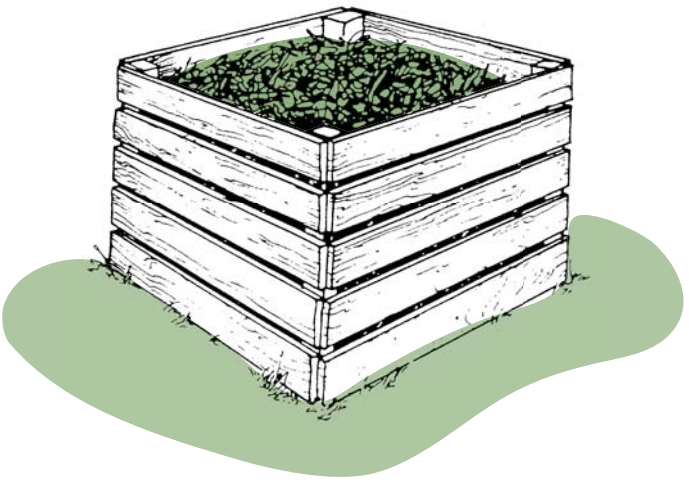
Redesigned reprint (with publisher's permission) of *Composting to Reduce the Waste Stream: A Guide to Small Scale Food and Yard Waste Composting*, NRAES-43, by Nancy Dickson, Thomas Richard, and Robert Kozlowski; published by NRAES, the National Resource, Agricultural, and Engineering Service, Cooperative Extension, 152 Riley-Robb Hall, Ithaca, New York 14853-5701. (607) 255-7654.

PLEASE NOTE - to prevent problems with rodents, etc., the Baltimore County Code prohibits placing ***any*** type of food material in compost piles or bins. Worm bins are acceptable.

PLANS FOR CONSTRUCTING COMPOST BINS



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YOUR "WASTE," YOUR RESPONSIBILITY.
Baltimore County Bureau of Solid Waste Mgmt.

WOODEN-PALLET HOLDING UNIT

A holding unit can be built inexpensively using wooden pallets, or pressure-treated lumber may be used to make a nicer looking bin. The costs will vary, depending on whether new lumber or pallets are used. Used pallets are often available from manufacturers and landfills.

Building a Holding Unit Using Wooden Pallets

1. Nail or wire four pallets together to make a four-sided bin at least 3 feet x 3 feet x 3 feet. The bin is then ready to use.
2. A fifth pallet can be used as a base, to allow more air to get into the pile and to increase the stability of the bin.

Building a Holding Unit Using Lumber

1. Saw the 8-foot lengths of 2 x 4 pressure-treated lumber into four pieces, each 4 feet long, to be used as corner posts.
2. Choose a 3-foot-square site for your compost bin. Use the sledge hammer to pound the four posts into the ground 3 feet apart, at the corners of the square.
3. Saw each of the five 12-foot boards into four 3-foot pieces. Allowing 5 boards to a side and, starting at the bottom, nail the boards to the posts to make a four-sided container. Leave 2 inches between the boards to allow air to get into the pile.
4. If you wish to decrease your composting time, build a second holding unit so that the wastes in one can mature while you add wastes to the other.

Materials

- four wooden pallets (five pallets if you want a bottom in the container), sized to make a four-sided container at least 3 feet x 3 feet x 3 feet
- nails
- baling wire

or

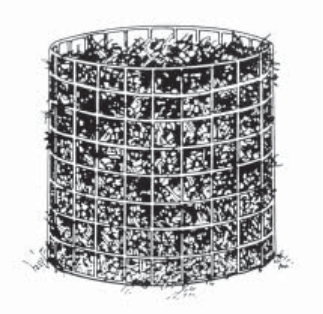
- two eight-foot lengths of 2 x 4 pressure-treated lumber
- five 12-foot lengths of 1 x 6 pressure-treated lumber
- galvanized 8d nails (1 pound)

Tools

- saw
- sledge hammer
- claw hammer
- work gloves

WIRE-MESH HOLDING UNIT

A wire-mesh holding unit is inexpensive and easy to build out of either galvanized chicken wire or hardware cloth. (Nongalvanized chicken wire can also be used, but will not last very long.) Posts provide more stability for a chicken wire bin, but make the bin difficult to move. A wire-mesh bin made without posts is easy to lift, and provides access to the compost that is already "done" at the bottom of the pile while the compost at the top of the pile is still decomposing.



Materials

- at least a 10-foot length of 36-inch-wide 1-inch galvanized chicken wire

or

- at least a 10-foot length of ½-inch-wide hardware cloth (Note: the maximum bin diameter for a given length of chicken wire is the length of chicken wire divided by 3.14.)
- heavy wire for ties
- three or four 4-foot-tall wooden or metal posts (for chicken wire bin)

Optional Material for Lid

- at least a 3-foot additional length of 36-inch-wide, ½-inch hardware cloth

Tools

- heavy-duty wire or tin snips
- pliers
- hammer (for chicken wire bin)
- metal file (for hardware cloth bin)
- work gloves

Building a Wire-Mesh Holding Unit Using Chicken Wire

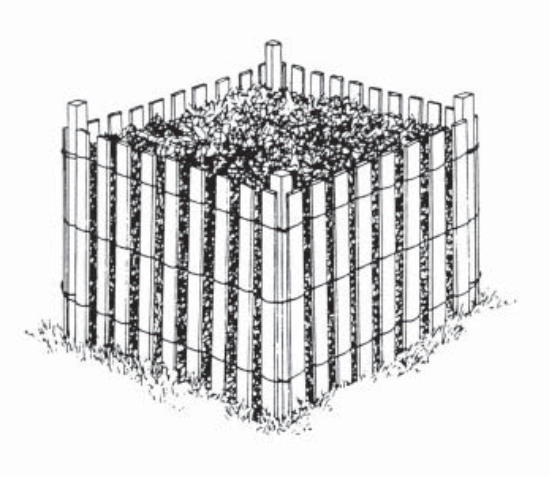
1. Fold back 3 to 4 inches of wire at each end of the cut piece to provide a strong, clean edge that will not poke or snag, and that will be easy to latch.
2. Stand the wire in a circle and set it in place for the compost pile.
3. Cut the heavy wire into lengths for ties. Attach the ends of the chicken wire together with the wire ties, using pliers.
4. Space wood or metal posts around the inside of the chicken-wire circle. Holding the posts tightly against the wire, pound them firmly into the ground to provide support.

Building a Wire-Mesh Holding Unit Using Hardware Cloth

1. Trim the ends of the hardware cloth so that the wires are flush with a cross wire to get rid of edges that could poke or scratch hands. Lightly file each wire along the cut edge to ensure safe handling when opening and closing the bin.
2. Bend the hardware cloth into a circle, and stand it in place for the compost pile.
3. Cut the heavy wire into lengths for ties. Attach the ends of the hardware cloth together with the wire ties, using pliers.

SNOW-FENCE HOLDING UNIT

A snow-fence holding unit is simple to make. It works best with four posts pounded into the ground for support.



Building a Snow-Fence Holding Unit

1. Choose a 3-foot-square site for your holding unit, and pound the four wooden or metal posts into the ground 3 feet apart, at the corners of the square.
2. Cut the heavy wire into lengths for ties. Attach the snow fence to the outside of the posts with the wire ties, using pliers.
3. Attach the ends of the snow fence together in the same way, forming a 3-foot-square enclosure.

Materials

- four wooden or metal posts, 4-5 feet long (Use pressure-treated lumber for the wooden posts.)
- heavy wire for ties
- a 13-foot length of snow fencing, at least 3 feet tall (a 16-foot length with optional top)

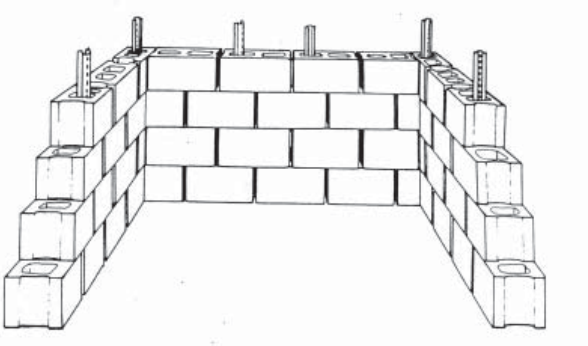
Tools

- heavy-duty wire or tin snips
- pliers
- sledge hammer
- work gloves

See the last page for another bin that is simple to build!

CONCRETE-BLOCK HOLDING UNIT

A concrete-block holding unit is sturdy, durable, and easily accessible. If the concrete blocks must be purchased, a concrete-block holding unit may be slightly more expensive to build than the wire-mesh or snow-fence holding units. The concrete-block unit cannot be conveniently pest-proofed.



Materials and Tools

- about forty-six concrete blocks for the first bin
- (optional) about thirty-two blocks for a second bin
- wooden or metal posts to stabilize the bin
- work gloves

Building a Concrete-Block Holding Unit

1. Place five concrete blocks in a row along the ground at the composting site, leaving about ½ inch between each block to let in air.
2. Place four concrete 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 four concrete blocks at the opposite end of the first row to form a three-sided enclosure.
4. Add a second layer of blocks, staggering them to increase stability and leaving about ½ inch between each block. There should be a layer of four concrete blocks on each of the three walls of the enclosure.
5. Add a third layer of blocks, again staggering them to increase stability, with five blocks across the back of the enclosure and three on each side.
6. The last, and top, layer should have four blocks across the back and three on each side.
7. To make the bin more stable, drive wooden or metal posts through the holes in the blocks.
8. (Optional) If you wish to decrease your composting time, build a second bin next to the first, so that the wastes in one can mature while you add wastes to the other. Use one side wall of the first bin so that you only need to build two additional walls.

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 a long time. Construction requires basic carpentry skills and tools. With optional lids and bottom, this unit can be made rodent-resistant.

Materials

- four 12-foot lengths of pressure-treated 2 x 4 lumber
- two 10-foot lengths of pressure-treated 2 x 4 lumber
- one 10-foot length of construction-grade 2 x 4 lumber
- one 16-foot length of 2 x 6 lumber
- six 8-foot lengths of 1 x 6 lumber
- a 22-foot length of 36-inch-wide ½-inch hardware cloth
- 16d galvanized nails (2 pounds)
- poultry wire staples (250)
- twelve ½-inch carriage bolts, 4 inches long, with washers and nuts
- one quart wood preservative or stain

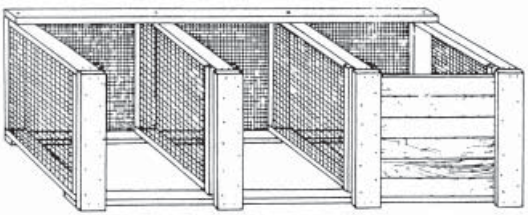
Optional Materials - For Lids and Bottom

- one 4-x-8-foot sheet of ½-inch exterior plywood
- one 4-x-4-foot sheet of ½-inch exterior plywood
- six 3-inch zinc-plated hinges
- twenty-four 3/16-inch galvanized steel bolts, with washers and nuts
- sufficient galvanized sheet metal to cover bottom of bins

Tools

- tape measure
- hand saw or circular power saw
- hammer
- tin snips

Tools continued on next page >



Building a Wood-and-Wire Three-Bin System

1. Cut two 31 ½-inch and two 36-inch pieces from a 12-foot length of pressure-treated 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.

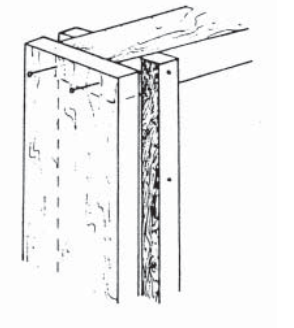
2. Cut four 37-inch lengths of hardware cloth. Fold back the edges of the wire 1 inch. Stretch the pieces of hardware cloth across each frame. Make sure the corners of each frame are square and then staple the screen tightly into place every 4 inches around the edge. The wood-and-wire frames will be 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.

Tools Continued

- carpenter's square
- drill with 3/16-inch and ½-inch bits
- screwdriver
- adjustable wrench
- pencil
- safety glasses, ear protection, dust mask, and work gloves

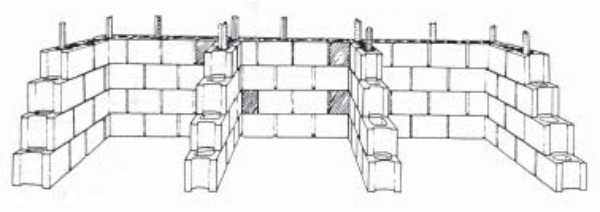
4. Cut a 9-foot piece from each 10-foot length of pressure-treated 2 x 4 lumber. Place the two treated boards across the tops of the dividers so that each is flush against the outer edges. Measure and mark on the 9-foot boards the center of each inside divider.
5. Line up the marks, and through each junction of board and divider, drill a ½-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 construction-grade 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 opposite corners, make sure the bin is square. Tighten all the bolts securely.
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 ¾-inch-wide strips. (Save the two remaining strips.)
9. Nail the 4 ¾-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 eighteen slats, each 31 ¼ inches long. Insert the horizontal slats, six per bin, between the dividers and into the vertical slots.
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. (Optional) For complete rodent protection, cut sheet metal to fit bottoms of bins.
14. Stain all untreated wood.

CONCRETE-BLOCK 3-BIN TURNING UNIT

A concrete-block turning unit looks like three concrete-block holding units in a row. It is sturdy and, if used concrete blocks are available, it is inexpensive to build. The concrete-block unit cannot be conveniently pest-proofed.

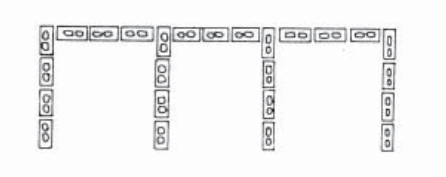


Materials and Tools

- eighty-six concrete blocks
- four concrete half-blocks
- work gloves
- wooden or metal posts to stabilize the bin

Building a Concrete-Block Turning Unit

1. Place twenty-five concrete blocks along the ground at the composting site as shown in the illustration below. Leave about ½ inch between each block to let in air.

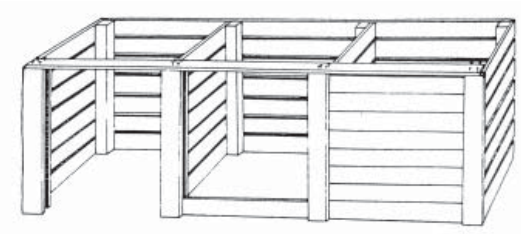


2. Add a second layer of blocks, staggering them to increase stability. Using the turning unit illustration above as a guide, place ten full and two half-blocks along the back wall, and three blocks along each side. Leave about ½ inch between each block.
3. Add a third layer of blocks, again staggering them to increase stability. Place twelve blocks across the back of the enclosure and three blocks on each side.
4. The last, and top, layer should have ten full and two half-blocks across the back and two full blocks along each side.
5. To make the unit more stable, drive wooden or metal posts through the holes in the blocks.

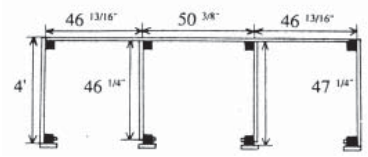
The illustration above shows a concrete block with a central slit that makes it easy to split into two half blocks. Score each side of the block in the plane of the slit with a chisel. Then use the chisel and a hammer to split the block along the score.

WOODEN THREE-BIN TURNING UNIT

This turning unit is a permanent, sturdy structure, but it may be difficult to space the posts to the exact dimensions illustrated. Before cutting the removable slats that slide into the grooves at the front of each bin, cut one slat and check for proper fit in each bin.



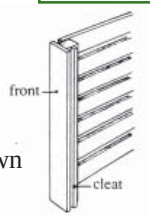
1. On level ground, set the eight posts as shown below using a post hole digger. (The posts are shown as darkened squares.) Embed each post 2 feet into the ground. Be sure all posts are plumb (perpendicular to the ground). The top of each post should be the same distance above the ground (48 inches).



[Note: dimensions given for the back are included to assist in post spacing.]

2. Nail (or screw) on the back and side slats and dividers (pre-drill all holes to prevent splitting). Use adhesive on all joints. The bottom slats should be at ground level. Leave 1 ½-inch (horizontal) spaces between slats. Note that the ends of the dividers should come out to 1 inch behind the front of the front posts, as shown in the illustration above.

3. Install the fronts and cleats, as shown for one of the center divider posts at right.



4. After the front slats have been sized and cut, slide them into place between the fronts and cleats as shown in the completed bin illustration above.

5. (Optional) Nail the top rail to each front post, as shown in the completed bin illustration above. Do not use adhesive, and do not drive the nails in fully, as they will be removed to allow access to the slats. The top rail is suggested to prevent the front posts from moving laterally. Another option to discourage this is to use 4-inch x 4-inch x 7-foot posts and embed them one foot deeper.

Materials

(All lumber should be pressure-treated)

- eight 4-inch x 4-inch x 6-foot posts
- seven 1-inch x 6-inch x 12-foot back slats
- fourteen 1-inch x 6-inch x 4-foot end/side slats
- four 1-inch x 6-inch x 4-foot fronts
- fourteen 1-inch x 6-inch x 46 ¼-inch dividers
- twenty-four 1-inch x 6-inch x 42 13/16-inch (approximate) front slats
  [Note: before cutting all the front slats, cut one and check for proper fit in each bin.]
- four 1-inch x 1(+)-inch x 4-foot cleats, rip cut from one four-foot 1 x 6 (the cleats are retainers for slats)
- 8d galvanized deck nails or deck screws
- one tube exterior construction adhesive
- (optional) one 1-inch x 6-inch x 12-foot top rail

Tools

- post hole digger
- hammer
- saw
- tape measure
- drill

WORM COMPOSTING BIN

Worm composting is a suitable composting option for apartment buildings or other homes with no yard space. The worms stay in the bin and eat household scraps, and the bin gives off little odor.

Materials

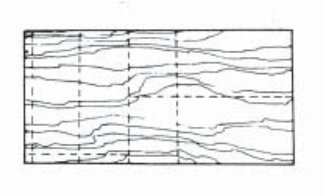
- one 4-x-8-foot sheet of ½-inch exterior plywood
- one 12-foot length of 2 x 4 lumber
- one 16-foot length of 2 x 4 lumber
- 16d galvanized nails (½ pound)
- 6d galvanized nails (2 pounds)
- two galvanized door hinges
- (optional) one pint of clear varnish
- (optional) plastic sheets for placing under and over the bin
- one pound of worms for every ½ pound of food wastes produced per day (The classified sections of many popular fishing and gardening magazines contain current listings of firms that market red worms.)
- bedding for worms: peat moss, brown leaves, moistened, shredded newspaper or moistened, shredded cardboard

Tools

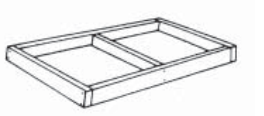
- tape measure
- skill saw or hand saw
- hammer
- sawhorse
- long straight-edge or chalk snap line
- screwdriver
- drill with ½-inch bit
- eye and ear protection
- work gloves
- (optional) paint brush

Building a Worm Composting Bin

1. Measure and cut the plywood as shown, so that you have one 24-x-42-inch top, one 24-x-42-inch base, two 16-x-24-inch ends, and two 16-x-42-inch sides.



2. Cut the 12-foot length of 2 x 4 lumber into 5 pieces: two 39-inch pieces, two 23-inch pieces, and one 20-inch piece.
3. Lay the five pieces on edge on a flat surface to form a rectangle, with the long pieces on the inside and the 20-inch length centered parallel to the ends. Nail the pieces together with two 16d nails at each joint.



4. Nail the 23-x-42-inch piece of plywood onto the frame with 6d nails every 3 inches.

5. Cut four 1-foot lengths from the 16-foot length of 2 x 4 lumber. (Save the remaining 12-foot piece.) Take the two 16-x-42-inch pieces of plywood and place a 1-foot length flat against each short end and flush with the top and side edges. Nail the 2 x 4s in place using 6d nails.
6. Set the plywood sides up against the base frame so that the bottom edges of the 2 x 4s rest on top of the base frame and the bottom edges of the plywood sides overlap the base frame. Nail the plywood sides to the base frame using 6d nails.
7. To complete the bin, nail the 16-x-24-inch pieces of plywood onto the base and sides at each end.
8. To reinforce the bin, stagger nails at least every 3 inches wherever plywood and 2 x 4s meet.
9. Drill twelve ½-inch holes through the plywood bottom of the bin for drainage.
10. To build lid frame, cut the 12-foot piece (from the 16-foot length) of 2 x 4 lumber into two 45-inch pieces and two 20-inch pieces. Lay the pieces flat, forming a rectangle with the short pieces inside.
11. Lay the 24-x-42-inch piece of plywood on top of the lid frame so that the plywood is 1 ½ inches inside all the edges of the frame. Nail the plywood onto the frame with 6d nails.
12. Attach the hinges to the inside of the back of the bin at each end (on the 2 x 4), and the corresponding undersides of the back edge, of the lid frame, so that the lid stands upright when opened.
13. The unfinished bin should last for at least five years; finishing the bin with varnish or polyurethane will protect the wood and prolong the life of the bin. Two coats of varnish with a light sanding between coats should be sufficient. If pressure-treated lumber is used, the bin will last years longer.
14. Find a good location for the bin. It can be placed anywhere, as long as the temperature is more than 50°F (10°C). The most productive temperature is between 55° and 77°F (13°-25°C). Garages, basements, and kitchens are all possibilities, as well as the outdoors in warm weather (not in direct sunlight). Make sure to place the bin where it is convenient for you to use. It is wise to place a plastic sheet under the bin.

Adding the Worms

Moisten the bedding material by placing it in a 5-gallon bucket and adding water to achieve a 75 percent water content, by weight. Weigh the dry material and multiply the weight by three to determine the weight of the water to add. If the material can not be weighed, or if it is already wet, add enough water to dampen all the bedding. Excess moisture will drain off most materials when they are placed into the composting bin; however, peat moss may hold too much water. It is a good idea to put wet bedding material into the bin outdoors and wait until all the water has drained out (one to two hours) before setting the bin up indoors. Add about 8 inches of moistened bedding to the bottom of the bin. Place the worms on top of

Continued on next page >

the bedding, and leave the lid off for a while. The worms will work down into the bedding, away from the light.

Adding Your Wastes

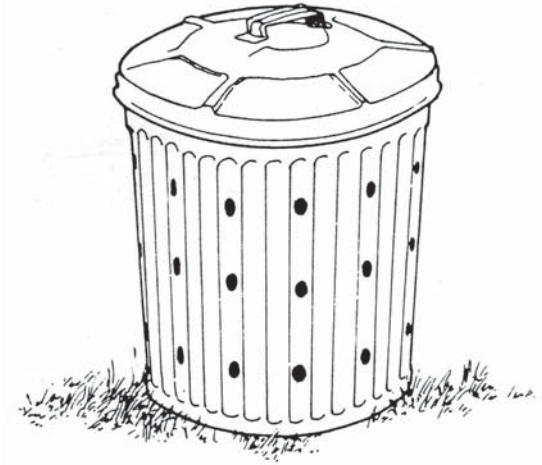
Dig a small hole in the bedding and add your vegetable and fruit scraps. Then cover the hole with bedding. Small amounts of meat scraps can be added in the same way. Do not add any inorganic or potentially hazardous materials, such as chemicals, glass, metal, or plastic.

Maintaining Your Worm Composting Bin

Keep your compost pile moist, but not wet. If flies are a problem, place more bedding material over the wastes, or place a sheet of plastic over the bedding. As an alternative, try placing some flypaper inside the lid. Every three to six months, move the compost to one side of the bin, and add new bedding to the empty half. At these times, add food wastes to the new bedding only. Within one month, the worms will crawl over to the new bedding and the finished compost on the "old" side can be harvested. New bedding can then be added to the "old" side.

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.



Materials

- garbage can with cover
- coarse sawdust, straw, or wood chips

Tools

- 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.