

Reduce, Reuse & Recycle

Month: Apr.

Week #: 31

Day: e. Fri. Time: 30 min.

Compost Completes the Cycle

Life Tree Learning Systems ©

Objectives/Aims

The students will: be able to name the four elements necessary for decomposition to take place; experience how organic topsoil is formed and understand that nature recycles all of its waste.

Materials

four large, clear glass jars with punctured lids; food scrapes, animal manure, soil & yard wastes; food grinder and pan

Illustration

How interesting! An experiment! Can we really turn our food scrapes into compost (a kind of rich dirt)?

Background

Each year America loses tons of topsoil because of by erosion. This is due to overgrazing and poor farming practices. The problem is compounded when we throw away our food scrapes and organic yard wastes. Both of these can be composted into a high quality topsoil.

Composting essentially needs four elements in order to 'manufacture' dirt effectively: bacteria, oxygen, nitrogen and water.

It is bacteria that do the composting. They are found in

common soil, but are more highly concentrated in an established composted pile and in various commercial products. It is a good idea to 'seed' a compost pile from either of these sources. When oxygen is lacking in a compost pile, the compost will stink due to anaerobic activity. A healthy compost pile is well aerated, leading to aerobic conditions (this is an important component missing from landfills). So mix, stir or turn over your pile frequently to speed decomposition.

Nitrogen, a major component of fertilizer, is found in animal dung. A higher proportion of nitrogen is needed when breaking down 'woody' substances (e.g. oak leaves, pine needles, wood chips, etc.)

Finally, a compost pile needs to be kept moist, not soggy or dry, in order to keep the bacteria thriving.



Group Activity

1. Ask the students where they think soil comes from. Accept all answers as hypothesis that can be tested. Tell them that we're going to test one hypothesis: that topsoil comes from dead organic materials.

2. Place the following ingredients in the following jars:

- In jar A, place soil, food scrapes (no meat because it attracts animals), animal manure, and yard wastes; sprinkle to moisten; cover with perforated top. Ask the students to name each ingredient as you add it. Mention that the soil has bacteria in it and that the animal manure has nitrogen in it. Label this jar, "A: Aerobic/Shake daily/Moisten as needed."

Group Activity (continued)

- In jar B, place the same ingredients as A, but grind the ingredients into small pieces. Ask the students why they think you're grinding up the ingredients. Respond to all answers with, "Let's wait and find out." Label this jar, "*B: Ground up/Aerobic/Shake daily/Moisten as needed.*"

- In jar C, place the same ingredients as A, but cover with an unperforated top. Explain that *anaerobic* means "without air." Ask the students what they think will happen without air. Respond to all answers with, "Let's wait and find out." Label this jar, "*C: Anaerobic/Do not shake.*"

- In jar D, place the same ingredients as A, but do not moisten or cover with a lid; place in a dry, sunny location. Ask the students what they think will happen without water. Respond to all answers with, "Let's wait and find out." Label this jar, "*D: Do not water/Shake daily.*"

3. A week to three weeks later (after there's been a noticeable change in the jars), take each jar, pass it around and let each student examine it. Ask them to withhold their observations until everybody has had a chance to look at them. Their observations should roughly parallel the following:

A. This jar should have a pleasant smell and be in the process of decomposition; items are brown/crumby.

B. This jar should contain decomposed organic material; topsoil. Explain the reason the ingredients decomposed rapidly is because grinding them up increased their surface area, allowing more oxygen, moisture and bacteria to gain access to the material.

C. This jar will stink, have 'goo' at the bottom, perhaps some mold growing and the ingredients will not be decomposed. Explain what leachate (liquids that flow through a solid leaching out some of the components) is and why many items do not break down in the dump.

D. This jar should have fairly well 'mummified' ingredients in it due to the lack of moisture (if you live in a dry climate or mold if you live in a moist climate.) Explain that bacteria needs water in order to do their work.

Group Discussion Questions

1. What did you learn from this activity?

A: Refer to the above conclusions.

Variations/Extensions

Conclusion

Say, "Just like nature, we can recycle almost anything! With the proper ingredients, we can compost our organic wastes into a valuable resource - topsoil."



**How interesting! An experiment!
Can we really turn our food scrapes into compost (a kind of rich dirt)?**