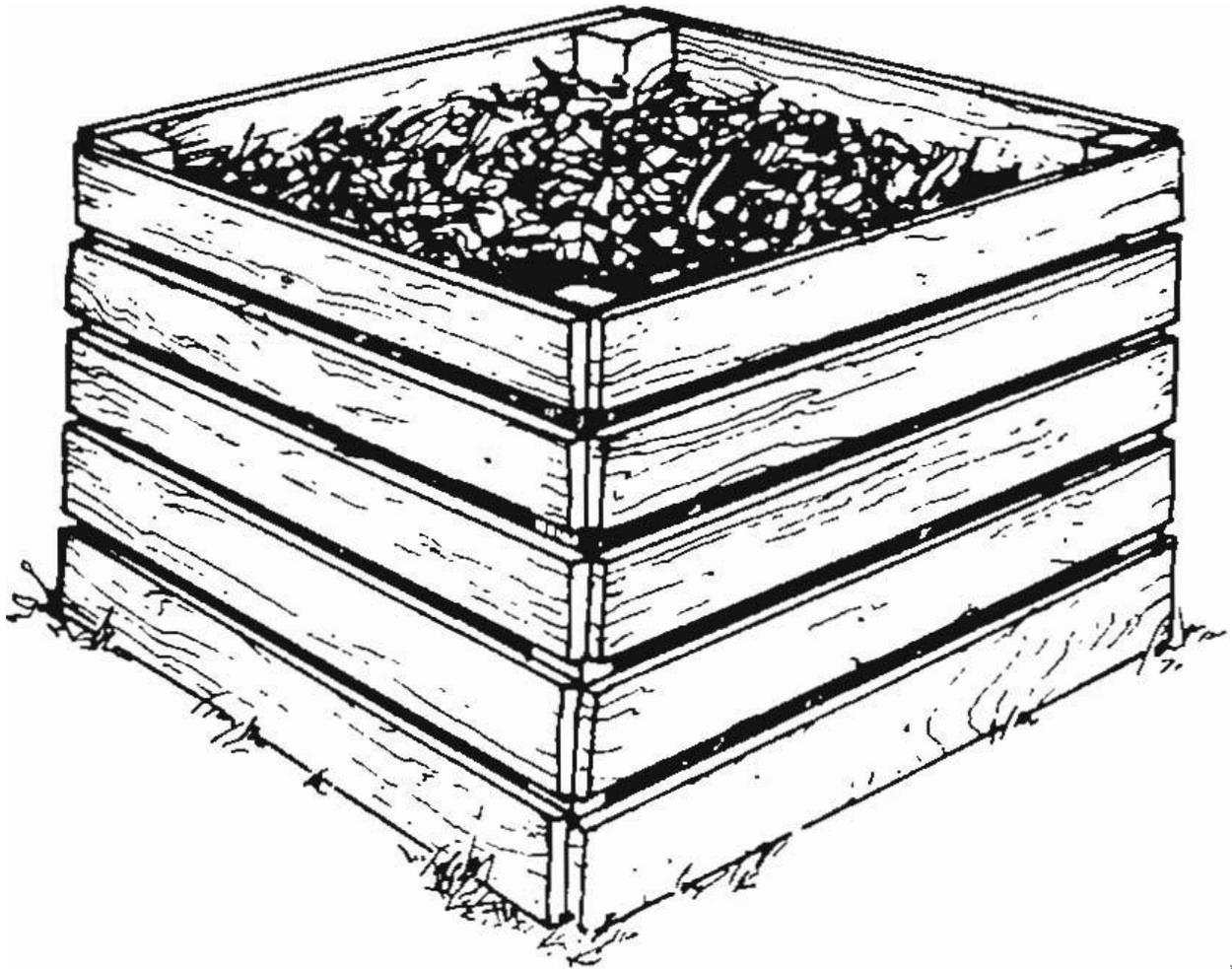


A Guide to Starting a Composting Program in Your School



Green Mountain Farm to School





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Introduction & Goals

If your school is like most across the country, recycling has become a part of your culture. Why not take the next steps and start composting? With one-third of Vermont's food scraps being thrown away, composting is a way to promote a responsible and environmentally friendly way to deal with waste. Along with saving landfill space, school composting programs have many benefits:

- Compost as a finished product enhances the soil and plant quality in school vegetable and flower gardens
- Providing educational opportunities that promote sustainable environmental practices
- Reducing the school's cost of waste removal
- Providing a medium for many environmental and science related topics for discovery along with opportunities for student development and responsibility, art and inspiration projects

The goal of this manual is to help aid schools to establish a successful composting program providing information, tips and resources.

Why Compost?

What is composting?

Nature recycles by breaking down organic material and re-using it. Composting is the accelerated form of this decomposition process. In order for nature to decompose, microorganisms eat and inhabit decaying matter to break these materials down even further. Compost happens when materials are gathered in a bin or pile, moistened, and aerated. Fungi, bacteria, and invertebrates are able to take over and composting happens. In the end, the finished product is humus, dark brown organic matter which builds up soil, saves space in the landfill, and teaches schoolchildren how nature recycles.

All compost ingredients generally fall under one of two categories, brown or green. Browns are dry materials such as newspaper, dry leaves, and hay. Greens are fresh, moist materials such as grass cuttings, manure and food scraps.

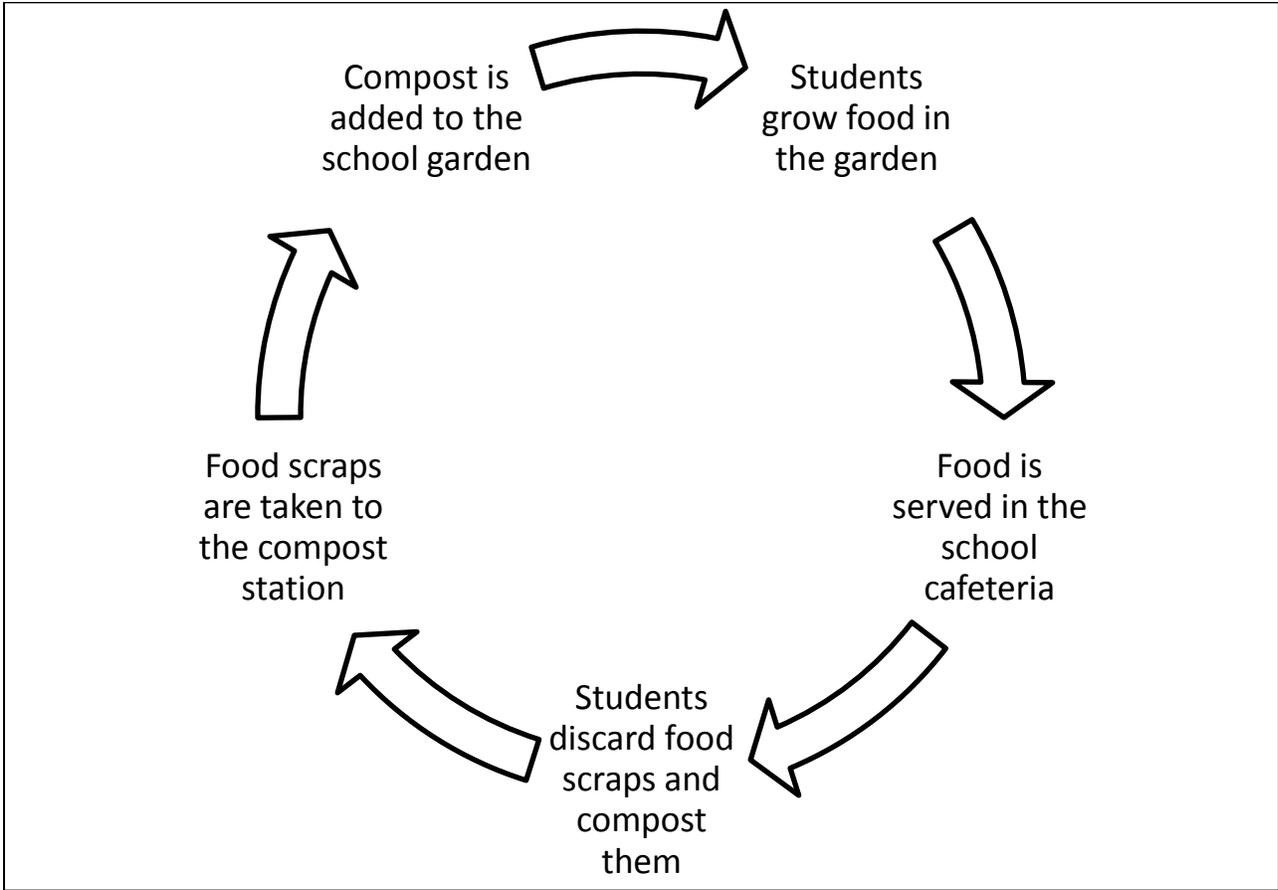
The Benefits of Composting

The benefits of composting can be limitless.

- The amount of trash your school produces is reduced.
- Nutrients are recycled back into the soil.
- Soil erosion is prevented when you add compost.
- Money is saved.
- Awareness is created around recycling and waste reduction efforts.
- School pride is raised through the positive contribution made to the environment.

Closing the Loop: Implementing Composting in Your School

We can close the loop on the food system by diverting food waste from landfills and turning it back into soil to grow more food.



Regulations & Health Concerns

When starting up a composting program at your school people in the community, and possibly yourself, will have questions about the health and safety of the project. Familiarize yourself with the regulations and safety concerns before you begin.

Regulations

Section 5-213 Item 34 of the Health Department's code for Food safety indicates that "Food waste may be disposed of by composting with the following requirements:

- A. Compost sites cannot be in close proximity to the outer openings of a food service establishment.
- B. A compost site must be properly operated and kept free of insects, rodents, and vermin.
- C. Compost sites cannot create a health hazard or nuisance to any food establishment or neighboring property owner."

Health and Safety

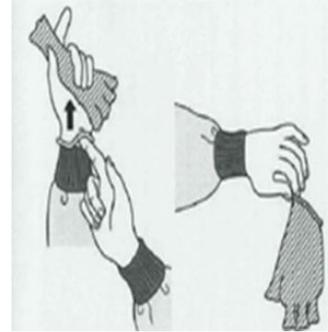
Composting can be a fun and educational experience that can involve students, staff, and parents. To make it an educational environment, look into reducing potential risks.

1. Protect those likely to be most sensitive. Involve the teachers, school nurse or physician, parents, and faculty/staff to discover any potentially susceptible students or staff. Protect the privacy of medical information, but determine who may have allergies, be immunocompromised or be prone to infections that could make them sensitive to potential risks. Control exposure of these individuals by restricting who actually comes in contact with the compost. Other students or the teacher could feed the compost bin or take samples. Do not stir or otherwise disturb the pile or bin when people susceptible to inhalation of allergens are nearby.
2. If the temperature of the compost pile is properly maintained (it says at a high temperature), the risk of pathogens is decreased. Be sure to monitor temperatures and turn the pile frequently. For more information, see the fact sheet on Health & Safety Guidance for Small Scale Composting at: <http://cwmi.css.cornell.edu/smallscaleguidance.pdf>
3. Turning the compost pile will release airborne particles and gases that can cause symptoms in some people. So if a pile is turned, be aware of the wind direction and of the susceptibility of those nearby and those doing the turning. Susceptible children should not turn the compost.

4. Making compost requires a mix of materials, some high in nitrogen (like food scraps) and others high in carbon (like leaves, newspaper, and hay). Keeping food scraps covered with high-carbon materials will keep down flies and dispersal of fungal spores. Make sure you have a handy source of high-carbon materials. A list of materials and their carbon to nitrogen ratios can be found at:

<http://cwmi.css.cornell.edu/compostbrochure.pdf>

5. Practice good hygiene. Anyone coming in contact with the compost bin or compost should practice good hygiene by either washing hands well or wearing disposable gloves. Effective hand washing requires use of soap and sufficient time (sing "Happy Birthday" twice while lathering up). Gloves should be available (use of non-latex gloves such as polyethylene is advisable due to latex allergies) and users should know proper technique for removing gloves (see diagram). Hands should be washed after gloves are removed. Anyone with cuts and abrasions should cover them with bandages and wear gloves.



Getting Started

In six easy steps, here is how to start a composting program in your school:

1. Share your ideas and seek out others who may be supportive

Include as many people as you can to be involved! Ask the principal, food service staff, janitor staff, teachers, parents, a knowledgeable compost staff (GMFTS staff), and even students to join in. All of these people need to have a voice in the beginning stages to help give ownership of the project, insure its sustainability, and provide a venue for later meetings. Start by having a forum to discuss how composting can be done at your school, listen to and express concerns, and learn about the benefits.

2. Recruit a core group of people to develop the idea to form a Steering Committee

Effective leadership from a few staff members who are committed to making school composting a reality is critical to the success of the program. An administrator and a few representatives from other parts of the school community should round out the committee. Members can come from the board of education, administration, custodial staff, kitchen staff, teachers and staff, parents and students. The committee is responsible for developing a clear plan of action, promoting the program, coordinating the actual work, and evaluating what's working and what's not. To start up a program will take several hours of planning. Expect to meet once a month, at least, for the first year of the process. As the program matures, quarterly meetings may be all that is necessary.

3. Research what is involved in a school-wide composting operation

Now that you have rallied the support of the school community and formed a steering committee, it is time to look at the compost program infrastructure. There are many resources available from organizations to books to websites. This is your time to take advantage of others experience to determine the system that will work best for your school. First, decide if the school will compost on or off site. On site composting comes with both challenges and rewards. Composting can be used as a curriculum resource and the finished product can be used by the school. Challenges range from the potential issue of odors, rodents and space. Doing the research ahead of time will aid the steering committee in decided on compost bin design, location and supplies.

4. Clearly define the scope of the project (it's okay to start small)

Once you learn as much as you can, the committee will be able to speak about the process and clearly plan the scope of the composting program they are envisioning. You can start with a small pilot program or develop the program in phases.

5. Follow the school system protocol and garner community support

Each school has different ways they develop new programs. In order for the program to be successful, be sure to follow the correct protocols and gather as much support and enthusiasm as you go.

6. Planning the details

Don't forget about the details once you have a plan and a course of action. Make sure everyone knows what to do and why they are doing it! Here are a few tips to help in your journey:

- The *convenience* is important all down the cafeteria garbage line. Placing a table next to where students compost, recycle and throw things away helps students make the right decisions and reduces trash in the compost stream. Another method would be cutting a table to fit three buckets for these three options.
- Use *strong signage* to aid the visual connection of separating waste items. Engage student participation throughout the process with artwork like poster contests and stickers (for cafeteria and kitchen). Customized signs are available at NEKWMD. Posters and signage should visually reflect the specific types of waste generated at the school. Customized signs are available at NEKWMD and examples are located in **Appendix II**.
- Creating a strong / fun *incentive* programs that encourages participation. Your school can celebrate a compost awareness week where the students receive tickets for separating compost correctly. During the week, have a drawing at the end of each day for a prize.
- Save all of your trash for a *waste audit!* Assess the amount of food waste generated to help discover how much of your trash is really compost. Use the waste audit data to compare to future data either annually or biannually. Also, conducting a waste audit before the official kick off of composting establishes a baseline for comparison. The process will open a discussion with students about ways to reduce their waste and modify their behaviors. This creates awareness and starts the conversation about composting.

On-Site vs. Off-Site Composting

Choosing to compost at your school or to send your compost off site is a decision each school needs to make early on. What you ultimately decide will be based on space, time and staff.

On-Site Composting		Off-Site Composting	
<p>The school maintains composting bins on the school grounds. All food scraps go directly into those bins. With daily monitoring and maintenance, the finished compost can be used in the school gardens.</p>		<p>The school has a local contact that offers to take the cafeteria's food scraps on a regular basis. The school must arrange a pick up time or the transportation of the scraps.</p>	
Benefits	Challenges	Benefits	Challenges
Ability to demonstrate a full composting system to students	Costs money to build a composting structure	Builds community connections	Must coordinate with someone to pick up compost
School keeps the finished composted product	Compost pile needs to be maintained on a daily basis	Less logistics to figure out (ex: construction of bins)	School does not keep final composted product
School doesn't need to coordinate days and times for someone to pick up scraps	Need enough space to install a 3-bin compost system	Cheaper to start and to continue since no structures need to be built	Storage containers must be kept outside until pick up
Students have an active role in the process	Must have staff and student buy-in	No regular compost pile maintenance	Fewer opportunities to make connections to student learning

Off-Site Composting

Setting Up Your System

- Put out an application for bids for food scrap or organics collection. This can include regular haulers, Highfields Composting, community members, or local farmers. Explain what you are looking for and make sure to ask how often they will pick up food scraps and how they will use the finished product.
- Accept an offer and figure out the following details:
 - When will they pick up and how often? Arranging a consistent schedule, like every day at 2:30, will be easy to remember. Make sure the time works for the school and staff.
 - What is a collection container that they recommend using? Will they empty the contents during pick up or take the containers with them? If they take them, how and when will they be returned?
 - Who is responsible for cleaning the collection containers?
 - Where will the food scraps be picked up? Storage containers kept outside the cafeteria doors are typically the most convenient location for both storing and collecting food scraps.
 - What are the do's or do not's of their composting program? Some places allow meat, others do not. Finding out their system up front will allow you fewer problems in the future.
- Arrange transportation from the school to the composting site if needed.

Supplies and Equipment

All of the parts of the composting process need to be in place before you can start collecting food scraps during the school day. Make sure to secure the materials you need to compost at school. You will need:

- | | |
|---|------------------------------|
| ○ 5 gallon buckets (at least 5 to start with) | ○ 1 cart for housing buckets |
| ○ Cloth rags | ○ Scale |
| ○ Outdoor tote (if NEKWMD is picking up) | ○ Sawdust |
| ○ Clipboard with record sheets | |

- 5-gallon buckets with lids- as many as necessary to collect food scraps
 - These will collect food scraps during meal times. The amount you need will be determined by the number of students, their eating habits, and frequency of your pick up. If you aren't sure, start with 5.
 - After lunch, the buckets will be placed outside in a designated location with the lid on. This will prevent odor and pests for a day or two.
 - If you are part of the Northeast Kingdom Waste Management District, they will provide these buckets at no cost.
 - Instead of paying for the buckets, find a parent or community member that uses 5-gallon buckets and ask them to donate them.
- 1 Cart for housing buckets
 - A rolling cart to house the buckets can help when transporting them from the cafeteria to outside.
- Cloth rags
 - Have a supply of rags on hand that are to clean up food scraps from buckets and floors.
- Scale that measures in one pound increments
 - Recording the weight of food scraps composted everyday can serve several purposes. By keeping records, you can show how much food is not being eaten, how much food is being diverted from the landfill, and how much waste is produced by the cafeteria over time. Students can get involved and use the weights to construct math problems or track the composting operation.
 - The best type of scale to use is one where the weight can be viewed from the side or has a memory lock feature since the bin will likely cover the top of the scale.
 - You can find a memory lock scale, or industrial scale, by searching online or by visiting www.quill.com.
- Clip board with record sheets
 - Find an example of a record sheet in **Appendix III**.

- 48 gallon toter as an outdoor bin
 - If the waste management district is picking up your food scraps, they will not collect them everyday. Therefore, a large toter can be used to store the contents of the 5-gallon buckets.
 - If you are part of the Northeast Kingdom Waste Management District, they will provide one of these at no cost.
- Sawdust
 - If food will not be picked up on a daily basis, placing sawdust on top will prevent odors.
 - This step is most necessary in warmer months when the risk of odor and attracting animals is present.

Procedures

1. Place a sign above compost buckets that show students what to compost. Some food service staff use a small white board to write what lunch items can be composted that each day. Examples of signs can be seen in **Appendix IV**.
2. Students scrape ALL food scraps into 5 gallon buckets that sit on a cart in lunch room.
3. Weigh food scraps by placing bucket on a scale and subtracting the weight of the container. Record the amount to show savings in the disposal of solid wastes produced by the cafeteria. The weights can also be used to construct math problems or track the composting operation.
4. A designated staff or a group of students (one grade can be the compost keepers) take the buckets with lids outside to the pick up location after every lunch. If using large totes, empty buckets into totes and clean out buckets.
5. Buckets should be picked up everyday and large totes should be picked up weekly.
6. Adjust your trash pickup schedule accordingly to reflect the diversion of food scraps and recycling. Be sure to monitor cost change to keep track of the monetary value of composting.

Daily Tasks
1. Collect Food Scraps
2. Weigh Food
3. Transport Food Scraps Outside
4. Clean Up
5. Have Food Scraps Picked Up

Annual Time Line

Launch Year Time Line

- Form a Steering Committee
- Draft a Plan
- Secure Materials and Supplies
- Train kitchen staff: develop daily routine, food handling procedures, and container placement
- Have an all-school assembly with "Chef Suzette" play (Association of Vermont Recyclers) to build enthusiasm
- Offer a small group training for staff, students, and volunteers on cafeteria procedures to ensure a smooth transition
- Have an in-class training with ALL classes about how they will compost during the school day
- Train one of the older grades as Compost Keepers by holding an in-class workshop that will teach them about monitoring and caring for the compost throughout the year.
- Send a note home to parents describing the composting that is going on at school and the role their children have in it. This is a great way to build enthusiasm and create a connection to home. An example can be seen in **Appendix II.**
- Start Composting- On the first day of composting, make an announcement during lunch. Have the Compost Keepers stand by the trashcans and compost buckets to remind students where food and trash goes.
- Use community volunteers to monitor cafeteria food waste recycling system for approximately 2 weeks.
- Thank You Cards- Be sure to properly thank everyone that helped started, cared for, or provided materials for the compost.

- Program Report- Evaluate the effectiveness of your composting infrastructure. Keep track and share the volume of compost collected, the students who helped and community members involved. Use your program report to challenge your school to make a bigger impact next year.

- Adjust your trash pickup schedule accordingly to reflect the diversion of food scraps and recycling, monitor cost change.

Second Year and Beyond Time Line

- ❑ Train the next class of Compost Keepers. Hold an in-class workshop that will teach them about monitoring and caring for the compost throughout the year.
- ❑ On the first day of composting, have an All-School Refresher Training. Make an announcement during lunch to remind students how to use the compost bins. Have the Compost Keepers stand by the trashcans and compost buckets to remind students where food and trash goes. For the next few days, closely watch the students sorting and train when necessary.
- ❑ Send a note home to parents describing the composting that is going on at school and the role their children have in it. This is a great way to build enthusiasm and create a connection to home.
- ❑ Thank You Cards- Be sure to properly thank everyone that helped started, cared for, or provided materials for the compost.
- ❑ Program Report- Evaluate the effectiveness of your composting infrastructure. Keep track and share the volume of compost collected, the students who helped and community members involved. Use your program report to challenge your school to make a bigger impact next year.
- ❑ Adjust your trash pickup schedule accordingly to reflect the diversion of food scraps and recycling, monitor cost change

Roles & Responsibilities

In order to have a successful compost program, the responsibilities need to be clearly defined and designated. The staff that works with food the most, Food Service Directors, will inevitably have the largest role, but they should not be alone. Don't be afraid to get the students involved or throw a work party and inviting parents for the largest tasks.

- **Coordinator:** This person will be in charge of making sure all of the tasks are assigned and completed. A Coordinator is the go-to person for any questions or contacts. (A compost contact form can be found in **Appendix V.**)
- **Compost Monitor:** This person will set up and maintain the compost station in the kitchen, keep signage and bins in good order, and assure there is appropriate time to sort wastes between lunch periods. The Compost Monitor has a crucial role of reminding other assigned adults and students when they are to volunteer as the Lunch Sorter.
- **Lunch Sorter:** This can be one person or a rotating group that watches the emptying of trays at lunch to ensure that food scraps, recyclables and garbage go into the correct bins.
- **Compost Keeper Class:** One class in the school, typically 6h grade or older, is in charge of the compost. After lunch, a few of the students take the food scrap bins to the compost pile. They will take the compost's temperature, record it, add the food scraps, and top it off with hay. If they notice a temperature drop, damage to the bin, or anything unusual, they will report it to their teacher or the coordinator.

Staff and Community Connections

As you know, there is a wealth of talent and resources in a school building. Make sure everyone in your school is aware of the program and ask them to share their expertise.

Teachers

- Art teachers can use their classes to help with signage for composting.
- Science teachers can use the compost for exploration or build on the topic by starting a worm bin in their classroom.
- All teachers should encourage students to compost fully, set a proper example at lunch, and be knowledgeable about composting if students have questions.

Students

- Older students or classes can have leadership roles.
- Students can plan and be responsible for extra projects that improve the composting system.
- Start a recycling club during the school day or after school.

Custodial Staff

- Use custodial staff as a resource to determine where an appropriate location for placing food scraps on site would be to maintain curb appeal and functionality.
- Do they have a role in collecting food scrap buckets? On site how involved are they in the project?

Food Service Staff

- The chefs at schools do an amazing job encouraging students to eat good food, use them as a resource to encourage students to compost their food scraps.
- Encourage food service to compost their kitchen food waste.
- Ask them to help decide where the best place for compost bucket in kitchen and the location of outside bin placement.
- Since food service makes the lunch, they can write the food that is compostable daily on a white board sign to make it easier for students.
- Make sure they are comfortable cleaning out the compost buckets as it will undoubtedly fall onto the food service to clean them.

Parents

- Help them learn about composting through letters home or their students engagement.
- Ask for parent volunteers to monitor the composting at lunch.
- Parents can be a great resource for materials, talent and time when starting up a program. Find ways to include them.
- Encourage parents to help enhance the program.

On-Site Composting

Setting Up Your System

- Secure the materials and people you will need to construct your composting bin. We recommend a 3-bin system (plans are in **Appendix VI**). A composting system should be large enough to handle the demands of your schools food scraps. It should, therefore, be larger than a home composting bin.
- Find a local source to provide your school with hay and manure, two things you will need to help your food scraps turn into compost.
- Designate a class to be the Compost Keepers. They should empty the food scraps daily, monitor the piles, and take measurements.
- Designate a staff member to check on the compost pile, add amendments, turn over piles regularly and add to the garden when needed.

Supplies and Equipment

All of the parts of the composting process need to be in place before you can start collecting food scraps during the school day. Make sure to secure the materials you need to compost at school. You will need:

<ul style="list-style-type: none">○ 5 gallon buckets (start with at least 5)○ Scale○ Work gloves	<ul style="list-style-type: none">○ 1 cart for housing buckets○ Shovel or pitchfork○ Supply of hay and manure	<ul style="list-style-type: none">○ Cloth rags○ Compost thermometer○ Sifting screen
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- 5-gallon buckets with lids- as many as necessary to collect food scraps
 - These will collect food scraps during meal times. The amount you need will be determined by the number of students, their eating habits, and frequency of your pick up. If you aren't sure, start with 5.
 - After lunch, the buckets will be dumped into the compost pile.
 - If you are part of the Northeast Kingdom Waste Management District, they will provide these buckets at no cost.
 - Instead of paying for the buckets, find a parent or community member that uses 5-gallon buckets and ask them to donate them.

- 1 Cart for housing buckets
 - A rolling cart to house the buckets can help when transporting them from the cafeteria to outside.
- Cloth rags
 - Have a supply of rags on hand that are to clean up food scraps from buckets and floors.
- Scale that measure in one pound increments
 - Recording the weight of food scraps composted everyday can serve several purposes. Keeping track of the food composted in a period of time can show savings in the disposal of solid wastes produced by the cafeteria. The total weight of food can also be compared to the amount of compost produced. Students can get involved and use the weights to construct math problems or track the composting operation.
 - The best type of scale to use is one where the weight can be viewed from the side or has a memory lock feature since the bin will likely cover the top of the scale.
 - You can find a memory lock scale, or industrial scale, by searching online or by visiting www.quill.com.
- Shovel, pitchfork or garden fork for turning compost pile
- Work gloves
- A steady supply of bulking materials such as leaves, wood chips, wood shavings or hay, and manure
- Clip board with record sheets
 - Find an example of a record sheet in **Appendix III**.
- Compost thermometer
 - The long probe of the compost thermometer can take a clear temperature when it is pushed to the center of the pile, where it is warmest. Monitoring the daily temperature of the compost pile will help staff and students follow the progress of decomposition. Temperatures can rise to 150 degrees, but if temperatures fall and the food scraps have not

decomposed, adjustments need to be made. (See Trouble Shooting Guide in **Appendix VII** for more information)

- You can find a composting thermometer by searching online or by visiting www.reotemp.com.
- Sifting screen (hardware cloth stretched over wooden frame)
 - Sift through the piles to find insects or to see how much food has decomposed.
 - Pieces of non-decomposed food or large scrapes can be sifted from your final product.

Day to Day Procedures

1. Place a sign above compost buckets that show students what to compost. Some food service staff use a small white board to write what lunch items can be composted that each day. Examples of signs can be seen in **Appendix IV**.
2. Students scrape ALL food scraps into 5 gallon buckets that sit on a cart in the lunch room.
3. Weigh food scraps by placing a bucket on a scale and subtracting the weight of the container. Record the amount to show savings in the disposal of solid wastes produced by the cafeteria. The weights can also be used to construct math problems or track the composting operation.
4. A designated staff or a group of students (one grade can be the compost keepers) to take the buckets to the compost pile outside.
5. Take the compost temperature by placing the long probe into the center of the compost pile. Record the reading. If the temperature has dropped, decomposition has taken place or the balance of the compost needs to be adjusted. (See Trouble Shooting Guide in **Appendix VII**.)
6. Spread the food scraps onto the pile, do not pile them high.

Daily Tasks

1. Collect Food Scraps
2. Weigh Food
3. Transport Food Scraps Outside
4. Take Compost Temperature
5. Spread Food Scraps
6. Layer with Bulking Material
7. Clean Up

7. Follow the specific recipe designed for your site and layer with the bulking material recommended (wood chips, wood shavings, leaves or hay). Spread with a pitchfork to cover the food completely. This will make it less attractive to animals.
8. Adjust your trash pickup schedule accordingly to reflect the diversion of food scraps and recycling. Be sure to monitor cost change to keep track of the monetary value of composting.

On-Going Procedures

Lots of decomposition takes place in a compost pile. In fact, food wastes and bulking materials are reduced as much as two thirds! To get the most out of your compost, you will need to:

- Check and Maintain Your Bin
 - Any structural problems should be reported to a supervising adult so they can be fixed right away.
- Turn Your Pile
 - When there is a drop in temperature or the pile is overflowing out of the bin, it is time to turn your pile. Simply, this means to mix it up or to move it from one bin to another.
 - The best way to turn your pile is to use a garden fork or pick fork to move the materials in one bin to another bin. The “green” materials and “brown” materials will be mixed up and this will give compost organisms the opportunity to break down more food scraps.
- Test and Cure Your Compost
 - A successful compost will be dark, crumbly, and sweet-smelling. The process should take about a year.
 - Placing partially-decomposed compost on plants will burn new shoots due to an unstable nitrogen and salt content. To prevent this, be sure to “cure” the compost before adding it to your garden.
 - To begin the curing process, stop adding food scraps to the pile. Throughout the next several months, turn the pile over once a week or every other week and keep moist.

- When the large particles have broken down and the temperature has cooled, it will be ready to use as compost.
- Use Your Compost
 - Use the finished compost as a soil amendment by mixing into garden soil before planting or by putting into soil around plants.

Annual Time Line

Launch Year Time Line

- Form a Steering Committee
- Draft a Plan
- Secure Materials and Supplies
- Train kitchen staff: develop daily routine, food handling procedures, and container placement
- Have an all-school assembly with "Chef Suzette" play (Association of Vermont Recyclers) to build enthusiasm
- Offer a small group training for staff, students, and volunteers on cafeteria procedures to ensure a smooth transition
- Have an in-class training with ALL classes about how they will compost during the school day
- Train one of the older grades as Compost Keepers by holding an in-class workshop that will teach them about monitoring and caring for the compost throughout the year.
- Send a note home to parents describing the composting that is going on at school and the role their children have in it. This is a great way to build enthusiasm and create a connection to home. An example can be seen in **Appendix II.**
- Start Composting- On the first day of composting, make an announcement during lunch. Have the Compost Keepers stand by the trashcans and compost buckets to remind students where food and trash goes.
- Use community volunteers to monitor cafeteria food waste recycling system for approximately 2 weeks.
- Thank You Cards- Be sure to properly thank everyone that helped started, cared for, or provided materials for the compost.

- Program Report- Evaluate the effectiveness of your composting infrastructure. Keep track and share the volume of compost collected, the students who helped and community members involved. Use your program report to challenge your school to make a bigger impact next year.

- Adjust your trash pickup schedule accordingly to reflect the diversion of food scraps and recycling, monitor cost change

For the Compost Pile:

- Build compost 3-bin structure
- Secure material resources (hay, manure, etc.)
- Maintain compost structure
- Check in on compost regularly
- Turn over piles
- Cure older piles (stop adding food scraps) to finish process

Second Year and Beyond Time Line

- Train the next class of Compost Keepers. Hold an in-class workshop that will teach them about monitoring and caring for the compost throughout the year.
- On the first day of composting, have an All-School Refresher Training. Make an announcement during lunch to remind students how to use the compost bins. Have the Compost Keepers stand by the trashcans and compost buckets to remind students where food and trash goes. For the next few days, closely watch the students sorting and train when necessary.
- Send a note home to parents describing the composting that is going on at school and the role their children have in it. This is a great way to build enthusiasm and create a connection to home.
- Thank You Cards: Be sure to properly thank everyone that helped started, cared for, or provided materials for the compost.
- Program Report: Evaluate the effectiveness of your composting infrastructure. Keep track and share the volume of compost collected, the students who helped and community members involved. Use your program report to challenge your school to make a bigger impact next year.
- Adjust your trash pickup schedule accordingly to reflect the diversion of food scraps and recycling, monitor cost change

For the Compost Pile:

- Secure material resources (hay, manure, etc.)
- Maintain compost structure
- Check in on compost regularly
- Turn over piles
- Cure older piles (stop adding food scraps) to finish process

Roles & Responsibilities

In order to have a successful compost program, the responsibilities need to be clearly defined and designated. The staff the works with food the most, Food Service Directors, will inevitably have the largest role, but they should not be alone. Don't be afraid to get the students involved or throw a work party and inviting parents for the largest tasks.

- **Coordinator:** This person will be in charge of making sure all of the tasks are assigned and completed. A Coordinator is the go-to person for any questions or contacts. (A compost contact form can be found in **Appendix V.**)
- **Compost Monitor:** This person will set up and maintain the compost station in the kitchen, keep signage and bins in good order, and assure there is appropriate time to sort wastes between lunch periods. The Compost Monitor has a crucial role of reminding other assigned adults and students when they are to volunteer as the Lunch Sorter.
- **Lunch Sorter:** This can be one person or a rotating group that watches the emptying of trays at lunch to ensure that food scraps, recyclables and garbage go into the correct bins.
- **Compost Keeper Class:** One class in the school, typically 6h grade or older, is in charge of the compost. After lunch, a few of the students take the food scrap bins to the compost pile. They will take the compost's temperature, record it, add the food scraps, and top it off with hay. If they notice a temperature drop, damage to the bin, or anything unusual, they will report it to their teacher or the coordinator.
- **Bin Mover:** At least once a year, the resting compost bin needs to be emptied to make room to the new school year's food scraps. If the compost is fully decomposed, it can be added to the garden. If it is not, it can be added to the already existing compost pile in the garden.
- **Pile Monitor:** The compost needs to be monitored on a regular basis by taking the temperature and layering with hay. This can be done by a class on a daily basis.
- **Materials and Resource Coordinator:** Materials like hay, manure or even tubs and lumber, need to be acquired. A person needs to be assigned the task of finding free, donated, or cheap sources of materials. They should also make sure those supplies are at the school when they are needed. You can keep track of your contacts with the Compost Contact form in **Appendix V.**

- **Pile Turner:** When the compost temperature goes down, the compost is not working to its full potential. By having a designated person to turn the pile on a regular basis will help increase compost production. Simply, they will use a pitch fork to mix the pile up or move it from one bin to the next bin.

Staff and Community Connections

As you know, there is a wealth of talent and resources in a school building. Make sure everyone in your school is aware of the program and ask them to share their expertise.

Teachers

- Art teachers can use their classes to help with signage for composting.
- Science teachers can use the compost for exploration or build on the topic by starting a worm bin in their classroom.
- All teachers should encourage students to compost fully, set a proper example at lunch, and be knowledgeable about composting if students have questions.

Students

- Older students or classes can have leadership roles.
- Students can plan and be responsible for extra projects that improve the composting system.
- Start a recycling club during the school day or after school.

Custodial Staff

- Use custodial staff as a resource for determining where an appropriate place for composting on site would be to maintain curb appeal and functionality.
- How involved are they in the project?

Food Service Staff

- The chefs at schools do an amazing job encouraging students to eat good food, use them as a resource to encourage students to compost their food scraps.
- Encourage food service to compost their kitchen food waste.
- Ask them to help decide where best place for compost bucket in kitchen and the location of the outside compost.

- Since food service makes the lunch, they can write the food that is compostable daily on a white board sign to make it easier for students.
- Make sure they are comfortable cleaning out the compost buckets as it will undoubtedly fall onto the food service to clean them.

Parents

- Help them learn about composting through letters home or their students engagement.
- Ask for parent volunteers to monitor the composting at lunch.
- Parents can be a great resource for materials, talent and time when starting up a program. Find ways to include them.
- Encourage parents to help enhance the program.

Evaluation

The steering committee should meet regularly to evaluate the composting program and operation. A short summary describing the successes and food scraps diverted from the landfill may justify the continuation of the program.

- ❖ Is the daily processing of food scraps running smoothly?
- ❖ Are the bins and equipment in good repair?
- ❖ Are the students and staff volunteer working well?
- ❖ What is the general attitude of the students and staff about the composting program?
- ❖ What adjustments can be made to make the process more efficient?
- ❖ How can we recognize and celebrate our accomplishments thus far?

Appendixes

Appendix I: FAQ about Starting a Compost at School

Will the compost pile smell bad?

No. A compost with the right mix of food scraps, hay, moisture and oxygen has a balance of microorganisms to break the pile down and prevent any odor. If food is uncovered or the pile is not turned frequently, then the organisms can not break the food down and a smell may occur. If you do have a foul smell, try turning the pile, adding moisture, or more food scraps or hay.

Will the compost pile look unpleasant?

No. The compost bin should be built with sturdy materials that will hold up in four-season weather. If you are concerned with ascetics, you can place the compost in the back of the school, plant shrubs or a fence, or design a compost bin that resembles an open shed.

Can people get disease from handling composting food waste?

The heat generated from a compost is between 130-150 degrees F. While this is hot enough to kill most pathogens, anyone coming into contact with the compost should take proper precautions by wearing gloves and washing their hands when they are done. Once the food scraps are fully decomposed, it can be used and touched just as soil.

Won't the compost pile attract wildlife?

If a compost is well-constructed and maintained, it will discourage and prevent unwanted wildlife. When planning your composting system, pick a design that creates a good defense against intruders. For example, using mesh wire or strong wood will help eliminate rodents and a latched lid will discourage raccoons. Keeping the bins maintained and following proper compost procedures will keep odors to a minimum and attract fewer intruders.

Isn't composting a lot of work?

Not at all! Create a simple and convenient system to make it as easy as possible. When designing, keep in mind placement of buckets, bins and supplies. Turning the piles will take time and planning ahead, but it can easily become part of a routine. The rest of the work is done for you by the organisms in the compost pile!

** For specific composting problems and solutions, refer to the Trouble Shooting Guide in **Appendix VII** .*

Appendix II: Sample Flyers

The following page is a sample flyer that can be sent home to announce the new composting program at your school. If there is going to be an all school assembly, be sure to include that. Also, don't be afraid to ask for parent volunteers to launch the start of the program.



Bringing _____ School Full Circle!

In _____, _____ School will begin composting food scraps from the kitchen and the cafeteria.

This will reduce the cost and environmental impact of putting biodegradable materials into landfills and garbage disposals.

(Provide a brief explanation of how it will work at your school and who will be doing what)

Look for more details about training for staff and students in ____.
We look forward to launching this new exciting project with you!

If you have any questions, please contact _____.

Appendix III: Recording Log

An effective and efficient composting program that will make all stakeholders happy requires monitoring and recording. There are several components to a successful pile that should be recorded. This form is simple enough for students (the Compost Keepers) or staff to use in observing the pile on a daily basis.

Compost Log 1: The first example is a two week log to monitor the amount of food scraps being composted daily. This will work for an off-site composting program.

Compost Log 2: The second example is a one week log that monitors the amount of food scraps being composted, the temperature of the compost pile, and any observations of the structure or compost. This is designed for an on-site composting program.

Start of Week Date: _____

	Monday	Tuesday	Wednesday	Thursday	Friday
Types of Food					
Weight of plate scrapings					
Recorder:					
Total Weight for Week:					

Start of Week Date: _____

	Monday	Tuesday	Wednesday	Thursday	Friday
Types of Food					
Weight of plate scrapings					
Recorder:					
Total Weight for Week:					

Start of Week Date: _____

	List Types of Food	Weight of Plate Scrapings	Temperature of Pile	Observations
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
		Total Weight:	Average Temperature:	

* Make observations about the compost bin structure, any animal activity, the temperature of the compost, or any other important information. Report your observations to your teacher.

Appendix IV: Compost Signs

Sings above the compost buckets and trash cans will make it easier for students to compost the items on their food trays. We have included the following set of signs to meet the needs of any composting program.

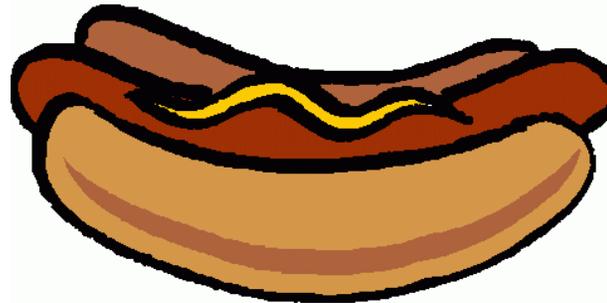
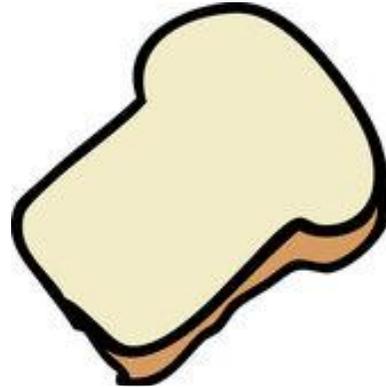
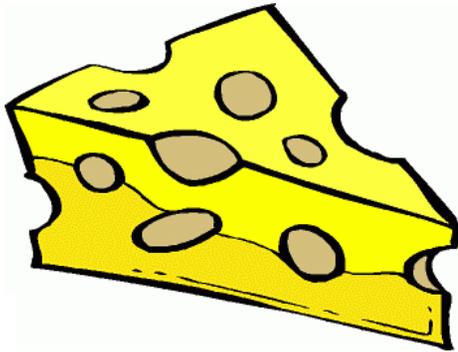
Set 1: *Picture* compost & garbage signs that **include meat** being composted

Set 2: *Picture* compost & garbage signs that do not include meat being composted

Set 3: *Word* compost & garbage signs that **include meat** being composted

Set 4: *Word* compost & garbage signs that do not include meat being composted

COMPOST!



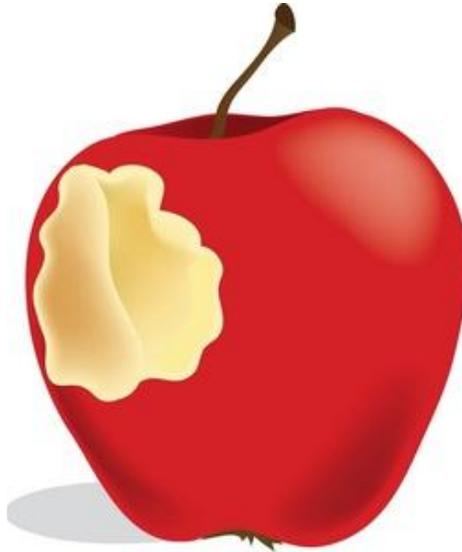
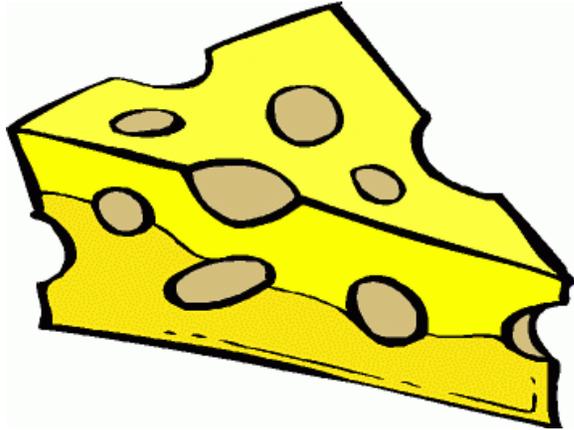
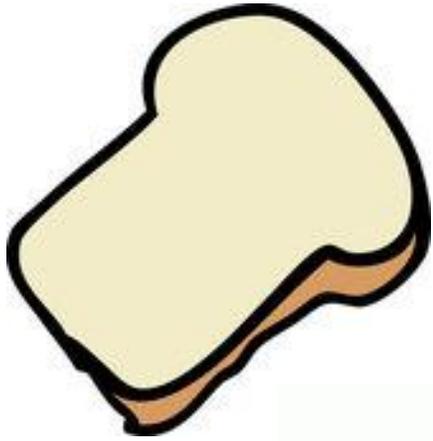
Guide to

GARBAGE!

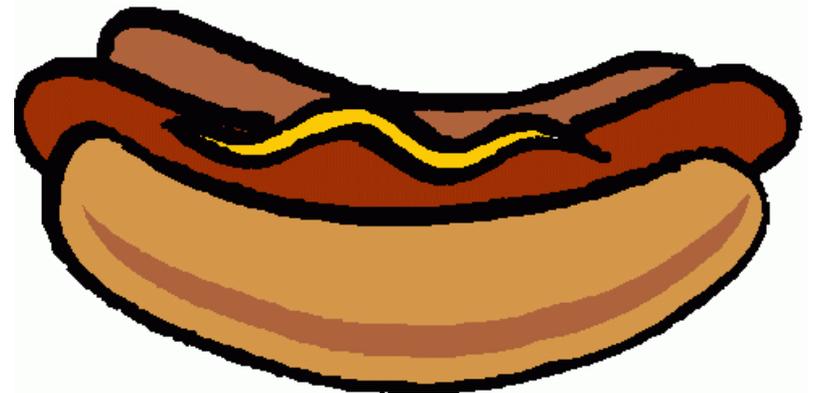


Composting

COMPOST!



GARBAGE!



post

COMPOST!

- ❖ **FRUITS & VEGETABLES**
- ❖ **MEAT**
- ❖ **BREAD**
- ❖ **CHEESE**
- ❖ **PEANUT BUTTER & JELLY**
- ❖ **CHIPS**
- ❖ **CHOCOLATE**

GARBAGE!

- ❖ **MILK/JUICE CARTONS**
- ❖ **NAPKINS**
- ❖ **PLASTIC BAGS**
- ❖ **PLASTIC FORKS**
- ❖ **ANYTHING PLASTIC,
METAL, OR GLASS**

COMPOST!

- ❖ **FRUITS & VEGETABLES**
- ❖ **BREAD**
- ❖ **CHEESE**
- ❖ **PEANUT BUTTER & JELLY**
- ❖ **CHIPS**
- ❖ **FRUIT SNACKS**
- ❖ **CHOCOLATE**

GARBAGE!

- ❖ **MEAT**
- ❖ **MILK/JUICE CARTONS**
- ❖ **NAPKINS**
- ❖ **PLASTIC BAGS**
- ❖ **ANYTHING PLASTIC,
METAL, OR GLASS**

Appendix V: Compost Contacts

This is a location to store important compost contacts. When you secure a source for hay or manure, or an individual to transport compost, be sure to note that information.

Appendix VI: Compost Bin Design

The following design is for a 3-Bin Composting System prepared by HighFields for Holland Elementary School.

Notes and Suggestions:

- Sauna tubing and concrete below frost level for the structural posts--this prevents twist to the structure during freezing and warming of ground
- At least four inches of $\frac{3}{4}$ " inch gravel for appropriate drainage and as a rodent deterrent, in front, beneath and around bins—roughly 2 cubic yards
- A appropriate step-stool for when food scraps in bin reach 2+ feet in height and top Dutch door needs to be closed

Tools Needed (multiples of each): Hammers, staple gun, hand saw, circular saw, square, tape measure, table saw, portable drill with bits for drilling and roofing screws, posthole digger, shovel, and level.

Unnoted costs in materials list

Lumber (costs are rounded up to the half dollar):

1) 2x4x12: bin bottom supports	cost: \$3.50
10) 2x4x8: ridge supports	cost: \$20.50
2) 2x4x16: rafter braces	cost: \$8.50
2) 2x4x10: rafter braces	cost: \$5.50

Hardware:

6) hook and eye set	cost: \$18.00
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Gravel:

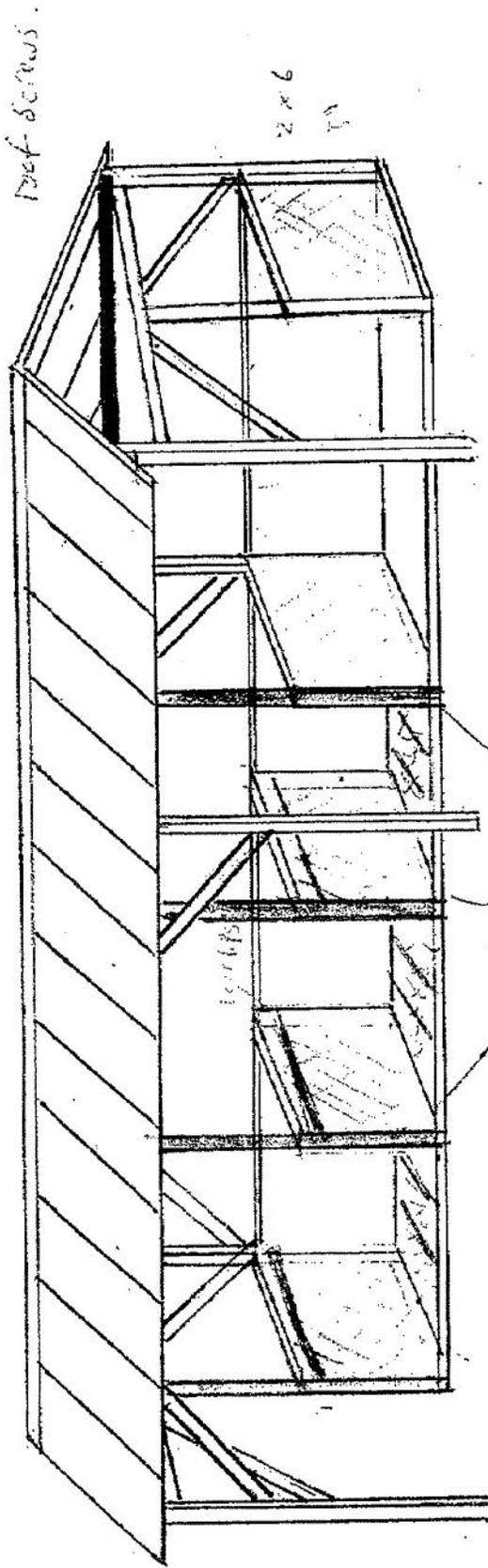
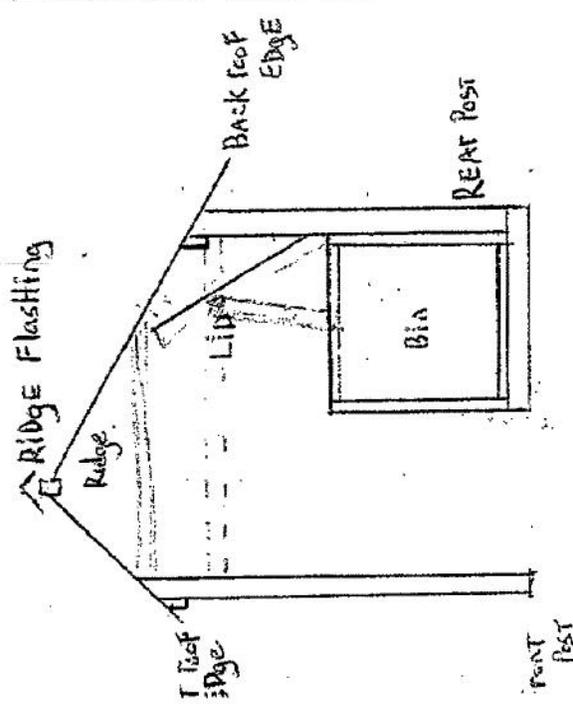
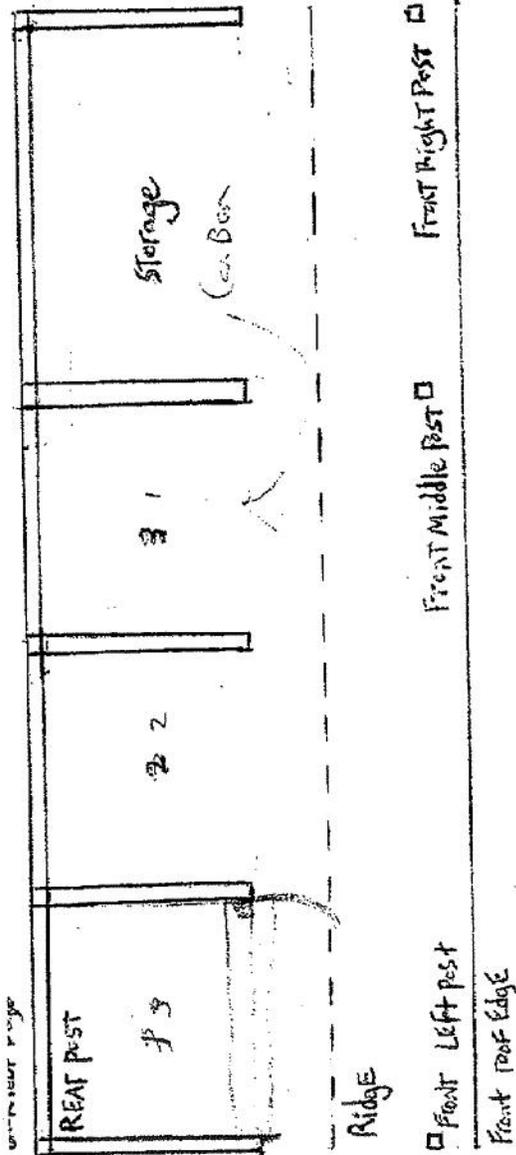
2) Cubic yard bank run gravel	cost: \$20
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Subtotal Cost: \$76

Materials List Subtotal: \$846.11*

Grand Total: \$922.11

*Lumber in this quote is dressed. Using rough cut lumber is likely to reduce the cost substantially.



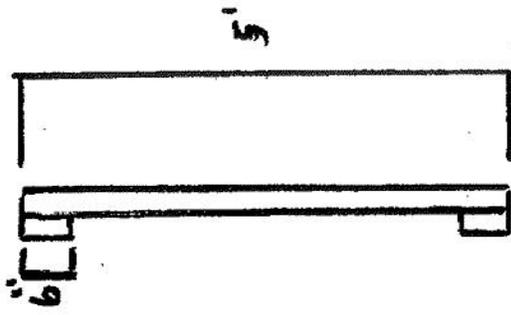
PROPOSED LAYOUT
 HOLLAND SCHOOL
 3-Bin Composting System
 PREPARED BY: HIGHFIELDS
 M. Schmitt

PROPOSED LAYOUT VISUAL
 SHOWS WITH NO DOORS OR LIDS

DOORS x 3

Total Lumber:
 6) 2x6x10 \$ 23.4
 3) 2x6x8 \$ 7.1
 12) 3" Hinges \$ 36.
 15' of 40" Hardware cloth 1/4" (included)

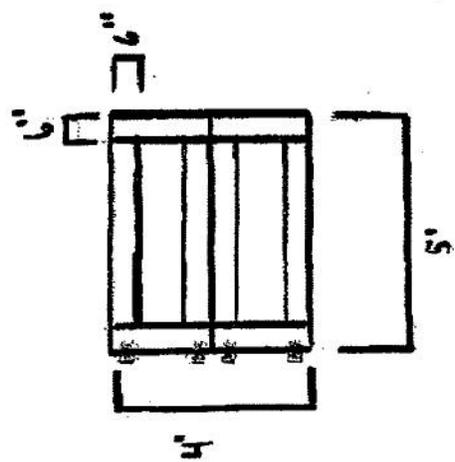
TOTAL: \$ 68.5



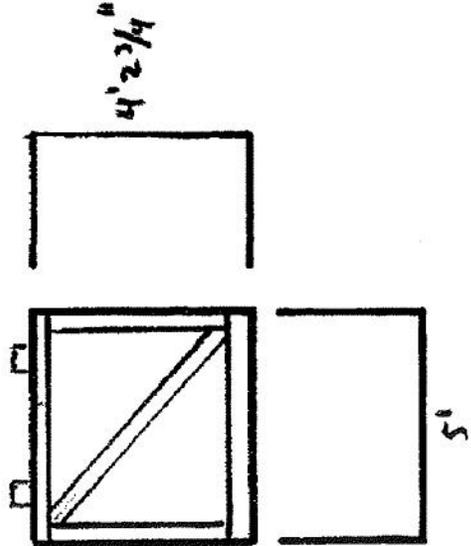
TOP



SIDE



FRONT



BACK

FRONT

Total: \$ 52.50

\$ 6.50

LIDS x 3

TOTAL LUMBER 3) 2x4x10 \$ 7.00
 * ALL LIDS 1) 2x4x20 (cross brace) \$ 5.50
 3) 2x4x8 \$ 6.5
 6) 3" Hinges \$ 18.00
 3) Appropriate handles \$ 9.00
 3) 2x4x8 (Lid stops ripped in 1/2)

Appendix VI: Trouble Shooting Guide

Problem	Cause	Solution
Compost pile contains earwigs, slugs and/or other insects	Pile is composting correctly	Insects are a good sign of a productive compost pile!
Compost pile is attracting raccoons, dogs, flies or other pests	Amount or type of greens incorrect	Avoid meats, bones, oils
	Exposed food scraps	Place food scraps in center of pile and cover completely with browns
	Compost bin needs repair	Keep the bin well maintained
Compost isn't heating up	If it seems damp and sweet-smelling, it may be a lack of nitrogen	Mix in food scraps or other materials high in nitrogen
	Not enough moisture	Add water
	Not enough oxygen	Turn or fluff the pile
	Pile may be too small (less than a cubic yard)	Build the pile up to 3' x 3' x 3'
Temperature levels off	More food scraps needed	Add more greens
	Composting is finished	If it looks dark and crumbly and smells earthy, it is time to remove compost and let it cure. Begin a new pile.
Matted, undercomposed layers of leaves or food scraps	Compaction, poor aeration	Break up layers with garden fork, or shred them, then re-layer or turn the pile Avoid adding thick layers of bulking materials

Large, undercomposed materials	Size and composition of materials	Screen out undercomposed items, shred and reuse in new pile Reduce particle size by shredding
Compost pile has a bad odor like a mixture of rancid butter, vinegar and rotten eggs	Not enough oxygen, compaction	Turn the pile and shake materials to loosen and aerate
	Not enough oxygen, too wet	Turn the pile and add coarse dry materials such as leaves, wood shavings, sawdust, straw or shredded newspaper to soak up excess moisture
Compost has a bad odor like ammonia	Pile may have too much nitrogen	Add materials high in carbon such as leaves, wood shavings, sawdust, straw or shredded newspaper Mix in to aerate

*Taken from: *School Composting: A Manual for Connecticut Schools*. (2002). Connecticut, Connecticut Department of Environmental Protection.

Appendix VIII: Resources

ORGANIZATIONS

Compost Association of Vermont

www.compostingvermont.org/

U.S. Composting Council

631-737-4931

www.compostingcouncil.org/

NEK Waste Management District

Marcus Berry: Outreach Coordinator

outreach@nekwmd.org

802-626-3532

www.nekwmd.org/composting.html

Highfields Institute

Josh Kelly, Project Manager for Close the Loop Program
Ext. 204

Josh@highfieldscomposting.org

802-472-5138

www.highfieldsinstitute.org/

UVM Extension Master Gardener office

Nancy Hulett, Director

Lisa Avery, Program Assistant

Master.gardener@uvm.edu

802-656-9562

www.uvm.edu/mastergardener/mastercomposter

- Vermont Master Composter Course

The Association of Vermont Recyclers

info@vtrecyclers.org

(800)223-0150 ext. 17

<http://www.vtrecyclers.org/>

- Trash on the Lawn Day- Trash Audits
- Compost Play

Chittenden Solid Waste District

Jessica Sankey

802-872-8111

info@cswd.net

<http://www.cswd.net/programs/schools-students/>

- Trash on the Lawn Day- Trash Audits
- Customizable Posters
- School Composting Guides
- Presentations and Consultation
- Recycling and Composting Containers
- Signs, Stickers and Posters
- Phone and E-mail Contact for Questions
- Ongoing discounted Compost Bin Sales
- Video Library

Green Mountain Soil in Stowe, VT

Kurt Reichelt

kurt@greenmountainsoil.com

802-595-9681

www.greenmountainsoil.com

- Red Wigglers – Worm Composting

Down To Earth Worm Farm

281 The Bend Rd

Greensboro Bend, VT 05842

802-533-9836

www.downtoearthwormfarmvt.com

- Red Wigglers- Worm Composting

BOOKS:

Let It Rot by Stu Campbell

Worms Eat My Garbage by Mary Applehof

The Rodale Book of Composting edited by Deborah Martin & Grace Gershuny

Compost! Growing Gardens from Your Garbage by Linda Glaser and Anca Hariton

CURRICULUM GUIDES

Do the Rot Thing

Central Vermont Solid Waste Management District, 2007

Funded by State of Vermont Department of Environmental Conservation

http://www.cvswwmd.org/wp/wp-content/files/pdf/Do_the_Rot_Thing_CVSWMD1.pdf

Composting Across the Curriculum, A Teacher's Guide to Composting

Marin County Office of Waste Management

Funded by the U.S. EPA

10 N. San Pedro Rd, Suite 1022

San Rafael, CA 94903

Project Learning Tree Exploring Environmental Issues: Municipal Solid Waste

American Forest Foundation with the Council for Environmental Education, 1997

Kellogg Environmental Center

PO Box 435

Derby, CT 06418

A Quest for Less, A Teacher's Guide to Reducing, Reusing, and Recycling

U.S. EPA

1200 Pennsylvania Ave, NW (5305W)

Washington, DC 20460

November 2000

www.epa.gov/osw (you can download or print all or part of the document)

The Wonderful World of Wigglers

Julia Hand

Food Works

64 Main Street

Montpelier, VT 05602

A Common Roots Book, 1995

What a Waste! A Teacher's Resource for Integrating the Solid Waste Crisis into the Classroom

The Garbage Museum

1410 Honeyspot Rd. Extension

Stratford, CT 06615

1992

MAGAZINES

Biocycle
Emmaus, PA
www.biocycle.net

Composting News
Cleveland, OH
(440) 238-6603
www.recycle.cc

WEBSITES

Cornell University website: www.cfe.cornell.edu/compost

Master Composter: www.mastercomposter.com

The Virtual Composter: www.compostinfo.com

University of Minnesota Extension Service:
www.extension.umn.edu/distribution/horticulture/DG3296.html

VIDEO

<http://www.cswd.net/wp-content/uploads/2010/10/CSWDSchoolPrograms.pdf>

<http://www.highfieldscomposting.org/CompostVideo1.htm> "Compost Only" School Composting
Instructional Rap Video – Highfields

<http://downtoearthwormfarmvt.com/videos> Worm Composting - Down to Earth Farm