

GARBAGE-EATING WORMS

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This program topic will help participants learn about earthworms and how to compost with them.

What you will need...

- * One 2-liter soft-drink bottle for each participant. You may collect these ahead of time, or have each participant bring a soft drink bottle to the meeting.
- * Nails, scissors, etc.
- * Source of heat, such as a candle.
- * Work/garden gloves.
- * Large bucket.
- * Small amount of garden soil.
- * 15-20 redworms (available at bait stores) for each participant.
- * Old newspapers.

Getting Started... What Do You Know About Worms?

Before the meeting, write the following quote on a large sheet of paper and

*display it so that all the participants will be-able to see it. **Note:** Wait until the meeting is finished to hand out the participants' lesson sheets.*

“It may be doubted whether there are many other animals which have played so important a part in the history of the world as these lowly organized creatures.” Charles Darwin, 1881.

Ask the group which “creatures” they think Charles Darwin is referring to in this quote. (Answer: earthworms) Then ask, “What do you know about earthworms?” or “What comes to mind when you think about earthworms?” Keep a list of responses on a large sheet of paper for everyone to see.

Darwin, who studied earthworms for over 40 years, considered them to be extremely important in the development of human culture. Why? The answer lies in the prominent role earthworms play in the production of agricultural soils; The earthworm is nature’s plow, constantly tilling and improving the soil through which it moves.

Another way of looking at the earthworm is that it is one big digestive tract. Earthworms are perfectly adapted to eating and excreting. They eat almost everything they encounter as they move through the soil.

They leave behind tunnels, which aerate the soil, and nutrient-rich manure, called **castings**.

Play a quick round of “worm trivia” using the following questions.

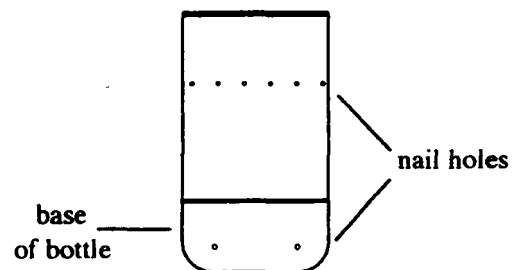
- * How many different species of earthworms are there? (Answer: There are at least 1,800 known species, although there may be many more we do not know about.)
- * How long do earthworms live? (Answer: Research indicates that some earthworms have a potential life-span of up to eight years, although most probably succumb to being eaten, to experiencing sudden freezes, to being doused with toxic chemicals, etc. after a few months of life.)
- * Why are earthworms slimy? (Answer: The earthworm’s skin is covered by a film of mucus. This helps keep the skin moist and lubricates the worm as it burrows through the soil. It also aids in the exchange of oxygen and carbon dioxide through the skin, which is how the worm breathes.)
- * How can you tell a male earthworm from a female earthworm? (Answer: You can’t. Earthworms are **hermaphrodites**: Each worm is equipped with both male and female reproductive structures. Each must mate with another worm to reproduce, however.)
- * How fast do earthworms multiply? (Answer: A mature worm may produce a capsule of eggs every 7 to

10 days. Each egg capsule can contain up to 20 baby worms.

Let them eat garbage...

During this part of the meeting, participants will construct their own worm mini-farms to compost household garbage. Make sure everyone has a 2-liter soft drink bottle. Then lead the group in the following procedure:

1. Cut the top off of your bottle about 1/2-inch above the shoulder. You may also want to remove the label so you will be able to watch the worms more easily.
2. Make four 1/4-inch holes in the side of the bottle near the bottom of the base for drainage. One way to accomplish this is to heat a large nail (try using a candle flame) and use it to melt the holes into the plastic bottle. Be sure to wear work or garden gloves when handling hot nails. Place the drainage holes so they are equally spaced around the bottle. (See figure below.)
3. Use a smaller nail to put about 10 holes, equally spaced, in a row near the top of the bottle. (See figure below.)



4. Cut about 10 pages of newspaper into 1/4-inch strips, and then cut these strips in half. Put the cut newspaper into a bucket and toss it with your hands so that it is not clumped together.
5. Add 2-3 cups of water to the tossed newspaper, and squeeze the paper to make sure it is saturated. Toss the paper again, and drain the excess water from it.
6. Add a few tablespoons of garden soil to the wet newspaper.
7. Transfer newspaper to your bottle so that it is about 2/3 full.
8. Place 15-20 worms on the wet newspaper in your bottle.
9. Place a cover on your worm bottle. You can use aluminum foil, plastic wrap, or the detached base of another soft drink bottle, etc.

You are now the proud owner of a worm mini-farm!

Now what?

There are a few things you need to know about the care and feeding of your worms:

- * Keep them in a dark place.
- * Don't let them get too hot. Keep them at about 70-75 degrees Fahrenheit.
- * Make sure the bedding (newspaper) in the bottle stays moist, but not soggy.

- * Feed the worms organic garbage from your kitchen every three to four days. You can give them almost anything except meat, bones, or dairy products, which are hard to digest and tend to spoil. Cover the food with about an inch of new, moist, newspaper strips.
- * You may want to purchase litmus paper at your pharmacy to make sure your worm farm is not too acidic. The pH should be between 6.5-8.5. If it is lower than this, try adding some crushed eggshells to the bedding.
- * When your worms have turned your garbage into rich soil, you can put it on your garden!

Worm Watching...

Your worm farm is more than just a great garbage disposal. If there are children in your house, it can provide hours of fun learning. Try the following:

- * Ask children to figure out which end of the worm is the mouth (the darker end).
- * Point out the large band near the front of the worm. This is called the **clitellum**. It is a reproductive structure.
- * Point out the bristles (called **setae**) on the bottom of the worm which help it move. Have the children watch the worms move.
- * Place a worm on a piece of glass and hold it up to the light. See if the children notice the blood vessels and beating heart.

* See what other observations the children make while watching worms!

For the serious worm farmer...

If you enjoy some success with your worm mini-farm, you may want to expand your operation. Start a farm in a large plastic bucket or wooden box. In addition to newspaper, you can use peat moss and leaves from your yard for bedding. Be creative. Experiment!

References

Barrett, Thomas J. 1976. *Harnessing the Earthworm*. Bookworm Publishing, Ontario, CA.

Bottle Biology: An Idea Book for Exploring the World Through Plastic Bottles and Other Recyclable Materials. Kendall Hunt, Dubuque, IA.

The EarthWorks Group. 1990. *50 Simple Things Kids Can Do to Save the Earth*. Andrews and McMeel, Kansas City, MO.

Frank, Marjorie. 1990. *202 Science Investigations*. Incentive Publications, Nashville, TN.

Minnich, Jerry. 1977. *The Earthworm Book. How to Raise and Use Earthworms for Your Farm and Garden*. Rodale Press, Emmaus, PA.

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