

Wiggling Worms

Description

Learners keep careful records in journals as they ask questions about earthworms, observe their adaptations, conduct simple experiments, and explore ways that earthworms help the Earth.

Suggested Grade Levels: 2–4

Lesson Objectives Connecting to the Standards

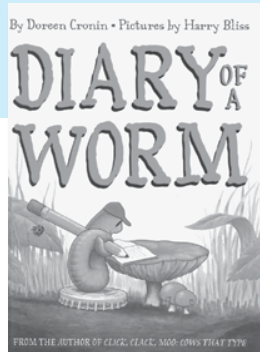
Content Standard A: Science as Inquiry

- Ask a question about objects, organisms, and events in the environment.
- Design and conduct simple experiments to answer questions.
- Use data to construct reasonable explanations.

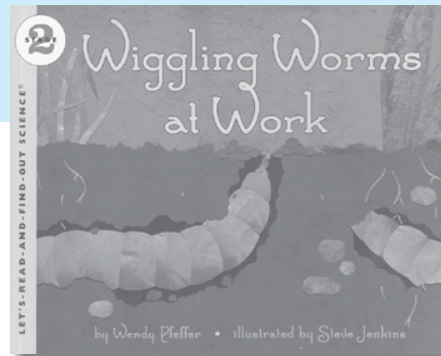
Content Standard C: Life Sciences

- Understand that each plant or animal has different structures that serve different functions in growth, survival, and reproduction.
- Understand that organisms cause changes to their environments. Some of these changes are detrimental, and some are beneficial.

Featured Picture Books



Title *Diary of a Worm*
Author Doreen Cronin
Illustrator Harry Bliss
Publisher HarperCollins
Year 2003
Genre Story
Summary A young worm writes a hilarious journal about his daily adventures.



Title *Wiggling Worms at Work*
Author Wendy Pfeffer
Illustrator Steve Jenkins
Publisher HarperCollins
Year 2003
Genre Non-narrative Information
Summary Explains how earthworms eat, move, and reproduce and how they help plants grow.

Time Needed

This lesson will take several class periods. Suggested scheduling is as follows:

Day 1: **Engage** with *Diary of a Worm* read aloud and Worm Wonderings.

Day 2: **Explore/Explain** with Earthworm Observations.

Day 3: **Explore/Explain** with Damp or Dry? Experiment and A Day in the Life of an Earthworm.

Day 4: **Explain** with *Wiggling Worms at Work* read aloud.

Day 5 and beyond: **Elaborate** with How Do Worms Help the Earth?

Day 6 and beyond: **Evaluate** with Save the Worms Posters and optional Wiggling Worms quiz.

Materials

Per class:

Prepared worm bin with a ventilated lid and sides covered by black paper (see background for suggestions)

Worms (night crawlers or red wigglers—see safety box)

Per pair for Earthworm Observations:

Night crawler or other large earthworm

Paper plate

Paper towel

Hand lens

Metric ruler

Per group or class for Damp or Dry? Experiment:

4 earthworms

“Experimental chamber” made of a plastic shoebox with a lid and paper covering the sides, or a cardboard shoebox and lid

Wet paper towel and dry paper towel

Per group or class for How Do Worms Help the Earth?

2 flowerpots

Soil from a yard

Castings from outside a worm’s tunnel

Seeds (pumpkin, watermelon, grass seeds, lima beans, or other similar seed)

Per student or group for Save the Worms Posters:

Poster board

Markers

SAFETY

The worms should come from a commercial source that can guarantee they have been raised in a safe, nonchemical soil or medium. Students should wash their hands with soap and water after handling earthworms. Students who have cuts or hangnails or who are immune compromised should use gloves for this activity.

Also take care that the worms do not become dehydrated, are not too hot or cold, and are not handled roughly. Remind students that all living things should be handled gently.

Student Pages

My Worm Journal (Copy the cover on one sheet; copy pp. 2 and 3 back-to-back with 4 and 1. Fold and staple along spine.)

How Do Worms Help the Earth? (Make one-sided copies as students will be cutting out the cards.)

Save the Worms Poster Rubric

Wiggling Worms Quiz (optional)

Background

According to the National Science Education Standards, elementary students should build understanding of biological concepts through direct experience with living things. Earthworms are an ideal animal for this type of exploration. They are fascinating, easy to find, and fairly easy to care for. Earthworms are *annelids*, a phylum of animals that have joined, segmented body parts. There are thousands of different species of earthworms. Night crawlers are very large earthworms that eat soil and plant material. They are not the same as red worms, which are used for composting.

Earthworms literally eat their way through the earth. As they eat, they form *tunnels* that help aerate the soil and increase the rate of water movement into it. They also crawl above ground occasionally, pulling dead leaves and bits of plants back down with them. Earthworms leave behind droppings (known as *castings*) that make excellent fertilizer. A pile of worm castings located outside an earthworm's burrow is known as a *midden*. Soil is greatly enriched by the actions of earthworms.

Students can observe the external anatomy of the earthworm with the naked eye or a hand lens. Earthworms have many *adaptations* (body parts or behaviors that help an animal meet its needs) that enable them to lead a burrowing life. Students can observe and attempt to count the many *segments* that make up the long, tubelike body (night crawlers have about 150 segments). Each segment has eight small *bristles* that worms use to grip the ground as they move. If you place an earthworm on your arm, you can actually feel its bristles stick to your skin as it stretches and moves. Earthworms have both a *head* and a *tail*. The earthworm's head is closest to its thickened end, called the *saddle* (or *clitellum*). It usually crawls headfirst. The covering of its *mouth* serves as a wedge to force open cracks in the soil. A worm lacks teeth, so, when it swallows soil and organic material, that is passed to a storage area known as the *crop* and then ground up in the muscular *gizzard*. The food is then passed through the rest of its digestive system to the *anus*, where the castings are released back into the soil. Worms have no lungs. Gases are exchanged directly through the skin, which must be moist. That's why earthworms avoid dry ground, sun, and extreme heat. Worms lack eyes, ears, and noses, but do have taste and light receptors. They can also sense vibrations, which helps them hide when predators approach.

You can make a simple classroom worm bin using a clear plastic storage container, large glass jar, or small aquarium. It should be something that has a secure ventilated lid or cover to let air circulate but prevent the worms from climbing out. Fill it with garden or potting soil. Add a little sand or peat to make the soil less subject to packing and easier for the worms to get around in. Cover the sides with black paper to simulate underground conditions, and keep the habitat in a cool place out of direct sunlight. This will keep the worms from overheating or retreating to the darker parts of the habitat. You can peel the paper back temporarily so students can observe the worms and tunnels. Put a layer of shredded and moistened dead leaves or newspaper on top of the soil. There should be enough organic matter in the soil for the worms to eat for a couple of weeks. Add small amounts of aged tap water as necessary, but don't let it get soggy.

If you want to keep the earthworms for more than a few weeks, stir in more organic matter, such as shredded dead leaves or fruit and vegetable scraps. If you want to keep a permanent worm habitat in your classroom, use red worms (also called red wigglers, manure worms, or fish worms) rather than night crawlers. They are much better adapted to living in worm bins. You can buy commercially made worm bins for around \$40 to \$100.

Engage

Diary of a Worm Read Aloud and Worm Wonderings

Making Connections: Text to Self

Ask students,

- ? Have you ever kept a diary or journal?
- ? What are some things that people include in diaries and journals? (Answers might include: dates, things they did, their ideas, pictures, and drawings.)

Then tell students that you have a very unusual diary to share with them. Show the cover of *Diary of a Worm* and introduce the author and illustrator. Read the book aloud to the class.

QtA (Questioning the Author)

“Questioning the author” (QtA) is an interactive strategy that helps students comprehend what they are reading. When students read in a QtA lesson, they learn to question the ideas presented in the text while they are reading, making them critical thinkers, not just readers. This strategy can be very effective in the science classroom as a way to keep students from acquiring misconceptions from the text or illustrations in a picture book or textbook. After reading *Diary of a Worm*, turn back to some of the dates in the diary and model the QtA strategy.

Say, “I know that Doreen Cronin meant *Diary of a Worm* to be a funny, imaginary story. I realize that worms can’t talk or write, and they certainly don’t wear clothes! But in the book the author wrote some things about worms that did make me wonder. There were some pictures in the book that I wondered about as well. I wrote down some of these questions, or wonderings that I would like to ask the author.” Then share the following questions with the students. You can demonstrate how to interact with the text by placing sticky notes on the corresponding pages with these questions (or

just large question marks) on them.

“March 20: When we dig tunnels, we help take care of the earth.”

- ? The worm in this picture is digging a tunnel. Do worms really make tunnels? Do they push with their heads like the worm in the picture is doing?

“March 20: Never bother Daddy when he’s eating the newspaper.”

- ? The worm’s “Daddy” has teeth. Do worms have teeth?

“March 29: Today I tried to teach Spider how to dig.”

- ? It looks like the worm in this picture is crawling into the ground. On the next page the worm is crawling above the ground. Can worms crawl above ground?

- ? The illustrator, Harry Bliss, draws all of the worms in this book with eyes and noses. Do worms have eyes and noses?

“April 10: It rained all night and the ground was soaked. We spent the entire day on the sidewalk.”

- ? I see the sun in this picture. Do worms like to be in the sun? Do worms prefer dry places or damp places?

“June 15: My older sister thinks she’s so pretty. I told her that no matter how much time she spends looking in the mirror, her face will always look just like her rear end.”

- ? Is this accurate—a worm’s head and tail look just alike? Can you tell a worm’s head from its tail?

Next, explain that scientists are always asking questions and making observations about the world around them. Scientists who study animals are called *zoologists*. Tell students that they are going to make some observations, read a nonfiction book, and even do an experiment the way a zoologist would in order to find the answers to these worm wonderings. Give students a worm journal for each, and have them write their names and the date on the cover. Next, read the “Worm

Wonderings” on page 1 of the journal together. Have students make predictions by writing “yes” or “no” for each question, and then turn and talk to a partner about why they made each prediction. (All of these questions will be answered at various points in this lesson through observation, experimentation, or by reading a nonfiction book.)

Then have students brainstorm and share some of their own wonderings about earthworms. They should write their questions on the last two rows of the chart. (If their own questions are not answered by the end of the lesson, encourage them to do further research on their own). These journals and questions will serve to guide the rest of the activities in this lesson.

Explore/Explain

Earthworm Observations

In advance, prepare a worm bin in a clear plastic container with a ventilated lid. Cover the sides with black paper and keep in a cool, dark place until you begin this activity. Then bring out the worm bin and peel back the paper on the sides to expose the earthworm’s tunnels. Allow students to observe the tunnels. Describe how you set up and maintain a worm bin. Then have them turn to page 1 of their journals and fill in their learnings for the first question:

- 1 Do worms make tunnels? (yes)

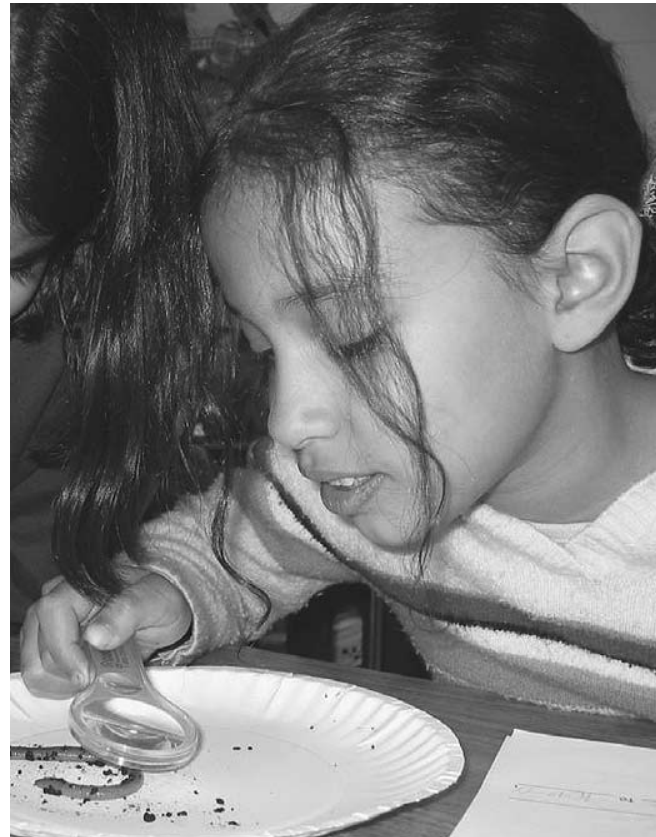
Then explain that students will be getting up close and personal with some live earthworms in order to collect *data*. Data is information. Data collected by a zoologist might be in the form of measurements, labeled scientific drawings, or observations of an animal’s habitat, body covering, body parts, or behaviors. Discuss that good zoologists always record the data they collect about the animals they are observing. Their data can help them explain what they are observing about the animals.

Before students begin collecting their earth-

worm data, remind them that **all living things should be treated humanely**, including earthworms. Students should handle the earthworms with care and respect and then return them to the safety of the worm bin.

Give each pair of students an earthworm on a paper plate. Instruct them not to touch or handle the worms until they get to journal question #4, because the worms can dry out if handled too much. Have them use hand lenses to make some initial observations for question #1 and then draw and color their earthworm in the box provided on page 2 of the journals. After reading question #2, they can identify and label the head, tail, and saddle.

After reading question #3, they should carefully count as many segments as they can and then circle an estimate (10, 20, 30, 40, 50, or more than 50).



Observing an earthworm



Feeling the bristles



Measuring an earthworm

Night crawlers generally have about 150 segments, so it will be difficult to count them all. It should be sufficient for students to estimate that there are over 50 segments on an earthworm. Before students complete questions #4 through #6, review humane treatment of the earthworms. In #4, they observe a worm's response to touch. In #5, they learn about the bristles of the earthworm, which act like tiny legs to help the earthworm grip and pull itself forward. If they gently place the earthworm on their arm, they may be able to feel the scratchy bristles as the earthworm moves on their skin.

For journal question #6, explain how to measure the length of an earthworm humanely: Supervise as one student holds both ends of the worm and GENTLY stretches it to full length on the paper plate while another student measures in centimeters. **Students should be extremely cautious when they are stretching the worms out to measure their length. Earthworms can break!** Next, have them measure their worms' width and also describe how the worm feels.

Have students compare their observations to others and discuss any differences they find. Then refer to the Worm Wonderings on page 1 in the worm journal and ask students which questions they can now answer after observing the earthworms. Students should be able to answer the following questions:

- 3 Can worms crawl above ground? (Yes—they can crawl on a paper plate.)
- 4 Do worms have eyes and noses? (Not that we could see with a hand lens.)
- 6 Can you tell a worm's head from its tail? (Yes—the head is closest to the thickened part, called the saddle.)

Next, write the word *adaptation* on the board and discuss that an adaptation is a body part or behavior that helps an animal meet its needs. Ask

- ? What is an earthworm adapted for? (Answers might include: burrowing through, living in, and eating soil)
- ? What adaptations can you see that might help the worm live in soil? (It has segments

to help it bend and move through soil, it can move by grabbing on to the plate and pulling its body forward with its tiny bristles, it is slimy, which might help it move through the soil, it doesn't have eyes because it lives in the dark, it moves away when you touch it, which would help it get away from predators might be among the answers.)

Explore/Explain

Damp or Dry? Experiment and A Day in the Life of an Earthworm

Discuss that scientists can't answer all of their questions by observation and measurement alone. Often they need to design experiments to answer questions, such as question #5 on page 1 of the journal, *Do worms prefer damp or dry places?* Tell students that you have prepared an experimental chamber for investigating earthworms. Show them a shoebox with a lid (either a plastic shoebox with the sides covered or a cardboard shoebox). Ask them to think about how you could **humanely** test whether earthworms prefer damp or dry places using the experimental chamber and two earthworms. Then have them turn to page 3 of their worm journals and read the prediction, "I think the earthworms will move to the damp/dry paper towel (circle one)."

Explain that scientists often begin their experiments by making a *prediction*, which is a guess based on what they already know. Ask students to think about what they already know about earthworms and their behaviors before making a prediction. Then have students circle their prediction (damp or dry). You can do the following experiment as a class demonstration. Or you can prepare several experimental chambers and have students work in groups. Next, place a wet paper towel on one side of the chamber and a dry paper



Visualizing life as a worm

towel on the other, with the paper towels about 1 cm apart. Place two earthworms in the space between the paper towels, and close the lid. Wait 10 minutes.



Visualizing

While you are waiting, have students turn to A Day in the Life of an Earthworm on page 4 of their journals. Tell them that they are going to pretend to be a real live earthworm. Not an earthworm that can talk, write a diary, and wear clothes, but an earthworm they might find in a shovelful of dirt in their back yard. Have students close their eyes and visualize what life would be like. What adaptations do they have for living underground? What things do they do that help the soil and the earth? What dangers would they face? What would a day in their life be like? Have them open their eyes, discuss with a neighbor, and then begin writing a realistic story about a real earthworm.

After 10 minutes, remove the cover of the experimental chamber and observe the location of

the worms. Have students record the results using a check mark for each worm. Put the worms back in their container, and repeat the experiment using two “fresh” worms. Then have students write a conclusion with evidence based on their data, such as, “When given a choice, worms move to a damp paper towel more often than a dry paper towel.” Have students discuss possible reasons. Then have students record their answer to the following question on the Worm Wonderings page of their journal:

- 5** Do worms prefer damp or dry places? (Worms prefer damp places.)

If you choose to perform this experiment in groups, have students compare their results to others and discuss possible reasons for differences in their data.

Explain

Wiggling Worms at Work Read Aloud

Have students go back to the “Worm Wonderings” on page 1 of their worm journals. Ask

- ?** Were there any wonderings that you couldn’t answer completely by observing and measuring earthworms and doing the Damp or Dry? experiment? (Yes—question number 2. We couldn’t see if worms have teeth. Students may still have some unanswered questions of their own.)



Determining Importance

Tell students that scientists can’t always find out everything they want to know by making observations or doing experiments. They often research using nonfiction books and scientific articles to find the answers to their questions. Sometimes they also look to these sources to see how the results of their experiments compare to what is already known. Explain that you have a nonfiction book called *Wiggling Worms at Work* by Wendy Pfeffer that might help them answer the question about teeth, and clear up some of their own wonderings. They

can also compare what they have observed to what is known about worms by reading this book. The author worked closely with several scientists when she wrote the book to make sure that it contained accurate information about earthworms.

Have students listen carefully for the answers to the “Worm Wonderings” in their journals as you read pages 1–17 aloud (you may want to skip the rest of the book, which is about the earthworm life cycle, as it is not necessary for this lesson). Have students signal by raising their hands or touching their noses when they hear an answer or a verification of a learning. Stop when each question is answered, discuss briefly, and then allow students time to add to the “I leaned” column of their journals. The answers to the worm wonderings can be found on the following pages:

- 1** Do worms make tunnels? (Page 6—They push aside loose soil and this creates tunnels. Page 8—Worms tunnel in hard-packed soil by swallowing it.)
- 2** Do worms have teeth? (Page 10—Worms do not have teeth. They grind the soil in their gizzards.)
- 3** Can worms crawl above ground? (Page 12—Sometimes worms crawl above ground.)
- 4** Do worms have eyes and noses? (Page 17—Worms have no eyes, no noses, no ears, and hardly any brain at all.)
- 5** Do worms prefer damp or dry places? (Page 17—Worms must live in damp soil since they breathe air through their moist skin. In the hot sun their skins dry up and they can’t breathe.)
- 6** Can you tell a worm’s head from its tail? (Not found in the book.)

After reading, discuss how the information found in the book compared to the students’ predictions and observations. Also discuss if any of the students’ own wonderings were answered by the book.

Elaborate

How Do Worms Help the Earth?



Rereading

Reread the last page of *Diary of a Worm*:

“August 1: The earth never forgets we’re here.”

Then ask

- ❓ What does the author mean by this? How do worms help the earth?

Next, follow the directions on page 33 of *Wiggling Worms at Work* for setting up the experiment called “Do Earthworms Really Help the Soil?” This can be done at school or as a home project. Students will make long-term observations of two plants to answer the question, “Which plant will grow bigger and better: one planted in regular soil or one planted in soil enriched with worm castings?” Brainstorm a list of controlled variables (things to keep the same to make sure the experiment is fair), such as

- same type of plant,
- same sized plant,
- same sized pot,
- same amount of water,
- same temperature, and
- same amount of light.

Then set up the experiment, and determine how data will be collected (measuring the height of the plants, comparing the number of leaves, and so on). Students can record their data and observations on the back cover of their journals. The plant in the casting-enriched soil should grow bigger and better, if so, students can infer that earthworms really do help the soil.



Cloze Paragraph/Rereading

Next, pass out the How Do Worms Help the Earth? student page. Directions for students are

as follows:

- 1 Cut out the cards in the boxes below.
- 2 Read the cloze paragraph, and lay the cards where you think they belong on the blanks.
- 3 Listen carefully while your teacher reads pages 5–13 of *Wiggling Worms at Work*.
- 4 Move the cards around if necessary, and glue or tape them on the page.
- 5 On the back, draw a picture that shows an earthworm helping the earth!

The paragraph should read:

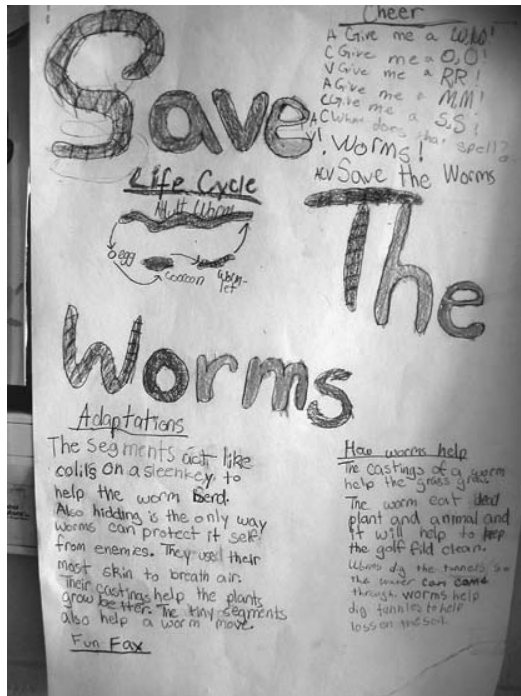
Worms loosen the *soil* as they wiggle along. As worms twist and turn, they create *tunnels*. *Air* flows along these tunnels. *Rainwater* trickles down. Moist ground helps plants grow better. Worms *digest* leaf and plant bits. What’s left passes through a worm’s body and comes out its tail end in the form of worm *castings*. They make good plant food. Worms help new *plants* begin to grow.

Evaluate

Save the Worms Poster and Wiggling Worms Quiz

Tell students that their study of earthworms can help save the worms! Pretend that there is a debate going on concerning a local golf course. The golf course has been overrun with moles who are digging up the grass in search of their favorite food source: earthworms. The groundskeeper, Mr. Spackler, wants to spray pesticides on the ground to kill the earthworms. He thinks that killing their food source will make the moles go away. He also thinks that earthworms are disgusting, worthless creatures, and doesn’t want them on his golf course.

Pass out the Save the Worms Poster grading rubric. Tell students that their assignment is to create a poster to convince Mr. Spackler that killing the earthworms is a bad idea. Their posters should promote earthworms as fascinating, useful



Sample "Save the Worms" poster

animals that can actually help the grass on the golf course grow better. Have students or groups of students create their "Save the Worms" posters using the information from their worm journals. They may want to do more research on the internet or through nonfiction reading in order to support their arguments (see Websites and More Books to Read). Posters should include

4 Points: Descriptions of four different earthworm adaptations

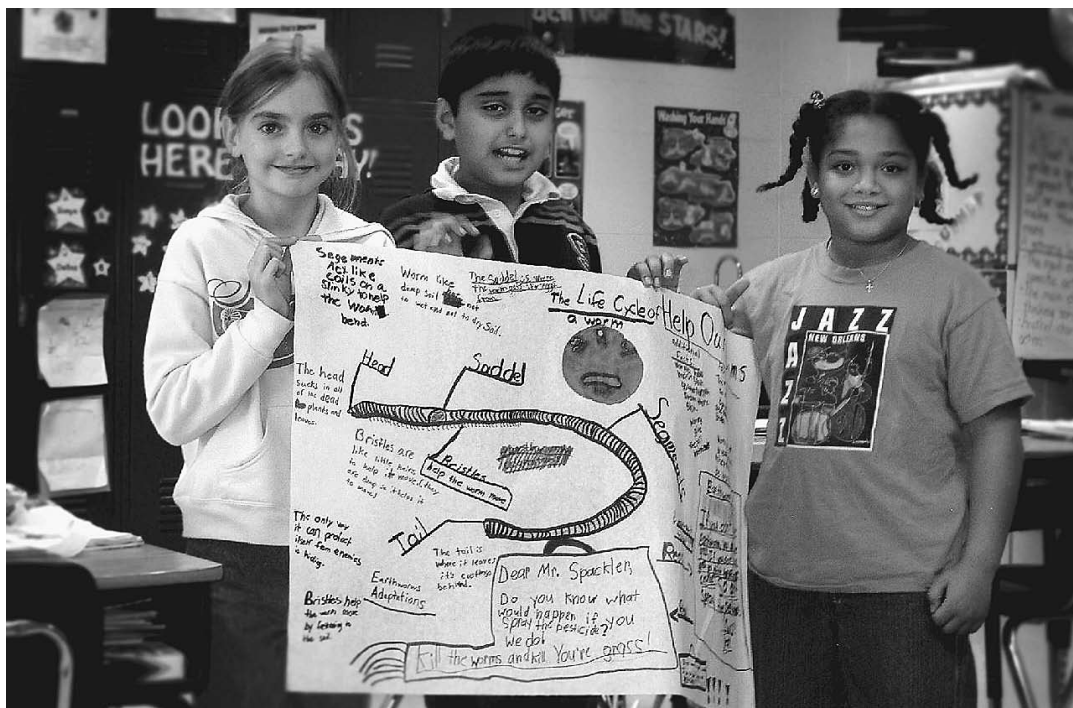
3 Points: A labeled, detailed, full-color drawing of an earthworm

2 Points: Two ways earthworms help the earth

1 Point: One additional fascinating fact about earthworms

Extra Credit: A poem, song, rap, or cheer about saving the worms.

You can use the rubric to score completed posters and make comments. As an additional evaluation,



"Save the Worms" poster session

you may want to give the Wiggling Worms quiz. Answers are as follows:

- 1 head
- 2 saddle
- 3 segment
- 4 tail
- 5 castings
- 6 c
- 7 Answers might include two of the following: Use damp soil; add leaves, compost, or other

decaying matter; add newspaper; keep in a cool, dark place; keep out of the sun; and treat worms humanely.

- 8 Answers might include two of the following: same type of plant, same-sized plant, same-sized pot, same amount of water, same temperature, and same amount of light.
- 9 Answers might include two of the following: Worms loosen the soil by creating tunnels, worm tunnels let air and/or water into the soil, and worms make castings which make good plant food.

Inquiry Place

Have students brainstorm testable questions about worms, such as

- ? Does a worm move headfirst or tail first more often?
- ? Do worms prefer different types of food?
- ? Do worms react to strong smells?
- ? Do worms prefer light or dark?
- ? How long does it take a worm to burrow into the soil?
- ? Do different types of earthworms have a different number of segments?

Then have students select a question to investigate as a class, or have groups of students vote on the question they want to investigate as a team. After they make predictions, have them design an experiment to test their predictions. Students can present their findings at a poster session or gallery walk.

More Books to Read

Cronin, D. *Diary of a spider*. 2005. New York: Joanna Cotler Books.

Summary: Fans of *Diary of a Worm* will enjoy reading the humorous adventures of young worm's friend, Spider.

Himmelman, J. 2001. *An earthworm's life*. New York: Children's Press.

Summary: Simple text and illustrations describe the daily activities and life cycle of the earthworm using an engaging story format.

Kalman, B. 2004. *The life cycle of an earthworm*. New York: Crabtree Publishing.

Summary: This book details characteristics of earthworms and their important role in nature. Fairly large text, simple explanations, colorful photographs, table of contents, glossary, and index make this a great choice for budding researchers. The common misconception that earthworms cut in half can regenerate major body parts is dispelled.

Oxlade, C. *Soil (Materials, materials, materials)*. Chicago: Heinemann Library.

Summary: A simple presentation of information about soil, including its composition, properties, and some of its uses. Includes large full-color

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photographs, bold-print words, fact file, glossary, more books to read, and index.

Rosinsky, N. 2003. *Dirt: The scoop on soil*. Minneapolis: Picture Window Books.

Summary: Simple text and colorful illustrations explain what soil is made of, how worms and other burrowing creatures help soil, and why dirt is important to all life on Earth. Includes a table of contents, glossary, simple experiments, and a FactHound website with links to other safe, fun websites on the topic.

Tomecek, S. 2002. *Dirt: Jump into science*. Washington, DC: National Geographic Children's Books.

Summary: Young readers get down in the dirt with a friendly star-nosed mole as he shows off the different parts of his garden and some

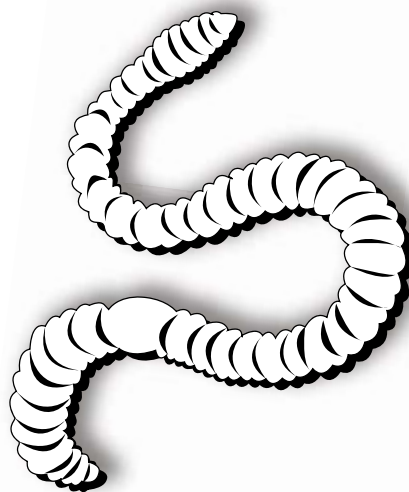
amazing creatures who live in the dirt. During this exciting tour, children discover what soil is, how it is formed, and why this substance is vital to plants, animals, and humans. Colorful art and simple text show how the soil that plants grow in differs from the soil that building foundations sit in, and help youngsters understand why this precious resource must be conserved.

Websites

Visit Discovery Kids Worm World for all the dirt on worms. <http://yucky.kids.discovery.com/flash/worm/index.html>

Visit "The Adventures of Herman" to learn all about Squirmin' Herman the Worm (also available in Spanish) www.urbanext.uiuc.edu/worms/index.html

My Worm Journal



Zoologist's Name: _____

Dates: from _____ to _____

A Day in the Life of an Earthworm



Pretend you are a real earthworm. What are some of your adaptations for living underground? How do you help the earth? What dangers would you face? What would a day in your life be like?

Worm Wonderings

I wonder...	I predict...	I learned...
1. Do worms make tunnels?		
2. Do worms have teeth?		
3. Can worms crawl above ground?		
4. Do worms have eyes and noses?		
5. Do worms prefer damp or dry places?		
6. Can you tell a worm's head from its tail?		

My Own Worm Wonderings

I wonder...	I predict...	I learned...

Earthworm Observations

1. Draw and color your earthworm in the box below.

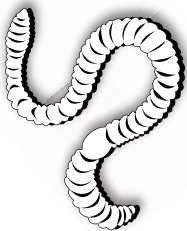
2. An earthworm's **head** is closest to the thickened part of its body, called the **saddle**. Label your earthworm's head, tail, and saddle in the box above.
3. An earthworm's body is made up of rings, or **segments**, that let it bend. How many segments can you count? 10 20 30 40 50 >50
4. What does the worm do when you gently touch it?

5. An earthworm has eight tiny **bristles** under each segment that act a little like legs. They help it move. Gently place the worm on your arm. Can you feel the bristles? _____

6. Data Table

Length	Width	Feels Like
cm	cm	

Damp or Dry? Experiment



Question: Do earthworms prefer damp or dry places?

Prediction: I think the earthworms will move to the **damp/dry** paper towel (circle one).

Procedure:

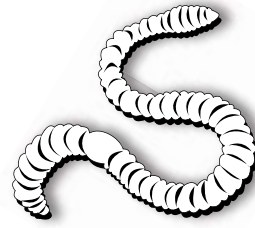
1. Put two worms in the box and cover.
2. Wait 10 minutes.
3. Observe the worms. Record the results using a ✓ for each worm.
4. Repeat with two new worms.

Worm's Response	Trial #1	Trial #2
Damp Paper Towel		
Dry Paper Towel		

Conclusion: Do earthworms prefer damp or dry places?
What is your evidence?

Name: _____

How Do Worms Help the Earth?



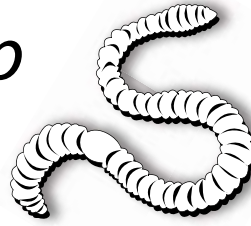
Directions:

1. Cut out the cards in the boxes below.
2. Read the cloze paragraph, and lay the cards where you think they belong on the blanks.
3. Listen carefully while your teacher reads pages 5–13 of *Wiggling Worms at Work*.
4. Move the cards if necessary, and glue or tape them on the page.
5. On the back, draw a picture that shows a worm helping the earth!

food	castings
plants	digest
soil	air
tunnels	rainwater

Name: _____

How Do Worms Help the Earth? cont.

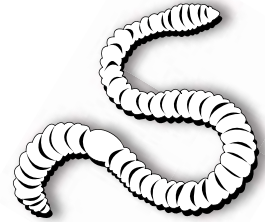


Worms loosen the _____ as they wiggle along. As worms twist and turn, they create _____ flows along these tunnels. _____ trickles down. Worms _____ leaf and plant bits. What's left passes through a worm's body and comes out its tail end in the form of worm _____. They make good plant _____. Worms help new _____ begin to grow.

Name: _____

Save the Worms

Poster Rubric



Name(s): _____

Your poster includes:

4 Points: Descriptions of four different earthworm adaptations

4 3 2 1 0

3 Points: A labeled, detailed, full-color drawing of an earthworm

3 2 1 0

2 Points: Two ways earthworms help the earth

2 1 0

1 Point: One additional fascinating fact about earthworms

1 0

Extra Credit: Your poster includes a poem, song, rap, or cheer about saving the worms.

1 0

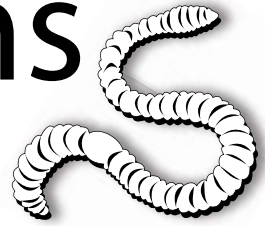
Total Points _____/10

Comments: _____

Name: _____

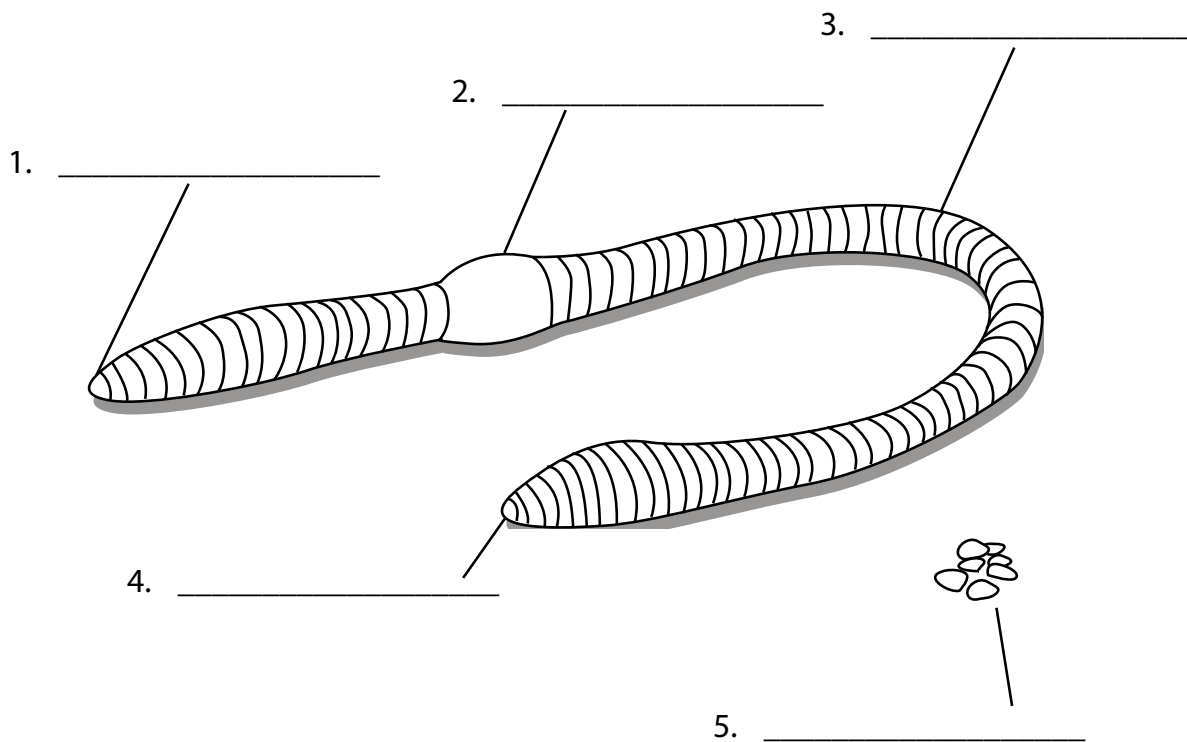
Wiggling Worms

Quiz



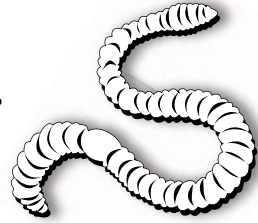
Label the earthworm picture below. Use the WORD BANK.

WORD BANK	
castings	saddle
tail	segment
head	



Name: _____

Wiggling Worms Quiz cont.



6. How do an earthworm's tiny bristles help it live?
- a. The earthworm uses its bristles to breathe.
 - b. The earthworm uses its bristles like tiny roots to soak up water.
 - c. The earthworm fastens its bristles to the soil, helping it to move.
7. Marcus wants to raise earthworms in the classroom. Describe two things he should keep in mind when setting up the worm bin.

a. _____

b. _____

8. Wendy wants to set up an experiment to see if plants grow better in soil with or without earthworms. What are two things Wendy should keep the same in her experiment so that it is a fair test?

a. _____

b. _____

9. Describe **two** ways earthworms help the soil:

a. _____

b. _____