

Compost & Composting

A collection of information and resources
brought to you by YOUR
St. Joseph County Soil & Water Conservation District

www.stjoseph.iaswcd.org/



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Why Compost?

- Landfills and the Law
 - Improve your soil
 - The Environment



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Why Compost? LANDFILLS AND THE LAW

- Composting saves landfill space.
- Home composters are one part of the solution in meeting the state's long term disposal needs by reducing the volume of solid waste needing to be land-filled or incinerated.
- Source: Indiana Department of Environmental Management, "Backyard Composting" Factsheet (<http://www.in.gov/idem/4571.htm>)

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Why Compost? LANDFILLS AND THE LAW, cont.

The Yard Waste Disposal Ban:

- Indiana Statute, IC 13-20-9 states that, "...[A] person may not knowingly deposit vegetative matter resulting from landscaping maintenance or land clearing projects in a solid waste landfill." The ban applies to residential, commercial, and industrial sources.
- Based on the plain words of the statute, the [Indiana Department of Environmental Management interprets the following:
 - Materials SUBJECT to the Yard Waste Disposal Ban:
 - leaves
 - Brush
 - woody vegetative matter (e.g. twigs; branches; tree stumps) greater than 3 feet in length
 - Materials EXEMPT from the Yard Waste Disposal Ban:
 - Grass
 - woody vegetative matter (e.g. twigs, branches) that is less than 3 feet in length and is bagged, bundled, or otherwise contained
 - very small amounts of vegetative matter that is less than 3 feet in length that is bagged, bundled, or otherwise contained and combined with other solid waste
 - Christmas trees
 - house plants

Source: Indiana Department of Environmental Management, "Important Notice Regarding The Yard Waste Disposal Ban" (http://www.in.gov/idem/files/nrpd_waste-0019.pdf)

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Why Compost? LANDFILLS AND THE LAW, cont.

- Composting allows for the reclamation and reuse of materials that would otherwise end up at Indiana's landfills and incinerators.
- The Indiana Department of Environmental Management administers a registration and annual reporting program for facilities composting vegetative matter.
- Indiana composting facilities process between 1 and 2 million cubic yards of vegetative matter annually – mostly leaves, wood, and brush.
- About half the compost produced each year is given away by local governments as part of their reuse and recycling efforts.

Source: Indiana Department of Environmental Management, "Managing Solid Waste: Indiana Composting Facilities"
(http://www.in.gov/idem/files/solid_waste_compost94-97.pdf)

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Why Compost? LANDFILLS AND THE LAW, cont.

FOR MORE INFORMATION, CONTACT:

Solid Waste Management District Of St. Joseph County
621 East Jefferson Boulevard
South Bend, IN 46617
Phone (574) 235-9971
Fax (574) 235-9973
<http://www.swmd.org/>



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Why Compost? IMPROVE YOUR SOIL

- Compost is created from the naturally decomposed parts of organic material such as manure, plants (yard wastes), and food (kitchen wastes).
- Its unique physical and chemical properties provide a number of benefits to soil, including:
 - Improved soil fertility
 - Improved soil structure
 - Improved water-holding capacity
 - Reduced erosion
 - Reduced levels of plant pathogens, insects, and weeds
- **Source:** Indiana Purdue Extension, "Home and Environment: Household Composting: Methods and Uses for Compost"
(<http://www.extension.purdue.edu/extmedia/HENV/HENV-103-W.pdf>)

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Why Compost? THE ENVIRONMENT

- Compost use can result in a variety of environmental benefits. The following are a few of the most important benefits:
 - Compost enriches soils
 - Compost helps cleanup (remediate) contaminated soil
 - Compost helps prevent pollution
 - Using compost can reduce the need for water, fertilizers, and pesticides
- **Source:** EPA, "Composting: Environmental Benefits"
(<http://www.epa.gov/epawaste/consERVE/rrr/composting/benefits.htm>)

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SOIL STRUCTURE: ADDITIVES

**There are 3 main types of “soil additives”
(aka soil amendments)
(aka soil conditioners)**

A soil amendment is any material added to a soil to improve its physical properties. The goal is to provide a better environment for roots.

- Decomposable Organic Materials
- Synthetic Organic Materials (aka Synthetic Chemical Fertilizers)
 - Inorganic Minerals

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SOIL STRUCTURE: ADDITIVES, cont.

**Organic Materials: Decomposable/Natural Organic Fertilizer
vs. Synthetic Chemical Fertilizers**

- Compared to synthetic fertilizers, organic fertilizers contain relatively low concentrations of actual nutrients
- However, organic fertilizers/amendments perform important functions that synthetic fertilizers do not
- Organic conditioners increase the organic content in the soil, and consequently the water-holding capacity of the soil
- Organic conditioners improve the physical structure of the soil which allows more air to get to plant roots
- Organic amendments increase the bacterial and fungal activity in the soil, which makes other nutrients more available to plants
- Plants thrive in soil where the organic matter content is high.
- Organically derived plant nutrients are slow to leach from the soil making them less likely to contribute to water pollution than synthetic fertilizers.

Excerpted from The Virginia Gardener Handbook via the Virginia Cooperative Extension, "Organic Fertilizers" (<http://tinyurl.com/22uhfi>)

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SOIL STRUCTURE: ADDITIVES, cont.

- **Decomposable organic amendments come from something that is or was alive.**
 - Organic amendments include sphagnum peat, wood chips, grass clippings, straw, compost, manure, biosolids, sawdust and wood ash.
- **Inorganic amendments are either mined or man-made.**
 - Inorganic amendments include vermiculite, perlite, tire chunks, pea gravel and sand.

Source: Colorado State Extension, "Choosing a Soil Amendment"
(<http://www.ext.colostate.edu/Pubs/Garden/07235.html>)

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WHAT DO SOIL CONDITIONERS DO?

- Improve Aeration
- Improve Moisture Retention
- Improve Drainage
- Tilth (soil workability)

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SOIL CONDITIONERS ...cont.

- Soil texture and structure can be modified by using soil conditioners.
- Soil conditioners act to improve soil aeration, drainage, moisture-holding capacity and tilth, or workability, of the soil.
- Commonly used soil conditioners include compost, peat moss, sawdust, wood chips, composted animal manures, green manure crops, coarse sand, and perlite.
- By incorporating coarse, rather than fine sand, and organic matter into a garden soil, the gardener can, over time, produce a desirable loamy-type soil. The addition of fine sand to some soils, especially clay, however, will be detrimental to the soil structure.
- Source: Ohio State University Extension: Horticulture and Crop Science: Improving Soils for Vegetable Gardening Fact Sheet (<http://ohioline.osu.edu/hyg-fact/1000/1602.html>)

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More on Soil Structure/Conditioners: Clay Soil and Sandy Soil...

- Compost helps to loosen heavy clay soil by opening pore spaces that allow air and water to penetrate into the soil.
- With composting, the fine particles in sandy soil are united into larger ones that can hold greater amounts of water.

Source: LandandWater.com, "The Dirt on Soil Amendments"
(http://www.landandwater.com/features/vol50no5/vol50no5_2.php)

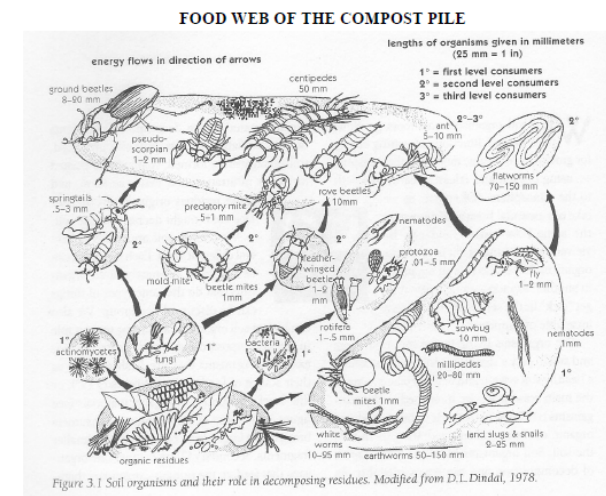
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Optimal Composting Conditions

- Oxygen: >5%
- Moisture: 40-60%
- Carbon:Nitrogen Ratio: 30:1
- Temperature: 90-140 F
- PH: 6-8

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Food Web of the Compost Pile



Source: Online at: <http://www.thegreenteam.org/Compostfoodwebposter.pdf>

See also: SoilFoodWeb.com:
http://www.soilfoodweb.com/03_about_us/approach_pgs/b_03_box_diagram.html

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C:N (Carbon:Nitrogen Ratio)...

A C:N ratio of 30:1 is ideal for the activity of compost microbes

The compost recipe:
moisture
+ air
+ time
+ browns & greens
COMPOST

BROWNS AND GREENS:

Carbon / Nitrogen Ratio: 30:1

- This is the big one—the one where most people fail.
- Carbons are **BROWNS**, nitrogens are **GREENS**
- Leaves, twigs, sawdust, ashes, straw, paper are all **BROWNS**
- Food waste, grass clippings, fresh weeds and manure are **GREENS**
- We have far more **BROWNS** than **GREENS** around us
- To solve this problem you may actually need to add synthetic organic fertilizer to your compost pile
- The New York City Compost Project website (<http://www.nyccompost.org/how/materials.html>) includes a great chart of **BROWNS** and **GREENS**

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C:N (Carbon:Nitrogen Ratio)...

A C:N ratio of 30:1 is ideal for the activity of compost microbes, cont.

HIGH NITROGEN MATERIALS (GREENS) –	C:N
Food Wastes	15:1
Grass Clippings	20:1
Manure	10-12:1

HIGH CARBON MATERIALS (BROWNS) --	C:N
Fruit Wastes	35:1
Leaves	40-80:1
Straw	80:1
Bark	100-130:1
Paper	150-200:1
Wood & Sawdust	300-723:1

See: Ohio State University Extension: Horticulture and Crop Science: Composting at Home Fact Sheet (<http://ohioline.osu.edu/hyg-fact/1000/1189.html>)

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COMPOST COOKBOOK!!

Abbreviation Key

N = nitrogen

NN= higher nitrogen

NNN= highest nitrogen

C=carbon

CC=higher carbon

CCC=highest carbon

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COMPOST COOKBOOK: Recipe #1

2 parts	Dry leaves	CC	Browns
2 parts	Straw or wood shavings	CCC	Browns
1 part	Manure	NNN	Greens
1 part	Grass clippings	NN	Greens
1 part	Fresh garden weeds	N	Greens
1 part	Food scraps	NN	

NOTE: Weed plants heavily laden with seeds might be better left out of the compost pile if the compost is to be returned to the garden. Even though some seeds are killed during composting, those that survive might create an unnecessary weed problem. (See Univ of Missouri Extension: Making and Using Compost (<http://extension.missouri.edu/explore/agguides/hort/G06956.htm>))

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COMPOST COOKBOOK: Recipe #2

3 parts	Dry leaves	CC	Browns
1 part	Fresh garden weeds	N	Greens
1 part	Fresh grass clippings	NN	Greens
1 part	Food scraps	NN	Greens

NOTE: Weed plants heavily laden with seeds might be better left out of the compost pile if the compost is to be returned to the garden. Even though some seeds are killed during composting, those that survive might create an unnecessary weed problem. (See Univ of Missouri Extension: Making and Using Compost (<http://extension.missouri.edu/explore/agguides/hort/G06956.htm>))

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COMPOST COOKBOOK: Recipe #3

6 parts	Dry leaves	CC	Browns
3 part	Fresh grass clippings	NN	Greens
3 part	Food scraps	NN	Greens



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COMPOST COOKBOOK: Recipe #4

3 parts	Dry leaves	CC	Browns
3 part	Fresh grass clippings	NN	Greens



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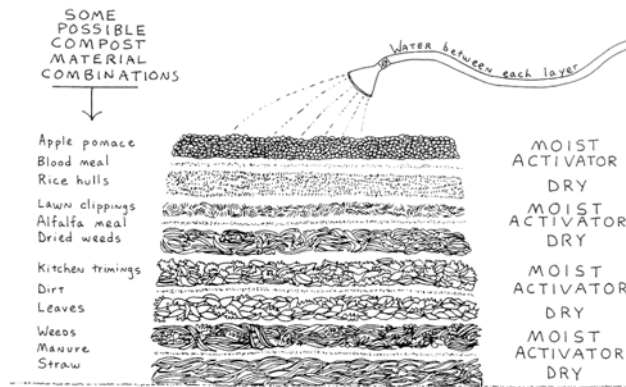
COMPOST COOKBOOK: Recipe #5

3 parts	Dry grass clippings	C	Browns
3 part	Fresh grass clippings	NN	Greens



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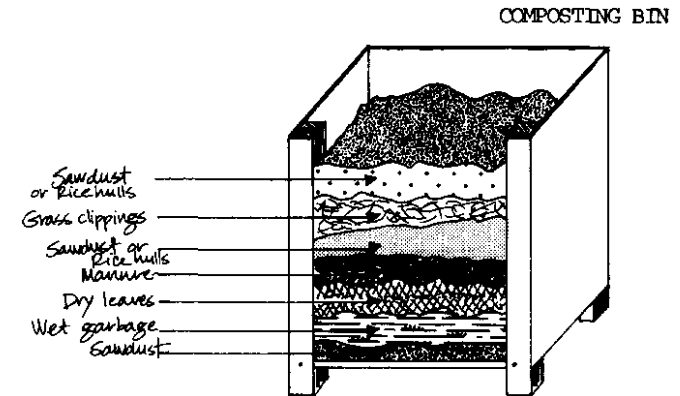
Composting: Layers...1 possibility



Source: Compostfun.com (<http://www.compostfun.com/>)

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Composting: Layers... another possibility

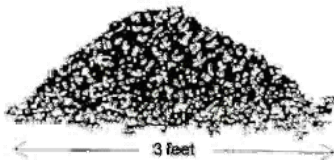


Source: The Biogas/Biofertilizer Business Handbook (Peace Corps, 1985), available online at (<http://tinyurl.com/cntyto>)

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Compost Mound

Yard wastes can be composted without a bin if you don't mind the appearance of an unconfined compost mound in your yard. The only costs are your time and effort and the benefits are a rich soil amendment, reduced waste to the landfills, and wonderful fresh veggies and flowers.



Source: Louisiana Department of Environmental Quality, "Compost Mound" (<http://www.deq.louisiana.gov/portal/tabid/2078/Default.aspx>)

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Compost Mound, cont.

What You Need

- shovel or pitchfork
- work gloves

Building a Compost Mound

Find a good location and pile your yard waste in a mound about 3 feet x 3 feet x 3 feet (1meter x 1 meter x 1 meter). If you cover the pile with a layer of soil, it will keep in moisture for the micro-organisms and soil animals working to make compost.

Source: Louisiana Department of Environmental Quality, "Compost Mound" (<http://www.deq.louisiana.gov/portal/tabid/2078/Default.aspx>)

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Compost Mound, cont.

Adding Wastes

Add wastes as they become available. Non-wood materials such as grass clippings and garden wastes work best.

Maintaining Your Compost

It's best to have two piles. After the first pile is large enough, stop adding organic material and let the material in the pile age or decompose. In the meantime, add your wastes to the second pile. Make sure the piles are kept moist, especially if they are not covered with soil.

You can turn the pile to speed composting process. Compost should be ready in three to four months if a good compostable mixture of organic materials is used and the pile is turned regularly. It will be ready in about one year if you don't turn the pile.

Source: Louisiana Department of Environmental Quality, "Compost Mound" (<http://www.deq.louisiana.gov/portal/tabid/2078/Default.aspx>)

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Compost Pockets

This is an easy composting shortcut!

What you will need: Food wastes, Shovel. Work gloves

Start by digging a hole about 18" deep. Place fruit, vegetable scraps and coffee grounds from the kitchen in the hole. Remember, don't use meat, fat, milk or eggs because animals will dig them up and eat them...

Next, cover the scraps with soil to bury them and fill the hole.

Now you can make more compost pockets in other locations.

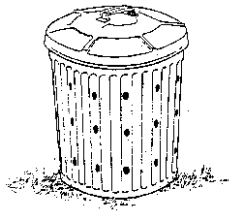
After about a month or two you can plant something on the spot where you made the compost pocket.

Source: Texas A&M University, "Composting for Kids" (<http://sustainable.tamu.edu/slidesets/kidscompost/compostingforkids.pdf>)

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Garbage Can Composter

A garbage-can composter is inexpensive and easy to build. It can be used for food or garden wastes. The wastes do, however, need to be turned.



Source: RRFB.com, "Garbage Can Composter" (http://www.rffb.com/pages/compost/Garbage_can.html)

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Garbage Can Composter, cont.

What you need:

- garbage can with cover
- coarse sawdust, straw or wood chips
- drill
- pitch fork, shovel or compost turner
- work gloves

Building a Garbage Can Composter

1. Drill three rows of holes 4 to 6 inches apart all around the sides of the garbage can. Then drill several holes in the base of the garbage can. The holes allow air movement and the drainage of excess moisture.

2. Place 2 to 3 inches of dry sawdust, straw or wood chips in the bottom of the can to absorb excess moisture and let the compost drain.

Source: RRFB.com, "Garbage Can Composter" (http://www.rffb.com/pages/compost/Garbage_can.html)

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Garbage Can Composter, cont.

Maintaining your Garbage Can Compost Pile

Regularly mix or turn the compost with a pitchfork, shovel, or compost turner and keep it covered. This adds air and mixes up the different wastes, preventing the compost from getting smelly. A smelly compost pile may attract animals and cause neighbors to complain.

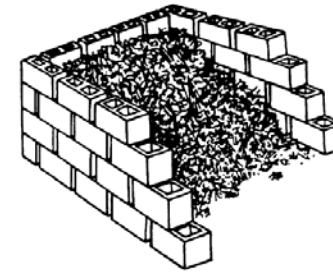
TIP: If the lid will stay on, try rolling the garbage can on its side to mix things up...

Source: RRFB.com, "Garbage Can Composter" (http://www.rafb.com/pages/compost/Garbage_can.html)

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Cinder Block Composting Bin

A cinder block bin is sturdy, durable, and easily accessible...



Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Bin" (<http://tinyurl.com/ce95mo>)

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Cinder Block Composting Bin

What you need:

- About 46 cinder blocks for the first bin
- Optional: about 32 blocks for a second bin
- Work Gloves

Building a Cinder Block Bin

1. Place 5 blocks in a row along the ground at your composting site, leaving about ½ inch between each block to let in air.
2. Place 4 blocks in another row along the ground perpendicular to and at one end of the first row, forming a square corner; leave about ½ inch between each block.
3. In the same way, place 4 blocks at the opposite end of the first row to form a 3-sided enclosure.

Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Bin" (<http://tinyurl.com/ce95mo>)

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Cinder Block Composting Bin, cont.

4. Add a second layer of blocks, staggering them to increase stability and leaving ½ inch between each block. There should be a layer of 4 blocks on each of the three walls of the enclosure.
5. Add a third layer of blocks, again staggering them, with 5 blocks across the back of the enclosure on each side.
6. The last and top layer should have 4 blocks across the back and 3 on each side.
7. Optional: If you wish to decrease your composting time, build a 2nd bin next to the first one so the wastes in one can mature while you add wastes to the 2nd one. Use one side wall of the first bin so you only need to build 2 additional walls.

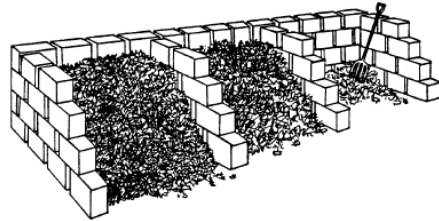
Maintenance: Although you do not need to turn this pile, keep things moist during dry spells. Compost should be ready in about 1 year or a little longer.

Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Bin" (<http://tinyurl.com/ce95mo>)

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Cinder Block Multiple Bin / Turning Unit

A cinder block multiple bin looks like three cinder block holding units in a row. It is sturdy, and if you can find used cinder blocks, it is relatively inexpensive to build.



Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Multiple Bin" (<http://tinyurl.com/c68sbl>)

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Cinder Block Multiple Bin / Turning Unit, cont.

What You Need

- about 98 cinder blocks
- work gloves

Building a Cinder Block Turning Unit

1. Place 12 cinder blocks in a row along the ground at your composting site, leaving about 1 inch between each block to let in air.
2. Place four cinder blocks in another row along the ground perpendicular to and at one end of the first row, forming a square corner; leave about 1 inch between each block.

Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Multiple Bin" (<http://tinyurl.com/c68sbl>)

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Cinder Block Multiple Bin / Turning Unit, cont.

3. In the same way, place four cinder blocks at the opposite end of the first row to form a three-sided enclosure.
4. Place two more rows - four cinder blocks each along the ground, parallel to the ends and evenly spaced within the enclosure. This divides the enclosure into three separate bins.
5. Add a second layer of blocks, staggering them to increase stability and leaving about 1 inch between each block. There should be a layer of 13 cinder blocks across the back and three blocks on the sides of each bin.
6. Add a third layer of blocks, again staggering them to increase stability, with 12 blocks across the back of the enclosure and three on each side.

Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Multiple Bin" (<http://tinyurl.com/c68sbl>)

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Cinder Block Multiple Bin / Turning Unit, cont.

7. The last and top layer should have 13 blocks across the back and two on each side

Adding Wastes

Do not add waste as it becomes available with this system. Collect enough waste to fill one of the three bins at one time. You can collect woody as well as non-wood waste. Add thin layers of different kinds of organic materials or mix the wastes together. Before adding new waste to an empty bin, collect enough to fill the entire bin.

Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Multiple Bin" (<http://tinyurl.com/c68sbl>)

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Cinder Block Multiple Bin / Turning Unit, cont.

Maintaining Compost

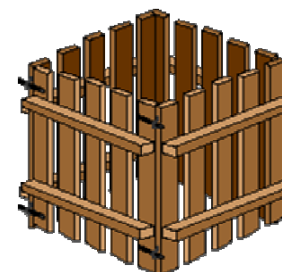
Take the temperature of your pile every day. After a few days, the temperature should reach between 130° and 140°F (54° to 60°C). If your pile gets very hot, turn it before the temperature gets above 155°F (68°C). In a few days, when the temperature starts going down, turn your compost pile into the next bin with a pitchfork. The temperature of your compost pile will increase again and then, in about four to seven days, start to drop. Turn your compost pile into the third bin. Continue to take the temperature and turn the compost pile until the compost is ready. The compost should be stable within two to three months.

Source: Louisiana State University Agricultural Center, "Backyard Composting, Cinder Block Multiple Bin" (<http://tinyurl.com/c68sbl>)

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Wooden Pallet Compost Bin

Wooden pallets can make an inexpensive and durable compost bin. The bin can be used as a holding or turning unit. Used pallets are often available from local businesses, manufacturers or landfills.



Source: University of Wisconsin, Milwaukee Extension, "Wood Pallet Compost Bin" (<http://tinyurl.com/c5fp2r>)

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Wooden Pallet Compost Bin, cont.

Cost: Less than \$30

Capacity: Holds 1 cu yd or 8 to 10 30 gal bags of yard materials

Materials:

- 4 wooden pallets (5 if want a bottom for bin), sized to make a four-sided container at least 3 feet x 3 feet x 3 feet
- 8 large hook and eye gate latches (bolt latches, rope or bailing wire are also options)

Tools:

- Level
- Shovel
- Work gloves

Source: University of Wisconsin, Milwaukee Extension, "Wood Pallet Compost Bin" (<http://tinyurl.com/c5fp2r>)

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Wooden Pallet Compost Bin, cont.

Construction Details:

1. Level ground at location where pallet bin will sit.
2. Connect four pallets with hooks and eyes or bolt latches to make a four-sided bin at least 3 feet x 3 feet x 3 feet. The bin is then ready to use. To turn the pile, unhook the sides, set up pallets next to existing pile and transfer compost materials to the empty pallet bin. The pallets can also be tied or wired together.
3. (Optional) A fifth pallet may be used as a base to allow more air to get into the pile and to increase the stability of the bin. However, this base pallet will decompose faster than the sides and make turning the bottom of the pile more difficult.

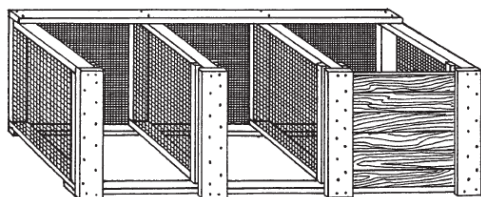
Source: University of Wisconsin, Milwaukee Extension, "Wood Pallet Compost Bin" (<http://tinyurl.com/c5fp2r>)

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Wood and Wire Three-Bin Turning Unit

A wood-and-wire three-bin turning unit can be used to compost large amounts of yard, garden and kitchen wastes in a short time.

Although relatively expensive to build, it is sturdy, attractive and should last building three more frames with a long time. Construction requires the remaining 12-foot lengths of basic carpentry skills and tools.



Wood-and-Wire Three-Bin Turning Compost Bin

Source: University of Arkansas, Division of Agriculture Extension, "Wood and Wire Three-Bin Turning Unit" (<http://tinyurl.com/dhot9g>)

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Wood and Wire Three-Bin Turning Unit, cont.

MATERIALS

Lumber should be cedar, pine painted with nontoxic wood preservative or latex paint, or recycled composite lumber:

- Four 12-foot lengths of 2 x 4 lumber
- Two 10-foot lengths of 2 x 4 lumber
- One 10-foot length of 2 x 4 lumber
- One 16-foot length of 2 x 6 lumber
- Six 8-foot lengths of 1 x 6 lumber
- One 22-foot length of 36-inch wide 1/2-inch hardware cloth
- 16d galvanized nails (2 pounds)
- Poultry wire staples (250) or a power stapler with 1 inch galvanized staples
- Twelve 1/2-inch carriage bolts, 4 inches long, with washers and nuts
- One quart wood preservative or stain

Optional materials - for lids

- One 4 x 8 foot sheet of 1/2-inch exterior plywood
- One 4 x 4 foot sheet of 1/2-inch exterior plywood
- Six 3-inch zinc-plated hinges
- Twenty-four 3/16-inch galvanized steel bolts, with washers and nuts
- Tape measure
- Hand saw or circular power saw
- Hammer
- Tin snips
- Carpenter's square
- Drill with 3/16-inch and 1/2-inch bits
- Screwdriver
- Adjustable wrench
- Pencil
- Safety glasses, ear protection, dust mask and work gloves

Source: University of Arkansas, Division of Agriculture Extension, "Wood and Wire Three-Bin Turning Unit" (<http://tinyurl.com/dhot9g>)

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Wood and Wire Three-Bin Turning Unit, cont.

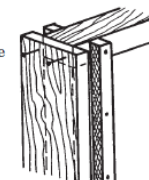
1. Cut two 31 1/2-inch and two 36-inch pieces from a 12-foot length of 2 x 4 lumber. Butt-joint and nail the four pieces into a 35-inch x 36-inch "square." Repeat, building three more frames with the remaining 12-foot lengths of 2 x 4 lumber.
2. Cut four 37-inch lengths of hardware cloth. Fold back the edges of the wire 1 inch. Stretch the pieces of hardware cloth across each frame. Make sure the corners of each frame are square and then staple the screen tightly into place every 4 inches around the edge. The wood-and-wire frames will be dividers in your composter.
3. Set two dividers on end, 9 feet apart and parallel to one another. Position the other two dividers so that they are parallel to and evenly spaced between the end dividers. Place the 36-inch edges on the ground. Measure the position of the centers of the two inside dividers along each 9-foot edge.
4. Cut a 9-foot piece from each 10-foot length of 2 x 4 lumber. Place the two boards across the tops of the dividers so that each is flush against the outer edges. Measure and mark on the 9-foot boards the center of each inside divider.
5. Line up the marks, and through each junction of board and divider, drill a 1/2-inch hole centered 1 inch from the edge. Secure the boards with carriage bolts, but do not tighten them yet. Turn the unit so that the treated boards are on the bottom.
6. Cut one 9-foot piece from the 10-foot length of 2 x 4 lumber. Attach the board to the back of the top by repeating the process used to attach the base boards. Using the carpenter's square, or measuring between opposing corners, make sure the bin is square. Tighten all the bolts securely.

Source: University of Arkansas, Division of Agriculture Extension, "Wood and Wire Three-Bin Turning Unit" (<http://tinyurl.com/dhot9g>)

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Wood and Wire Three-Bin Turning Unit, cont.

7. Fasten a 9-foot length of hardware cloth to the back side of the bin with staples every 4 inches around the frame.
8. Cut four 36-inch long pieces from the 16-foot length of 2 x 6 lumber for front runners. (Save the remaining 4-foot length.) Rip-cut two of these boards to two 4 3/4-inch wide strips. (Save the two remaining strips.)
9. Nail the 4 3/4-inch wide strips to the front of the outside dividers and baseboard so that they are flush on the top and the outside edges. Center the two remaining 6-inch wide boards on the front of the inside dividers flush with the top edge and nail securely.
10. Cut the remaining 4-foot length of 2 x 6 lumber into a 34-inch long piece, and then rip-cut this piece into four equal strips. Trim the two strips saved from step number eight to 34 inches. Nail each 34-inch strip to the insides of the dividers so that they are parallel to and 1 inch away from the boards attached to the front. This creates a 1-inch vertical slot on the inside of each divider.
11. Cut the six 8-foot lengths of 1 x 6 lumber into 18 slats, each 31 1/4 inches long. Insert the horizontal slats, six per bin, between the dividers and into the vertical slots.



Source: University of Arkansas, Division of Agriculture Extension, "Wood and Wire Three-Bin Turning Unit" (<http://tinyurl.com/dhot9g>)

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Wood and Wire Three-Bin Turning Unit, cont.

12. (Optional) Cut the 4 x 8-foot sheet of exterior plywood into two 3 x 3-foot pieces. Cut the 4 x 4-foot sheet of exterior plywood into one 3 x 3-foot piece on one of the three bins, and attach each to the back, top board with two hinges.

13. Paint or stain all untreated wood.

Adding Wastes

With this type of bin, do not add wastes as they become available. Collect enough waste to fill one of the three bins. Collect woody as well as nonwood wastes. Chopping and shredding materials are recommended. Layer different materials in, or you can mix the wastes together.

Maintaining the Pile

After a few days, the temperature of the pile should reach between 130°-140°F. In a few days, the temperature will start to drop. (You may want to monitor the temperature with a thermometer.) When the temperature starts to drop, turn the compost into the next bin. The temperature of the pile will increase again and then, in four to seven days, start to drop. Turn the compost into the third bin. The total time for composting should be four to six weeks.

Source: University of Arkansas, Division of Agriculture Extension, "Wood and Wire Three-Bin Turning Unit" (<http://tinyurl.com/dhot9g>)

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Compost Bins Vs. Compost Tumblers

Which is better?

Really, it all depends on who you ask and what their current lifestyle is like.



Garden Gourmet compost bin



The popular Compost Tumbler

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Source: Articlebase.com, Compost Bins vs. Compost Tumblers (<http://tinyurl.com/d4ocyx>)

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Compost Bins Vs. Compost Tumblers, cont.

Compost Bins:

- Easy to use
- Often just as easy to put together as a tumbler, with few to no parts
- Popular manufactured compost bins, like ones you can buy on Composters.com (Expandable Worm Tower & Garden Gourmet, for example) have few parts and take about 20 minutes to assemble.
- Personally turning compost with a pitchfork or other tool can be satisfying and good exercise
- For the Expandable Worm Tower and other vermiculture-type bins, the worms do most of the work (vermiculture = worm casting compost)
- Can get messy when evacuating the finished compost
- Do take quite a bit of time and a commitment to maintain (turn the compost, etc.)

Source: Articlebase.com, Compost Bins vs. Compost Tumblers (<http://tinyurl.com/d4ocyx>)

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Compost Bins Vs. Compost Tumblers, cont.

Compost Tumblers:

- A bit more expensive than manufactured compost bins
- Ideal for those who don't have as much time on their hands
- No need to manually turn the compost
- The whole point of a tumbler is that you can easily rotate it via a crank or just by spinning it, therefore aerating the compost inside
- Can get messy especially if you have to roll the tumbler around the yard when the compost is not yet ready
- Depending on the model, you may have to purchase the compost tea collector separately

Source: Articlebase.com, Compost Bins vs. Compost Tumblers (<http://tinyurl.com/d4ocyx>)

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Compost Bins Vs. Compost Tumblers, cont.

It's all about personal preference, and based on your lifestyle and other time commitments...

Additional resources for consideration:

MotherEarthNews.com, "Compost Tumblers" (<http://tinyurl.com/db3m7u>) -- Mother Earth News tests several compost tumblers and shares results, including tumbler styles, feature pros and cons, operating factors, test results.

Gardening Tips n Ideas.com, "A Review of Garden Compost Tumblers" (<http://tinyurl.com/dcs3ux>)

Go Organic.com, "Compost Tumbler or Worm Farm-Which is Best?" (<http://goorganicgardening.com/compost/compost-tumble-or-worm-farm-which-is-best>)

EzineArticles.com, "Pros And Cons Of Compost Tumblers" (<http://tinyurl.com/csbr62>)

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Mulching

WHY MULCH?

- Enriches the soil
- Protects the soil from erosion
- Preserves water
- Helps to keep roots cool
- Helps prevent freezing and thawing damage to plants
- Prevents weed growth



Source: Natural Resources Conservation Service (NRCS), "Backyard Conservation" (<http://tinyurl.com/dn75dp>)

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Mulching, cont.

Applying mulch

Apply mulch when plants are established and soil is warm.

First, water your garden well. Then place a layer of mulch around the plants.

Thickness of the mulch layer varies for each material:

- | | |
|---|---------------|
| ❖ Dry grass clippings | 2 inches |
| ❖ Shredded hardwood mulch, straw, or wood chips | 2 to 4 inches |
| ❖ Compost | 3 to 4 inches |
| ❖ Dry leaves | 6 inches |

Source: Natural Resources Conservation Service (NRCS), "Backyard Conservation" (<http://tinyurl.com/dn75dp>)

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Yard Waste FAQ's

{Choose all that are true statements}

1. Grass clippings left on the lawn will:
 - a. Decrease watering needs
 - b. Increase occurrence of thatch
 - c. Kill the grass
 - d. Add some nitrogen, decreasing the need for fertilizer

Find the answers at:

➤ Connecticut Department of Environmental Protection (CT.gov), "Don't Trash Grass" (<http://tinyurl.com/c8qlkv>)

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Yard Waste FAQ's, cont.

- How often should you mow your lawn? (Find the answer at Purdue University Extension, "Mowing" [<http://www.purdue.edu/envirosoft/lawn/src/mowing2.htm>])
- What ratio of Carbon:Nitrogen is optimum for composting yard wastes? (Find the answer at (Ohio State University Extension: Horticulture and Crop Science: Composting at Home Fact Sheet [<http://ohioline.osu.edu/hyg-fact/1000/1189.html>])
- What causes foul odors in compost? (Find the answer at Purdue University Extension, "Composting Turns Trash to Treasure" [<http://www.hort.purdue.edu/ext/comp-treasure.html>])
- Which of the following materials are suitable for composting?

Dry leaves	Grass clippings	Diseased plants
Fruit scraps	Nitrogen fertilizer	Limestone
Vegetable scraps	Bones	Egg shells
Insect infested plants	Weeds	Sawdust
Large tree limbs	Fats/oils	Dead garden plants

(Find the answer at Florida's Online Composting Center, "Can I Compost It?" [<http://www.compostinfo.com/tutorial/CanICompostIt.htm>]. See also: See Univ of Missouri Extension: Making and Using Compost [<http://extension.missouri.edu/explore/agguides/hort/G06956.htm>])

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Yard Waste FAQ's, cont.

- A good sized compost pile will reach what temperature in the center? (Find the answer at (Ohio State University Extension: Horticulture and Crop Science: Composting at Home Fact Sheet [<http://ohioline.osu.edu/hyg-fact/1000/1189.html>])
- Why is it important to turn the compost pile? What causes foul odors in compost? (Find the answer at Univ of Missouri Extension: Making and Using Compost [<http://extension.missouri.edu/explore/agguides/hort/G06956.htm>])
- How do you know when the compost is finished decaying? (Find the answer at Univ of Missouri Extension: Making and Using Compost [<http://extension.missouri.edu/explore/agguides/hort/G06956.htm>])
- List 4 ways compost can be contained (Find the answer by reviewing the information above)
- List 3 uses of compost in the garden and landscape (Find the answers at Virginia Cooperative Extension, "Using Compost in your Landscape" [<http://tinyurl.com/co2sf5>] and Purdue University Cooperative Extension Service, "Managing Yard Wastes: Clippings and Compost" [<http://www.hort.purdue.edu/ext/ID-182.pdf>])

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Composting Books

Check your local library or bookstore...

The St. Joseph County Public Library can be reached at 574-282-4646
The Mishawaka-Penn-Harris Public Library can be reached at 574-259-5277

Compost This Book – The Art of Composting (<http://tinyurl.com/d7ipwm>)
The Dirt Doctor's Guide to Organic Gardening (<http://tinyurl.com/crx3rh>)
Easy Composting – Environmentally Friendly Gardening (<http://tinyurl.com/d2qzcp>)
Great Garden Shortcuts (<http://tinyurl.com/dff6jz>)
Indiana Yard Waste Solutions (<http://tinyurl.com/d3amzk>)
Let it Rot – The Gardener's Guide to Composting (<http://tinyurl.com/dl65oh>)
Maria Rodale's Organic Gardening: Your Seasonal Companion to Creating a Beautiful and Delicious Garden (<http://tinyurl.com/c4aqvd>)
The Mulch Book (<http://tinyurl.com/dkxh5v>)
Mulch It! (<http://tinyurl.com/dyw5q9>)
The Organic Garden Book (<http://tinyurl.com/cwd4ts>)
Organic Gardening for Dummies (<http://tinyurl.com/c6uob3>)
Rodale's Chemical-Free Yard and Garden (<http://tinyurl.com/c33esq>)

More Choices from your library can be seen at <http://tinyurl.com/c53oy9>

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SOIL AND WATER CONSERVATION DISTRICTS

- Your local Soil & Water Conservation District (SWCD) can provide an excellent resource for environmental education. Each SWCD is different in its personnel and how it can help. The SWCD is a non-profit affiliate with the State Government and is run by five supervisors, who are volunteers. Located in each office that the SWCD is housed within is the Federal government's Natural Resources Conservation Service (NRCS) and the State's Division of Soil Conservation (the SWCD). Together, we make up the Conservation Partnership for your county. As partners, we firmly believe in environmental education and in helping to spread the environmental word.

YOUR local SWCD's ...

St. Joseph County SWCD 574-291-7444 ext 3 www.stjoseph.iaswcd.org	Wabash County SWCD 260-563-7486 ext 3	LaGrange County SWCD 260-463-3471 www.lagrangeswcd.org/
Elkhart County SWCD 574-533-3630 www.elkcoswcd.org	Kosciusko County SWCD 260-267-7445 ext 3	Miami County SWCD 765-473-6753 Ext. 3
Fulton County SWCD 574-223-3220	Marshall County SWCD 574-936-2024 ext. 3 www.marshallcountyswcd.iaswcd.org/	

Learn more at the Indiana Association of Soil & Water Conservation Districts website (www.iaswcd.org)

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