

# A Guide for School Composting



Help your school reduce waste,  
save money, and save the planet!

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## Introduction

The purpose of this Guide is to provide all the necessary information to get a successful and fully functional on-site composting system up and running at your school. We have included general information on the processes of composting, step-by-step procedures on how to set up the program, as well as task assignments for general maintenance, a communication plan and troubleshooting tips. This Guide serves to help educators, administrators and school staff develop a school-wide composting program. For more details regarding tools for composting and classroom activity ideas, read the companion booklet “Tools and Activities for School Composting.”

*I am only one, but I am one. I cannot do everything, but I can do something. And I will not let what I cannot do interfere with what I can do.*

~ Edward Everett Hale



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## What is Composting?



Composting is the process of decomposing organic materials (food scraps and yard waste) into a nutrient-rich fertilizer that can be applied to school gardens and landscapes. It is an easy and teachable method for significant waste reduction, which promotes the health of our planet.

## Why Compost at School?

Composting is a great teaching tool as it's a positive learning opportunity for students to understand our impact on the earth's systems. Students will gain a **better understanding of ecosystems**

and how they interact, the **cycle of organic materials** and the **impact of waste reduction**. This helps to promote the development of responsible, eco-conscious future leaders.

Composting also teaches students about the growth cycle by returning organics back into the ground and connecting us to the earth. The diversity of nutrients and micro-organisms found in finished compost significantly improves plant growth. These nutrients will be slowly released into the soil, increasing stability, improving drainage and retaining moisture.

By choosing to compost at your school, you are **reducing your impact** by keeping organics out of landfills. This is important because:

- Organic materials added to landfills break down anaerobically (without oxygen) to produce methane gas, a greenhouse gas 21 times more harmful than CO<sub>2</sub>; and
- Buried organics can react with metals in the landfill to produce toxic leachate, a potential source of groundwater pollution.

**“As a result of our composting program, our school is saving lots of money on garbage collection. We have reduced our garbage pick up to every 2 weeks instead of every week.”**

**Jane Couch, principal at Stevenson-Britannia School**

Curriculum-links to composting can be found in a number of areas:

- The process of decomposition and soil regeneration is an important curriculum connection for **Science** learning objectives.
- **Social Sciences** can be addressed by developing an understanding our relationship with the planet, our community and how we fit in it.
- **Outdoor education** such as maintaining a compost bin can be a powerful experiential learning experience where students are actively involved in natural processes.



## Food Waste Prevention

Creating an eco-conscious school requires a number of initiatives and programs. However, prior to setting goals in waste reduction such as composting, the act of reducing is also important to emphasize. Studies show that over 50% of food is wasted in average Canadian households.<sup>1</sup> Primary causes of such waste are consumer attitudes towards food, over-purchasing of discounted foods, poor meal planning and disposal of edible food.

Consider working on changing behaviours and assumptions related to consumption. Have discussions on food waste and prevention strategies (litter-less lunches, meal planning, unnecessary purchases, etc.).

A well-developed food-waste prevention campaign at school can help raise awareness about this pressing issue.

**“Composting in schools is a practice that not only allows children to become active participants in caring for the earth, but it also serves as a practical application to meet many curricular needs of the classroom.”**

**Kevin Kehler, teacher at Grosvenor School**

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<sup>1</sup> Developing an Industry Led Approach to Addressing Food Waste in Canada, Prepared by Nicoleta Uzea, Martin Gooch and David Sparling (2013).

# Composting Basics

## Compost Biology

Composting is the process of decomposition of organic matter. This is achieved with the help of various organisms, comprising a complex food web. These organisms are drawn to and help break down the compost pile. Micro-organisms (1st level consumers) include bacteria, actinomycetes, fungi and protozoa, whereas macro-organisms (2nd and 3rd level consumers) are critters such as mites, springtails, beetles, and millipedes. In order to maintain a properly functioning compost pile, it is important to take care of these organisms, ensuring their productivity in breaking down the material. In the same way that you would maintain a pet, they need food, water and air.



## Food

There are two main types of organics that can be put into your compost bin, “greens” and “browns.” **Greens** are wet materials rich in nitrogen, while **browns** are generally dry and rich in carbon. You need both of these materials to have a successful compost pile. Create layers by always covering your greens with approximately twice as many browns. This will help to maintain the proper balance.

The following items are accepted in an on-site school compost bin:



### GREENS

Vegetable and fruit scraps, coffee grounds/filters, tea leaves/bags, fresh garden waste, fresh weeds without seeds, fresh grass clippings.



### BROWNS

Dry leaves, shredded paper, straw, sawdust, wood-chips from untreated wood, twigs, dried grass clippings and garden waste, dried weeds without seeds, paper napkins.

***Always cover greens with approximately twice as many browns.***

## AVOID

Certain items are better left out of a school on-site compost pile to avoid attracting unwanted pests.



**Do not add** meat, fish, eggs, dairy products, oily foods, bones, pet waste, weeds with mature seeds, plants infected with disease, plastic or petroleum products, metals, or synthetic materials.



**Bread** is a compostable item but **is not recommended for school composting** in order to keep the separation rules simplified. For example, a meat sandwich should not be included if the students are not separating the meat out.

## Water

Your compost pile should have a moisture content of approximately 50%, an ideal amount for the biology of the compost pile. To conduct a quick check of the pile, take a handful of compost and squeeze it in your hand. Your hand should be moist and drip only a few drops when squeezed tightly. Add water periodically to ensure sufficient moisture, especially during the hot, drier months.



## Air/Oxygen

Aeration is important as it provides oxygen to the organisms in the compost pile, producing an efficient composting system. A lack of air causes the pile to become anaerobic, producing an unpleasant odour and slowing decomposition. Aerate your pile once a week using a pitchfork, shovel or an aerating tool.



## Temperature

Once you have obtained the right balance of food, water and air, the bacteria in the pile will thrive and release heat energy causing the temperature to rise. When the pile reaches approximately 38 degrees Celsius, a very efficient bacteria called thermophiles take over the pile. Regular aeration and continual addition of food (browns and greens) and enough moisture will keep them working to break down the materials.





When your bin is full, continue to aerate and add moisture occasionally to allow the materials to fully decompose. The temperature will eventually decrease and thermophiles will leave the pile while the macro-organisms and fungi begin to dominate and consume the residue.

If your pile does not attain high temperatures that attract thermophiles, other micro and macro organisms will still break down your materials, but at a slower rate. A compost thermometer for the pile will help to understand the fluctuation of temperatures and maintain an efficient compost system.

## Setting Up Your Compost Program

### Bin Location

Bins should be placed in a convenient location for students to deposit collected materials, with access to water. Ensure that the bin will remain accessible during the winter months, where the snow will be cleared. Whenever possible, place bins in half sun and half shade to promote faster decomposition without drying the pile during hot summers. Additionally, it is helpful to place the bins on grass or soil when possible.

### Type of Bin

There are many options for compost bins. Choosing the right bin depends on various factors, including **size, cost, safety and access to the compost pile.**

Green Action Centre recommends a **multi-bin composter** for school-wide composting because it is durable and designed to handle the large amount of organic materials generated from a school. As well, they are optimal for accessibility to work and learn about compost.



Several **single composters, such as the Earth Machine**, are an affordable option for schools and may be selected when space is an issue. However, these bins tend to fill up quickly and purchasing multiple bins will likely be required.



## Compost Tools

### COLLECTION PAILS

Pails are to be distributed throughout the school and placed in convenient locations. They should be appropriately sized for the amount of scraps that are generated. A cafeteria kitchen may benefit from a large pail. The pail should have a lid to prevent odours and fruit flies, be well labeled with allowable and avoidable foods, and be located in a logical place, near the garbage and recycling bins.



Set up the cafeteria and classroom waste-separation systems using signs and labels. Consult the custodial staff as to the best placement of the food-waste bin and schedule student monitors for lunch periods to watch for contamination.

### AERATING DEVICE

A compost aerator or turner is a helpful tool for turning and adding air pockets to a compost pile. A pitch fork or shovel are also alternatives.



### SIGNAGE AND OTHER POTENTIAL TOOLS

A series of other tools are useful for good maintenance of the bin and excellent teaching tools. They include: rake, shears, pitch fork, shovel, thermometer, Solvita kits, signage/posters about composting and tracking sheets.

### Brown Sources

It is important to have a significant amount of brown sources available in the spring when your pile begins to melt (see winter composting below). Options for brown sources include dry leaves, sawdust, straw, wood-chips or shavings and shredded newspaper. Consider organizing a raking activity with your students to collect leaves for storage.

## People Needed

### STAFF



A lead educator that is passionate about composting and waste reduction is needed to oversee the school composting program. The educator may also be required to offer brief compost training sessions to other staff members. If the lead is enthusiastic and motivated by the program, this will incite others to become more involved. Monitoring and emptying of the pails and other tasks that the students can do, will need to be supervised by staff as the program is getting started.

### CHAMPIONS



These students are the ambassadors of the program as they serve to maintain and ensure the success of the system. The champions should receive a specialized training session outlining the details of tasks and maintenance procedures. They should be able to answer questions from other students, assist in the record keeping and present the process to other groups of students. These students could also be recognized visibly in the school (t-shirt, badge, apron, etc.), as well as earn certain rewards and incentives for their dedication (year-end lunch party, prizes, recognition in the newsletter, etc.).

**“Students involved in Argyle’s composting program often comment at the end of the week, ‘We are helping the planet one bucket at a time.’”**

**John Danko, Science/Math teacher, Argyle Alternative High School**



### STUDENTS

All students must fully understand the process of composting and be educated on the requirements. Assembly meetings, classroom presentations, informal teachings and signage are a good way to keep the students involved.

### COMMITTED VOLUNTEERS

In order to maintain the bin during the summer months, community volunteers (or school staff) would be very useful for the program. They should have a full understanding of the composting process and troubleshooting techniques. Access to the bin (if it is locked), as well as any recording charts, a water source and compost turner are essential for the proper maintenance of the bin.

## How to Get Buy-In from School Staff and Parents



The custodial and kitchen staff should be consulted at the outset. It's critical that they be on board with the program and understand the process. The kitchen staff will be responsible for the waste separation in the kitchen and should be consulted on:

- The location of collection pails and bins; and,
- Determining waste separation system in the cafeteria kitchen.

Parents are also a good ally for school composting programs. They can help get the program off the ground.

- A presentation at the Parent Council meeting to outline program goals and give specific examples of how they can help.
- A parent group may take the program on as a project, help fund-raise for needed materials, or provide incentives for student volunteers.
- An article in the Parent Council newsletter will help spread the word.

## Communication Plan

Communication with the staff, especially the custodial staff, is extremely important. Consider organizing a lunch hour or after-work seminar to go over the basics. This will help to ensure that everyone knows what to expect once the program is underway.

Use the designated champions to conduct presentations and skits on the topic and empower them to be the educators for the staff and students. Consider these ideas for stimulating interest on the topic:

- In-class presentations with costumes and props on the proper way to separate the foods, explain the decomposition process or why it's important. Have the students perform short skits during a school assembly.
- Students who compost correctly are given a ticket after they dump their scraps. A daily draw for small prizes will motivate students to participate (for example, a gift certificate for ice cream, a book, a sticker, a compost-themed item such as a plant, package of seeds).



- Connect program with existing celebrations such as Earth Day, Waste Reduction Week, International Compost Awareness Week, etc.
- Contests: offer prizes for compost-themed posters, run a scavenger hunt, put on a compost-themed quiz show, etc.
- School compost club: use in-school and extracurricular activities to encourage a sense of ownership of the program for students and staff.

## Compost Maintenance

### Compost Rotation Method

When composting at school, you will have large amounts of food scraps to manage. It is recommended to use a rotation method with a multi-bin compost unit or multiple single bins. Concentrate on creating layers of greens and browns and aerating in one bin before moving on to another. Once the first bin is full, stop adding food but continue to aerate and check moisture so that decomposition is accelerated. This bin is now designated a “maturing” compost pile. Meanwhile start a new pile in a second bin, continuing with the same layering and aeration process. The third bin can be used to store brown materials such as dead leaves or sawdust if an alternative storage location is not available. Depending on the volume of organics generated by your school, this method can work with more than three bins should you need more space.



Using signage to help keep track of the active and maturing piles can be helpful if several people are responsible for maintaining the compost bin. **Add and Don't Add** signs (found in the equipment list) are good tools.

### Winter Composting

The procedure changes slightly in winter. Because the pile will be mostly frozen, there is no need to add brown materials throughout the winter months. Keep adding green materials to the frozen pile. Once the materials start to thaw, the materials will decompose faster. Begin to add your stored leaves (or other browns) and stir the contents to regain the balance and begin composting.

## Harvesting and Using Your Compost

Compost is ready to be harvested when the product is a **rich dark brown color and smells earthy**. The compost is **not** ready if there is still recognisable food content, foul odors or heat being generated from the pile. With the rotation method, a “maturing bin” should have finished compost approximately one year from the onset of the program. Harvesting in the fall will help to ensure that any remaining decomposition needed can happen during the winter months.



A compost screen can be used to filter out any remaining large organic materials such as fruit pits and twigs. Spend some time passing your finished product through a screen to get a smooth, fluffy product to add to your garden. Distribute finished compost to the garden by tilling approximately 3-5 cm of finished compost into the soil at the depth 10-15 cm.

## Summer Plan

During the summer months when the intake of organic scraps slows down and there are no students to maintain the bin, the required maintenance is less. However, for the pile to continue decomposing and to deter unwanted pests, help from a volunteer or custodial staff is highly recommended. Depending on the state of the pile and the level of humidity for the summer season, a designated person would visit the bin, check on the status of the pile, turn it periodically and add some water if the summer is particularly dry.



- Discuss the summer plan with your students, custodial staff and perhaps the parent council to identify a volunteer that is willing to attend to the bin
- Ensure that the volunteer has access to all necessary equipment (turner, water hose, key to the lock, etc.)
- Pre-schedule the visits to ensure commitment and regular maintenance. One to two visits per month should be sufficient, weather depending. A particularly dry summer may require more frequent watering of the bin.

## Maintenance Tasks

### Starting Your Pile

- Start your pile with a generous layer of browns on the bottom
- Alternate the layers of greens and browns
- Use 2 to 3 times as much browns as greens

### Daily

- Collect food scraps from all collection pails around the school
- Transfer classroom food scraps into one pail (optional)
- Dump food scraps in outdoor bin
- Add a layer of brown material (when the pile is frozen, this is not required) to cover the greens and prevent odour
- Rinse collection pails and return to classrooms

### Weekly

- Aerate pile using a turning tool – compost turner, pitch fork, shovel, etc.
- Check moisture level of the pile – squeeze in your hand
- Ensure sufficient brown materials are in supply
- Observe/track the stage of decomposition of the pile based on sight, smell and feel

### Annually

- Check your bin and repair any damages
- Check the status of your pile, is it ready to harvest?
- Clean out any contaminants (plastic or synthetic materials)
- Reassign tasks as students change
- Reassess the collection system in place for any needed improvements
- Provide training and education to incoming students
- Continue to educate and encourage staff and students on how to compost and why it is important

# A Guide for School Composting

## Contact Us

If you have questions about composting, Green Action Centre is here to help. Visit our website at [greenactioncentre.ca](http://greenactioncentre.ca) for detailed information on home, school, and workplace composting, vermicomposting, compost bin plans, and many other subjects.

**You can call us on our toll-free compost InfoLine at 1-866-394-8880 or in Winnipeg at 204-925-3777.**

Green Action Centre would like to thank Manitoba Sustainable Development for financial support.

## About Us

Green Action Centre is a non-profit hub that promotes greener and better living by sharing practical solutions and advocating for change.

Sign up for our e-newsletter. Stay informed and make a difference in your community.

## Happy Composting!



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