



EARTHWORMS – NATURE’S RECYCLERS



Chances are, you have seen an earthworm somewhere. Perhaps you have seen some while digging in your garden, wiggling on the sidewalk after a hard rain, or in the beak of a hungry bird.



These humble little creatures go unnoticed most of the time, but they are very important to farmers, gardeners, and to the health of our entire planet. The famous naturalist and author of the *Theory of Natural Selection*, Charles Darwin, wrote, “It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organized creatures.” Darwin spent 39 years studying them! The last book that he published during his lifetime is all about his earthworm research: *The Formation of Vegetable Mould, Through the Action of Worms* (1881).

The earthworm, also known as a rainworm, nightcrawler, or angleworm, is a type of **annelid** (segmented worm). It is an **invertebrate**, which means it does not have a skeleton. The body of an earthworm is made of ring-like segments called **annuli** that are covered with small hairy bristles called **setae**. The earthworms use the setae and their muscles to move about. Their skin is covered by a slimy mucus which helps them slip and slide through the dirt.

Earthworms live in most parts of the world, except in very dry deserts or polar climates. They must have damp, loose soil filled with organic material to live. They usually stay near the surface but may burrow much deeper in the winter or if it is very dry. Some worm tunnels have been found to go as deep as 16.5 ft. below the surface! There are many different species of earthworms that live at different depths.



The body of an earthworm is amazing! Here are just a few fascinating facts about them.



- Earthworms cannot see, hear, or smell. They can detect light through special light sensitive cells on their skin. These skin cells convert light into electrical impulses that the worms can sense. They do not like light and will move into the soil to avoid it.
- Earthworms do have a sense of taste and touch. They taste things through **chemoreceptors** in their skin. These are tiny organs that can detect chemicals in the soil. They can also detect vibration. When they sense vibrations in the soil nearby, they dive deeper into the soil to avoid predators, such as birds, skunks, snakes, frogs, and foxes.
- Earthworms do not have teeth. They swallow grit to help them grind their food.
- Earthworms do not have lungs. They breathe through their skin, and they must stay moist to breathe. If their skin dries out, they will die from suffocation. You may see them come to the surface after it rains because they cannot breathe if the soil becomes too water-logged.
- They can have up to 5 hearts!
- Earthworms are **hermaphrodites**, which means they have both male and female reproductive organs.
- Earthworms can range in size from about a half inch to 3 yards, but much larger ones have been found. The average length is 7 – 14 inches.
- If an earthworm's body is injured, even cut in half, it can regrow its body if it has not been too badly damaged.
- Earthworms produce 2,000 to 3,000 offspring each year!

Why are earthworms so important?

Earthworms are very important to the soil ecosystem. As they dig burrows, they break up the soil and keep it loose so that air and water can be absorbed and retained more easily.

They are very hard workers and voracious eaters! They can eat food equal to their own body weight each day. Earthworms feed on decaying organic matter, like dead leaves, grass, scraps of fruit and vegetables, fungi, some garden pests, and other microscopic organisms. They drag their food into the soil as they burrow. After it passes through their digestive system, the waste (**castings** or **worm poop**) is changed to fertilizer. Castings contain five times the amount of nitrogen, six times the phosphorous, and ten times the potassium as most potting soils available to purchase.

Without worms, Earth's soil would not be as healthy for plant life.



ACTIVITY: Make an earthworm house and see how earthworms live and work

Materials:

- Large glass jar with a wide mouth
- Smaller jar with lid that fits inside the larger jar
- Gravel or small rocks
- Rich garden soil or potting soil purchased in a garden shop



- Sand (colorful craft sand will make this more interesting)
- Kitchen scraps, grass clippings, and/or dry leaves
- Water
- Earthworms, which may be found in your garden or purchased at a garden shop. If you are not able to dig for worms, you can find some by pouring some mustard water on soil or grass (1 tablespoon of mustard mixed into a 1.5-liter bottle of water). This will not hurt them but will irritate them enough to make them rise to the surface.
- Cheesecloth, netting, or other thin fabric
- Rubber band

Procedure:

1. Place a 1-inch layer of small rocks or gravel on the bottom of the large jar.
2. Fill the small jar with water and tightly close the lid.
3. Place the water-filled small jar inside the large jar, right in the middle.
4. Place a 1 – 2" layer of garden soil on top of the gravel, sprinkle or spray it with a little water.
5. Add a 1" layer of sand on top of the soil, add water again.
6. Alternate a few more layers of sand, soil, and water – as much as your jar will accommodate.
7. Add some kitchen scraps on top (fruit and vegetables), plus grass clippings or dry leaves from your yard if you have them.
8. Finally, add a few worms.
9. Place a piece of cheesecloth or netting on top and secure it with a rubber band.
10. Place the jar in a cool, dark place.
11. Take it out throughout the day and observe the worms at work!
12. Add just a little water each day while you are observing your worms.
13. When you have finished with this project, return the earthworms to the soil in your yard or at a park so that they will continue to enrich the soil and plants in your neighborhood.

Vermiculture describes the process of raising worms. The purpose of worm farming is to use the worms to **decompose** (break apart) food and/or garden waste and turn it into castings, which can be used as fertilizer. The earthworm house that you made is an example of vermiculture. Healthy soil should have at least 10 earthworms per square foot. Fertile soil may have as many as 500,000 to 2 million worms per acre!!

ADDITIONAL RESOURCES

Books available from the Washoe County Library System:

[*Carl and the Meaning of Life*](#) by Deborah Freedman

[*Charles Darwin*](#) by Kathleen Krull

[*Charles Darwin's Around-the-World Adventure*](#) by Jennifer Thermes



[A Child's Introduction To Natural History: The Story of Our Living Earth: From Amazing Animals and Plants to Fascinating Fossils and Gems](#) by Heather Alexander

[The Earth Moved: On the Remarkable Achievements of Earthworms](#) by Amy Stewart

[Earthworms](#) by Sue Barraclough

[Earthworms, Leeches, and Sea Worms: Annelids](#) by Beth Blaxland

[Earthworms: Underground Burrowers](#) by Adele Richardson

[Genetics and Evolution Science Fair Projects Using Skeletons, Cereal, Earthworms, and More](#) by Robert Gardner

[Leaf Litter Critters](#) by Leslie Bulion

[Lowdown on Earthworms](#) by Norma Dixon

[Rotten! Vultures, Beetles, Slime, and Nature's Other Decomposers](#) by Anita Sanchez

[Squirm, Earthworm, Squirm! Retuercete, Lombriz, Retuercete!](#) by Dana Meachen Rau

[Step-by-step Science Experiments in Biology](#) by Janice Pratt VanCleave

[This is a Book to Read with a Worm](#) by Jodi Wheeler-Toppen

[Up in the Garden and Down in the Dirt](#) by Kate Messner

[We Dig Worms! A Toon Book](#) by Kevin McCloskey

[Who was Charles Darwin?](#) by Deborah Hopkinson

[Winnie Finn, Worm Farmer](#) by Carol Brendler

Videos:

BBC, "The Amazing World Of Earthworms In The UK - Springwatch - BBC Two" <https://youtu.be/9ZHTerOJYMA>

Natural History Museum, "Show a Bit More Love to the Humble Earthworm" <https://youtu.be/QlFqqGEpLA>

SciShow Kids, "Worms Are Wonderful" https://youtu.be/l-zc_1vjLnI

Websites:

Kids Growing Strong, Creepy Crawlers: Vermiculture

<https://kidsgrowingstrong.org/worms/#:~:text=Vermiculture%20is%20the%20process%20cultivation,grow%20strong%20and%20healthy%20plants>.

USDA, Natural Resources Conservation Service (Soils), Earthworms

https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/biology/?cid=nrcs142p2_053863

