



**Science Unit:** *The Earth Around Us: Air, Water & Soil*

**Lesson 6:** *Can Worms See?*

School year: 2007/2008

Developed for: Carnarvon Elementary School, Vancouver School District

Developed by: Linda Hanson (scientist), Moira Corrigan and Tania Pearse (teachers)

Grade level: Presented to Grade 2; appropriate for grades 1 – 7 with age appropriate modifications.

Duration of lesson: 1 hour and 15 minutes

Notes: Students should already be familiar with the process of science.

**Objectives**

1. To perform a scientific experiment to reinforce the process of science.
2. To learn more about worms.

**Background Information**

See previous Lesson 5 Worm Composting, The Earth Around Us: Air, Water & Soil science unit (Earth Science curriculum area), available from the Scientist in Residence Program website <http://www.scientistinresidence.ca>.

Note that although worms do not have eyes they can sense light. They do this via light sensing organs.

**Materials**

- Worms (1 per student)
- Plastic Petri dishes
- Black paper
- tape
- flashlight (1 per group)
- water
- worksheets

**In the Classroom**

**Introductory Discussion**

1. Have a brief question and answer period to address any questions/concerns that may have arisen from the presence of the worm composter in the classroom. Review proper worm care.
  - Has anyone ever tried to collect worms for fishing? What time of day do you find the most worms on the surface? How do worms know if it is day or night?
  - Do worms have eyes? If possible you can pass around a worm or two in a Petri dish for the students to observe. Be sure to keep the worm moist.
  - Do you think worms can “see” light? What happens when we open the lid of the composter? Where do all the worms go?
  - Tell the students that they are going to test the hypothesis that worms can “see” light.



## SCIENTIST IN RESIDENCE PROGRAM

2. Short description of other items to discuss or review.
  - Remind the students of the importance of respecting living creature.
  - Ensure that the worms stay moist at all times and are not exposed to excessive light.
3. Briefly describe science experiment/activity.
  - The students will expose individual worms to light and observe their reaction.
4. The students will conduct a full experiment and focus on the entire process of science (hypothesis, methodology, observations, recording results, conclusions).
5. Briefly describe safety guidelines.
  - Ensure your hands are clean before handling the worms and wash your hands when you are finished handling the worms.
  - Do not shine light on the worms unnecessarily.

### Science Experiment

Experiment Title: Can Worms “See” Light?

Purpose of Experiment: to determine if worms can sense light.

Experimental Observations: students will observe if worms avoid light, are attracted to light or are indifferent to its presence.

Hypothesis: What do you think will happen when you shine light on the dish?

Methods and Instructions:

Set-up prior to experiment: Use the black paper to make a semi-circle sleeve for each Petri dish. The sleeve should cover one half of the dish. The covered side is referred to as the dark half of the dish. (see diagram on worksheet if clarification is required)

Students will work in teacher assigned groups of 4 students. Each student will have a chance to perform one replicate of the experiment. Group members will take turns such that one replicate is performed at a time.

1. Hand out the materials to each group. Give each group one worm – ensure the worms are kept moist by sprinkling a small amount of water into the dish or misting it with a spray bottle.
2. Discuss the experimental procedure and what factors the students want to control for (length of light exposure, worm positioning, light intensity, using a new worm each time versus using one worm per group etc.)
3. Have the students record a hypothesis before beginning the experiment.
4. The first student will place the worm in the centre of the Petri dish. They will then position the cover in such a way that the worm is half in the light and half in the dark.
5. The student will hold the flashlight directly above the dish (1-2” away) and shine it on the dish for 60 seconds.
6. After 60 seconds the student will record the position of their worm on their worksheet.
7. The next student will repeat the above procedure. Each student can use a new worm or the same worms can be used, this is up to the teacher/scientist/class consensus.



## SCIENTIST IN RESIDENCE PROGRAM

8. Once each group member has had a turn record the class results on the board and have students copy this information onto their worksheet.

### **Closure Discussion**

1. Did everyone get the same results?
2. Are the results what we expected? Does our hypothesis make sense based on what we know about worm behavior?
3. If the above is true why do you think the worms did/did not behave as we expected?
4. What other factors might also influence their behavior to light?

### **References**

5. Appelhof, Mary. 2003 Worms eat my garbage: how to set up and maintain a worm composting system. Flower Press.
6. <<http://www.cityfarmer.org/wormcomp61.html>> Gillian Elcock and Josie Martens. Composting with red wiggler worms. Hosted by City Farmer, Canada's Office of Urban Agriculture. Copyright 1995. Accessed February 1 – April 31, 2008.

Scientist: \_\_\_\_\_

Date: \_\_\_\_\_

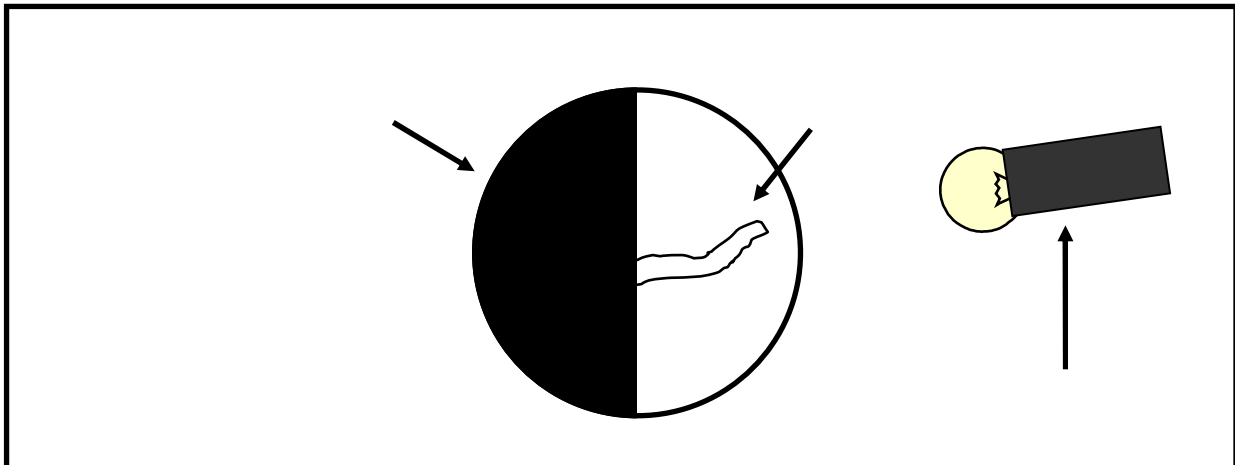
## Experiment: Can Worms “See” Light?

Worms don't have eyes but can they still “see” light?

### Method

We will place the worm in the centre of a dish with one light side and one dark side. Then we will shine a light on the dish and observe what happens.

Label your experimental set up



### Hypothesis

What do you think will happen when you shine light on the dish?

\_\_\_\_\_

## Results

What happened when you shone light on the dish?

---

## Class Results

Observation	Number of times observed
Worm stayed in the middle	
Worm moved to the covered side (dark)	
Worm moved to the uncovered side (light)	

## Conclusion

Explain what happened. Why do you think it happened?

---

---