

The West Michigan Environmental Action Council presents:

Worms in the Classroom



WMEAC
wmeac.org/education

Composting is an engaging and hands-on science project that will reduce your carbon footprint. WMEAC can help you set up a *vermicompost* system your classroom to reduce food waste and produce nutrient-rich humus that is great for gardens, lawns, or houseplants. Your students will be inspired by nature's ability to turn their apple cores, banana peels, and paper towel into super rich fertilizer!

WMEAC can provide several activities, souvenirs, and an opportunity for your class to construct a vermicompost bin. We can accommodate 1-3 hours of programs per class and pricing is listed on the last page. You will takeaway a good understanding of how composting works, a fully prepared vermicompost bin with a maintenance plan, and of course a 1,000 new class pets!

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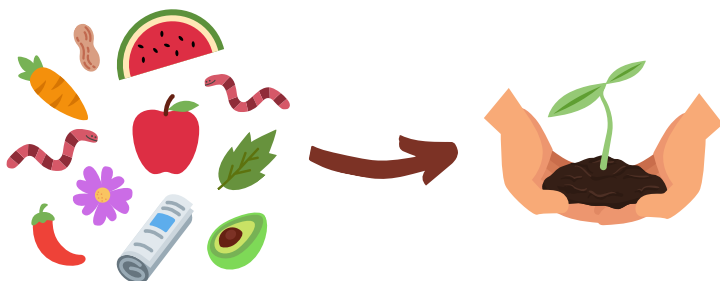
What is Vermi-Composting?

Vermi- (or worm) composting is a traditionally indoor method that uses red wiggler worms (*Eisenia fetida*) to speed up the process and allow you to compost more food waste. The worms require some weekly maintenance and a proper diet of organic material. An active vermicompost culture is a dynamic science project that can scale to your food waste needs and learning objectives.

Common material you can vermicompost include fruits, veggies, plant leaves and stems, paper towel, and sawdust. Keeping to this diet will have your bin smelling fresh like a garden or spring soil!

Material you should not vermicompost include meat, bones, bread, dairy products, oils, processed food like leftover meals, used tissues or toilet paper. Putting these in your bin can cause foul odor or attract pests.

Our education team can provide as much assistance as you would like to get your class up to speed on the science of composting and how to take care of your own bin.



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The following core activities are highly recommended to give your students a proper understanding of caring for a vermicompost bin. Our additional activities are optional and up to you to decide.

Core Activities:

Stages of Decomposition (15 - 25 minutes per group of 3 - 8 students)

Students will explore a "mature" vermicompost bin with tools such as spoons, trowels, forceps, and even their hands! They will be able to touch, smell, and look at the red wigglers as they consume food scraps and produce humus. All materials are provided however close access to a sink for students to wash their hands before and after is preferred.

Equipment provided by WMEAC:

- Mature vermicompost bin containing food scraps, red wigglers, and worm castings (humus)
- Example of acceptable food scraps such as fruit peels, cores, and rinds, paper towel, sawdust, etc
- 5' by 5' vinyl tarp for activity space
- Identification tools such as trowels, spoons, forceps, petri dishes, hand magnifying glasses, etc
- Hand sanitizer
- Available for grades 4th and up: *Wolfe Stereomicroscopes* (up to 2) to let students take a supervised closer view of the worms, other soil organisms, and food scraps. These are battery powered, do not require any outlets, and could be used outside. Students will pair and share the cards in their group that form their compost mixture.

Additional equipment suggested:

- Student observation notebooks & writing utensils
- Close access to a sink

Diet of a Worm (15 - 25 minutes per group of 3 - 8 students)

Students will learn about what red wigglers eat, what foods can and cannot go into the vermicompost bin, and the difference between *green food* and *brown food*. WMEAC staff will present an overview of the diet of a worm then play an activity to review the 3:1 ratio of brown food and green food.

Equipment provided by WMEAC:

- *Browns & Greens Matching Game:* students will be given a notecard with a type of food scrap or other organic material that is either brown or green. They will form groups of 4 with their fellow students to try and find 3 brown and 1 green material.

Additional Activities:

Shred it up! (15 - 25 minutes per group of 3-8 students)

Students will shred newspaper into quarter-sized pieces for the vermicompost bin bedding. Having a supply of brown material next to your vermicompost bin makes it easier to follow the 3:1 ratio of brown to green material. Add a few handfuls of newspaper into your bin each time you add a food scrap.

Equipment provided by WMEAC:

- Old newspaper
- Reusable bag to store paper



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Additional Activities:

Doodle a Worm (15 - 25 minutes per group of 3-8 students)

WMEAC will provide several self-guided coloring activities sheets for students to complete. They will have the opportunity to draw their own worm with its two favorite foods, complete a word search, or make educational signs or posters for your new vermicompost bin.

Equipment provided by WMEAC:

- Coloring pages for each student
- 3 packs of colored pencils
- 30 sheets of blank cardstock paper

Additional equipment suggested:

- Any additional supplies for coloring activities

Brewing Worm Tea (group discussion or included in intro)

+ additional cost of \$20 per bucket

"Worm tea" is a potent liquid fertilizer that is made from steeping a bag of humus in water for 24 hours. It is much easier to apply liquid worm tea to houseplants, garden beds, and lawns rather than amending the soil with the humus produced by your vermicompost bin. WMEAC will provide some equipment to rent and keep in your classroom. We will make arrangements to pick up the equipment within 5 days of your initial program. Each 5-gallon of bucket of water produces about 8 gallons of worm tea.

Equipment provided by WMEAC:

- 5 gallon bucket (5-day rental)
- Battery powered bait aerator (5-day rental)
- Cloth bag for steeping (5-day rental)
- Measuring cup
- Molasses

Additional equipment required:

- Close access to a sink for 4 gallons of tap water
- Containers for finished worm tea. We recommend students each bring in an upcycled container such as a jar or disposable water bottle that they can bring some worm tea home in.



Worms & Dirt Pudding Cups

+ additional cost of \$30 per class

A classic dessert treat featuring vegan chocolate pudding, crushed Oreos, and vegan gummy worms served in upcycled yogurt cups. Cups and reusable spoons are available for up to 40 students per class. WMEAC will collect the cups and utensils to be washed at our office and reused once again!

Please let our staff know if there are any food allergy restrictions for your school or classroom.

Equipment provided by WMEAC:

- 40 reusable cups of *Worms and Dirt* dessert
- 40 reusable spoons
- Hand sanitizer



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Additional Activities:

Zero Waste Pledge Pins

+ additional cost of \$30 per class

WMEAC will provide each one of your students a zero-waste themed metal pin to keep. We can also offer this as a station for your students to design their own button to be minted. We will provide blank templates, colored pencils, and a Badge-a-Minit press.

Equipment provided by WMEAC:

- Up to 30 metal buttons with various eco-conscious themes about reducing plastic waste and litter

Additional equipment available from WMEAC (for button-making station)

- Badge-a-Minit button press
- Blank button templates for students to draw in
- Zero-waste themed coloring button templates
- 3 packs of colored pencils

Additional equipment suggested:

- Any additional supplies for coloring activities



Construct your own Vermicompost Bin

+ additional cost of \$100 per bin

A worm bin is an engaging science experiment where your students will learn about decomposers, the carbon cycle, and how to reduce their food waste along the way. Each bin contains hundred of red wigglers who will eat food scraps and paper towel to produce worm castings (poop) and humus that combine into a nutrient-rich fertilizer. You will be able to harvest humus from your vermicompost bin in 3 to 6 months depending on how much organic material you put into the bin.

Equipment provided by WMEAC:

- 2 battery powered hand drills & drill bits
- Safety impact glasses for each student
- Plastic bins (can be purchased by WMEAC ahead of time if desired)

Depending on your students' ability to use power tools (drills) WMEAC can prepare your vermicompost bin with holes BEFORE your program OR as a station where each students can drill a few holes while supervised. Please refer to the guide *How to Compost with Worms!* for more information on supplies.

After the bins have holes drilled your class will be able to add bedding, worms, and food scraps to start vermicomposting!



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Activity Pricing:

WMEAC Staff Time

Our program rates depend on the number of educators we will provide and total program time. Please refer to the following chart for a quick reference of program costs:

# of WMEAC Staff	0	\$30	N/A	N/A	N/A	N/A	N/A	N/A
	1	N/A	\$50	\$90	\$140	\$180	\$230	\$270
	2	N/A	\$60	\$120	\$180	\$240	N/A	N/A
	3	N/A	\$80	\$160	\$240	\$320	N/A	N/A
	4	N/A	\$100	\$200	\$300	\$410	N/A	N/A
	5	N/A	\$120	\$250	\$370	\$490	N/A	N/A
		0	1	2	3	4	5	6
# of Program Hours								

Mileage

Please refer to the following chart to estimate transportation costs for WMEAC staff. **PLEASE NOTE: field trip costs for your students will be an additional expense.**

# of WMEAC Staff	0-1	\$10	\$20	\$30	\$40	\$50
	2	\$20	\$40	\$60	\$80	\$100
	3	\$30	\$60	\$90	\$120	\$150
	4	\$40	\$80	\$120	\$160	\$200
	5	\$60	\$120	\$180	\$240	\$300
		0 - 15 miles	16 - 30 miles	31 - 45 miles	45 - 60 miles	60+ miles
# of miles away from WMEAC Grand Rapids Office						

Additional Costs:

- \$_____ Vermicompost Classroom Bin (**\$100 per bin**)
- \$_____ Worm Tea (**\$20 per bucket**)
- \$_____ Zero Waste in Landfill Buttons (**\$30 per class**)
- \$_____ Dirt & Worms Pudding Cups (**\$30 per class**)



Notes:

