

SC Farm Bureau  
Ag in the Classroom  
Post Office Box 754  
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## September 2022 Book of the Month

### Wonderful Worms By Linda Glaser

**Grade Level(s):**

PreK- Second Grade

**Reading Levels**

- Lexile- 480L
- Fountas and Pinnell- J

**Estimated Time:**

- 45 minutes

**Purpose:**

- Students will understand how worms increase nutrients, better drainage, and improve farm productivity.

**Vocabulary:** <sup>1,2</sup>

**Herbivore** – an organism that feeds mostly on plants

**Cast-** an organic form of fertilizer produced by earthworms

**Burrow-** tunnels dug by animals

**Rotting-** going bad or breaking down into small pieces

**Background Agricultural Connections:** <sup>1</sup>

Although they often go unnoticed, earthworms play a significant role in our lives. As **decomposers**, worms have the important job of recycling waste material into nutrients that plants can use to grow and provide food for people and other animals. As worms burrow through the soil, they ingest soil particles and obtain nutrition by digesting any dead plant or animal remains, **fungi**, and bacteria in the soil. Through this process, the worms mix up the soil, providing air spaces for roots and water to penetrate. Worm excrement, or castings, provide excellent fertilizer. This is why many home gardeners put worms into their compost piles.

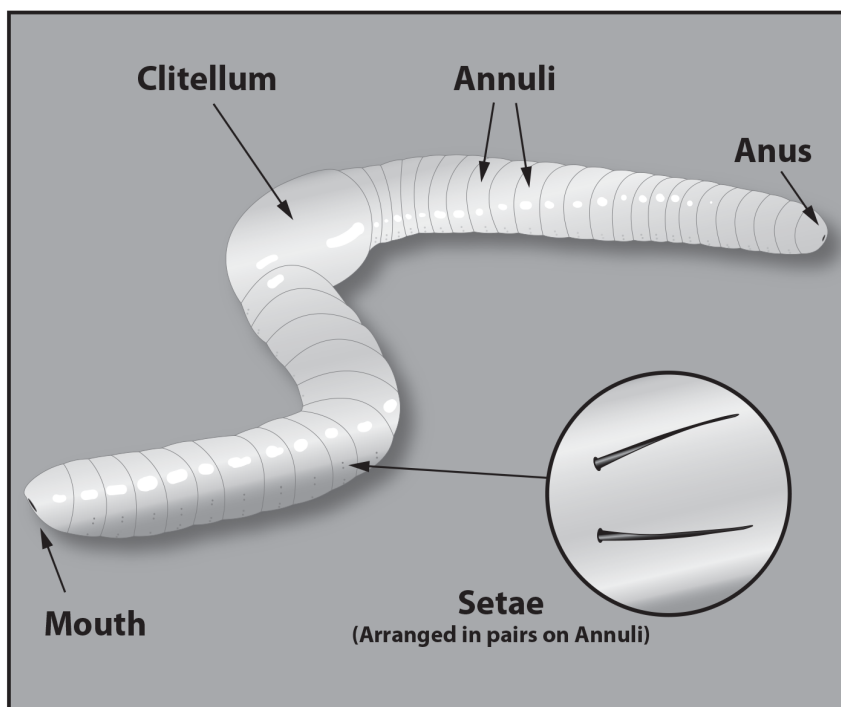
If you have ever held an earthworm, you probably noticed that it was moist. Earthworms do not have lungs, they breathe through their skin, which must be moist in order for oxygen to dissolve and pass into their bloodstream.

Earthworms need a cool, dark, moist environment. They do not have eyes but do have special receptor cells to sense ground vibrations and light. The rings on an earthworm's body are called annuli. Tiny bristles called setae help the worms pull themselves through the soil. The lighter colored "bump" in the middle of the earthworm is the clitellum, the structure responsible for secreting mucous required for the worm to breathe, reproduce, and for protection as the worm burrows through rough soil. Worms have a special organ called a gizzard to help them grind up and digest the soil that they eat.

Earthworms come in a variety of sizes. The largest known earthworm species in Australia can reach nearly ten feet in length! Some worms live close to the surface of the soil, while others burrow six or seven feet deep.

Earthworms can be classified into three main groups based upon the soil areas where they prefer to eat and burrow.

- The worms you find in compost piles are in the Epigeic group. Epigeic earthworms live in plant litter near the surface of the soil and need a lot of decaying **organic matter** to feed on. These worms are relatively small and can tolerate living in conditions with many other worms. This makes them well suited for composting.
- Endogeic earthworms live in the upper-to mid-soil layers and feed on soil and decomposing organic matter. Endogeic earthworms don't have permanent burrows.
- Anecic earthworms are deep burrowing and have permanent burrows that can be spotted by little piles of worm castings at the soil surface. These worms are large and are often referred to as "night crawlers." Anecic earthworms feed on decaying vegetation that they pull into their burrows from the topsoil.



Earthworms are hermaphrodites, meaning they have both female and male reproductive parts. After mating, earthworms lay eggs inside a cocoon covering that hatches in about two or three weeks, but this can vary depending on species and weather conditions. Baby worms are called wormlets and look like tiny pieces of thread when newly hatched.

In addition to improving soil and decomposing waste, earthworms are important food for a variety of animals such as birds, snakes, amphibians, rodents, and other small animals.

### **Worm Facts:** <sup>3</sup>

- An earthworm can grow only so long. A well-fed adult will depend on what kind of worm it is, how many segments it has, how old it is and how well fed it is. An *Lumbricus terrestris* will be from 90-300 millimeters long.
- A worm has no arms, legs or eyes.

- There are approximately 2,700 different kinds of earthworms.
- Worms live where there is food, moisture, oxygen and a favorable temperature. If they don't have these things, they go somewhere else.
- In one acre of land, there can be more than a million earthworms.
- The largest earthworm ever found was in South Africa and measured 22 feet from its nose to the tip of its tail.
- Worms tunnel deeply in the soil and bring subsoil closer to the surface mixing it with the topsoil. Slime, a secretion of earthworms, contains nitrogen. Nitrogen is an important nutrient for plants. The sticky slime helps to hold clusters of soil particles together in formations called aggregates.
- Charles Darwin spent 39 years studying earthworms more than 100 years ago.
- Worms are cold-blooded animals.
- Earthworms have the ability to replace or replicate lost segments. This ability varies greatly depending on the species of worm you have, the amount of damage to the worm and where it is cut. It may be easy for a worm to replace a lost tail, but may be very difficult or impossible to replace a lost head if things are not just right.
- Baby worms are not born. They hatch from cocoons smaller than a grain of rice.
- The Australian Gippsland Earthworm grows to 12 feet long and can weigh 1-1/2 pounds.
- Even though worms don't have eyes, they can sense light, especially at their anterior (front end). They move away from light and will become paralyzed if exposed to light for too long (approximately one hour).
- If a worm's skin dries out, it will die.
- Worms are hermaphrodites. Each worm has both male and female organs. Worms mate by joining their clitella (swollen area near the head of a mature worm) and exchanging sperm. Then each worm forms an egg capsule in its clitellum.
- Worms can eat their weight each day.

### **Materials:**

#### Wonderful Worms

Fact card- one per student (see resources)

### **Interest Approach – Engagement:**

The teacher will have an earthworm habitat for viewing. (See Worm Habitat Enriching activity 1) The students will observe and make inferences about the earthworms before reading Wonderful Worms. Discuss what the students know about earthworms.

### **Procedures:**

Before reading Wonderful Worms, the teacher will lead a picture walk through the book asking questions about the pictures. Students can make predictions about the story. While reading the teacher will ask the following questions:

- 1- How do earthworms work?
- 2- Where do earthworms live?
- 3- What do earthworms eat?
- 4- What is a burrow? Do you see a burrow in the picture?

- 5- Do you think earthworms help plants grow? How?
- 6- Why do you think the author called the earthworms “gardeners”?

**Assessment:**

The students will use a fact card to write one new fact that they learned about earthworms and how they are important to plants and the soil.

**Enriching Activities:**

**1-Make a worm habitat**

**Materials:**

Empty water bottle -1 per student  
Soil- 1 cup per student  
Earthworm- 2-3 per students  
Rubber band- 1 per student  
Plastic wrap- small square per student

**Preparation**

Cut the water bottle in half  
Cut a small piece of plastic wrap to cover the top of the water bottle  
Have soil easily available to the students

**Procedure:**

The teacher will distribute a water bottle, rubber band, and plastic wrap square to each student. The students will fill their water bottles with soil leaving a small space at the top to place their worms in the soil. The students may want to put a little more soil over the top of their earthworms before covering them with plastic wrap. The students will use the rubber band to secure the plastic wrap tightly on the top of the water bottle. The teacher will use a sharp object to poke a few holes in the top of the plastic.

Teachers can add a small amount of water and observe the worms as they move about and make burros in the soil.

\*You can take the activity one step further by planting a flower to see how the earthworm interacts and helps the plant grow.

**2- Growing Worms**

**Materials**

Straw with paper cover (2- 4 per student)  
Marker  
Water dropper  
Small plastic container (one per student or pair)

**Preparation**

Collect the items on the material list

## **Procedure**

Before scrunching the paper cover to the end of the straw, have the students draw several lines with their markers on the paper cover. Once the lines are drawn, have the students stand the straw on one end and scrunch the paper to the bottom of the straw and then gently remove the paper cover keeping it scrunched. Students will repeat this step two to four times depending on how many the teacher has given the students. After scrunching, the students will place the worms in the plastic container. Once in the plastic container, the student will use the water dropper to drop 1-2 drops of water to make the worm grow.

## **Companion Lessons**

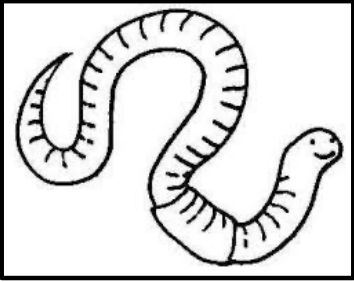
- [Make Your Own Worm Bin](#)
- [Worm Farm](#)
- [Worms Eat My Garbage](#)

## **Sources/Credits:**

- 1- Debra Spielmaker, Administrator and Yasuko Mitsuoka Grow. "It's a Dirty Job." *Matrix Lesson*, <https://agclassroom.org/matrix/lesson/345/>.
- 2- "Natural Resources Conservation Service." *Earthworms | NRCS Soils*, [https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/biology/?cid=nrcs142p2\\_053863](https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/biology/?cid=nrcs142p2_053863).
- 3- "Worm Facts: The Adventures of Herman the Worm: U of I Extension." *Worm Facts | The Adventures of Herman the Worm | U of I Extension*, <https://web.extension.illinois.edu/worms/facts/>.

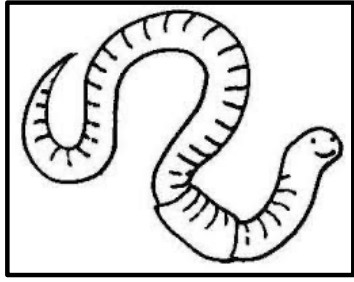
Resource:

**Earthworm Fact**



Four sets of primary writing lines (top solid, middle dashed, bottom solid) for taking notes.

**Earthworm Fact**



Four sets of primary writing lines (top solid, middle dashed, bottom solid) for taking notes.

*Erwood 22*

## Suggested SC Standards Met:

### **ENGLISH/ LANGUAGE ARTS**

K.I.1.1 Engage in daily opportunities for play and exploration to foster a sense of curiosity, develop the disposition of inquisitiveness and begin to verbally articulate “I wonders” about ideas of interest.

K.RL.5.1 With guidance and support, ask and answer who, what, when, where, why, and how questions about a text; refer to key details to make inferences and draw conclusions in texts heard or read.

K.RL.5.2 With guidance and support, ask and answer questions to make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.

K.RL.6.1 Describe the relationship between illustrations and the text.

K.RL.9.2 With guidance and support, identify how an author’s choice of words, phrases, conventions, and illustrations suggest feelings, appeal to the senses, and contribute to meaning.

K.RL.11.1 Identify the author and illustrator and define the role of each.

1.RL. 5.1 Ask and answer who, what, when, where, why, and how questions to demonstrate understanding of a text; use key details to make inferences and draw conclusions in texts heard or read.

1.RL. 5.2 Make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.

1.RL.9.1 Identify the literary devices of rhythm, repetitive language, and simile and sound devices of rhyme, onomatopoeia, and alliteration; explain how the author uses each.

1.RL.9.2 Identify how an author’s choice of words, phrases, conventions, and illustrations suggest feelings, appeal to the senses, and contribute to meaning.

1.RL 11.1 Identify the author’s purpose—to explain, entertain, inform, or convince.

2.I 1.1 Ask self-generated questions that lead to group conversations, explorations, and investigations.

2.RL. 5.1 Ask and answer literal and inferential questions to demonstrate understanding of a text; use specific details to make inferences and draw conclusions in texts heard or read.

2.RL.5.2 Make predictions before and during reading; confirm or modify thinking.

2.RL 6.1 Use information gained from illustrations and words in a print or multimedia text to demonstrate understanding of its characters, setting, or plot.

### **Writing**

K.MCC. 3.1 Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, to tell about the events in the order in which they occurred, and to provide a reaction to what happened.

1.MCC.3.1 Explore multiple texts to write narratives that recount two or more sequenced events, include details, use temporal words to signal event order, and provide a sense of closure.

2.MCC. 3.1 Explore multiple texts to write narratives that recount a well-elaborated event or short sequence of events; include details to describe actions, thoughts, and feelings; use temporal words to signal event order; and provide a sense of closure.

## **SCIENCE**

K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

K.L.2A. Conceptual Understanding: The environment consists of many types of organisms including plants, animals, and fungi. Organisms depend on the land, water, and air to live and grow. Plants need water and light to make their own food. Fungi and animals cannot make their own food and get energy from other sources. Animals (including humans) use different body parts to obtain food and other resources needed to grow and survive. Organisms live in areas where their needs for air, water, nutrients, and shelter are met.

1.L.5A.1 Obtain and communicate information to construct explanations for how different plant structures (including roots, stems, leaves, flowers, fruits, and seeds) help plants survive, grow, and produce more plants.

1.L.5A.2 Construct explanations of the stages of development of a flowering plant as it grows from a seed using observations and measurements.







