



Backyard Composting

Presenters Workshop Overview: Composting

One third of Canadian household waste is high nutrient organic material¹. The majority of this material is hauled off to Canada's landfills for disposal. Unfortunately, landfill disposal does not enable natural decomposition of organics, therefore rendering the nutrients contained in these materials virtually lost. This is a harmful to the environment for two reasons. Firstly, these nutrients can no longer be cycled naturally. Secondly, one third of the material entering landfills can be proactively disposed elsewhere, thereby reducing pressures to expand or create new landfills.

The Composting Workshop was developed by One Simple Act (OSA) to help reduce the barriers impeding Albertans from composting at home. The Workshop aims to inform Albertans about reducing the waste we send to landfills by implementing outdoor and indoor composting.



This document is intended as a presenter's resource to familiarize you with the workshop and associated tools. Please contact One Simple Act at aenv.act@gov.ab.ca for more information or if you have any questions.

¹ Natural Resources Canada, 2006.

The goals of this workshop are:

1. To gain an understanding of the benefits of composting at home and elsewhere.
2. To successfully start a backyard and/or vermicompost bin.
3. To address troubleshooting issues through group discussion.

The Workshop Audience:

While this workshop can be delivered to both adults and children, it is more relevant for adults because they have more experience working with yard and kitchen waste. Adults are also more receptive to the informational PowerPoint presentation format of this workshop than children. The composting activities will engage and involve children, although learning the specific “do’s and don’ts” of composting will likely not appeal to them. Children are best included when they come with other members of their family. This way, the children will be engaged in the activities, leaving the adults able to take note of the details. Family composting workshops tend to be a lot of fun and very successful. (If you intend to deliver a composting workshop to children only, OSA can provide lesson plan created specially for 4-6 years.)

The presentation can be given to a group of any size, although the backyard composting activity is best for a group size ranging from 4 to 20 individuals. The vermicomposting activity, which consists of building the vermicompost bin, can be done with a group of any size.

Location and Time:

This workshop is best held indoors in a room with a computer, projector, and screen. It is best to have participants seated at tables (with their group members if the number of workshop participants warrants working in groups).

This workshop has two parts: backyard composting and vermicomposting. These sections can be presented together or separately. Each section can be completed in 1 hour, including group discussion. If you wish to conduct both sections together, the workshop can be completed in 1.5 hours because some of the introductory information is the same for both sections. Regardless, the workshop facilitator should manage group discussion to meet the time requirements.

Before the Presentation:

Once you have committed to presenting a composting workshop, take some time to research the community. Consider the following things:

1. Does the community have any composting facilities?

2. Does the community have any by-laws about composting? (*This is of note in alpine or northern communities, especially where wildlife is a concern.*)
3. Do the local hardware stores carry composters?
4. Where is the closest distributor of red wigglers for vermicomposting?

Presentation Materials

1. PowerPoint Presentation

The PowerPoint presentation provides a visually stimulating and attractive backdrop for the workshop. Be sure to have the title slide of the presentation projected on the screen as participants enter into the room. Refer to the workshop script for slide change cues throughout the presentation. The presentation is fairly reliant upon the PowerPoint to demonstrate the concepts, tips, and tools discussed. Therefore, if you do not have access to a projector, or do not wish to utilize the PowerPoint, you will have to tailor the presentation to be strictly verbal.

2. Workshop Lesson Plans

The lesson plan will help the presenter deliver the presentation. There is a significant amount of information dispensed throughout the workshop, it is highly recommended to have a copy of the lesson plan on hand for reference. In addition, give yourself plenty of time in advance to learn the material so your presentation is informative and enjoyable for participants.

3. Composing Pamphlets

There are two brochures available for composting workshops. One is called, *Backyard Composting to Reduce Organic Waste* and the other is *Vermicomposting to Reduce Kitchen Waste*. PDF versions of these brochures are located at:

<http://environment.gov.ab.ca/edu/listingEd.asp?txtsearch=composting&searchtype=asset&audience=Public>

4. Bag of Compost

A small plastic bag of finished compost is stored together with the materials for the activity. Pass the bag around in the presentation to demonstrate what finished compost looks, smells and feels like. You may need to provide this on your own.

5. Backyard Composting Activity Materials

You will need to locate backyard-composting materials if you are presenting the backyard composting portion of the workshop. These materials may consist of:

- Small transparent or wire compost bins
- Twigs
- Greens: plastic and wooden fruits, vegetables, and green foliage
- Browns: felt leaves or fall leaves, coffee filters, raffia
- Soil: large square pieces of brown felt
- Water: square pieces of blue cloths or felt
- Inappropriate compost items: fish, plastic forks, bones, sunglasses
- Sun: paper or wooden
- Reusable bags



Before the workshop, separate all of the twigs, greens, browns, soil, water, non-compostable items, and suns into the reusable bags. Do not divide the materials evenly; each bag should *not* have all the components of a good compost bin.

The lesson plan denotes when the backyard composting activity should be done. When it is time to run the activity, divide the participants into groups of 2 to 5 people and provide each group a mini compost-bin, a backyard composting pamphlet, and one of the reusable bags you have filled with composting items.

The object of the activity is to have each team build a compost bin by using the information found in the composting pamphlet. Because each team does not have all the necessary materials, they will have to trade, beg, or borrow materials from their neighbours. When each team has completed their compost bin, review the steps, talk about any difficulties, look at the items that were not included, and discuss how sun can benefit composting but is not necessary.

6. Vermicomposting Activity Materials

You will need the vermicomposting materials only if you are presenting the vermicomposting portion of the workshop. These materials can consist of:

- A Rubbermaid bin (*recommended dimensions: 60 x 40 x 20 cm*)
- A hand held drill and a drill bit (to make ¼ inch holes)
- A spray bottle of water
- Newspaper
- Approximately a pound of red wiggler worms
- A plastic or rubber gloves to handle the worms

The lesson plan denotes when the bin building activity should take place. The purpose of this activity is to have the group build a vermicompost bin together.

Ask for one volunteer to drill holes in the lid and high on the sides of the Rubbermaid bin with the drill. Ask the remaining individuals to rip the newspaper into long strips. Pass the container of worms around for people to see while others are ripping the paper. If they wish to hold the worms, have them put on the gloves. When enough holes have been drilled in the top of the bin (20-30 holes), remove any plastic bits and place the shredded newspaper in the bin. Choose a volunteer to spray and fluff the newspaper until it feels as damp as a wet sponge. Have everyone feel the damp newspaper to give them a reference point for building future bins. Ask a volunteer to place the red wigglers into their new home, sandwiched within the newspaper.

In the past, OSA has given away the vermicompost bin to a participant to take home. If this is possible, find out who is interested in taking the bin home (not everyone will be). Ask the interested participants to write their names on strips of paper and draw a winner from the names you've collected.



7. One Simple Act Commitment Cards

Once the workshop is complete, ask each participant to make a personal commitment to compost at home. If they are still not interested or ready to start composting, guide the participants to choose any other action they are prepared to tackle; something they will *actually* do, not just something they will think about. Once a simple action has been chosen, the individual will write out their commitment on a One Simple Act commitment form and sign their name. Research has shown that when someone writes down and signs their name to something, they are more likely to follow through with it².

http://www.onesimpleact.alberta.ca/docs/ACT_commitment_form.pdf

Each participant can then take their card home following the workshop as a reminder of their commitment. The commitment card can also serve as an inspiration to others to begin taking environmental action.



² <http://www.cbsm.com/public/world.lasso>, accessed February 4, 2010.

8. Workshop Evaluation Form

Have each participant complete and return an evaluation form (provided in this document). It is useful to have a large envelope for participants to place their completed sheets into before they leave (rather than giving them directly to the presenter). Though this workshop generally receives a great degree of positive feedback, it is always helpful to get constructive criticism to improve the workshop in the future. Therefore, placing evaluation forms in an envelope allows for participant anonymity and increases the likelihood for useful improvement tips.

Workshop Delivery Tips

1. Review the workshop content well in advance of the presentation date to be sure you feel comfortable with the material you will be presenting.
2. As with any presentation, being flexible and adaptable is pertinent. Do not be put off if the number of participants is less than you had expected. As you deliver the presentation, read your audience's comprehension level. If the audience is looking lost or bored, adapt your presentation style, language, and energy level.
3. It is often valuable to begin the workshop by having everyone share their composting experiences (as well as introduce themselves). This will create a dialogue and encourage participants to ask questions and comment throughout the workshop.
4. Monitor group conversation. Be conscious of timing, but also try to allow space for conversations which add value to the workshop. Participants will learn more if they feel involved, and have been given the opportunity to share their own stories.
5. During the backyard composting activity, keep extra composting items to yourself. Sometimes groups will use up all their browns or greens in one layer instead of trading, leaving some groups short on materials. By keeping some material out, you can help out any groups that are struggling to finish.
6. If you have experience with composting, incorporating your personal experiences, and talking about your routines will add a lot to the presentation. This is especially true for the vermicomposting portion because people are often hesitant to accept the idea of keeping worms in the house.

Vermicompost Lesson Plan

Target Audience: Adults interested in composting

Setting: This workshop can be done inside or outside. Tables are required for the activity. If the workshop is outside you may have to modify because you will not have access to PowerPoint.

Time Required: 1 hour

Learning Objectives:

- ⇒ Participants will gain an understanding of the benefits of composting.
- ⇒ Participants will be able to successfully start a backyard compost bin.

Materials:

- ⇒ Sign up page
- ⇒ Evaluation Questionnaire
- ⇒ Lesson plan
- ⇒ Referenced lesson plan
- ⇒ LCD projector
- ⇒ Laptop
- ⇒ PowerPoint presentation
- ⇒ Remote slide clicker (optional)
- ⇒ Backyard Composting brochures

Supplies for activity

- ⇒ Transparent mini compost bins
- ⇒ Greens - plastic and wooden fruits, vegetables, and foliage
- ⇒ Browns – felt leaves, coffee filters, raffia
- ⇒ Twigs
- ⇒ Soil – brown pieces of felt
- ⇒ Blue cloths to represent water
- ⇒ Unacceptable compost items like fish, plastic forks, bones
- ⇒ Wooden suns
- ⇒ Reusable bags
- ⇒ Bag of finished compost

What you should find out about the community before the presentation:

- Does the community have any composting facilities?
- Does the community have any by-laws about composting (especially important for mountain or northern communities).
- Do the local hardware stores carry composters?

Working with adult learners:

- Adult education should tap into the experiences and knowledge adults come with, begin with what they know.
- Adults learn more if they discover it for themselves.
- Adults should have some control over the learning process, including setting goals and learning how to learn.

- Adult education should help solve immediate problems or issues they encounter in daily living and working.
- Adults need to process and use information immediately after it is presented.

Introduction

My name is _____ I am with _____. *(Please give a brief introduction and tell the audience a little more about yourself)*

Before we get started, I would like to learn a little about you and why you have come to this workshop. Please tell us your name and one thing you are hoping to get out of today.

This helps set up a two way dialogue and allows you to find out some of the knowledge in the room already. Don't forget to tell them a bit about yourself as well.

Today we will be looking at: household waste, a bit about landfills, what is composting, and how to start a vermicompost bin. We will have an activity where you will be starting a compost bin from scratch. We will also discuss some common problems you may run into and possible solutions. Let's get started.

Household Waste

When we look at the waste our society produces, it is divided into residential and non-residential sources. Non-residential are things like waste from industry, office buildings and construction waste. Residential waste is what comes out of our own homes and this is what we have some measure of control over. The average Albertan generates 289kg (637 lbs) (Stats Canada report) of residential waste every year, about 1/3 of this is organics and much of it could be composted at home.

In some communities, like Edmonton and Sherwood Park for example, organics are collected from households and composted on a large scale. This is probably one of the best solutions to reducing what goes to landfill. But most communities do not do this so composting is left up to the individual. Composting at home allows you take advantage of the benefits of composting. Let us start with what exactly is composting?

What is composting

Composting is a controlled natural biological process where bacteria, fungi (microbes), and other organisms decompose organic materials like leaves, grass clippings, and food wastes.

Decomposition is what you would call composting in nature. If decomposition or composting didn't occur our world would be riddled with dead animals and plants. The nutrients cycle back into the system to be used again by other plants and animals.

Another way to look at composting is that it is recycling materials to give growing things what they need. By removing organic material from our home and property by putting it in the garbage, we are exporting nutrients that could be recycled in our lawn or garden. A neighbor, for instance, the one with the immaculate lawn who each Fall bags his leaves as well as grass clippings and leaves them curb side. Essentially, exporting the resources the plants, trees and grasses his yard needs. Come spring the very same neighbor spends money to add fertilizer, soil enhancer and excess water to his lawn, essentially buying back the resources he just threw away.

Why compost

So, why should we compost? To get to the answer, look at the alternative, landfill.

- ⇒ Have you ever driven by your local landfill?
- ⇒ Have you ever visited your local landfill?
- ⇒ What was your impression of a landfill?

There is a distinction between a landfill and a dump. A dump is how we used to dispose of garbage, find somewhere out of the way and make a big pile. Today we use the term landfill and they are engineered storage facilities for our garbage. There is a misconception that landfills are just giant composters and organic material will just decompose, no harm done. Here are some examples of organic material from a landfill. Can anyone guess what these items are?

The photo on the left is carrots; on the right is corn with some chicken. These materials were retrieved from the landfill after 10 years!

So how does a landfill work?

Waste is collected, compacted and then covered with a mixture of soil and clay to prevent waste from being blown away or taken by birds. A landfill is an anaerobic environment, which means it is very low in oxygen. Decomposition does occur very slowly in a landfill and because it is occurring without oxygen, you get bad odors, methane gas, carbon dioxide and leachate. As materials breakdown leachate (present when materials with moisture breakdown, think about lettuce that's been in the fridge for way too long, the mush that's produced) is produced. Leachate is then collected, leachate may have harmful chemicals in it think about the items that shouldn't go to the landfill but end up there i.e. batteries, and the gases are vented out and can be collected to use as fuel.

Landfills are an important source of methane gas, which is a very powerful greenhouse, more powerful than carbon dioxide. Some landfills capture the methane and use it to heat buildings, but not all do.

So, what is the difference between landfill and composting?

How it works (Soil Organisms)

Here are your friendly neighborhood decomposers, they are essential to a healthy functioning composter. Microorganisms are at work in your bin decomposing your waste, in one spoonful of compost there is an entire ecosystem.

Bacteria - retain nutrients and make micro-aggregates to improve soil structure. Use nitrogen and carbon from organic matter to survive. Bacteria are everywhere, all over us, and can be added to a start up bin by adding soil or compost from another bin.

Fungi - retain nutrients and making micro-aggregates to improve soil structure. Feed off nitrogen and carbon from matter placed in bin and need oxygen in order to survive. *must be a balance between fungi and bacteria

Protozoa - Flagellates, Amoebae, Ciliates feed on bacteria which allow plants to access the nutrients tied up in the Bacteria (if bacteria die and are not consumed nutrients may be inaccessible to plants).

Nematodes - Nematodes consume the bacteria and fungi, which releases Nitrogen, P, S, and micronutrients that would now be available to plants.

Earthworms and Micro-arthropods - Feed off bacteria, fungi and nematodes. Because compost piles can reach temperatures of 60 Degrees Celsius many larger insects are not present.

So, if these are the organisms doing all the work, you have to take care of them and give the food in the correct proportions to allow them to thrive. What makes good compost?

If you are presenting this together with a backyard composting workshop, being here after completing the backyard composting section.

Worm Trivia: True or False

Worms cannot see. – True

Worms cannot see, but are light sensitive. If you would like to observe worms less intrusively cover the light with red cellophane as they are less sensitive to red light.

Worms have blood. – True

Worms have hemoglobin and a circulatory system similar to humans.

Worms have teeth. – False

Worms do not have teeth and can only consume particles small enough to draw into their mouth. Moisture helps to soften material and bacteria/microorganisms help to break down the material once inside of the worm. Worms also have one muscular gizzard where grainy particles are lodged and then used to break down particles by contracting the gizzard like muscles.

If a worm is cut in half both parts will grow back. – False

Some regeneration may occur if you cut off the tail of a worm, but the tail will not grow a head.

Why Vermicompost?

1. You have limited space – Vermicompost bins take up very little space and are ideal for apartment dwellers and those who don't have a large yard.
2. You can compost year round – Because the worms are kept indoors at a constant temperature you don't have to adjust or change your behaviors throughout the year
3. Educational experience – great for schools or homes with kids. A biology lesson all in itself, teaches responsibility like a pet. Also helps to encourage environmental stewardship at a young age.

4. Castings make an excellent soil conditioner – which you can add to plants and gardens.
5. Diverts materials from the landfill.

Getting Started

The Container

- The container should be 50L container with air holes in the lid (7mm holes spaced every 5cm) and can be made of wood, plastic or metal.
- Optional, Poke holes in the bottom of the bin have blocks or cans for the bin to sit on which allows air to flow through from the bottom. Bin should be placed in any convenient space where temperatures remain between 10-25 Degrees Celsius. A classroom, kitchen, storage room, or basement is a suitable location for a vermicompost bin.
- Worm Tower – Worms and bedding along with food are placed in the bottom tray, when food is added it is added to the tray above the worms. The worms migrate to where the food is located, leaving behind their castings which makes for easy compost harvesting.

The Bedding

- The bedding should fill about $\frac{3}{4}$ of the container and should be mixed to add air
- Newspaper – must be shredded
- Potting Soil – must be fertilizer free, should also add a handful of sand to provide grit
- Leaves and Straw – may get other outdoor critters in your compost bin, okay, but these may harm your worms.
- Add water – should feel like a moist wrung out sponge
- Sand – Grit should be added, this helps worms digest
- Egg Shells – Help with reproduction, must be rinsed and crushed

The Worms

- Red worms (a.k.a brandlings, red wigglers and manure worms) are ideal for composting because they process organic material quickly, 1 lb of worms eats $\frac{1}{2}$ lb of organics in a 24 hr period. - Earthworms or nightcrawlers do not process organics as quickly and are not ideal for a compost
- A 250ml container of worms is all you need to start off. You can order worms or if a neighbor has a lot of worms, which will happen, you can borrow a cup full to start your bin.
- Check out the recycling line 1-800-463-6326 for Alberta suppliers or www.cityfarmer.org for Canadian suppliers.

Multiply and Divide

A 3mth old red wiggler can produce up to 2-3 egg sacs per week; each sac contains roughly 3 hatchlings. The egg sacs take about 11 weeks (3mths) to mature and hatch. In 4-5 months you should see apple seed sized egg sacs in your compost bin, worms coming from the egg sacs will appear white and thread like but eventually will turn red. Red wigglers produce rapidly, make sure your bin isn't more than one-fifth worms if this occurs encourage a friend to begin a bin or

share them with an avid fisherman. Red wigglers shouldn't be placed in the soil outside because they live within the top layer of soil that freezes in the winter.

Create a vermicompost bin with the group to be given away at the end of the workshop

Feeding

Food

Worms enjoy most kitchen scraps such as peels, lettuce, apple cores, vegetables etc. Coffee, orange peels and tomatoes should be added in moderation; they may acidify your compost causing odors to occur. Egg shells help to control acidity and are needed for reproduction. Small amounts of breads and pasta can be added but very carefully. Meat, bones, oils and dairy shouldn't ever be added; nor should spicy, salty or large amounts of onions. These items may be harmful to your worms.

Feeding

Begin by feeding your worms about 500ml/week. Food should be frozen first and then added to the compost bin once a week. Remove bedding from the area, place food and cover. Mark where the feeding has taken place so that next week you can check to see how much of the food has been eaten and add food to a new area in the bin. By adding the food to a new area in the bin each time you are making better use of the bedding and allowing the materials to fully decompose. You may have to adjust your food amount according to how quickly the worms are eating the food and reproducing.

Harvesting

Migration Method

Move all the material over to one side of the bin; place new bedding in the space created and add food waste to the new side for the next six to eight weeks.

The worms will gradually migrate over and the finished compost can be removed.

Cone Method

Dump the bin onto a large plastic sheet, shape 6 to 9 cone-shaped piles.

Place a bright light over the piles for 30 minutes.

Remove the top layer of compost until you see the worms, allow the worms burrow again.

Repeat the process.

The Easy Method

The easiest method of them all is to simply leave the lid open for 10 minutes to let light drive the worms deep into the compost.

Then scoop off the top worm-free layer for use.

Two bin or Screen Method

Place a new container, with holes in the bottom, on top of your vermicompost pile. Add bedding and then add food only to the new bin, eventually worms will migrate upwards to where the food is at and the castings will be left in the old bin.

Note: Freeze compost before you use it on indoor household plants.

Common Problems

This is meant to be done as an interactive activity. Ask the participants to partner up. Assign each partner a problem to troubleshoot (Common problems are listed in the vermicomposting pamphlet). Have the participants consult the brochure to find the solutions and have them share these with the group.

Conclusion

Encourage individuals to make commitments to composting and use this time to answer any questions.

EVALUATION QUESTIONNAIRE

Please reflect on this workshop and let us know what worked well and what needs improvement. Your input will help us enhance future workshops and resources. Your individual responses are confidential.

EVENT INFORMATION

Workshop Name: _____ **Facilitator(s)** _____
Workshop Location: _____ **Date:** _____

OVERALL ASSESSMENT

1. Please indicate your overall assessment of the workshop.

- Very Effective
 Effective
 Somewhat Effective
 Definitely Not Effective

WORKSHOP OVERVIEW

Please check the best measures your level of agreement with the following statements:

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
<u>Workshop Content</u>					
The workshop objectives were clear to me.					
This workshop lived up to my expectations.					
The content is useful/applicable to me.					
<u>Workshop Design</u>					
The workshop activities stimulated my learning.					
The difficulty level of this workshop was appropriate.					
The pace of this workshop was appropriate.					
<u>Workshop Facilitator(s)</u>					
The instructor(s) was well prepared.					
The instructor (s) was helpful.					
<u>Workshop Results</u>					
I will be able to use what I learned in this workshop.					
I believe the goals of the workshop were met.					

2. Which topics or aspects of the workshop did you find most interesting or useful?

3. How will you apply what you learned at this workshop? Please complete the following statement:

As a result of this workshop, I intend to:

4. Please tell us how we could make this workshop more effective. Please tell us what topics you would like more information on and share other comments you may have.

BUILDING THE MOVEMENT

5. How would you like to continue your engagement with *One Simple Act*? Please check all items that interest you.

- Add my email to the *One Simple Act* electronic newsletter
- I would like to share my progress with *One Simple Act*. Please contact me by phone or email within six months to learn how I used the information from this workshop.

Name: _____ Phone: _____

Email: _____

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