



# Vermicomposting

## Why should we compost our organic waste?

- Some estimates predict that compostable material accounts for 25% of trash in landfills.
- Biodegradable matter either fails break down in a landfill, or it does so very slowly due to the lack of oxygen, soil and sunlight.
- Worm castings are great for house plants, vegetable gardens, etc. and worm tea can be used for watering plants.
- You will have to take out your trash less often!

## WORMS:

**Type to get:** Red worms – eat their own weight each day, high reproductive rate, thrive in compost bin.

**Where to get them:** Here are a few suppliers. I have used the first two companies listed:

[www.wormyworms.com](http://www.wormyworms.com) (1 lb for \$19.95)

[www.wormswrangler.com](http://www.wormswrangler.com) (1 lb for 24.95)

[www.redhenenterprises.net](http://www.redhenenterprises.net) (1 lb for \$18 AND this is local in Raleigh!)

[www.planetnatural.com](http://www.planetnatural.com) (500 worms for \$24.95, free shipping)

Do not let your worms loose in your yard – they are invasive!

For your reference: 1 lb = approx. 1000 worms. 1000 worms can eat .5 lbs of food waste per day.

## BIN:

Make your own or buy one.

**Where to buy:** One of the advantages to buying a bin are that they make the humus collection process easier. Some of the bins are also made from 100% used plastic.

[www.wormswrangler.com](http://www.wormswrangler.com)

[www.compostbins.com](http://www.compostbins.com)

**How to make:** I will share with you how I made my first bin. I will also provide a few websites that explain how to make other bins.

-Bought a plastic tub (approx 1 ft x 2 ft x 10 inches). Drilled 20 holes in the bottom and evenly spaced holes across the top border (do this if your bin has a tight fitting lid)

-Shred newspaper, office paper, and cardboard (mostly newspaper), into approx. 1 inch strips, dipped in water and wrung out. Filled the bottom 4-5 inches with paper. Add a cup of dirt, begin to add food waste, and place in your worms.

*Websites:*

<http://whatcom.wsu.edu/ag/compost/Easywormbin.htm>

<http://www.wikihow.com/Make-Your-Own-Worm-Compost-System>

<http://www.uky.edu/OtherOrgs/AppalFor/bins.html>

\*keep in mind: you'll need one square ft of surface area in your bin for every pound of food you'll add to it

## HOW DOES IT WORK?

-Worms eat the bacteria and fungi that break down the organic matter. They do not directly eat the food.

-If you can let your food begin to decompose before putting it in the bin, it will shorten the amount of time that the food waste is in the bin.

-Worms eat the odor causing bacteria and fungi – this makes your bin virtually smell-less.

-Worms stay away from light, so be sure to bury your waste. You should always have a layer of bedding on top of the waste.

-Be careful not to let the waste become compacted. There must be oxygen flow.

**\*\*In an effort to reduce waste, this packet has been printed on used paper. Please disregard the opposite page.**

## MAINTANENCE:

Good news – your worms will be the easiest pets you’ve ever had. You can avoid feeding them for awhile if you’re away, they don’t need attention, and they tell you when they’re not happy.

### *Keeping your bin healthy:*

- When you add a layer of food, be sure to add a layer of paper. This helps keep undesirable pests and odors away.
- Avoid having a large build up of food without adequate bedding by following the step above
- Harvest your bin at appropriate times. Don’t let your worms sit in their castings forever (I generally harvest once every 3 months).
- If conditions are too wet (worms will stay at the top of your bin), add paper. If conditions are too dry (worms will be hidden at the bottom), add water.
- Be sure that you put in appropriate organic matter.
- Worms prefer temperatures between 55-77°F. Bedding above 84°F can be fatal, as can bedding below freezing. Worms can survive in temperatures lower than 55°F, but their activity will slow down.
- If you use the compost system supplied to you by Slow Food Powe, you will be given a three-tray system. Fill one tray (the bottom) and when it is full, only add food to the tray above it. The worms will finish the food in the first tray and migrate to the second tray. Likewise, when the second tray is full, move to the third tray.

### *How to harvest compost*

Two popular methods:

1. If you purchase/build a compost bin with layers, the majority of your worms will crawl from the bottommost layer once the food is gone. However, there will always be stragglers, so you will have to pick them out by hand.
2. If you have one large bin, bury your waste strategically. Bury on the left hand side for a month or more. Once the material becomes mostly castings, bury on the other side. Eventually your worms will crawl over, although you will have to pick some out.

## WHAT ABOUT UNWELCOMED CRITTERS?

For the most part, additional bugs in your compost system are beneficial because they help break down the organic waste. Here are a few common visitors:

**Mites (very small and brown dots):** Mites are not harmful unless they are extremely abundant. If your worms are mingling with the mites, then the mite population is fine. If your worms fail to come to the surface, the mites may be overwhelming. To get rid of mites, put a melon slice on top of the bedding, leave it for a little while, and then remove (most of the mites will be on the melon). Then leave the lid off of the bin for a few hours and put it in the sun.

**Pill bugs:** Are not a problem. They eat material high in cellulose.

**Fruit flies:** Not harmful to worms, but very annoying to humans. Freeze or microwave waste before putting it in the worm bin.

**Solder’s Fly Larva AKA maggots:** These are gross, but are fine for your bin. The conditions are not ideal in the bin for the larvae to become adults, so you may see a lot of maggots, but very few flies will emerge. In addition, solder’s fly larva help the worms break down the compost more quickly.

## INCORPORATING THE WORM BIN INTO YOUR CLASSROOM

There are a number to resources for incorporating a compost system into your classroom culture. Here are a few ideas and resources:

- Assign students a classroom job to care for the compost bin. Students can shred and add paper, monitor the compost bin to determine when it should be harvest

**\*\*In an effort to reduce waste, this packet has been printed on used paper. Please disregard the opposite page.**

- Students can weigh compostable materials and track how much ‘trash’ they’ve diverted from a landfill
- Students can make observations week to week to observe how quickly the worms are breaking down the materials. They can also compare the temperature of the compost bin to the ambient air temperature (bins are hotter)
- Compost bins provide a method to teach students about closed loop systems. For example, food grown in the garden can be served to students in the classroom. Students put the waste from that food into the compost bin and in a few months have nutrient-rich casting. The castings go back into the garden as a fertilizer for new plants.

## RESOURCES

- A complete how-to resource guide on worm bins and lesson plans
  - \* <http://www.calrecycle.ca.gov/Publications/Schools/56001007.pdf>
- K-3<sup>rd</sup> grade lesson plans on composting and waste reduction
  - \* <http://cwmi.css.cornell.edu/trash%20goes%20to%20school.pdf>
- Elementary lesson plans
  - \* <http://kidsfootprint.org/lessons/Science/Classroom%20Composting%20-%20ES,%20MS.pdf>
- Composting classroom activities
  - \* <http://www.calrecycle.ca.gov/Education/curriculum/worms/98Activities.pdf>
- Extensive composting lesson plans
  - \* [http://www.educationworld.com/a\\_lesson/03/lp308-03.shtml](http://www.educationworld.com/a_lesson/03/lp308-03.shtml)

Common problems/solutions:

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Worms dying, trying to crawl out	Too wet or dry, not enough bedding	Add more bedding, moisten bedding, harvest the bin
Bin smells	Too wet, not enough air circulation, too much food	Add ventilation holes, reduce feeding amount, add more bedding
Fruit flies	Exposed food	Bury food in bedding, freeze compost before adding it to bin
Bedding is too hot	Summer time!	Add frozen water in plastic water bottles, add bedding to prevent build up of food waste, keep bin in the shade.
Worms are too cold	Winter time!	Insulate by adding makeshift insulation to the outside (cardboard, bubble wrap, etc.). Bring your worms inside in the night and put them out during the day.

# WHAT TO PUT IN YOUR COMPOST BIN

## DO:

- Raw vegetable and fruit scraps

**\*\*In an effort to reduce waste, this packet has been printed on used paper. Please disregard the opposite page.**

- tea leaves/bags
- Coffee grounds and filters
- Newspaper, office paper (in moderation), cardboard, toilet paper rolls
- Bread/grains
- Pulverized egg shells
- Citrus (be careful – too much citrus will make the conditions too acidic).
- Light yard waste (leaves and grass, as long as it is not chemically treated)
- Herbivore manure (hamsters, cows, horses, etc.)

Cut your food/paper/cardboard, etc. into small pieces if you can. This will increase surface area and help the food break down faster.

## **DON'T:**

- Meat
- Foods with oils (e.g., peanut butter, vegetables cooked in olive oil, etc.)
- Dairy
- Banana peels (conventional bananas have heavy pesticide residues on the peels – not good for your worms or if you use the compost on your own vegetable plants/herbs). Banana peels ok in moderation if you are only going to use the compost on houseplants.
- Carnivore manure (dogs, cats, etc)
- Wood/sticks
- Stumps (tops of the pumpkins/butternut squash)
- Shiny/glossy paper

