

The Rotten Truth – Shelburne Farms

Objectives: Students will learn about the decomposition process.

Grade Level: 3-6

Groupings: Pairs

Materials: Lunch leftovers; scissors; plastic zip-locked sandwich bags; paper and pencil; soil; plant mister; rubber gloves.

Time Allotment: 30 minutes for initial set up, short observation time throughout and 20 minutes for final analysis.

Directions:

1. Ask the students to name some of the things they have thrown away over the past two days. What happens to these things? Do they disappear? Decompose? Remain in the same form forever? Record the students' ideas on the blackboard. Explain that they will conduct an experiment with the leftovers from their lunches to learn the fate of some common throw-away items.
2. Give each student a plastic zip-locked lunch bag. Explain that they will place one small piece of each item in their lunch into the bag. This includes food, peelings, a corner of the lunch bag, paper napkins, plastic bags, waxed paper, plastic utensils, paper cups, milk cartons, and straws. Have them use scissors to cut items up, if necessary. Stress that they not add any meat to their bags as potentially harmful bacteria could grow.
3. Divide The class into pairs. While one student adds items to his or her compost bag, have the other student record the exact contents. The recorder should also note his or her partners' predictions as to what will happen to each item over time. Will it rot? Smell yucky? Remain the same? Have the students switch roles and create a second compost bag with a list of contents and predictions.
4. Ask the students to add a sprinkling of soil to their bags and to lightly mist the contents with a plant mister. Have the students breathe air into the bags and carefully seal them. Explain that they will leave the bags for 2-8 weeks. You may decide to keep all the bags together, or place them in various locations with differing



conditions (hanging in a sunny window, hidden inside a dark closet, in a cool entry way, etc.). Ask the students if these varying conditions might have a different effect on what occurs in the bags. (If you let the students choose their compost bag's location, be sure to have everyone register their location on a class master list or you may be unpleasantly surprised when a missing bag finally makes its presence known.)

5. Have students create compost bag journals. Ask them to observe their bags periodically and record what they see happening inside. Remind the students that they are not to open the bags until the designated time is up.

6. On the selected date, have the students bring their compost bags outdoors. Distribute rubber gloves for the students to wear while sorting through the contents of their bags with their partner. Record any items still identifiable and their present state. Are any items missing? Provide plant misters so items can be cleaned off for closer observation and identification. How did the results compare to the predictions?



7. Define and discuss the process of decomposition and decay. Explain how certain materials are broken down by microorganisms, mainly bacteria and fungi, into basic nutrients and recycled back into the soil. Talk about composting as an alternative to the garbage dump for certain items. Introduce the terms biodegradable, non-biodegradable, recyclable, and reusable (see [Waste Words](#)). Have the students sort the items in their compost bags into these categories.

Extensions:

a. *Have the students conduct a similar experiment burying selected lunch items in clay or plastic plant pots. After 2-8 weeks, empty pots and sort through the contents. Compare and contrast decomposition times between the pots and the plastic sandwich bags.*

b. *Read the book **MOUSEKIN'S GOLDEN HOUSE** by Edna Miller (Prentice-Hall, 1964) and discuss what happens to Mousekin's pumpkin. After Halloween, set up an old jack o' lantern inside an empty aquarium in the classroom. Cover the aquarium with Plexiglass and observe the changes that occur over time.*

WASTE WORDS

biodegradable - capable of being broken down by living microorganisms into simpler compounds

compost - well-rotted plant and animal waste prepared by people to be used as a soil conditioner or fertilizer in gardens

decomposer - an organism that digests organic waste and dead organisms by breaking them down into simpler compounds and absorbing soluble nutrients

decomposition - the process of breaking down dead plants, animals and animal waste into simpler nutrients

humus - dark organic matter found in topsoil that consists of decayed vegetable matter; humus increases water retention of soil and provides nutrients important for plant growth

non-degradable - material that can not be broken down by natural processes

nutrient - any element an organism needs to live, grow and reproduce

photodegradable - material capable of being broken down by exposure to sunlight

recycling - the process of collecting and reprocessing matter from garbage or the waste stream so that it can be made into new products

reusable - a product that can be used over and over again in the same form

THE DIRT *on* DECOMPOSITION

Decomposition is a fundamental process on which all life depends. We'd all be knee deep in garbage without it. Bacteria, fungi and other microscopic organisms that live in the soil, air and water are responsible for turning once living plants and animals into nutrients that can be used again and again. Think of them as nature's recyclers. They have the ability to produce special enzymes which allow them to break down these dead plants and animals and use them as food. No job is too big as they enlist the help of friends and family. As they eat, they grow and multiply at an amazing rate. In just four hours, one bacteria can grow a colony of 5096! And at day's end, there are millions and billions of them working together. Why, in one spoonful of soil there are more bacteria and fungi than all the people on Earth! Despite their microscopic size you've probably seen evidence of them right in your own homes. Remember that orange with the blue-green mold in the back of the refrigerator? Or that black fuzzy slice of bread hidden in the bread box? Or those damp old gym socks, newly spotted with black and pink that you left in a plastic bag? These are colonies of our microbial friends hard at work at the fine art of decomposition.