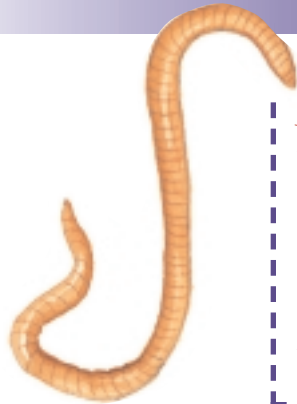


Earthworm Composting

AGE LEVEL
9-12



Life Skill: Wise use of resources

Project Skill: Vermicomposting (composting with worms)

Objective: Build a composting bin to house earthworms and recycle food scraps

Success Indicator: Participants recycle household organic waste into garden compost using worms

Provisions Needed

- Large wooden box (about 21" long by 15" wide and 16" tall) or plastic tote box with a lid (53-liter capacity)
- One week's worth of newspapers
- Pan of water for soaking newspaper
- 1-quart watering jar
- Kitchen scraps (3-4 pounds per week)
- Scale
- Drill
- 1 pound of red wiggler (*Eisenia fetida*) worms*
- Sheet of plastic and lamp (for sorting worms from finished compost)



Trailhead

Have you ever wondered what all those worms are doing underground? What do they eat, and how do they move? Worms help to create new soil and keep the forest floor clean of debris. Worms are valuable in the garden, too. Earthworms excrete their waste as castings, which are fertile and enhance the soil. You can learn more about worms by raising them and letting them help you and your family recycle kitchen scraps.



Trailblazing

Using the drill, make several air holes on all four sides of your container. You may need an adult to help with this. The holes should be of varying heights to allow ventilation through the entire container.

Next, prepare bedding for your worms. Tear newspaper into 1-inch strips and soak them in water. Fill the worm bin with dampened newspaper. Add 3 to 4 pounds of kitchen scraps to the container. Do not include any meat or greasy foods. Fruits and vegetables make the best food. Finally, add the worms.

build a worm bin



Drill air holes on all four sides.

*You can purchase worms from your local fish bait dealer or order them by mail. (Some sources may be found at: <http://www.cityfarmer.org/wormsupl79.html>.)

To keep the worms happy and healthy, you need to keep the bedding moist. Add kitchen scraps to the bedding regularly to provide nutrition for the worms. You also will need to add fresh bedding every few months. Store the worm bin in an



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area that does not get direct sunlight or freeze in the winter. About 65 degrees Fahrenheit is a good average temperature for bedding. Old bedding can be used as compost for the garden. To separate worms from the usable compost, dump the container contents onto a sheet of plastic under a bright light. After a few hours remove the top portion of the bedding. All of the worms should be in the bottom few inches of bedding.

Internet Resources

- <http://www.wormwoman.com> (Mary Appelhof's home page)
- <http://www.urbanext.uiuc.edu/worms> (University of Illinois Extension)
- <http://www.oldgrowth.org/compost/wormfaq.html#> (D. Brian Paley resources)

Suggested Reading

- Appelhof, Mary. *Worms Eat My Garbage: How to Set Up and Maintain a Worm Composting System*. Kalamazoo, Mich.: Flower Press. 1997.
- Appelhof, Mary. *Worms Eat Our Garbage: Classroom Activities for a Better Environment*. Kalamazoo, Mich.: Flower Press. 1993.



Field Guide



Compared to other species of worms, **red wigglers** are able to recycle a large amount of kitchen waste in a wide range of temperatures.



As much as **70 percent** of the material discarded in landfills is suitable food for earthworms.

In ideal conditions, earthworms in a **compost bin** will recycle their weight in waste every 24 hours.

Baby earthworms look similar to adults, except they are smaller and lighter in color. Earthworms are old enough to reproduce in about 60 to 90 days.

Earthworms lack teeth. Like chickens, they have an **internal gizzard** with tiny stones that grind their food.

Earthworms excrete their waste as **castings**, which is a great fertilizer and soil enhancer.

The ultraviolet rays in **sunlight** are deadly to earthworms. The creatures have a distaste for bright lights.

Earthworms make tunnels in the ground that **aerate** the soil. This activity adds oxygen to aid the growth of plants.



Earthworm Composting



The Extra Mile

Keep a log of how much water, bedding, and food scraps you add to your worm bin every month. Record how long it takes the worms to break down different food scraps. What types of food scraps seem to disappear the fastest? Record the temperature of your worm bin. How might you keep track of the rate of worm reproduction?



Field Notes

SHARE

- What kinds of food did you feed your red wigglers?
- What different materials did you use in making your compost bin?
- How did you prepare the bedding and food for the worms?
- Why do you keep a lid on your worm bin?
- What unexpected things did you notice while monitoring your bin?
- What are some advantages and disadvantages to recycling food waste instead of throwing it away?

PROCESS

- How did you know whether the worm bedding had the proper moisture?
- Why do you think red wigglers are the best species to use?
- Why are some foods better than others in vermicomposting?
- Why is an earthworm's lifestyle a good example of wise use of resources?
- Why is vermicomposting a good example of the wise use of resources?
- Why is it important to have worms in your garden?

GENERALIZE

- What other animals might eat kitchen wastes? Could they be used in composting? Why or why not?
- Why is it important to recycle your kitchen waste rather than throw it away?
- In what other ways are earthworms valuable besides their benefit to the soil?
- What can you do with the earthworms if your bin becomes too crowded?

APPLY

- In what other smart ways can you recycle everyday waste?
- What positive influences are exhibited by recycling?