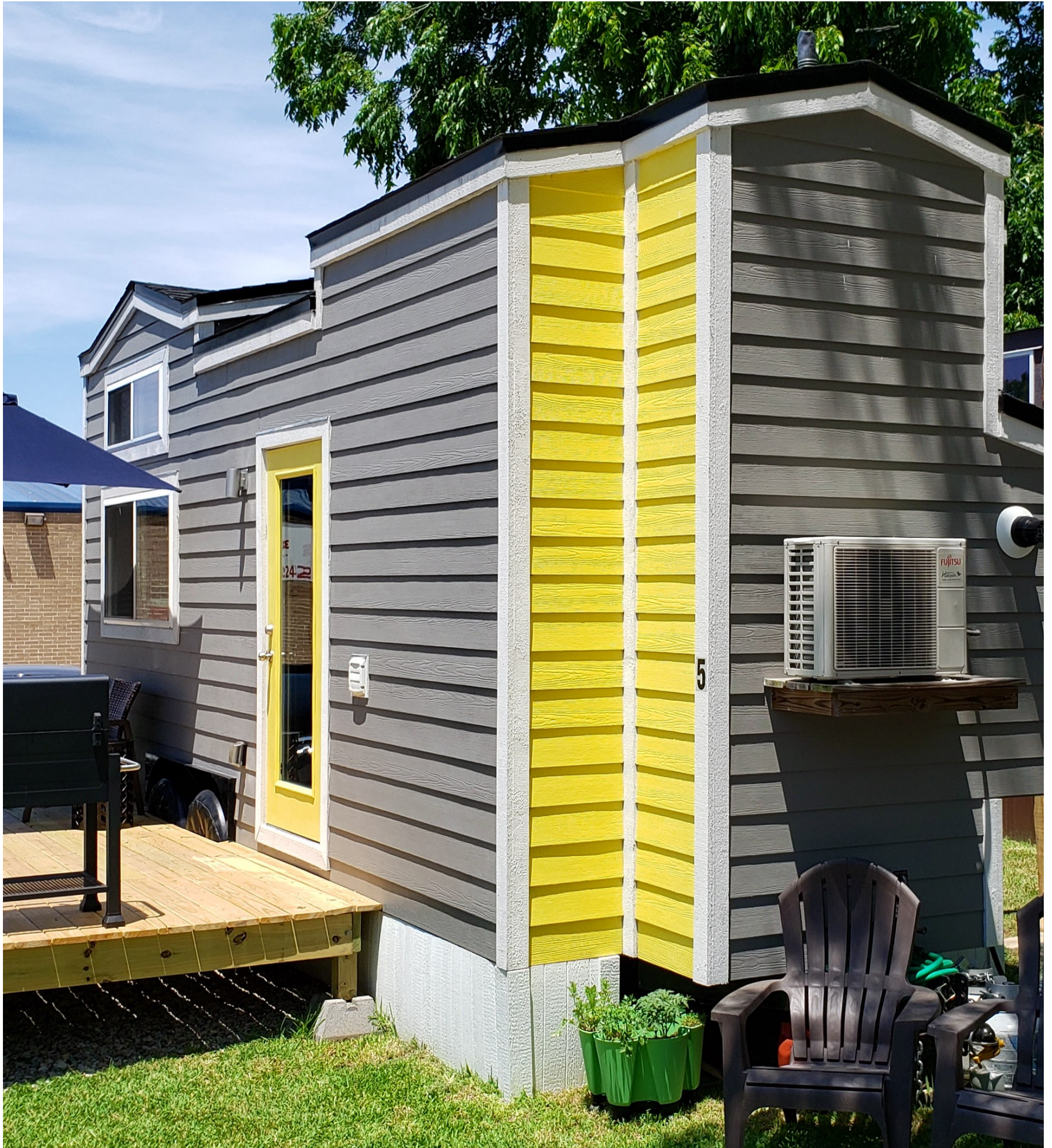


TINY HOUSE

FOR MICRO, TINY, SMALL, AND UNCONVENTIONAL HOUSE ENTHUSIASTS

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The Art Of Compost. **Breaking It Down.**

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Our family of five adventurous humans and one lovable canine, recently exchanged our 3100 sq. ft. mega-home for 680 sq. ft. of manageable mountain cabin nirvana. For tiny house enthusiasts, ourselves included, one of the biggest challenges has been accessing utilities or municipal utility alternatives.

At our new forest home, we were suddenly tasked with hauling our own rubbish for disposal. The amount of waste our family produced was shocking. We are not alone. The estimated annual waste per capita in the US is 25.9 metric tons.¹

Priority number one was reducing trash production. Next, we removed that which could be responsibly burned. Composting seemed the next logical action.

Prior to the move, our experience with composting was limited to food scraps passively trench-composted directly into the garden, but our lackluster efforts ended there. I wasn't too concerned about placing food and other organic waste into our city trash container, erroneously believing it would breakdown in a landfill.

After a great deal of research, followed by trial and error, I found that composting isn't complicated. It does require a bit more finesse than someone's persistent habit of throwing his food waste off the back deck (you know who you are) but not by much. The challenges are easily surmountable, and the benefits - immeasurable.

What is Compost and Why Do it?

Simply stated, composting is the act of breaking down organic matter and returning

nutrients to the soil. This does not occur in a landfill. Why? Municipal solid waste facilities traditionally process refuse by sealing it with a polyethene cap, creating anaerobic, i.e. oxygen free conditions.

This system promotes the production of methane, a greenhouse gas 30 times more potent than carbon dioxide at trapping heat. Why? Methane producing bacteria flourish when there is no oxygen. The Environmental Protection Agency (EPA) reports Municipal Solid Waste (MSW) landfills are the third-largest source of human-related methane emissions in the United States.²

According to the US Composting Council, if every American family composted, it would be the environmental equivalent of removing 7.8 million cars from the road.^{3,8}

Properly managing the breakdown of organic matter and returning it to soil also enriches nutrient content, reducing the use of chemical fertilizers. Compost improves soil's water retention capacity, decreasing watering needs and reducing topsoil erosion. Did I mention it's free?

So, you've decided to compost.

What's next?

If you're anything like me, you immediately jumped onto YouTube, and fourteen hours later,



your head was swimming with confusing images of brown/green ratios, rats, worms, fermenting buckets, swarming flies, and a very lovely gentleman composting a dead rooster in his banana tree.

Don't despair. Methods for composting are numerous, but when stripped down to the basics, you're just managing the natural process of decomposition; something the earth is capable of doing without us. I've put together a simple guide that breaks down - pun intended - the process, and hopefully encourages you to join me in reducing our collective carbon footprint.

Comprehensive Composting Guide

Hot Composting

What you need:

1. A space large enough to accommodate your debris, ideally at least one cubic yard. (If you choose a container, remember that compost needs air).
2. A method to turn and aerate your pile. A pitchfork works nicely.
3. Brown matter: dead leaves, branches, twigs, cardboard/paper, cloth etc. to provide carbon.
4. Green matter: grass clippings, vegetable waste, fruit scraps, coffee grounds, etc. to provide nitrogen.
5. Water to provide moisture to help break down the organic matter.

BASICS: Layer brown matter proportionally with green. I think this works best with 2-3 bins; one to store yard scraps, and one to mix compost. Turn the pile once per week. Aeration reduces methane production and speeds the process of decomposition. Keep the pile moist, but not wet, like a damp sponge.

TROUBLESHOOTING:

- Odor: add more brown matter, turn it more often and add less water.
- Flies or maggots: add more browns, lime the compost to raise the pH, remove the larvae.
- Rodents: Avoid adding animal products - milk, eggs, meat, bones, or oils. If you have already added animal products, bury the compost.

DO:

- Most yard debris, manure.
- Kitchen scraps: all fruits (including the pit), vegetables, pasta, bread, cereal, coffee grounds and filters, tea leaves and tea bags, egg shells, wine, herbs and spices, toothpicks, wine corks and nut shells.
- Pet bedding from herbivores ONLY — rabbits, hamsters, etc.
- Dry cat or dog food.
- Dust from sweeping and vacuuming, dryer lint, pet fur and human hair.
- Any non-glossy paper, tissues, paper toweling, and cotton balls.
- Cardboard, egg cartons, toilet rolls (shredded or cut).
- Used clothes, towels, and sheets made from natural fabrics — cotton, linen, silk, wool, bamboo (shredded or cut into pieces).
- Old string & twine made of natural fabrics.
- Pine needles and pinecones, saw dust or wood chips from untreated wood.

CAUTION:

Meat, fish, egg, poultry scraps, oils can be composted but attract pests, take longer to compost, and may smell. In city or classroom composting situation, these are best avoided.

DON'T:

- Coal or charcoal ash – contains substances harmful to plants. (Fireplace or wood ash is okay).
- Diseased or insect ridden plants – potential spread.
- Pet waste or litter - may contain parasites or germs.
- Yard waste with pesticides may kill composting organisms or future plants.
- Black walnut tree leaves or twigs are toxic to some plants.
- Glossy papers, magazines, or foil wrapping paper have strong dyes, inks and printing chemicals.
- Blackberry brambles.

PRO TIP: Shred papers and chop your debris to make the process go faster!

Worm Composting, Vermicomposting, or Vermiculture

Vermicompost is worm excrement, called castings, which improve biological, chemical, and physical properties of the soil.

What you need:

1. A container with a lid, elevated within a second waterproof bin.
2. Enough holes in the bottom and sides of the worm bin to allow air to enter and water to drain. Moist newspaper strips.
3. 1 pound of Red Worms or Red Wigglers (*Eisenia foetida* and *Lumbricus rubellus*). Earthworms also work, albeit more slowly.
4. Garden soil, approx. 1 pound.
5. A container to keep food scraps for up to one week.
6. A trowel.
7. Thermometer.

The [EPA has made a simple tutorial](#) available for download.

BASICS: Line the base of your elevated container with at least 3 inches of moist newspaper strips mixed with soil. Add the worms and let rest a few days. Feed your worms once per week by making a small hole in the contents in the center of the bin and adding a handful of moist shredded paper, followed by food scraps. Cover with dirt and additional paper. Water collected in the lower bin can be diluted to water plants. Harvest moist worm castings (excrement) every few months.

PROS:

- Odor free
- Low maintenance (about 30 minutes per week)
- Castings aerate and provide nutrients to soil, increase water retention of the soil, and provide natural resistance to pests including aphids, mealybugs, and mites.

CONS:

- Worm castings are not sufficient fertilizer for other plants. Especially for some that require macronutrients. Not suitable for acid-loving plants.

TROUBLESHOOTING:

- Fruit flies: Avoid placing rotten food in the bin. Don't add more than the worms can eat. Completely cover food with soil, castings or more paper. Keep bedding moist but not wet. Add plastic sheeting over the contents of the bin. Limit citrus. Tape fly paper to the inner lid. Add lime to the bin to neutralize acidic conditions.



- Odor: Too wet? Add more dry bedding. Not enough air? Add more side holes, add fresh bedding. Mix the bin daily. Animal products or oils? Remove from the bin.

- Dead worms: Moist but not wet; worms can drown. Ideal temperature is 55-77 degrees F. If worms run out of food they will eat their own castings, which are toxic. Harvest castings. Excessive heat? Excess food waste will steam as it decomposes; decrease food scraps.

DO:

- Crushed eggshells, tea/bags, coffee, bread, cooked pasta, oatmeal, cereal, chopped banana peels, vegetable and fruit scraps, shredded non-glossy paper.

CAUTION:

Heavy preservatives and spicy foods. Also, pick out foods that the worms won't eat to avoid rotting.

DON'T:

- Animal products such as fat, bone, dairy, meat, eggs.
- Plastic or fabric tea bags, coffee filters.
- No yard debris.

PRO TIP: Finely chop your scraps and shred paper. Your compost pile can be kept indoors if air and drain holes are covered with rust proof screen.



Bokashi Compost Countertop Composting

Bokashi Composting is the process of fermenting organic waste. It is an anaerobic process that occurs at low pH. Methane-producing microbes can't survive an acidic environment, so even though it is an anaerobic process, very little methane gas is produced. Bokashi doesn't compost your scraps, it ferments them. They still need to be composted, buried or fed to worms. Wait, what? Then, why bother? Stick with me, I'll explain...

What you need:

1. Bokashi Starter Mix: a mix of bran, molasses and EM-1 (Effective Microorganisms).
2. A bokashi bucket, or airtight bucket with a grate in the bottom and spigot to remove liquids.

BASICS: Add scraps to the bucket and sprinkle with a tablespoon of bokashi bran for every cup of waste, (more for animal products), press to compact and remove liquids, seal the container. Allow to sit 2-4 weeks. Fermented waste can be buried, added to compost or the worm bin.

PROS:

- All kitchen scraps, including meat scraps, dairy, fats, oils, bones.
- Takes up little space - good for apartment dwellers.
- Makes it possible to compost animal products with less odor, attracting fewer vermin.
- "Pre-digests" meat products, enabling worms to process them.
- Fermented product can be trench composted without producing methane.

- Juices, diluted at 2 tsp per liter of water, can be used to fertilize plants.

CONS:

- Requires the purchase of Bokashi mix or its components.
- Smells like fermentation.
- Fermented scraps still need to be composted, buried or fed to worms.

TROUBLESHOOTING:

- Mold: Add more bokashi and a bit of sugar. If doesn't resolve, bury with more bokashi and sugar.

DO:

- Kitchen scraps, compacted, with as much liquid removed as possible.

CAUTION: Pure bokashi waste is acidic for the first couple of weeks. Do not bury near young plants or roots. Be sure waste has fermented for 2 full weeks before feeding to your worm bin.

DON'T:

- Synthetic tea bags or staples, large bones, shellfish, rotten foods.
- Liquids – no broths, milk, wine, etc. Drain cooked foods.
- Don't wash your bucket with detergent, rinse only.

PRO TIP: Bokashi mix can be added directly to your compost.



Trench composting or direct burying scraps in the garden

Relies on anaerobic microbes for breakdown and produces methane, a greenhouse gas. It is not recommended as a home composting method where a significant amount of garden or food waste is produced, unless methane is harvested with an Anaerobic Digester for use as fuel. However, it is still a better option than the landfill, where food cannot decompose.

Community composting programs

The EPA reports that Americans produce about 40.7 million tons of food waste in one year. (That's about 250 pounds of food waste, per person). Of that, approximately 7.5 million tons of food waste is combusted with energy recovery and only 2.6 million tons (6.3 percent) of food waste is composted. That leaves 30.6 million tons of food waste per year, in landfills.

Many communities have local composting programs. Check out community gardening projects or look for “green bin” programs offered by your city waste management program.

Happy composting! Your childrens' childrens' childrens' children, thank you.

Resources:

1. <https://www.usatoday.com/story/money/2019/07/12/canada-united-states-worlds-biggest-producers-of-waste/39534923/>
2. <https://www.epa.gov/lmop/basic-information-about-landfill-gas>
3. https://sustainability.ucsf.edu/Learn_to_Sort_Your_Waste/compost#:~:text=According%20to%20the%20Composting%20Council,million%20cars%20from%20the%20road.
4. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials#R&Ctrends>
5. <https://science.howstuffworks.com/environmental/green-science/landfill6.htm#:~:text=As%20mentioned%20above%2C%20each%20cell,from%20getting%20into%20the%20trash.>
6. <http://compost.css.cornell.edu/worms/troubleshoot.html>
7. <https://www.epa.gov/recycle/composting-home>
8. <https://www.compostingcouncil.org/>

