

Worm Investigations

Lesson Description



In this lesson, students closely observe characteristics of earthworms and how they react to various environments. Students will become familiar with the importance of earthworms and how earthworms help the soil in the garden. If time allows, students will conduct earthworm races.

- Time required: 60 minutes
- Location: Classroom and garden

Learning Objectives

- Describe how earthworms help the soil in the garden.
- Describe which environments worms prefer; light or dark, damp or dry.
- Gain an appreciation for earthworms and learn to treat them gently and respectfully.



Materials and Preparation

- Earthworms; 1 worm for each group of 2 students (from a bait shop or dug up from the soil)
- Small (Dixie) cups of soil; 1 for each group of 2 students
- Moist soil; enough to fill all small Dixie cups and 2 flat pans or boxes used in the investigation activity
- Magnifying glasses or microscopes if available
- 1 roll of paper towels
- 6 flat pans or boxes for worm stations
- Water in a medium container (for wetting paper towels in Station #2)
- 2 pieces of 8"x10" cardboard or dark colored paper
- Tape
- Rulers; 1 for each group of 2 students or 4-5 rulers to pass around between groups
- Pens or pencils; 1 for each student
- Stopwatch, clock, or other device for timing
- 3 shoeboxes
- 3 sheets of paper and markers for making station labels
-  **Worm Investigations**
-  **Worm Station Cards**; print or photocopy 3 sets of the cards (1 set for each group of students)
- Prepared vegetable snack of the week – 1 for each student
- Water to drink during the Class Warm-up – water dispenser in the classroom and 1 cup or a water bottle for each student


Preparation for Worm Investigation Activity Stations (5 minutes)

- Prepare 3 separate stations for students to rotate through. Each station should have enough space around it for a group of roughly 5 students to work around. Stations may be set up outside in the garden or inside of the classroom.
- For Station #1: Set out 2 flat pans or boxes on a table. Cover half of each pan or box with a piece of cardboard or dark colored paper. Secure the paper with tape if necessary. Label this area “Station 1: Light and Dark”.
- For Station #2: Set out 2 flat pans or boxes on a table. Place paper towels and container of water next to the pans or boxes. Label this area “Station 2: Damp and Dry”.
- For Station #3: Set out 2 flat pans or boxes on a table. Fill the pans ½ to ¾ inch deep with moist soil. Label this area “Station 3: Buried in the Dirt”.

Class Warm-up: Champion Cheer and Veggie Taste Test (5-10 minutes)

- Give each student a cup of water or ensure that they have a filled water bottle in front of them.
- Give each student the prepared veggie snack of the day.
- Lead the students in enthusiastically reciting the  **Champion Cheer**.
- At the end of the cheer, drink water and eat the veggie snack together.
- Have students complete their  **Taste Test Observations** about the vegetable snack of the week.

Review of Last Lesson (2-3 minutes)



- Review the evaluation questions from last week’s lesson. Evaluation questions from all lessons are listed at the end of the workbook .





Class Discussion (5 minutes)

Earthworms are star decomposers in the garden. That is one reason why it is very important to be gentle and kind to earthworms. Today, we will closely observe earthworms.

- *What basic things do you think earthworms need to be happy?*
- *Do you know what decompose means? (Answer: to break down organic matter)*
- *In what ways do you think earthworms help the soil? (Answers: earthworms eat dying plants and their poop acts like fertilizer to make the soil healthy)*
- *What do earthworms and all other living things need in order to be able to survive in their habitat? (Answers: food, water, air)*
- *How do you think earthworms get these things in their soil habitat?*
- *What adaptations do you think they might have that might help them get these things?*

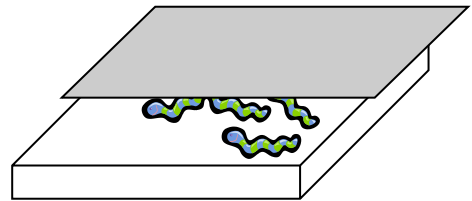
Activities (30-35 minutes)

-  **"What is a Worm?" (10 minutes):** Students observe an earthworm and record their observations.
 1. Ask students to brainstorm ways that they can treat earthworms kindly, gently and respectfully. Write these ideas on the board as a reminder throughout the activity.
 2. Divide students into pairs. Give each pair a small container of soil and one earthworm to place on top of the soil. Pass out rulers and magnifying glasses or use microscopes if available.
 3. Encourage the students to observe as much as they can about their earthworms for 5-10 minutes. Have students measure the length of their worm in centimeters using a ruler. Students record at least 4 observations about their earthworms in their student workbook page  **Worm Investigations**.
 4. Ask students to share their observations with the class.

-   **"Worm Investigations" (20-25 minutes):** Students observe earthworms at 3 different prepared stations, which represent 3 different environments.
 1. Divide the students into 3 groups. Each group will spend approximately 5 minutes at each prepared station before rotating to the next station. They will record their observations at each station in their student workbooks  **Worm Investigation** pages and on the  **Worm Station Cards**.

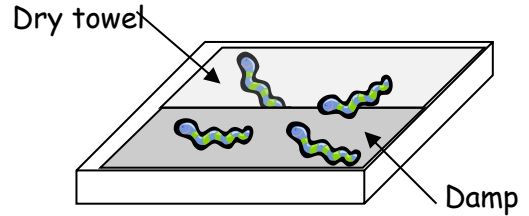
- Station 1: Light and Darkness - Students will investigate how earthworms react to light and darkness.

- Students will put their earthworm in the middle of a flat tray or pan. One half of the pan is covered with dark paper or cardboard, and the other 1/2 is open to the light.
- Students watch the worms in the pan for about 3 minutes. Students count how many worms are in the light area and how many are in the dark area. An adult supervisor at this station may act as a timekeeper.
- Record the data on the data card and in their workbooks, repeating the experiment if they have time.



- **Station 2: Damp and Dry** - Students will investigate how earthworms react to damp areas and dry areas.

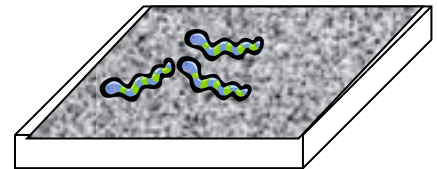
- The students will lay down 1 dry paper towel and wet another one with the water and lay it down. Ask them to wring it out so that it is still damp but not dripping wet.



Set the dry towel on 1/2 of the pan and the wet towel on the other 1/2 of the pan.

- Students place their worms in the center of the pan right where the 2 towels meet.
- Watch the worms for about 3-4 minutes, and then count how many are on the dry towel and how many are on the wet towel.
- Record their data on the data card and in their workbooks, repeating the experiment if they have time.

- **Station 3: Buried in the Dirt** - Students will time how quickly earthworms can bury themselves in soil.



- Students place an earthworm on top of the soil, and then time how long it takes the worm to bury itself completely. Give them only 3 minutes total for this station, even if the worm never buries itself completely.
- Students record data on the data card and in their workbooks, repeating the experiment if they have time.

2. After all the students have completed each station, bring the whole class back together (probably inside the classroom) to discuss what they have learned. Gather the station cards with the recorded data and use them to compare each group's observations out loud with the class.
3. Discussion: *How do worms move in the soil? Do they prefer moist or dry areas? How do they react to light and darkness? How might this help them to survive? What other adaptations do worms have to help them live in soil? How do you think earthworms change soil and break down organisms?*

- **Optional Activity (time allowing): Worm Races (10 minutes)**

1. Group students into their worm investigation station teams again. Each team chooses a name and receives a worm. Pass out 1 shoebox (or other temporary worm holding bin) for each group.

2. Ask the students to make the shoebox a comfortable place for their worms. *What will the worm need?* Have students layer some moist dirt or damp paper towels in the box. The worm stays in the box until it is ready to race.
3. Lay out 1 sheet of newspaper per group. These will be the students' (and worms) racetracks. Put a ruler or yardstick on either side of the newspaper to measure the distance the worm travels.
4. Challenge students to come up with ways to measure the worm's speed. *What are some normal ways that we can measure speed?* (Answer: miles per hour, feet per second, even inches per year) *How fast do you think worms move? How can you measure that?"*
5. With the students, make a plan for their worm racetrack. *Where on the newspaper will the worm start? How will we measure how far it travelled? What time interval should you use – that is, how long should the race be?* Note: It is probably best to structure this race in terms of how far a worm goes in 1 minute or 3 minutes rather than how long it takes a worm to travel a particular distance. Convincing a worm to aim for a particular finish line could be difficult!
6. Suggest that students use a pencil to mark the starting place and a ruler to measure distance. Each team should set their worm at the starting mark at the same time. After 3 minutes is up yell, "Time!" Have the students write down how far the worms went in their workbooks, and return them to their racing boxes. *Did any of the worms move? How did they move? Was the race a fair measure of an earthworm's speed? Why do you think the worms behaved the way they did?*
7. At the end of the lesson you can have the students place their earthworms in the garden or outside in order for them to survive in their natural habitat.

Evaluation Questions (5 minutes)

1. *How do earthworms help the garden?* (Answers: they make the soil better)
2. *How are earthworms helpful to the soil?* (Answer: they are decomposers and breakdown things in the soil to improve soil quality)
3. *What do earthworms prefer, light or darkness?* (Answer: darkness)
4. *What is the best habitat for an earthworm?* (Answer: soil that is damp and dark)
5. *How much water should you drink every day?* (Answer: at least 6 cups of water a day)
6. *How many fruits and vegetables should you eat every day?* (Answer: at least 5 fruits and vegetables a day)
7. *Does gardening connect you to your culture and help you learn new words in your language?* (Answer: yes)

Preparation for Future Lessons – Reminder for the Instructor

- Review the materials and preparation needed for the next lesson.

- Remember that an Elder guest instructor is needed for these Fall lessons: Lesson 2 (The Plant Life Cycle), Lesson 4 (Seed Saving), Lesson 6 (Drying Foods the Traditional Way) and Lesson 10 (Companion Planting and Traditional Cooking).

Notes
