

Classroom Composting



Time: 30 minutes to create; 30 minutes per week for maintenance

Supplies: 2 plastic storage bins (5-10 gallon - not clear plastic), drill, bedding, red wiggler worms, food scraps

Background:

- **Why vermicompost?**
 - A vermicompost bin is a unique, easy-to-use tool to teach your students about decomposition, food chains, and waste reduction. Creating and maintaining a worm bin is inexpensive, takes up little space, and if kept inside, pest management is simple. Your new classroom pets will entertain, engage, and educate students as they come to understand the importance of reducing food waste. Our landfill is comprised of over 30% organic waste, most of which could have been composted. By becoming familiar and comfortable with vermicomposting in the classroom, students will be conscious of resource conservation throughout their lives.
- **Vocabulary:**
 - **Red wigglers (*Esenia fetida*):** Ideal worms for vermicomposting.
 - **Bedding:** Shredded paper, shredded newspaper, dried leaves, or coir (coconut fiber)
 - **Grit:** Helps the worms to breakdown the food. It can include crushed egg shells, coffee grounds, rock dust, or calcium carbonate.
 - **Decomposition:** The breakdown of organic matter.
 - **Food Chain:** The way energy travels from organism to organism in an ecosystem.
 - **Worm Castings:** The finished compost that the worms have produced. It will look dark brown/ black in color.

Goal: To build and maintain a classroom vermicompost bin in order to educate students about waste reduction, decomposition, and food chains.

How to build a worm bin:

1. Drill holes every 2-3 inches on the border of the lid, every 2-3 inches across the entire bottom, and every 2-3 inches along the upper 3 inches of one plastic storage bin (see below). The holes provide oxygen for the worms and drainage of excess moisture.
2. Place storage bin with holes inside storage bin without holes.
3. Prepare the bedding. Soak in water and then squeeze out excess moisture. Bedding should feel like a damp sponge but not be dripping with water.
4. Add 3-4 inches of bedding to the bin and mix in a handful of grit.
5. Add 4-5 handfuls of worms to damp bedding.
6. Add food on top of worms (watermelon rind is a good starter food).
7. Add a 2-3 inch layer of bedding on top of worms and food.
 - Optional: Place a thin piece of cardboard that is the size of the bin on top of bedding to prevent fruit flies.
8. Keep bin in a shaded or temperature-stable area.

9. Worms may not eat for the first 1-2 weeks as they are adjusting to their new home. Wait to add more food until the worms have begun to feed on the existing food.
10. Once the worms have adjusted to their home and begin to eat, you may add food more frequently. Worms tend to eat about 1 pound of food scraps per week.

Maintenance of your worm bin:

- Your worm bin should be wet, but not dripping with water. If your worm bin is too dry, mist with water. The second bin underneath will collect excess water.
- Keep your worm bin at 60-80 F.
- Harvest finished compost by placing worm castings on a tarp in the light. Worms will crawl to the bottom and you will be able to remove the top layer of finished compost.
 - Sprinkle finished compost onto soil and mix in.



Drill holes in lid.



Drill holes along top edge and across bottom of one bin.



Place drilled bin inside bin without holes.



Layer damp bedding, worms, food scraps, and top layer of bedding.



Cover with cardboard to repel fruit flies.



Harvest worm castings.

What can go in the vermicompost bin?

- **Can:** fruit, vegetables, bread, pasta, rice, coffee grounds, tea leaves, paper, eggs shells (will take a long time to break down)
- **Cannot:** meat, dairy, dog/ cat feces, fats, oils, grease, weed seeds, plants (some plants are okay), long stems and wood, plastics, metal

Further application:

- Create a worm journal and have students record their daily or weekly observations of the worms and the decomposition process.



- Add “worm bin maintenance” to your classroom job list. Have students track how much and what type of food the worms consume.
- Have students hypothesize what the worms like to eat. Place different types of food in specific areas of the worm bin and observe where the worms migrate.
- Have student worm-bassadors educate other classrooms on vermiculture.
- Design an experiment using the finished compost.
 - Plant vegetables with and without worm castings. Observe the difference in growth rate, water retention, vegetable production, and taste.
- Use the finished worm castings to nourish your school garden, or sell the worm castings to make a profit for your school.

FAQ's

- **Will my worm bin smell?**
 - Follow the provided list of what “can” go in your worm bin to prevent unwanted odors. Worm bins have an earthy scent when the lid is removed, but should not be “stinky”. The earthy smell is not noticeable when the bin is covered.
- **Why are some items restricted?**
 - **Dog and Cat Feces:** Dog and cat feces can contain harmful bacteria and pathogens. This can pose problems for handling the compost, using it to grow fruits and vegetables, and for the health of the worms.
 - **Fats, oils and greases:** Worms breathe through their skin. If fats, oils and greases coat their skin, they could potentially suffocate.
 - **Plastics:** Plastic is not biodegradable and will not breakdown in the worm bin.
 - **Meat and dairy:** Meat and dairy can cause unwanted odors and attract unwanted pests.
 - **Plants:** Some plants, such as grass clippings, can cause the worm bin to heat up and exceed the ideal temperature range for worms. Dried plant matter is ok to place in the compost bin.
- **How do I prevent fruit flies?**
 - Always cover food scraps with a layer of bedding. To further prevent fruit flies, place a piece of cardboard on top of the bedding.
- **How do I keep my worms happy?**
 - Remind students to treat these living organisms with respect. Students may hold and touch the worms, but it is important to be gentle. Since the worms need moisture, they should not be out of the bin for more than a couple minutes.
- **What's the best way to collect food scraps?**
 - Keep on odor resistant bin in your classroom to collect food scraps. Have students bring their compostable food waste back to the classroom after lunch.
- **How often should I harvest worm castings?**
 - There is not a specific time frame for when you harvest your worm castings; it will depend on the size of your bin and how often you feed your worms. Generally, harvest occurs every few months.

For further ideas or questions, contact I Love A Clean San Diego's education department at education@cleansd.org.