

## Activity 7

# Humidity of Habitat

**Rationale:** The wetness of the vermicompost is one of the variables that will have the most detrimental effect on the growth of the worms. One way to determine the wetness of the Habitat is to monitor the humidity of the air above the vermicompost. A too wet vermicompost will mask the correct earthy odor associated with a healthy Habitat.

### Objectives

- 1) Determine the humidity of the air above the vermicompost.
- 2) Use the humidity value as a measure of the wetness of the vermicompost.
- 3) Compare the humidity of the air with the actual water content of the vermicompost.
- 4) Compare the relationship between the humidity, water content, and growth of the worms.
- 5) Compare and correlate the smell value associated with Activity 3 with the humidity of the air above the Habitat.

### PDE Standards

#### Science and Technology

3.1.7. A,B,C

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

3.5.7. D

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

CBL2

Humidity sensor

TI 83/84

Computer

Graphical Analysis

Duct tape

## **Introduction**

The water content of the vermicompost should not exceed 2 to 3 times the mass of the original mass of the shredded paper, 60 – 70% moisture. This may be very difficult to maintain, especially after adding fresh food. When the vermicompost is maintained correctly, the water content of a healthy Habitat will not exceed 60 – 70% of the mass of the worms, castings, and partially decomposed food. If excessive water appears in the bottom of the worm bin the total water content will be too high. To help maintain a healthy vermicompost, monitoring the humidity will prove to be well correlated with the water content of the vermicompost.

## **Strategies**

Have students discuss within their groups how to best monitor the water content of the vermicompost. One of the easiest methods is to physically weigh the vermicompost and monitor any changes. However, whenever samples are collected for weighing, the vermiculture is shocked, which will lead to a day or more of re-habitation. Also the water content will be much higher near the bottom of the vermicompost than at the top. Once the students decide to also use a humidity sensor, the same thought processes that went into establishing a data collection schedule for the temperature measurements should ensue. However, a correlation must be established and weighing samples of vermicompost and comparing those masses to the humidity must be established. Once the relationship has been established very few, if any weighings of vermicompost will need to be done for only water content. However, the lack of an earthy smell to the vermicompost will occur within a few days of excessive humidity readings.

## **Procedure**

- 1) Press the APPS button and select DataMate.
- 2) Set up the CBL2/TI 83/84 to record humidity values.
- 3) Place the humidity sensor near one of the “exiting” air holes in the Habitat.
- 4) Use duct tape to hold the sensor in place.
- 5) Remove all worms, castings, cocoons from several samples, dry under a heat lamp, and weigh the dry compost.
- 6) Determine the average water content of each sample of the vermicompost. Record the mass of the samples in Data Table 1.
- 7) Download the humidity measurements to the computer using Graphical Analysis.
- 8) Fill in Data Table 1 for this activity.
- 9) Determine what sets of humidity measurements should be entered into Data Table 1.
- 10) Determine what humidity values in percent relative humidity correlate to water content.



