



Composting in Schools

Composting Outdoors

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Best Ever Compost

This is an excerpt from [Composting: Wastes to Resources](#), a 4-H Leader's/Teacher's Guide written by Jean Bonhotal and Marianne Krasny and published by Cornell Cooperative Extension.

Just Follow the Recipe!

Composting is like baking a cake. Simply add the ingredients, stir, "bake," and out comes -- compost!

Whether you compost kitchen wastes or yard and garden wastes, there are a few basic steps to follow. Here are the necessary ingredients and general directions for composting.

Ingredients:

KITCHEN COMPOST

Add a mixture of some or all of the following ingredients:

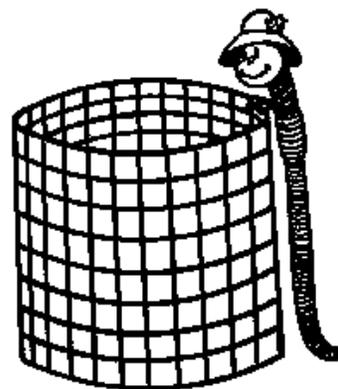
- vegetable peels and seeds
- egg shells
- fruit peels and seeds
- nut shells
- coffee grounds
- any other vegetable or fruit scraps

Note: (Do not add meat scraps, bones, dairy products, oils, or fat. They may attract pesty animals.)

YARD OR GARDEN COMPOST

Add a mixture of some or all of the following ingredients:

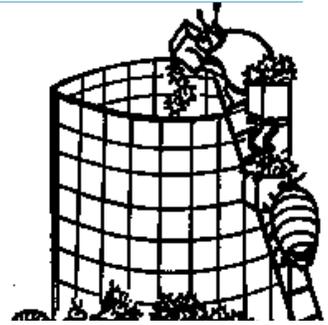
- hay or straw
- wood chips
- grass clippings
- weeds and other garden waste
- leaves
- manure
- ashes
- shredded paper
- sawdust



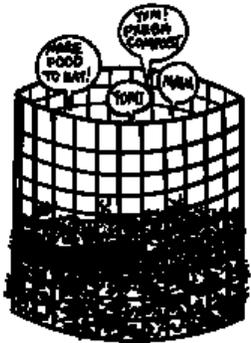
Directions

1. Choose a "pot" for baking your compost. Any type of composting bin will do.

2. Place kitchen or yard wastes into the composting bin. Chop or shred the organic materials if you want them to compost quickly.



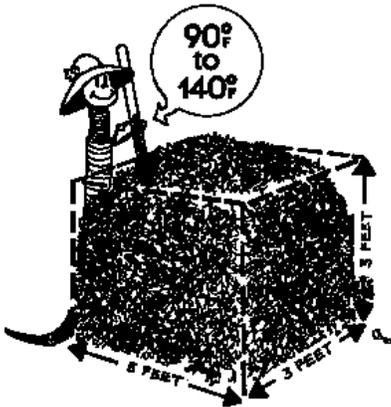
3. Spread soil or "already done" compost over the compost pile. This layer contains the microorganisms and soil animals that do the work of making the compost. It also helps keep the surface from drying out.



4. Adjust the moisture in your compost pile. Add dry straw or sawdust to soggy materials, or add water to a pile that is too dry. The materials should be damp to the touch, but not so wet that drops come out when you squeeze it.



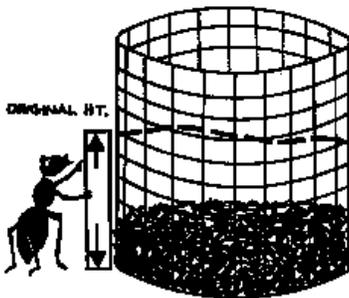
5. Allow the pile to "bake." It should heat up quickly and reach the desired temperature (90° to 140°F, or 32° to 60°C) in four to five days.



6. Stir your compost as it bakes if you want to speed up the baking time.



7. The pile will settle down from its original height. This is a good sign that the compost is baking properly.



8. If you mix or turn your compost pile every week, it should be "done," or ready to use, in one to two months. If you don't turn it, the compost should be ready in about six to twelve months.

9. Your "best ever compost" should look like dark crumbly soil mixed with small pieces of organic material. It should have a sweet, earthy smell.

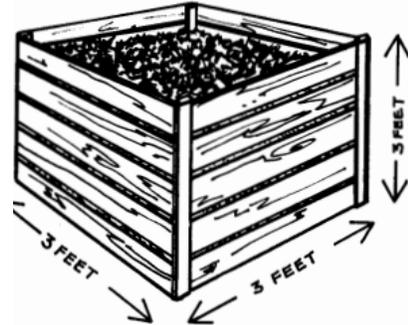
10. Feed compost to hungry plants by mixing it with the soil.



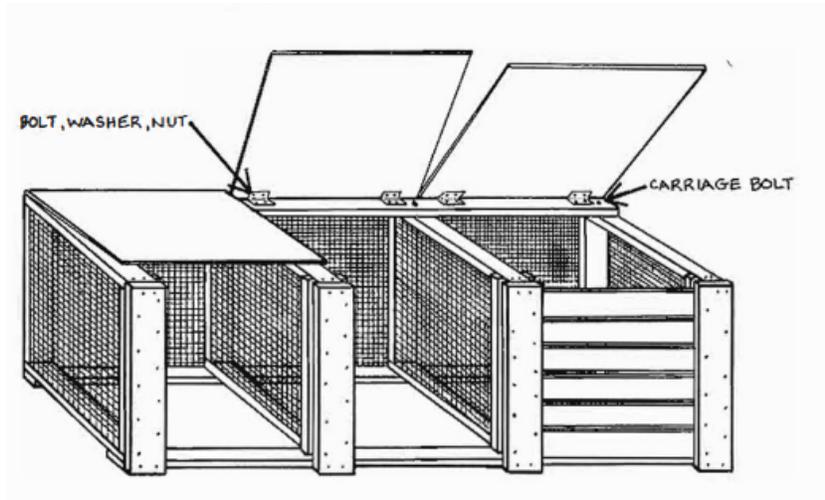
Bin Designs

Plans for other [OUTDOOR BIN DESIGNS](#) from Compost: Waste to Resources include:

Wooden Box Bin
Wood and Wire Three-Bin Turning Unit
Cinder Block Bin
Cinder Block Turning Unit
Wire Mesh Bin
Snow Fence Bin
Garbage Can Composter
Worm Composting Bin
Compost Mound
Compost Pockets Mulch
Compost



And don't forget to keep a Project Record!



Outdoor Composting

Outdoor composting systems can be larger than indoor bioreactors, allowing students to compost greater quantities of food scraps and landscaping trimmings. Although slightly less convenient than a system right in the classroom, students can monitor the temperature, moisture content, and other aspects of an outdoor system, and they can bring samples of the compost inside for observation and experimentation. Many schools have developed outdoor composting systems into demonstration sites, with signs explaining the composting process.

Unlike indoor systems, outdoor systems are home to a diverse range of invertebrates such as millipedes, centipedes, earthworms, pseudoscorpions, beetles, snails, mites, and springtails. These organisms form an intricate food web, and they can be used for illustrating ecological principles as well as for investigating topics such as life cycles and feeding preferences.

In some outdoor systems, the organic materials are periodically mixed or "turned." This redistributes materials that were on the outside of the pile and exposes them to the higher levels of moisture, warmth,

and microbial activity found in the center. It also fluffs up the compost materials, allowing better air flow through the pile. The net result generally is to speed up the composting process.

Bins should be located close to a water source in case they become too dry. Good drainage is also important in order to avoid standing water and the build-up of anaerobic conditions. Other considerations include avoiding exposure to high winds which may dry and cool the pile, and to direct sunlight which may also dry out the pile. The pile should not touch wooden structures or trees because it may cause them to decay. There should be space nearby for temporary storage of organic wastes.

There is an endless variety of outdoor composting systems, so feel free to design your own outdoor bins using readily available scrap materials. Three general types of systems are described below. Refer to [*Composting: Wastes to Resources*](#) (Bonhotal and Krasny, 1990) for more details on outdoor bin designs.

Holding Units

Holding units provide a low-maintenance form of composting. You simply build the unit, fill it with organic materials, and then wait for the materials to decompose. A holding unit can be any container that holds organic materials while they are breaking down. The unit should be about a cubic meter in size (1 m x 1 m x 1 m), and it can be built from wire mesh, snow fence, cinder blocks, wooden pallets, or other materials. You can fill holding units with high-carbon materials such as autumn leaves and yard trimmings, realizing that these materials by themselves will not heat up and will require a year or more to fully decompose. If your system is dominated by leaves, you may want to avoid adding any food scraps, which might attract rodents or raccoons during the slow decomposition process. Alternatively, if you start with a mix that has the right C:N ratio and moisture level to become thermophilic, food scraps should break down quickly before any pests become a problem.

Turning Units

A turning unit looks like three holding units placed side by side. Each unit should be a cubic meter (1 m x 1 m x 1 m) in size. Leave one side open or build a gate along one edge for easy access. Fill one bin at a time, using a mixture of high-nitrogen and high-carbon materials. For rapid composting, turn the contents into the empty adjoining bin every week or two, or each time the temperature begins to decline. A pile that is kept "hot" like this should produce compost within a couple of months, although an additional period of curing is necessary before the compost is used for growing plants. The final bin provides the space needed for curing while a new batch of compost is started in the first bin.

Enclosed Bins

For small-scale outdoor composting, enclosed bins are an option. They can be purchased from home and garden centers or inexpensively built from a large garbage can. Simply drill 2-cm aeration holes in rows at roughly 15-cm intervals around the can. Fill the cans with a mixture of high-carbon and high-nitrogen materials. Stir the contents occasionally to avoid anaerobic pockets and to speed up the composting process. Although no type of bin is rodent-proof, enclosed bins do help to deter rodents and are popular for food scrap composting.

Troubleshooting Compost Problems

Symptom	Problem	Solution
Pile is wet and smells like a mixture of rancid butter, vinegar, and rotten eggs	Not enough air	Turn pile
	Or too much nitrogen	Mix in straw, sawdust or wood chips
	Or too wet	Turn pile and add straw, sawdust or wood chips: provide drainage
Pile does not heat up	Pile too small	Make pile larger or provide insulation
	Or pile is too dry	Add water while turning the pile
Pile is damp and sweet smelling but will not heat up	Not enough nitrogen	Mix in grass clippings, food scraps, or other sources of nitrogen
Pile is attracting animals	Meat and other animal products have been included	Keep meat and other animal products out of the pile: enclose pile in 1/4-inch hardware cloth
	Or food scraps are not well covered	Cover all food with brown materials such as leaves, wood chips, or finished compost