

Activity 13

Worm Behavior

Rationale: The usual species of worms used in vermiculture are considered to be phototropic, that is, they move towards light = positive (+) phototropism or move away from light = negative (-) phototropism. Vermiculture worms move away from BRIGHT light, but may be attracted to dim light. To what extent is the brightness related to the movement of the worms?

Objectives

- 1) Design an experiment that addresses worms' movement towards light.
- 2) Determine the effects, if any, of light on the worms.
- 3) Determine the effect of light intensity on the worms.

PDE Standards

Science and Technology

3.1.7. A,B,C

3.2.7. A,B,C,D,E,F

3.6.7. A,B

3.7.7. A,B,C,D

Environment and Ecology

4.1.7. A,B,C

4.2.7. A,C

Materials

CBL2 and light sensor

TI 83/84

Computer

Graphical Analysis

Ring stand

Test tube clamp

Introduction

If worms are removed from the vermicompost and placed on top of a flat pile of vermicompost, they dive for cover. The students will observe this trait quite quickly – but what is the reason? The worms may be diving for cover for various reasons. The students will need to be coached to devise an experiment to determine the variable(s) that causes this effect.

Strategies

For any inquiry approach to work successfully, the student must observe the behavior for a sufficient period of time. To have students come to class and be expected to develop questions to study, without a large number of observations, is counterproductive. If this Activity is done as a true inquiry approach, the students need to have made and recorded several hours (total for class) of observations. The journal entries from the very first day can be used to record these observations. After the appropriate amount of hours of observations as many reasons as possible for this behavior can be suggested. This activity can be done as the very first experiment. If it

done as one of the first activities it will have to be planned out for the students and cannot be used as a student developed strategy. If this activity is used later in the program it can be used as a true inquiry approach to a study. It will be assumed that worms move away from light because a light was used to collect and sort the worms. However, it will need to be shown the assumptions are in fact, true. All the variables that may be related to this behavior should be listed and experiments designed to determine which of the possible variables cause the effect.

Procedure

- 1) Break into groups of three or four students.
- 2) In each group make a list of the possible causes.
- 3) Each group makes a presentation.
- 4) The class comes to a consensus.
- 5) Each group selects the variable(s) to be studied by the group.

Expectations

The students should be able to:

- 1) make appropriate observations.
- 2) decide what observations are needed for a specific behavior.
- 3) select appropriate potential causes (variables).
- 4) design several drafts of possible methods to test for cause and effect.
- 5) design an appropriate experiment with coaching.
- 6) design an appropriate data table.

Data Table 1 *(Typical Table)*

Variable	Light	Moisture	Temperature	Noise	?	?
Toward (+)						
Neutral						
Away (-)						