

# Earthworms

Students learn about earthworms by observing them in their natural habitats and participating in activities that exhibit basic worm functions.

**Grade Level:** Kindergarten

## Phenomena:

**What special adaptations do earthworms have that help them survive in their environment?**

## Objectives:

- Students will describe how earthworms help plants to grow.
- Students will observe and explain how worms move.
- Students will evaluate the basic systems that allow worms to survive with very different bodies.

## Materials:

- Live worms in dirt
- Chenille stems (pipe cleaners) cut in half
- Wooden beads
- Plastic interlocking beads of various colors in cups
- Small-tipped marker
- Magnifying glasses
- Newspaper
- Close-up earthworm pictures

## Appendixes:

- *Little Wiggle Worm* song: Page 5
- Earthworm pictures: Page 6
- Worm care instructions: Page 7
- Wonders of wiggly worms: Page 8

## Time Considerations:

Preparations: 15 minutes

Lesson Time: 50-60 minutes

*Introduction: 7 minutes*

*Activity 1: 15 minutes*

*Activity 2: 5-10 minutes*

*Activity 3: 10-13 minutes*

*Activity 4: 10 minutes*



## Next Generation Science Standards

### K-LS1-1.

Use observations to describe patterns of what plants and animals (including humans) need to survive.

### Science and Engineering Practices (SEP):

Analyzing and interpreting data.

### Disciplinary Core Ideas:

Organization for matter and energy flow in organisms.

### Crosscutting Concepts:

Patterns

## Excellence in Environmental Education Guidelines

- Strand 2.2 – The Living Environment (A, B, C,): Learners understand basic similarities and differences among a wide variety of living organisms. They understand the concept of habitat. Learners understand that plants and animals have different characteristics and that many of the characteristics are inherited. Learners understand basic ways in which organisms are related to their environments and other organisms.

## Background

Worms are often seen as “gross” or “ewwy” to young children, but helping them to interact and touch worms, as well as to learn about how they live can break down fears and stereotypes of soil, worms, insects and dirt.

The most common worm is the earthworm, a member of phylum *Annelid*. Earthworms in general have been around for 120 million years, evolving during the time of the dinosaurs. Earthworms live in the ground and help to condition the soil. They are very helpful for plants and fertilize the soil with their castings or excrement, while

also aerating and draining the soil through constant burrowing. They eat soil that contains decaying leaves or roots. They will then process that into nutrients for plants.

Earthworms have long, cylindrical, soft bodies and do not have legs. Instead, they have small hairs, called setae, that help them move through the soil. An earthworm moves by stretching its body in the direction it wants to go. Then it scrunches up again. As it moves, it gets fatter and thinner with each movement. An earthworm’s body has segments. The middle segment, which is fatter and lighter than the rest of the body, is called the

*clitellum*, or saddle, and is the reproductive organ. Earthworms lack eyes, but have light-sensitive photoreceptor cells scattered in their outer skin. Worms also do not have lungs, but are able to breathe through their skin. Earthworms are hermaphrodites, both sexes in one animal, but can cross fertilize (*Wolford, R.*)

## Preparation

Gather required materials. For wiggly worm craft, assemble the head with drawn-on face onto half of a chenille stick. Put the chenille stick through the wooden bead and bend it over so that students have the start of their wiggly worm.

This activity requires students to observe real live earthworms. Depending on your climate and the season, you could dig for the worms. Personal or community gardens or the banks of a river are good places to look. Otherwise, you can buy night crawlers at most hardware or fishing supply stores. Keep the worms in a dark, cool and slightly moist container. You can feed the worms oatmeal or decaying leaves if you want to keep them for a while.

## Doing the Activity

Begin by telling the students that today we are going to be investigating WORMS!!

However, before you begin you will be learning some big words !

Go over the following vocabulary words as a group

### Introduction:

Show the class pictures of worms. Ask the students if they have seen a real live worm before. Share that today everyone will have a chance to study real worms!

Bring out a worm for students to see. Ask students how they believe these worms should be cared for. (carefully and nicely)

## Vocabulary

**Castings:** a worm's excrement which is rich in nutrients good for plants

**Clitellum:** the fatter, lighter segment on an earthworm's body that is essential for reproduction, also called the saddle

**Compost:** natural plant fertilizer that can be made through a number of processes including using red wiggler worms

**Setae:** tiny hairs on a worm's body that help it move

Let students know that they do not have to hold the worms if they choose not to. Instead, students can pet them by using one finger, or if they prefer to just observe, that is OK too.

Demonstrate to students what you mean by petting. This will ease any fears kindergarteners may have.

Explain to the class that in just a few moments each person will be put in a group to study their worms. But first, we all get to sing a great song about worms!

Sing the *Little Wiggle Worm* song with students. When finished, have the students either line up around the outside of the carpeted area or sit back down so the groups can be made!

### Activity 1: Watch Them Go!

This activity can be done indoors or outdoors. In either case, lay out newspaper prior to handing out worms.

Lead three to four students to their newspaper and give them one worm a piece. Tell students to handle them carefully.

Encourage students to place worms on the newspaper. This will help them to compare lengths and how worms move along the ground.

Repeat the before mentioned steps with all students.

Hand out magnifying glasses to look at the worms up close. Kindergarteners will not know how to use magnifying glasses. It is best to introduce the tool to groups individually and demonstrate how to use it.

Periodically stop groups to look for the tiny hairs or setae that worms use to move and other interesting finds on worms.

## **Activity 2: Earthworm Basics**

Now that students are more curious about worms, come together as a class to discuss basic questions about worms.

Where do earthworms live? (in the soil underground)

How do their bodies look? (they have tiny rings or segments in their body with a large segment in the middle called the saddle or clitellum that is the worm's reproductive organ)

How do worms see? (they don't have eyes, but they do have light-sensitive cells scattered in their outer skin) Have students experience this sensation by having them close their eyes while you turn the lights on and off.

How do earthworms breathe? (they don't have lungs, but they can breathe through their skin when it is moist)

What do worms eat? (earthworms eat soil with decayed leaves and roots)

Are worms helpful for plants? (Yes, earthworms fertilize the soil with their castings or excrement. They also aerate and drain the soil by constantly burrowing. Worms help to make compost, which is natural fertilizer for plants.)

How do earthworms move? (They don't have legs, but they

have tiny hairs called setae that help the earthworm move through the soil. A worm moves



An earthworm with a visible saddle

by stretching its body in the direction it wants to go. Then it scrunches up again. As it moves it gets fatter and thinner with each movement. The worm needs to be moist to move through the soil.)

Throughout this part of the discussion, show students close-up pictures of worms that show the features that you have mentioned.

## **Activity 3: Worm Dance**

This activity will help students to better understand how worms move.

To begin, confirm with students that worms have no legs. If necessary, show students the close-up pictures of worms again.

Share with students that worms use their bodies to move through the soil and we're going to see how worms move by moving like a worm right now!

First, demonstrate this activity using four helpers. Have four helpers stand in a line holding hands. Point out that each person is one segment of a worm. Designate which student is the worm's head and tail.

Ask the students to guess how might the worm move without legs. (it scrunches)

Demonstrate the scrunching movement by asking the back three students to move closer to the head. Now, have the head of the worm stretch out, followed by its other parts.

Explain that now the class is going to make the biggest worm ever seen using everyone! Have all students stand up and hold hands.

Designate one person as the head and another the tail. Assist the "worm" as it moves about the classroom.

Throughout the activity, relate each student's legs to the tiny hairs on worm bodies that help them move.

Return to the carpeted area and check for understanding by asking students how exactly do worms move? (scrunching, moving its body parts, using its hair, etc.)

## **Activity 4: Wiggle Worms**

Share with students that they now get to make a worm of their own! Before dismissing



Wiggle worm craft

students, demonstrate how the craft is to be done.

Dismiss students back to their seats and hand out a pre-assembled chenille stick (one that already has a head) and small cup of 10 beads to each student.

Allow students a few minutes to make their worm.

Tell students to hold their worm in the air, when they are finished and then you will go around and finish the craft, by pinching the end chenille stick down.

### **Activity 5: Worm Story**

Hand out worm story sheets and have students write a story about their worm. Ask students to include something they learned today like how does your worm move? or what does your worm eat?

## **Conclusion**

Review key points with the students. Such as what worms eat, how they move, how they see, etc.

Students can also demonstrate using their crafts how worms move.

## **Assessment**

Informally assess students' knowledge by asking students to state two things about the basic functions of worms

## **Extensions**

### **Little Wiggle Worm song!**

### **Worm Journeys**

Fill each corner of a shallow box with the following: very wet soil, regularly moist soil, sand and gravel. Tell students that you will be putting earth worms in the center of the box and have them make predictions about which corner the worms will go towards. Once all the students have made their predictions, put the worms in the center of the box and observe where they go (normally to moist soil). Follow up with questions examining why they go to that area and what might be undesirable about the other corners.

### **Worm Compost Exploration**

Build a worm composting bin with your class. This requires special worms called red wigglers that can be obtained from other worm composters, a community garden or ordered online. See worm care instructions and activities to do with your new worm bin!

### **Fun Earthworm Facts**

Share these interesting worm facts with your students:

- Earthworms have five hearts
- Earthworms have more segments the older they are
- Earthworms can push objects up to ten times their weight
- Largest earthworm ever found was in South Africa and measured 22 feet
- In one acre of land, there can be more than a million earthworms

## **Little Wiggle Worm**

To the tune of: *I'm a Little Teapot*

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



## **Sources**

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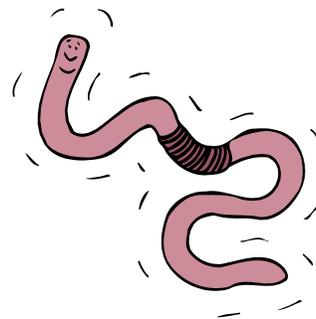
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## Worm Care

1. Keep your red worms in a cool, dark place. Room temperature is fine, as long as the room isn't too hot.
2. Worms do not like the light! Keep them in a dark container.
3. Make sure there is plenty of access to fresh air. A large number of air holes in the container would work well. There should also be drainage holes in the bottom of the container. Don't worry, the worms won't escape. They don't like being out of their cozy home!
4. Put torn up newspaper in their home every so often for food and bedding. Do not use glossy paper.
5. Worms love rotting foods! Feed them things like apple cores, pumpkins, lettuce, oatmeal, coffee grounds, etc in small pieces. Be careful not to feed them too many acidic foods (tomatoes, citrus fruits/peels, etc.). Do not feed them meat, eggshells, fatty/greasy foods or dairy products. As a rule of thumb, these worms can eat their bodyweight in food every day, so a pound of worms can eat a pound of food. Try not to give them too much food before they can eat it so the container doesn't start to stink! Make sure to bury the food under the paper as well to allow for optimum consumption and for prevention of odors and flies.
6. Keep them moist. Mist the newspaper with water to keep their home damp. Do not pour water in their home, since they could drown! The best option is to use a spray bottle with water in it. This is important since worms need the moisture to breathe.
7. Castings or rich soil created by worms will eventually be seen towards the bottom of the container. Remove it every few months and use as a fertilizer. Replace the space with more damp newspaper. Too many castings in the container is not good for the worms.
8. Your worms will reproduce if kept happy, so you may need to move them into a larger container or split them up into another similar sized container.
9. After moving the worms in their new home, it may take a few days for them to start eating again, so please be patient!
10. If you have any questions or would like to get rid of the worms at any point, we will gladly take them back, please give Nevada Outdoor School a call at 775-623-5656.



# Wonders of Wiggly Worms

Fun facts and activities to do with your students!

- Put a selected student on worm duty. Have them spray the bedding with water and feed their little worm friends
- Older worms have more segments than younger worms.
- Collect your castings! Students will love to dig in the dirt to separate their worms from their castings. Use a large plastic sheet or cut up garbage bags and spread them across the floor or large tables. Make many small piles of castings on the plastic. Collect as many worms as you can off the top and put them back in their home. Shine flashlights on the pile of castings. Since the worms don't like the light, they will move to the bottom of the pile. Collect the castings off the top of the pile and put them in a container off to the side. Repeat with the flashlight until you reach the bottom of the pile and can pick out the rest of the worms.
- Take your students fishing! The wiggly worms make a tasty meal for fish.
- Do an awesome experiment! Plant a few of the same type of seeds in similar but separate containers. Give both of the plants the same amount of water, but give one of the plants some of the worms castings every few weeks. Measure the plant's height every few days. See if the worm castings make a difference in the growth of the plant.
- In just one acre of land there can be more than a million earthworms!
- If worms dry out, they will die.
- Choose a special part of the playground to fertilize with your worm castings. They are helping out their school one worm at a time!
- Create a Worm Day celebration! Pick a date, create posters, make up wormy skirts and eat gummy worm treats! Use this day as a reward for taking such great care of your wormy friends.
- The largest earthworm ever found was in South Africa and measured 22 feet from its nose to the tip of its tail.

