



## A Worm's Senses

### Connected Next Generation Science Standards

**K-LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive.

### Featured Science and Engineering Practices

Analyzing and Interpreting Data

### Featured Cross-Cutting Concepts

Patterns

### Materials

- Magnifying glasses
- Hand trowels
- Clear plastic cups or containers
- Newspaper or cardboard
- Optional: flashlight

### Settings

- School garden or green space where students can observe a variety of living organisms.
- More plant and animal life will be around in warmer weather.

### Overview

Worms are one of the most important organisms in the garden ecosystem. They recycle organic material, increase nutrients in the soil, improve soil structure, and provide food for other animals. In this lesson, students will observe worms' body structures, behaviors, and habitats in the garden.

### Students will

- Identify and observe worm structures and behaviors.
- Explore worm habitats.
- Identify worm habitat condition preferences.

### Teacher Preparation

- Identify a garden bed students can dig for worms without harming the plants you will be harvesting.
- Optional: Premoisten newspaper or cardboard for worms

**Guiding Question-** How does a worm's body help it survive in the soil?



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Digging for worms can be a great way to turn over a cover crop or loosen soil before planting. If the garden bed does not have any plants, there may be less worms. You may need to dig in a compost pile or look under logs as well

### Explore

- On your way to the garden, ask students, Where do we often see worms in the garden?
- Explain that today you will be discovering how worms use their bodies to survive in those places. If you want to find and observe worms, where should you dig? Gather a few responses.
- We want the worms to stay healthy. How should we treat the worms? Remind students to be gentle with worms and not make someone touch a worm, if they do not want to. You may want to demonstrate carefully picking up a worm and putting it in a cup or "petting" the worm with a pinky finger.
- Circle the class around a garden bed or beds that all students can dig in. Pass out hand trowels and 2 cups to each student or pair of students.
- Allow students about 5 minutes to dig and look for worms. Collect worms in one plastic cup and put soil in the other.

### Digging Deeper

- Gather students in a circle with their cups of worms. Pass out magnifying glasses. Review how to use them, if needed.
- Ask students to look and see if they notice eyes or ears on the worms they found. Worms do not have ears or eyes. Encourage deeper observation if students are unsure.
- Ask students to predict if they think the worms are still able to see or hear. Why or why not?



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You can also do the light test when digging up the worms. Ask students to notice how the worms react once they are dug up from the earth and lifted into the sunshine. Alternatively, demonstrate the light reactions indoors for more obvious worm behavior.

Use a different worm for each test so the worm does not become too stressed.

Test the worm's sense of smell: Put a strongly scented fragrance on the end of a Q-Tip (essential oil, nail polish). Have one student put the Q-tip next to each end of the worm, making sure to not touch the worm. How does the worm react?

- Explain that you are going to do some tests to see if worms can still detect light and sounds without having eyes or ears.
- For the first test, pass out moist paper towels or cardboard to each student or pair. Have the students carefully place one or two worms on the paper.
- Cover the worms with a thin layer of soil from their other cup. You can also have them hover their hands over their worm. How is their worm reacting to less light? Is it squirmy or calm?
- Next, have students remove their hands and soil to expose the worm to sunlight. You can also use a flashlight and shine it at the worms, so it receives more light. How are the worms reacting to the light? Students may notice how the worm moves and crawls into the soil.
- Ask students if their prediction about worms being able to sense light was correct. How do they know the worms could tell the difference between light and dark? Tell students the worm cannot see as well as them but its body senses light and dark.
- What is the soil like where the worms live? The soil is dark but worms still need to sense light to survive. How well would they be able to see if they lived in the dark soil?
- Tell students to carefully dump their worms and soil. You should hold onto 1 or 2 worms.



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### Making Connections

- Gather students together in a tight half-circle around you, preferably in the shade.
- You are now going to test the worm's sense of hearing. They first have to be very quiet, and when you say "Go!" students should start clapping fast and loudly.
- Take a minute to let the worm you are holding calm down. Once the worm is relatively calm, shout, "Go!" indicating that they should all begin clapping. The noise from the clapping should make the worm become squirmy and possibly even flop around.
- Ask students how the worm was able to sense the clapping if it does not have ears. Ask students if they have ever felt noise from a speaker or other loud source. Students should come to understand that worms may feel sound vibrations the same way they can feel the temperature change in light and darkness.
- Why would a worm need to be able to sense sounds to help it survive? (Predators, potential danger, signaling rain falling above, etc.)
- On the way back inside, have students reflect what kind of conditions worms probably like to live in based on the observations you made today. (Moist, dark, cool, quiet, etc.)