



GUIDE TO BUILDING A VERMICOMPOSTING BIN

GRADE

Grades: All

PLACE

Classroom / Home

DURATION

30 minutes

OVERVIEW

Vermicomposting (worm bin composting) is a type of composting that uses red wiggler worms to decompose organic food scraps into rich soil. This method is popular for many reasons as it can be done indoors, has little odor, and doesn't need turning. Red wigglers can eat up to half their body weight in food scraps a day. Vermicomposting teaches children about the decomposition process and allows them to see it firsthand.

MATERIALS

- **Worms** - 1 pound (about 500) of red wigglers (*Eisenia fetida*)
 - Avoid common garden worms.
 - Red wigglers (red worms) can be ordered online or bought where fishing supplies are sold.
- **Containers** -1 container
 - 12 - 18 Inches deep
 - Should hold 10 gallons or more
 - Avoid clear containers as worms like the dark
- **Bedding material:** shredded newspaper, paper, napkins, paper towels, cardboard, coconut coir, or leaves
- **Food scraps** (fruit/ veggie peels and parts, coffee grounds and filters, eggshells, tea bags (no staples))
- **Water** - Use a spray bottle to moisten the bedding (should feel like a squeezed-out sponge)
- **Soil** - one or two handfuls
- **Gloves** (optional)
- **Drill**



TEACHER PREP

• Prepare the bins:

- Drill **small** holes (about 1/8 inch) on the *sides* and *lid* for ventilation about 2 Inches apart.
- You do NOT need holes in the bottom as there shouldn't be much excess liquid. Worms can escape if the holes are too big. If excess water collects at the bottom, you can drain as needed.

INSTRUCTIONS

1

Add Bedding

- Add paper bags or newspapers to cover the bottom (this will absorb extra liquid)
- Add shredded newspaper, paper, or other bedding material to the bin.
- Moisten the bedding with water until it feels like a wrung-out sponge.
- Fill the bin about 1/3 to 1/2 full of this bedding.
- Add a handful of garden soil to introduce microbes and grit for digestion.
- Mix the bedding and soil.



2

Add the Worms

- Dig a small area out with your hand into the bedding.
- Gently place the red wigglers down into the bedding.
- Cover the worms with some of the bedding and soil.
- Leave the lid off for a few minutes; worms will burrow down away from the light.



3

Feed the Worms

- Let the worms adjust to their new environment for a few hours or a day before adding food scraps.
- Bury small food scraps a few inches down in one corner or side of the bin and cover with bedding. (Tip: smaller scraps will be broken down quicker by the worms).
- Feed the worms one - two times a week.
- Alternate feeding areas to different sides of the bin each week.
- **Avoid:** meat, dairy, oily foods, citrus, onion, garlic





4

Maintain the Bin

- Check the moisture. Add water if it's too dry and bedding if it's too wet.
- If it has an odor, you may be overfeeding, or it is too wet.
- Make sure the ventilation holes are not blocked.

5

Harvest the Compost (After 2–4 Months)

- Push finished compost to one side and add fresh bedding and food to the other.
- Worms will migrate to the new food.
- Scoop out the finished compost and use it in your garden or potted plants.



6

Continue adding bedding and food scraps as needed.
Happy vermicomposting!

TIPS FOR SUCCESS

- *Always keep food scraps covered to prevent bugs and mold.*
- *Keep a ratio of about 70% "browns" (i.e. carbon source = paper, napkins, etc..) and about 30% "greens" (i.e. food scraps).*
 - *This keeps the soil balanced and prevents odor.*

ADDITIONAL RESOURCES

Visit <https://www.swaco.org/201/Schools> or email schools@swaco.org.





TROUBLE SHOOTING

| PROBLEM.... | SOLUTION... |
|--|---|
| SMELLS BAD | Add more "browns" and give it a light stir to introduce more oxygen into the soil. |
| TOO WET | Leave the lid off for a few hours and add more dry "browns" to absorb the moisture. |
| TOO DRY/ NOTHING SEEMS TO BE HAPPENING | Add more food scraps. |
| ATTRACTING BUGS | Make sure all food scraps are buried. |



INTRODUCTION TO VERMICOMPOSTING

GRADE

Grades: K-5

SUBJECT

Life Science

DURATION

60 minutes

OVERVIEW

Vermicomposting (worm bin composting) is a type of composting that uses red wiggler worms to decompose organic food scraps into rich soil. This method is popular for many reasons as it can be done indoors, has little odor, and doesn't need turning. Red wigglers can eat up to half their body weight in food scraps a day. Vermicomposting teaches children about the decomposition process and allows them to see it firsthand.

LEARNING OUTCOMES

- Understand the role of worms in decomposition and nutrient cycling.
- Describe the components and maintenance of a vermicomposting bin.
- Apply knowledge to reduce food waste and promote sustainability.
- Observe and record data on a living system.

MATERIALS

- Supplies for "Guide to Building a Vermicomposting Bin"
- Student Worm Journal



TEACHER PREP

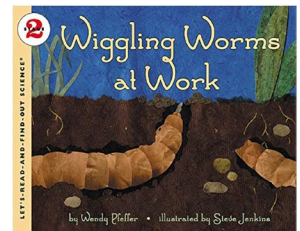
- Gather all the materials needed for a vermicomposting bin.
- Have the *Vermicomposting Teacher Guide* on hand

ESSENTIAL QUESTIONS

- What is composting?
- What is vermicomposting and how is it different?
- Why are red wiggler worms important?
- What is decomposition? Who are decomposers?
- How does vermicomposting help the planet?

INTRODUCTION

- Use books to introduce the concepts.
- Here are some examples:
 - *Garbage Helps Our Garden Grow: A Compost Story*, By Linda Glaser (Grades K-2)
 - *Composting: Nature's Recyclers*, By Robin Koontz (Grades K-5)
 - *Compost Critters*, By Biana Lavies (Grades 1-4)
 - *Wiggling Worms at Work*, By Wendy Pfeffer (Grades 1-4)



LESSON

Direct Instruction:

- Create a chart to brainstorm what students already know or think they know about compost.
- During or after reading, add ideas or new learning to the chart.
- Define "compost" and "vermicompost" with students (see Key Terms below).
- Identify how red wigglers help the earth (they create paths for air to flow in the soil, they eat food scraps, their poop (castings) creates rich soil for more plants to grow).
- Define decomposition and help students identify some common decomposers found in our soil.
- Create another chart of "Decomposers" with pictures and words to label them.



Whole Group Activity: This could be done on day two.

- Show the materials listed in the Vermicomposting Teacher Guide (bin, worms, bedding, scraps).
- If you haven't prepared the bin with holes, show students how you would do this step.
- Let students help shred newspapers and prepare bedding.
- Add worms and scraps together.
- Create observation journals to track changes over time.



EXTENSION ACTIVITIES

Guided or Independent Practice:

- Create a class how-to book or have students work with a partner to teach someone the steps it takes to create a vermicomposting bin.
- Print out photos of each step and have students put the steps in order.
- Have students draw or put images of decomposers on a chart
- Create food webs and have students put the organisms and animals in order
- Create observation journals for students to track their learning
- Create a worm journal for students to measure worms, count the segments, and label their body parts.

LANDFILL FIELD TRIP

- We would love to have your students visit the Franklin County Sanitary Landfill and learn more about why it's important to keep food waste out of the landfill.
- Visit <https://www.swaco.org/493/School-Tours> or send an email to tours@swaco.org if you have questions or want to schedule a field trip.
- SWACO reimburses up to \$220 for each bus trip for schools within Franklin County.



KEY TERMS

- Aeration** • The process of adding air to the compost to help aerobic organisms thrive.
- Bedding** • Material like shredded newspaper or cardboard that provides habitat for worms in the bin.
- Castings** • Worm waste (also known as worm poop); rich in nutrients and excellent for plants.
- Compost** • The dark, crumbly, nutrient-rich soil-like material produced by decomposing organic matter.
- Decomposer** • An organism that breaks down dead or decaying organic material (e.g., worms, bacteria, fungi).
- Feeding Zone** • The area where food scraps are placed for the worms to consume.
- Harvesting** • The process of separating worms from the finished compost for use or restarting the bin.
- Microorganisms** • Tiny organisms (like bacteria and fungi) that help break down organic material.
- Organic Waste** • Natural, biodegradable waste such as fruit and vegetable scraps, coffee grounds, and eggshells.
- Red Wiggler** • Common name for *Eisenia fetida*, the species of worm best suited for vermicomposting.
- Vermicomposting** • The process of using worms to break down organic waste into nutrient-rich compost.

ADDITIONAL RESOURCES

Visit <https://www.swaco.org/201/Schools> or email schools@swaco.org.



STANDARDS THAT CAN BE INTEGRATED INTO THIS LESSON

| Grade | Standard |
|-------|---|
| 1 | LS.1 Living things have basic needs, which are met by obtaining materials from the physical environment. |
| 1 | LS.2 Living things survive only in environments that meet their needs. |
| 2 | LS.1 living things cause changes on Earth. |
| 3 | LS.1 Offspring resemble their parents. |
| 3 | LS.3 Plants and animals have life cycles that are part of their adaptations for survival in their natural environments. |
| 4 | LS.1 Changes in an organism’s environment are something beneficial to its survival and sometimes harmful. |
| 5 | LS.1 Organisms perform a variety of roles in an ecosystem. |