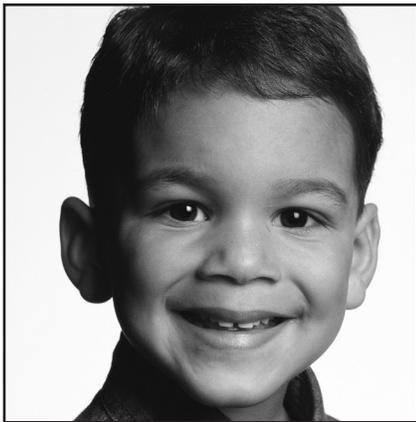


COMPOSTING:

A Guide for South Carolina Schools



A Publication of the
**S.C. Department of Health and Environmental Control's
Office of Solid Waste Reduction and Recycling**



www.scdhec.gov/recycle
1-800-768-7348





The S.C. Department of Health and Environmental Control (DHEC) encourages schools to set up composting programs. Whether a large-scale, school-wide program or small, single-classroom effort, composting helps schools reduce waste, protect the environment, create a useful product, provide a hands-on learning experience for students and perhaps save money. Although there are basic requirements for schools to follow and possible risks to be aware of (see page 7), composting can be fun and easy to do.

“Composting: A Guide for South Carolina Schools” provides recommendations for collecting organic material at school, selecting and placing bins as well as actually composting.

What is composting?

Composting is the controlled, natural decomposition of organic material such as yard trimmings (e.g., grass clippings, leaves, branches) and food scraps. Microorganisms break down this material into compost – a crumbly, dark-colored and soil-like material. This material is a nutrient-rich product that can be used in gardens and flower beds as well as on the surrounding lawn.

There are many benefits to composting and using compost.

- **Composting reduces the amount of waste a school sends to a landfill.** Organic material makes up a large portion (30 to 40 percent according to some studies) of a school’s waste stream.
- **Composting may help schools save money.** Schools may save money by reducing the frequency of garbage collection and/or the number of dumpsters needed on campus. In addition, using compost may save money by reducing water usage for landscaping and the need to buy compost.
- **Composting at school presents hands-on environmental education opportunities.** Composting provides a forum for teaching topics such as decomposition, pollution, habitat loss, microbiology, chemistry and soil ecology. Composting also helps students understand their responsibility in reducing and managing waste as well as becoming community and environmental stewards.
- **Compost is a beneficial product.** Compost improves soil quality by increasing air circulation (aeration) and water-holding capacity (reducing the need to water) as well as helping plants absorb nutrients. All of this leads to healthier plants.
- **Compost reduces or eliminates fertilizer and pesticide use.** This helps protect the environment by reducing runoff pollution.

Composting: Part of a Well-rounded Recycling Program

Composting has been shown to reinvigorate conventional recycling programs and awareness of waste reduction in general, resulting in further environmental and economic benefits.

Before Starting ...

There are many small and large details in setting up and implementing a school composting program. It is essential to address these details to have a successful program. Here are some basic recommendations to consider.

1. Learn, organize and plan.

Learn as much as you can about school composting and gather support for the program. Take time to plan and address the details. Know how the composting process works and the necessary tools that are needed. Composting can be easy and fun to do. Remember, it's fine to start small and grow the program.



2. Gather champions.

The composting program leader plays an integral role, but other champions – including administrators, teachers, students, cafeteria and kitchen staff as well as housekeeping and groundskeeping staff – will be needed. Don't forget parents and community volunteers.

3. Educate and train.

Education is vital for a successful composting program. Teachers, staff and students – everyone involved – must be trained to varying degrees about composting. Classroom instruction should include lessons on composting.

4. Promote the program.

The following activities will increase understanding and awareness as well as participation. Create posters. Make announcements. Place information on the school's Web site. Form a composting club. Celebrate Earth Day (April 22), International Compost Awareness Week (the first week of May) and America Recycles Day (November 15).



Students need to be involved.

Students can feel ownership of the program if they are involved in the process. Each student will need to sort his or her leftover breakfast, lunch or snack items into separate containers. Other students can be used as monitors to ensure that material is sorted appropriately. Students can carry the material to the compost bin, turn the material in the bin and even place the final compost product – with guidance – on campus.

Resources on the Web ...

- Visit DHEC's Office of Solid Waste Reduction and Recycling's composting Web page at www.scdhec.gov/compost to learn more.
- Clemson Extension has an extensive amount of information on composting at www.clemson.edu/extension/hgic/plants/other/compost_mulch/hgic1600.html.
- Cornell University's Web site explains how to compost either indoors or outdoors and gives detailed information on the science of composting. It also includes frequently asked questions and a composting quiz. Visit <http://compost.css.cornell.edu/schools.html> for more information.



Getting Started ...

Where and how should organic material be collected at school?

There are two general types of organic material:

- yard trimmings; and
- food scraps.

Yard Trimmings

Generally, school maintenance staff will be in charge of yard trimmings collection and organization.

If grass is mowed, the clippings can be left in place to decompose – returning nutrients and perhaps water to the soil. If grass clippings are collected and composted, they should be considered high-nitrogen material (also known as “greens”).

Fallen leaves are a great source of high-carbon material (also known as “browns”). To speed the composting process, shred leaves and branches greater than a half inch in diameter or more than 8 inches long before adding them to the compost bin.

Because material must be added to the compost bin in a timely manner (see page 7), yard trimmings and food scraps collection should be coordinated.

Food Scraps

Consider collecting organics from the cafeteria and kitchen as well as other locations such as the faculty lounge and classrooms. Paper towels from restrooms are another potential source.

When starting a composting program, it may help to start in the cafeteria and expand to other areas. Discuss with kitchen staff the best way to collect scraps from food preparation. Respect their time and ability to make good decisions.

To collect food scraps in the cafeteria, the material will need to be sorted.

- Consider providing separate containers, preferably color-coded, for food scraps, recyclables (e.g., plastic milk or juice bottles), waste and liquids (pour down the drain).
- Clearly label the containers.
- To reduce congestion, set up several sets of containers in different parts of the cafeteria or allow students to sort leftovers at their leisure. Keep in mind that it will take time for the students to get up to speed.

What can be composted?

These materials CAN BE COMPOSTED at school ...

- **“Greens”** (high-nitrogen material) – Fruit and vegetable scraps, bakery waste, bread and grains, coffee grounds and filters, tea bags and eggshells generated in on-site cafeterias as well as yard trimmings from the school grounds
- **“Browns”** (high-carbon material) – Non-recyclable paper, non-recyclable paperboard, paper towels, leaves, clean sawdust and wood shavings from untreated wood

These materials SHOULD NOT BE COMPOSTED at school ...

- **Meat, fish, poultry, bones, fats, grease/ cooking oil* and dairy products**
- **Evergreen leaves** (e.g., magnolia leaves), **coated paper** as well as **sawdust and shavings from painted or treated wood**
- **Plastics** (including bags, wrapping, ties and string)

* Although grease/cooking oil cannot be composted, commercial recycling services are available in some parts of the state. For more information, call 1-800-768-7348.

Compost Bins

Type, size and placement are keys to a successful program.

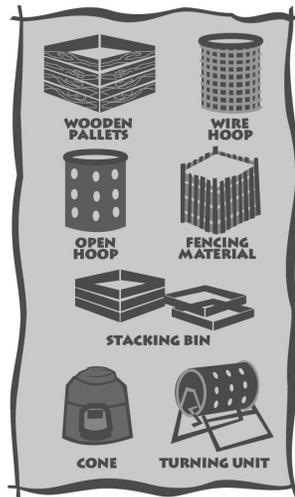
There are several compost bin designs appropriate for school-wide composting programs. In some cases, you may be able to successfully compost without the use of a bin. Compost bins are not necessary if you do not have much material to compost and have a suitable area in which to compost that is unlikely to be disturbed.

Location

Bins need to be located in a convenient place and should be built on level grass or soil to reduce or eliminate runoff. Consider placing gravel, wood chips or another porous material around the perimeter of the bins. For aesthetics and safety reasons, bins should be located behind the school or a partition, in a low foot-traffic area. If possible, do not locate the bins in the vicinity of a dumpster. Dumpsters often attract animals and the foul odors from the dumpsters may be mistakenly associated with the compost bins (which, if maintained properly, should produce no foul odors).

Bin Size and Number

The minimum recommended bin size is 1 cubic yard (3 feet X 3 feet X 3 feet). The number and size of bins needed, however, depend on the amount of organics expected. One way to estimate this is to weigh food scraps from the cafeteria and kitchen every day for a week. A bin should accommodate about 12 pounds of food scraps per day. Also consider the yard trimmings that you plan to compost when selecting a bin size and number of bins needed. Yard trimmings are more difficult to estimate. Slightly larger bins also can be built; however, bins that are taller than 4 feet make it difficult for students to use. Ultimately, the dimensions and style of the compost bins may be determined by the space available. By the end of the process (see page 7), the material added to the compost bin will have decreased in volume by about half. This may take a few weeks or months. To more easily manage material at varying stages in the composting process, more than one bin may be needed so that new material can be added to one bin as older material is composting in another.



So you want to build your own bins?

Consider the life of the material, cost, availability and ease of construction. When selecting material to construct a compost bin, toxicity of the material, durability and appearance are important factors. Think about using bins from reused material. For example, wooden shipping pallets – often obtained free from local businesses – are a convenient size for the frame of a compost bin.

Building bins requires well-drawn design plans and a material list. Material must be conveniently sized to handle, cut and connect. Student workers require adequate supervision in reading design plans and using tools safely. Safety glasses should be worn at all times.

Here are some Web resources for bin construction.

- <http://extension.missouri.edu/publications/DisplayPub.aspx?P=G6957>
- www.calrecycle.ca.gov/Publications/Documents/347%5C44295054.pdf

Costs

The initial expense of the compost bins and tools will vary depending on the material you select. It will cost something, but it doesn't have to be a budget buster. A local lumberyard or manufacturer may donate or sell material to the school at cost. Look for funding from the school and parent/teacher organizations or local civic groups.

Composting with Worms ...

Vermicomposting is a great way to speed up the composting process, aerate the organic material in the bin as well as enhance the finished compost with nutrients and enzymes from their digestive tracts. It can be done inside during all seasons, but generally can only handle a small amount of organic material.

Here are several resources to learn more.

- www.scdhec.gov/HomeAndEnvironment/Docs/sb_handbook_all.pdf ("S.C. Smart Gardener Handbook," Part 2.)
- www.clemson.edu/extension/hgic/plants/other/compost_mulch/hgic1607.html
- www.calrecycle.ca.gov/organics/worms/wormfact.htm

The Basics: Managing the Program

Once your school has established procedures and guidelines for collecting organics, it is time to make compost.

The compost pile should be operated in a manner to:

- control odors;
- prevent the attraction of birds, insects, rodents and other animals; and
- control leachate (rainwater that passes through the compost pile) and runoff from the compost.

It is best if there is enough oxygen that the material can compost aerobically. To ensure an adequate amount of oxygen, the pile can be turned at least once or twice a month.

The pile also should have adequate moisture. If there is not enough rain to keep the pile moist, water may be added until the pile has the consistency of a

damp sponge. If there is too much rain and the pile is soaked, turning it can introduce oxygen and help the pile dry.

Other points to consider are listed below.

- Organic material to be composted should not be mixed with finished compost.
- Open burning of solid waste including food scraps and yard trimmings is prohibited in South Carolina.
- Plans should be made so that the composting process is complete and all compost is properly distributed prior to the end of the school year, unless there is staff available to manage the composting operation over the summer.

When is it ready?

The “jar” test is useful if you have any remaining doubts about whether or not your compost is finished. Scoop some compost into a jar. Empty plastic containers with lids work just as well. Seal the jar tightly and leave it alone. After a week, open the jar and check for odors. Does it smell sweet and earthy or sour and stinky? If your compost needs more time, you’ll know. Repeat the test in a week if needed.

Where can the compost be used?

There are two main uses for finished compost. The finished product can be used as a soil amendment (by mixing it into the soil) or as mulch for existing plants. If the desired end use of the compost is for potting soil, it will need to be screened to remove any large pieces.



Daily Tasks ...

1. Collect food scraps from the cafeteria, faculty lounge and kitchen. All food scraps must be added to the compost bin within 72 hours (see page 7).
2. Add food scraps to the compost bin. The food scraps should be spread evenly.
3. Cover the food scraps with high-carbon material (e.g., yard trimmings or paper towels).
4. The container used to carry food scraps to the bin should be wiped or washed and returned to its place.

As-needed Tasks ...

1. Check the bins to be sure they are in good shape (e.g., no loose nails, boards). If repairs are needed, be sure they are made promptly to prevent injuries.
2. Check the compost for odor and moisture. If there is an odor or the compost is too wet, turn it. If the pile is too dry, add water. The compost should feel like a damp sponge.

Keep records and set goals.

Records can be kept of the amount of material placed in the compost bin, how much compost was generated or both. Another measure of the program is the amount of garbage disposed of by the school. Once composting starts, this should decrease.

Requirements That Must Be Followed ...

Composting falls under S.C. solid waste regulations, 1) R.61-107.4 Solid Waste Management: Compost and Mulch Production from Land-clearing Debris, Yard Trimmings and Organic Residuals; and Compost and 2) R.61-107.6 Solid Waste Management: Solid Waste Processing Facilities.

Schools that compost less than 400 cubic yards food scraps, yard trimmings and of land-clearing debris ARE EXEMPT from permitting requirements as long as:

1. **all of the material composted is generated on campus;** and
2. **the compost produced is used on campus.**

If any material to be used in the compost mix is generated at other sites (e.g., student homes) or if your school plans to sell the compost to the public, permitting, financial assurance and compost product testing may be required by state regulation.

The regulations are available at www.scdhec.gov/Agency/docs/lwm-regs/R61-107_4.pdf and www.scdhec.gov/Agency/docs/lwm-regs/R61-107_6.pdf.



Possible Risks ...

DHEC recognizes that even though permitting requirements for the final product are not applicable to exempt schools (see above), certain risks are associated with composting and should be addressed.

There are risks at all composting sites associated with pathogens (both plant and animal) in the compost bin and finished product. Gloves should be worn when working with compost and compostable material.

Additionally, if the composting process is not complete (see above), the product may reheat and cause damage or death to plants grown in the product.

Remember ...

- Food scraps should be added to the compost bin within 72 hours. If stored, the food scraps must be in a closed, covered container that will control odors and prevent the attraction of birds, insects, rodents and other animals.
- Food scraps SHOULD NOT be left uncovered for more than two hours in the compost bin.
- If your school has classroom pets, and they are herbivores (strictly plant-eaters), their waste (which is "green") and discarded bedding (which is "brown") can be composted.
- Have monitors available to help students and staff sort material and ensure that unacceptable material (e.g., glass, paper, plastic bags, metal) is not placed in the compost mix. Items such as glass or metal – which should be recycled – may injure people who work with the compost mix or the final product.

Success Stories ...

- During the 2013-2014 school year, 21 elementary and middle schools in **Charleston County** diverted nearly 400 tons of food scraps from the landfill through the county's food waste collection program. The county composts the leftovers from school lunches, including paper napkins and milk cartons, and sends finished compost back to some schools for use in their gardens. Due to composting, the school district was able to save more than \$58,000 in disposal and user fees compared to the previous school year.
- Students at **Oakview Elementary School** in Simpsonville compost leftover fruit and vegetable scraps from their cafeteria in a series of backyard compost bins on school grounds. Students sign up at the beginning of each school year to help collect scraps and manage the compost, which is used as a soil amendment in the school's gardens. Based on the average amount of food scraps collected each lunch period, the school composted an estimated 7,200 pounds of material during the 2013-2014 school year.

More Resources from DHEC ...

DHEC can help K-12 public or private schools set up, maintain and expand recycling and composting programs through technical assistance, educational material and grant funding.

DHEC also offers "Action for a cleaner tomorrow: A South Carolina Environmental Curriculum Supplement" ("Action"). Developed by teachers and DHEC in conjunction with the S.C. Department of Education, "Action" can serve as a starting point for introducing environmental education in the classroom. The award-winning, activity-based interdisciplinary curriculum supplement is correlated to the state's science standards.

"Action" is only available as part of a FREE training provided by DHEC. For details, call **1-800-768-7348**.

In addition, DHEC's "Action in the Classroom" provides fifth- and seventh-grade as well as high school students an overview of recycling, buying recycled, waste reduction, reuse, composting and landfill disposal in South Carolina.

Additional Guides Available

In addition to this composting guide, there are two additional publications that may assist in your school's sustainability efforts – "Recycling: A Guide for South Carolina Schools" and "Environmental Clubs: A Guide for South Carolina Schools."

Both are available at www.scdhec.gov/recycle or by calling **1-800-768-7348**.

Grant Funding Opportunities

DHEC's Recycling Education Grant Program provides funding – when available – to any K-12, public or private school or school district. The funding may be used for recycling containers, composting projects and supplies to support "Action" lessons and school recycling or environmental clubs.

Take Action Today Awards

Each year, DHEC recognizes innovative and successful school recycling, composting, waste reduction and reuse programs as well as a recycling teacher of the year.



For more information, call **1-800-768-7348**.

