

# Cheat Sheet: Composting

According to the EPA, 24 percent of the U.S. municipal solid waste stream is composed of food remnants and yard trimmings. If these materials were diverted to another use that kept them out of the trash, a significant portion of the country's everyday waste could be recovered for reuse.

Grass clippings, food scraps and yard waste are all ideal materials to add to a compost pile. This means that starting one is about more than just creating a great soil booster for your garden or farm – it can cut down on your waste output as well.

For those who have been thinking about starting a pile for some time now, but are still unsure about taking on the challenge, understanding the basics of composting can make it a less intimidating process.



It's not as hard as you think! Starting a compost pile is as easy as picking up a bin.

## First Thing's First: What is Composting?

**For households**, composting is a way to recycle certain materials and kitchen scraps and turn them into a beneficial soil amendment for home gardens and reduce waste output.

**For small-scale farms**, composting is a way to utilize the residual plant and animal material generated and put it to good use as a fertilizer and soil-builder for future crop production.

In both cases, composting is the natural process of decomposition, sped up by a deliberate strategy in a concentrated environment to transform materials such as grass clippings, vegetable scraps, newspaper and more into a new material (known as “humus”) that can then be incorporated back into the soil. Also, composting with worms, or vermicomposting, is another option over traditional composting using outdoor bins.

## Break It Down: The Process

So, how does composting work? According to Nance Trautmann and Elaina Olynciw of Cornell University, microorganisms break down organic matter, producing heat, carbon dioxide, water and humus in the process.

When composting is done correctly, a pile undergoes three optimal phases:

1. The **mesophilic**, or moderate temperature phase, lasts 2-3 days
2. The **thermophilic**, or high temperature phase, lasts anywhere from 3 days to several months, depending on what is in the pile
3. The **cooling and maturation** phase lasts several months

In the first stage, what are referred to as mesophilic microorganisms quickly break down the easily degradable materials in the pile. The microorganisms' output of this breakdown is heat, so the temperature in the pile rise. High temperatures in a compost pile are necessary to ensure that the next phase—where thermophilic (meaning “heat loving”) microbes replace the mesophilic ones—ensues.

Thermophilic microbes then kill any pathogens that may exist, as well accelerate the breakdown of complex carbohydrates, fats and proteins that exist in the pile. Important to note is that if temperatures in the pile go above 149 degrees Fahrenheit, even the heat loving microbes can be killed, slowing the rate of decomposition.

Because piles can get too hot, aerating, or turning the pile, is essential if the cooling phase is to be reached. The cooling phase is where the high microbial activity of the other two phases is reduced, allowing for the compost to mature and become ready for application.



Materials that are ideal for composting include food scraps such as vegetables, fruits and other materials that do not contain animal products or oil and fats

## **The Do's and Don'ts: What to Add, What to Leave Out**

Besides the process itself, knowing what ingredients should go into a backyard composting operation is essential for a successful outcome.

“Green” (nitrogen rich) and “brown” (carbon rich) materials are required to be in proper balance to ensure that the pile does not become anaerobic. Anaerobic decomposition occurs as a result of an improper chemical balance, mainly a lack of oxygen.

This lack of oxygen necessitates aeration (turning the pile). If the pile is not properly aerated or has too much nitrogen and not enough carbon, rotting and stinking can occur. A compost pile should never smell..

So, how to achieve this proper chemical balance? Let's start with the greens. Green materials refer to those that are rich in nitrogen. Some examples of green materials include:

- **Food scraps** - Vegetable peelings are a common material produced by households and make a great compost amendment. However, never add animal-based leftovers (fat trimmings, meat, cheese, milk, etc) as the oils and fats are not conducive to a backyard composting operation.
- **Fresh grass clippings**
- **Manure** - If you have access to manure from horses, cows, sheep, goats or chickens, it is a great compost ingredient because it speeds up the decomposition process. It is not a requisite for a successful compost pile, however. Never use manure from carnivores.
- **Plants and plant cuttings** - Just-picked weeds from around the backyard (as long as there are no developed seeds or seed heads) are permissible, as are flower tops. Green leaves from a freshly cut branch work as well (just make sure to shred them).

Brown Materials, on the other hand, are rich in another crucial ingredient, carbon. Carbon gives the microbes the energy they need to work. It is useful to shred most brown ingredients so as to lessen the workload for microbes, enabling decomposition to happen faster.

Some examples of brown materials include:

- **Dead, dry leaves**
- **Hay and straw**
- **Simple paper products** – Newspaper, paper and cardboard
- **Crushed egg shells**
- **Coffee grounds** – tea bags and loose-leaf tea work as well
- **Wood ashes and sawdust** – Use sparingly. Wood ashes can make the pile very alkaline, which limits microbial activity, and sawdust can take a long time to break down.



It's amazing what rich soil can yield. Use your compost as fertilizer for your backyard or garden.

## **Some Final Tips: Water**

According to the EPA, another important factor to keep in mind is the moisture content of the pile, since the hard-at-work microorganisms need an adequate amount to survive. Water also transports nutrients and organic matter throughout a compost pile, which keeps the pile from becoming stagnant.

But how do you tell if water should be added? According to the New York City Compost Project, if you have just loaded the pile with autumn leaves from the backyard, make sure to add sufficient water to them so that they glisten. Doing so kick starts the decomposition process of the carbon-rich leaves.

Additionally, the NYC Compost Project recommends that “Optimal moisture levels for composting occur when materials are about as moist as a wrung-out sponge—obviously moist to the touch, but yielding no liquid when squeezed.”

For advanced-level composting, moisture content instruments are available and can help you to be more precise, although rainfall will often do the trick, as it provides a slow soak that is optimal for infiltrating a compost pile. For those in a drier climate, however, intentional watering will probably be necessary. Make sure to add water slowly and to turn the pile to incorporate the water so it reaches all sections.

## **Make It Easy!**

To avoid countless trips out to the backyard to dispose of kitchen scraps, put them in an airtight bag and freeze them. This also helps to avoid the smell of old food.

Additionally, freezing will assist in achieving chemical balance in your compost pile. For example, if you have an overload of “green” food scraps from that get-together you had the other night and you do not have the necessary “brown” materials to balance out the pile, freeze the scraps for a while until you have enough “brown” to add to the pile.

Where you live and your particular climate will have a significant effect on your pile, some it occasionally may come down to some experimentation.