

Life Sciences: Investigating Earthworms

Activity Overview

Children **observe** live earthworms and notice different parts of their bodies, and other characteristics, including appearance, movement, and behavior. As they investigate different features of the worms, they **make comparisons** between themselves and these fascinating invertebrates. Children learn about the important role that worms play in nature. They **communicate their questions and discoveries and record** their observations through drawings.

*Science process skills are in bold.



Underlying Science Concepts:

- Earthworms have unique features that help them live in their environment.
- Earthworms play a vital role within the soil ecosystem.

Materials:

- Tray of soil for the introduction
- One or more photographs of earthworms (can be printed from online sources)
- Live earthworms (redworms or night crawlers)*
- Magnifying lenses
- Plastic plates or small trays (paper plates tend to be too dry)
- Damp paper towels
- Dry leaves and/or cardboard tunnel (cut toilet paper tubes in half)
- Small rocks
- Paper and drawing utensils
- Mister (recommended for adult use only)

*Note: Redworms are the kind used in compost bins, whereas night crawlers are larger and make burrows underground.

Getting Ready:

- Purchase worms from a garden supply or bait store, or collect some from outside (look in damp places, such as under rocks or logs). Worms can be kept in a container of soil in the refrigerator for up to a couple of weeks until you are ready to use them.
- Mist or rinse the worms to clean them off before the activity. It is important to keep them moist, so you can keep them in a container with dampened paper towels for a short time.

Note: At the end of the investigation, you can release the worms in a garden or other appropriate outdoor area.

→ Engage

- Show the children a tray of soil and ask what kinds of small animals might live in the soil.
- After they share their ideas, hold up a photograph of a special animal that lives under the ground - a worm! Ask questions such as:
 - *Where have you seen earthworms?*
 - *Have you ever touched an earthworm? How did it feel?*
 - *What do you know about earthworms?*
- Show the children a live earthworm. Model how to gently pick up and hold the earthworm in your hands. Emphasize that worms are living things and the importance of being gentle. Ask the children how they think we should handle the worms and take care of them so that we do not hurt them.
- Place the worm on a plastic plate or tray and show the materials and tools the children can use in their investigations. Model how to be careful not to hurt the worm as you place the damp paper towel, paper tunnel, leaf, and small rock on the plate. The purpose is to observe how the worm moves, what direction it can go, and where it goes when something blocks its path.

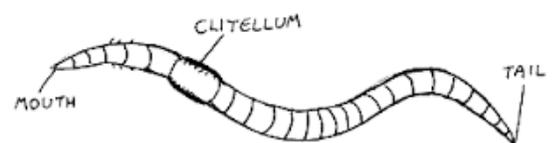
This is a time to share ideas, don't worry about teaching facts at this point or correcting any misconceptions.

→ Explore

- Give each child or pair of children an earthworm on a small tray or paper plate to observe. Encourage the children to touch the worms and make observations about their bodies. Carefully supervise to make sure children handle the worms gently.
- Encourage the children to gently pick up the earthworms and hold them in their hands if they want to.
- Allow plenty of time for free exploration with the worms and exploration materials.
- Notice how the worms can move forwards, backwards and sideways. Do the worms change shape as they move?
- As the children observe the worms, share as much information as you feel is appropriate, based on the children's readiness. Some features to identify are: the segmented body, pointed head, tail, mouth, and clitellum. Children will probably find it interesting to know that earthworms do not have eyes!
- Invite the children to make an observational drawing of their worm.
- At the end of the activity, let the children place their earthworms in a container of soil. Within a short time, the earthworms will dig beneath the surface.
- Wash hands.

As the children are exploring, you may want to take notes on their observations and questions to use when debriefing the activity.

You may need to lightly mist the worms to keep them moist.



→ Reflect

- Lead a discussion with the children about their observations and discoveries. *"What did you learn about earthworms?" "How is the earthworm's body the same as/different than your body?" "Would you like to be an earthworm? Why/Why not?"*
- Show the children the container of soil where the earthworms were placed. Let them see that the earthworms have gone (or are beginning to go) underground. Ask the children, *"Where did the earthworms go?" "What do you think they are doing?"*
- This discussion is a good opportunity to introduce earthworms' important role in keeping soil healthy by making tunnels underground that bring air and water to plant roots. If your children noticed any earthworm castings, explain that they are good for the soil and help plants grow.
- Sing the Worm Hokey Pokey. Either stand up or lie on tummy. Pretend to have the body of a worm. Ask, *"Do we have arms and legs?" "What can we "put in?"* Use the children's ideas while singing the traditional song...worm style!

If you took notes during the exploration, refer to them and point out some of the things you noticed the children saying and doing. Children enjoy hearing their comments read aloud. They can then be prompted to elaborate on their ideas.

Guiding Questions

- What does the worm feel like? (Wet or dry? smooth or rough? cold or warm? Soft or hard?)
- What color is it? What shape?
- How is your worm moving?
- Can you figure out which end is the head and which is the tail? How did you figure that out? (Earthworms extend their head first when moving but can also move backwards.)

Key Vocabulary

During the activities integrate the words below into your conversations. Children's vocabulary will build with practice.

- Earthworm
- Segments
- Observe
- Clitellum
- Soil
- Castings

Teacher Tips

Be aware of not passing on any fears or negative attitudes you may have towards earthworms. Even if your preference is not to touch them yourself, be encouraging of the children's explorations. Positive modeling is important for all children, especially those who may be fearful.

If you think your children need to practice gentle handling before touching the real worms, you can use rubber bands, pieces of yarn, or pipe cleaners as pretend worms.

Reinforce gentleness and respect for living things by saying phrases like, "I noticed how carefully you picked up that worm!"

Hand lenses. If using hand lenses in this activity, allow children time for free exploration to practice using them.

Wiggle Wiggle Song
(Tune: "Frere Jacques")

Wiggle, wiggle, Wiggle, wiggle
Little worm, Little worm,
Crawling on the ground,
Wiggling all around,
Squirm, squirm, squirm,
Squirm, squirm, squirm.

Little Wiggle Worm Song
(Tune: "I'm a Little Teapot")

*Stand up and wiggle.
On the last line, wiggle down to the ground.*

I'm a little wiggle worm, watch me go!
I can wiggle fast, or very slow
I wiggle all around, then back I go
Down into the ground, to the home I know.

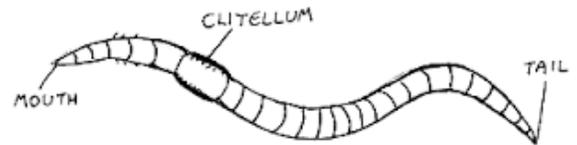
Ideas for Further Explorations

- Take children outside to search for earthworms and other creatures such as slugs, millipedes, and pill bugs (most of which can be found in damp places like under leaf piles, rocks, or logs).
- Children can imagine that they are earthworms and try to move their bodies like real earthworms. You can put down blankets or sheets to burrow under. Provide sleeping bags to wear while moving like a worm.
- Roll worms of different sizes out of play dough.
- Set up a worm bin with the children. This is a way to compost food scraps while involving the children in ongoing worm investigations. Instructions can be found online.

Background Information for Teachers

Anatomy of an Earthworm

Earthworms do not have a nose, eyes, or ears. To gather sensory information about their environment, they "feel" their way through the soil. They are very sensitive to vibrations. The worm's body is divided into *segments*; some types of worms have over 100 segments. Along the underside (ventral side) of the earthworm are small bristles called *setae* that help them to move and sense their environment. Earthworms breathe through their skin and must stay moist to avoid drying out.



Earthworms also have a *clitellum*, a thickening or swelling of the earthworm's body about one-third of the way down from the front end. It is only found on adult worms and plays an important role in reproduction. Earthworms are neither male nor female. Each individual has both male and female reproductive parts. When two worms mate, they fertilize each other and both will lay eggs.

Earthworms and Soil

Earthworms play many very important roles in maintaining healthy soil. Earthworms help in the process of decomposition by breaking down dead organic matter. They do so by ingesting the organic matter and excreting *castings*, releasing essential nutrients back into the soil. They also help to aerate the soil by burrowing underground, creating tunnels for air and water to pass through.