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# K-12 Partnership Lesson Plan

# Brook Wilke

# *Rainy Day Habitat Lesson*

## Overview

It is important that students learn the different components of habitats and the consequences of removing one or more of those components. This activity can allow empirical study of habitats in the classroom when weather conditions are unfavorable outdoors. This experiment gives earthworms a choice of two habitats and identifies which habitat they prefer. Students will learn that earthworms prefer habitats with high organic matter. Results from this study can then be used to predict where worms prefer to live in the schoolyard or across a landscape.

**Objectives**

At the conclusion of the lesson, students will be able to:

* Identify the habitats of familiar organisms and their needs for survival
* Conduct an experiment to identify preferred habitats of earthworms

**Length of Lesson**

Two 30 minute sections

**Grade Levels**

Elementary

**Standards covered (NGSS)**

Disciplinary Core Ideas:

 *Elementary School*

* **K-LS1-1**: use observations to describe patterns of what plants and animals (including humans) need to survive
* **K-ESS3-1**: use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live

Cross Cutting Concepts:

* Patterns
* Energy and Matter in Systems

Science and Engineering Practices

* Asking questions and defining problems
* Planning and carrying out investigations
* Engaging in argument from evidence

***Previous Michigan Standards Met:***

* **III.4.e2\* (LE 2.1\*)**: describe how the behavior of organisms is related to hunger and changes in the environment
* **III.5.e1 (LEC 1):** identify familiar organisms as part of a food chain or food web and describe the feeding relationships within the web
* **I.1.e2 (C2):** develop solutions to problems through reasoning, observation, and investigations
* **II.1.e4 (R 4):** develop an awareness of and sensitivity to the natural world

**Materials**

* Plastic container with large removable lid, at least 1 gallon
* 50-200 redworms
* Moist soil or sand that is low in organic matter content
* Plant material

**Background**

### *Strategy:* *inquiry cycles*: finding and explaining patterns in data (arguments from evidence); *Experimental inquiry*: predict-explain-observe-explain (POE)

###  *Observations, patterns, and explanations*

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| --- | --- | --- |
|  Observations or experiences (examples, phenomena, data) | Patterns (laws, generalizations, graphs, tables, categories) | Explanations (models, theories) |
| Earthworms are given a choice between soil with little to no organic matter and soil with high amounts of organic matter. Worms will choose to move towards the side with high organic matter. | Numbers of earthworms will be counted on each side of the plastic container and displayed in a table or graph. | The organic matter in the soil is part of the earthworm’s habitat and is needed for survival |
| Application: Model-based Reasoning |
| Inquiry: Finding and Explaining Patterns in Experience |

###  *Introduction/Anticipatory Set*

### Students will be prompted to think about an earthworm’s habitat and draw a picture of an earthworm in its habitat.

### Activities of the session

1. Students will think about the habitat of an earthworm and draw a picture of an earthworm in its habitat.
2. During this, the teacher will be setting up the plastic container with soil in it, which will be divided into two sides.
3. After drawing pictures, students will be asked what earthworms require to survive. Ideas will be listed on the board by the teacher.
4. The teacher will then add plant material (leaves, apple cores, watermelon, coffee grinds, etc.) to one half of the soil in the plastic container and mix around, making sure to keep the plant materials on one side of the container. Students may be asked to bring in plant food waste to use as the plant material.
5. Students will be asked to predict which side of the container the worms will move towards if they are dropped in the middle.
6. Each student will grab five worms from a pile and drop them into the middle of the plastic container.
7. A lid will be put on the plastic container and it will be placed in the dark.
8. The container will be allowed to sit idle for at least one day.
9. The two sides of the container will be emptied separately. Students will count the number of worms that are present in each half of the soil.
10. A graph or table should be made to compare results

**Conclusion**

* Students will help to place soil back into the plastic container
* As a group, go over results of the experiment. Where did the worms like to go? Why did they like to go there? Was the plant material part of the worm’s food, shelter, space, or water?
* Make sure the students understand that the worms prefer a habitat with dead plant material in it. Talk about how land that is barren like crop fields in the winter might not have many worms because the habitat is not very good.

**Extensions and Modifications**

* Make sure every student participates by adding worms to the container. Call on students who seem to be uninterested
* Have each student or group of students conduct the experiment on a small scale
* Go out into the schoolyard into different habitats and dig up some soil in certain areas. Identify areas where worms are more abundant, and areas where they are less abundant.

**Assessment**

An appropriate assessment for this experiment would be a short worksheet where the student answers specific questions about the experiment, what the results were, what a worm’s habitat is, etc.

**Post-lesson Comments and Reflection**

*12.11.06*

*This lesson was perhaps the most successful of the entire semester. The second graders loved having the worms in the classroom and learning about their habitat.*

*The worms “cooperated” during the experiment as about 70% of the worms migrated towards the side of the container with food waste and 30% migrated toward the side without food waste.*

*Students also learned a lot about what worms need to survive, most importantly that they did not just eat soil, but required organic matter to survive.*