

Composting 101

Innovation Towards the Future

The Problem



Food waste continues to be a huge problem affecting communities around the world.

- Worsens world hunger
 - 1.3 billion tons of food wasted every year
- Intensifies food insecurity in marginalized communities
- Creates dirtier and more disease-prone environments

Not only that, but food waste also intensifies and accelerates other environmental issues.

- A major contributor to greenhouse gases (8-10% of all)
 - Leads to global warming
- Unnecessary land usage puts pressure on biodiversity

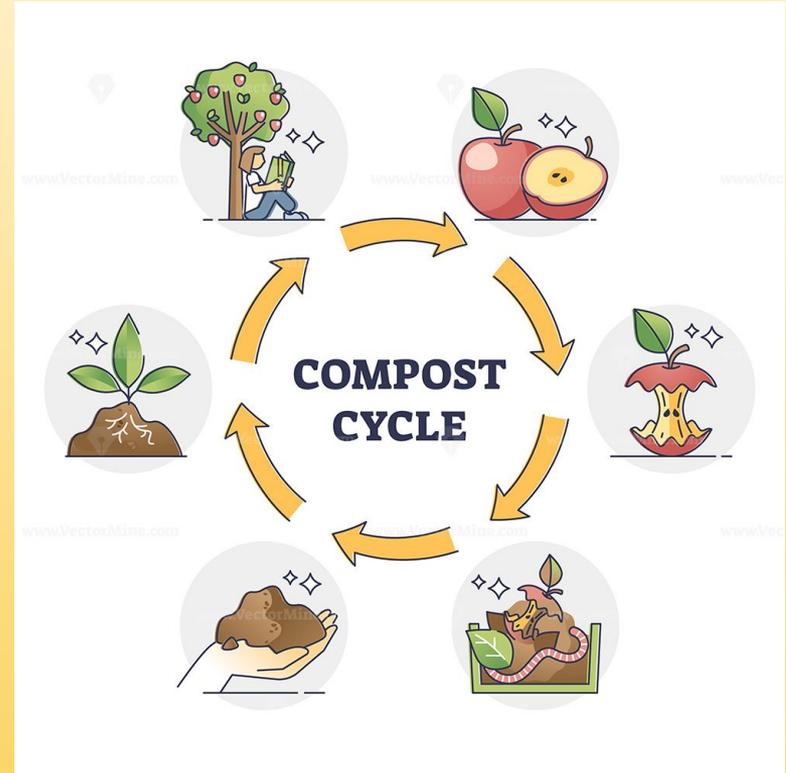
What is Composting?

Composting is a way of recycling organic matter, such as:

- Leaves
- Weeds
- Leftover food scraps

It speeds up the decomposition process of organic matter by providing an environment where organisms (like worms) can break down the material faster.

As a result, the organic matter is turned into fertilizer that can be used to enrich soil and grow plants.

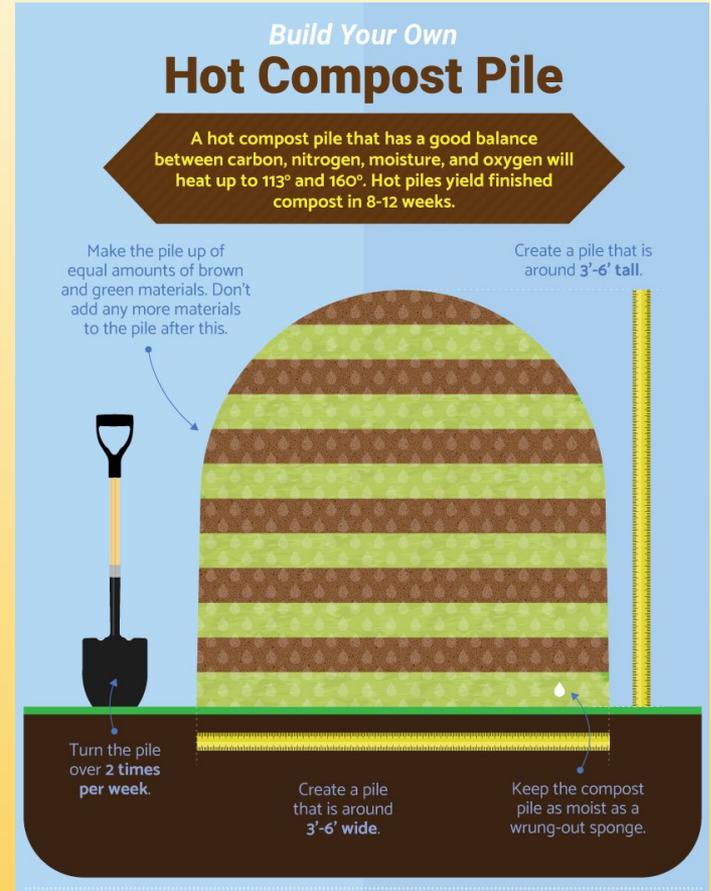


Hot Compost

There are two different types of composting: hot and cold.

Hot composting is a method where microbial activity is optimized by aerating the compost pile. Aerating causes the microbes to produce heat, maintaining the pile's internal temperature at **130-140F**.

At this temperature, microbes can reproduce at higher rates, resulting in faster composting.



Cold Compost

Cold composting is a simpler method than hot composting. It doesn't require aerating the compost pile, and therefore does not need active maintenance.

Hot composting requires about a cubic meter of material to begin, but cold composting can be done gradually by adding more organic material to the compost bin.

However, cold composting is a longer process compared to hot composting. Hot compost can be ready in a few weeks, while cold compost needs several months.



Materials

To make good compost, it's best to keep the ratio between brown materials and green materials to 2:1.

Green Materials: Nitrogen Rich

- Vegetable scraps
- Grass clippings
- Coffee grounds/filters
- Plants like alfalfa, legumes, and clover
- Herbivore manure

Brown Materials: Carbon Rich

- Leaves
- Wood ashes
- Shrub prunings
- Corn cobs/stalks
- Straw/hay
- Newspaper

RECIPES FOR

Great Compost

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Customize your compost to meet your garden's specific nutrient needs. After you get your soil tested, find the deficiency below you would like to fix and add a few items from the list to your compost pile. Make sure you still **keep the ratio** between brown and green items.



CARBON 1/2

Carbon

Brown materials make up the majority of good compost. Too much carbon slows decomposition so be sure to create a balance of carbon and nitrogen.

LEAVES	WOOD ASHES
SHRUB PRUNINGS	CORN COBS OR STALKS
STRAW OR HAY	NEWSPAPER



NITROGEN 1/2

Nitrogen

Greens are high in nitrogen & help build cell structures. For every bucket of greens you add to your compost, make sure to add 2-3 buckets of brown materials to balance your compost.

VEGETABLE SCRAPS	FRESH GRASS CLIPPINGS
COFFEE GROUNDS AND FILTERS	"GREEN MANURE" (plants such as alfalfa, legumes & clover)
MANURE FROM HERBIVORES	

Benefits of Composting

Composting can introduce many important nutrients to soil such as:

- **Nitrogen**
- Oxygen
- Carbon

All of these are essential for plant growth, especially nitrogen. Nitrogen depletion can cause soil to become infertile and incapable of growing plants.



Composting also suppresses disease and pests, encouraging development of beneficial microbe colonies.

In general, composting fruit and vegetable waste prevents it from going to landfills, causing pollution, or damaging the environment.

Solutions other than Composting

Although composting is an effective method to combat food waste, many methods besides composting need to be implemented at the same time to solve this problem.

- When buying perishable foods, buy only the food you are able to eat.
- If you want to get rid of food that is still unopened and fresh, consider donating to a food drive.
- Preserve fresh fruits and vegetables that you want to eat at a later time by making jams and pickles. (Up-valuing)
- On a wider scale, companies are creating biofuel from food waste to prevent ecological damage as well.

Hands-on Project!

Materials needed:

- **One large bottle** (a 2-liter soda bottle works the best)
- **Garden soil/dirt** (not from a shop, must be from outdoors)
- **Some sheets of paper** (will have to be shredded later)
- **Grass clippings** (non-pesticide treated, if yours is, you can use more peels instead)
- **Wax paper**
- **One rubber band**
- **Scissors**
- **Peels and waste** (not citrus or onion)

Step 1

First, take your soda bottle and cut around the bottle where the label ends, making a wide opening. This is where you will be able to access the inside of the bottle.

Step 2

Add garden soil to the bottom of the bottle, about 1 inch deep.

Step 3

Put in a layer of peelings (**your choice, but not citrus or onion**), about the same thickness as the first layer of soil. On top of that, add another 1 inch layer of soil.

Step 4

Take a sheet of paper and shred it. (If you have a paper shredder, perfect! If you don't, ripping it into pieces works as well.) Add your shredded paper to the bottle.

Step 5

Add another layer of soil, then add your grass clippings.

Step 6

Continue doing this pattern until your bottle is filled up. (peels, paper, grass)

Step 7

Take about two tablespoons of water and dampen the contents of the bottle with it.

Step 8

Take your wax paper, and cover the top of the bottle with it. Fold the edges over the bottle, and wrap your rubber band around the top so the wax paper stays in place.

Step 9

Now, you just have to wait. The bacteria in the soil will start breaking down the contents of the bottle, drawing nutrients into the soil. It will take about 3-6 weeks for change to be visible.

What to Compost

If you want to continue composting in a new bottle, here are some things that you can try adding to your composter:

- Fruits, vegetables, grass, straw, leaves, wood, nut shells, eggshells
- Shredded cardboard, newspaper, paper
- Coffee grounds, coffee filters, tea bags



What Not to Compost

Although there are many things you can compost to help the environment, you shouldn't be composting everything, even if it's plant-based/natural. Here are some things you shouldn't compost:

- Coal or charcoal ashes, fats, greases, oils
- Meats, whole eggs, dairy products, fish, other animal products
- Biological waste
- Black walnut tree twigs/leaves
- Grass or leaves contaminated with chemical pesticides
- Orange/Onion peels

Further Information

If you want to learn more about composting, here are some online sources:

- EPA: <https://www.epa.gov/recycle/composting-home>
- NRDC: <https://www.nrdc.org/stories/composting-101>
- TAMU: <https://agriflifeextension.tamu.edu/library/gardening/composting/>
- NIH: <https://pubmed.ncbi.nlm.nih.gov/35143985/>



Thanks for Listening!

We will send the link to the slides in the chat.

Have fun with your projects!

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