions” activity book](#), Virginia Resource-Use Education Council.

Fundamental Learnings Related to Waste Management

- Handling and disposing of waste has become an environmental issue because of concerns to public health, pollution of groundwater, location of landfills, depletion of natural resources, and generation of land and air pollution.
- The rate of waste and types of waste generated vary. Analyzing what is discarded can help determine how to manage wastes more effectively.

How You Can Help

- Recycle right and if in doubt, throw it out. Learn what you can and can't recycle in your community.
- Do what you can to keep waste out of landfills. Recycle, compost, or just buy less stuff.
- Buy products made with recycled materials.
- Buy items with less packaging.
- Bring your own bags to the store and if you forget, remember to reuse plastic bags.

Did you know?

At one time, it was estimated that there were over 1,300 tire piles in the state. Consisting of about 25 million environmentally unfriendly tires, the piles were not only an eyesore, but also breeding grounds for mosquitoes and other insects as well as a fire hazard.

At present, there are 97 active tire piles in the commonwealth, holding an estimated 1.44 million tires. DEQ is committed to working with the public and the recycling community to reduce that number and continue to recycle tires responsibly.

Waste Stream Analysis

Preparation

Collect one or more containers of “clean” household garbage.

Precaution

Due to the possibility of used tissues or broken glass, or other sharp objects present, the teacher should provide the trash can or bag for the students to examine. Sort through the classroom trash can and remove all tissues and sharp objects or bring in a bag of garbage from home after removing any items that the students should not be handling (e.g., dirty tissues, diapers, glass of any type, etc.).

Procedure

1. Spread the tarp or plastic out on the floor and dump the classroom wastebasket out in front of the class. Once the garbage is spread out in front of the students, have students put on gloves and assist with sorting the garbage. Separate the trash into as many categories as possible, including non-recyclable and recyclable, reusable, etc. You can use the categories on the data sheet or have the students determine their own categories during this sorting process. Weigh each group of wastes.
2. Leaving the trash spread out and visible, discuss the amount and types of garbage you found. Using the data on the breakdown of Municipal Solid Waste in the U.S., compare the classroom sample with national waste composition.
3. Discuss which waste categories could be eliminated by reusing, recycling, or composting.
4. Give each student a data collection page and ask them to keep track of their family’s garbage as it is thrown away or placed in the compost or recycling bin. (Allow two to three days for completion; if possible, schedule over the weekend). Collect the data sheets and determine a class average for each category. You might want to have information on family size as well. Obviously a family of four will produce less waste than a family of six. Graph the results. Compare this average with the classroom breakdown and also with the national waste composition.

Grade Level: 6

Science SOL: 6.11

(can be easily adapted to 4.8 and younger grades)

Materials:

- Large plastic or paper tarp
- Plastic gloves for each student
- One or more waste containers filled with garbage
- Bathroom scale

Objective:

Students will measure by weight how much waste is generated by their families and use this information to make an estimate for their community.

Vocabulary Words:

Incinerator

Landfill

Waste stream

5. Use math skills to determine weights and percentages of materials.
6. Once you have determined how much waste is produced by your class and how much can be removed from the waste stream by recycling, reusing and composting, you can use this data to make an estimate about the amount of waste produced by all classes in the school and all families in the community, and how much can be prevented from going to the landfill or incinerator.

Follow-up Questions and Review

1. What category represents the largest amount of garbage?
2. Name differences in the types of waste produced at school and at home.
3. How do your results differ from the national averages?
4. Do you see any reason why your results might be different (examples are: curbside recycling available in your community; season of year analysis is done—there is less yard waste during winter)?

Discuss why there may be differences among families. In any of the families was there an event that happened that could cause a temporary increase in garbage production (possibilities: birthday party, trip to grocery store, monthly pizza celebration, etc.)?

Conclusion

What is the biggest source of waste in your school and in your home? Can you make suggestions on how to reduce any of these sources of waste?