

How to: Run an Introduction to Home Composting Workshop

Introduction

This guide is intended for individuals or groups wanting to run an 'Introduction to Home Composting' Workshop. Let us know if you use it and send feedback to info@cagoxfordshire.org.uk

This document covers the following topics:

- What is composting?
- What are the benefits of making compost?
- Why make compost from food waste?
- Who are the composting creatures?
- Aerobic versus anaerobic composting
- Position and size
- What makes good compost?
- What can you compost?
- Carbon to nitrogen ratio (C:N) of materials
- Getting the mix right
- Composting systems
- Practical activity ideas
- Frequently asked questions

TIP:

Ask your participants whether they have tried composting.

Did they try garden waste, food waste or both?

What are they most interested in?

Tailor the session to match

The guide can be used as the basis for the workshop, especially if it is taking place outdoors without the ability to present slides. It will probably take around one hour, depending on how interactive you make the session and the number of questions.

DECIDE:

Your venue
Indoors or outdoors?
Online or in person?
How long will it be?
How many participants?

An accompanying slide set is available for indoor or online workshops. You can adapt this to meet the aims of your workshop. The presentation takes 30-40 minutes; allow extra time for questions. The workshop works well as an interactive outdoor workshop for 15 people or less. As an indoor or online talk, a larger audience would be fine.

Think about promoting your event - give people at least 4 weeks notice. Do you have a newsletter where you can advertise? Is there a local parish or community newsletter or a social media group for your area? We can help promote the event in the CAG newsletters and on our socials (comms@cagoxfordshire.org.uk).

What is composting?

- Compost is made when organic matter (something that is, or used to be, alive), such as food scraps and garden waste, is eaten/digested by living creatures/organisms for energy.
- Complex organisms (e.g. plants) are broken down into more basic elements and we call this end product, compost.

What are the benefits of making your own compost?

Good for your wallet

Shop-bought compost can be expensive. Composting transforms kitchen and garden “waste” into a valuable resource while costing very little.

Good for the soil

- Once the organic matter has been broken down, the nutrients locked within them are more available to plants and other organisms that form part of the soil ecosystem (also known as the ‘soil food web’).
- Food waste is high in nitrogen. This is an important nutrient for plants, particularly vegetables.
- Improves soil structure, especially if heavy clay or very light sandy soil.
- While shop-bought compost may be sterile, homemade compost is teeming with life (such as bacteria and fungi) that help create a living soil.

INTERACT:

Ask your audience why they do/want to do home composting

What are the benefits to: them, their gardens the environment?

Why make compost from food waste?

Different ways of dealing with food waste:

- **Put it in your general waste bin:** In Oxfordshire, general waste goes to an incinerator where it is burnt alongside other waste. As food waste contains a lot of water (around 70%), it doesn't burn well - slowing down the process and wasting energy and money.
In many counties, general waste goes to landfill. Food waste in landfill breaks down without air (anaerobically), meaning it releases methane into the atmosphere and contributes to climate change. NB. Methane is a very potent greenhouse gas (25% more than carbon dioxide)
- **Put it in your food recycling bin:** Most food that is recycled in Oxfordshire goes to an Anaerobic Digester. The food breaks down and produces methane. This is captured and burnt to generate electricity which is fed into the national grid. The remaining liquid material (digestate) can be used as a fertiliser on farmland. Dealing with food waste in this way is better for the environment, but collecting and transporting food waste from homes still has a carbon footprint.
- **Compost it at home:** This is the least polluting process, as waste is recycled 'in house' into a usable resource.

Who are the composting creatures?

There are thousands of living creatures/organisms involved in the composting process. These include:

- **Microorganisms** (small organisms) like bacteria and fungi
- **Macroorganisms** (big) like worms, millipedes, ants, woodlice, slugs and snails

Diversity leads to resilience: a healthy compost pile contains many different types of organisms that are suited to different environmental conditions. This means that as conditions in the pile change (for example, you have a very cold winter, or a very hot and dry summer) there are still some creatures that can survive in your pile - meaning it is resilient.

Aerobic versus anaerobic composting

- **Aerobic composting** - organic matter is broken down by aerobic organisms - this means they require oxygen to survive
- **Anaerobic composting** - organic matter is broken down by anaerobic organisms - they don't require oxygen to survive

Why do we want aerobic composting?

- It's a faster process
- The bacterial activity produces heat, which can kill diseases and weed seeds
- Carbon dioxide is produced instead of methane - this is better for the climate
- It's not smelly

For aerobic composting to happen, it's important to make sure there is enough oxygen in your compost pile.

The 3 stages of aerobic composting

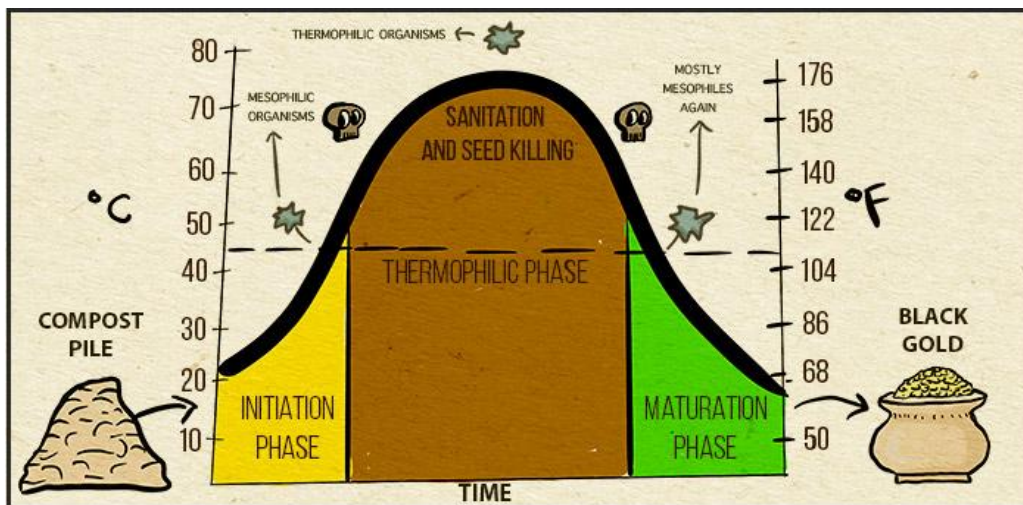


Image by [Kirstynn Joseph](#) from [Untamed Science](#)

1. Mesophilic stage: This stage is dominated by mesophilic microorganisms. The compost heap starts to warm up as these organisms increase in number, break down materials into smaller pieces and give off heat. This stage takes 5-10 days.
2. Thermophilic stage: As the heat increases, heat-loving thermophilic microorganisms take over, creating an even hotter pile. Most of the plant materials are broken down during this stage. Stage 2 can last weeks or months, depending on the other conditions. In order to kill pathogens and weed seed the temperature needs to reach 60 °C for a prolonged period. In the UK, this can be difficult to achieve without using a hot composter.
3. Maturing stage: As thermophilic microorganisms use up easily available proteins, fats, and complex carbohydrates, the compost enters the maturing stage and the mesophiles take over again. Tougher material is broken down, with more work done by larger creatures like worms, millipedes, ants, woodlice, slugs and snails.

Position and size of compost heap

Directly on the ground: positioning directly on the soil or grass allows worms and other organisms to get in and excess water to drain into the surrounding soil. Can situate on concrete, but less ideal.

Sheltered location: stops your pile overheating or drying out due to hot sun or wind and stops it getting very wet from rain. A partly sunny position will help it heat up.

Near a water source: compost heaps need to be kept moist, so position near a water butt/tap or make sure your hose pipe can reach.

Away from fences/sheds: as the compost heats up there is a slight fire risk, especially in summer. Keeping the contents moist will help prevent this.

Away from trees: to avoid roots growing under or into the compost bin and to prevent them from taking all the moisture and drying out your compost.

Accessible: choose a convenient location to both add new materials and to empty the bin. Consider if you can access the site with a wheelbarrow to transfer the compost to where you want to use it and position it fairly near your veg patch / flower beds. Passing or visiting the site regularly also reduces the chance of rodents nesting, especially if you make noise.

3-5 feet or 1.5 metres cubed: is a good size to retain moisture and large enough to heat up sufficiently. Bigger bins will get hotter and produce compost faster, so choose the largest size you can fit in the space available, especially in a cooler climate.

What makes good compost?

A mix of material: different creatures in the pile have different diets. Having a mix of organic matter for them to eat supports diversity.

Add some organisms: a spade full of material from an established heap will introduce bacteria and other organisms, and some soil from the 'forest floor' will introduce fungi.

INTERACT:

Ask some members of your audience to suggest one thing you need to make good compost and then you can explain why

Material of the right size: Smaller materials have more surface area, making it easier for organisms to digest them. This leads to faster decomposition. Particularly important for tougher materials that are more difficult to break down, such as woody materials. Chop up kitchen waste, shred or mow garden waste.

Warmth: important for heat-loving thermophilic bacteria. Use a compost thermometer with a probe to check the temperature within your pile

Oxygen: Aerobic bacteria and other organisms require oxygen to survive.

To aerate the pile:

- Add woodchip or screwed up newspaper to create air pockets
- Make chimneys in the pile by poking holes with a big stick
- Turn the pile regularly with a garden fork or compost aerator
- Mix up different materials well through the pile
- Ensure the right amount of water - see next point...

Water: The creatures in your compost need this to survive, but if there's too much water, there isn't space for air and it's difficult for the creatures to access oxygen. The composting process will slow, and anaerobic composting may take place.

Checking moisture levels:

- **The squeeze test:** Mix your compost, pick up a handful (with gloves on!) and squeeze it. It should release 2-3 drops of water.
- **Signs there isn't enough water:** It looks dry, there are ants in the pile. To fix add greens like food waste and grass clippings, or water the pile and mix well.
- **Signs it's too wet:** It's smelly and things are not breaking down quickly. Fix by adding more dry materials like woodchip, cardboard and newspaper and mix well. Cover the pile.

What can you compost?

Any organic material will break down to form compost, but some materials should not be added, especially in a cold composting system or one that is not fully enclosed.

YES	NO
Coffee grounds, tea leaves / tea bags	Cooked food - OK in some systems
Grass clippings / garden waste / leaves	Meat/fish and dairy - OK in some systems
Fruit and vegetable scraps	Fats and oils
Hay* - avoid hay that contains a lot of seeds	Dog poo and cat litter
Manure*	Non-organic materials (plastic, metal, glass)
Wood chips or wood ash	Perennial weed roots and weed seeds
Shredded cardboard, paper or newspaper	Diseased plant material
Straw / bedding from vegetarian pets	Charcoal or coal ash
Wool / cotton	

*Avoid hay that is non-organic as it can contain aminopyralid, a type of weed killer. Aminopyralid can also be in **manure** of cattle and horses fed on non-organic hay.

Carbon to nitrogen ratio (C:N) of materials

- Carbon and nitrogen are 2 key elements that composting organisms need to survive, providing them with energy, proteins etc.
- You need a balance of carbonaceous and nitrogenous materials to make sure the microorganisms have what they need.

Table of materials and their C:N ratio

High carbon materials (aka browns)	C:N	High nitrogen materials (aka greens)	C:N
Wood chips	400:1	Vegetable scraps	25:1
Cardboard	350:1	Coffee grounds	20:1
Paper	175:1	Grass clippings	20:1
Straw	75:1	Manure	15:1
		Vetch (similar for other legumes)	11:1

TIP:

Running an in person workshop?

Take some example green and brown materials in containers and use these as props.

Or mix them up and ask people to decide if each material is 'green' or 'brown'.

Or include some items you can't always compost and ask your audience to say yes or no.

Is there anything else they add to their compost?

- All materials are higher in carbon than nitrogen, but for 'high carbon' materials this difference is very big and for 'high nitrogen' materials it is much smaller.
- Materials high in carbon are called "browns" and those high in nitrogen called "greens" - this can be confusing as browns are not always brown in colour, and greens not always green!
- Aim for roughly 50% high carbon and 50% high nitrogen materials
- Adding 10% very high nitrogen materials (like legumes, coffee grounds or urine) can help feed bacteria and get the party started.
- [Sharewaste](#) connects people with compostable waste to dispose of with those who need it.

Getting the mix right?

It can be hard to know exactly how much of each material to put in, as all have different C:N, but you can observe your compost and notice the signs...

Signs of too much high nitrogen matter:

- Smelly : excess nitrogen means pile can release ammonia which smells bad
- Smelly, slow to break down and wet: high nitrogen materials normally have more water content - doesn't leave much space for air - can get anaerobic

Fix by mixing in carbonaceous materials. Wood chips or scrunched up newspaper are useful for adding air pockets.

Signs of too much high carbon matter:







- Slow to break down, dry - bacteria are key players in breaking down organic matter. They need enough nitrogen to survive so without this you can't support large populations of bacteria and the process will be slow.

Fix by mixing in high nitrogen ingredients - sometimes also adding some water

Layers: Add high nitrogen and high carbon ingredients in layers so that ingredients are mixed throughout.

Often, especially if you're composting food waste, your problem will be too much nitrogen as opposed to not enough.

Composting systems - available in Oxfordshire from www.getcomposting.com/

System	Indoors or outdoors?	Food waste?	Pros	Cons
Dalek bin - £25+ 	Outdoors	No	Cheap No assembly required	Not rodent/fox proof Avoid weeds/seeds/diseased material Difficult to access finished product and to turn / aerate - use aerator Takes 6-12 months
Wood or Pallet bays - £0 	Outdoors	No	Free/cheap Easy to turn with 2+ bays - 3 bay system is best Turn single bay with garden fork Good for large volumes	Not rodent/fox proof Avoid weeds/seeds/diseased plants If one bay only, need to stop adding new material to allow compost to form
Hot bin - £140+ 	Outdoors	Yes, including meat/fish/bones	Insulated and fully enclosed Gets to 60 °C - OK for weeds, seeds and diseased plants Faster - takes approx. 3 months	Expensive Limited capacity Better to mix green and brown material first
Tumbler - £50+ 	Outdoors	Yes, not meat/fish or bones	Fully enclosed and off the ground Easy to turn Good for batch composting Fast - takes 4-8 weeks - remove partially composted material to mature - won't attract rodents	Limited capacity Can become heavy and more difficult to turn Better to mix green and brown (wood chip or shredded paper) material first
Wormery - £60+ 	Indoors or outdoors	Yes, not meat/fish or bones	Produces two products: - Rich compost/worm poo - Liquid feed: dilute 1:10 water Clean and odourless Require little space Fast - takes 2-3 months	Limited capacity Requires special worms - red wigglers or tiger worms - can buy online Worms don't like onions/garlic or citrus fruit/peel Can't add lots of food at once
Bokashi bin - £25 	Indoors or outdoors (will slow down if cold)	Yes, including meat/fish/dairy	Produces two products - Solid fermented waste - Liquid feed: dilute 1:100 water Requires little space	Requires specialist bran (£15 for 9-12 month supply) Solid material not fully ready - bury or add to outdoor compost system



TIP:

Print out an enlarged copy of the tables in this guide to show participants:

What you can and can't compost
Carbon: nitrogen ratios
Compost systems

DEMONSTRATE:

Take a small homemade wormery and/or Bokashi bin (plus or minus contents) with you to show participants



See [How to Make a Mini Worm Farm](#)

Practical activity ideas

Make a new compost heap or pile

or you could turn / add to an existing pile, perhaps one that has slowed down

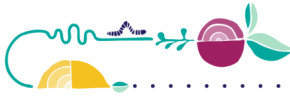
What you'll need

Twigs or straw
 Green and brown materials
 Very high nitrogen material
 Some compost from another heap or garden soil
 Secateurs or pruning sheers
 Water
 Fork or spade
 Gloves



Steps

1. Walk around the location and choose a good site for the compost (see above)
2. Wet the ground first - this helps to retain moisture in the pile
3. On bare earth, lay woody materials like twigs around 10-12 cm deep to help drainage or use a wooden pallet as a base
4. Add a layer of 'green' materials (fruit/veg scraps, fresh garden clippings, small amounts of grass) around 10 cm deep and then add a 10-15 cm layer of 'brown' materials (torn cardboard, woodchips, shredded paper, autumn leaves)
5. Chop up, tear or shred larger materials
6. Sprinkle each layer with water if materials are dry or if the weather is hot
7. Include crushed egg shells and wood ash sparingly between layers if available.
8. Sprinkle in some compost from an existing pile and/or some garden soil to add composting creatures
9. Add a high nitrogen material like animal manure (including chickens), grass clippings, vetch or coffee grounds to activate the pile
10. Continue to add alternate layers until you run out of materials
11. Don't squash down and end with a carbon layer
12. Cover the pile with wood, cardboard or plastic or metal sheeting to help retain heat and moisture / stop it getting too wet in winter (not essential)



Make compost tea

What you'll need

- 5 gallon bucket
- Water (rain water or dechlorinated tap water)
- 1 shovel full of finished compost
- Mesh bag or garden sieve
- Stick or other stirring implement
- Watering can or spray bottle

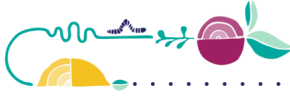


Steps

1. Fill the bucket with rain water* to about three quarters
2. Add a shovel full (around 500g) of compost to a muslin, burlap or other mesh bag - you can even use an old pair of tights (it should be around 1 part compost to 5 water) or add the compost directly to the water**
3. Squeeze the bag to ensure it absorbs the water or stir several times to mix the compost into the water
4. Ideally stir every few hours to oxygenate the water
5. Leave for 1-24 hours, but don't use if it starts to smell bad as there could be harmful bacteria like e-coli
6. Remove and squeeze out the bag or strain using the sieve covered in an old piece of cotton or old tea towel
7. Use your tea immediately diluted 1:10 parts water to water plants or spray on the foliage
8. Return the solid material to the compost heap

*If using tap water, leave uncovered to dechlorinate for 24 hours before adding the compost

** Some recipes include adding extra food for the bacteria and fungi e.g., 1 tbsp seaweed fertiliser or unsulphured molasses and involve adding more air to the mix using a pump.



Frequently Asked Questions

Q. Will my compost smell bad?

A. No, properly managed compost should not smell unpleasant. It might smell if there is too much 'green' material or excess water, or not enough oxygen.

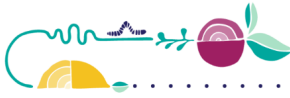
Add more 'brown' material.
Turn or mix well.
Make holes with a stick to add air.
Veg scraps can be kept in the freezer until added to the compost.

Q. How can I get rid of house flies in my compost?

A. House flies are attracted by decomposing food and manure and will lay eggs in the pile.

Cover these items with 'brown' materials like cardboard and/or a layer of soil.

Turn the pile regularly to heat it up, which will discourage flies.



Q. How can I stop rats living in or visiting my compost pile?

A. Rats are looking for food and shelter. Use an enclosed system i.e., wormery, bokashi, tumbler or hot bin - rats don't like the heat. Place dalek on concrete and line base with strong wire mesh.

Avoid cooked food, meat, fish, dairy, egg shells and potato peels.
Keep moist, turn regularly, make noise and position in a more open location.

Q. Can I compost 'compostable' or 'biodegradable' packaging, cups or cutlery?

A. No, it is not advised to compost these materials unless they are specifically labelled as 'home compostable'

“Biodegradable” just means it can be broken down into smaller pieces by microorganisms, but the material might not be organic and could contain plastic. The term is not currently regulated.

“Compostable” usually means the material is compostable in commercial composters. Home composting systems don't usually get hot enough to fully breakdown this material.