Activity 29

Leaf Litter vs. Shredded Newsprint

Rationale: In nature leaf litter is a by-product of plant metabolism and can present disposal challenges. If leaves can be ground up into small bits can they be used in the Habitat instead of shredded newsprint? Additionally, will the leaves provide extra nutrients not available in newsprint alone?

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

2-L bottle (2 per group)
Leaf litter
Distilled water

Introduction

Both newsprint and leaves are by-products of our habitat and must be disposed of to maintain an orderly environment. Certainly, vermiculture does not recycle a significant amount of newsprint, but none-the-less, some is recycled. If leaves can be recycled instead of newsprint, which is recycled at present, that would be a good investment. Leaves contain a lot of possible critters that are not wanted in a healthy vermiculture. On the other hand, worms do not digest all of the foodstuffs by

themselves. They get considerable help from a zoo of other very small critters. Because many of these critters found in nature may be absent from the typical indoor vermicompost, leaves may be very beneficial.

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. Students may need to review what chemical and biological active substances remain in the fallen (dead) leaves. The fallen leaves attract many forms of molds, fungi, and protozoa that may or may not be beneficial to the growth and health of the vermiculture. These last few Activities are intended to challenge the students' abilities to design rigorous and well conceived experiments. Provide as little coaching as possible without sacrificing good scholarship.

Procedure

1) Set up 2, 2-liter or larger habitats per group.
2) Place shredded newsprint in one mini habitat.
3) Add water equal to 3 times the mass of the dry newsprint.
4) Dry the leaves thoroughly, crush or grind up.
5) Add water equal to 3 times the mass of the leaves.
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 their length.
11) Record measurements in the journal and in Data Table 1 or 2.
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 or 2.
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.

Data Table 1 *(Typical Student Data Table)* **Newsprint**

Date	Cocoons		Hatchlings		Increase in Cocoons		Increase In Hatchlings	
	#	Mass	#	Mass	#	Mass	#	Mass
Totals					**XXXX**		**XXXX**	
Average Per worm					**XXXX**		**XXXX**	

Data Table 2 *(Typical Student Data Table)* **Leaf Litter**

Date	Cocoons		Hatchlings		Increase in Cocoons		Increase In Hatchlings	
	#	Mass	#	Mass	#	Mass	#	Mass
Totals					**XXXX**		**XXXX**	
Average Per worm					**XXXX**		**XXXX**	