

Activity 17

Mass of Input vs. Mass of Output

Rationale: The amount of foodstuffs added to the Habitat compared to the mass of runoff water and the increase in the mass of the worms should be related to the health of the Habitat. These data can be used to determine the efficiency of the system.

Objectives

- 1) Enter data from Data Table 1 and 2 from Activity 1 in the graphing calculator or Graphical Analysis.
- 2) Decide what variables are to be compared.
- 3) Decide what causes and effects are present, if any.
- 4) Evaluate the variable data collected and decide if the appropriate variables are being measured.
- 5) Make changes, if necessary.

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. AB,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

Data from Activity 1

TI 83/84

Computer

Graphical Analysis (software)

Introduction

The bedding was weighed and 3 times its mass equals the amount of water added to the bedding. This became the original mass of the future vermicompost. Food-

stuffs were added and the average amount of water was generally considered to be about 70% of the mass of the foodstuffs. In a healthy Habitat, the excess water will drain off at the bottom of the bin. Some water evaporates and therefore cannot be measured. The worms will grow, reproduce, and produce more worms. As the Habitat matures and weekly or bi weekly mass data are collected and analyzed, patterns will begin to appear. If the appropriate amount of foodstuffs is added, a relationship will begin to develop between the input amounts and the growth of the worms and excess water that is present.

Strategies

This activity will require more guidance/coaching than more recent activities. The relationships developed in this Activity will enhance the learning and understanding by the students of the micro ecosystem developed in the Habitat. The maximum and minimum of the measurements will give the students some idea of the complexity of the Habitat. The previous activities have given the students confidence in their abilities to solve ecological problems.

Procedure

- 1) Groups observe Data Table 1 and 2 from Activity 1 and propose a method of analysis.
- 2) Groups design an appropriate analysis of data sets.
- 3) Groups present a data analysis design to the class.
- 4) Students reflect on suggestions and redesign the method, if appropriate.
- 5) Groups' data analysis design is given to the teacher for final approval.
- 6) Conclusions are drawn from the results.

Expectations

The students should be able to:

- 1) design appropriate data analysis methods.
- 2) determine the quantitative values.
- 3) link the quantitative aspects of the Habitat with the qualitative conditions.

