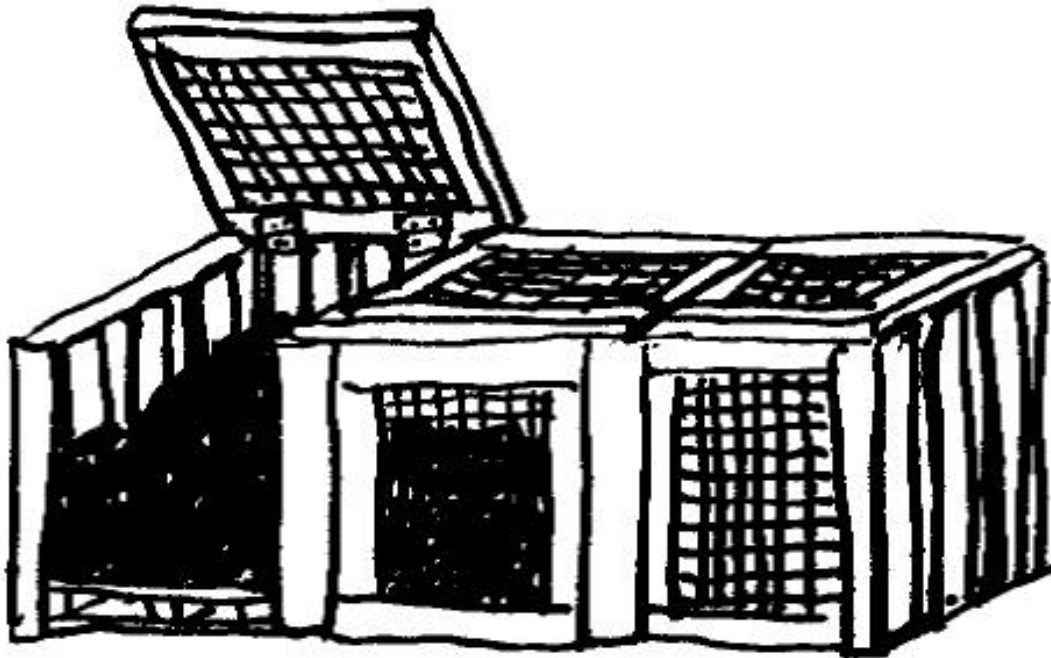


COMPOSTING

At your school
A "How to..." guide

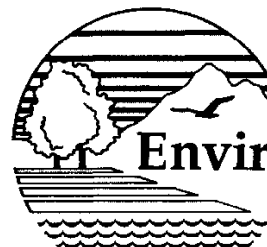


October 2006



School
Recycling
CLUB

c/o Northeast Resource Recovery Association
2101 Dover Road (NH Rt 4), Epsom, NH 03234
Phone:(603) 736-4401 Fax:(603) 736-4402
E-Mail:theclub@nrra.net Web:www.nrra.net



NEW HAMPSHIRE
DEPARTMENT OF
**Environmental
Services**

6 Hazen Drive, Concord, NH 03301

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INTRODUCTION

Students are great recyclers. They recycle their aluminum cans and they recycle their paper. But what about their food waste, those cafeteria left overs from preparing the students' breakfast and lunch? This material can be recycled through composting!

Why Compost at Schools?

Composting is nature's way of recycling. It is the natural process of organic materials (i.e., food, leaf and yard waste) breaking down into a valuable soil amendment, just as a leaf does on the forest floor. Between 6 to 14 percent of the daily waste in a school is compostable food scraps. Composting these organic materials cannot only save money by reducing the school's disposal costs, but can also strengthen an environmental science program with hands on science activities. Educators can play a major role in teaching students about the values of composting both in the school and at home, while providing a great example of a natural life cycle.

School Composting Can:

- Re-use organic material, a valuable natural resource;
- Save money by reducing the school's waste disposal costs;
- Create a valuable soil amendment for planting or mulching;
- Provide an opportunity for students to study the biology and chemistry of how the composting process works;
- Provide students with an example of a natural life cycle, and;
- Give students a feeling that they can help make a difference.

Testing School Composting in NH!

In order to test whether backyard composting was possible for New Hampshire schools, the NH Governor's Recycling Program and the NH Department of Environmental Services have conducted the "Composting at New Hampshire Schools" pilot program at the New Boston Central School and Belmont High School since March of 1995 (see Appendix A for an overview of these schools).

Primary Goal: To develop a school composting program that can be easily duplicated by other NH schools with a minimal investment of time and money.

Secondary Goal: To educate students in science, math and solid waste issues by learning how to compost and demonstrating the possible environmental and economic advantages of composting.

What to Expect in This Guide?

This Guide is based on the knowledge gained from the two pilot programs. It is designed to provide users with background information to help decide if they want to start composting, as well as how to set up, operate and promote a school composting project. The Appendices include information sheets, tracking forms, etc. from the pilot. Please use them in any way which is helpful.

In addition, the Guide can assist teachers in educating students in science, math, and solid waste issues. Appendices include a list of the "New Hampshire Curriculum Frameworks" that the Guide addresses and several composting-related classroom activities. Throughout the Guide, you will find markers referring to an activity in the Appendices that best relates to that section of the Guide.

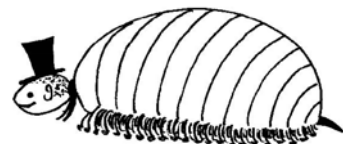
As always, for any further questions, please do not hesitate to call the School Recycling CLUB at (603) 736-4401 or the NH Department of Environmental Services at (603) 271-3712.

GETTING STARTED

Starting a school composting program can be fun and easy. However, an understanding of how school composting works and whether or not composting is an option for a specific school is needed before starting.

What does it take to Compost?

School cafeterias produce food waste from two sources.



1. Preparing meals ("prep scraps")
2. Students' leftovers ("plate scrapings")

The operation of a school composting program involves

1. Collecting the food wastes (we recommend starting with prep scraps")
2. Depositing them into a composting bin
3. Mixing them with a bulking agent (i.e., leaves or wood shavings).
4. Ensuring the combination of food waste, bulking agent and moisture is correct
5. Deciding how to use the finished compost

Although the operational steps listed above are simple, there are many small details of setting up, coordinating, and operating a school composting program. It is essential to address these details for a successful program.

Can Your School Compost?

The NH Department of Environmental Services encourages food waste composting activity throughout the state by allowing kitchen wastes to be composted at the same location that they are generated without any permitting requirements. Consequently, no State permit is required for a school to compost their food waste on the school grounds.

The checklist below can help a school community decide if it should compost.

- Is there a school lunch program?
- Does the school administration support a composting project?
- Is there one person willing to be the point of contact for the program and keep the program going?
- Do teachers, maintenance, or other involved staff support composting?
- Is the kitchen staff willing to place the food waste in a separate container?
- Can an adequate site for the compost bin be found on the school grounds?
- Are there people (staff, local volunteers, or students) willing to construct and/or maintain the composting bins?
- Can enough bulking material be made available to mix with the food waste?

Getting everyone's Support!

Once the leader(s) in charge of implementing and maintaining the school composting project have been designated, it is then time to meet with the principal to gain his/her full support. Hopefully, the response will be "I love composting. What can I do to help?," or "Sure, great idea. Take the ball and run with it." However, if the response is "Composting, what's that?" refer to the tips listed below for a tactful and sensitive approach. The reply "No way, composting is not for this school," may mean regrouping or finding a new project.



NH Experience: A typical reaction among school principals and teachers may be that composting will attract wild animals and consequently put children at risk. Therefore, a focus of the pilot programs was to determine if this was true. Many precautions were taken to avoid attracting pests (see page 11). No wild "critters" have been seen around the compost bins and there has been no evidence of any visits occurring at night. However, do not take this issue lightly; offer to stop composting food if any problems develop.

If the principal supports the idea, arrange a meeting with all interested parties and anyone whose daily routine may be affected by a school composting project, i.e., maintenance or custodial personnel, kitchen staff, teachers' aides, and school administration. Go over the "Can Your School Compost?" list as a group, addressing each individual's needs. Use the tips listed below when talking to the group.

1. Introduce the idea as something you are **exploring**, and the decision to compost will need to be **a joint decision**.
2. **Sell the program** on the positive aspects that relate to studying science and ecology, working with the community, an example of a natural life cycle, and a possible financial savings to the school, rather than just emphasizing "being good for the environment."

Activity #1

3. Let staff people know it is ***not the intention to create more work*** for them in their daily routine, and that feedback is needed on how to avoid that.
4. Be sure that everyone ***understands how composting works*** and what a school composting program involves.
5. ***Do not force the issue***. If people are not receptive, it may not be the right project or the best time to start.

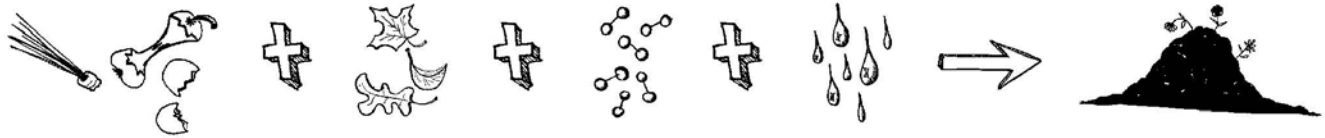
Time to Get Organized!

Once a decision is made to compost and the full support of all involved parties is obtained, it is time to organize a composting committee and solicit volunteers to participate in the program. The following are suggestions on ways to get the word out to the school and community for moral support, and financial and/or physical help.

- Notify other environmental type school organizations/clubs;
- Use school and community newsletters;
- Notify the Student Council;
- Use the school's public address system for announcements;
- Contact local Garden Clubs, Conservation Commissions, Recycling Committees, etc.;
- Make announcements at school related meetings, and;
- Contact local Public Works, Recycling Contractors, and Coordinators.

NH Experience: The composting committee in New Boston consisted of the Sixth Grade Science Teacher, School Secretary, Hot Lunch Director, Lunch Helper, and New Boston Transfer Station Manager and Assistant Manager. In Belmont, the committee was made up of the Technology Education Teacher, Physical Science Teacher, Food Service Director, Head Custodian, and selected students from the Environmental Club.

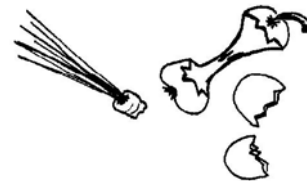
THE COMPOSTING EQUATION



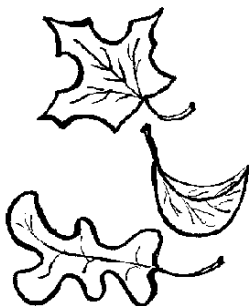
Compost is the result of organic waste material decomposing through the actions of soil micro-organisms. The micro-organisms which create compost need relatively large amounts of carbon material (leaves, wood chips, etc.), small amounts of nitrogen material (food waste, fresh manure, grass clippings, etc.), air and moisture to thrive and actively do their job.

Food Waste = Nitrogen

Most of a school's compostable food wastes are high in nitrogen and can include bread, fruit and vegetable scraps, coffee grounds, and eggshells. Fresh green grass clippings are also a source of material high in nitrogen. Meats, dairy products, oils, fats, and bones should be avoided when composting because they will take a long time to decompose and are likely to create odor and attract pests.



Bulking Agent = Carbon

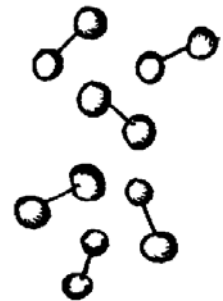


Either wood shavings (available by the bag from a grain store) or fall leaves (keep in mind oak leaves decompose more slowly than maple leaves) are good materials to use as a bulking agent since both are high in carbon. Ensure you have access to enough dry bulking agent for the entire school year. If the plan is to use leaves, this may require stockpiling many bags.

NH Experience: The New Hampshire pilot schools started their composting programs in March of 1995 using mulch hay as a bulking agent. After 3 months of composting, much of the food was breaking down but the hay was not. Belmont continued to experiment using hay as a bulking agent, while in September, New Boston switched their bulking agent to leaves. New Boston used a ratio of one part food to one part leaves (by weight) and by 3 months, both the food and leaves had broken down to a finished compost product. Belmont's hay continued to show little breakdown, so they reused their partially decomposed hay by mixing it again as a bulking agent with the food waste.

Compost's Micro-Organisms Need Air!

As with all living things, the compost's micro-organisms need oxygen to survive and do their work. The compost bin must be able to supply plenty of air. If a pile is larger than four square feet, the material in the center will be too compressed to allow air to reach the middle. Turning a pile from one bin to another is one way to aid in ventilation.



NH Experience: At both pilot schools, the turning of the compost pile from one bin into the next took about 45 minutes and was done anywhere from twice a week to once a month, depending on the temperature of the pile and the availability of people to do the turning.

Moisture Is Important!



The micro-organisms in a compost pile work best when the pile is as moist as a wrung-out sponge. Sitting in direct sun all day may dry out the pile and the microbes will die. However, during heavy rains, too much water may make it soggy, keep the oxygen out of the compost, and drown the microbes.

NH Experience: New Boston achieved the right amount of moisture by using a tarp to cover the bins in the winter (to keep out the snow) and exposing the bins to partial sunlight and rain during the rest of the year. Belmont experimented with not using their tarp, and due to a rainy fall, found that the compost was a little too wet. For additional moisture control research, students attached plywood tops to the bins, which resulted in compost that was a little too dry by the end of the summer.

Heat means compost action!



Micro-organisms generate heat as they decompose organic material. Pile temperatures between 90F and 150F indicate rapid composting. A composting thermometer (see page 19) is the best way to keep track of the temperature deep inside the pile to indicate whether the compost pile is active.

Activity #2

Temperatures below 90F indicate the pile is not actively composting. This may be because . . .

1. The pile needs to be turned to get more oxygen into the center;
2. The pile is too wet or too dry for the micro-organisms to do their work;
3. The pile needs more nitrogen material, i.e., green grass clippings, food waste, and manures to feed the micro-organisms; or
4. The pile is done composting and is now "finished" compost.

Refer to

Activity #3

Above 150F indicates the pile is too hot and should be turned to avoid burning up the big and little organisms.

NH Experience: With much fanfare, both New Hampshire pilot schools were able to celebrate active decomposition with a jump in temperature to almost 130° after just 17 days of mixing food waste and bulking agent in the composting bins.

THE COMPOST BIN

The needs of a school compost bin are a little different than the needs of a household's backyard compost bin. Issues to consider when deciding what type of compost bin are right for a school include: the quantities of food waste generated; attracting wild animals to the school; and extra finances to buy or build a fancy compost bin.

Ready-made and easy-to-assemble bins can be purchased at local hardware and garden supply stores. Keep in mind that these bins are typically used by single households, therefore, depending on the amount of food waste the school produces, you may need multiple bins, which can be expensive.

When constructing compost bins, there are a number of designs which can be easy and fun to build. There are "holding units," such as snow fencing, wire fencing or hardware cloth tied in a circle to contain the compost pile. However, for the larger quantities of food waste a school generates, a "turning unit," a series of three or more bins that allows wastes to be turned regularly from one bin to the next, may be more appropriate.

NH Pilot Programs Use 3 and 4 Bin Turning Unit

Before choosing a compost bin design for the "Composting at NH Schools" pilot program, the successes and failures of other school composting programs throughout the United States were researched. Some schools had tried using the ready-made bins, however, they were unable to handle the large quantities of food waste. Others built elaborate multiple bin units with buildings around them, however, that required a large financial investment. For the New Hampshire pilot programs, it was decided that a three or four bin "Turning Unit" made from re-used wooden pallets and lined with hardware cloth would best address a NH school composting program's needs because:



- It can handle the large quantities of food waste and, if necessary, can be easily expanded by adding another bin.
- It is easy to line the pallet bins with hardware cloth to keep out unwanted animals.
- Reusing wooden pallets to make the bins keeps the composting program's costs down, and is a form of recycling!

NH Experience: In New Boston, building the compost bins was a community collaboration of school faculty/staff and local transfer station staff and family. In Belmont, the students in the Technical Education class were able to use some of their skills constructing the compost bins with minimal supervision. At both schools, the preparation, construction, and clean up time totaled about 5½ hours for five to ten people.

How To Avoid Attracting Animals

Whenever composting food waste, and especially in a situation where there will be children around, additional care should be taken to avoid attracting animals. Some suggestions for accomplishing this are to:

- Line bins on sides, top and bottom with hardware cloth or chicken wire.
- Stay clear of food wastes that are high in protein and fat such as meats, oils, fish scraps, and dairy products.
- Place food wastes into the center of the pile so that no food is exposed.
- Turn the compost pile frequently to keep it actively composting.
- Maintain the bins over time! Holes or weaknesses can become an open invitation for some unwanted critter's dining experience.

NH Experience: In Belmont, the ½ inch hardware cloth lining the inside of the pallets and covering the fronts and tops of the bins, proved to be more than adequate in keeping out any pests. However, in New Boston sagging wire had to be reinforced on the tops after several cats had been found sleeping there while enjoying the heat from the compost below!

How To Keep Costs Down

A wood and wire three bin "Turning Unit" made from virgin lumber can cost approximately \$300. However, a similar three bin "Turning Unit" that also meets all the school's composting needs can be made from re-used pallets and hardware cloth or chicken wire for about \$150 (see Appendix B).



Another way to keep costs down is to solicit donations for bin materials, money and/or labor from local organizations and/or businesses. Also consider the possibility of grant programs supplementing a school composting budget.

How Many Compost Bins Will Be Needed?

Depending on the size of the school and the type of food served (i.e., quantity of fresh fruits and vegetables), a school kitchen feeding 100 to 800 students can average 5 to 30 pounds of "prep scraps" per day. Most of these schools will need a turning unit with four bins. The first bin will be used for "new" food waste, the second bin will hold actively composting food waste, the third will contain finished compost, and the fourth can be used for extra capacity during winter months. Additional bins may be added for bulking agent storage.



Schools with more than 800 students should plan on a five or six bin turning unit in order to have space to compost the extra amount of food waste generated. However, to see if your school has more than an average of 30 pounds per day, you may want to do a school food waste audit by collecting and weighing "prep scraps" for one week before building the compost bins.

Refer to

Activity #4

A very small school with less than 100 students can use a turning unit with three bins instead of four, or call the School Recycling CLUB (603) 736-4401 or the NH Department of Environmental Services (271-3712) for information on alternative composting methods.

NH Experience: For both the New Hampshire pilot programs, the three bin composting unit made from reused wooden pallets would have been sufficient for the volume of food waste they produced. However, just in case more space was needed, a fourth bin was built at both schools, and became very handy to store the bulking agent.

Where should the Compost Bins Be Placed?

Compost bins should be placed on a flat grass or soil surface. To assist with keeping the compost moist, but not too moist, it is best if the bins are facing south for heat, but are partially shaded to keep the compost from drying out. For convenience, being close to the lunchroom and/or kitchen exits and a water supply, without being too close to a frequently traveled area, is ideal. Remember that access to the bins in the winter and snow plowing requirements should be considered.

The amount of space needed for composting depends on the size and number of bins used. Generally speaking, the four bins (each four feet square) in the pallet system need an area at least 20 feet across by eight feet deep for bins, bulking agent storage, and maneuvering. If placing the bins near a wall or fence, be sure to leave enough space for a person to walk behind the bins to keep the area clean.

Before making any decisions as to where to locate the bins, the most important step is to check with the food service, custodial and grounds keeping staff.

NH Experience: In Belmont, everyone appreciated that the bins were conveniently placed near a door outside the Technical Education classroom and only a few feet away from a routinely plowed driveway. In New Boston the composting bins were placed at the far end of a large parking lot, partially under some trees. Although there were no complaints about having to travel the distance (about 100 yards), the students bringing the food from the kitchen to the compost bins felt that the bins could have been a little closer to the school.

FOOD WASTE COLLECTION

Food waste makes up approximately 6 to 14 percent of a school's waste stream. However, this includes all food waste - "prep scraps" and "plate scrapings" (see page 2). Composting is most likely a new and different activity for schools. Consequently, it is important to begin as simply as possible (i.e., avoid contamination, fewer people requiring training and smaller quantities of food). It is suggested to start composting only "prep scraps" until you feel comfortable with the composting process. To get an understanding of how much food waste this will be, consider collecting and weighing it for a week. This will help with planning a collection schedule and the number of compost bins needed.

NH Experience: At Belmont High School, "prep scraps" were approximately ½ pound per student per month, while at New Boston Central School, "prep scraps" were approximately one pound per student per month.

What Happens in the Kitchen?

When kitchen "prep scraps" are being composted, it is important to have the support and cooperation of the kitchen staff. The job of the kitchen staff is to keep compostable food scraps separate from other waste materials. Education is the key to keeping this a relatively simple task.

A few ideas on how to gain the support of the kitchen staff are:

- Be aware of the kitchen staff's needs and minimize inconvenience for them.
- Pay attention to where most of the food gets prepared for convenient placement of the collection containers.
- Provide clear signage to minimize confusion. Students may want to be involved in creating attractive signs for compost containers.
- Outline the "do's and don'ts" of the types of food accepted.
- Use the following do's and don'ts for separating food waste.

DO's
Breads
Fruit Scraps
Coffee Grounds
Vegetable Scraps
Crushed Egg Shells

DON'Ts
Oils
Fats
Bones
Meats
Dairy Products

Meats, dairy products, oils, fats, and bones should not be composted because they will take a long time to decompose and may attract pests to the compost bins. In addition, anything nonbiodegradable, i.e., plastic forks, wrappers, cups, etc., will not break down in the compost pile.

Activity #5

NH Experience: Both pilot programs were designed so that the only responsibility of the kitchen staff was to place the "prep scraps" into a separate container. The New Boston Central School kitchen staff found this new routine required less time and energy than the garbage disposal that they had been using previously. There was also the added advantage of the septic tank requiring less maintenance.

In many schools, the food waste is usually disposed of by adding it to the other solid waste they generate while incurring obvious added disposal costs for the school. Once a food waste composting program is underway, there will be the obvious benefit of saving money from avoided waste disposal costs. Another food waste disposal method commonly used in schools is to flush it down the garbage disposal, grinder or "pigger" with water. When a school switches from this disposal method to composting the food waste, there will be a savings incurred by not only extending the life of their leach field and septic tank but also requiring less maintenance and cleaning.

In What Will Food Waste Be Collected?

Food waste is relatively wet and heavy. Consequently, collection containers need to be:

- **Water Proof** - To keep wet food from leaking and for easy cleaning.
- **Light Weight** - For ease of lifting, weighing and carrying by students and/or staff.
- **Covered** - To control odors and avoid attracting fruit flies.

To help determine the proper size container needed, consider the size and strength of the person lifting and transporting the food waste, as well as the amount of food waste produced at the school. A few options for food collection containers are:

- *5 gallon buckets*: Oftentimes it is easy to find 5 gallon plastic buckets which are discards of bakeries, grocery stores or drywall contractors (sometimes referred to as sheetrock" or "mud" buckets). These buckets can usually be obtained at a low cost and are easy to handle, wash, and place in a convenient spot for kitchen staff. Don't forget the lids!
- *33 or 55 gallon garbage cans with or without wheels lined with a plastic bag*: These can be obtained at most hardware or department stores or through a supplies catalog that maintenance uses. They can be handy for large quantities of food waste. For heavy duty wheels, a dolly can be attached to a garbage can with bungee cords.

NH Experience: The New Boston Central School used 5 gallon buckets with lids. This size was desirable because the elementary students were able to handle them on their own and easily place them in a wagon to pull across the parking lot to the compost bin site. The high school students and the kitchen staff at Belmont chose a 55 gallon plastic garbage can lined with a plastic bag. If the can was heavy, two students would carry it together to the compost bins. The plastic bag made it possible to weigh the food by tying a knot in the bag and hooking it on a scale.

How Much Food Waste Is Composted?

Record the food waste's weight to document how much food is being diverted from the school's waste stream and to estimate how much bulking material is needed (see Appendix C1 - C4). A standard bathroom scale can be used by placing the bucket of food waste on the scale and then subtracting the weight of the bucket, or standing on the scale with the bucket of food waste and subtracting the weight of the person and the bucket. Although it may be a little more expensive, a hanging scale typically purchased at a local hardware or feed store can also be used.



Who Will Collect the Food Waste?

The job of the food waste collector is to collect the buckets of food waste from the kitchen staff, record their weight, and bring them to the composting bins. This task provides an opportunity to involve the students, consequently giving them responsibilities and ownership of the program. Selecting reliable volunteers for the collection of food waste is critical. Willing and eager participants are key.

The collection process can be part of the regular classroom routine and responsibilities. Teachers can set up rotating schedules for students to follow, giving everyone a chance to participate. The environmental club, student council, or other similar student organizations may also be a resource for volunteers. An individual may also enjoy the responsibility of food waste collection.

NH Experience: At Belmont High School, Environmental Club students have a scheduled time to be "in charge" of composting and this has worked well, with the students maintaining full responsibility of the project. The New Boston Central School initially had the 6th grade science class students take turns with the food waste collection and composting responsibilities. After several months, the novelty of the assignment wore off, and the responsibilities were given to a special needs student and his aide. This resulted in a tremendous learning experience for the student. Both schools documented their total time associated with all composting responsibilities (including turning the compost from one bin into the next) to be only 1½ hours per week.

When preparing the collection routine for the volunteers, remember to:

- Set a regular schedule for collection volunteers.
- Create clear and precise instructions for the food collectors.
- Spend time educating collectors about their duties and responsibilities.
- Collect the food waste containers on a schedule which fits the kitchen staff's needs.
- Keep everybody happy! Do not create more work for the cafeteria or the custodial staff. Their support is critical in the success of the composting program.

NH Experience: In New Boston Central School, food waste was initially picked up after lunch every day. However, arrangements were later made for every other day on Monday, Wednesday, and Friday. This new schedule was satisfactory with the kitchen staff as long as the students were consistent with their pickup routine and did not forget.

What About Plate Scrapings?

Collecting plate scrapings or "post consumer" food is very different from collecting prep scraps or "preconsumer food." Plate scraping collection involves educating the entire student body. It also requires a fair amount of monitoring at the garbage cans. Students need to understand the correct way to sort their plate waste in order to keep out contaminants, such as meats, plastic straws, napkins, etc.

Many New Hampshire schools are interested in composting food collected from the students' cafeteria plate scrapings. Although plate scrapings were not included in the New Hampshire pilot programs, research of a few schools that do separate plate scrapings has provided some of the following suggestions on getting started.

- Watch the students' routine in the cafeteria in order to develop an efficient traffic flow and avoid a backup of students at the food separation point.
- Educate the garbage can monitors about the "do's and don'ts" of separating plate scrapings for composting. They need to be present near the garbage cans at every lunch period to serve as a friendly reminder to the students.
- Create signs so the students can refer to the list of "do's and don'ts" and prepare themselves for the correct procedure. A mounted example on poster board of what to put in each garbage can will help the students identify the correct places to put things.

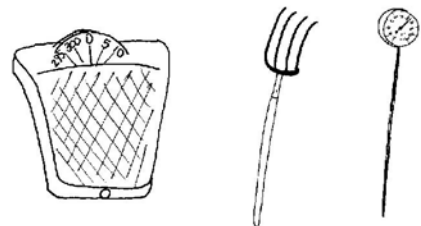
Deciding to compost school cafeteria plate scrapings can be an excellent opportunity to educate everyone in the school about food waste composting and potentially save even more money on disposal costs. For more detailed information on incorporating plate scrapings into your school's composting program, please contact the School Recycling CLUB or the NH Department of Environmental Services.

COMPOST BIN OPERATION

The following information pertains to a school using the three or four bin turning unit for their school composting program.

What Equipment Is Needed?

A few basic pieces of equipment are needed for the composting operation. Refer to the check list below for suggestions on what is needed and where to get it.



- Pitch Fork (for turning the compost) - Hardware or garden supply store.
- Tarp (for covering the bins to keep out rain or snow) - Hardware or department store.
- Bungee Cords (to fasten the tarp to the bins) - Hardware, camping, or department

store.

- Compost Thermometer (to take the temperature of the compost) - Feed or garden supply store.
- Hanging or Bathroom Scale (for weighing the amount of food waste you place in compost bins) - Feed, hardware, or department store.
- Bib or Coveralls (to protect the clothing of the bin operator) - Retail Store

Let's Compost!

Once the bins are constructed, the bulking agent selected, and composting equipment obtained, you can begin composting.

Starting a New Compost Pile

Step 1: Place six to ten inches of bulking agent in the bottom of the bin as a base. This will absorb any excess moisture from the food waste and help let air into the pile.

Step 2: After the weight of the food has been recorded, scatter the food over the entire bulking agent surface.

Step 3: Estimate an equal weight of bulking agent to the food (usually one bucket of food waste equals two buckets of leaves or shavings).

Step 4: Cover the food waste/bulking agent making sure no food is visible. This will help avoid the potential of odors and attracting flies or pests.

Step 5: Be sure the door and top are securely replaced on the bin. Return the bucket to the kitchen and rinse clean.

Adding to the Compost Pile

Step 1: Insert compost thermometer into center of the compost (see Appendix C1 - C4) and record the temperature. Thoroughly mix food and top layer of bulking agent from last food deposit with a pitch fork.

Step 2: After the weight of the food has been recorded, mix it in with the food and bulking agent you just stirred.

Activity #6

What About NH Winters?

As the temperature drops below freezing, compost will most likely freeze. However, because the composting process gives off heat, it may stay active well into December or January. Even though compost freezes, food waste and bulking agent can continue to be added during the cold winter months. Some tips for getting through the winter are:

- Locate the bins in an area where they can be plowed.
- Have access to plenty of dry bulking agent.
- Mix the food with the bulking agent thoroughly when adding it to the bin.
- Cover the bins with a tarp to keep out the snow.

A suggestion for extending your composting season is to insulate the bins before November. Stacking bales of hay or attaching rigid insulation board around the bins before the compost temperature drops below 100F are two ways of insulating the bins.

NH Experience: To experiment with extending the active composting season further into winter, the bins in one of the pilot schools were insulated on November 20, 1995 with 1 inch styrofoam insulation board with an R value of 5. However, the compost bins were not active at the time the insulation was applied (bin temp was about 45°) and the temperature did not increase again until the spring thaw.

"FINISHED" COMPOST

In anywhere from six weeks to one or two years, you will be able to enjoy one of the greatest benefits of a school composting program: "finished compost!"

Is the Compost Finished?

Compost is finished when the materials placed in your bin have transformed into a crumbly brown "soil." The compost pile will be close to air temperature and the compost should feel like good garden soil with a sweet, clean aroma. If the compost is still "cooking," it will be too "hot" to use on young plants.



Should the Compost Be Tested?

It is not necessary to have the finished compost analyzed. However, for those interested, a soil analysis of the end compost product can be done at UNH for a fee. They will provide a comprehensive analysis covering the minerals and salts present and overall plant nutrient value of the finished product.

NH Experience: A finished compost sample was taken from the New Boston Central School bins in June of 1996 and analyzed at the UNH Analytical Services Lab. The Soil Scientist commented on the excellent C:N ratio of 12:5 and that the compost sample was a nutrient rich media that looked like an excellent growth medium for plants (see Appendix D).

How to Use the Compost?

How compost looks and how it will be used determines whether or not it needs to be screened. Most uses of compost, i.e., landscaping, mulching, and gardening projects, do not require screening. However, if screening is desired, half-inch hardware cloth can be used to pass the compost through.

Because the finished compost is valuable, it most likely will be in great demand. Compost can be used as a rich soil amendment or mulch for:

Refer to

Activity #7

- landscaping projects or class planting projects;
- greenhouses or vocational programs;
- school grounds landscaping (work with the maintenance staff);
- home gardens (for the school community); or
- a fund raiser for the school (some teachers may want to incorporate this into their math, business, accounting or art curricula).

NH Experience: New Boston Central School has a Christmas tree planting program, in which the students plant seedlings every year and then dig them up and sell them to the public a few years later. This was an ideal situation to use the finished compost as a mulch to enrich the soil around the trees and to protect their roots in the winter.

PROGRAM EVALUATION



Changes will probably be made throughout the program making it more efficient each step of the way. However, once the project has been up and running, take some time to meet with those involved, evaluate the program, and see if there are ways it can be streamlined. Encourage the cafeteria staff, students, faculty, and maintenance to spend time discussing what they like and dislike about the program. This feedback will help the program to run smoothly. With school composting, getting the people involved and excited is really important. If the process goes smoothly, the group of composters will be happier. Make sure they know that their input is valued and important.

Education, kick-off and promotion

A successful composting program needs to educate all of the active participants. Have an event or activity to mark the start of the program, and keep the motivation going throughout the program's life.

Education Is Key!

Education can begin when the idea of a school composting program is first conceived and continue as an ongoing process. Some school composting education ideas to think about are:

- Teach people (faculty, staff, and students) the basic concepts of composting, i.e., compost formula, what can be composted, etc.
- Relate composting to the basic solid waste management concepts of "reduce, reuse, recycle" - Composting is nature's way of recycling!
- Help people in the school and community learn the importance of the program and how it can impact the school through school or community wide events.
- Include education in school assemblies and individual classroom presentations.

- Utilize informational resources that are available, including the UNH Cooperative Extension, community recycling coordinators, state recycling representatives, and a composting video and guide in each New Hampshire community library entitled "Turning Your Spoils to Soil." The School Recycling CLUB also has a number of educational materials which can help incorporate composting into the reading, writing, and arithmetic of every day classroom learning and curriculum (see page 48).

Kicking It Off!

Having a specific time set aside to celebrate the start of the school composting program will help ensure the enthusiasm and follow through with all active participants. Some suggestions for a kick-off are:

- Invite the press to cover the kick-off event.
- Organize a "compost bin building" event on the day of the kick-off and invite the community to participate.
- Kick-off the project in conjunction with other community events, like Earth Day or Arbor Day.
- Make posters and other public information materials to publicize the event.
- Invite keynote speakers, i.e., local Conservation Commission members, UNH Cooperative Extension Educators, Garden Club members, landscapers, organic farmers, state or local environmental representatives, etc., to endorse the composting project and to help illustrate the importance and impact of the project.
- Invite professional performers to entertain and educate students and staff about composting and other environmentally related issues.

NH Experience: In Belmont, the kick-off event was in conjunction with the High School students building the composting bins. Before construction began, a brief "What is composting?" presentation was given to the participating classes by the NH Governor's Recycling Program and the NH Department of Environmental Services. Two reporters from local newspapers attended the event to take photos and interview the students (see Appendix E).

Don't Forget Promotion!

Once a school composting program is implemented, the new routines can become second nature to the participants and the program basically runs itself. However, to get the full benefit of the program, it is important to keep the motivation going. Some suggestions for ongoing promotion are:

- Keep the motivation for the project going by providing recognition to participants, i.e., kitchen staff and collection and composting crew, for a job well done.
- Use the public address system to make announcements about the project's milestones.
- Post graphs or charts indicating how much food is being diverted from the waste stream.
- Get more press coverage highlighting results.
- Plan a celebration focusing on use of the end product (i.e., a tree planting on Arbor Day utilizing the compost to plant the tree).
- Help other schools who may be interested in learning the benefits of implementing a composting program.



Good Luck!

School composting is an excellent way to recycle an important and plentiful organic waste. All who are interested in this concept are heartily encouraged to pursue it. There are many potential volunteers throughout the school and community to help make it a reality.

So, good luck with school composting. Remember, this is not the end of the "Composting at New Hampshire Schools" guidance. This is just the beginning of available school composting assistance and resources.

P.S. When you start your school composting program, please contact the School Recycling CLUB at (603) 736-4401 or the NH Department of Environmental Services at (603) 271-3712. We would like to keep track of the schools in New Hampshire that are composting, and are always happy to answer any questions.