Composting at Home

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I. Composting Basics

What is Compost?

Compost is decomposed organic materials that have a soil-like texture with many valuable nutrients. Compost can be combined with existing soil to grow flowers, trees, lawns and vegetable gardens.

What is Composting?

This is the biological breakdown of organic matter into a rich humus, soil-like material. Tiny microbes perform the process and, if "nurtured", will make the process speed up significantly! As these organisms decompose the materials, they generate by-products of heat, carbon dioxide (in tiny quantities), water and compost. The organisms are already present in the materials, and additionally migrate from the existing soil.

II. WHY Compost?

Waste reduction

At least 50% of your garbage can be diverted form the landfill, reducing the waste stream, reducing disposal costs which burden your tax base, and leaving space in the landfill for items that are not compostable or recyclable.

Creating a useful and needed resource.

It's useful as a soil amendment, essential to the restoration of landscapes where topsoil has been removed or destroyed during construction, mining or farming operations, and is increasingly being applied to agricultural and forest lands depleted of their organic matter.

III. What CAN and CANNOT be Composted at Home?

All organic materials (ie, anything that was once alive) *can* be composted; ***however***, it is not advisable to include certain items in your pile/bin at home. Large amounts of **meat, cheese, or fatty products (oils, dairy, etc)** can attract pests and **should be left out**. Additionally, remnants from diseased plants or seeds from weeds should be excluded, as small-scale composting won't kill these items (they will re-appear next year wherever you use the compost you make).

Glass, metal and plastic ***cannot*** be composted; however, paper and *un*treated wood can be.

Dog and cat manure ***should not*** be composted because they may contain human parasites or diseased organisms that would also survive the compost process.

Otherwise, keep a small pale in the kitchen, collect all of your table scraps and spoiled "stuff" from the refrigerator (with the above exceptions), and compost, compost, COMPOST! More details to follow....

IV. How To Compost:

Know the factors important to the process. Compost "factors" are the conditions that can be altered to affect or enhance the decomposition process. They are **particle size, carbon-to-nitrogen ratio, oxygen, moisture and temperature.** Here's what each one means:

particle size--Basically, the smaller the materials are, the faster the organisms can break them down. Leaves, for example, can be run over by your lawn mower before being added to the pile. Food scraps--such as whole fruits or broccoli stems can be cut up. *Do not puree the materials though, as air must be able to move between particles.*

carbon-to-nitrogen ratio--(huh??!) Carbon and nitrogen is for the microbes what food is to people: fuel. While carbon serves as the food source, nitrogen is the protein source for energy and reproduction of cells. One without the other doesn't work well. When we talk about a "carbon-to-nitrogen ratio" (C:N ratio), it means the proportion of high-carbon materials (brown items) versus the proportion of high-nitrogen materials (green items) we've mixed together. The ideal ratio is about 30:1 (or 2/3 Carbons to 1/3 Nitrogen), and will vary slightly depending on the ingredients we choose. It takes a certain amount of experimentation to find your ideal mixes. A table containing some popularly composted materials and their C:N levels, as well as a formula for calculating a mixture, is at the end of this handout. Basically though, if you remember 2 parts brown with 1 part green, you'll be okay!

What happens if:

There's too much carbon?

--decomposers won't work (and the pile won't heat up); they need nitrogen to work.

Solution: add nitrogen-rich materials to the pile, like fresh grass clippings or food scraps.

There's too much nitrogen?

--decomposers will work too fast, using all available oxygen, and other *anaerobic* ("without air") decomposers will take over causing the pile to *smell.*

Solution: turn the pile to add more air, and add carbon-rich materials to the mix. Dried leaves or shredded paper work well.

oxygen--The microbes need air to survive. If the pile becomes too compacted or too wet, air won't reach all the microbes. The anaerobic microbes will take over, and odor will occur. Alcohols may also form, which are toxic to growing plants. To avoid anaerobic decomposition, turn the pile as needed (if it begins to compact or smell), or insert an aeration pipe into the center of the pile (a PVC pipe with holes, placed vertically or horizontally through the pile).

moisture--Ideal moisture content of the pile is around 50%, meaning that if you pick-up a handful of compost (taken from a couple of inches inside the pile) and squeeze it, a drop of moisture should fall from your hand. Barely a drop. If the pile is too dry, the microbes go dormant. If the pile is too wet, the pile can go anaerobic due to lack of oxygen circulation. Add water or dry materials as needed, and stir the pile to mix moisture throughout.

temperature--Ideal temperature is 90-140 degrees F. This is an indication that the organisms are hard at work, producing "body heat" (sort of), and releasing energy as they break down organic compounds. Temperature can be taken with a compost thermometer inserted into the pile, or done by touch a few inches into the pile (it should be warm to your touch)

What happens if:

The pile's too hot?

--certain decomposers will *die*.

Solution: turn the pile to let the heat escape, or add water if moisture is not already excessive.

The pile doesn't heat up?

--decomposers are not active.

Solution: insulate the pile and/or make it larger; also, check carbon-to-nitrogen ratio and moisture content, as more nitrogen or more water may "spark" the interest of the microbes!

V. Getting Started

First, choose your ingredients (for help with this, see the table at the end of this handout). After you've gathered some feedstocks, line the bottom of your bin with carbon materials--usually leaves. In order to achieve a nice initial mix, add the different ingredients in layers of 2-3 inches each, finishing with a carbon layer. *This is especially important if you are adding food scraps: it's not good practice to leave them exposed.* If the materials you choose are not very moist, water the pile after it is formed. Then let nature take its course!

After a week, review your pile's characteristics. Refer to the "factors" listed above. Don't be too alarmed if it doesn't start "cooking" right away--as the pile grows larger the process will be more obvious. Small piles (less than 3-ft high) have much slower reactions, but the process is still going on!

VI. Using Your Fabulous, Finished Compost!

When it looks like dirt you'd see on the floor of a lush forest, it's done! Many folks screen the final product to achieve a fine-grained material, but this is not necessary. Compost is great for gardens, lawns, houseplants and more, because:

--it improves soil structure and helps roots penetrate better
--it holds moisture better than regular soil
--it attracts earthworms
--it does *not* contain chemicals that may harm groundwater

The best time to apply your compost is when an area is prepared for planting. Compost can also be spread over lawns in fall and spring to encourage growth and maintain moisture.

For more information on compost(ing), visit any of the following websites:

the US Composting Council: www.compostingcouncil.org
Cornell University : http://www.cfe.cornell.edu/compost/Composting_Homepage.html

Or contact Earthtenders in Farmington, NH: (603) 767-0806 www.earthtenders.com

Carbon-to-Nitrogen Ratios:

High Carbon Materials

Material	*C:N*
Leaves (dried leaves-green leaves)	30-80:1
Corn Stalks	60:1
Straw	40-100:1
Bark	110:1
Paper	180:1
Wood Chips and Saw Dust	100-500:1

High Nitrogen Materials

Material	*C:N*
Vegetable Wastes	12-20:1
Coffee Grounds	20:1
Grass Clippings	12-25:1
Cow Manure	20:1
Horse Manure	25:1
Horse Manure with bedding	30-60:1
Poultry Manure	10:1
Pig Manure	6:1

Calculating a mixture:

example--ideal C:N is 30:1, right? so:

2 parts leaves	2 x (50:1) =	100:2
1 part vegetable scraps	1 x (12:1) =	+ 12:1
		112:3 or,
		37:1

Source: Cornell Waste Management Institute, Master Composter Resource Manual. Ithaca, NH; 1998.