



# Biologist: Worm behavior



**Time:** 45 Minutes      **Skill Level:** Elementary (age 6–11), Middle School (age 12–14)

## Background

### What is Science Inquiry?

Children are natural scientists. From a very early age they explore the world, ask questions and seek answers. This journey of exploration and discovery is Science Inquiry. Science Inquiry helps young people understand their environment, solve problems and gain knowledge about scientific ideas and processes.

## Next Generation Science Standards (NGSS)

### Science and Engineering Practices

1. Asking questions
3. Planning and carrying out investigations
4. Analyzing and interpreting data
6. Constructing explanations
7. Engaging in argument from evidence

### Disciplinary Core Ideas

- LS1:** From molecules to organisms: Structures and processes
- LS2:** Ecosystems: Interactions, energy, and dynamics

### Crosscutting Concepts

2. Cause and effect: Mechanism and explanation

## Objective

In this activity, students perform various tests to investigate worm behavior.

## About the Scientist

A biologist is a scientist that studies living organisms. Some biologists are working to explain the underlying mechanisms for how organisms function. Other biologists are involved in *applied research*, where they attempt to develop or improve more processes and understanding in fields such as medicine, industry, and agriculture.

## The Science of Worms

Earthworms are invertebrates, they have no back bone (unlike snakes, which do have a back bone). Earthworms are annelids which means their bodies are segmented. They crawl using circular and longitudinal muscles which are located under the epidermis. Each segment also has bristle like setae which help to anchor their segments as they crawl. You will feel these bristle when a worm moves across your hand. Earthworms do not have a well-developed respiratory system. Instead of lungs, they breathe through their skin which needs to stay moist for breathing. This is why we must be sure to keep the worms moist while the students study them.

### **Preparations:**

Additional information and pictures are available on line. Print pictures of worm anatomy before the lesson. Nature Watch has a link to ***Worm Watch*** with links to an earth worm field guide <https://www.naturewatch.ca/english/wormwatch/about/guide/intro.html>, earth worm anatomy <https://www.naturewatch.ca/english/wormwatch/resources/anatomy.html>, worm facts and other citizen science activities

**Watch the Video:** <http://oregon.4h.oregonstate.edu/science-engineering-and-technology>

### **Materials List:**

- Worms-Red Wigglers or Night Crawlers
- Show box or something similar
- Wax Paper or clear sandwich wrap
- Scissors and tape
- Flashlight
- Water
- Chart paper or poster board to record data

**Discuss** ...What do students know about worms. What questions do they have? Use the information on the video, at the on-line link provided and in the FYI section to provide some information about worms and worm behavior. Discuss what can be varied in the experiment. How will the worms react to light vs. dark, dryness vs. moisture, or warm vs. cold water. What other ideas do students have? Select an experiment that the group agrees upon or let groups try different tests.

**Predict** ...How do the students think the worms will behave to each variation to their environment?

### **Experience “What to Do”- What is the plan for the investigation?**

Have the students brainstorm how they should handle and be respectful of the worms. The worm box has two internal rooms that can be used to experiment with varying environmental conditions to observe worm behavior. Please remember, students should do no harm to the worms when they do their tests.

### **Share ...**

Guide students to share questions about what information their worm experiments might be showing them. Recording data is an important part of sharing.

### **Reflect ...Analyze and interpret the data and results. Discuss among the group.**

Help the students develop questions of their own. Some example questions may be:  
Are worms more likely to migrate toward a damp surface more than a dry surface?  
Do Red Wigglers differ from Night Crawlers in their behavior?  
Are worms more likely to migrate toward a light source or away from one?  
Is there a specific food source worms seem to prefer more?

### **Generalize ...to real world examples. Construct explanations.**

What type of environmental conditions would you think worms require to live?

### **Apply ...outside the classroom or club meeting.**

After doing this experiment, what do you think is the best time of the day to collect worms, and why?  
If you wanted to raise worms, what would you want their new home (worm bin) to have to make sure your worms were safe and healthy?

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Agriculture Sciences & Natural Resources, Family & Community Health, 4-H Youth, Forestry & Natural Resources, and Extension Sea Grant programs. Oregon State University Extension Service offers its programs and materials equally to all people.