

Activity 28

Growth with Egg Shells

Rationale: Many vermiculturists feel that egg shells or fine sand should be part of the diet. Vermiculture worms have a gizzard and small grains of sand or egg shells will remain in the gizzard to help scour/grind food stuffs for digestion. The egg shells (mostly CaCO_3) help to sweeten the vermicompost, as well.

Objectives

- 1) Design an experimental design for new variables.
- 2) Design the setup.
- 3) Analyze the data collected.

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

4.6.7. A,B,C

Math

2.1.8. A,B,D,G

2.2.8. A,B,F

2.3.8. A,B,D

2.4.8. A,B,D,F

2.5.8. A,B,C,D

2.6.8. A,B,C,E,F

2.7.8. B,C,D

2.8.8. F,G,H,I,J

2.11.8. A,B

Materials

Crushed dry egg shell

Shredded newsprint

Fine sand

Large mini habitats

Distilled water

TI 83/84

Introduction

The whole concept of the function of a gizzard will be foreign to most students. Chickens and turkeys have gizzards and they are regularly fed a diet with granular limestone. If the vermicompost is only newsprint and water, the diet will not have any grit in it. Therefore, a simple agriculture experiment is apparent – two samples get grits and the other sample does not.

Strategies

This should be as much of an inquiry based experiment as can be accomplished. The experimental design should be very similar to many previous activities. Refrain from over coaching in this activity. It will be necessary to explain how the gizzard functions in the worm's digestive processes. The students should decide to study the effect of grit on the general health of the vermiculture. If the present diet for the worms is void of egg shells, then the students only need to set up two Habitats. The present Habitat will serve as the Habitat without the grit. If the present diet contains egg shells, three new Habitats will be needed.

Procedure

- 1) Set up 3, 2-liter or larger habitats.
- 2) Place shredded newsprint in one mini habitat.
- 3) Mix thoroughly shredded newsprint and an equal mass of finely crushed and dried egg shells.
- 4) Mix thoroughly shredded newsprint and an equal mass of fine sand.
- 5) Add water equal to 3 times the mass of the dry newsprint.
- 6) Add 10 juvenile worms to each mini Habitat.
- 7) Place in a dark safe environment.
- 8) Feed immediately and monitor.
- 9) Record observations in the journal.
- 10) Remove worms on a regular basis, weigh, and measure the length.
- 11) Record measurements in the journal and in Data Table 1, 2 or 3.
- 12) Note the first appearance of cocoons; count and record the numbers.
- 13) Note the first appearance of hatchlings; count and record the numbers.
- 14) Complete Data Table 1, 2 or 3.
- 15) Draw conclusions from the results.

Expectations

The students should be able to:

- 1) complete a well conceived and designed experiment.
- 2) a well conceived Data Table.
- 3) analyze the collected data.

