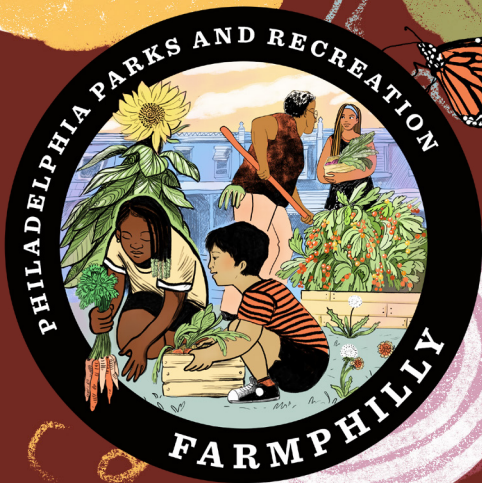


Philadelphia

Community

Compost

Manual



Philadelphia Community Compost Manual 2022

Acknowledgments

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Introduction

This manual is a guide for community-led composting activities that can be built in any neighborhood. The manual was developed by Farm Philly as a public resource, and was initiated after the development of the Community Compost Network in 2019. Anyone interested in local and community-scale composting, including home composting, can benefit from reading this manual. Its primary focus, though, is on community garden sites interested in providing neighborhood participants with an opportunity to compost their food scraps and, in doing so, make finished compost that can be used to help grow healthy gardens, plants, and trees. ***This manual is a guide for community groups, community gardens or a collective of residents who want to create their own community-led composting sites.***

In the pages ahead, you will learn about:

- The brief history of municipal composting in Philadelphia
- Collecting and storing your food scraps so you can make them into compost
- Collecting and storing other materials necessary for making your food scraps into compost, such as fall leaves and wood chips
- Equipment and other resources you will need for making compost
- The importance of water and air in making compost
- Heat as a byproduct of, and indicator for, the composting process
- Recording data about the process and amount of food scraps composted
- Ways to use your finished compost
- Ways that people of all ages and abilities in your community can be involved in the process

Farm Philly

The mission of Philadelphia Parks and Recreation is to create and nurture thriving public green spaces informed by our commitment to sustainability, open space, the environment, and urban agriculture. In 2014, Parks & Rec established Farm Philly as its Urban Agriculture Program to serve the various agriculture constituencies across the city. Through diverse programming, Farm Philly connects Philadelphians to the natural world and physical activity while supporting the self-determination and sovereignty of communities to grow and produce their own food. The program supports urban agriculture projects on parkland and is actively involved in food policy and advocacy within the city. The Community Compost Network is one of the public programs managed by Farm Philly.

In conjunction with these efforts, the City of Philadelphia's Zero Waste and Litter Action Plan and Greenworks Sustainability Plan calls for a multitiered approach to introducing citywide composting. In order for this work to be effective and accessible, local residents must be engaged and given support to practice the basic principles and systems of composting, and all City agencies must work together to make citywide composting a sustainable reality for Philadelphia. The Community Composting Network and this subsequent manual are supporting residents to move the city towards accessible composting city-wide, and to participate in local food waste diversion while learning about the enriching science of composting.



Community Compost Network

Philadelphia Parks and Recreation (Parks & Rec) launched the Community Compost Network (CCN) in 2019, modeled after a similar program instituted by the Department of Parks and Recreation in Washington, DC. Currently, the program supports composting at 13 sites across the city (two schools, nine community gardens, and two farms). To launch CCN, Parks & Rec provided the initial 13 CCN sites with three-bin composting systems (each measuring 4 ft x 4 ft x 12 ft), supplies (e.g., thermometers, shovels, a wheelbarrow, sifters, etc.), education materials, and training (in-person and virtual). Trainings for this inaugural cohort were led by the Institute for Local Self-Reliance (ILSR) in partnership with Parks & Rec in fall 2019 and spring 2021.

The bins were constructed by the Urban Forestry Crew of PowerCorpsPHL, a career training program working with AmeriCorps, and delivered by PowerCorpsPHL, the City of Philadelphia, and Parks & Rec. This program's success relies on the incredible partnerships with PowerCorpsPHL, ILSR, and the entire 2019 CCN cohort. Farm Philly wants residents to know that this type of grassroots approach to reducing waste is having a direct impact on neighborhoods and landfills, and is making a new resource from which residents can benefit.

If you start a new community composting site and would like to connect with other folks in our network, feel free to reach out to FarmPhilly@phila.gov.

Chapter 1

What Is Community Composting?



Composting

Composting is the process of transforming materials such as food scraps, fall leaves, and yard trimmings into compost, a valuable soil amendment. It is a controlled decomposition process done by combining these organic materials—in the right proportions and with air and water—that people in your community might otherwise throw away as trash. Composting can be done in many systems and sizes. You can create compost within your community, then use that compost to grow healthy plants.

Most of America's food scraps today are thrown into a dumpster or trash can, then end up in a landfill or incinerator. When sent to a landfill, wasted food sits in a dumping ground and contributes to emissions of methane, a highly potent greenhouse gas. Greenhouse gasses trap the sun's heat in the Earth's atmosphere, which causes the planet and oceans to warm at alarming rates. A warming planet (i.e. climate change) leads to severe weather, including droughts, floods, extremely hot summers, and freezing winters. Incinerators burn waste materials and are highly polluting because they release many pollutants and toxins that harm local air quality. Composting your food scraps helps our environment instead of hurting it the way landfills and incinerators do.

Lastly, compost is not soil; it's a soil enhancer. Think of compost as a vitamin you give to your soil from time to time to make it healthier. It is the product of microbial activity and is teeming with life. When added to soil, compost provides organic matter, nutrients, and biological diversity that help grow healthier plants. Compost also improves soil structure and fends off compaction, which also increases the ability of soil to hold water.

Community Composting

Community composting is a hyperlocal way to prevent food scraps from going into harmful landfills or incinerators. The Institute for Local Self-Reliance (ILSR) defines community composting as keeping the process and product as local as possible while engaging the community through participation and education. The idea is that the compost is used within the same community where the material is generated.

Community composting is an environmental justice issue. Black, Brown and lower-income neighborhoods often receive inferior municipal services, including street cleaning and trash collection. When trash piles up, the smell and mess can cause stress for residents and disrupt their ability to enjoy their neighborhoods. Trash landfills are also frequently located in or near Black and Brown neighborhoods and negatively impact residents through environmental pollution.

While there are many issues to tackle, community composting is one way for residents to take control of their own waste management. Composting food scraps significantly reduces the amount of trash that is thrown away. Neighbors could use composting on the community level to bring more awareness to trash and dumping, and participate in diverting food scraps to safe and clean compost operations. One of the many positive results of this community-led action is the opportunity to share valuable compost with neighbors to improve the soil in street trees, parks and community gardens.

Community Composting as a Closed Loop

Closed-loop recycling describes the circular process by which a discarded product or material is converted into a new product or converted back to raw material indefinitely without losing its properties during the recycling process. This illustration depicts what this recycling loop might look like for community composting. Volunteers, neighbors, gardeners, and farmers come together for a common cause, improving the social and environmental fabric of their community. They collect and convert food scraps into compost at a community site, where they use the compost to build healthy soil and grow food. The resulting food scraps from the food grown are again collected and the cycle repeats. Community composting promotes social inclusion, community power, and self-determination, and provides a direct way to be active in caring for the Earth and our community.

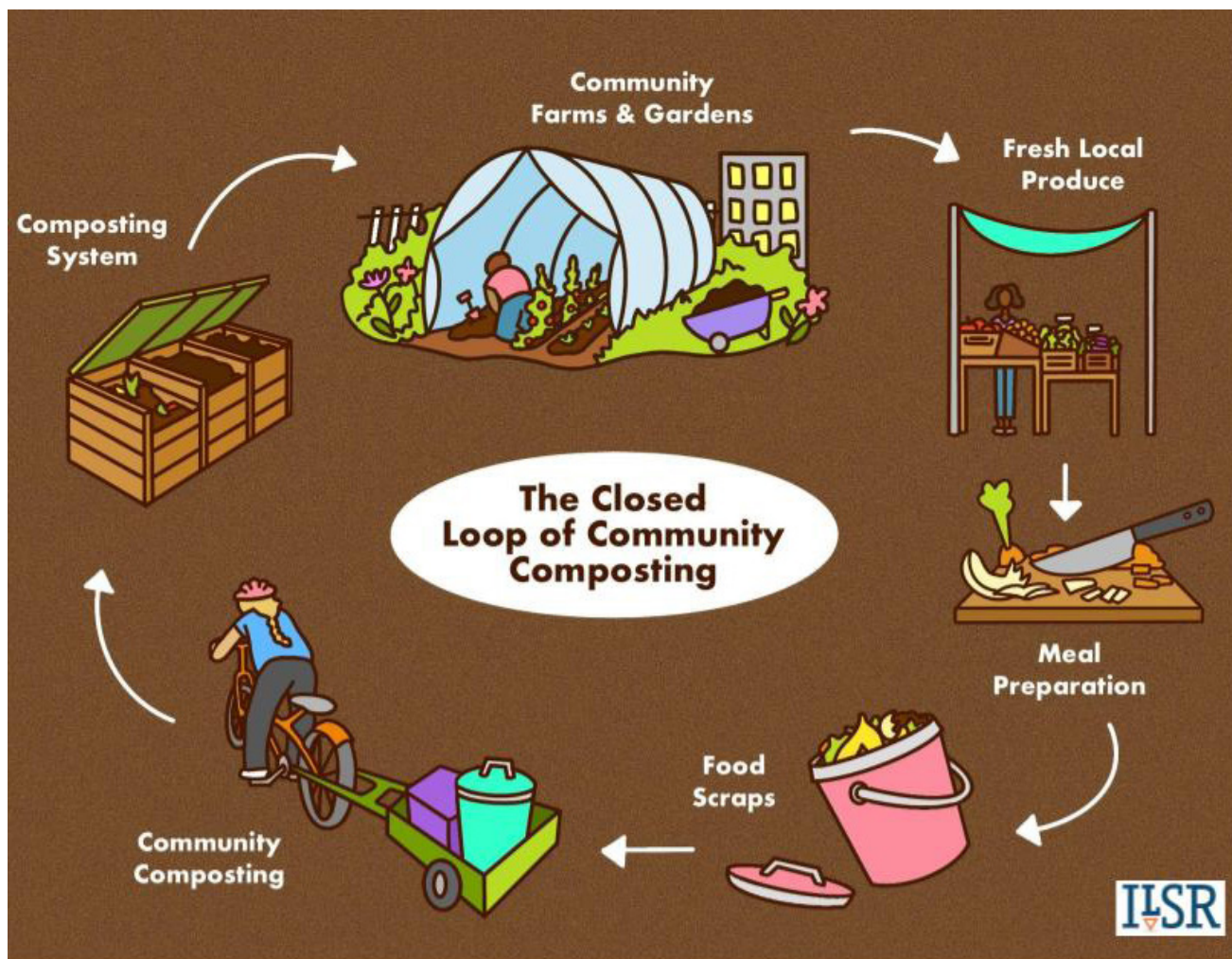


Image: Illustration of the closed loop of community composting. Courtesy of the Institute for Local Self-Reliance. Art credit: Clarissa Libertelli. Reprinted with permission.

The Brief History of Municipal Composting in Philadelphia

Philadelphians have been composting as long as they have been eating and growing food. Community gardens and farms have various systems for composting, and households have handled their food waste in a number of ways from backyard compost piles to in-sink garbage disposals. Philadelphia Parks and Recreation (Parks & Rec) even has its own Organics Recycling Center in Fairmount Park, where leaves and herbivore manure (e.g., horse manure collected from City stables and the Philadelphia Zoo) are composted and offered back to residents and businesses free or at a reduced cost. The facility, starting in 1981, was developed to cost-effectively divert City-collected leaves from landfills, which is mandated by the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). Not only does the facility help the City to meet State leaf waste requirements, it also helps the City manage the abundance of woody and vegetative materials in parks and city forests. The compost produced at the Center is approved for various applications and is tested periodically through one of the US Composting Council's recommended labs.

Curbside compost pickup has gone through different forms in the city. From 1920 to 1995, New Jersey pig farmers were paid by the City of Philadelphia to come pick up household food scraps to feed their pigs. This program helped to prevent significant amounts of Philadelphia's food scraps from going into landfills and saved the City money by reducing waste disposal costs. The farmers picked up an estimated 24,000 tons of food scraps per year from around 2,000 households at the height of the program. Farmers were paid around \$1.8 million per year by the City to make these pickups in the early 1990s, and the city estimated saving around \$3 million per year in trash collection and landfill costs.

The pig farmer program ended in 1995 for multiple reasons, including increased use of garbage disposals by Philadelphia households, increased consumption of processed foods not suitable for high-quality pork by Philadelphia households, and the closing of many New Jersey pig farms as farmland was sold to housing developers.

About a decade later, community-led projects and private composting companies began stepping in to fill the void of curbside food scraps pickup. More recently, in 2019, Parks & Rec developed Philadelphia's Community Compost Network to support composting efforts at community-led sites across the city. Through an open public application process, 13 sites were selected, based on the groups' capacities and missions, to manage three-bin composting systems that would collect food scraps from neighbors or nearby community members. Parks & Rec collaborated with PowerCorpsPHL to support the building and assembly of the bins. PowerCorpsPHL's Urban Forestry Crew spent two seasons constructing and delivering the bins as a construction project in their program. Through multiple grants, Parks & Rec was also able to give every site high-quality tools specifically for their composting projects, as well as hands-on training with the Institute for Local Self Reliance.

Chapter 2

Glossary



The following terms are used throughout this manual:

air Oxygen. We all breathe it, and so do the beneficial microbes that help compost piles break down.

aerobic With oxygen or air. Composting is an aerobic process. Oxygen is one key to success.

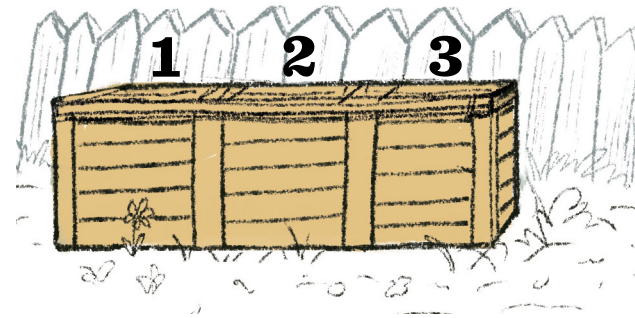
anaerobic Without oxygen or air. Term used to describe a compost pile that is not getting enough air.

bins Containers used for making compost, specifically in this manual the following three-bin system:

1. Collection bin The bin on the left where participants add their green and brown material, and where the breaking down of that material begins.

2. Active bin The bin in the middle where material from the full collection bin is moved by participants and volunteers, and where the majority of the transformation into compost occurs.

3. Curing bin The bin on the right where material from the active bin is moved by participants and volunteers after most of the transformation into compost has occurred; material arrives in this bin as semi-finished compost, then “cures” into finished compost.



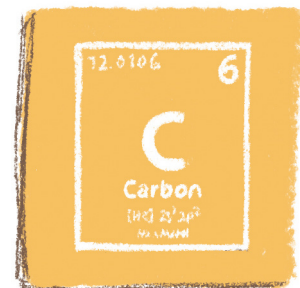
brown materials Materials with high carbon content such as fall leaves, wood chips, straw, twigs, and shredded paper. They should make up two-thirds to three-quarters of your composting mix by volume.



carbon rich Has a carbon to nitrogen ratio (C:N ratio) above 30:1. Carbon-rich materials, such as fall leaves and wood chips, raise the C:N ratio of the compost mix.

community composting

Collecting and transforming organic materials into compost on a local level; generally compost is used within the same community where the material is generated. Community composting keeps the process and product as local as possible while engaging the community through participation and education.



compost Soil amendment made from fully decomposed organic material such as food scraps and fall leaves.



contamination Anything you do not want in your compost pile, such as produce stickers, twist ties, or plastics.

cooking Slang for the state of your actively composting material as it breaks down.



donut method A way to combine green and brown materials by creating a circle or donut shape of brown materials, filling the center with green materials, and then mixing it all together before adding to the active bin. This method generally requires an impermeable surface such as concrete or asphalt.

feedstocks All materials that go into your compost bins; the ingredients for making compost, including all of your green materials and brown materials.

food scraps Parts of food that people usually do not eat, such as banana peels and apple cores, and, for the purposes of this manual, any discarded and wasted food that is not going to be eaten.



green materials Compostable materials such as food scraps and grass clippings, that are high in nitrogen, such as vegetable stems and trimmings, apple cores, banana peels, and coffee grounds. They should make up approximately one-quarter to one-third by volume of your composting mix.

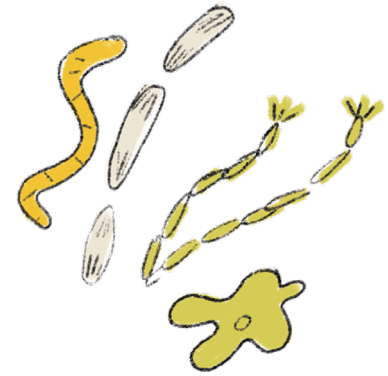


landfill A disposal facility where refuse and waste are piled up and buried. Landfills are highly polluting and emit environmentally harmful gases such as methane.

lasagna method The layering of green and brown materials into your active compost pile.

material ratio The volume of brown material compared to green material added to your compost piles at the same time.

microbes Organisms such as bacteria and fungi that break down organic materials into compost and are too small to see with the naked eye.



moisture Water or other liquid, a key ingredient for successful composting.

nitrogen rich Materials that have a carbon to nitrogen ratio (C:N ratio) below 30:1. Nitrogen-rich materials, such as food scraps and grass clippings, lower the C:N ratio of the compost mix.

organic materials Materials that came from something once living, such as from a plant or animal.

participant A person who signs up to bring their household food scraps to a community composting site.

pathogens Bacteria, viruses, or other microorganisms that could cause disease.

pests (i.e., animals living their lives) Rodents, raccoons, and other animals who will try to make homes in your piles and could create a public nuisance.



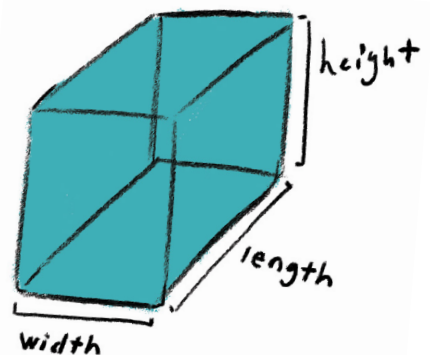
pile turning The beneficial process of mixing or moving materials from one bin to another, breaking up clumps, redistributing the materials, position in the pile, and exposing it to air.

soil Upper layer of earth in which plants grow.

volume The amount of space something occupies, like a cubic foot or a gallon.

volunteer A person who donates their time to help a community compost site succeed.

waste stream The flow or generation of refuse or discarded materials.



Chapter 3

Building Your Compost System



Site Considerations

When planning your site layout, you need to consider a variety of questions including, but not limited to, how food scraps or material feedstocks will be received, where the active composting will take place, and where compost will be cured and stored.

A great site has the following attributes:

- 1.** At least two feet of clearance between the bins and any fence or wall (and between the bins and browns storage). This allows for airflow and for participants to approach the bin from any side. It also helps avoid rodents, who travel along walls and avoid open spaces.
- 2.** Level ground with dirt tamped down and settled in advance of bin building, so the ground does not sink.
- 3.** A cement, asphalt, or gravel pad beneath the bins to prevent sinking and avoid harboring rodents; also a location that has no standing water after rain events and that does not drain into garden plots growing edible food.
- 4.** Space near the bins to store brown materials, finished compost, and equipment and supplies (e.g., a compost screener, data recording log books, temperature probes, scale, gloves, and pitchforks).
- 5.** Access to water, as the composting process requires moisture.
- 6.** If you are not the landowner, check with the necessary parties before you begin any site preparation or bin construction. If you do not know the landowner, visit the City's Property application to find information about properties in Philadelphia, including ownership, assessed value, square footage, and sales history:
<https://www.phila.gov/services/property-lots-housing/find-property-information/>

Important!

When fully loaded with compostable materials, the bins are heavy. This is why preparing a level, tamped down surface, ideally on a concrete, asphalt, or gravel pad, is important. A pad will also prevent rodents from harboring underneath the bins. If the surface is not level, the bin will not remain square and it may become challenging to remove and replace slats during everyday use and even close the lids properly. If the surface is not properly prepared, the bins can sink into the ground, also causing problems. Placing solid concrete masonry unit blocks under each leg of the bin is recommended if you do not have a concrete, asphalt, or gravel pad.

Quick Tip

If you are gardening on land that is City-owned or tax delinquent, you can contact the City of Philadelphia Land Bank to understand your options for ownership or leasing: <https://phdcphila.org/land/buy-land/community-gardens-open-space-and-recreational-areas/>

Compost Bin Considerations

While there are many ways to design a successful composting operation, this manual focuses on community composting with a three-bin system. Philadelphia Parks and Recreation (Parks & Rec) launched the Community Compost Network in 2019 by providing each of the 13 Philadelphia sites with a three-bin compost system. Parks & Rec utilized the Compost Knox system designed by Urban Farm Plans, a design and infrastructure services business in Washington, DC. The Compost Knox system is composed of a series of 4' x 4' bins. In the three-bin design, the overall footprint of the system is 4' x 12'.

Parks & Rec chose this design for its durability, large size, and modular nature. The 4' cubes can handle much more material than other designs based on 3' cubes. However, its size can be a drawback for children and individuals of small stature. The system is also designed to be repaired by nonprofessionals, and many of its components are replaceable.



Photo: Example of a Compost Knox three-bin system installed on a gravel pad at one of the Philadelphia Parks and Recreation Community Compost Network sites.

The New York Compost Project hosted by the **Queens Botanical Garden (QBG)** has had success building and using a three-bin design they adapted from Vancouver, British Columbia. The QBG design is smaller and sits directly on the ground, making it easier for youth to participate. Instead of seven slats in the front, the design has only two larger slats (more like panels), making them less prone to warping. The lids are not as heavy as those in the Compost Knox design, but they're also not as durable. We have adapted the **Queens Botanical Garden's** open source design into a Bin Building Guide called the "Vancouver." This guide is available in conjunction with this manual.

There are, however, countless do-it-yourself three-bin composting system designs available online. You can even design your own if you have basic composting knowledge and carpentry skills.

If you design your own bins or find alternative plans online, make sure your bins:

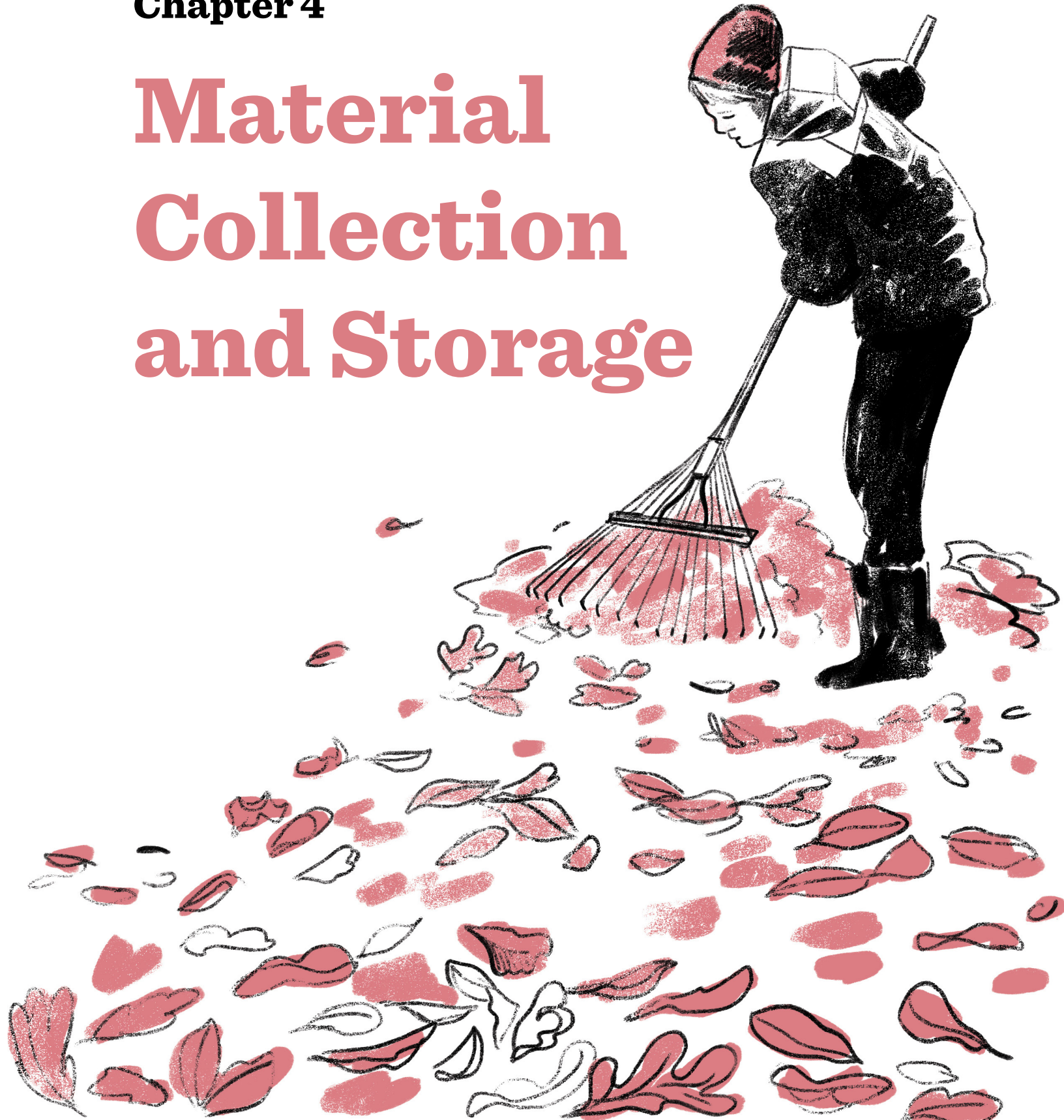
1. Are made of durable materials that will not break down in just a year or two of use.
2. Include the following pest protection measures:
 - Snug lids
 - No space between lids and bins
 - Bottom and sides lined with 1/4-inch hardware cloth.
3. Will fit your space and allow you to maintain a two-foot clearance around the bins. Think about the surface on which the bins will be placed; is the surface leveled, tamped down, or an impermeable (e.g., no fluid could pass through) surface?
4. Are the appropriate size for the height/physical ability of your membership. For example, if you're working mostly with children you may want to pick a smaller design.



Photo: Side profile of a compost bin system, showing the hardware cloth and pavers at the bottom of the bins.

Chapter 4

Material Collection and Storage



Feedstocks

Before you can start making compost, you will need to collect and decide how to handle compostable materials to use in your mix. The materials that go into your composting mix are also often referred to as feedstocks. Feedstocks fall into two categories: green materials and brown materials.

Green Materials

Green materials are nitrogen-rich materials such as coffee grounds and fresh fruit and vegetable scraps from your household participants. These can include vegetable stems and trimmings, apple cores, banana peels, mango and avocado pits, and corn cobs.

Do not include meat or animal by-products. Though meat and animal by-products can be composted in large, commercial systems, they are not ideal for most community-managed operations. Eggshells are the only exception. (Meat, fish, bones, dairy, and greasy and oily food can create nuisance odors and attract rodents, which need protein to survive.) Because most cooked food has some oil, grease, or protein, leave it out too. **When in doubt, leave it out.** Community participants can collect and deliver their food scraps. You can encourage participants to collect their food scraps in buckets that close tightly or in the freezer before delivering to the community composting site.

Once delivered to the site, green materials need to be processed immediately. Because they are highly putrescible (rot easily), they cannot be stored on-site. You will need to post clear instructions for how to drop off food scraps, which usually involves mixing and covering with browns.



Quick Tip

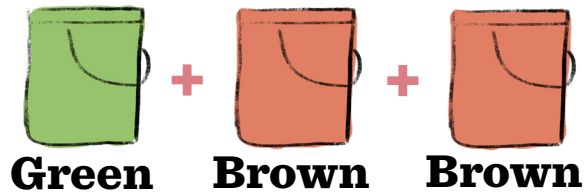
Site leaders can determine the exact list of green materials to accept or not accept at the site. There are many resources online that offer guidance on what to accept and expect from this process. See the Resources Section on page 58 for more information.

Brown Materials

Every composting site, regardless of size, needs to have brown or carbon-rich material collected and stored on site, ready to mix with greens. Fall leaves are an excellent source of browns. Others you can use include wood chips, shredded wood, untreated wood shavings, and sawdust from local woodworkers, straw (whole or chopped), twigs, woody garden stalks, and torn-up or shredded paper.

A mix of browns is ideal. Wood chips and twigs can help create the all-important air space in the compost pile but take a long time to break down. Some trees produce acids that inhibit plant growth or are toxic to microbial life. Black walnut is one example and, in general, softwoods like cedar and pine decompose more slowly than hardwoods like maple.

Participants will collect green materials in their homes, then bring them to your site. Collection of brown materials will be a team effort managed by your site leaders.



When you mix these materials to make compost, you will generally mix at least **two times** more brown than green material by volume. So when a participant brings **1 bucket of green material** from their home, you or they will need to fill approximately **2 buckets of brown material** to mix with it. For this reason, collection and storage of brown materials is very important for the success of your site.



Collecting Green Materials

Green materials are the food scraps that participants will bring to the site. You will need to determine how many participants the site can handle and how materials from these participants will be managed.

Consider the following when accepting food waste:

- What is the capacity of the composting system being used? How will you maintain a constant supply of browns throughout the year? How much total storage space do you have for brown materials? These are important in determining how much green material can be brought to your site.
- How often and at what times of day will participants be able to come to your site to compost the green materials they bring from home?
- What is the average weight of green materials brought to the site weekly by participants? This will require weighing material brought by initial participants.
- Where and how will participants drop off their food scraps? Will they be responsible for mixing into the receiving bin? Will volunteers sign up to do this task instead, such as during weekly open hours?

Be careful not to start with too many participants all at once, so they do not overwhelm the bins. Perhaps start with 10 participants and work upward from there. Have all participants sign up and participate in a short training session. The most important factor contributing to the success of any compost site, regardless of size, is trained operators or site leader. At a minimum, you need each participant's name, address, phone number, and email address. See more about this in Chapter 8: Promoting Your Site and Managing People.



Image: Sample signage template developed by the Institute for Local Self-Reliance. Art credit: Clarissa Libertelli. Reprinted with permission.

Quick Tip

Make a weather-resistant sign with your list of accepted green materials and display it in a visible place by your bins. You can also make a sign showing common green materials you do not accept at your site.

Collecting Brown Materials

Brown materials are absolutely necessary to make compost. These carbon-rich materials need to be mixed in the right proportions with the nitrogen-rich food scraps brought from homes to your site's compost bins. We recommend having a mix of brown materials ready to use.

Fall Leaves

- Encourage your program participants to collect as many fall leaves from their homes and blocks as possible in the autumn. Set up a place at the compost site to store them. You will need leaves throughout the year.
- If you see your neighbors bagging leaves, ask if you can have them for your compost system.
- If there are trees with leaves that fall at your actual site, then of course you can collect those leaves.
- Use big brown paper leaf bags for collection. After you compost the leaves from those bags, you can tear up the bags and compost them too (paper is a carbon source).

Wood Chips

- Wood chips act as bulking material, creating airspace in the compost pile, but should be limited to not more than 25 percent by volume of your brown materials. Why? Because the carbon in the wood is generally not readily available to the composting process and doesn't easily or quickly biodegrade. If you add too many wood chips, you will spend a lot of time screening them out at the end.
- Local tree services often prefer to unload their wood chips as close to where they do the actual chipping as possible. If you know local tree service companies or see them doing work near your site, you can ask them if they would be willing to unload some chips for you.
- If the chips can't be unloaded inside your site, you can have them dumped outside the entrance and schedule volunteers to move them into your site. This may not be possible for all sites. As you use the chips from your first delivery, determine how often you will need deliveries going forward.

Quick Tip

As **fall leaves** make for such excellent brown materials for composting, site leaders can host a leaf collection event around your site. When planning such an event, be sure to:

WEAR NEEDLE-PROOF GLOVES

Always protect yourself against the possibility of sweeping up used needles or other toxic trash while collecting leaves. Avoid collecting leaves from streets or other contaminated areas. Safety first, always. Some volunteers might have medical conditions, such as asthma, therefore providing face masks or asking volunteers to bring their own is important.

HAVE TRASH BAGS NEARBY

Making trash bags readily available will allow volunteers to easily throw away any trash as they collect leaves.

- Wood chips should not be made from black walnut, as black walnut does not break down well. Be sure to inform any tree services you work with that you do not want black walnut.
- Any Philadelphia resident can pick up wood chips for free from Fairmount's Organics Recycling Center. See the Resources Section on page 58 for more information.
- It can be difficult to find a neat way to store brown materials. Stacking piles of bags in a haphazard, cluttered way, particularly against walls, may attract rodents who travel along walls and avoid open areas.

Wood Shavings and Sawdust

- If possible, connect with local woodworkers in or near your community. They might be paying a trash service to take their shavings and sawdust. You can save them some money and help the environment by offering to pick up bags of their shavings and sawdust (or if you're lucky, they may be willing to drop off the material at your site). These shavings and sawdust are already so fine that they break down very well in compost piles.
- Make sure wood shavings and sawdust you receive are from untreated wood only. Wood shavings and sawdust from treated wood is likely to include unwanted chemicals.
- Just as you do not want black walnut wood chips, you also do not want black walnut wood shavings. Be sure to let your woodworking partners know this.

Quick Tip

PICK OUT CONTAMINATION

It is much, much easier to pick out trash such as gum wrappers, aluminum foil, plastic, and cigarette butts, while you are collecting the leaves than when adding them to your piles. It is always better to avoid contamination at its source than to have to pick it out later.



Photo: A gardener carrying an armful of paper and cardboard.

Brown Paper, Newspaper, and Other Paper

- Leaf bags and other brown paper can be torn up and used as a carbon source for your piles. Newspapers can be torn up or shredded and added to other browns, then added to the compost pile. **Do not** add a stack of folded up newspapers. They will not break down if added in that way and they will block airflow through the pile. Other paper can be torn up or shredded and combined with other brown material for composting.
- Avoid coated paper or paper with a lot of printer ink, as the ink may contain chemicals. Newspaper ink is generally soy-based.
- Paper is not recommended as the only source of browns.

Straw

- Straw is preferable to hay as hay contains seeds. Procuring a bale or two of straw is always an option should your supply of fall leaves run out.
- Knowing where your feedstocks come from is important. You want carbon sources that, for instance, are not treated with persistent herbicides, which in extremely minute concentrations can contaminate compost.
- Buy untreated straw. For more information on potential problems with persistent herbicides, see the link listed for the U.S. Composting Council in the Resources Section on page 58.

Garden Stalks and Trimmings

- If you're located at a community garden or urban farm, you will have a ready supply of twigs, plant stalks, and other trimmings, but you will likely have to manage the flow of this material at your site.
- Where will gardeners place their unwanted material? What will you accept? Avoid adding diseased plants and noxious weeds. Do the stalks need to be cut into sizes you can handle?



Photo: Sample mix of browns at Earth Matter's compost demonstration site on Governors Island, New York City: three parts variety of leaves, two parts wood chips/chopped plant stems, and two parts wood shavings/sawdust. Photo courtesy of the Institute for Local Self-Reliance.

Storing Brown Materials

Site leaders and volunteers will need and storage of brown materials. Storage of brown materials can be tricky because browns are bulky and require a lot of space.

Pests can ruin all of your hard work if you do not plan and work to avoid them. If storing browns in a large, covered pile, be sure to turn the material often, checking for any sign of rodent burrowing. If using lidded containers, always seal them well and check them for any holes, cracks, or other issues. Refer to Chapter 9: Troubleshooting for how to handle pests.

Here are some recommendations for storing brown materials on-site:

- Stack bags under a large tarp, anchor down the tarp's edges with bricks, stones, etc.
- Pile unbagged material under a large tarp, and anchor down the tarp's edges.
- Transfer brown material into large, lidded containers. These could be 18-gallon totes or larger trash cans.
- When using lidded containers, make sure participants always seal lids. Consider placing a weight (like a brick) on top of each lid, to help avoid pests.
- Purchase or construct a small storage shed or shed roof where browns can be stockpiled.



Photo: Stacked piles of bags full of brown materials (e.g., dried leaves).

Quick Tip

Stacking piles of bags may encourage rodents, who love clutter, especially along walls. Find a way to store browns that does not create harborage for rodents or become an eyesore.

Collecting and Storing Water

Water is essential to transforming your mix of green and brown materials into compost. The microbes in your pile that break down material are teeny, tiny life-forms, and they need water to survive. They live in a thin layer of moisture around the particles in the pile. The whole pile needs a moisture content of 50 to 60 percent by weight. Wet putrescible food scraps can provide a lot of the needed moisture. But you will likely need to add water when you initially build your pile. As the microbes consume materials, they give off energy in the form of heat, which in turn drives off the moisture.



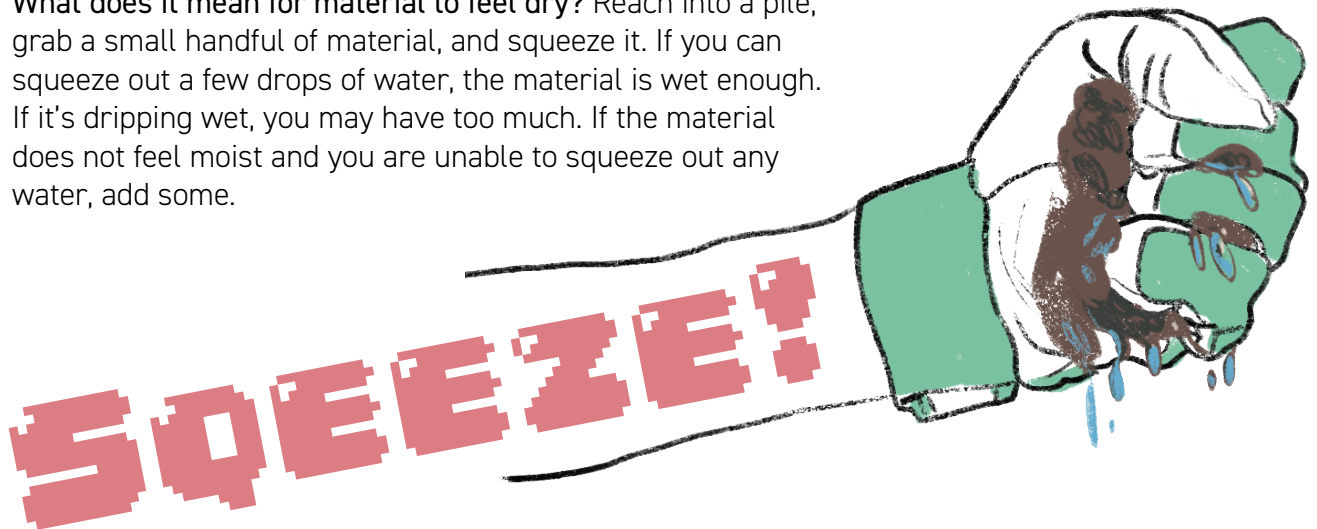
Photo: Farmer Kim at Parks & Rec's Carousel House Farm watering the compost in the second bin.

Important!

The ideal moisture content for actively composting piles is between 50 and 60 percent by weight. Below that level, composting microbes go dormant. Above that level, they drown, and water fills the air pockets in the pile. You can estimate the ideal moisture by using the hand-squeeze test. Over time, you will develop a feel for the proper amount of moisture in your composting pile. Do your best and learn as you go.

Hand-Squeeze Test

You will need to add water to the mix when materials feel dry. **What does it mean for material to feel dry?** Reach into a pile, grab a small handful of material, and squeeze it. If you can squeeze out a few drops of water, the material is wet enough. If it's dripping wet, you may have too much. If the material does not feel moist and you are unable to squeeze out any water, add some.



To add water to your compost bins, you will need a water source on-site, such as:



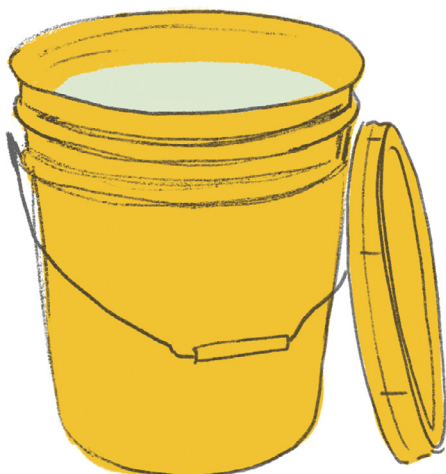
Rain Barrels

You can acquire an old food grade drum or make one from a plastic trash can or other large container. It is best to have a thin mesh screen over the top to avoid attracting mosquitoes.



Piped Water Supply

If your community garden has a water spigot, you can use that. You can also use rain barrels to recycle rainwater into your compost and avoid a higher water utility bill.



Participants and Volunteers Bring Water

This is a last resort if you do not have other water sources on-site. Even if you do have other options, it may be necessary to bring water to your site during colder winter months when gardens generally shut off the water supply to avoid the pipes freezing.





Equipment for Composting

Making compost requires some basic equipment, and that equipment needs to be stored somewhere. If your site is part of a community garden, gardeners may already be storing some tools there. It is important, though, that you and your team have your own, separate equipment to use for making compost. Your **composting tools should never be used by gardeners**, as tools making contact with compost in process could contain pathogens.

Be sure to rinse your tools after each use, store them separately from gardeners' tools, and mark them in some way to make it clear that they are to be used for compost only.

Equipment you will need should include, but is not limited to the following items. **We recommend buying adaptive and ergonomic garden tools that are designed to be inclusive of disabled gardeners and gardeners with limited movement.** In addition to the list below, we recommend five gallon buckets, data-recording binders, and a place to secure supplies such as a lockable tool chest or storage shed.

WHEELBARROWS OR GARDEN CARTS

For moving material such as browns or finished compost around the site. Two-wheeled are better than one-wheeled as they're more stable and can carry heavier loads.

SHOVELS

Spades are best for penetrating your mix of materials and your finished compost. Flat shovels work well for cleaning up if you have a concrete or asphalt pad.

PITCHFORKS

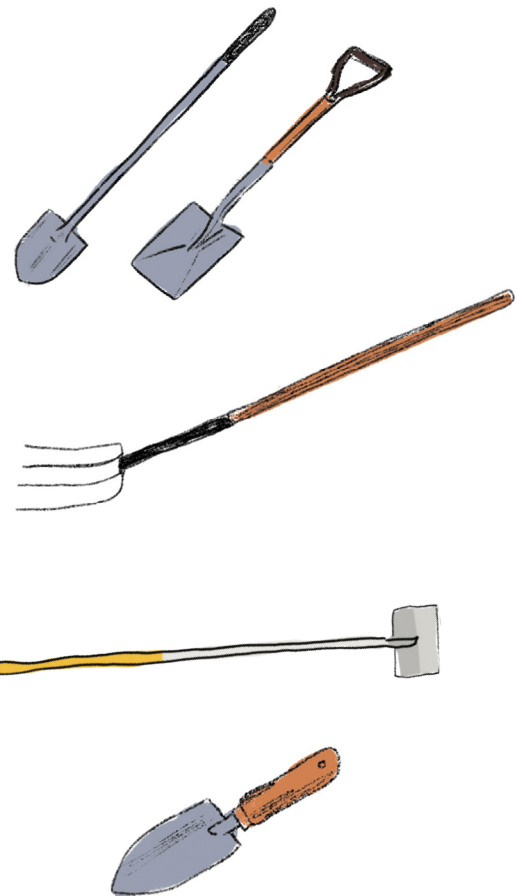
Great for pile turning. Can be used to poke holes in the pile, which help with airflow. Procure manure or compost forks, which have a scooped profile and pointier tines.

SIDEWALK ICE SCRAPERS

For chopping large pieces of material such as corn cobs, pineapple tops, and broccoli stalks. Flat shovels can work too.

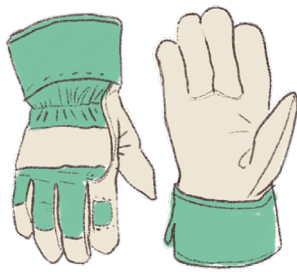
SMALL-SIZED TOOLS

Trowels and tools designed for kids or youth can be used by any children or volunteers with smaller hands on volunteer days.



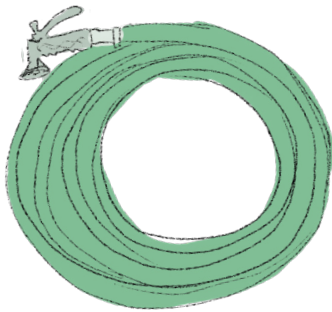
Important!

Rinse your shovels and pitchforks after use, if possible, to avoid any bacteria from the composting process. And don't forget to store your equipment separately from any gardening equipment kept on site by others.



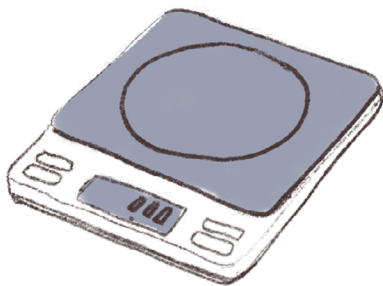
GLOVES

Work gloves or gardening gloves will work. Protect your hands from calluses while shoveling and using other tools. Protect your hands from pathogens when in contact with active compost piles. There are hypodermic needle-resistant gloves (ASTM F2878-10) that we recommend for anyone collecting leaves in areas with high needle use.



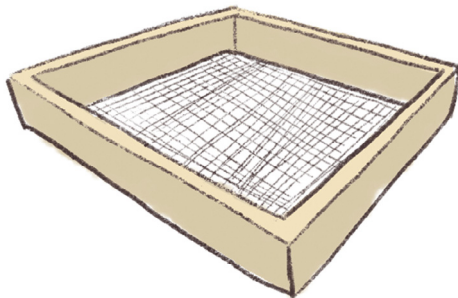
GARDEN HOSE FOR WATERING

For watering the compost piles or moving water from your rain barrel to the compost bins. A watering can might suffice in a pinch and allow for adding small quantities of water to your piles, as needed, but is far from ideal and efficient.



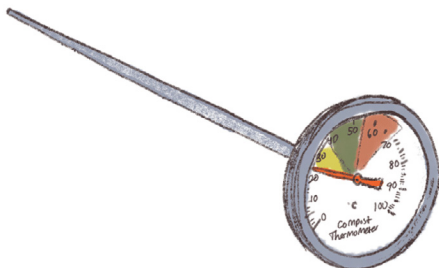
SCALE

For weighing food scraps dropped off at your site and other materials you might want to track. If it's easier you can estimate weights of materials or finished compost if you know the average weight of a gallon, a bag of leaves, or a wheelbarrow of the specific materials you work with on a frequent basis.



SCREENER

When the compost is stable and mature, you can sift out larger particles with a compost screener. A simple screener can be built with wood and $\frac{1}{4}$ - to $\frac{1}{2}$ -inch wire mesh (such as hardware cloth). There are many DIY designs available, from flat screens that fit over a wheelbarrow to rotating trommel screeners made in part from repurposed bike tire rims. Screening is important to remove any contaminants as well as woody pieces that have not fully biodegraded. If wood chips remain in compost added to soil, they will continue to break down and rob nearby plant roots of the nitrogen they need. The larger particles that get screened out can be reused (after any contamination is removed). These "overs" can be added back into the active compost pile or if there's no partially decomposed food remaining, they make a great mulch.



THERMOMETER OR COMPOST TEMPERATURE PROBE

For measuring the temperature inside your bins. purchase or borrow a temperature probe made specifically for composting. See the Resources Section on page 58 for a few suggested options.

Chapter 5

Making Compost



What's Happening in the Bins?

Understanding a little bit of science about the composting process will help your site be successful. The practical steps covered in this manual will set you up to apply the science in an easy and straightforward way. Here is a quick summary of what's happening inside the bins when everything is working well:

- Microbes will happily consume the food scraps or compostable materials people don't want or can't digest. Composting is a way to facilitate that natural decomposition process in a managed and thoughtful way.
- When you combine green and brown materials, you are creating a balanced diet for our microbial relatives. Green materials have the proteins needed for the microbes to multiply and brown materials provide long-lasting energy. Following the **one bucket or wheelbarrow of greens to two buckets or wheelbarrows of browns** ensures these basic nutritional needs are met.
- When microbes eat, they generate energy, and some of that energy gets trapped in the compost, which is a very good insulator. Incidentally, microbes like it hot, so they are creating an optimal environment for themselves. Between 120° and 140° Fahrenheit (F) is the ideal range for fast decomposition, although a lot is happening at lower temperatures as well. Above 160° F, things will start to slow down because most of the microbes don't like it that hot.
- Like us, most microbes need some oxygen, and the harder the microbes work their decomposition magic, the faster they consume oxygen (similarly, if we jog around the block, we start to breathe harder to supply our bodies with enough oxygen). If the microbes have too little oxygen they slow down and this is also when things can have a strong odor (anaerobic).
- The microbes need a wet environment, so keep the composting pile moist but not too wet, because then the microbes can't breathe.
- Each little piece of material (or particle) that goes into the compost pile has an outside (or surface) and an inside (or core). Most of the decomposition happens on the surface of particles where there is moisture and some contact with oxygen. Smaller particles have more surface area, but they can also get packed into really dense clumps. Therefore, the ideal compost mix has lots of surface area, where the microbes can work, but it is not really dense. The best way to make this happen is to have lots of different sizes of particles (ideally 2" or less) and some woody materials mixed in like wood chips, which create and maintain air space.
- In a nutshell, the main elements of composting are: protein from greens, energy from browns, heat generated by microbes, air around the surfaces of particles, and moisture for the microbes to stay wet. It's the combining of different materials together that gets all these things in the right balance, and thoroughly mixing your materials together is the fastest way to get there.
- As long as there is energy in the materials, and enough moisture and air, the microbes will continue to generate heat. When the heat drops, that usually means that there is a lack of food, water, or air. And if the pile gets turned and has good moisture, but still doesn't heat up, that means that most of the energy has been consumed. And that means that the compost is starting to finish.

Did You Know?

How do microbes get into the bin so that they can start breaking down the material? The answer is that they are already there. Bacteria and fungi are present in plants and animals, and they start breaking down our green and brown materials when you start piling them up.

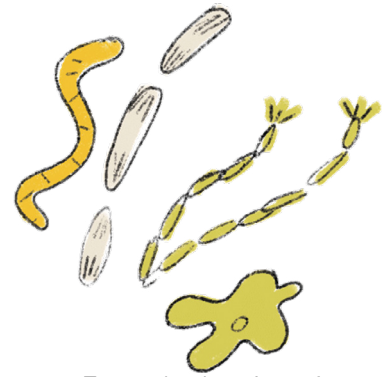


Image: Example drawing of microbes (i.e., bacteria).

Important!

The outside of the pile does not really break down, so when composting a material like food scraps, it's important to keep the fresh mix surrounded by other materials. This compost layer, and the bin itself, also traps in those rotting scraps, and creates a protective barrier between the active compost and the world around it. This manual teaches a fairly specific three-bin composting style, but there are infinite variations of composting, and quite frankly, no one best method. This is why we have best management practices (BMPs) that can apply the science of composting to the many diverse systems that will inevitably evolve in Philadelphia. Review the Resources list on page 58 and familiarize yourself with BMPs and the wealth of knowledge available in the community composting movement.

Time for the Fun Part: Making Compost!

Before adding any greens or browns to your bins, label each of the three bins, so participants know where to add materials.

Bin 1: Collection bin

The bin on the left side where participants should always add their green and brown materials. Start by adding 4" to 6" of brown materials to this bin before anyone adds green materials. This initial 4" to 6" of brown material will help with airflow as the bin fills up, and absorb any liquids from the first addition of green materials.

Bin 2: Active bin

The bin in the middle where you will move materials from the collection bin when the collection bin fills up.

Bin 3: Curing bin

The bin on the right side where you will move semi-finished compost from the active bin when the active bin fills up.

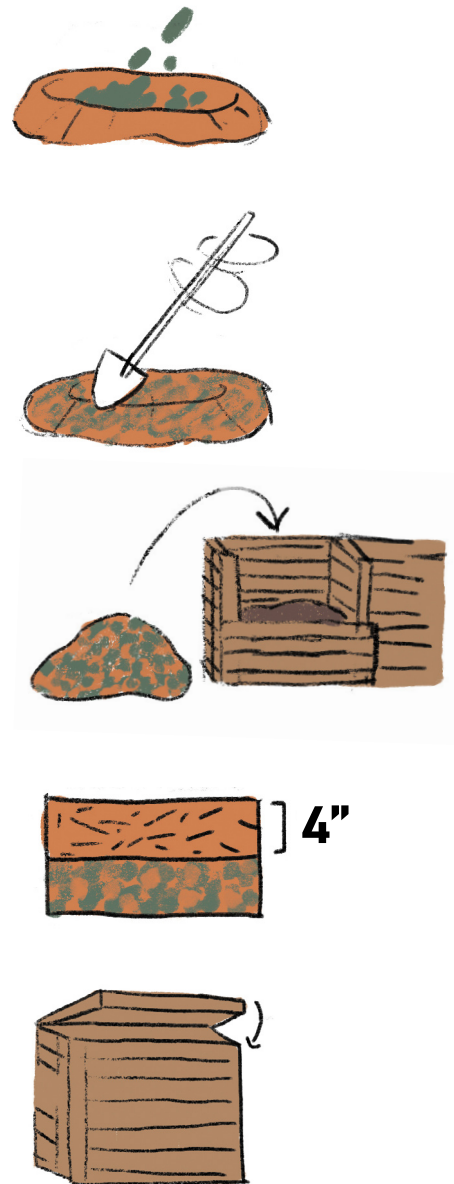
How do you combine your green material with brown materials? You have options.

Mixing first outside the bin (donut method) provides composting microbes with the right balance of carbon and nitrogen they need to thrive, and can thus speed the process. The donut method is one way to do this. If you do not have a surface or container to mix on or in, then you can add materials in layers directly to Bin 1 as you build your pile (lasagna method) or do your best to mix within the bin, which sometimes can be challenging. With the lasagna method, the real material blending comes when Bin 1 is flipped into Bin 2. No matter what method you choose, checking moisture and watering as you mix or layer is critical to ensure the entire pile has adequate moisture to make the microbes happy.

The Donut Method

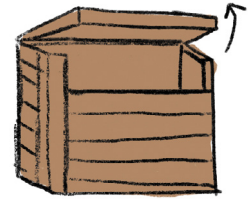
This method requires a concrete or asphalt pad or other impermeable surface.

- 1.** Outside the composting bins, create a circle of brown materials shaped like a donut. Fill the center of the donut with green materials and use flat shovels or sidewalk ice scrapers to chop any large materials into pieces approximately 2" in size. Use a bucket or wheelbarrow to make sure you are combining at least twice as many browns by volume as greens.
- 2.** Mix your brown material donut with its green material center using a shovel or pitchfork. Add and mix in water as needed.
- 3.** Open the top of the bin and remove slats from the front of the bin as needed. Shovel the mixed material into Bin 1, the collection bin.
- 4.** Cover the material in the collection bin with an additional 4" layer of brown materials. No food scraps should be visible.
- 5.** Replace the slats on the front of the bin and close the top. Make sure there are no gaps between slats or between lid and top slat.

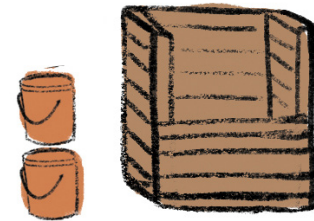


The Lasagna Method (adapted)

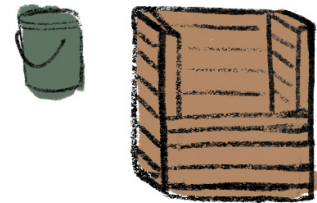
1. Open the top of the bin and remove slats from the front of the bin as needed.



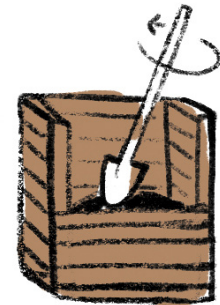
2. Add at least two buckets (or 4" to 6") or wheelbarrows of brown materials directly to the collection bin, before anyone adds green materials. This initial 4" to 6" of brown material will help with airflow as the bin fills up, and also absorb any liquids from the first addition of green materials. If using a bucket, use a standard size such as a five-gallon bucket.



3. Add one bucket or wheelbarrow of green materials directly to the collection bin, using the same size bucket or wheelbarrow you used to add brown materials.



4. Mix the green and brown materials together inside the collection bin. Add water and mix in as needed.



5. Cover the materials with an additional 4" layer of brown materials. No food scraps should be visible.

6. Replace the slats on the front of the bin and close the top. Make sure there are no gaps between slats or between the lid and top slat.



Quick Tip

Chopping tough items such as corn cobs, pineapple tops, broccoli stalks, and potatoes will help increase surface area and speed decomposition. Some items such as banana peels or wilted lettuce do not warrant chopping as they will readily break down.

*The **ratio of brown material to green material does not have to be exact.** This method of composting is not an exact science. Do your best to use the correct ratios. Composting is flexible. You can adjust the recipe as you go and learn.*

Every time you make a donut or a lasagna layer, look for contamination, and remove it immediately.

Common contamination you may see in your green materials includes metal and plastic twist ties around vegetable stems; mesh bags that had onions or other produce in them; plastic bags and other plastics; and metal and plastic spoons, forks, and knives. Common contamination you may see in your brown materials, especially bagged leaves, includes gum and candy wrappers, plastic bags, and cigarette butts.



Image: examples of contamination (e.g. bread ties, cigarette butts and candy or snack wrappers).

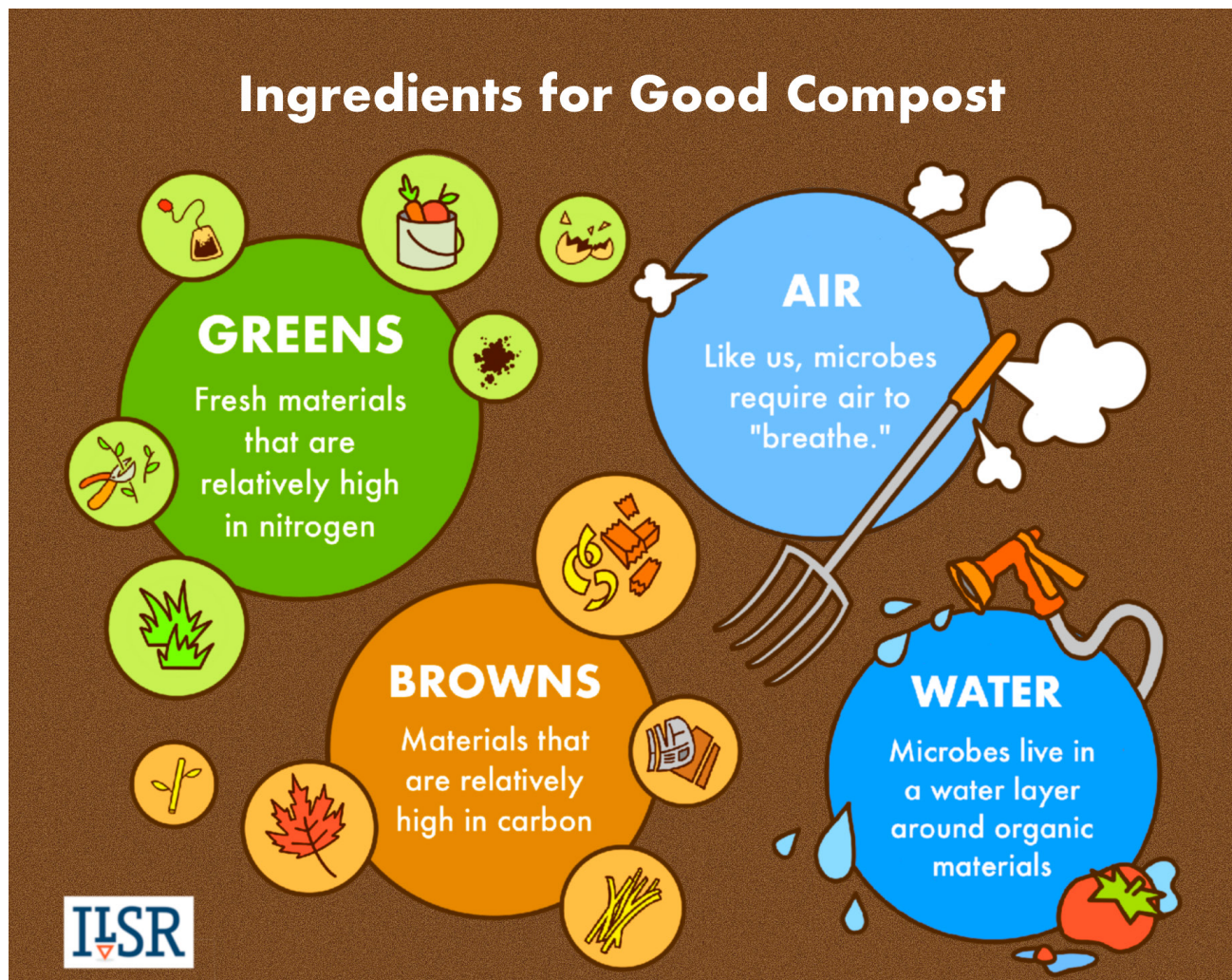


Image: Illustration of ingredients that are good for compost. Courtesy of the Institute for Local Self-Reliance. Art credit: Clarissa Libertelli. Reprinted with permission.

Pile Turning and Airflow

When Bin 1, the collection bin, is nearing the top, it is time to schedule a pile turning session for participants and volunteers. (It goes without saying that this needs to happen before space becomes limiting.) Pile turning is simple: you shovel material from one bin into another bin, which allows air to reach all of the material you are moving. Remove the front wooden slats one by one as you turn material from one bin to the other.

Why does the compost pile need air? Microbes need oxygen to stay active, so when compost piles are not getting enough air, decomposition slows. Compost piles that are not getting enough air are often described as anaerobic, and this can lead to nuisance odors.

Before Bin 1, the collection bin, fills up again, schedule another pile turning session. This time, materials will need to be turned from Bin 2, the active bin, to Bin 3, the curing bin.

Don't be surprised if your active bin is filled only halfway to the top one month after you turned material into it. The volume decreases as microbes process your mixed green and brown materials, turning them into compost. In addition to the material getting exposed to air as you turn piles, a pile that has been turned is naturally less compressed and air will be able to flow through the pile even without another immediate turn. This is known as "passive aeration," or a well-made compost mix's ability to breathe somewhat on its own. When materials are dense or compacted, gases get trapped and the microbes quickly deplete the available oxygen, leading to anaerobic conditions.

While turning can open up new pathways for air to flow, it's a labor-intensive and short-lived strategy in terms of its ability to aerate compost (but critical for other reasons). A more sustainable means of increasing passive aeration is to create mixes that will maintain air space throughout the life of the composting process, by incorporating some coarse woody materials into the recipe. Even a small percentage (10-15 percent by volume) of wood chips will go a long way.



Photo: Two volunteers turning the compost in their bins.

Important!

Pile turning is the best time to check for adequate moisture and add water to your piles, as needed. It also allows you to pick out any contamination that was missed initially.

Adding Water

Adequate moisture is a key ingredient to successful composting. See the Collecting and Storing Water section on page 24 for options on sourcing water. Monitor moisture in your active piles and add more as the pile heats up, being sure to distribute the moisture throughout the pile using a pitchfork or shovel as you water. It can take a while for dry compost to become absorbent again, so apply the water slowly to avoid it draining away too fast. This is a simple and effective process.



Photo: Example of someone adding water to their compost bin.

Taking the Temperature

Heat is created by microbes during the composting process, and is therefore an important indicator of microbial activity. When you turn your piles from the collection bin to the active bin, and from the active bin to the curing bin, you may see steam rising from the material. Putting your hands close to the material as you move it, you should feel the heat. The sight of the steam and feeling of the heat is one of the fun parts of the process.

But heat is not just a fun by-product, it is important because heat kills pathogens that may be present in your materials.

Use your compost thermometer to take the temperature of the bins, and make sure the temperature remains above 131° F (55° C) for at least three consecutive days; this is the temperature target that indicates you have reduced the risk of pathogens. Meeting this temperature and process time should be sufficient to kill most weed seeds, reduce pathogens (such as E. coli or salmonella), and prevent vector attraction (unwanted critters). Ideal temperature from a purely decomposition perspective is 120–140° F (49–60° C).

Temperatures above 140° F are common, but once you reach 160° F, most microbes cease being active and the composting process slows.

For more information about reducing pathogens and the importance of tracking temperature as a barometer of the composting process, see ILSR's report, *Community Composting Done Right: A Guide to Best Management Practices* (pages 43–45). The website for this guide is in the Resources Section on page 58.

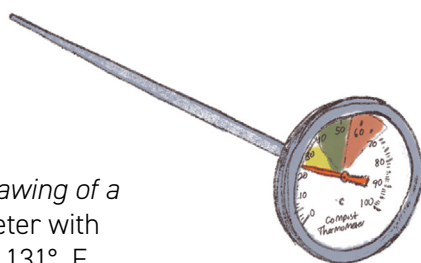


Image: Example drawing of a compost thermometer with the temperature of 131° F.



Finishing the Composting Process

After your compost pile has passed through the active composting phase, it needs to cure and mature. Curing produces a chemically stable, plant-friendly finished product. Compost is ready for curing when it no longer has recognizable food scraps and the pile no longer heats up beyond 104° F after turning. It takes time. A minimum of four weeks is needed for curing but two to four months, or even longer, is recommended.

Because curing takes longer than the active composting phase, you may need to empty Bin 3 to finish curing elsewhere in order to continue accepting and moving material through the system. You often will be able to consolidate two active bins into one curing bin. The curing pile still requires aeration and some moisture, but not as much as the active pile.

When the compost has cured, it's ready for screening. Screening is a process that uses hardware cloth in the form of a flat screen to remove large particles (e.g., twigs, rocks, food wrappers). Encourage participants who are sifting the compost to wear face coverings to protect them against airborne particles during the screening process. Participants can also place the flat screen on top of a wheelbarrow to sift compost directly into a receptacle made for transport.

After screening, there are a few simple tests you can do to assess the compost. One is a germination test. Try growing 100 seeds in some moist compost. The germination rate should be close to what is printed on the packet or provided by the seed company. If not, you may have to send the compost to a lab for further testing. The other test is a maturity test. You put some compost in a sealed plastic bag in a dark place inside for a couple of days. When you open the bag, if you smell ammonia, the compost is not yet ready.

If you're planning to sell your compost, we recommend having it tested at a certified lab. The US Composting Council's website includes a list of certified compost testing labs, which includes the Ag Analytical Services Lab at Penn State. See the Resources Section on page 58.

For more information on finishing the composting process, see ILSR's *Community Composting Done Right: A Guide to Best Management Practices*, pages 47–50.

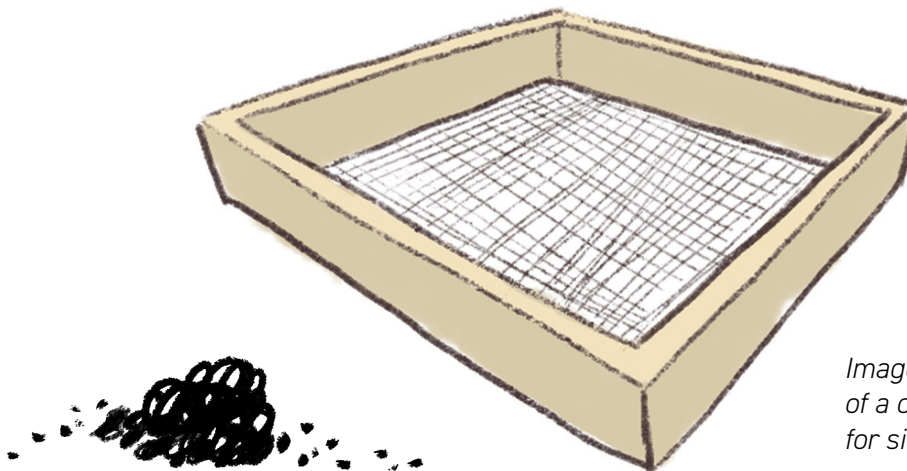


Image: Example drawing of a compost screen used for sifting cured and

Composting Quick Guide

Not surprisingly, the section on making compost contains a lot of information to absorb and process! Don't be intimidated by it all – it's a lot easier than it may sound! Here's a checklist of what we covered:

DONUT METHOD

1. Create donut-shaped circle of **browns**.
2. Fill center of the donut with **greens**.
3. Mix and chop with shovel or pitchfork (**2" pieces**).
4. Remove top and slats from collection bin and shovel in the mixture.
5. Cover with an additional **4" of browns**.
6. Replace top and slats.

LASAGNA METHOD (Adapted)

1. Remove collection bin top and slats.
2. Add **2 buckets** of **browns** to collection bin.
3. Add **1 bucket** of **greens** to collection bin.
4. Mix **greens** and **browns** together.
5. Cover with an additional **4"** of **browns**.
6. Replace slats and bin top.

AIR

Microbes need oxygen to remain active. Air is introduced to the composting pile with turning and via passive aeration created by bulking agents such as wood chips. When the collection bin is full, turn the materials with a pitchfork into the active bin. This allows air to reach all the layers of the compost pile. When the collection bin is full again, turn materials from the active bin into the curing bin, and then turn the materials from the collection bin into the active bin.

WATER

Check your piles for moisture: grab a handful of material, and squeeze it. If you can squeeze out a little water, the material is wet enough. If the material does not feel moist and you are unable to squeeze out any water, add some. Use a hose, watering can, or bucket to add water to your compost piles. Mix it up with a shovel or pitchfork.

TEMPERATURE

Take the temperature of your bins. Maintain an average of 131° F or greater for at least three consecutive days. Ideal temperature for decomposition is 120°-140° F. If the pile is too hot or too cold, try turning it to increase airflow, and add water to it if it seems dry.

Checklist for Site Leaders

Prior to Bin Building

- Level ground with dirt packed down in area where bins will be built, or level concrete / pavement if bins being built on pavement.
- Secure space measuring at least 4' x 12' for footprint of bins, with at least 2' clearance around bins.
- Secure an additional 10' x 15' of space near the bins for brown materials storage and equipment storage.

Equipment and Supplies

- Shovels – spades and flat ones
- Work gloves
- Notebook for recording data
- Pitchforks
- Watering hose or rain barrels
- Wheelbarrows or garden carts
- Hand Trowels
- Scale
- Sidewalk ice scrapers
- Screener
- Compost thermometer

Signs (weather-resistant)

- List acceptable green materials and unacceptable contamination.
- State that this is a community composting site, making it clear that the bins are not for trash or recycling drop off.
- List expectations for all participants and volunteers, i.e., proper storage of equipment, using donut or lasagna methods, etc.

Signing Up Community Participants

Ten participants is a good number to get started. Get each person's **name, address, phone number, and email**. If you don't have ten participants consider:

- Creating and distributing an outreach flyer.
- Posting the flyer or information on the project to community social media groups, listservs, or via email.
- Printing and posting it at community centers and local businesses.
- Speaking at community meetings.
- Organizing a team to knock on doors in your community.

Maintain an interest sheet with minimum information listed above, so you can contact people when ready for additional participants.



Chapter 6

Keeping Track of Data



Recording Data

Recording data at your site is a good idea for many reasons. Knowing how much green material your site processes per person in one month, for example, will help you determine how many participants your site can handle. Store a notebook on-site where each person can write down the weight of green material they add to the collection bin, each time they add material. The notebook could be stored in a waterproof bag, a lockable toolbox, or a shed or other structure if you have one at your site.

We recommend recording the following information, at a minimum:

- Date
- Participant name
- Weight (use scale) or volume (number of buckets and size of bucket) of greens added
- Weight in browns added (use scale)
- Any comments or notes about the food scraps received or the condition of the compost (e.g., turning, smells, etc.).
- Compost pile temperature

The image shows a screenshot of a data collection application interface. It is divided into two main sections by a horizontal line. The top section is titled "Work Completed" and contains a list of six items, each with an unchecked checkbox: "Created Pile", "Turned Pile", "Watered Pile", "Moved Pile", "Sifted Pile", and "Other:". Below the "Other:" checkbox is a horizontal line for text input. The bottom section is titled "Problems?:" and contains a list of four items, each with an unchecked checkbox: "Bin, chamber or pile open", "Browns supply is low", "Food scraps were not covered with browns", and "No tools or equipment to chop food waste".

Quick Tip

Your site may decide to collect data on applications such as Google Forms. This platform allows any participant with a computer or smartphone to upload information to a spreadsheet that's shared with others in real time.

Image: Example of a data collection application (i.e., app), where participants can each fill out to provide feedback and log data entries.

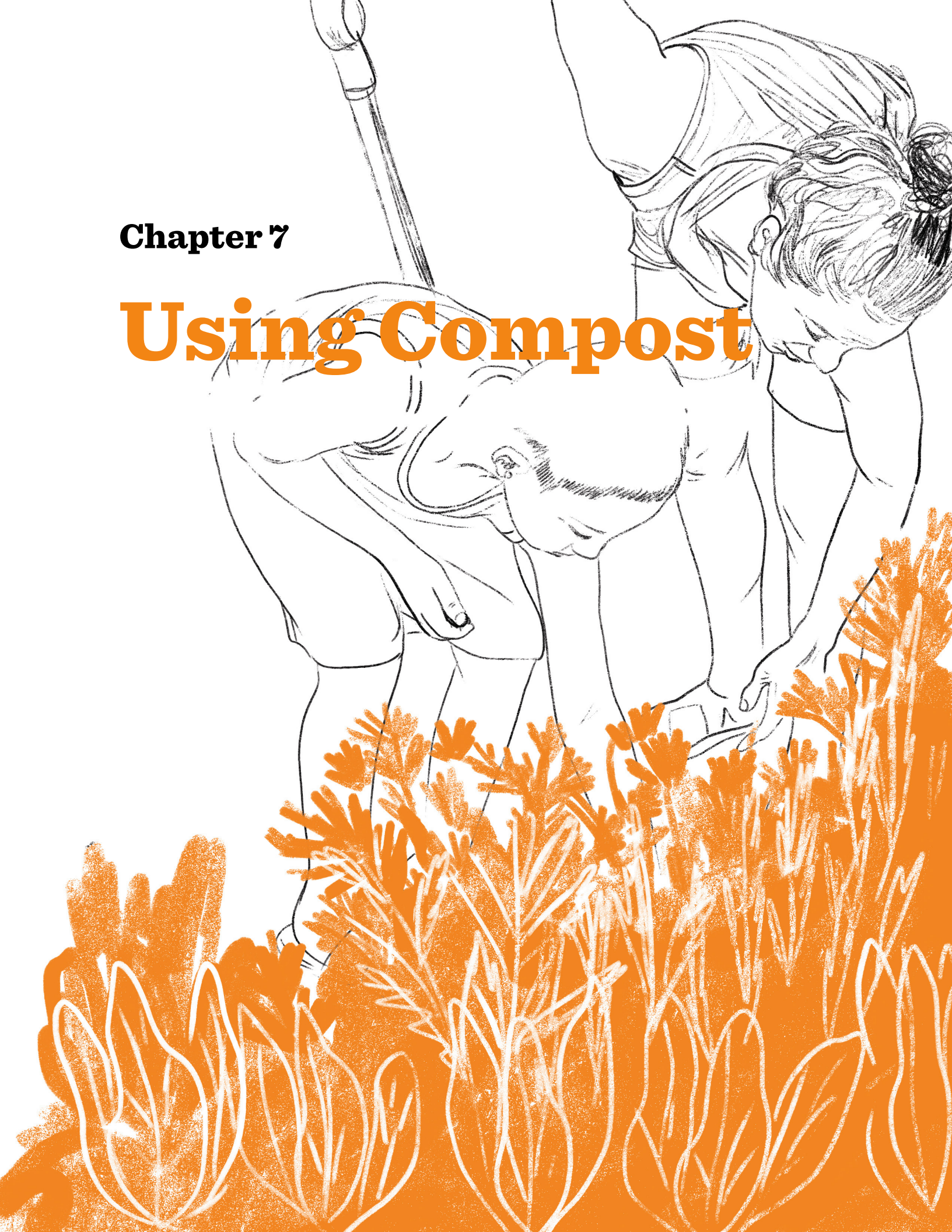
DATE	NAME	WEIGHT	* Please note if you turn the pile. COMMENTS (Moisture, Pests, Smell, etc.)
10/3/20	Court/Sophia/Steve	20 lb	
10/3/20	Sophia	8 lb	Looking Great!
10/6/20	Sophia	4 lb	Looked dry, 75°F, added more water
10/8/2020	Amy	11 lb	turned pile
10/9/2020	COURT	4 lbs	Looked dry added 2 cans of water turned pile
10/10/20	Steve	5 lb	turned, added 1/2 can water
10/11/20	Sophia	3 lb	Felt dry, added a lot of H ₂ O
10/11/20	Dustin	5 lb	84°F.
10/13/20	COURT	3 lbs	80° turned added 2 cans H ₂ O
10/14/20	LIZ	18 lbs ^{← edit} 16 lbs	turned
10/15/20	Dustin K./Amy J.	13 lbs	* Moved 1 bottle hand sanitizer to shed. This is great, thanks!
10/19/20	Casey	3.7 lbs	turned, very moist
10/19/20	COURT	5 lbs	turned
10/20/20	Steve	4 lb	
10/21/20	LIZ	11 lbs	turned
10/24/20	Sophia	15 lb	81°, 89°F, 89°F (3 points) Turned. * Bottom of pile a bit smelly.
10/28/20	COURT	6 lbs	turned
10/30/20	Steve	12 lb	turned
10/31/20	Casey	4 lb	
10/31/20	COURT	—	Turned

Photo: Example of a compost bin log sheet, where participants record data.



Chapter 7

Using Compost





Using Compost

The compost you create at your site has many uses. You are not only preventing food scraps from going into landfills, you are creating a valuable tool for growing healthy plants.

Here are some uses for the compost you are creating:

1. Apply a ½ inch top layer to garden beds. The nutrients in the compost will slowly seep into the soil beneath it, and plants will absorb those nutrients. The compost will also absorb water during rainfall and slowly feed that water to the soil beneath it and to plants growing in that soil.
2. Add compost to potting soil and mix it together. You can add around three parts soil to one part compost into your mix and plant directly into that mix.
3. Apply a ½ inch layer of compost around street trees. If you have more compost than your gardeners need, this is a great way to use the excess. Your trees will thank you for it!
4. Top dress turf or lawns with ½ inch layer of compost. This is a great way to keep lawns healthy, or rehabilitate fields that have dried out over time.
5. Allow participants to take home for their use.
6. Offer it to other community gardens and gardeners.
7. Organize a “free compost day” for neighbors to stop by and pick up small quantities to bring home to their houseplants.

The best part about making compost is there is always a use for it. If you make more than your gardeners need, you will have plenty of takers who will want some for their street trees and house plants. You are providing a valuable benefit to your community!



Photo: Finished compost being added to a raised garden bed by a volunteer.



Photo: Seedlings being planted into compost by volunteers.





Chapter 8

**Promoting
Your Site and
Managing People**

Getting People Involved

Though the number of participants will always need to be limited based on your site's composting capacity, you can never have enough volunteers. Be sure to keep accurate lists and engage your community in positive ways.

Before you begin to publicize your site, it is important to determine a model for managing your membership. Many sites choose to run as a co-op, in which a small group of participants are allowed to drop off materials as needed in exchange for volunteering to help with tasks related to composting. Some sites have a specific drop-off day, and some allow members access to the bins 24/7 or during open hours. Sites with less consistent interest from community members may choose to operate with a free-to-all drop off day during regular community events like a farmers' or flea market. Committing to a system ahead of time will allow you to ensure you have the support you need to run your site and don't exceed your capacity.

Your site may already have more interest from community members than you can handle at the moment. If so, that is a good problem to have. If you have a few people interested in participating, but need to get more on board, here are some ways you can reach out to your community to get more people involved.

Create a Simple Flyer

- List the benefits of composting.
- Include images and/or drawings of your three-bin system and people working.
- Include images of green materials, brown materials, the method you might be using, finished compost, and more!

Quick Tip

Remember, the compost bins used in this program can only support a limited number of households/ participants. Start with just 10 members and work your way up from there.

Distribute Your Flyer

- Email to community organizations and email lists.
- Post it on community social media groups.
- Print and post it at community centers.
- Speak at community meetings about your site.
- Organize a team to knock on doors of immediate neighbors; bring your flyer and an interest sheet for people to sign up to attend a future on-site meeting with more information.

Create an Interest Sheet

- Name
- Address
- Phone number
- Email address
- State your interest in being a compost participant or a site volunteer
- Do you have composting experience? Any formal or informal training?

Getting Started

Once you have a list of interested participants and volunteers, you can then reach out to those people to get started. Try starting out with no more than ten participants. If you have more than ten people interested in participating, consider keeping them on a waitlist to participate and asking them to volunteer in the meantime.

You can let people on the waitlist know that you want to get through at least one collection bin cycle with your initial group of participants, which will take around one month, then be back in touch with them.



Photo: Two youth volunteers holding a worm from a compost worm bin.

Ways to Participate

Your site will need volunteers with all kinds of abilities. People with disabilities, seniors, and youth can all get involved.

Important tasks include:

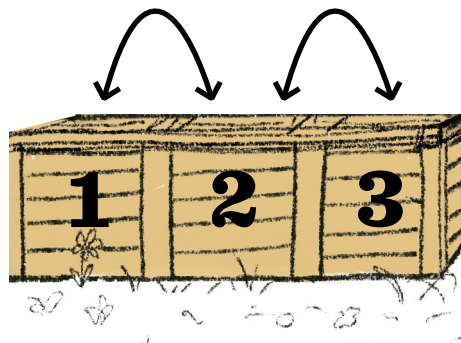
- Weeding around bins
- Sifting large quantities of compost
- Securing carbon/browns
- Turning the compost pile

Tasks that do not require a high level of physical strength or ability include:

- Looking for and picking out contamination during the donut making, lasagna layering, and pile turning processes. This is an extremely important role because contamination avoidance is so important to creating high-quality compost.
- Sifting compost. You can have five-gallon buckets of finished compost ready for sifting. Even small kids can help with sifting.
- Organizing volunteer workdays, training sessions for new participants, and compost giveaways.
- Making signs for acceptable green materials and bins.
- Making signs to hang up around your site stating that this is a community compost site, making it clear that these bins are not for dropping off or depositing trash.
- Leading small projects with children who are present during workdays.
- Recording and reporting data, including weight of green materials being processed, weight of finished compost created, pile temperatures, pile heights, and more.
- Promoting your site to educate the community and encourage increased participation.
- Calling and emailing other volunteers to schedule events.

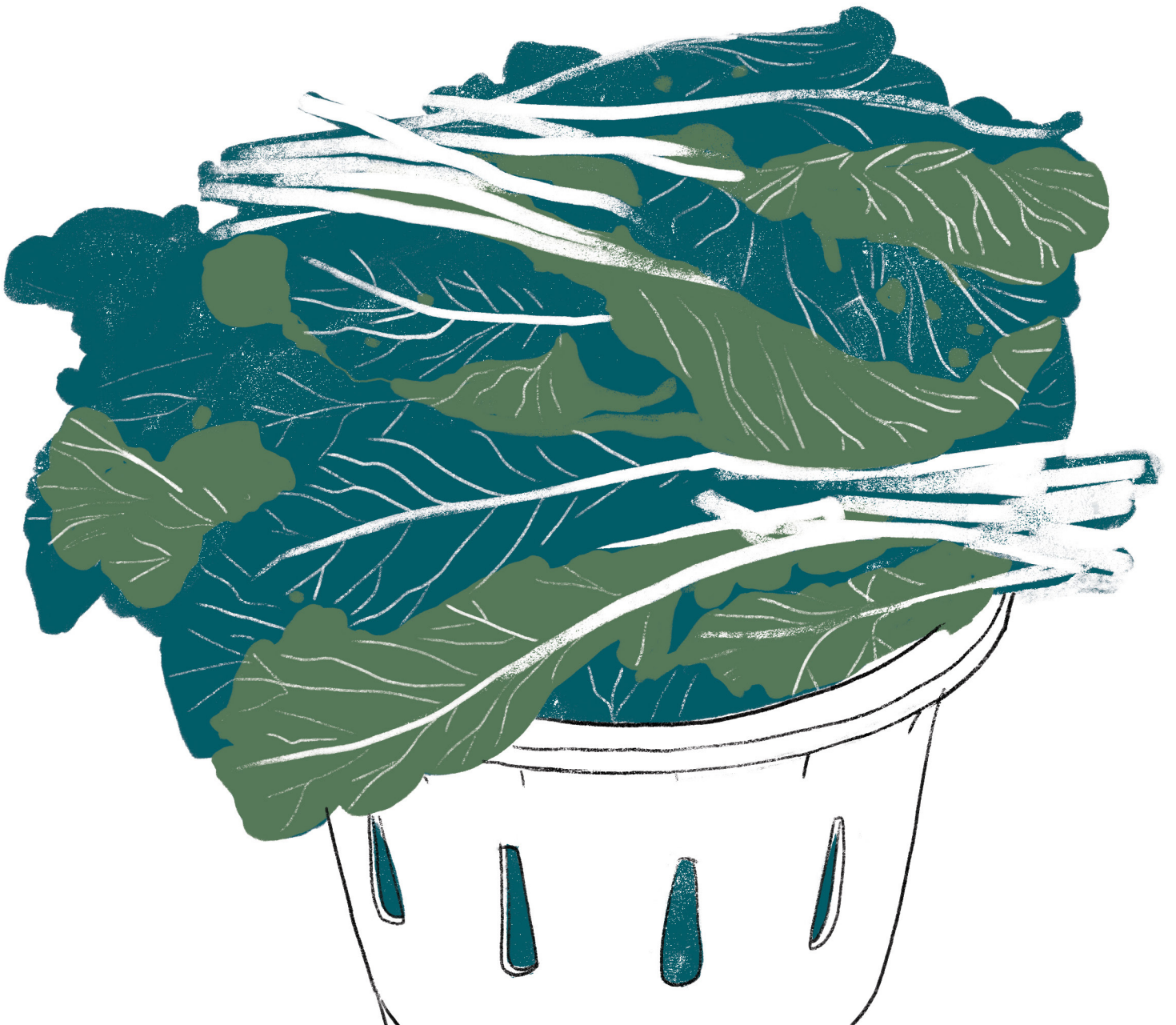
Important!

When it comes time for **pile turning**, your site will need its share of volunteers who are capable of lifting. It could take two to three people and around one to two hours to turn one bin's material over into the next bin.



Chapter 9

Troubleshooting



Common Issues

As we've mentioned throughout this manual, composting is not an exact science. You are likely to hit some bumps on the road from green and brown materials to earthy, nutrient-rich compost. Here are some issues you may encounter, and how best to handle them.

Active pile does not get hot

Reasons: Material being too dry, too wet, piles not getting enough air, or your material ratio is off.

Solution: Turn the pile and add water if too dry; add brown materials if too wet. You will provide the air the piles need through the pile turning process.

Active pile gets too hot (over 155 degrees F)

Reasons: Air does not have sufficient means to flow out from the pile, low moisture.

Solution: Turn the pile, adding water as you turn it.

Active pile smells bad, like rotten eggs or worse

Reasons: Pile is not getting enough air or material ratio is off.

Solution: Turn the pile, allowing air to flow through. Break up any clumps of material that were not breaking down. Add water and brown materials as you turn.

Lots of mosquitoes or gnats flying around piles

Reasons: Green materials being left exposed (not properly covered with a layer of browns after adding to collection bin), stagnant water near the bins.

Solution: Make sure participants cover the donuts or lasagna layers they add to the collection bin with an approximately 4" layer of brown materials. Avoid having standing water around the bins; make sure rain barrels have a mesh screen across the top.

Neighbors start dumping household trash/contaminants in or around your bins

Review with neighbors signs you have already placed around your site for neighbors to see, showing that this is a community compost site, not a place to dump or deposit trash. Speak at or host a community meeting to address the issue.

Quick Tip

These are just a few of the general issues you may encounter at your site. For more information on these and other issues, see the ILSR Troubleshooting Table listed in the Resources Section.

Site leaders in Philadelphia's Community Compost Network can call their contact at Philadelphia Parks & Recreation for troubleshooting advice if they can't troubleshoot an issue on their own.





Pests

If you find evidence that mice, rats, or other unwanted animals have found their way into your compost bins, there are different actions you can take depending on the situation.

If evidence is found in your collection bin or active bin, remind participants that they need to secure the lids properly and cover the collection bin pile with 4" of brown materials after each addition of fresh feedstocks. Stick with the list of approved green materials, and avoid meat and dairy. You will need to have the entire pile reach 131°F for three consecutive days. That may entail emptying the bin, mixing the materials, adjusting recipe and moisture, and putting back in. Check the area around the bins for any potential homes for vermin and handle them accordingly if found.

Rodent issues need to be dealt with immediately. One healthy female Norway rat (the type that live in Philadelphia) can have 80+ offspring a year. That is exponential growth if left unchecked.

While it is a shame to see compost go to waste, it is always better to be safe than sorry. Be very careful when touching or handling anything that may be contaminated with rodent urine or feces. Please contact a professional if you are unable to trap rodents yourself or unsuccessful in your attempts.

9 TIPS TO AVOID RODENTS & OTHER UNWANTED CRITTERS

1 Do not compost meat, dairy, fats/oil, cooked food.



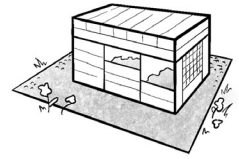
6 Turn piles thoroughly and regularly so rodents see no opportunity for a habitat.



2 Incorporate all bits of food well into pile, never leave any exposed or visible.



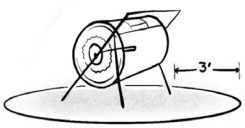
7 Bin systems need a barrier at the base to prevent habitat formation where it's nice and warm (1/4-inch hardware cloth or something else inhospitable like cement or a 6-inch dug-out pit with sand or gravel).



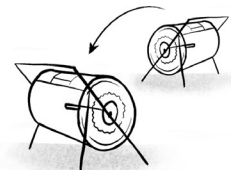
3 Cover all piles with a thick layer of browns or finished compost.



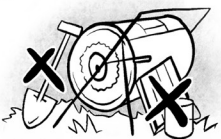
4 Maintain at least 3 feet of open space all around your system (this makes rodents nervous about predators).



8 If you have space and a moveable system, consider moving your system from time to time. Rodents like habitats that are undisturbed.



5 Avoid clutter and trim back grasses and shrubs to eliminate potential rodent hiding places.



9 Activity is good!



Image: Courtesy of the Institute for Local Self-Reliance. Art credit: Clarissa Libertelli. Reprinted with permission.

Communication

Establish a group communication method that suits your community. Examples include:

- Email list (i.e. listserv) or email distribution list
- Text message group text list
- Instant messaging programs (e.g. Signal, Discord, Slack, Google Groups, Microsoft Teams, etc.)
- Social media groups (e.g. facebook groups, etc.)

You can have one group communication contact list for all people involved in your site, and other group communication lists for subgroups such as members or participants only, volunteers only. Creating a communication plan, as needed, for delegating tasks and addressing any issues would be a helpful resource to members.

Conflict Resolution

We encourage you to be proactive about conflict occurring at your site or within your community projects. Ensure all participants involved at the site and in the project can commit to community agreements (ideally created with consensus) when conflict arises.

Avoiding or not dealing with conflict can result in relationships based on inequality and privilege. Therefore, we suggest establishing a conflict resolution protocol that includes but is not limited to any form of oppression based on racism, anti-Blackness, white supremacy culture, gender, sexual orientation, class, age, religion or spiritual beliefs and physical and mental abilities. Your site should figure out and make space for a process that can promote community safety, trust and affirmation.

We also suggest that participants document conflict (e.g. written, email or other electronic format) when it arises to acknowledge any transgression (e.g. physical, social, interpersonal), and then develop a process to respond to it in a timely manner.

Your site may also choose to hire a community facilitator or conflict mediator to support participants through conflict as it arises or through conflict your site does not have the capacity or training to address. Facilitators and conflict mediators also can help negotiate a reasonable solution. Although community responses to conflict may vary widely with regard to the degree of the conflict, we suggest participants handle conflict in-person if possible (versus in writing or over the phone). If meeting in-person, your site should ensure that all parties involved can commit to specific community agreements (e.g. active listening, no physical and verbal abuse, etc.) and respect. We also suggest that sites explore language in their agreements to remove participants that, after many mediations, continue to exhibit behaviors that are not aligned with the community agreements.

It is the responsibility of your site's leadership to check in with all parties involved in the conflict to ensure that the conflict has been resolved, and that the steps identified to reach a solution were completed. It is important to be proactive in working with all parties involved to continue their dialogue, which can create a safer, more positive and healthy community environment.

Chapter 10

**Conclusion:
Have Fun!**



Enjoy the Process!

Community composting requires work — there is no denying that. But it is the type of work that can also be fun and rewarding. Some of the fun aspects of community composting are:

- Being outdoors, spending time at your community garden site.
- Connecting with neighbors around a common cause.
- Teaching children to live an environmentally friendly lifestyle, leading by example.
- Seeing your food scraps transformed into compost.



Photo: Parks & Rec staffer speaking with a gardener during a garden work day.

The community composting work you do is rewarding on a personal and community level. You and your team can feel great about:

- Eliminating a problem (food scraps formerly destined for environmentally hazardous, unsustainable, expensive landfills or incinerators) and creating something positive (compost to grow healthy plants) at the same time.
- Avoiding smelly food scraps sitting in your household trash all week long.
- Giving the City's sanitation department less weight to lift up, as food scraps are the heaviest component of a typical trash can's contents.
- Helping the City spend fewer of your tax dollars on landfill space.
- Contributing to a positive, team-oriented activity in your community.

Important!

By reading this manual and putting its contents to good use, composting food scraps in your community, you have made yourself a part of the solution to one of our city and planet's biggest problems. Congrats to you on being a part of that solution, and best wishes in your community composting journey!



Photo: Youth volunteers working with the land, pulling leeks out of the ground.

Resources

Gardening Resources

Neighborhood Gardens Trust is a Philadelphia-based land trust dedicated to preserving and supporting community gardens and other shared open spaces across the city. To prevent the threat of development taking place on gardens, NGT works with self-organized gardeners, community organizations, property owners, and the City of Philadelphia to secure ownership or long-term leases for community-managed open spaces. www.ngtrust.org
Phone: 215-988-8798

Pennsylvania Horticultural Society has a Community Gardens Program for new and existing community gardens in the city that offers resources, workshops, supplies, technical assistance, and educational support for growers. <https://phsonline.org/programs/community-gardens>
Phone: 215-988-8800

Public Interest Law Center, Garden Justice Legal Initiative is an organization that represents growers in need of pro bono counsel, and provides key policy research and analysis on urban agriculture, garden, and open space policy in Philadelphia.
<https://www.pubintl.org/cases-and-projects/garden-justice-legal-initiative-gjli/>
Phone: 215-627-7100

Farm Philly is the urban agriculture program of Philadelphia Parks & Recreation. The program supports gardeners, farmers, and residents' ability to grow in spaces that nourish and heal their own communities. The program supports urban agriculture projects (e.g., community gardens, production farms and orchards) on park land and is actively involved in food policy and advocacy within the City. Farm Philly provides growers with program support, supplies, outreach materials, workshops and training technical support. <https://www.phila.gov/programs/farmphilly/>
Email: farmphilly@phila.gov

Fairmount Park Organic Recycling Center is a Philadelphia-based land trust dedicated to preserving and supporting community gardens and other shared open spaces across the city. To prevent the threat of development taking place on gardens, NGT works with self-organized gardeners, community organizations, property owners, and the City of Philadelphia to secure ownership or long-term leases for community-managed open spaces.
<https://www.phila.gov/services/trees-parks-the-environment/get-organic-materials/>

Philadelphia Land Bank is the agency responsible for helping residents gardening on land that is City-owned or tax delinquent, you can contact the City of Philadelphia Land Bank to understand your options for ownership or leasing.
<https://phdcphila.org/land/buy-land/community-gardens-open-space-and-recreational-areas>

Pennsylvania State Cooperative Extension offers many resources to support food production and safety. One of those resources is soil and compost testing services and reports to inform growers what's in their soil.
<https://agsci.psu.edu/aasl/soil-testing/fertility>

Soil Safety and Urban Gardening in Philadelphia Guide was released in 2017 by the Philadelphia Food Policy Advisory Council (FPAC). The report seeks to guide readers through the process of creating the Philadelphia Soil Safety Working Group, the policy research, process conclusions and policy recommendations given to the City of Philadelphia for soil testing and evaluation for urban agriculture projects. The document also informs growers of soil health and safety, and provides resources to research land where food production is taking place.

<https://www.phila.gov/documents/soil-safety-and-urban-gardening-report/>

Institute for Local Self-Reliance Resources

Community Composting Done Right: A Guide to Best Management Practices

<https://ilsr.org/composting-bmp-guide/>

Troubleshooting Guide

<https://ilsr.org/wp-content/uploads/2019/03/Compost-BMP-Appendix-C.pdf>

Growing Local Fertility: A Guide to Community Composting

<https://ilsr.org/size-matters-report-shows-small-scale-community-based-composting/>

Neighborhood Soil Rebuilders Composter Training Program

<https://ilsr.org/neighborhood-soil-rebuilders/>

Home Composting Website

<https://ilsr.org/home-composting/>

James McSweeney, Community-Scale Composting Systems: A Comprehensive Practical Guide for Closing the Food System and Solving Our Waste Crisis

www.chelseagreen.com/product/community-scale-composting-systems

Thermometers

Reotemp Backyard Compost Thermometer

<https://reotempcompost.com/backyard-compost-thermometer/>

Cate's Garden Compost Thermometer

<https://www.catesgarden.com/products/compost-thermometer>

ThermoWorks Heavy Duty Waterproof Thermometer (Digital High/Low Memory)

<https://www.thermoworks.com/RT610B-24>

Other Resources

U.S. Composting Council Persistent Herbicide FAQs

<https://www.compostingcouncil.org/page/persistent-herbicides-faq>

Compost Training Programs

<https://www.compostfoundation.org/Education/COTC>

US Composting Council

<https://www.compostingcouncil.org/>

Certified Compost Testing Labs

<https://www.compostingcouncil.org/page/CertifiedLabs>

