



Lesson Plan: **Wonderful Worms**

How do we learn about worms?

Alignment with STEM Framework

Investigator  Conservationist 

Overview

In this lesson youth will conduct an investigation to observe movement and behavior of living worms. Youth will collect data from their observations.

Practice Goals

- Conducting an investigation that is considerate of the observed worms
- Collecting Data
- Obtaining, evaluating, and communicating information about worms movement and sensory experience

Content Goals

- Do worms have senses?

Purpose

This lesson provides youth with the opportunity to engage in experiments to add to their body of knowledge about worms and their role in the natural world. It provides youth with the opportunity to collect data, make claims and support their claims with evidence. By raising youth awareness of the sensory experience of worms this lesson intends to build empathy for worms and develop youth connection to the natural world.

Teacher Background Information

To engage thoughtfully in scientific inquiry using living creatures it is important for youth to know how to care for and handle the worms during the investigation. Worms breathe through their wet skin. During the investigation the worms should be kept moist. Any objects used to interact with or touch the worm, should be soft.



Worm movement - worms contract and relax their muscles in waves to move. When the circular muscle contracts the worm moves forward. When the long muscle contracts the circular muscles relax shifting the tail end of the worm toward the front. The worm has tiny bristles on its body to keep it from skidding by adhering the body to the surface.

Affinity Goals



I can act like an **Investigator** by conducting experiments that will help me learn about the movement of worms and their sensory experiences.



I can act like a **Conservationist** by conducting my experiment in an empathetic way and returning the worms to their habitat unharmed.



Materials

- Aluminum pan
- Spray bottle filled with water
- Plastic tweezers
- Flashlight
- Red cellophane
- Q tip
- Hand lens
- Several paper towels
- Fresh leaf from outside (youth should find before meeting)
- Pipette (dropper)
- Paper plate
- Hand shovel
- Rubber band
- Scrap of paper
- Large sheet of black construction paper

Time Needed

45 Minutes

Instructional Sequence

Facilitator will:

- Ask youth to think about and discuss the following questions:
 - How do they move?
 - Can worms feel?
 - Do worms need friends?
 - Do worms need water?
 - What is the average length of a worm?
 - Are worms sensitive to light?

Youth will:

- Write questions down in their notebooks one per page to leave room for observations.

Facilitator will:

- Explain to youth how important it is to keep the worms moist
 - Youth will lightly spray the bottom of the aluminum pan with water.
 - Youth will place a paper towel at the bottom of the pan and spray it so it is damp but not wet.
 - Youth will spray paper towel and worm throughout investigations if they begin to dry

III. The Investigations

How do worms move?

Youth will:

- Gently move 1 worm from the vermiculture compost to the paper towel lined aluminum pan. Youth may use a mini hand shovel to do this, gently use their fingers or the plastic tweezer being careful not to squeeze too hard.
- Using the Q-Tip, gently touch the worm. Youth will notice the worm move both forwards and backwards.
- Record their observations. Can worms feel?
 - Using the leaf collected from outside, Youth will gently brush the leaf along the worm's body.
 - Youth will record what the worm did. Did the worm respond? What does this tell you? Is it the same response as the Qtip? How do the youth answer the question?

Do worms need water?

Youth will:

- Place a scrap of paper near the worm.
- Fill the pipette with water. Place a large water drop on the paper.
- Cover the pan with the black construction paper so that it is a darker environment for the worm.
- Lift a corner of the paper to peek in and observe the worms.
- Observe the worm moving to the water.
- Record their observations in their notebooks.

Do worms need friends?

Youth will:

- Gently place a second worm in the aluminum pan away from the original one.
- Cover the pan with the black construction paper.
- Lifting a corner youth will observe what the worms do.
- Discuss with each other why they think the worms responded that way.
- Record their observations and thoughts in their notebooks.

What is the average length of a worm?

Youth will:

- Gently straighten out one of the worms and using their ruler, measure it.
- Record the measurement.
- Straighten out and measure the second worm, recording the measurement.
- Gently add a third worm, measuring and recording it's length.
- Repeat with a fourth worm.
- Average the measurements of all their worm lengths. Note: the more worms the more accurate the average.

Are worms sensitive to light?**Youth will:**

- Cover the flashlight with red cellophane using the rubber band.
- Place black construction paper over the top of the aluminum pan.
- Shine the covered flashlight on a worm. Nocturnal creatures are not sensitive to the red end of the light spectrum. The worm will probably not react.
- Remove the red cellophane from the flashlight and shine it on the same worm again. The worm can be expected to turn away.
- Write their observations down in their journal.
- Repeat this investigation with two or three more worms. Recording their observations.

Facilitator will:

- Instruct youth to gently return the worms to the vermiculture compost bin.
- Instruct youth to save aluminum pan for next week.
- Remind youth to continue to care for and observe the vermiculture compost.
- Remind youth to continue monitoring their sunflower seeds.