What Makes Stuff Rot – How Compost Works

A lesson from the New Jersey Agricultural Society
Learning Through Gardening Program

Note: For this lesson, the homework assignment "This Homework is Garbage" should be sent home two or three days ahead of the scheduled lesson so that students have time to collect green and brown plant matter for composting.

Objective: The student will be able to:

- Define humus as the rich top layer of garden soil that helps hold on to water and provides valuable nutrients for plants.
- Explain how gardeners can recycle vegetables scraps, weeds, and leaves in a compost pile to make humus.

Grades: K-5

Materials:

one gallon-size baggie per small group of students
green and brown plant material students have brought from home
one cup of soil from the garden (do not use potting soil)
spray bottle
"This Homework Is Garbage" sheet
"What Can Be In Compost?" sheet

Procedure:

Remind students what happens to all the leaves that fall from the trees every autumn. Why don't we have to wade through huge drifts of leaves when we walk through the forest? A natural process called decomposition breaks down the leaves and turns them back into soil or humus. Molds and microscopic animals called bacteria that live in the soil recycle dead plants and animals. The decomposed plants and animals make compost. Compost added to any soil makes it healthy and better for plants. Humus is the rich top layer of garden soil that helps hold on to water and provides valuable nutrients for plants.

Tell students today we are going to learn a way that gardeners can use the decomposition process to make their own supply of rich humus for their plants. The process is a type of natural recycling called composting.
Explain the four key elements of composting: green plant matter, brown plant matter, air, and water. Ask students what might be included in the green and brown plant matter categories.

Ask students to put one cup of green plant matter, two cups of brown plant matter, and a cup of soil into a gallon-size baggie. Stir all the materials well. Mist it with water until the plant matter is moist but not soggy. Keep the baggie in the classroom so that students can watch the decomposition process.

NOTE: The decomposition process will be quicker if the plant matter is cut or shredded into little pieces.

Next, ask the students to place the rest of the "homework" green and brown plant matter in the garden in a composting drum or cage. You can also simply place the compost in a pile on the ground out of the way of foot traffic. Ask students to mix the plant matter and water it until it is moist.

Continue to stir the compost in the baggie every day and add a little water when it looks dry. The bacteria in the soil will turn all the waste material into brown compost in about six to 10 weeks.

Evaluation: The student will be able to define humus, compost, and decomposition. The student will be able to list the four key elements of compost and explain how compost is made.

Extensions: Ask students to record the change in the contents of the baggie. Discuss which materials decompose first, which materials take longer to decompose, and why this might happen.

Ask students to track the time it takes for the waste material to decompose and turn in to rich compost.

Use the compost to plant some seeds.

Read:
Compost Stew by Mary McKenna Siddals
Garbage Helps Our Garden Grow by Linda Glaser.

How To Make a Low-cost Compost Bin

Compost bins don't have to be expensive. You can make one easily out of a large storage tub you can buy at any discount or home improvement store. A 30-gallon size works well for a school program. If you are planning on composting for awhile, you should use two: one to sit and 'cook' while you are filling the other.

To make the compost bin, just drill eight to 10 holes in the bottom of the tub for drainage and aeration, and another eight to 10 holes in the top. Now you are ready to make compost! The storage-tub compost bin is inexpensive and easy to use. You can remove the top easily to stir the compost and allow your students to see what is going on inside.

What Can Be in Compost?

"BROWN" *dry* (carbon-rich)	"GREEN" *wet* (nitrogen-rich)
dry leaves	fruit scraps
straw	veggie scraps
dry grass clippings	green grass clippings
shredded paper	coffee grounds
pine needles	tea & teabags

What Should <u>NOT</u> Be in Compost?

animal products: meat, bones, fat, dairy products

This Homework is Garbage

On _____ we will be learning about composting -- how when air, water, and soil mix with the right amount of green and brown plant matter, it results in a process called decomposition. For our experiment, we will need every student to bring in some of each kind of plant matter. You will need about **one cup** of **green plant matter** such as lawn clippings, green leaves, weeds, and vegetable and fruit scraps (cucumber or apple peels, for example). You will also need about **two cups** of **brown plant matter**, such as dead leaves, straw, dead grass, cornstalks, sawdust, or shredded newspaper. Please bring this plant material to school in a bag by _____so we can start learning about composting, and how compost is great for your garden!

THANK YOU!

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