

# Making a Mini Worm Habitat

## Summary

This activity, making a mini-worm habitat, will allow the students to understand the process of converting organic waste into usable fertilizer. Students will observe how living and nonliving things interact with one another.

## Materials

- *Diary of a Worm*
- [Inchworm Cutouts](#) pdf
- [K-W-L About Earthworms](#) pdf
- [Comparing Temperatures](#) pdf
- [Inchworms and Fraction Rulers](#) pdf
- 3-4 quart clear container
- Gravel
- Soil or Organic All Purpose Potting Soil
- Coarse sand
- Newspaper
- Earthworms 12-25
- Organic matter
- Cheesecloth
- Rubber band
- Black paper/plastic
- Tape
- Spray bottle
- Measuring tape
- Science journal
- Magnifying glass
- Metric scale - optional
- Thermometers - optional

## Additional Resources

- Into the Forest, (food chain card game) - 2-6 players, age 7 and up. Ampersand Press 1-800-624-4263.
- Onto the desert, (game of survival) - 2-6 players, age 7 and up. Ampersand Press 1-800-624-4263
- Predator, - 2-6 players, age 7 and up. Ampersand Press 1-800-624-4263

## Books

- *How to Eat Fried Worms*  
, by Thomas Rockwell ISBN 0440445450
- *Interesting Invertebrates*  
, by Elaine Landau ISBN 0-531-20036-1 Worms, by Jill Bailey ISBN 157572665-3
- *I Wonder What It's Like to Be an Earthworm*  
, by Erin M. Hovanec ISBN 0-8239-5454-4
- *Diary of a Worm*  
, by Doreen Cronin and Harry Bliss ISBN 006000150X
- *The Important Book*  
, by Margaret Wise Brown ISBN 0-06-443227-0

- *Worms Eat Our Garbage: Classroom Activities for a Better Environment*  
by Mary Applehof, Mary F. Fenton, & Barbara L. Harris ISBN 0-942256-05-0
- *The Worm Cafe: Mid-scale Vermicomposting of Lunchroom Wastes*  
by Binet Payne ISBN 0-942256-11-5

#### Media

- *How to Eat Fried Worms*  
, by Thomas Rockwell; New Line Cinema: Distributors; Item #42231

#### Background for Teachers

There are around 4,400 species of worms on Earth and 2,700 different kinds of earthworms. Earthworms are incredibly useful to our environment. Without the aid of earthworms, every living thing that dies would just keep piling up and we would be trying to push through it. Talk about a recycling problem! Earthworms eat soil and the organic material in it, such as insect parts and bacteria (e-coli). They aerate the soil, mix the top rotting materials with the ground below, and enrich the soil with their worm castings or worm "poop". They can be so tiny that you can barely see them. Their size ranges from less than an inch to over 22 inches long and some can live as long as 15 years!

Earthworms (often called night crawlers or fish worms) are invertebrates (without a backbone). They have no ears, eyes, teeth, or legs, but have a small brain and five hearts. Earthworms can grow new body parts if they get hurt. Many earthworms can regenerate almost half of their body's length.

Earthworms like other living things cannot live without food, water, shelter, and space. Earthworms rely on sensory devices near their mouths and sensory receptors in their skin to detect light and feel vibration. Earthworms have two layers of muscles in each segment the outer one is circular and the inner one is longitudinal. They have four pairs of setae "see-tee" or hairy bristles like legs on each of their segments except the first and last.

Earthworms are hermaphrodites ("her-Ma-fre-daits"), which means they have both male and female reproductive organs. When two earthworms huddle together with their heads pointing in different directions, they fertilize each other's eggs. The clitellum (saddle) secretes a cocoon to protect their fertilized eggs. Later on, they lay the egg case in the soil and leave it unattended. The hatching time can vary anywhere from one to five months--depending on environmental conditions--but on an average, earthworm eggs hatch within six to eight weeks. Earthworms can eat the equivalent of their own body weight daily.

Observations indicate that earthworms enjoy eating oatmeal, old bread, vegetable scraps, leftovers, shredded newspaper, grass, mulched leaves, ripe fruits, etc. Things they try to avoid include acidic and spicy foods, salt, and vinegar products.

This activity, making a mini-worm habitat, will allow the students to understand the process of converting organic waste into usable fertilizer. Students will observe how living and nonliving things interact with one another.

#### Intended Learning Outcomes

##### Science

1. Use science process and thinking skills
2. Manifest science interests and attitudes
6. Understand the nature of science

##### Math

5. Connect mathematical ideas within mathematics, to other disciplines, and to everyday experiences.
6. Represent mathematical ideas in a variety of ways

#### Instructional Procedures

## Invitation to Learn

Read *Diary of a Worm* to the students.

Ask the students to write in their journals- KWL (What they know about worms, want to know about worms and later write what they have learned.)

Ask students to raise their hands to share what they know about worms. The instructor may want to jot them on the board so they don't repeat something said previously, even writing down incorrect facts.

Review what living and nonliving things are and have the students give examples.

Discuss how worms interact with living and nonliving things.

Ask the students how earthworms affect our living conditions, or what they think earthworms do.

Ask them if they feel earthworms help or hurt our environment.

## Instructional Procedures

Please keep in mind that when making your mini-worm habitat, you should keep it for three to four weeks to give the class enough time to observe the changes that go on. Students will enjoy this opportunity to assist you in measuring with this hands-on activity. You may want to make two identical habitats a control group.

Begin by covering the bottom of container with gravel in a nice even layer (about 1 cup).

Cover gravel with 4 cups of soil (do not pack down soil).

Add 2 cups of course sand and again lightly smooth it out.

Add 3 more cups of soil on top of the course sand (again making a nice layer look). Then spray a mist of water to moisten the soil.

Measure and cut a piece of 12" x 22" newspaper. Now, tear the newspaper in strips, then saturate with water, and wring out so that the newspaper is moist (not dripping.)

Next, break more pieces of the wet newspaper and separate by placing the pieces around the inside of container uniformly.

Add 1/2 more cup of soil (give it a little moisture).

Optional - You may want to have students measure the worms for fun and use *Worm Rulers*.

You also may want to weigh the worms and divide that in half to determine how much organic food your worms will enjoy feasting on.

Now, place a little organic matter (e.g., about two 1/4" slices of ripened banana or other ripened fruit will do) in the worm mini habitat. Place the food on the side of the container, pushing in the soil just enough to cover the top of the food with soil. \* Don't worry too much about accuracy right now, because the worms have newspaper to eat and that weighs approximately what they do.

Add your worms and watch them go. (Observe how they avoid the light.)

After observing the worms, ask students to draw their new worm habitat with the different layers. Have students draw the worms and organic matter too! Then have them write in their journals or use *The KWL About Earthworms worksheet*.

Wrap cheesecloth around the top of the container. Place a rubber band around to hold it in place.

Have students measure the width and length of the container with a measuring tape. Students will then measure and cut black paper to fit, making sure that they have a little extra to overlap and tape together. Optional - Use Worm Rulers, to measure width and length.

Then, place the worm habitat in a dark place and observe daily (preferably at the same time).

Have students note any changes and inferences in their journals.

## Extensions

Have students keep a journal to write any additional knowledge they have gleaned from magazines, books, websites, etc.

Have students measure several of the earthworms using inches, centimeters, and fraction rulers, Worm Rulers.

Have students use *Inchworm Cut Outs* to make mathematical Arrays. (e.g., 2 x 5, 2 boxes down and 5 across or 5 x 2, 5 boxes down and 2 across.) Students can do all kinds of math problems using these inchworms.

Have students observe and measure the temperature of the room next to the worm habitat (preferably at the time as they take off the black paper every day), and check the temperature of the worm habitat by simply placing a thermometer (slowly and carefully) in the middle of the container. Then the students can record these two temperatures daily using the *Comparing Temperatures worksheet* and note any changes in their journal.

Have students make two identical worm habitats and use one habitat as a control group. (The students will place worms in one container and none the other.) When you do a control group, you just place the same amount of food in both containers and observe what happens.

Students can research more about worms or how to make a worm bin (see website on next page).

Students can check out other animals that interest them and write or give an oral report.

#### Family Connections

Read, *How To Eat Fried Worms*, by Thomas Rockwell with your family.

Have your family see the movie, *How To Eat Fried Worms*.

Have your family build a worm bin and recycle their leftovers.

#### Assessment Plan

Check each student's journal or *KWL About Earthworms* to see what they have learned.

Check earthworm activity worksheets for understanding.

Look for student's self-reflection upon their predictions and observations.

Have each student write a revision of what they observed in their journal, checking for science vocabulary terms, etc.

Check students understanding of measurement with *The Inchworm Cutouts worksheet*,

- *Comparing Temperature and Worm Rulers*

#### Bibliography

##### Research Basis

Bransford, J.D., Brown, A.L., & Cocking, R.R., (Eds.) (1999). *How People Learn; mind, experience, and school*. Washington, DC: National Academy Press.

The authors explored the methodologies and barriers in motivating young learners to enjoy and participate in classroom science research and learning. They concluded that a standard-based curriculum provides information on what students should learn concluding that teachers make the curriculum accessible to students through their choice of instructional materials, lessons, homework, and types of assessment.

Loucks, S.H., Hewson, P.W., Love, N., & Stiles, K. (Eds.) (1998). *Designing Professional Development for Teachers of Science and Mathematics*. Thousand Oaks, CA; Corwin Press.

In this study the authors identified three components of effective professional development that nurture continuous improvement; context, process, and content. Professional development requires careful planning with the needs of teachers being an integral part of the process.

#### Authors

[Utah LessonPlans](#)