6 Project Ideas

#1 Morning Announcements

Submit one tip a week to be read during the morning announcements.

> Sample tip: *"Texans throw away about 6.5 pounds of garbage every day. Make a difference by bringing a reusable water bottle to school."*

Find more tips on our website. TakeCareOfTexas.org or TakeCareOfTexas.org/teens.

#2 Build a Rain Barrel

Help your school save water by building a rain barrel! Get detailed instructions in *Rainwater Harvesting with Rain Barrels, A Take Care of Texas Guide* and on our YouTube video *Building a Rain Barrel.*

Order or download the guide at TakeCareOfTexas.org/publications and view the video at youtu.be/MBlqT94y5QI.

#3 Start Recycling at School

Save energy and natural resources by recycling. Use the *School Recycling Guide* to start or improve a recycling program at your school!

Order or download the guide at TakeCareOfTexas.org/publications.

#4 Enter the Video Contest

Spread the word at school about the Take Care of Texas Video Contest! It's a fun way to learn about the environment. 6th – 8th grade students can win GoPro cameras. 9th – 12th grade students can win scholarships.

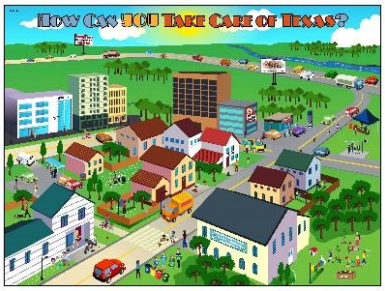
Order the *Take Care of Texas Video Contest* flyer from TakeCareOfTexas.org/publications to put up around your school. Find out more about the contest at TakeCareOfTexas.org/video-contest.

#5 Save Water at School

Help your fellow students learn to save water at school. These mirror clings will help remind you to turn off the water when it's not in use.

Order the *Water Conservation Mirror Cling* to put up in your school's bathroom. TakeCareOfTexas.org/publications

#6 Teach Others

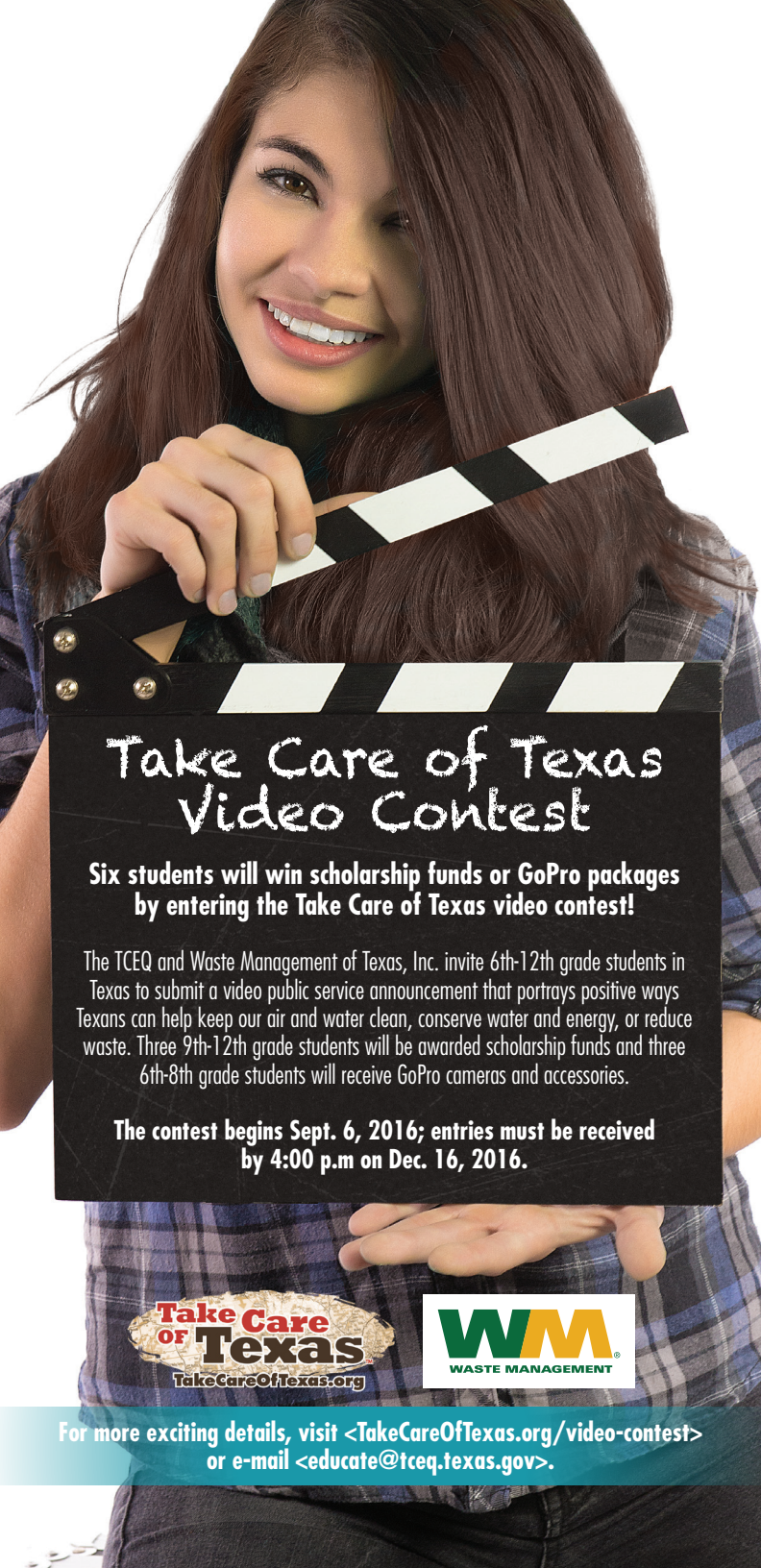


Help others learn about the environment. Visit elementary schools and teach students about ways they can Take Care of Texas. Order our free publications to use as teaching tools and handouts.

Check out all of our free publications at TakeCareOfTexas.org/publications.

Learn More

TakeCareOfTexas.org



Take Care of Texas Video Contest

Six students will win scholarship funds or GoPro packages by entering the Take Care of Texas video contest!

The TCEQ and Waste Management of Texas, Inc. invite 6th-12th grade students in Texas to submit a video public service announcement that portrays positive ways Texans can help keep our air and water clean, conserve water and energy, or reduce waste. Three 9th-12th grade students will be awarded scholarship funds and three 6th-8th grade students will receive GoPro cameras and accessories.

The contest begins Sept. 6, 2016; entries must be received by 4:00 p.m on Dec. 16, 2016.

Take Care of Texas
TakeCareOfTexas.org

WM
WASTE MANAGEMENT

For more exciting details, visit <TakeCareOfTexas.org/video-contest> or e-mail <educate@tceq.texas.gov>.

Video Contest Details

Who: 6th-12th grade students in Texas

What: Students submit a unique, 30-second video public service announcement portraying positive ways Texans can help keep our air and water clean, conserve water and energy, or reduce waste. The video must include the slogan "Take Care of Texas. It's the only one we've got."

When: Contest opens on Sept. 6, 2016, and closes on Dec. 16, 2016, at 4:00 p.m.

How: Participants submit their videos to the TCEQ. The videos will go through three rounds of judging, including a public voting period from Jan. 11, 2017, until Jan. 25, 2017. For more details, visit <TakeCareOfTexas.org/video-contest>.

Why: Winners from grades 9-12 will be awarded scholarship funds, provided by Waste Management of Texas, Inc. (WMTX). The grand-prize winner will receive $2,500 in scholarship funds, second-place $1,500 in scholarship funds, and third-place $500 in scholarship funds.

Winners from grades 6-8 will receiveGoPro cameras and accessories, provided by WMTX. The grand-prize winner will receive a GoPro HERO4 Black with accessories (approximate value $840), second-place a GoPro HERO4 Silver with accessories (approximate value $610), and third-place a GoPro HERO+LCD with accessories (approximate value $440). If the GoPro model listed is unavailable, an equivalent model will be awarded.

All winning videos will be showcased by Take Care of Texas and the TCEQ through their websites, social media posts, newsletters, and media announcements. The grand-prize winners will also be recognized in Austin on May 17, 2017, at the TCEQ's Environmental Trade Fair and Conference.

Take Care of Texas
TakeCareOfTexas.org

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

How is our customer service?
tceq.texas.gov/customersurvey

M-60 (6/16)

printed on recycled paper using vegetable-based ink

T E X A S

SCHOOL RECYCLING *Guide*

GI-30 (Rev. 9/14)

Take Care of Texas™

TakeCareOfTexas.org

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

CONTENTS

GETTING STARTED IN A SCHOOL RECYCLING PROGRAM

Texans annually dispose of more than 30 million tons of trash. That's more than one ton for every person in the state. As the population grows, the volume of waste, and the cost of disposing of it, increases.

Reducing waste is more important than ever, not just to protect the environment, but to save money as well.

Fortunately, waste is a challenge we can do something about. Every Texan can make a difference. And all Texans should do their part. Because schools create waste, they should also be part of the effort to deal with it effectively. In fact, Texas law requires school districts to have recycling programs (Texas Health and Safety Code, Section 361.425).

This manual is designed to help you recycle at school. It describes how to set up a school recycling program and suggests ways to keep it going. Ideally, you'll want to implement a district-wide recycling program to take advantage of shared transportation and centralized storage.

Some school districts that have started recycling programs have already cut waste-disposal costs noticeably, saving thousands of dollars a year. Your approach to recycling may vary somewhat from the one described here, but the steps outlined in this manual should help you get started.

You may not be able to implement all of the suggested recycling and waste-reduction practices immediately. Start with one of them, though, and keep adding more as time goes on. Your efforts, especially when coupled with those of other school programs, will go a long way toward reducing waste and preserving natural resources.

Step ONE

DO A LITTLE RESEARCH

You must do a little research before you propose a recycling program to administrators. If you are an administrator, there are things you'll want to investigate before you implement a recycling program at your school.

A simple audit form, partially completed, might look something like this:

Container Location	Capacity (cu. yds.)	Date	Total Contents[1]	Office Paper[2]	Corrugated Cardboard[3]	Alum. Cans	Plastic Bottles[4]
West side	10	9/7	60%	1/2	1/5	1/20	1/10
East side	8	9/7					
Cafeteria door	6	9/7					

Note: The Total Contents column indicates how full the container is. The columns for each category of recyclable material show what fraction of the Total Contents each material makes up. Columns for recyclable materials can be added or deleted as needed.

[1] If containers are consistently less than half full when they are picked up, you might consider reducing the number or size of outdoor trash containers, or reducing the frequency of collections to reduce the cost of your school's disposal service. (Extra pickups can be scheduled at the beginning and end of each term to allow for exceptional disposal needs, rather than paying for unused container space all year.) Once your recycling program is in place, you will need to reassess your needs for container size. This also could save you disposal cost.

[2] This category may include any kind of printing, writing, or copy paper, including newspapers, magazines, and shopping catalogs. Check with paper recyclers in your area to find out which kinds of paper they accept and how much they are worth.

[3] Estimates should be based on the space occupied by *flattened* boxes; otherwise, you are calculating (and paying for) air space.

[4] The most commonly recycled plastic bottles are polyethylene teraphthalate (PET, #1) and high-density polyethylene (HDPE, #2). You can find out what kind of plastic a container is by looking at the bottom. Check with plastics recyclers in your area to find out which kinds they accept and how much they are worth.

Determine the Level and Costs of Disposal Service

Most school districts pay for waste disposal based on volume—on how much is thrown away. Before you start recycling, it is important to determine how much waste the school generates and how much money is spent on disposal. These facts will give you a yardstick to measure your waste reduction and cost savings through recycling.

You will need to know:

- How many outdoor trash containers you have; and their capacity in cubic yards.
- The frequency of pickups.
- The cost of disposal services (for an outdoor container, there is usually a monthly rental fee plus a charge for each pickup, or "pull").

Get help from your school administration to access records of waste-disposal-service levels and costs.

Conduct a "Waste Audit" for Your Campus

By taking a look in your outdoor trash containers, you can find out

(a) if your school is paying for more disposal service than it needs, and

(b) how much waste could be reduced through a recycling program.

Since waste volumes may vary from day to day or week to week, conduct your informal audit over four to six weeks, checking the outdoor containers just before each scheduled collection, recording an estimate of how full the containers are, and noting the amount of recyclable materials they contain.

Keep in mind that illegal dumping in outdoor trash containers can be a problem. In other words, people outside the school may be dumping trash in the school's

containers. To keep out unwanted materials, lock your containers at night. This practice will hold down disposal costs and ensure that you have an accurate picture of your waste-management program.

A simple audit form, partially completed, might look something like the table on page 2.

Contact Collectors of Recyclable Materials

Contact your city or county solid-waste department to determine the types of recycling services, if any, that are available to schools in your area. The city might be willing to pick up your recyclables or connect you with a commercial collector. Your school district may have trucks or buses that could transport recyclables from several schools to a single location to reduce commercial collection charges. Another option is to identify a recycler on your own. You may also want to look for commercial recycling collectors. They can usually be found in the Yellow Pages under the listings for "Recycling Centers," "Scrap Metals," and "Waste Paper."

Some questions you may want to ask are:

- Which materials do they collect?
- What is the cost of collection?
- What grades or types of paper do they accept? (Have them explain grades if it is not clear.)
- Will they pay you for materials picked up at your school? If so, how much? (Generally, collectors pay by the pound or the ton.)
- What condition should the materials be in, and how should they be prepared (for example, cardboard flattened, white paper only, tops off containers)?
- Is a minimum volume or weight required for each pickup?
- Will they pick up on a fixed schedule, or as needed?
- Will they supply collection containers? If so, at what cost?
- Will they sign a contract for the recycling service? (One-year contracts with an option to renew for a second year are most common.)
- Will they help you organize and promote the program?

There is no such thing as a truly free collection service. Some companies will supply containers and collect recyclables at no charge, if the value of the material collected exceeds the cost of the service. Problems can arise if the market value of the material falls below the service cost, and the school may face either unexpected service charges or a loss of the program. To avoid this situation, schools are encouraged to do all of the following:

- Ask the collector to calculate the cost of the collection services.
- Get a quote on the current market value of each material to be collected.
- Consider entering into a service agreement that honors established costs for at least a full school year.

You may need to deal with several vendors if no single vendor can handle all the types of materials you are collecting.

Through your waste audit and your discussions with commercial recyclers, you should gain insight into which materials are the most beneficial to recycle.

To keep things simple, you may want to start out by recycling one or two basic materials. Once your program is running smoothly, you can expand it to include other materials.

The landfill disposal rate for Texas for 2013 was 6.33 pounds per person per day. This equals more than 1 ton per person per year,

–TCEQ, *Municipal Solid Waste in Texas, 2013*

Commercial waste, which includes waste from schools, institutions, and businesses, makes up 35 to 45 percent of municipal solid waste.

– EPA, 2010

Step TWO

GET YOUR ADMINISTRATION'S SUPPORT

Materials diverted for recycling and reuse in 2013 accounted for 1,291,239 tons of materials that was not landfilled.

–TCEQ, *Municipal Solid Waste in Texas, 2013*

After conducting an informal waste audit and gathering information from local recyclers, you will be ready to make educated estimates of your school's disposal service needs and opportunities for recycling. The prospect of reducing your school's disposal costs, backed up by the information you have collected, should help to gain the support of school administrators.

Having your administration's support is important for the success of the program. Without proper backing—including allocation of staff and funding—the program may never get off the ground. Keep in mind that administrative decisions are strongly influenced by budgetary considerations. From an economic standpoint, a recycling program will likely cost money. However, depending on the volume of reduced waste and the value of the recycled materials, a recycling program could reduce waste disposal costs or even make money from the recycled materials. Only by considering all of these factors can you determine the "bottom line" for your program.

Your proposal should include as many of the following items as possible:

- Annual or monthly volume of waste and the cost of disposal.
- A list of recyclables to consider, with approximate annual or monthly volumes for each.
- Potential savings based on the volume of materials diverted from disposal, smaller outdoor trash containers, less frequent outdoor-container pickups, and other savings.
- Potential revenue generated from recyclables, if any.
- Start-up cost of your program, including the purchase of recycling containers (if applicable), employee- and student-education materials, and other costs.
- Potential net savings.
- Benefits to the students, the staff, and the community.
- A summary of the Texas law that requires school districts to have recycling programs (Texas Health and Safety Code 361.425).

Step THREE

PICK A RECYCLING COORDINATOR

Finding the right faculty or staff person to head up your recycling program is an important step. This person should have a personal interest in, and enthusiasm for, recycling, as well as good communication and organizational skills. The amount of time required of this person may be considerable at first. His or her involvement could taper off as the program becomes more of a routine.

You may also want coordinators for the cafeteria, the administrative office, and each classroom. These people can help promote the importance of putting recyclables in the correct containers and keeping the wrong materials out.

Step FOUR

SELECT A RECYCLING COMMITTEE

Form a school recycling committee or team to help organize and oversee the recycling program. One option is to use your site-based management committee, or include all divisions of the district. You should recruit support for recycling in your school or school district from a diverse range of individuals or groups, such as:

- janitorial personnel
- food-service personnel
- teachers
- students
- facilities and maintenance personnel
- grounds personnel

Hannah Jordan Bevers: Cafeteria Recycling Inspires Others

When most people think of an individual who inspires their community to take care of the environment, a high school student does not usually come to mind. Yet that is exactly what Hannah Bevers has done for Lamar Consolidated ISD.

In eighth grade, Hannah wrote, printed, and distributed a pamphlet to her school's science classes about the benefits of recycling. She hoped to encourage her peers to believe that recycling is not just for adults, but that wasn't enough.

As a sophomore at George Ranch High School (GRHS), Hannah saw an opportunity to revamp how the cafeteria handled lunch waste. The school district conducted paper recycling, but none of the schools incorporated cafeteria waste—including recyclables like plastic, paper, and aluminum. Hannah worked with recycling directors at Rice University and the Texas Medical Center to finalize a recycling plan for her school's cafeteria, and it caught on. GRHS now delivers approximately 11 bags of paper, plastic, and aluminum to a local recycling center each week.

Following the success at GRHS, Hannah wrote a resource guide, outlining how to start a student-led recycling program for school cafeterias, and distributed it to 10 local secondary schools. Following Hannah's lead, Lamar Consolidated High School started its own recycling program, and three more schools are also starting programs.

Now the attitude around GRHS is that recycling is something that students just do. It is not unusual to see students carrying baskets with empty water bottles into the cafeteria or bundles of paper to the large containers in the parking lot. Hannah Bevers has shown how the energy and enthusiasm of one high school student can ignite a passion throughout the district.

- business managers
- district purchasing agents
- Adopt-a-School partners
- parent-teacher organizations

Involve all of the above groups in planning the program from the very beginning. They will be an integral part of your success and should feel ownership of the program. Custodial personnel and facility managers, for example, have special knowledge that will be vital in developing the collection system and will play a key role in the process.

Make everyone aware that the school may not be reimbursed for its recycled materials. The main economic benefit of the program most likely will be to reduce or hold down your school's cost of waste disposal.

Step FIVE

DEVELOP A COLLECTION-SYSTEM PLAN

Before collection begins, work out each step involved in moving the materials from their points of generation to the collector. Make your program simple and reasonably convenient for people to use. Be sure your plan fits with the collector's equipment and schedule. Considerations in planning the recycling system include where to collect the materials, types of containers to use, moving and handling the materials, storage, and pickup.

Collection Points

You might collect materials in some or all of the following places.

- classrooms (white and mixed paper)
- break areas (plastic bottles and aluminum cans)
- cafeterias (cardboard, aluminum and steel cans, plastics)
- supply or storage rooms (cardboard)
- offices (white and mixed paper, cardboard)
- next to copiers and printing equipment (paper)
- machine-shop areas (metals, wood, paper)
- libraries (white paper, newspaper, magazines)

Containers

Different types of containers may be needed at different locations. For example, smaller bins or containers (12–18 gallons) may be used in classrooms or offices. (Ten-ream copy-paper cartons decorated with recycling logos can work well for classroom use.) A larger container (30–60 gallons) might be appropriate near copy machines. Typically, you will need containers for the following purposes:

- To serve as collection points.
- To transfer the materials from collection points to vendor pickup areas (this may require a wheeled, hamper-style container).
- To store materials while awaiting a vendor pickup (some facilities use a designated outdoor trash container or storage shed).

Whatever type of collection containers you use, be sure that they are clearly marked for recycling and, if possible, that they are placed alongside all trash cans in convenient locations. You can start with cardboard boxes or specially marked trash containers converted for recycling. Containers made especially for recycling work best because they have different shapes, colors, and sizes than regular trash containers.

Outside containers might be large trash receptacles marked for recycling or large recycling containers provided by vendors. School machine shops might help to design or produce special recycling containers. Talk with your vendor and local government about options for containers.

Moving and Handling Materials

Two questions you need to address regarding the handling of materials are:

- How will the materials be moved from collection points to storage?
- Who will move the materials?

Typically, paper is collected in special containers located in each classroom or office. These containers are emptied regularly into larger rolling containers or centralized containers at key locations throughout the building. The materials are then moved to a storage area to be held for pickup.

Materials can be handled or transferred by students, faculty, custodial staff, or a combination of these. It is crucial that the movement of materials be well-planned and efficient, so as to minimize the amount of effort needed to implement the program.

Although your system will probably evolve over time, recycling is likely to become a permanent element of your school's waste-management procedures. So, remember to plan for the long term.

Materials Storage

Frequently, you will use intermediate or central collection points within a building. Storage areas might include designated closets, empty rooms, or other similar locations. When planning your system, be sure to consider local safety, health, and fire codes.

You could also store materials in an outside location. Outside storage options might include a storage room or building or the outside containers themselves. Be sure to keep the paper or cardboard from getting wet. Some school districts apply for grants to build a permanent staging area for the recyclables from each campus.

Materials Pickup

In most cases, a commercial waste hauler or recycler will pick up recyclables. Whether you will be charged for this service depends on the value of the materials and the costs of collection.

Other options:

- Schedule school personnel to take collected materials to a vendor or city facility for recycling.
- Coordinate collection activities with other schools participating in a recycling program.
- Work with a local business owner to consolidate materials.

One strategy that reduces on-campus storage requirements is to transport materials daily or weekly from several campuses to a central location—such as a maintenance facility or bus yard—using school-district vehicles (trucks or buses). A commercial recycler might be willing to place a large container at the central storage site and pick it up when full, reducing its own collection costs and passing the savings back to the district.

Step SIX

KICK OFF THE PROGRAM

It is important to create a high level of awareness about your recycling program from the start. Include several elements as part of your kickoff plan, such as:

- Develop a school recycling logo and slogan.
- Organize a school assembly or recycling pep rally to celebrate the kickoff.
- Conduct contests, awarding prizes for the best poster, song, or poem.
- Distribute posters and other program materials throughout your school to tell students and staff how the program works and to encourage their participation.

Step SEVEN

REINFORCE THE RECYCLING HABIT

After the kickoff, you should reinforce the new recycling habit. Continual reminders will keep participation high and minimize problems. Keep everybody (including local media) updated and excited about the program, so that they can see that their efforts are producing results.

To get the word out, use:

- posters
- bulletin boards
- report cards
- bumper stickers
- contests
- school newspapers
- school supplies—such as rulers, book covers, erasers, and pencils—with a message or logo printed on them

Publicize program milestones, such as collecting the first ton of paper or aluminum, accumulating certain volumes of other recyclable materials, or reaching other specific levels, emphasizing the impacts of your effort (for example, resources saved, disposal costs avoided, etc.).

Step EIGHT

MONITOR AND EVALUATE YOUR PROGRESS

Monitor for problems during the first weeks of your recycling program. Make regular evaluations thereafter. Responding quickly and appropriately to problems is necessary for a successful program. Here are some questions to ask, followed by some corrective measures:

Right Materials in the Right Containers

Q. **Are targeted recyclable materials being thrown into the trash, and are the wrong materials being mixed in with recyclables?**

A. Solutions can include the following:

- Make sure that trash containers and recycling bins are located near each other, and that it's easy to tell the difference between them.
- Use recycling bins that are see-through or use clear plastic bags.
- Place signs on or above the containers with simple instructions (or examples) that explain what goes into each.
- Use recycling bins with openings designed for the targeted recyclable materials (for example, slotted lids for paper, small round openings for cans).
- Increase publicity to raise awareness of the program and its benefits.

Underuse or Overuse

Q. **Are some collection containers over- or underused?**

A. Consider changing the location of containers or altering the schedule of pickups.

Messy Appearance

Q. **Are there problems with the appearance of collection locations—are they neat and clean?**

A. Empty collection bins regularly.

Controlling Insects and Other Pests

Q. **Are there problems with insects around collected materials?**

A. Collect beverage bottles and cans in separate receptacles just for bottles and cans. And rinse these receptacles frequently, or set them outside. To learn more about environmentally sound ways to improve your pest-control program, see GI-405, *Managing 10 Common Texas Yard Pests, A Take Care of Texas Guide*. To view or order online, visit <TakeCareOfTexas.org/publications> or e-mail <educate@tceq.texas.gov>.

Remember to evaluate the program regularly. When your current system is running smoothly, you may be ready to add other materials.

Step NINE

GRASSCYCLING AND COMPOSTING

Benefits of Composting at School

- saves landfill space
- lowers disposal costs
- provides hands-on science education
- fertilizes lawns and landscape plants, reducing the need for chemical fertilizers
- loosens the soil, allowing water and air to enter, helping roots grow
- holds moisture in the soil, reducing the need to water
- reduces soil erosion and water pollution

Recycling, including composting, diverted 87 million tons of material away from disposal.

– EPA, 2012

When it comes to lawns and gardens, one of the easiest and most effective ways to recycle is by "grasscycling." By using a mulching mower (or a mulching blade on a standard mower) and leaving grass clippings on the ground, you will return valuable nutrients to the soil; reduce the need for watering, fertilizing, and pesticides; and save time and money on maintenance of the school grounds.

Consider implementing a composting program for your school's yard trimmings. You might be able to include fruit and vegetable waste from the cafeteria as well. For more information on grasscycling, mulching, and composting, see GI-36, *Mulching and Composting, A Take Care of Texas Guide*. To view or order online, visit <TakeCareOfTexas.org/publications> or e-mail <educate@tceq.texas.gov>.

For additional assistance on landscape management, contact your county AgriLife extension agent.

Step TEN

CLOSE THE LOOP: BUY RECYCLED

Remember, you are not really recycling until you also purchase products made from recycled materials. Purchasing these products is crucial to making recycling viable. There are many products available with recycled content, including office and computer paper, notebooks, forms, phone-message pads, calculator tape, napkins, toilet paper, and paper towels. Texas law requires school districts to (a) give preference to products made with recycled materials, and (b) make sure that their purchasing procedures are not biased against products made with recycled materials.

To establish a recycled-product purchasing program in your school or school district:

- *Confirm the commitment to buy recycled.* Ask the administration to make sure that they are following the law requiring the school or school district's purchasing policies and procedures to include provisions that encourage buying recycled-content products. Examine purchasing policies to see if they restrict the school district's ability to buy recycled-content products in any way. For example, look for terms, such as "virgin materials," that may prevent purchasing offices from considering recycled-content products.
- *Buy recycled and recyclable.* Whenever possible, products should not only have recycled content, but they should also be recyclable.
- *Publicize your efforts.* Your leadership will stimulate participation in your school recycling program and encourage others in your community to "buy recycled."

Check out the Texas Cooperative Purchasing Program, administered by the Texas Comptroller of Public Accounts. With this program, schools and local governments can purchase many recycled-content products through state contract, which provides price breaks for buying in large volume. For general information about the program, visit the Cooperative Purchasing Program's website at <window.state.tx.us/procurement/prog/coop>, call the program at 512-463-3368, or e-mail the program at <coop@cpa.state.tx.us>.

TIPS FOR INVOLVING STUDENTS IN YOUR SCHOOL RECYCLING PROGRAM

Recycling Is a Student Responsibility

Student ownership is critical to the success of a school recycling program. A student coordinator in the classroom can play an important role by monitoring what materials are placed in the container and ensuring that proper materials are being recycled. The role of recycling coordinator can be rotated periodically to allow more students to get involved. The student coordinators may also track the amount of recyclables collected per week. Charts and graphs can be used to record the amounts for future analysis and to foster classroom competition. Be sure to reward students for each week they help.

Curriculum Connections

Basic concepts in math, earth science, social studies, and economics can be reinforced using examples taken directly from your school's recycling program.

You can conduct a waste audit prior to starting your program, to calculate current waste-related expenditures and projected savings (see Step 1).

Through exercises like these, students not only gain appreciation of these savings and benefits, but reach a better understanding of larger economic and environmental issues. They can also discover how their actions can make a real difference.

Waste Analysis—Where Does It Go?

Ask students to analyze how much waste they contribute—either their personal trash, classroom trash, or school-wide trash. What do they throw away? How much of this material could they recycle or reuse? How could the volume of waste be reduced? Start a classroom discussion of where solid waste goes, and how various materials are recycled. Organize a class trip to a landfill and a recycling center, or invite speakers to your classroom from a waste-collection service and a recycling company to educate students about the processes of waste disposal and recycling.

Design and Decorate

Involve students in planning the collection system by having them design and decorate cardboard boxes or other recycling containers for the classrooms, library, cafeteria, and administrative offices. Discuss with your recycling coordinator how your students can be involved in moving the recyclable materials from the containers to central collection points. Be sure to recognize student participation regularly.

Publicity

Students are ideal promoters of recycling! Students can create posters (on recycled paper) for halls, cafeterias, and classrooms to encourage participation. Music students can compose songs and raps about recycling, or hold a pep rally to drum up support. Other students could produce a newsletter (with recycled paper) about their school's recycling program and its progress.

Plan a school carnival with events focusing on the concept of the four Rs (reduce, reuse, recycle, rebuy). For more information on this concept, refer to "Applying the 'Four Rs' at Texas Schools," on page 14.

Periodically, assign students to write essays or conduct classroom discussions about how they think the recycling program is working. What challenges have they faced since the program began? What are some ways to overcome

the obstacles? Has their behavior changed at home? What about their families' actions? What have they accomplished by recycling?

Buy Recycled!

Discuss how buying recycled products is an essential part of the recycling effort. Instruct students to analyze price differences between products made from recycled material and those made from raw material. Does it cost more to buy recycled products for your school? What would drive the cost down (laws of supply and demand)? Are there costs (economic, environmental, and social) of not recycling?

As a project, help students make recycled-paper notepads, using either scrap paper or recycled paper they have made themselves. (You can find instructions for making recycled paper by searching the Web.) After they make the paper, they can decorate it and staple it into notepads, which they could sell at the school store or at a table (staffed by students) during lunch or after school. Use the profits for an environmental project such as planting a tree on school grounds.

Grasscycling and Composting

If your school decides to compost, involve your students by teaching them the basic chemistry, biology, and ecology of composting. Check your school's compost site frequently to note changes in the composition of the pile. Invite a guest speaker from your county extension service to explain to students what's going on in the pile.

Start a School Environmental Club

Students who are dedicated ecologists on your campus can take the lessons learned in school out into the community. They can build compost bins and sell them to residents or businesses, pick up litter around their school or neighborhood, or put on plays or skits to teach younger students about solid waste and recycling. The number and variety of possible activities are as limitless as the students' imagination and energy! For more information on composting, see GI-36, *Mulching and Composting, A Take Care of Texas Guide*. To view or order online, visit <TakeCareOfTexas.org/publications> or e-mail <educate@tceq.texas.gov>.

And don't forget to enter your school or school's club in the TCEQ's Texas Environmental Excellence Awards program. For more information on the Environmental Excellence Awards, call 512-239-3143 or visit <teea.org>.

APPLYING THE "FOUR Rs" AT TEXAS SCHOOLS

The following tips for applying the "four Rs"—reduce, reuse, recycle, rebuy—have been compiled to help schools handle waste in a sound manner, and take care of Texas. You may not be able to adopt all of these practices at once, but it is important that you begin, one step at a time.

Office and Administration Four Rs

- Use recycled-content paper in your copier, and for your stationery, business cards, and forms. Print the "chasing arrows" logo, signifying recycled content, on your school's letterhead and publications—many people in the community will notice and appreciate it.
- Whenever possible, store your files electronically rather than on paper, and use e-mail for correspondence instead of paper.
- When possible, use both sides of a sheet of paper for correspondence, reports, work sheets, and copies.
- Buy supplies in bulk when possible to reduce packaging and expense.
- Keep mailing lists updated to reduce wasted mail.
- Reuse folders and notebook binders.
- Send used toner cartridges for refurbishing and refilling.
- Use white paper for writing paper, legal pads, assignments, notepads, etc. Colored paper is not as recyclable as white.
- Provide separate (and clearly marked) containers for recyclable materials and trash, but place them side by side, so that both options are available.

One of the most important factors in a successful school recycling program is getting students involved from the beginning. Involving students helps them develop pride and personal ownership in the program as well as in their school. Don't forget that your school's greatest resources are the students, so use their enthusiasm for protecting the environment to your school's advantage. Try to involve them in every aspect of your school's recycling program. Students will carry over good recycling habits developed in the classroom to their homes, workplaces, and communities for many years to come.

Classroom and Campus Four Rs

- Whenever possible, make two-sided copies—use both sides of the paper for reports, homework, work sheets, etc. This will cut your paper usage almost in half.
- Use cooperative learning and hands-on activities in addition to paper assignments.
- Use a projector, blackboard, or dry-erase board to minimize use of handouts for directions and information in the classroom.
- Keep a scrap-paper box handy for student use.
- Create a school-supply exchange. Collect unwanted pencils, notebooks, and other supplies at the end of the school year, and make them available to students at the beginning of the new term.
- Provide separate (and clearly marked) containers for recyclable materials and trash, but place them side by side, so that both options are available.

Library Four Rs

- Share magazine and newspaper subscriptions. Instead of discarding used

magazines and newspapers, donate them to other schools or libraries, or to retirement homes.
- Start a book exchange in the library for used paperback books and magazines.
- Encourage and facilitate the classroom use of old magazines for art and current-events projects.

Equipment Four Rs

- Buy copiers and printers with a "duplex function" that allows the use of both sides of the paper.
- Purchase high-quality, durable equipment with good service contracts.
- Instead of throwing away surplus equipment, repair it, or sell or donate it to someone who can repair it or use it for parts.

Food-Service Area or Teachers' Lounge Four Rs

- Use washable, durable tableware, cups, and utensils instead of disposables.
- Buy bulk condiments to use in refillable containers instead of single-serving packages.
- Reuse bulk containers for classroom storage.

- Encourage the use of lunch boxes and reusable containers rather than aluminum foil or plastic wrap.
- Set up recycling bins for aluminum cans, plastic bottles, and paper in the cafeteria and teachers' lounge.
- Recycle materials that are used in food packaging. Cans should be rinsed and stored for recycling. Before recycling plastic containers, remove the lids and flatten the containers to save space.
- Start a compost pile. Collect fruit and vegetable scraps, as well as tea and coffee grounds, for composting. Use your compost as a soil amendment on the school's lawn and garden.
- Promote a "Waste-Free Lunch" program. For more information, see the EPA document, *Pack a Waste-Free Lunch,* at <epa.gov/osw/education/lunch.htm>.

Other Ways to Apply the Four Rs

- Use cloth-towel machines or air dryers in restrooms rather than paper-towel dispensers. If you are using paper towels, buy those with recycled content. Toilet tissue with recycled content is also available.
- Buy products in returnable, recyclable, or recycled-content packaging.
- Look for disposable items that appear in large quantities in the waste stream. If possible, replace them with items that are reusable or recyclable.
- Replace regular incandescent light bulbs with more

energy-efficient bulbs, which can use up to 75 percent less energy and last up to 15 times longer, saving money and producing less waste.

- Install reflectors (available in commercial lighting stores) in fluorescent-bulb fixtures. This can supply the same amount of light with fewer bulbs.
- Remove your school from junk-mail lists. Select a company to perform this service for you by searching the Web for "reduce junk mail."
- Donate used furnishings, carpet, or equipment to nonprofit organizations when allowed.
- Use cleaned empty food containers for storage.
- Keep a swap box for CDs, videos, games, toys, books, and other items.
- Involve school clubs and classrooms in your campus recycling program (setting up bins, collecting, sorting, monitoring, and generating publicity).
- Publicize school recycling news and achievements in the daily announcements.

RECOGNITION OPPORTUNITIES

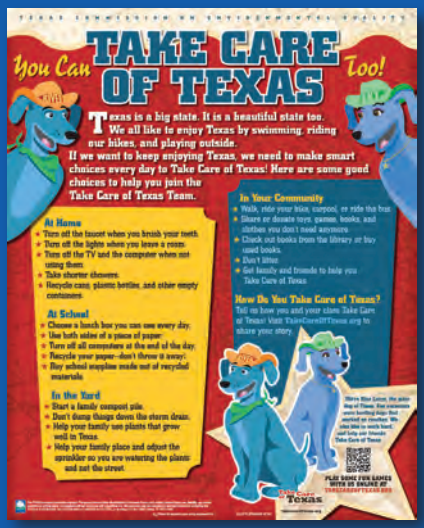
Every fall, the TCEQ accepts applications for the Texas Environmental Excellence Awards program. These awards honor those whose outstanding efforts help protect Texas' natural and human resources. With nine diverse categories, including Education and Youth, these awards spotlight Texans' recycling and conservation programs.

Past winners have included a Girl Scout from Sugar Land who started the first cafeteria recycling program in her district, a university in Central Texas with an impressive campus composting-research program, and a LEED Silver elementary school in El Paso whose Green Science Team members act as peer mentors, educating the other students about both recycling and water and energy conservation.

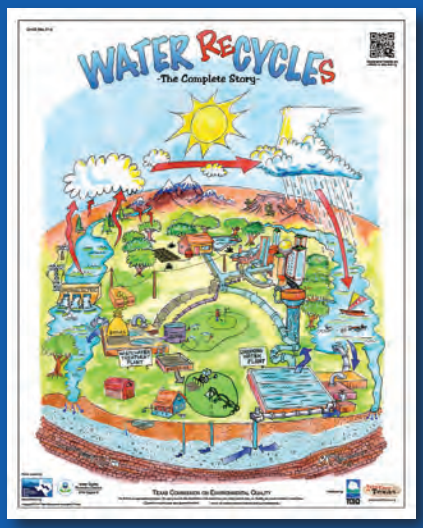
Your project could be next! Visit <teea.org> for more information.

Remember to always Take Care of Texas!

To enhance your recycling efforts, the TCEQ offers a number of materials for students and teachers. If you would like to order any of our publications, visit <TakeCareOfTexas.org/publications> or e-mail <educate@tceq.texas.gov>.

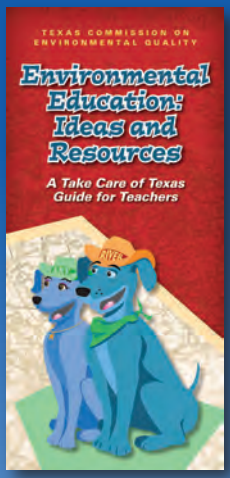


You Can Take Care of Texas, Too! Poster (GI-379)

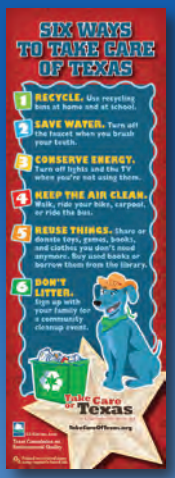


Water Recycles: The Complete Story Poster (GI-403)

Mulching and Composting: A Take Care of Texas Guide (GI-36)



Teachers' Guide to Environmental Education Resources (GI-79)



Six Ways to Take Care of Texas Bookmark (GI-324)

What Do I Do With It Now? (GI-288)

Take Care of Texas (GI-430)

Share these fun games online at <TakeCareOfTexas.org>.

Visit <TakeCareOfTexas.org> and take the pledge to conserve water and energy, and keep the air clean.

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Rainwater Harvesting with Rain Barrels

A "TAKE CARE OF TEXAS" GUIDE

Take Care of Texas
TakeCareOfTexas.org

See video info on back page

What Is Rainwater Harvesting?

Rainwater harvesting is the collecting and storing of rainwater. You can collect rainwater from a roof, which is the most common method, and store it in catchment tanks, such as rain barrels.

A Brief History of Rainwater Harvesting

Before there were public water utilities, many American households harvested rainwater. With the development of large, reliable water treatment and distribution systems, the appeal of rainwater harvesting diminished.

However, as the environmental and economic costs of providing centralized water escalate, a new interest in rainwater harvesting has emerged. The easiest way to begin harvesting rainwater for your home is to use a rain barrel to collect water for your container plants, landscape, and garden.

Reasons for Harvesting Rainwater

Benefits

- The water is free.
- Rainwater is better for plants than chemically treated water.

- Rainwater harvesting can help reduce flow to storm water drains and reduce stream pollution.
- Using stored rainwater can reduce utility bills.

Other Incentives

Texas Tax Code 151.355 exempts rainwater-harvesting equipment from sales tax. To download the Texas Sales and Use Tax Exemption Certificate, visit <www.window.state.tx.us/taxinfo/taxforms/01-339.pdf>.

Some cities and counties offer rebates or reduced costs for rain barrels. Check with your local government or water utility to find out if incentives are available in your area.

Troubleshooting

Like most things around your home, your rain barrel needs a little regular attention to keep working smoothly. To keep it in the best shape:

- Use all the water in the barrel regularly.
- Clean your gutters at least twice a year to reduce debris.
- Once a year, during a dry spell, tip the barrel over and rinse it out with a hose.

HOW TO CONSTRUCT A RAIN BARREL

Instructions

1. **Inflow.** Use the utility knife or jig saw to cut a hole in the top of the barrel approximately the same diameter as your gutter downspout.
2. **Spigot.** Measure 3 to 4 inches from the bottom of the barrel and drill a 1-inch hole. Screw the spigot halfway into the barrel, apply some Teflon cement to the exposed threads, and continue to twist until tight. In addition, you can use a rubber washer, metal washer, and a lock nut to more firmly secure the spigot to the barrel from the interior.
3. **Overflow.** Measure 3 to 4 inches from the top of the barrel and drill a 1-inch hole. Twist in the 3/4-inch PVC closed nipple about one-quarter of the way, apply Teflon cement to the exposed threads in the middle portion of the coupling, and continue to screw it in, leaving 1 inch of thread exposed.

   Connect the hose to the pipe coupling overflow spigot at the top of the barrel. You can run this hose into another barrel or to a soaker hose (which will evenly distribute excess water and help avoid flooding).
4. **Downspout.** Place the barrel directly below the downspout. You will need to reconfigure the downspout to flow into the hole. If you like, place the barrel on concrete blocks or bricks. Raising the barrel will allow you to get a bucket under the spigot, and will facilitate leveling the area where your barrel will sit.

   Cover the hole on the top of the barrel with the window screen, to prevent sticks, rocks, or dirt from getting into it. Screens also keep mosquitoes out. Secure the screen with a few bricks or rocks to keep it in place.

Materials

- 55-gallon polyethylene plastic barrel
- 3/4-inch hose spigot
- 3/4-inch PVC closed nipple
- window screen
- Teflon cement
- water hose (optional)
- bricks or concrete blocks (optional)

Tools

- drill with a 1-inch paddle bit
- utility knife or jig saw

Any standing water will begin to smell after a while, especially if it contains organic matter, such as leaves. Smelly water won't hurt your plants, but it can be a nuisance. To avoid it:

- Use all the water in the barrel within a month of collecting it.
- Put a capful of chlorine bleach into the water. This small amount won't hurt plants.

A well-sealed screen will help keep mosquitoes from getting into your rain barrel. However, mosquito larvae may still wash in from your gutters. You can help prevent mosquitoes from breeding and keep them at bay by emptying the barrel regularly. You can also add mosquito dunks to the water. These dunks contain a nontoxic bacterium that kills mosquito larvae. It's safe for your plants, and it will not harm pets or people. You can find this product at most garden-supply stores.

The Next Steps

Remember that the water collected in a rain barrel as described in this publication is intended to be used for outside purposes only, such as watering your container plants, landscape, and garden.

- If you decide that you want to store even more rainwater, you can connect two or more rain barrels.
- To safeguard the quality of your drinking water, never submerge a water hose in a rain barrel.
- To collect rainwater for extensive landscape use, you can install larger systems using cisterns.

Additional Information

For information on building a complex rainwater harvesting system for landscape use, see *Rainwater Harvesting* (GI-404, reprinted courtesy of the Texas A&M AgriLife Extension Service). You can download a copy of this manual at <TakeCareOfTexas/publications/gi-404.pdf>. Texas A&M AgriLife's website also discusses rainwater harvesting and lists publications, training programs, and suppliers of rainwater-harvesting equipment.* Visit "Rainwater Harvesting" at <rainwaterharvesting.tamu.edu>.

The Texas Manual on Rainwater Harvesting, from the Texas Water Development Board, offers comprehensive information on all levels of rainwater harvesting. Download a copy at <www.twdb.texas.gov/innovativewater/rainwater/docs.asp>.

Contact the Texas Comptroller's office at 800-252-5555 for questions about the exemption of rainwater harvesting equipment from state sales tax.

**The listing of suppliers is provided by Texas A&M AgriLife Extension solely to inform the reader of the different types of equipment and products that are available for harvesting rainwater. Neither Texas A&M AgriLife Extension nor the TCEQ endorses any particular vendor, manufacturer, or product.*

OTHER WATER CONSERVATION TIPS

- Check your faucets and fix any leaks you might have, to save up to $35 a year on utility bills.
- Wait until you have a full load of laundry before washing, or use a lower water-level setting.
- Avoid overwatering your lawn. When needed, water 1 inch, once a week. To water only 1 inch, place a 6-ounce tuna can on your lawn and stop watering when it is full.
- Invest in water-efficient plumbing fixtures. Replacing an older toilet with the most water-efficient model can save up to 13,000 gallons of water a year. Installing a faucet aerator can cut water consumption in half. For additional information on water-efficient products, visit the Environmental Protection Agency's WaterSense website, at <www.epa.gov/WaterSense>.

Watch our video on **Building a Rain Barrel**, a step-by-step demonstration on how to build a rain barrel using a 32 gallon plastic trash container. <www.tceq.texas.gov/goto/rain-barrel-video>

Also available is our video of **How to Start Composting in Your Own Backyard**, featuring Travis County Master Gardener Patricia Mokry, who explains simple ways to begin and maintain various types of compost. <www.tceq.texas.gov/goto/composting-video>

Need More Information on Yard Care?

Rainwater Harvesting with Rain Barrels complements the *Guide to Yard Care*, which is meant to be a general overview of ways you can help Take Care of Texas in your own yard. For more detailed information, see the following other TCEQ "Take Care of Texas" guides at <TakeCareOfTexas.org/publications>:

- *Guide to Yard Care* (GI-28)
- *Mulching and Composting* (GI-36)
- *Managing 10 Common Texas Yard Pests* (GI-405)
- *Managing Lawn Problems in Texas* (GI-407)
- *Landscape Irrigation* (GI-409)

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