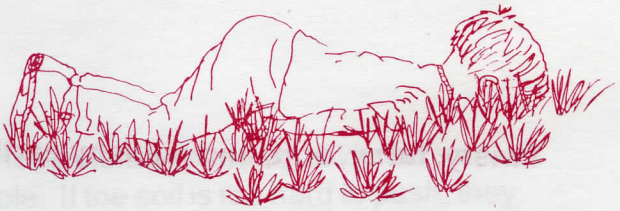
NATURE DETECTIVES



Spring 2001

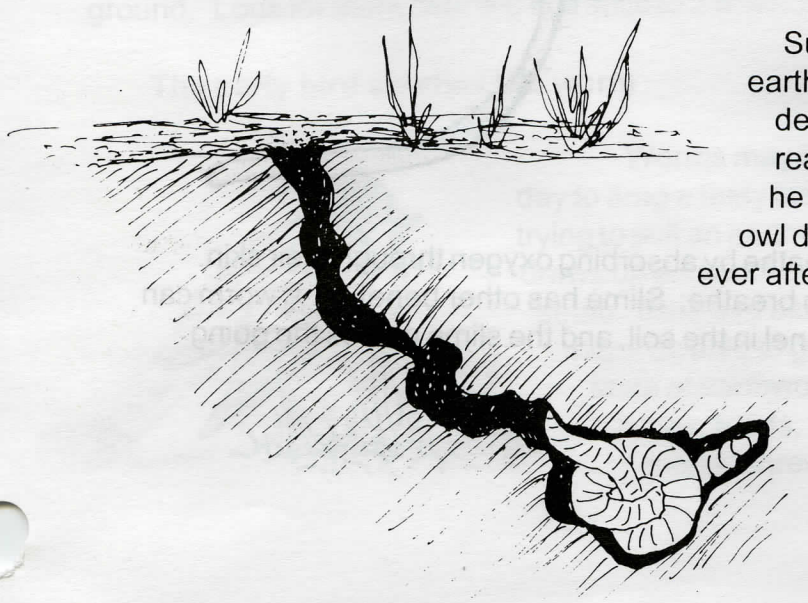
Earthworms Recycle

Enchanted Earthworms

Once upon a time, long, long ago, there lived a young fairy. One day she playfully cast a spell on all the worms living in the soil. She made them sleep since she thought they are of no use at all. Her teacher, an old troll of the forest, saw her and was displeased. So he cast a spell on the young fairy turning her into an owl until she could learn that all things, even the earthworms, have important roles to play in nature.

The former fairy wasn't unhappy about her sudden change; and, in fact, loved being an owl. She grew until one day she had little owlets to tend. But it got harder and harder for her to find enough mice to feed her offspring.

As she looked around, she saw that all the plants were rotting on the ground, and no new plants were growing. So there were no seeds or tender plants for the mice to eat. Afraid of not being able to feed her young, the owl asked her old teacher for help. He told her that dead plant and animal matter needs to be broken down into nutrients to feed growing plants.



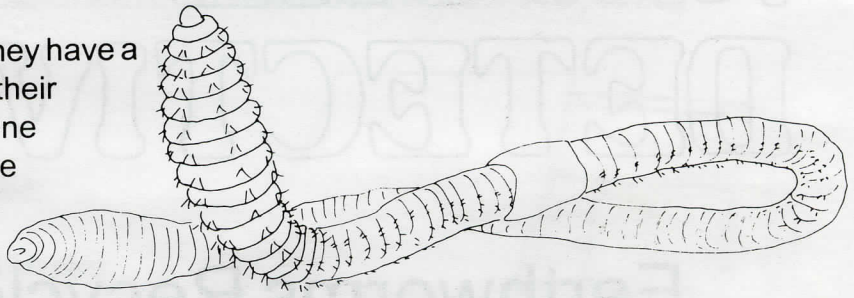
Suddenly, owl understood the job of earthworms. Earthworms do the recycling of dead plants. The troll saw that owl now realized the importance of earthworms, and he wanted to turn her back into a fairy. But, owl decided to stay an owl,and lived happily ever after. Only once did she use a spell again -- to wake up the earthworms.

adapted from a tale by
Chris Taylor

Pull Out and Save

Twisty, turny, soft, and squishy earthworms

Earthworms have no bones, nor do they have a hard outer shell such as beetles. Instead their body is formed by two sets of muscles. One set goes around their body in rings and the other set runs from their head to their tail.

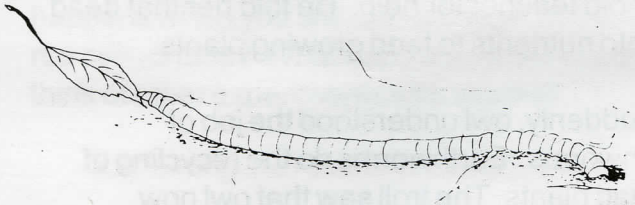


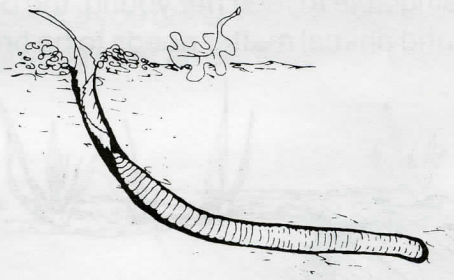
Wiggly, squiggly earthworms

When an earthworm contracts the ring muscles, it stretches out long and skinny. When it contracts the muscles running lengthwise, the worm draws up short and fat. It moves by stretching out along the ground with one set of muscles then drawing its tail toward its head with the other set of muscles. Along its body it has pairs of stiff little bristles called setae. The setae stick into the ground to help the earthworm pull itself forward or sometimes backward.

Food in a tube

Earthworms are mostly food-digesting tubes. They have no teeth. They pull tiny pieces of plant and animal matter into their mouth. The food goes to a holding area called a crop. Next the food is passed along to a gizzard where tiny stones the worm has swallowed grind the food particles even smaller. From the gizzard the particles of food go into the intestine where digestion allows the nutrients from the food to pass into the worm's bloodstream to be carried to all parts of the worm's skinny body. Worms have five pairs of special blood vessels that work like a heart to pump blood. All this activity is controlled by a little brain in the worm's head.





Slippery, slimy worms

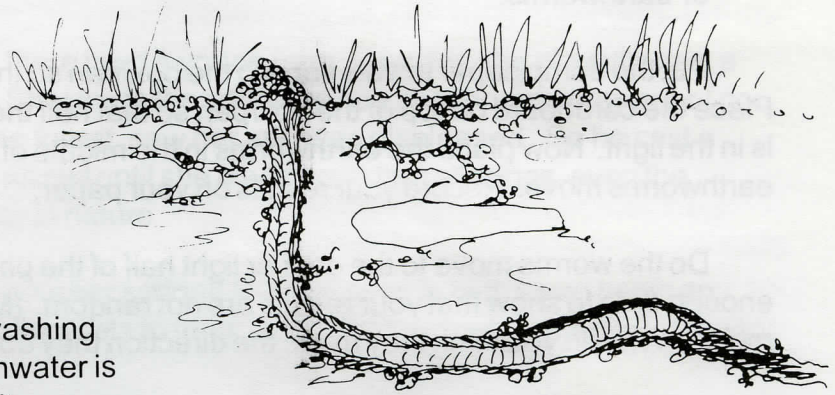
Earthworms don't have noses. They breathe by absorbing oxygen through their skin. The worm's skin has to be moist and slimy to breathe. Slime has other benefits. A worm can follow the scent of its own slime to find its tunnel in the soil, and the slime makes the going easier over rough ground.

Home sweet home

Earthworms live in tunnels in the soil. They make the tunnels by pushing aside the soil with their heads and drawing up their bodies to widen the hole. If the soil is too hard to push, they eat their way in. After all, the soil contains the plant and animal matter that is their food, so they can eat and make their home at the same time.

Remember that earthworms need moist skin, so they must live in damp soil. When the soil dries out, they dig down deeper to find wetter earth. If it rains hard and the soil is too wet, earthworms may come out of their tunnels. But that can be dangerous. They may get eaten or the same sun rays that give you a sunburn may kill them within minutes. In the winter, earthworms tunnel down below frozen ground. They may spend the winter curled up with other worms or by themselves. They don't move much until spring warms the earth above them.

Worms are good for plants



Plant roots need water and air. Where there are lots of worm tunnels, water and air flows down to plant roots easily. Tunneling worms also make the soil looser. Plant roots grow readily through loose soil. Worm-loosened soil also acts like a sponge to sop up rainwater. Instead of washing away and taking good dirt with it, the rainwater is held in the ground where plants can use it.

Worms are natural recyclers. Undigested plant and animal matter along with dirt and tiny pebbles is excreted from their anus at the end of their intestine. This material is called castings, and it makes very fertile soil for plants. Castings look like little bumps of soil on the ground. Look for them near the entrance to a worm tunnel.

The early bird catches the worm

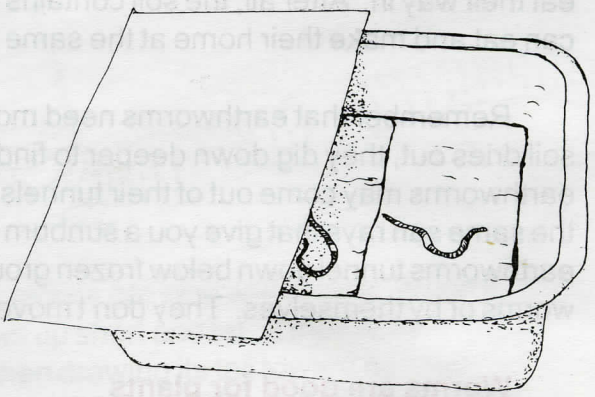
Worms may come to the surface at night or on a cloudy day to drag a tasty leaf into their tunnel. Have you seen a robin trying to pull an earthworm from the ground? A healthy worm draws up and anchors itself to the sides of its tunnel with its setae. If the bird bites off only a little of the tail, the earthworm might be able to grow a new tail. Many animals savor the taste of earthworms. Other birds, including owls do. Frogs, toads, salamanders, and snakes do. And so do moles, shrews, and skunks. Yum.

Experimenting with earthworms

Remember, any earthworms you collect need to be returned to the soil where you dug them as soon as possible.

Do earthworms like light?

To investigate this question, you need:



1. a shallow box or baking pan or dish pan
2. 2-3 wet paper towels
3. a lid for the box or a piece of cardboard big enough to cover half the box/pan
4. paper and pencil
5. earthworms.

Put the damp paper towels flat into the box/pan so they cover the bottom completely. Place the cardboard on top of the box/pan so that half the box is in the dark and the other half is in the light. Now place the earthworms in the middle of the box/pan and note where the earthworms move. Record your results on your paper.

Do the worms move to the dark or light half of the pan? Repeat the experiment to get enough data to show that your results are not random. (Make sure the paper towel stays moist.) Why do you think they move the direction they do?

Other experiment ideas

Worms have no eyes and no ears. Can you sneak up on them in the dark? What happens when you shine a flashlight on them? What happens if you cover the flashlight with red cellophane? What happens when you stamp on the ground near an earthworm? Can you think of other experiments with worms?

Explaining the results of your experiments

Since light means danger for earthworms they move to dark places. Nerve cells on earthworms allow them to sense light and vibrations along with pain and cold, but they are not sensitive to red light.