

APPENDIX B

COMPOSTING AT NH SCHOOLS: 3 BIN COMPOSTING UNIT MADE FROM REUSED WOODEN PALLETS

Instructions

In our pilot program, our design was a three bin turning unit made from pallets and hardware cloth. Donated pallets were covered with hardware cloth and connected to each other using "L" brackets. The tops and fronts of the bins were made from hardware cloth attached to wooden strapping for lightness, easy maneuverability, and maximum ventilation (see diagram of bins). Usually, a compost bin will sit right on the ground to maximize contact with micro-organisms. However, a floor was used in the pilot program to keep rodents and any other pests out of the compost. Therefore, the materials list is based on a three bin unit with floors.

The tops were attached to the bins using hinges. We screwed a piece of strapping along the back of the top of the bins to provide a common site of attachment for the tops. The separately built front was fitted to slide into two tracks on the sides of the unit. The tracks were constructed by using a 1" x 1" and a 1" x 6" to form a slot into which the door could slide up and down (see diagram). Safety gate hooks were used to fasten down the tops keeping in mind that raccoons have been known to unhook a regular hook and eye.

Hint: Measure your pallets before you bring them to the school. Wooden pallets are not always made the same size. For ease in putting together the bins, it is important to have the pallets as close to the same size and as square as possible.

Materials List

To Borrow:

- ✓ 1 - Heavy Duty Staple Gun (i.e., Arrow T-25)
- ✓ 2 - Battery Powered Drills - One for drilling holes and one for screwing screws (Electric drills and extension cords are OK if electricity is near by)
- ✓ 1 Pair - Heavy Duty Wire Cutters
- ✓ 1 - Hand Saw (Powered saw and extension cord are OK if electricity is near by)
- ✓ Measuring Tape

To Buy or Have Donated (local hardware or lumber supply store)

- ✓ 10 - Wooden Pallets* (All the same size)
- ✓ 13 - 1" x 3" x 8' Strapping or Furring Strip
- ✓ 4 - 1" x 1" x 3½' Lumber (14 linear feet total)
- ✓ 2 - 1" x 6" x 12' Lumber (24 linear feet total)
- ✓ 1 Box of 100 - 8" x 1" Flat Phillips Head Screws
- ✓ 1 Box of 50 - 8" x 1½" Flat Phillips Head Screws
- ✓ 20 - 10" x 3" Flat Head Screws
- ✓ 20 - 3½" "L" Bracket
- ✓ 6 - 2½" Safety Gate Hooks
- ✓ 6 - 3" LT Narrow Hinge, Tite Pin
- ✓ 1 Box 1,000 - d" Staples
- ✓ 1 - 100' x 48" roll of ½" Gauge Hardware Cloth or Equivalent Chicken Wire

* For free pallets, shop at your local recycling center/transfer station, businesses, and department, grocery, or hardware stores, or call Donation Depot at (603) 645-9622.

Bin Building Steps

Step 1. Measure, cut, and staple the hardware cloth or chicken wire onto one side of eight pallets for bottoms, backs and sides of bins. Two of the pallets will need hardware cloth or chicken wire on both sides to serve as inside walls. Use plenty of staples for strength, placing one every few inches.

- Step 2. Lay the hardware cloth or chicken wire covered pallets in place, as illustrated in the diagram (with the wire sides on the inside of the bins), making sure all corners meet. If necessary, do one bin at a time.
- Step 3. Use one drill to drill the holes in the pallets for the corner brace screws, and the other drill to screw in the 1" screws, fasten one corner brace along each corner between pallets as illustrated in the diagram.
- Step 4. Cut four pieces each of 1" x 1" and 1" x 6" lumber the same height as the front of the bins.
- Step 5. Fasten a precut 1" x 1" centered vertically on the front of each vertical pallet of the bins with two 3" screws as illustrated in diagram. (This is to create the runners for the doors.)
- Step 6. Fasten precut 1" x 6" centered on top of the 1" x 1" with two more 3" screws as illustrated in diagram. Repeat for all 4 fronts on bins (you have just made the slots that the front doors will slide into).
- Step 7. Measure for front door dimensions and cut pieces of strapping as illustrated in the diagram. Keep in mind that you want the door to fit loosely so it is easy to slide it in and out.
- Step 8. Fasten strapping together with 1½" screws to make the door as illustrated. Use spare strapping as a corner brace, or use corner braces, purchased at a hardware store.
- Step 9. Measure, cut and staple hardware cloth or chicken wire to the inside of the door and slide door in place in the front of the bins. Repeat for all three bins.
- Step 10. Lay strapping along the top of the back of the bins and fasten to the top of the pallets with 1½" screws.
- Step 11. Measure for tops the same as the front doors, keeping in mind that the top should lay over the door so that the door cannot be opened unless the top is up. Another option is to make one long top to cover the first two bins and a single top for the third bin. This is so you can open and prop up the top of the

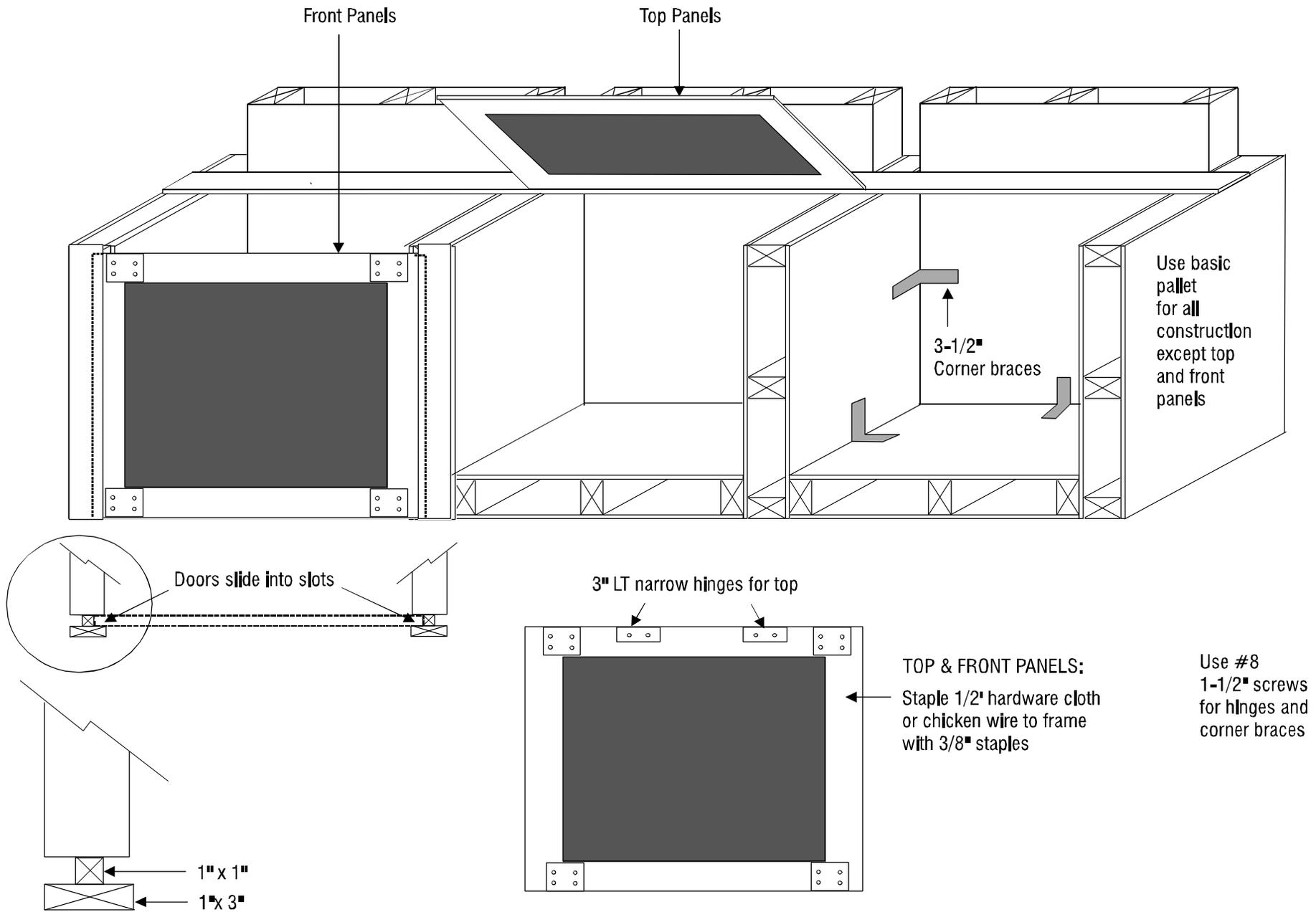
middle bin from the left side rather than throwing it open from the front of the bins.

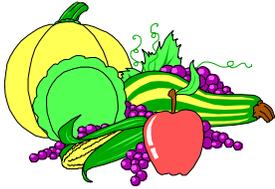
Step 12: Fasten together strapping for tops and staple hardware cloth or chicken wire the same as the doors.

Step 13: Place tops on top of the bins, then line up and attach two hinges to the back pieces of strapping and each top as illustrated.

Step 14: Attach safety gate hooks from each side of the front edge of the tops to the pallets on which they rest.

Step 15: You are ready to compost!



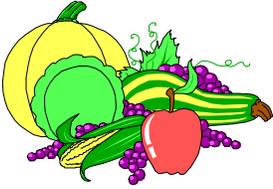


APPENDIX C DOCUMENTS TO COPY

Forms similar to these documents were used by the two schools participating in the "Composting at New Hampshire Schools" pilot program.

- The "Tracking Form" (C1) was used to record the food's weight and several other procedures or observations associated with the compost bin operation.
- The "Overview" (C2) was used as a handout to all the composting program participants, i.e. kitchen help, maintenance, teachers, etc., for an understanding of what the program was about and everyone's responsibilities.
- The "Reminder Notes" (C3) were attached to a conveniently located clip board as a brief reminder of the participants' responsibilities.
- The "Composting at NH Schools Trouble Shooting" chart (C4) is available not only to be conveniently located on the clip board and referred to for daily compost maintenance, but will also be a helpful tool to refer to when learning about how composting works.

Please feel free to make copies of these documents to use with your school composting program.



SCHOOL COMPOSTING OVERVIEW

What Is Composting?

Composting is nature's way of recycling. It is a natural process of organic materials, such as food, leaf and yard waste, breaking down into a valuable soil amendment. Between 6 to 14 percent of the daily waste in a school can consist of compostable food waste.

What Is This Project?

The school's compostable food waste will be placed in a separate container from "noncompostable" waste and mixed with a bulking agent (leaves or wood shavings) in an outside bin for composting. This will help to get food waste out of the garbage can, where it is useless, and into a compost bin, where it will break down into a very useful fertile soil-like material.

Part 1 - Kitchen Collection

In the kitchen, food waste for composting needs to be kept separate from other materials. Please use the containers provided for food waste collection. Using the lids on these will help control odor and any potential fruit fly problems. A food waste collector will check with kitchen staff routinely to monitor the amount of food waste generated. When separating food waste for composting, here are a few things to remember:

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

DON'Ts
Oils
Fats
Bones
Meats
Dairy Products

Why? Meats, dairy products, oils, and fats compost very slowly and create odors that are likely to be offensive, as well as attract animals to the bins.

Part 2 - Food Collection

The job of the food collector is to collect the containers of food waste from the kitchen staff, record their weight, and bring them out to the composting bins. When collecting food waste, here are a few things to remember:

1. Check with kitchen staff to see if containers need to be emptied.
2. Weigh food waste and record weight on tracking form.
3. Take food waste out to composting bins.

Why? Promptly removing the food waste from the kitchen is not only being considerate, but a necessity because the kitchen staff has Board of Health regulations about cleanliness they have to follow.

Part 3 - Bin Operator

The job of the bin operator is to mix the food waste into the bin, and to be sure it is covered with bulking agent so that no food waste is left exposed. You will need to add an equal weight of bulking agent for each container of food. When operating the bin, here are a few things to remember:

1. Open the bin, insert the compost thermometer into the center of the food waste and bulking agent, and record the temperature.
2. Stir the food and top layer of bulking agent that is already in the bin (from the last food waste deposit) with the pitchfork.
3. Add the food waste from the container, mixing it in with the food waste and bulking agent you just stirred and spread the material in the bin evenly.
4. Cover the mixed food waste and bulking agent with a layer of new bulking agent, making sure no food waste is visible.
5. Be sure to securely replace the door on the bin.

Why? The bulking agent will need to be mixed with the food waste to achieve the appropriate carbon/nitrogen ratio and provide oxygen for the composting process, to avoid odor problems, and not to attract pests and insects.

Part 4 - Compost Coordinator

The job of the compost coordinator is to make sure the composting process is working well. This is a very important part of the project and can help to eliminate any potential problems. When coordinating the compost project, here are a few things to remember:

1. Check the moisture of the bin; it should be as moist as a wrung-out sponge.
2. Check the temperature of the bin and record it on the tracking form.
When inserting the thermometer into the compost, grasp the stem about 6" back from the point and push (DO NOT push the head of the thermometer). Once the stem goes in 6", grasp the stem 6" farther back, and push again. Repeat until the stem is completely inserted. This method will avoid bending the stem. Once the thermometer is inserted in the pile, wait at least 45 seconds before reading the temperature. When finished using the thermometer, return it to its box.
3. If the temperature is under 100°F, or over 150°F, mix the whole bin (too hot kills off compost bacteria, too cold means the compost process has slowed down).
4. If in doubt, check "Troubleshooting" (Appendix C4).
5. Record any comments/observations on tracking form.

Why? Moisture is needed for the microbes to work and too much moisture will keep the oxygen out. The hotter the pile, the faster the composting (100+), but too hot (150+) kills off compost bacteria.

When Bin #1 is full, notify the "Compost Starter" designated in Appendix C3.

When Bin Is Full

1. Transfer all material from Bin #1 into Bin #2 using the pitchfork.
2. Be sure to securely replace the top and front of the bin.

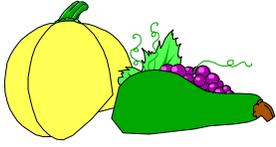
Part 5 - Compost Starter

The job of the compost starter is to start a new composting bin by setting the appropriate materials in the bin and to turn the contents of a full bin into an empty bin. Along with these ongoing responsibilities, make sure there is plenty of bulking agent available until the process will have to be repeated again. When starting the compost, here are a few things to remember.

To Start Bin #1 Again

1. Place 6"-10" of bulking agent in the bin as a base. This will absorb any excess moisture from the food waste.
2. Scatter the food waste over the entire bulking agent surface.
3. If you are using leaves for a bulking agent, you will not need to "seed" (add micro-organisms to) your compost. If you are using wood shavings, you may want to "seed" your compost. To "seed," sprinkle and mix approximately 1 five gallon bucket full of animal manure (cow, sheep, horse, chicken, or rabbit do not use dog or cat manures) or existing compost or leaves into the food waste and bulking agent. A "compost activator" sold at feed and hardware stores can also be used.
4. Cover the food waste with a layer of bulking agent, making sure no food waste is visible.
5. Be sure to securely replace the top and front of the bin.

Why? The well mixed food waste and bulking agent will aid in the composting process and help keep odors down and pests away.



APPENDIX C3

2. Stir the food and top layer of bulking agent (i.e., leaves or wood shavings) that is already in the bin (from the last food deposit) with the pitchfork.
3. Add the food from the container, mixing it in with the food and bulking agent you just stirred and spread the material in the bin evenly.
4. Cover mixed food and bulking agent with a layer of new bulking agent, making sure no food is visible.
5. Securely replace the top of the bin.
6. Return the container and clipboard to kitchen. Rinse the container clean.

Compost Coordination

The compost coordinators are: _____

1. Check the moisture of the bin, it should be as moist as a wrung-out sponge.
2. Check the temperature of the bin and record it on the tracking form.
3. If the temperature is under 100°F, or over 150°F, mix the whole bin (too hot kills off compost bacteria, too cold means the compost process has slowed down).
4. If in doubt, check "Composting Troubleshooting" section in this Guide (page 40).
5. Record any comments/observations on the "Tracking Form."

When Bin #1 is full, notify _____



SCHOOL COMPOSTING
TROUBLE SHOOTING

SYMPTOMS	CAUSES	SOLUTIONS
Compost has rotten odor	Not enough air and/or too much moisture.	Turn pile and/or add more bulking agent.
Compost has ammonia odor	Too much nitrogen (lack of carbon).	Add bulking agent.
Center of pile is dry	Not enough moisture and/or too much bulking agent.	Turn pile, moisten, and/or add more nitrogen, e.g., food wastes and/or green grass clippings.
Pile temperature is too low (<100°)	Not enough nitrogen, air, and/or pile is too small.	Add more nitrogen, i.e., food wastes and/or green grass clippings, turn pile and/or increase pile size.
Pile temperature is too high (>150°)	Not enough air, and/or pile is too large.	Turn pile and/or reduce pile size.
Pile is attracting animals	Presence of meat scraps, dairy or oils, not covering food waste well, and/or holes in composting bin that animals can get through.	Avoid meats, dairy and oils, cover other food wastes with bulking agent and/or repair any holes in composting bins.

APPENDIX D COMPOST TESTING

UNIVERSITY OF NEW HAMPSHIRE

Department of Plant Biology
College of Life Sciences and Agriculture
Nesmith Hall
Durham, NH 03824-3597
Fax (603) 862-4757

received
7/8/96

July 3, 1996

Governor's Recycling Program
2 1/2 Beacon Street
Concord, NH 03301

To Whom It May Concern:

I have been asked to provide input regarding the recent assay (enclosed) of your compost sample by our UNH Analytical Services Laboratory.

pH

The pH of 6.5 is within the normal boundaries for composts and should pose no problem in terms of satisfactory plant growth.

Soluble Salts

The soluble salts level of 1.97 mmhos/cm should pose no problem relative to salt stress on plants. Generally, I view a reading of 2.00 mmhos/cm as the critical level beyond which salts may pose a problem. A relatively high reading such as present in your compost indicates a nutrient rich media; usually potassium is the element which contributes most significantly to the salt reading.

Nutrients

Nutrient levels are high as one would expect from the salt index reading. There should be abundant nutrient supply present for satisfactory plant growth during the early part of the growth cycle. Supplemental nutrients (eg. nitrogen) may be needed for the complete growth cycle but composts often has significant amounts of slow-release nitrogen so this may not be necessary.

The total N is relatively high (1.07%) so a nitrogen reserve is certainly present. The phosphorus and potassium reserves are not so abundant so supplemental additions of P and/or K fertilizers may be important for best crop growth.

C:N Ratio

The C:N ratio of 12.5 indicates an excellent ratio whereby abundant nitrate-N should be present or able to be released for satisfactory plant growth. If the C:N ratio is > 20:1, one can expect immobilization of nitrate-N as microbes compete with plants for the available N.

If you have questions on this assay, please feel free to call me at 862-3220. Overall, it looks like an excellent growth medium for plants.

George O. Estes
Spaulding G48
UNH

Phone Numbers

County Extension Offices

Belknap	603-524-1737
Carroll	603-447-5922
Cheshire	603-352-4550
Coos	603-788-4961
Grafton	603-787-6944
Hillsboro	603-673-2510
Merrimack	603-796-2151
Rockingham	603-679-5616
Strafford	603-749-4445
Sullivan	603-863-9200

Department of Plant Biology

Extension Office	603-862-3200
Compost testing lab	603-862-3212

These offices are normally open 8:00 am to 12:00 noon, and 1:00 pm to 4:30 pm Monday through Friday except on holidays.

COMPOST TESTING

University of New Hampshire

Effective July 1, 1995



Analytical Services Lab
Spaulding Life Science Center, G-54
Durham, New Hampshire 03824
603-862-3210

composted materials.

Sampling and Submitting Composts for Analysis

Compost samples for analysis should be obtained with care. The collection procedure should yield a representative sample of the windrow or pile. The bulk of the sample should come from the interior of the windrow or pile. Take samples from a number of locations, mix them together and place about 2 cups in a plastic bag or clean plastic container. It is not necessary to dry the sample. Submit samples for testing as soon as possible after

and NH₄-N (Spurway)

Soluble salts

Total Nitrogen

Organic Matter (LOI)

Total carbon, C:N ratio*

Ash, CEC and base saturation* \$36.00

Additional tests -

Dry Matter (and calculated moisture) \$6.00

Total Ca, Mg, K, and P \$23.00

Heavy metals (acid extracted)

Pb, Cr, Ni, Cd, Cu, Zn (per element) \$5.00

*Calculated values.

APPENDIX E

NH PRESS COVERAGE

School Composting Plan Could Lead to Heap of Savings

by ED PUFFER
Staff Writer

BELMONT - Take a school cafeteria's food scraps - the ones cut out during preparing meals. Put them in a pile in the sun. Invite some worms and other organisms over. What do you get?

The state hopes you get money - money that you save by not throwing those things away.

Belmont High School, which has long saved its kitchen scraps for compost, is now part of a pilot program being run by the Governor's Recycling Program. Saving kitchen scraps is known to create good compost and the state wants to know if composting is actually cheaper than bagging the stuff and sending it out as regular trash.

On Wednesday, students and state workers teamed up to build composting bins that they then installed at the southern end of Belmont High School, just outside the woodshop run by teacher John Frick. The bins will be filled with kitchen scraps that are cut out during the preparation of school breakfasts and lunches. Meat and dairy products are not included and neither is any food left over after a meal.

"We're keeping pretty close records as to how much food can be diverted from the waste stream and turned into a re-useable product," said Sherry Godlewski of the state Department of Environmental Services. "Belmont's going to be using a lot of the students to help with the project."

"Our second goal would be to educate students about composting," said Barbara McMillan of the Governor's Recycling Program. "They're going to let it compost, mix it, take its temperature every day."

Frick's students will be in charge of the compost, as they have been for some time. Frick has benefitted by taking items home for his own compost pile, but he is glad to give that up for the state program.

"We average 15 to 20 pounds per day," said student Josh Mazzei. "We take some of it and grind it up in a food processor and put it in the worm container."

The worm container is located in the back of Frick's shop. It is a small box with paper, food scraps and red worms. The worms eat their own body weight every day and what they eat turns into a very fertile soil.

"It's great for indoor composting. There's no odor," McMillan said. "We'd like to see these in every single home."

The other schools involved in the project are New Boston Central School, Wentworth Elementary School and Keene's Franklin Elementary School.

Belmont's compost will be used at the school to fertilize trees and plants on the school grounds.

"Take a look around. We've got lots of things we can do to make things look nice," said Principal Howard Murphy. "I garden myself and know the value of good soil."

Murphy said residents who are interested in composting can always call and see the school's composting program.

"People are certainly welcome to see how it works," Murphy said. "It's funny because it's not the kids who need to learn lessons like that, it's the adults."

(Article reprinted with permission from the Laconia Citizen)

GLOSSARY OF TERMS

- Actinomycetes -- Micro-organisms that have the characteristics of both fungi and bacteria. Actinomycetes create cobweb-like growths throughout the compost and give compost an earthy aroma.
- Aeration -- The process by which the oxygen-deficient air in compost is replaced by air from the atmosphere. Aeration can be enhanced by turning compost.
- Aerobic decomposition -- Decomposition of organic wastes occurring in the presence of oxygen, making possible conversions of material to compost.
- Anaerobic decomposition -- Decomposition of organic wastes occurring in the absence of oxygen. Causes production and release of methane gas.
- Bacteria -- In a compost pile, the micro-organisms that do most of the work to decompose wastes. Hardworking bacteria cause the compost pile to heat up.
- Biodegradable -- Capable of being broken down by micro-organisms (bacteria and fungus) into simple compounds that act as fertilizers in the soil (plant and animal remains are biodegradable). Another word for biodegradable is compostable.
- Bulking agent -- Material, such as leaves, wood chips or shavings, added to compost primarily to help create good pore structure for air flow. Often provides part of carbon source as well.
- Carbon -- An element that is abundant in wood chips, sawdust, straw, and leaves. Carbon provides energy for living things.
- Celsius (C) -- A temperature scale in which 0° C is freezing and 100° C is boiling.
- Compost -- A rich soil-like mixture that is produced when organic materials break down.
- Composting -- The natural conversion of most organic materials into humus by the activity of micro-organisms, and an effective solid waste management technique for reducing the organic portion of waste.
- Decomposition -- The breakdown of organic waste materials by bacteria and fungi into simpler components (e.g., carbon dioxide, water, and inorganic solids).
- Disposal -- The discharge, deposit, injection, dumping, incineration, leaking, or placing of any waste into or on any land, air, or water medium.
- Dump -- An open and unmanaged disposal site used prior to sanitary landfills where waste materials were burned, left to decompose, rust or simply remain.
- Environment -- All the conditions, circumstances, and influences surrounding and affecting the development or existence of people or of nature. One's surroundings, inside or out-of-doors.
- Fahrenheit (F) -- A temperature scale in which 32°F is freezing and 212°F is boiling.
- Fungi -- Organisms such as molds, yeast, and mushrooms that feed on dead organic matter.
- Humus -- That more-or-less-stable organic fraction of the soil matter remaining after the major portion of added plant and animal residues have decomposed. Humus is usually dark in color.
- Invertebrate -- An animal without a backbone, such as an insect or worm.

Kitchen waste -- Food scraps, such as potato peels, apple cores, moldy food, and wilted lettuce.

Landfill -- A large outdoor area for waste disposal. Landfills where waste is exposed to the atmosphere are called open dumps; in sanitary landfills, waste is layered and covered with soil

Micro-organism -- A tiny living thing that is so small you need a microscope or magnifying glass to see it. Micro-organisms help break down organic wastes.

Millipede -- A tiny worm-shaped animal with many pairs of legs. Millipedes live in soil and compost.

Mite -- A tiny animal, or arachnid, no bigger than a pinhead, that lives in soil, plants, and compost.

Mulch -- A covering, such as leaves, straw, peat moss, or compost, that is placed on top of the soil in gardens and around trees to suppress weeds, keep soil moist, and keep plant roots cool in summer and warm in winter.

Nitrogen -- An element that is found in food scraps, grass clippings, and manure. Nitrogen is used by living things for growth.

Nutrient -- A food ingredient that supplies energy for living and growth.

Organic -- Made from living organisms, such as plants and animals. Organic substances include tree leaves, wool from sheep, and any other materials containing the nonmetallic element carbon (like diamonds and graphite, which are pure carbon in different forms).

Pill bug -- A small animal that lives in moist soil and rolls up in a little ball when it is threatened or scared.

Plate Scrapings -- The food waste left on plates after a meal

Potworm -- A small worm that lives in soil and compost.

Prep Scraps -- The food waste produced from preparing meals

Recycle -- To pass through a cycle again; to collect and reprocess manufactured materials for reuse either in the same form or as part of a different product.

Resources -- A supply of something that can be used or drawn upon. Something that can be used to make something else -- wood into paper, iron ore into steel, old newspapers into cardboard.

Roundworms (nematodes) -- Small worms (less than one centimeter) that prey on fungi spores, protozoa and each other and are very good for compost.

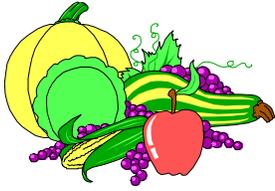
Solid waste -- Any unwanted non-liquid material that is discarded from households, industries or communities.

Turning -- In a compost pile, mixing and moving the organic material.

Turning unit -- Multiple composting holding bins built next to each other.

Waste stream -- All materials and resources being thrown away.

Yard and garden wastes -- Grass clippings, dead leaves, small branches, and weeds.



COMPOSTING RESOURCES

All these resources are available on loan to New Hampshire educators through the NH Governor's Recycling Program by calling (603) 271-1098.

Brochures or Handouts

- "Backyard Composting" An educational "how to" backyard composting brochure. Also available through your County Cooperative Extension.
- "Worming Your Way to Better Compost!!!" An 8 page handout explaining the "ABC'S" of worm composting and where to get worms, worm bins and worm books.

Video Tapes

- "Home Composting, Turning Your Spoils to Soil" (17 minutes) Teaches Home composting of household food and yard waste. "Composting to Reduce the Waste Stream" guide included. Also available through your local public library, County Cooperative Extension.
- "It's Nature's Way: The Composting Solution" (6 minutes) Overview of how composting of household waste works, emphasizing its parallel to degradation in nature.
- "The Magic of Composting" (13 minutes) Features a compost fairy who teaches a skeptical man about the basics and benefits of composting.
- "Vermicomposting" (25 minutes) A simple demonstration of setting up, feeding, maintaining, and harvesting your worm bin for food waste composting.
- "Wormania" (26 minutes) An entertaining and educational video featuring "Worm Woman" Mary Applehof explaining how worms can help the environment and step by step "how to" for a food waste worm composting bin.

Curriculum

The following composting related curriculum are available for loan through the NH Governor's Recycling Program's "Educational Lending Library." Please call for more information.

- "Compost Learning Guide: Teacher's Guide" Grades 4-8
- "Composting: Wastes to Resources" Camp Age
- "Composting in the Classroom: A High School Teacher's Guide for Indoor Composting Activities" Grades 9-12
- "Earthworms: Nature's Recyclers" Grades K-6
- "4-H Composting Education Program" 4-H Groups
- "Scraps to Soil: A How-To Guide for School Composting" Grades 3-6
- "Squirmy Wormy Composters" Grades K-6
- "Worms Eat My Garbage" Grades K-12
- "Worms Eat Our Garbage" Grades 2-8
- "Worms in the Classroom Activity Ideas" Grades K-12

TRADE ORGANIZATIONS and ASSOCIATIONS

This is a listing of Trade Organization and Associations that serve the composting and solid waste industry.

COMPOSTING COUNCIL
114 South Pitt Street
Alexandria, VA 22314
(703) 739-2401; Fax (703) 739-2407
e-mail: comcouncil@aol.com

This council was established to improve public and market acceptance of composting processes and products.

ENVIRONMENTAL ACTION FOUNDATION
6930 Carroll Avenue
Tacoma Park, MD 20912
(301) 891-1109

The Environmental Action Foundation works with the human side of the environment, such as air, water and land.

KEEP AMERICA BEAUTIFUL
101 Washington Boulevard
Stamford, CT 06901
(203) 323-8987; Fax (203) 325-9199
web site: <http://www.kab.org>

Keep America Beautiful is a national, nonprofit, public education organization dedicated to improving waste-handling practices in North American communities.

NATIONAL RECYCLING COALITION
1727 King Street, Suite 105
Alexandria, VA 22314-2720
(703) 683-9025; Fax (703) 683-9026

The National Recycling Coalition is a nonprofit organization whose members include businesses, recycling and environmental organizations, state and local governments and individuals.

SOLID WASTE ASSOCIATION OF
NORTH AMERICA
PO Box 7219
Silver Spring, MD 20910-7219
(301) 585-2898; Fax: (301) 589-7068
web site: <http://www.swana.org>

The Solid Waste Association of North America is a nonprofit educational organization of 5,800 solid waste management professionals.

EPA-New England
JFK Federal Building
Boston, MA 02203-0001
(617) 573-5720

The EPA's Office of Solid Waste deals with the legislative side of the solid waste industry. They provide regulations and guidelines to municipalities on recycling, composting, etc.

LOCAL

DONATION DEPOT
New Hampshire College
2500 North River Road
Manchester, NH 03106-1045
(603) 645-9622; Fax (603) 645-9666
web site: <http://www.nhc.edu/admin/depot/depot.htm>
e-mail: eatonfr@nhc.edu

Donation Depot plays the matchmaker between organizations who have useful equipment and/or materials for which they no longer have a use and nonprofits who can use these goods.

EARTH DAY NH
PO Box 266
Amherst, NH 03031-0266
(603) 672-5441; Fax (603) 673-6250

Earth Day NH is a nonprofit group that promotes environmental education and acts as the state wide Earth day coordinator.

NH DEPARTMENT OF ENVIRONMENTAL
SERVICES

6 Hazen Drive
Concord, NH 03301-6509
(603) 271-2900; Fax (603) 271-2456
web site:

<http://www.state.nh.us/des/discover.html>
e-mail: b_mcmillan@des.state.nh.us

The Department of Environmental Services (DES) is responsible for implementing waste disposal laws for the state. DES provides technical assistance to communities, schools, and businesses; conducts educational programs on solid waste management and recycling; and provides guidance for starting recycling programs.

NH GOVERNOR'S RECYCLING PROGRAM
2½ Beacon Street

Concord, NH 03301-4497
(603) 271-1098; Fax (603) 271-1728
web site: <http://www.state.nh.us/recycle/homepage.html>

e-mail: recycle@osp.state.nh.us

The Governor's Recycling Program provides technical assistance, stimulates and promotes new recycling ideas, and has developed databases on municipal recycling activities in New Hampshire and markets for the state's recyclables.

NH MATERIALS EXCHANGE
Business and Industry Association of NH
122 North Main Street
Concord, NH 03301-4918
(603) 224-1517; Fax (603) 224-2872
web site:

<http://www.wastecapnh.org/nhme.htm>
e-mail: exchange@wastecapnh.org

The NH Materials Exchange which is operated by WasteCap of New Hampshire, diverts waste from municipal landfills by providing a means for materials to be exchanged for reuse between businesses, municipalities, nonprofit groups, and individuals.

UNH COOPERATIVE EXTENSION

59 Taylor Road
Durham, NH 03824-3587
(603) 862-1520; Fax (603) 862-1595
<http://ceinfo.unh.edu>

UNH Cooperative Extension is part of a nation-wide Land Grant University System which provides educational outreach to families and individuals throughout the state, with an office in each of the ten counties.

WASTECAP PROGRAM OF NEW HAMPSHIRE
Business and Industry Association of NH
122 North Main Street
Concord, NH 03301-4918
(603) 224-1517; Fax (603) 224-2872
web site: www.wastecapnh.org
e-mail: reconinfo@wastecapnh.org

WasteCap is a pro-active, nonregulatory program providing businesses with the technical assistance necessary to recognize and act upon opportunities for solid waste minimization and recycling.

K - 12 SCIENCE CURRICULUM FRAMEWORK

To assist New Hampshire teachers in meeting specific curriculum requirements, this Guide and accompanying activities were examined for correlation to the "NH Science Curriculum Frameworks." For the resulting suggested correlations, please refer to the outline below and the New Hampshire Department of Education's K-12 Science Curriculum Framework.

1. Science as Inquiry

- 1a. Yes, both elementary and secondary

2. Science, Technology and Society

- 2a. Yes, elementary; secondary - could be applied to measuring with analog equipment
- 2b. Could apply to both elementary and secondary if teacher chose to explore composting organisms with microscopes, or testing the pH of compost etc.
- 2c. Yes, elementary; secondary - could fulfill if teacher chose to elaborate with activities.
- 2d. N/A
- 2e. Could fulfill both elementary and secondary if teacher chose to elaborate
- 2f. N/A

3. Life Science

- 3a. Yes, some of elementary and some of secondary
- 3b. Yes, some of elementary and some of secondary
- 3c. Yes, some of elementary and some of secondary
- 3d. Yes, some of elementary and some of secondary

These all relate to a portion of the overall life science standards (i.e., anatomical structures, food webs, requirements of organisms/processes etc.)

4. Earth/Space Science

- 4a. N/A
- 4b. N/A
- 4c. Related to both elementary and secondary via Earth's resources, water supply, human induced factors which contribute to changes in Earth etc.

5. Physical Science

- 5a. N/A for elementary, perhaps tangentially in secondary
- 5b. Perhaps tangentially in both elementary and secondary (i.e., change in substance = decomposition)
- 5c. Perhaps tangentially in both elementary and secondary (i.e., energy transformation)
- 5d. N/A
- 5e. N/A

5f. N/A

5g. Perhaps tangentially for both

6. Unifying Themes and Concepts

6a. Both elementary and secondary - tangentially

6b. Both elementary and secondary - tangentially

6c. Both elementary and secondary - tangentially (i.e., worm bin model of what happens in a forest or outdoor compost; the bin as a model of a natural process)

6d. Yes, both elementary and secondary