

## **Basics of Worm Composting**

Earthworm poop, AKA worm castings, is some of the best fertilizer in the world.

We give the earthworms in our worm bins **SHELTER, WATER, OXYGEN, and FOOD**.  
The earthworms give us poop for fertilizer.

The EARTHWORM BINS provide a stable and controlled HABITAT for the earthworms.  
It is ok to touch earthworms and earthworm poop.

## **Earthworms needs:**

**SHELTER:** Shelter from too much sunlight or heat, too much water (rain), and predators like birds or raccoons. Earthworms like a dark, moist habitat with temperature between 50-70 degrees Fahrenheit.

**WATER:** Too much water and the earthworms drown, not enough moisture and the earthworms dry out. Earthworms breathe through their skin, their skin has to be moist, but not wet, in order for them to breathe. If an earthworm is submerged in water or mud, it will drown.

**OXYGEN:** Earthworms breathe oxygen through their skin. The earthworm bins allow oxygen to circulate through the bins.

**FOOD:** Earthworms can eat most fruits and vegetables... except citrus fruits (oranges, grapefruits, limes, lemons, tangelos, tangerines, etc.) Earthworms DO NOT eat meat, dairy products, bread, grains, salad dressing, ketchup, mustard, mayonnaise, sweets, or vinegar.

The earthworms we have in our bins are called **Red Wigglers**. Red Wigglers are not the same species as the earthworms in our garden soil. The Red Wigglers are adapted to eating lots of sugary fruits and veggies, and they eat a lot! If they eat a lot, that means they POOP a lot!

**Red Wigglers can eat ½ of their body weight in food in one day.**

**One pound of Red Wigglers can eat more than 3 pounds of food scraps in one week!**

**Earthworm poop, AKA worm castings, is concentrated fertilizer for the plants.** Worm castings are like a vitamin for the plants, a small amount has a big effect! Worm castings help plants synthesize and absorb nutrients.

## **How do we mix the worm castings into the soil?**

1. Scoop out some of the worm castings from the bottom level of the worm bin.

**It is ok to touch earthworm poop!**

2. Separate any earthworms from the worm castings and put them back into the bin.

3. Put the worm castings into a watering can with large holes cut out of the sprinkler head of the can.

4. Mix in rainwater from the black rain barrel at the front corner entrance of the garden.

5. Mix the rainwater and castings together with a stick or by shaking the can.

6. Pour the rainwater and castings mixture into the soil around plants!

If you have any more questions about our earthworms or worm composting, contact Mark Hay at 714-307-9481 or mnhay2000@yahoo.com

**General Info for all Garden Masters**

- Text John O'Brien regarding repairs and supplies (714) 856-4007
- Barn, shed and gate codes 5278 – no children inside
  - Close and lock barn & shed
  - South gate to remain locked during school hours
- Supplies and tools
  - Return clean tools to where you found them
  - Have children fold left and right glove together before returning to bin
  - Rinse dirty rags in trough and hang to dry, put away dry rags
- Water
  - Use cistern water first
  - Turn valves inside barn and at hoses off
- Trash
  - Weeds go in the trash
  - Plant cuttings can go in fenced "browns" bin after being cut to 8" or smaller
  - Full trash cans must be dragged to tunnel area to be emptied
- Green Bucks
  - Reward for the 3 E's: engaged, enthusiastic and extra hard work
  - Redeemed for .50 at Tuesday Produce Stand
- Sign up for blog posts [Oorganicgardenblog.com](http://Oorganicgardenblog.com). All needed documents there
  - [tmagarden@ocorganicgardenblog.com](mailto:tmagarden@ocorganicgardenblog.com) is general email address
- Volunteer hours, teachers sign for garden visits, Garden Team sign for trainings
- Coinker donations used to purchase new seeds

## **Garden Master TIME LINE for Worm Composting**

**Anytime Mon 8am-Thurs 11am:** Deliver 5 Orange Worm Composting vests to your classroom teacher

- 12:45pm-1pm:** ALL COMPOST GMs arrive at 12:45pm to help students collect food scraps from Primary (12:45pm-12:55pm) and upper grade (12:55-1:00). GMs go to red barn to get collecting bins, take collecting bins to students on lower grade playground at 12:45pm.
- 1:00-1:12** Set-Up and Chopping: Compost GM(s) set-up Worm Compost materials and assist students with chopping food scraps. Students not chopping can assist with Set-Up.
- 1:12-1:20** MAINTAINER GM picks-up FIRST Group from classroom and divides into PLANTERS, MAINTAINERS and COMPOSTERS
- 1:20-1:45** FIRST group composts, plants or maintains
- 1:45** CLASSROOM TEACHER brings SECOND group out, takes FIRST group back.  
Maintainer GM divides SECOND group.
- 1:50- 2:15** SECOND Group composts, plants or maintains. ALL STUDENTS assist their GMs with Clean-Up
- 2:15** MAINTAINER GM escorts SECOND group back to classroom
- 2:15-2:20** GARDEN MASTERS put away tools and materials and lock up

## **Anytime Monday 8am to Thurs 11am**

1. Deliver the 5 Orange Worm Composting vests to your classroom teacher
2. The 5 Orange Worm Composting vests will be in the red barn in the Worm Compost Materials box

## **12:45pm – 1:00pm**

**ALL COMPOST GMs arrive at 12:45pm to help students collect food scraps**

1. GMs go to red barn to get collecting bins, take collecting bins to students on lower grade playground at 12:45pm. Students with Orange Worm Composting vests will go around collecting food scraps under your supervision.
2. Collect from Primary (12:45pm-12:55pm) and Upper Grade (12:55-1:00).
3. Students only need to collect a total of 1 pound of food scraps.

**1:00-1:12****COMPOST GMs SET-UP and students chopping scraps**

1. Worm Composting Materials box out of red barn, contains: data sheet on clipboard, scale, scoops, and other materials. Set out data sheets and clipboard, scale, and scoops on the white table under the shade structure.
2. Chopping tools: ONE flat ended shovel, ONE white plastic rolling cart. Place these on the gravel area in front of the barn, ready for students when they arrive with lunch scraps to chop.
3. STUDENTS Chop fruits and veggies to feed the worms.
  - a. Pour the food scraps into the white plastic cart. Remove any foods that will harm the earthworms... this students have the approved foods on their vests.
  - b. Supervise the students while ONE person chops food in the plastic cart, using flat end shovel. The remaining students should be 1) holding the white plastic cart by the handle to assist the chopper, 2) waiting in line to chop, 3) assisting GM with set-up
  - c. Students who are assisting with chopping should return to their classrooms before 1:15, escorted back to class by the Maintainer GM who will pick the FIRST group up. Collect orange vests from students before they return to class. The choppers will come out again later as part of their classroom rotation.
4. Take out Worm Bin #1 for the first group of 2nd graders, place it in the shade on the gravel between the path and the shade structure (worm bins are beneath the table under the shade structure). Worm bin #2 will be put out for the second group of 2nd graders, after the first group has completed their 20 minutes.

**1:12-1:20****MAINTAINER GM divides first group into Maintainers, Composters or Planters**

1. Students who are assisting with chopping should return to their classrooms before 1:15, escorted back to class by the Maintainer GM who will pick the FIRST group up.
  - Collect orange vests from students before they return to class. The choppers will come out again later as part of their classroom rotation.

**1:20-1:45 WITH THE STUDENTS, first group bin #1**

1. After Maintainer GM divides up class into groups, Compost GMs greet the students.
  - REVIEW with students the needs of the earthworms:
    1. **SHELTER** (Cool shade and protection from predators)
    2. **WATER** (Bins should be MOIST, not wet)
    3. **AIR** (Earthworms breathe through their skin!)
    4. **FOOD** (Earthworms eat rotten fruits and veggies we otherwise throw in the trash)
  - Ask the students, what can earthworms eat?
  - Is there anything earthworms CANNOT eat?
  - **WASTE BECOMES FOOD!**
2. Select ONE student from the group to be the data recorder, direct them to the GM at the white table with the data recording sheets.

**1:20-1:45 WITH THE STUDENTS, first group cont.**

3. Put one GM at the white table, helping students weigh food with the scale and record data on the Vermicomposting Data Sheet. Put a second GM at the Worm Bins to help students be careful with the worms and to help them locate thermometers under white table and at the side of the barn.
4. Ask the rest of the students to make teams of 4-5 kids around the worm bin. "Show me you are ready by placing your fingers gently on the edge of your worm bin."
5. Ask the students to carefully remove the top of the worm bin, pull back the cloth covers, and check to see how the worms are doing. Student may touch the worms, but they should not take them out of the worm bins because the worms will dry out! GM can remove second and third layers to check the worms in those layers also.
  - Look for worms castings and worm cocoons in the middle layer!
  - Determine whether the bottom layer of the bin needs to be drained or scooped. If so, put the drained liquid and scooped castings into the garden by pouring them into a watering can and adding water from the rain barrel at the entrance to the garden. Put this water on the soil (NOT directly onto the plants).
6. Each group at a worm bin will take a turn scooping food, weighing out the food, and feeding the food to their worms. Each group will give ½ pound of food per bin.
7. Students at each bin should also give data to the data recorder on Air Temp, Worm Bin Temp, and Moisture. There is a thermometer on the side of the barn for Air Temp, and one under the white table where the worm bins are stored for Worm Bin Temp.
8. When finished, students can wash hands at the long sink on the side of the barn. ON/OFF valve for sink is inside the barn, on the right hand side as you walk into the barn.
9. When students are finished, they can help Compost GMs move worm bin back under the table, and help the recorder finish collecting data.
10. Give each Student ONE GREEN BUCK if they completed all the tasks above and were helpful to other students and to the GM's.

**1:45 STUDENT TRANSITION**

1. Classroom teacher brings SECOND group out to garden, and gathers students from FIRST group to return to class. Maintainer GM divides students into COMPOSTER, PLANTER, MAINTAINER groups.

**1:50-2:15****WITH THE STUDENTS, second group bin #2**

1. Repeat the same procedure you did with the FIRST group. Check and feed earthworm bin #2.

**Students in the Second Group help GMs clean up,  
FOLLOWING THESE CLEAN UP PROCEDURES:**

1. Place the remaining Worm Bins back under the white table beneath the shade structure.
2. Rinse food scraps from the scale and scoops in the sink. Put leftover FOOD SCRAPS onto the large cold compost pile outside the gate at the end of the parking area.
3. Students can wash hands at the long sink on the side of the barn.
4. ON/OFF valve for sink is inside the barn, on the right hand side as you walk into the barn.
5. Put scale, scoops, data sheets and clipboard, and other materials back into the Worm Composting Materials box, and but the box back into the red bard.
6. Pour out the wash water bucket from the sink into the garden beds that need water.
7. Turn off the sink water going to the sink at the side of the barn. ON/OFF valve for the sink water at the side of the barn is inside the red barn, just inside the barn doors on your right as you enter the barn.
8. Check the area for trash, food scraps, etc.
9. Give each Student ONE GREEN BUCK if they completed all composting AND clean up tasks and were helpful to other students and to the GM's.

## 2:15

### Maintainer ESCORT SECOND GROUP BACK TO CLASS

1. Maintainer GM gathers all students, Composter, Planter, Maintainer students, and escorts all students back to their classroom.

## 2:15-2:20

### GARDEN MASTERS put away tools and materials and lock up

IF YOU HAVE ANY QUESTIONS or CONCERNS REGARDING TEACHING MATERIALS OR WORM BINS, CALL:

Diana Sutcliff 714-244-5675

Mark Hay at 714-307-9481

John O'Brien at 714-856-4007