



# CIY Compost It Yourself

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## WHAT IS COMPOSTING AND WHY DO IT?

Composting is nature's way to recycle. It is the controlled, natural decomposition of organic matter. Microorganisms and macroorganisms break down organic materials into compost, or humus, a nutrient-rich soil amendment that improves the health and efficiency of your garden ecosystem from the ground up.

### COMPOSTING HAS MANY BENEFITS FOR THE HOMEOWNER AND THE ENVIRONMENT:

- SOIL** Benefits your yard and garden by improving soil health and fertility, which increases plants' resilience to pests, disease, and other environmental stressors.
- WATER** Helps soil hold more moisture, minimizing erosion, runoff and nutrient loss, and reducing the need for frequent watering.
- RECYCLE** Diverts valuable organic resources from becoming hazardous materials in the landfill, and encourages natural nutrient cycling.
- MONEY** Saves money by conserving water and replacing the need to purchase commercial fertilizers and soil amendments.

*Composting can be practiced almost anywhere... in your backyard, at work or at school, even in an apartment! All you need to get started is a little bit of space, the basic ingredients, and an understanding of the process.*

### LOOK FOR THESE ICONS TO FIND THE COMPOST INFO YOU WANT, FASTER!



## COMPOSTING IN STYLE

There are several different styles of composting. Some require more time and effort, but yield quicker results. Many composters find they maximize their efficiency by practicing more than one type of composting, or by setting up multiple bin systems to have several stages of decomposition occurring simultaneously. Which style of composting best fits your needs and lifestyle?

**PASSIVE COMPOSTING** is a more relaxed style of composting, an involves turning and adding water less frequently. The pile won't generate as much heat and may dry out at times, so the materials won't decompose as quickly, and weed seeds may not be killed.

**ACTIVE COMPOSTING** is a more engaged style of composting, and involves turning the pile on a regular basis and maintaining optimal moisture and temperature levels. This method kills weed seeds and produces finished compost in the shortest period of time.

**VERMICOMPOSTING** or, composting with red worms, is a fun and easy way to recycle your food scraps. It uses less space than traditional composting, and can be done in an indoor setting. This method produces worm castings, another nutrient-rich soil amendment.

### COMPOST STYLE GUIDE

QUESTIONS TO ASK	PASSIVE COMPOSTING	ACTIVE COMPOSTING	VERMICOMPOSTING
What type of materials do I want to compost?	Fresh and dried yard debris, kitchen scraps, paper products		Kitchen scraps, paper products
What type of space do I have to compost in?	Outdoor area with additional space around the bin for turning and harvesting		Apartment or condo, limited yard space
How much effort do I want to put in?	Low effort, infrequent maintenance (turning and watering when convenient)	Engaged effort, frequent maintenance (turning and watering regularly)	Low-moderate effort, moderate maintenance (maintaining consistent food and moisture supply)
How soon do I want a finished product?	Finished compost expected in 6-18 months	Finished compost expected in 3-6 months	Finished worm castings expected in 3-4 months

### COMPOST BINS

A compost bin will help to keep your compost pile neat and tidy, deter rodent entry, and retain heat and moisture during decomposition. Compost bins kept in the shade are less likely to require frequent watering. Ideally, bins are placed on soil to invite a community of beneficial decomposers into the pile.

### HOMEMADE BINS

Homemade bins can be easily constructed out of wood, wire mesh, scrap pallets, and other materials commonly found around the home. To get a set of plans for building your own traditional backyard bin or worm bin visit [solanacenter.org/ciy](http://solanacenter.org/ciy)



### PURCHASED BINS

Purchased bins come in a variety of styles. They can be purchased at nurseries and garden centers, or ordered directly from the manufacturer. To see examples of the different types of composting bins, visit one of the Composting Demonstration Gardens around the County. For a list of sites, visit [solanacenter.org/ciy](http://solanacenter.org/ciy)

*Come by the Solana Center office or visit us online at [solanacenter.org/ciy](http://solanacenter.org/ciy) to learn more about our subsidized bin program!*

## COMPOSTING BASICS

There are four basic ingredients are required for composting: GREENS, BROWNS, WATER, & AIR. Mixing the proper amounts of these ingredients together will provide the composting organisms (see Compost Critters) with enough nitrogen, carbon, moisture and oxygen to break down the materials efficiently.

## GREENS + BROWNS + WATER + AIR

**GREENS** are fresh organic materials that serve as sources of nitrogen. Greens are the primary energy source of the active microorganisms, and are useful as a supplementary source of moisture in the pile.

**BROWNS** are dried or dead organic materials that serve as sources of carbon. Browns are useful for retaining moisture, creating small air pockets, and supporting a more diverse community of decomposers in the pile.

**WATER** helps ensure efficient processing of organics. Ideally, the pile is kept as moist as a wrung out sponge. Too little moisture will inhibit decomposition, but too much water can produce smelly, anaerobic conditions.

**AIR** is essential for a sweet, earthy-smelling compost pile. Turning your compost pile regularly will help to inhibit the growth of odor-causing anaerobic bacteria, and will result in faster decomposition.

### WHAT GOES IN THE COMPOST PILE?

#### 50% GREENS

Fresh yard trimmings, fresh grass clippings, fresh or moldy fruit and vegetable scraps, coffee grinds, tea leaves, breads, certain types of manure\*



#### 50% BROWNS

Woody materials, dead or dried yard debris, chopped branches and twigs, bark, straw, sawdust, coffee filters, tea bags, shredded paper and paper products

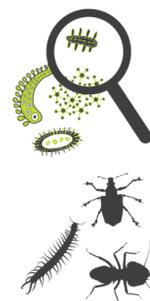
\*For more information on composting with manure, visit [solanacenter.org/ciy](http://solanacenter.org/ciy)

### COMPOST CRITTERS

A handful of compost contains more decomposer organisms than there are people on the planet. These amazing little creatures are responsible for making the whole composting process happen.

**MICROORGANISMS** (like bacteria and fungi) do the majority of decomposition work. Although too small to see, they are on everything you throw into the compost pile.

**MACROORGANISMS** (like insects, worms, and grubs) are large enough to see. They usually enter the compost pile from the surrounding landscape in the later stages of decomposition.



### WHAT STAYS OUT OF THE COMPOST PILE?

- Meat, fish, poultry & bones
- Charcoal or firelog ashes
- Dog, cat & human feces
- Oils, grease & lard
- Fresh weeds with mature seeds (unless building a hot compost pile)
- Eggs & dairy products
- Treated wood products
- Glossy/coated paper
- Inorganic materials



# THE COMPOSTING CONTINUUM

Composting occurs on a spectrum; once you have the four ingredients, it is the amount of attention that you pay to the pile that determines its level of activity and how quickly it will yield finished compost.

**MORE PASSIVE**

*Slower Decomposition*

**MORE ACTIVE**

*Faster Decomposition*

## COOL COMPOSTING

### MATERIALS

Bury food scraps in the core of pile to deter pests. Do not add weed seeds or diseased plants. You can start the process with any volume of compostables.

### MAINTENANCE

Turning and adding water to the pile are done at your leisure, remembering more aeration and moisture increase efficiency. The temperature of your pile may be 80°F or cooler.

### BIOLOGY

There will be no heat-loving bacteria present, and your pile will host a diverse community of macroorganisms. You may even notice some seeds sprouting in the pile.

### TIMELINE

Stop adding material several months before you plan to harvest. Expect finished compost in 6-18 months, correlated to your time and labor investments in the pile.

## ACTIVE COMPOSTING

### MATERIALS

Bury food scraps in the core of pile to deter pests. Do not add weed seeds or diseased plants. Starting with a bulk of material will speed up heating, but is not necessary.

### MAINTENANCE

Turning should be done with some regularity (approx. once or twice a month), water as needed to ensure even dampness. An efficient active pile operates between 80°F- 130°F.

### BIOLOGY

As pile temperature rises, populations of heat-loving microorganisms will grow. As the pile cools, you will notice more macroorganisms and possibly some seed sprouts.

### TIMELINE

Stop adding material 2-3 months before you plan to harvest. Expect finished compost in 5-6 months, correlated to your time and labor investments in the pile.

## HOT COMPOSTING

### MATERIALS

Weed seeds will be deactivated by even heat distribution throughout the pile. Starting with a large volume of material (try filling the bin) helps ensure a rapid temperature spike.

### MAINTENANCE

Routine turning and watering (approx. once a week). A pile is considered 'hot' at 130°F and above. As the pile cools after a few days, aerate and add water to re-spike the temperature.

### BIOLOGY

Hot piles are dominated by hard-working but short-lived communities of heat-loving bacteria. You will not see macroorganisms in the pile until it reaches a cooler phase.

### TIMELINE

You will add almost all of your materials at the initial set-up of the bin. Expect finished compost in 3-4 months.

For more information on hot composting, visit [www.solanacenter.org/ciy](http://www.solanacenter.org/ciy)

## EFFICIENCY TIPS ACROSS THE SPECTRUM

### LOCATION

Placing your bin on soil allows critical decomposers to more easily enter the pile. A shady location for the bin helps to conserve water, as pile contents won't dry out as rapidly.

### MIX IT UP

A greater diversity of inputs will produce a greater diversity of nutrients in the finished product. Don't be afraid to experiment with unconventional compostables!

### CHOP IT UP

Smaller particle size increases surface area of materials, and encourages faster decomposition. This is especially useful for breaking down woody, fibrous, and other resistant materials.

### "CAP" IT

Keeping a layer of browns (like pine needles, burlap, straw or cardboard) on top of the pile helps seal in moisture and deters pests like fruit flies and rodents from accessing food scraps.



## VERMICOMPOSTING BASICS

Worms used for composting are different than the large earthworms commonly found burrowing in San Diego backyards. Red worms are smaller, and are well-adapted to the conditions inside a vermicompost bin. Unlike the earthworms that freely enter a traditional compost system, vermicompost worms must be intentionally added to a worm bin. Red worms are voracious eaters, consuming up to half their body weight in organic material every day and excreting it in the form of castings, a nutrient rich soil amendment that plants love.

Besides the bin itself, four basic ingredients are required for vermicomposting: BEDDING, FOOD, WATER & AIR. These elements help to maintain an environment where both red worms and their composting associates (see Vermicompost Critters) will thrive.

# BEDDING + FOOD + WATER + AIR

**BEDDING** The primary materials added to the bin during set-up, bedding provides a medium for the worms to move through that will not get compacted, can hold moisture, and is easily digestible. All bedding material will eventually be processed into castings.

**FOOD** The primary materials added to the bin after initial set-up, food scraps should be chopped small and buried in the bedding on a regular basis. The majority of inputs should be fruit and vegetable scraps, which will eventually be processed into castings. See Worm Menu for more details.

**WATER** Worms require a moist environment to survive. Slowly add water to the bin as needed, working to maintain the moisture level of a wrung-out sponge. If your bin is located in direct sunlight, or in a warm climate, be mindful of the need to water more frequently.

**AIR** While air will naturally enter the bin as you dig to add food scraps, a worm bin should have air holes on the top and/or sides to prevent the development of smelly, anaerobic conditions. Air is also important to support the microbial populations working inside your bin.

## SETTING UP YOUR BIN

To get started, you need to make or purchase a bin specifically designed for vermicomposting. These bins are generally 10" to 15" deep, opaque, have a tight fitting lid, and have holes drilled in the bottom and sides for drainage and ventilation. Create a damp bedding for your worms by soaking and wringing out torn newspaper, napkins, paper towels, and/or coconut coir. The amount of bedding you add will determine the amount of castings you will receive, but aim for at least 6 inches of depth. Add your worms and a handful of food scraps to the bedding, burying food below the surface. Feed your worms slowly at first, and gradually increase the amount of food scraps you provide. With good conditions, the worms will eat and reproduce rapidly. Worm communities are self-regulating and will adapt population size to available space and food resources. Worm bins operate optimally at an internal temperature of 55°F-75°F, but must be kept between 32°F-95°F to ensure worm survival. Keeping a bin indoors or locating an outdoor bin in the shade will help regulate temperate and moisture levels.

## WORM MENU

FREELY ADD	ADD IN SMALL PORTIONS	AVOID ADDING
Fruit and Vegetable Pieces and Peels ( <i>chopped</i> )	Citrus Pieces and Peels	Inorganic Materials ( <i>i.e. plastic, metal, glass</i> )
Coffee Grounds and Filters, Tea Bags	Spicy Foods ( <i>i.e. onions, hot peppers</i> )	Meat, Poultry, Fish, and Bones
Moldy fruits, Vegetables, and Breads	Plain Bread, Cereal, and Pasta	Dairy products and Eggs
Egg Shells	Miscellaneous Plate Scrapings	Very Oily and Salty Foods
Shredded Paper Products	Leaves and Yard Waste	Glossy/ Shiny Paper

## VERMICOMPOST CRITTERS

Your bin will host not just red worms, but an entire community of decomposer organisms. Bacteria, fungi, and other microorganisms will naturally enter the bin and assist with decomposition. Outdoor worm bins are likely to attract small groups of macroorganisms, including potworms, ants, woodlice, soldier flies, and slugs. All of these organisms are beneficial, and will co-exist with the worm community. Red centipedes are the exception, and should be removed to prevent predation on the resident worms.

## HARVESTING & USING YOUR COMPOST



### HARVESTING FINISHED COMPOST

**CURING** Your compost is almost finished when the original inputs are unrecognizable, having been transformed into a dark brown, crumbly soil product with a pleasant, earthy aroma. Even when the materials appear to be fully decomposed, allow 2-4 weeks for the compost to cure. The curing phase is a period of rest during which compost contents stabilize and mature. While curing, aim to keep the pile contents evenly moist, but do not add any new compostables.

**SCREENING** Once your compost has finished curing, it is ready to harvest. There may be a few chunks of woody material left in your finished compost, as these are generally slower to break down. Large pieces can be screened out and used as mulch or placed in the next batch of compost to continue decomposing. Screening can be done by hand or with the use of hardware mesh.



### HARVESTING FINISHED CASTINGS

**VERMICOMPOST VS CASTINGS** Vermicompost is a mixture of worm castings and decomposed or partially decomposed organic matter that has not been digested by the worm. Castings are worm manure. If none of the original materials are recognizable, the bin composition is mostly castings, and is ready to harvest. Both vermicompost and castings are viable soil amendments.

**SEPARATING WORMS** Your finished castings will be ready to harvest in about 3-4 months. When harvesting, try to keep as many worms in the bin as possible. To separate your worms from the castings, place food in one area of the bin only. Most of the worms will migrate toward the food, leaving the rest of the bin full of largely worm-free castings. Start the process over by adding fresh bedding and food to the side of the bin that was just harvested. For more information on a variety of methods to harvest castings, visit [www.solanacenter.org/ciy](http://www.solanacenter.org/ciy)

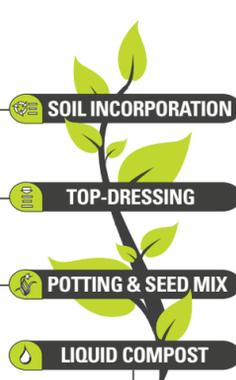


### USING FINISHED COMPOST

Mixing compost into soil helps to improve its structure, and increases nutrient levels and water holding capacity. Spread 2 to 4-inches of compost over the soil and turn it in with a shovel to a depth of about 6 inches. This is the most common use for compost.

Top dress your planters by spreading compost to a depth of 3-inches around the base of plants and shrubs, much like you would spread a mulch. For lawns, hand cast screened compost to a depth of 1/2 inch.

Finished compost is an essential addition to mixes for growing containerized plants, seedlings, or transplants. An adjustable recipe is: 20% traditional compost, 20% castings, 30% coconut coir & 30% sandy soil.



### USING FINISHED CASTINGS

Worm castings are very nutrient dense- a little goes a long way! Castings are generally mixed into the soil at a 4:1 or 5:1 soil to castings ratio. Castings can be added to the bottom of a transplant hole, or worked into the soil surrounding established plants.

Castings can be added near the soil surface, but exposed castings will dry, harden and become less accessible to the root systems. Instead, crumble up the castings, and mix them into the surface soil.

Vermicompost and finished castings make excellent ingredients in mixes for growing containerized plants, seedlings, or transplants. An adjustable recipe is: 20% traditional compost, 20% castings, 30% coconut coir & 30% sandy soil.

The nutrients in compost and castings can be applied to plants in liquid form. *Leachate*, or liquid traveling through *unfinished* decomposing matter, can be diluted to the color of iced tea, and used as a soil drench. *Tea* is made by soaking or steeping *finished* compost or castings in water. Water your houseplants, transplants, and seedlings with the liquid to give them a good start and keep them healthy. For more information on leachate, compost tea and worm tea, visit [www.solanacenter.org/ciy](http://www.solanacenter.org/ciy)

## TROUBLESHOOTING

THE PROBLEM	THE CAUSE	THE SOLUTION
Compost smells offensive	Anaerobic conditions (not enough air)	Turn the pile, add more browns to the pile
Pile doesn't heat up	Pile too small, too dry and/or not enough greens	Add more greens to the pile, add water while turning
Material isn't breaking down quickly	Not enough moisture and/or large material size	Add water, chop materials into smaller pieces
Pile is attracting ants	Pile too dry, food scraps not buried	Add water, bury all food scraps in core of pile
Excessive flies and/or rodent foraging	Food scraps exposed, wrong ingredients	Bury food scraps in core, do not add meat, dairy or oils

*Don't fret!  
Composting is a very forgiving process, and any problems that arise are often easily corrected.*

## COMPOSTING COMPLEMENTS

**GRASSCYCLING** is a quick and easy way to recycle your grass clippings and fertilize your lawn at the same time! It saves time and money, reduces the need for frequent watering and chemical fertilizers, and promotes healthy lawn growth. Grasscycling is simple: just take the bag off your mower and leave the grass clippings on the lawn. The nitrogen-rich clippings decompose quickly, adding nutrients to the soil and helping your lawn retain water.

**MULCH** is different from compost in the way that the materials are processed and used. While compost is fully decomposed material that can be used as a soil amendment, mulch is uncomposted material that is spread over the surface of the soil. Using mulch has many benefits: It prevents soil erosion, reduces the evaporation of water from the soil, and inhibits weed growth. It has even been shown to reduce the incidence of certain plant diseases. The best way to apply mulch is to spread a layer approximately 3-inches thick around the base of plants. Take care to keep the mulch from touching the base of plant stems or trunks.

## ADDITIONAL RESOURCES

**COMPOSTING IS BEST LEARNED BY DOING. WITH EXPERIENCE, YOU WILL LEARN WHAT WORKS BEST FOR YOU. FOR FURTHER EXPLORATION...**

### CALL THE ROTLINE

**(760) 436-7986 ext 222**

A hotline for all your composting questions!  
Open to City of San Diego, Unincorporated County, City of Encinitas, and City of Carlsbad residents

### VISIT OUR ONLINE RESOURCES PAGE

[www.solanacenter.org/ciy](http://www.solanacenter.org/ciy)

Expanded Composting and Vermicomposting Info, Free Compost Workshop Schedule, Demonstration Garden Site List, Master Composter Course Info, and **MORE!**

