



Building your Own Composting Bin:

Designs for Your Community

Attached are instructions sheets for building the following home composting bins, screen and worm bins:

- Portable Wood and Wire Composting Bin
- Single Compartment Wood Bin
- Urban All-Wood Bin
- Wire Mesh Composter
- Lath Snow Fence Composter
- Wood and Wire Three Compartment Bin
- Rotating Barrel Composter
- Compost Screen
- Homemade Food Waste Composter
- Worm Bins
- Known Worm Suppliers in California
- Worm Composting Bin
- Pallet Worm Bin

These designs range in complexity and price, and many can be made using recycled or reused materials. When providing this information to residents, safe tool use should be encouraged along with wearing of protective gear (safety glasses, hearing protection, etc.) when appropriate during bin construction.

The attached set of do-it-yourself compost bin designs has been compiled by the California Integrated Waste Management Board for reproduction, distribution and use by California Communities in order to promote home composting. Permission to use these designs was secured from the various original developers. Please leave any reference to original source within the document if it exists.

If you have additional design suggestions, please call (916) 341-6000.

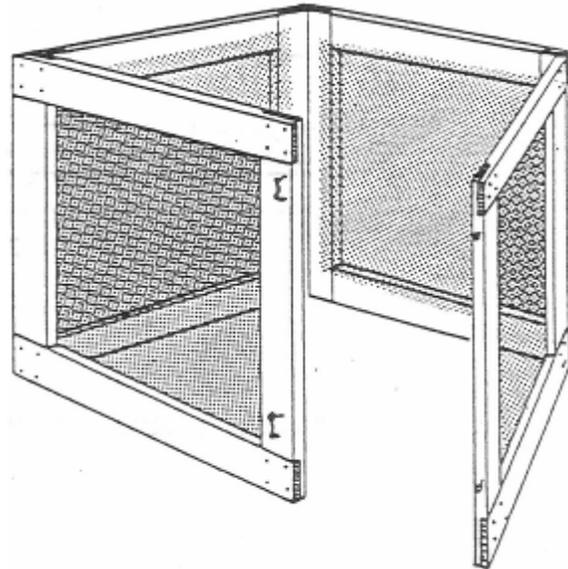
PORTABLE WOOD AND WIRE COMPOSTING BIN

Portable compost bins simply serve to temporarily confine a pile. When it is time to turn the pile or withdraw finished compost from the bottom, the bin is taken apart and set up in an adjacent location in the yard. The partially composted material from the top of the old pile is then forked over into the empty bin, leaving the finished compost at the bottom for removal and use.

Portable compost bins can be made from old wooden pallets lashed together or a roll of wire or snow fencing. This particular version is made from hardware cloth stretched over four wooden lap jointed frames. The design was originally developed for the Community Composting Education Program in Seattle, Washington.

List of Materials

- 4 12' 2x4s
- 12' 36" wide, 1/2" mesh hardware cloth
- 100 1/2" galvanized No. 8 screws
- 4 3" galvanized butt door hinges and screws
- 4 hook and eye gate latches
- carpenter's glue



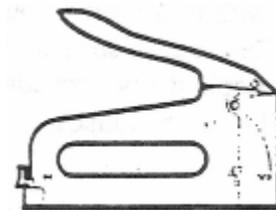
Specialized Tools

tinsnips

hammer and wood chisel or motorized saw (portable circular, or table saw or radial arm saw) with a dado blade

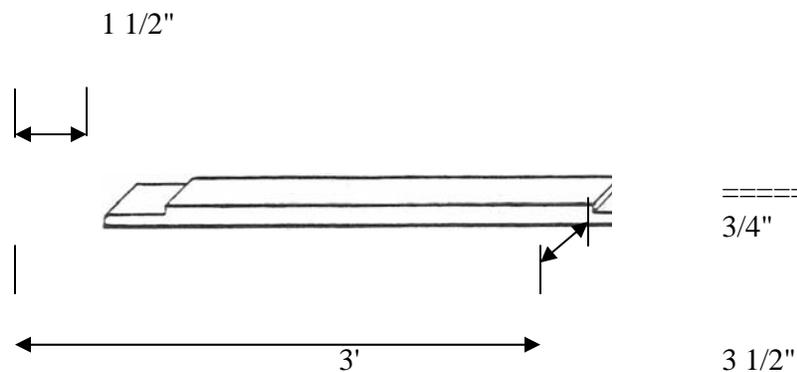
power or hand drill with a 1/8" bit

staple gun or power stapler c/w staples



Construction Sequence

1. Cut each 12' 2x4 into 4 pieces 3' long for a total of 16 pieces.
2. Cut 3-1/2" wide by 3/4" lap cuts at the ends of the 16 pieces of wood. Ensure that the cuts are made on the same side of each piece. If using a handsaw and chisel, first cut a 3/4" groove 3-1/2" in from each end and a 1/2" groove midway into the end of the board. This will help to prevent it from splitting as the ends are chiseled out. If using a power saw, set the blade depth to 3/4" and make multiple passes until the material at each end is removed.



3. Make four lap jointed frames 3' square with the 16 boards. Connect each lap joint with carpenter's glue and four wood screws. Pilot drill the screw holes with a 1/8" bit first to prevent the board ends from splitting.
4. Cut the hardware cloth with tinsnips into four 3' square sections. Reinforce each edge by bending it back an inch. Centre each section of cloth onto a frame (with the bent edge down against the wood) and staple the two together with a staple every 4". Tension the cloth so that it will not sag when filled with compost.

5. Connect each pair of frames with two hinges. At the outside edge of each connected pair, attach the hook and eye gate latches so that the L shaped sections will latch together (see illustration). For rain protection, plastic tarp can be placed on top of the pile.

SINGLE COMPARTMENT WOOD BIN

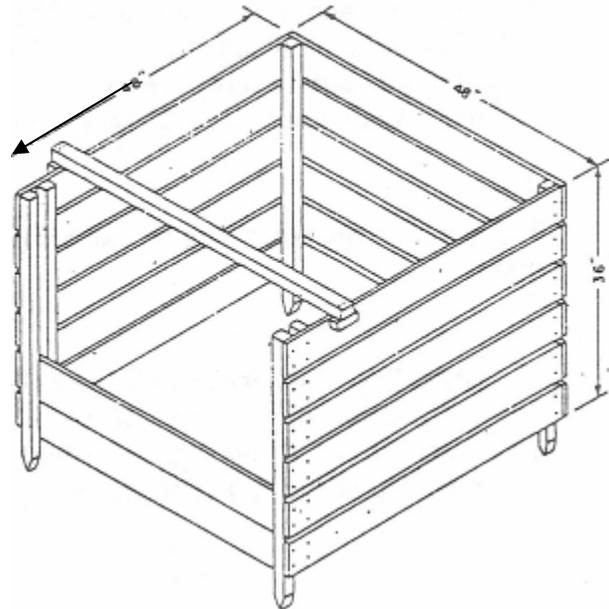
This single compartment bin serves to hold and confine a compost pile. Access for pile turning and removing finished compost is via the loose front boards which are fitted into the slots formed by four of the upright posts. A sliding cross bar at the top prevents the sides from bulging out. An optional removable top to the unit can also be made for the unit with a sheet of heavy black plastic stapled to the backboards and the cross bar.

This design is an adaptation of the New Zealand Hot Box developed by Sir Albert Howard, a noted pioneer composting researcher. It should be sited on a level piece of ground.

SINGLE COMPARTMENT WOOD BIN

List of Materials

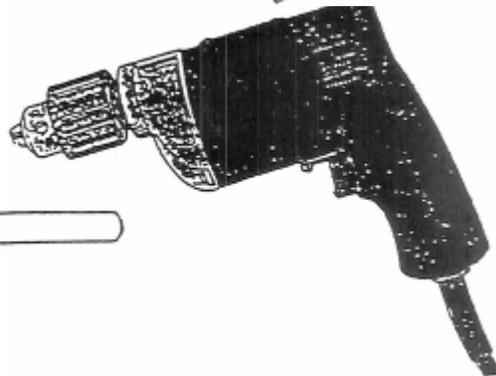
- 6 3'-6" 2x2s (posts)
- 1 4'-9" 2x2s
- 24 4' 1x6s
- 96 1-1/2" No. 10 galvanized wood screws
- 4 2-1/2" No. 10 galvanized wood screws



Specialized Tools

hatchet

power or hand drill with 1/8" twist bit



Construction Sequence

1. **Posts.** Shave down the ends of the six 3-1/2' long 2x2 posts to a point with a hatchet. At the location where the composter will be sited, pound in the four corner posts vertically to a depth of six inches into the soil. The posts should be spaced apart (outside of post to outside of post) 4 feet from front to rear and 3 feet 10-1/2" from side to side. Pound in the remaining two posts to the same soil depth immediately behind the front posts. Allow a one inch gap between the posts for the front boards.

2. **Sides and Rear.** Starting at the bottom with a 1/2" gap, attach six 1x6 boards to the side posts on each side. Use two 1-1/2" screws per post per board. Pilot drill the screw holes first with a 1/8" bit. Allow a 1/2" vertical gap between the boards for airflow. After the side boards have been attached, screw and attach six 1x6 boards to the rear of the unit. Again use two 1-1/2" screws per post per board.

3. **Front.** Fit the remaining six 1x6 boards loosely into the slots formed by the four front posts.

4. **Cross Bar.** Cut two 3" long pieces from the remaining 4'-9" 2x2. Turn the pieces and attach one under each end of the 2x2 with two 2-1/2" screws. Pilot drill the screw holes first with a 1/8" bit to prevent the wood from splitting. Fit the completed bar across the top of the unit at the front.

URBAN ALL-WOOD BIN

- For fruit, vegetable & yard trimmings
- For “No-Fuss” or “Mixed” compost (see *Basic Composting* brochure)
- Has 2 front doors for easy harvesting and turning, a top that doubles as a sifter, & full wire-mesh lining
- Produces small to large amounts of compost
- Carpentry skills needed for construction
- 100-120 for new materials

MATERIALS

- ◆ (8) 8' 1x6 wood*
- ◆ (2) 8' 2x4 wood
- ◆ (1) 10' 2x4 wood
- ◆ (3) 6' 1x4 wood
- ◆ 15' 1/4 wire mesh hardware cloth
- ◆ (4) 5" drawer handles
- ◆ (8) 1-1/2" hooks & eyes
- ◆ (8) 4" corner brackets with 1/2" wood screws
- ◆ Waterproof wood glue
- ◆ (20±) 8 penny galvanized nails
- ◆ (125±) 6 penny galvanized nails-or screws and a power drill-driver can be used instead
- ◆ (250±) 3/4" poultry wire staples

*Bin dimensions based on planed wood

TOOLS

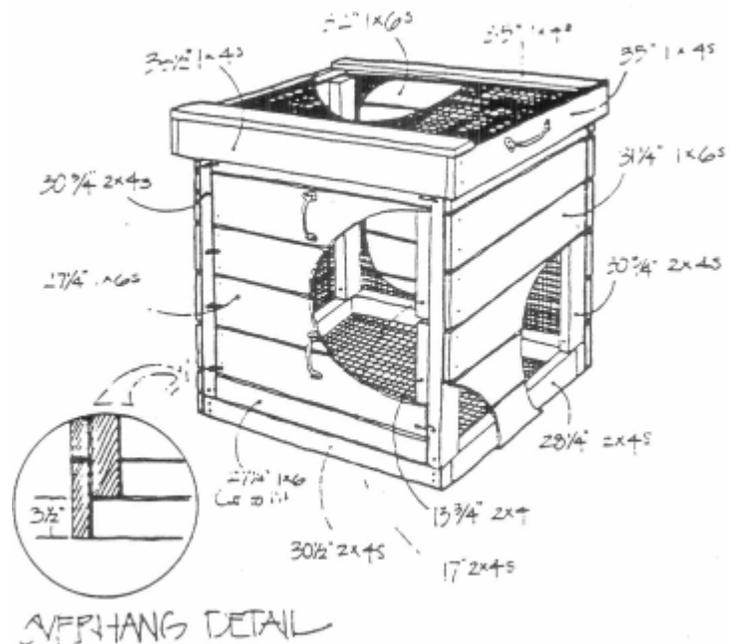
Power saw (use eye protection) or handsaw, screwdriver, hammer, measuring tape, pencil, square, drill with 1/16" bit, sandpaper

ASSEMBLY

Glue all wood pieces before nailing.

1. Nail 2x4 bottom frame together with the larger nails. Be sure the finish dimension is 30-1/2x31-1/4".

◆ 1x4 Lid			
53 1/2"	33 1/2"	33"	100
35"	35"		
35"	35"		
◆ 2x4 Frame			
30 3/4"	30 3/4"	17"	139 1/2"
30 3/4"	30 3/4"	17"	139 1/2"
30 3/4"	30 3/4"	17"	139 1/2"
30 3/4"	30 3/4"	17"	139 1/2"
◆ 1x6 Back - 1 front			
27 1/4"	27 1/4"	27 1/4"	100
32"	32"	27 1/4"	100
32"	32"	27 1/4"	100
32"	32"	27 1/4"	100
◆ 1x6 Sides			
31 1/4"	31 1/4"	31 1/4"	100
31 1/4"	31 1/4"	31 1/4"	100
31 1/4"	31 1/4"	31 1/4"	100
31 1/4"	31 1/4"	31 1/4"	100
31 1/4"	31 1/4"	31 1/4"	100



2. Build sides by nailing bottom and top 31-1/4" 1x6s to the 2x4s (use smaller nails). Be sure bottom 1x6shang down 3-1/2" below 2x4 uprights (see overhand detail). Fill in the remaining 1x6s equally spaced, with no gaps larger than 1/4".
3. Attach sides to base by nailing 3-1/2" overhang to base as drawn (with smaller nails). Toenail 2x4 uprights into bottom frame with larger nails.
4. Nail the six 32" 1x6s to back by first attaching the top and bottom pieces, then filling in the remaining four, spaced equally.
5. Before cutting pieces for the front doors, measure the actual opening at the front of the bin, and make sure to cut the 1x6s (1/4" apart), then measuring the remaining space, and cutting the last 1x6 lengthwise to fit.



6. Attach eyes to front 2x4 uprights, and hooks to front doors as drawn.

7. Build lid by pre-drilling and tracking together as drawn (using smaller nails), making sure the finished dimension is 35x35" and square. Then pre-drill and screw the corner brackets to the inside corners, and the

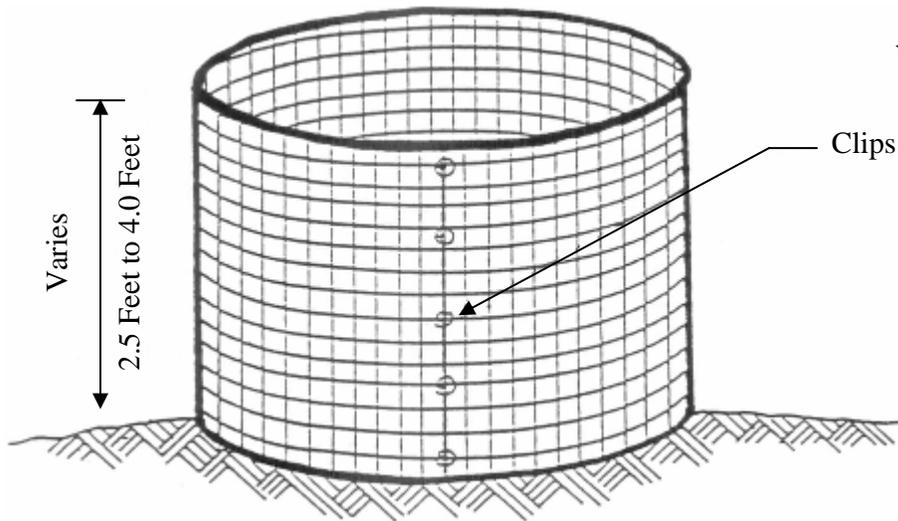
top 1x4s into place. Cut a 33x36" piece of wire screen and staple it in as shown in detail drawing.

8. Cut remaining screen to fit—staple side, back and door pieces inside bin on 1x6s (not over 2x4s). Staple bottom piece onto the underside of bin.

OTHER PORTABLE COMPOSTING BINS

Other portable bins can also be made with rolls of wire mesh or lath snow fencing. The following two illustrations are adapted from design sheets prepared by the City of Regina.

Diameter Varies
3 Feet to 4 Feet

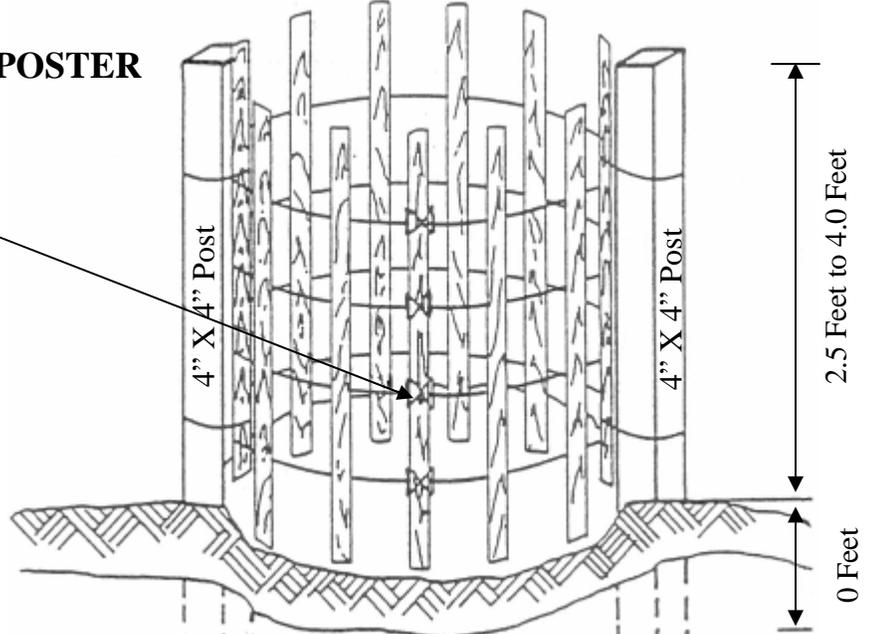


WIRE MESH COMPOSTER

LATH SNOW FENCE COMPOSTER

Diameter Varies
3.0 Feet to 4.0 Feet

Clips or Wire



WOOD AND WIRE THREE COMPARTMENT BIN

Multi-compartment composter bins allow for continuous processing of large amounts of material in batches. In a three compartment composter, material can be turned and mixed between two of the compartments, with the third compartment used for curing and storage.

A three compartment composter can be simply thought of as two additional sections attached to a single compartment unit. A simple three section unit can be constructed with seven discarded pallets lashed together. This particular design employs four identically constructed wooden frames connected to common top and bottom boards and with a single fiberglass lid. It is adapted from a design originally developed for the Community Composting Education Program in Seattle, Washington.

List of Materials

- 4 10'2x4s
- 4 12' 2x4s
or eight 6' 2x4s
- 4 10' 2x2s
- 2 6' 2x2s
- 1 12' 2x6s
- 9 6' 1x6s
- 22' 36" wide 1/2" mesh hardware cloth
- 1 10' x 2' sheet and one 8' x 2' sheet of 4 oz. corrugated fiberglass
- 40 gasketed aluminum nails for corrugated fiberglass roofing
- 3 8' lengths of wiggle molding to fit corrugated fiberglass
- 2 3" zinc plated butt hinges for lid
- 12 1/2" carriage bolts 4" long c/w nuts
- 12 1/2" flat washers for the bolts

12 1/2" flat washers for the bolts

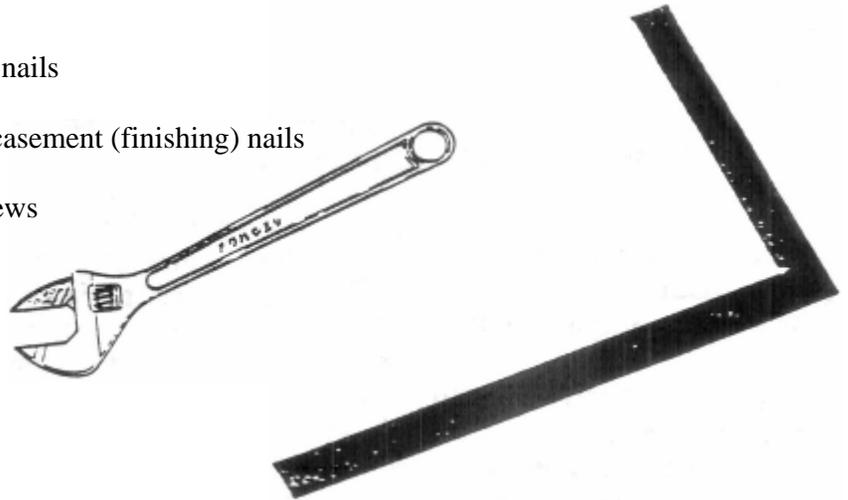
2 pounds of 3-1/2" galvanized nails

1/2 pound of 2-1/2" galvanized casement (finishing) nails

4 flat 4" corner braces c/w screws

4 flat 3" T braces c/w screws

carpenter's glue



Specialized Tools

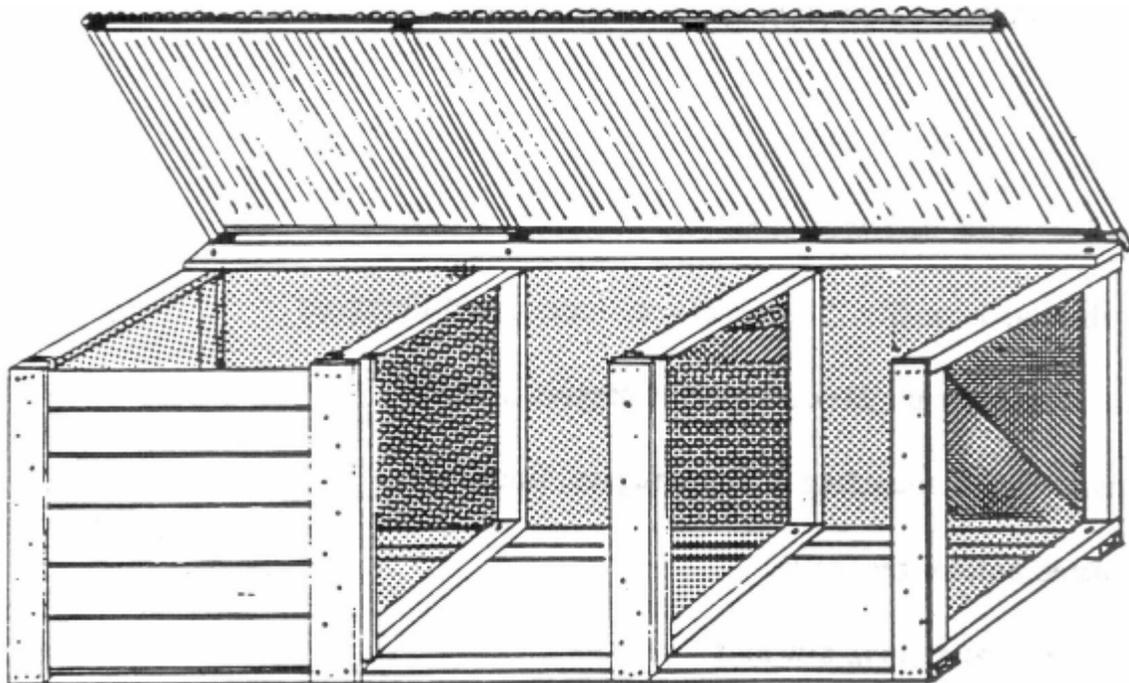
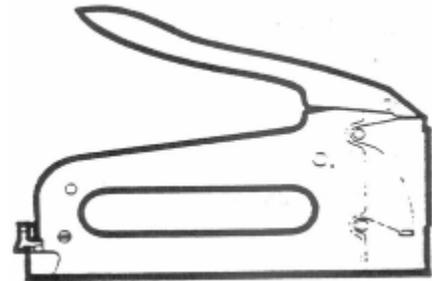
tipsnips

hand or power drill with 1/8" bit and 1/2" spade bit

3/4" socket wrench or adjustable wrench

carpenter's square

staple gun or power stapler c/w staples

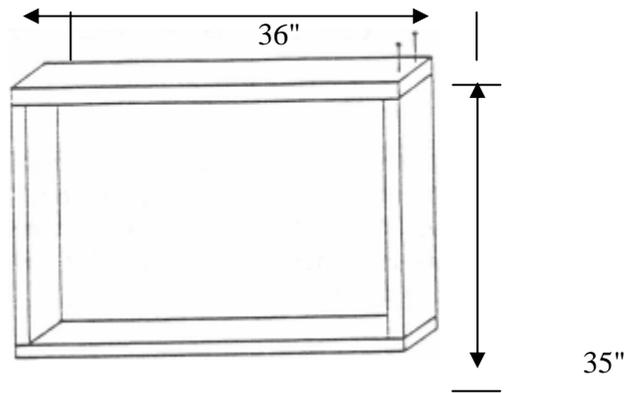


Construction Sequence

1. Sides and Dividers. From the 12' or 6' 2x4s, cut eight pieces 36" long and eight pieces 32" long. Using two pieces of each on edge, form four butt jointed frames 35" by 36" (see illustration). Connect each joint with nails and glue. Cut four 37" long pieces of hardware cloth. Reinforce each edge by bending it back an inch. Center each section of cloth onto a frame (with the bent edge down against the wood) and staple the two together with a staple every 4". Tension the cloth so that it will not sag when filled with compost.

2. Composter Frame.

Cut the four 10' 2x4s into four 9' pieces. Lay two of them flat side down parallel to each other, 36" apart, outside to outside. Place the four frame pieces on the two boards, 36" dimension down. The two outside frames should be flush with the ends of the board and the two dividers should start at 35" in from each end.



Mark the edges of each frame on both 9' long boards. Lay three of the frames aside.

Starting with an outside frame, align it with its markings on a base board and drill a 1/2" hole through the frame and base board into a piece of scrap wood. Secure the frame to the base board with a carriage bolt, washer and nut, but do not tighten. Feed the bolt through from the remaining three frames.

Lay another 9' top board on top of the frames aligned with their rear outside edge and mark it in the same manner as the bottom boards. Keeping the frames aligned with their markings, drill a 1/2" hole through the top board and each frame in turn. Again, feed a carriage bolt down through each hole and secure the pieces together with a washer and nut.

Check the composter frame for squareness with a carpenter's square or by measuring the distance between outside corners. Adjust if required and tighten down all bolts with a socket or adjustable wrench.

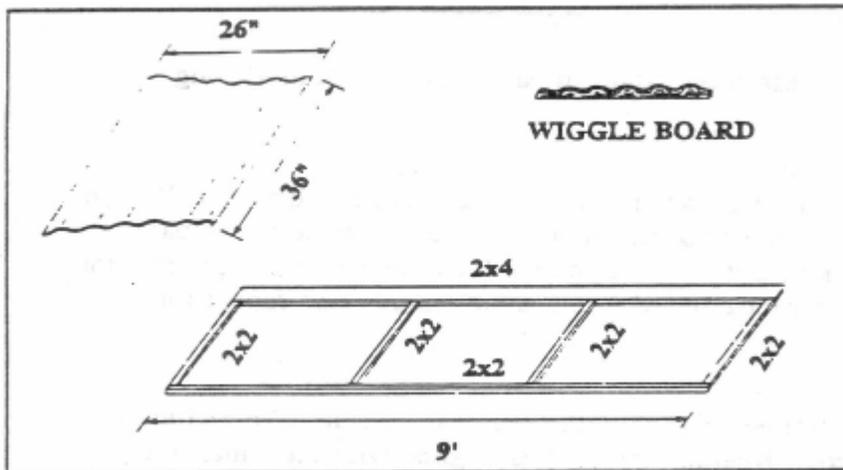
connect the cloth to the frame with a staple every 4". Keep the tension on the cloth to prevent sagging.

3. Runners and Front Slats. Cut four pieces 36" long from the 12' 2x6. Nail two of them flush to the top and outside front edges of the frame. Nail the other two 2x6 pieces to the front of the inside dividers, keeping them centered and flush with the top.

From two 10' 2x2s, cut six pieces 35" long for back runners. Nail these to the frames parallel to the front runners with a 1" gap for slats.

For slats, cut all nine 6' 1x6 boards into pieces 30-1/2" long.

4. Fiberglass Lid. For the lid frame, cut the remaining 10' 2x2 into a 9' piece and the two 6' 2x2s into four pieces 32" long. Form these pieces and remaining 9' 2x4 into a rectangular frame 9' by 37" as per the illustration. Check for squareness and then connect the frame together using corner braces for the outside corners and T braces for the interior dividers. Pilot drill the screw holes first to avoid splitting the wood.



Lay the lid frame, brace side down, on the compartment frame with the 2x4 piece at the rear. Attach the two together with the butt hinges. Pilot drill the screw holes first to avoid splitting wood.

Cut the wiggly board molding to fit the front and back of the lid frame. Position the pieces an inch in

from the sides of the frame and nail them to the top of the lid frame with the 2-1/2" casement nails. Pilot drill the nail holes first to avoid splitting the wood.

Cutting the 10' and 8' sheets of fiberglass into five pieces 37" long. Overlay each piece by at least one channel and position them on the top of the lid. Trim any overhangs at the ends to fit. Pre-drill the fiberglass and wiggly board molding with one nail hole every third hump and connect with gasketed nails.

ROTATING BARREL COMPOSTER

A rotating barrel composter can ease the labor requirements for turning and aerating the composting materials. Most of them are limited in capacity due to the size of readily

available barrels. They must be operated on a batch basis (no further materials added after a point in time) in order to produce finished compost. A number of small to very large commercially made barrel units are available that rotate either on their sides or end to end.

This particular side rotating barrel design makes use of the standard 45 imperial gallon size metal drum 34-3/4" in height. It is adapted from a design originally presented in The Rodale Guide to Composting.

List of Materials

- 1 45 imperial gallon (205 litre) 'food grade' metal drum
- 4 8' 2x4s
- 3 8' 1x3s
- 1 2' x 2' piece of 3/4" (19 mm) plywood
- 2 1-1/2" x 2" galvanized butt hinges
- 1 small hasp
- 1 steel rod, 1/2" diameter by 42" long
- 8 1/4" x 1-1/4" stove bolts c/w nuts
- 12 1/4" x 1" stove bolts c/w nuts
- 28 1-1/2" galvanized No. 10 wood screws
- 2 1/2" flat washers
- 2 1/8" x 1-1/2" steel cotter pins

Carpenter's glue

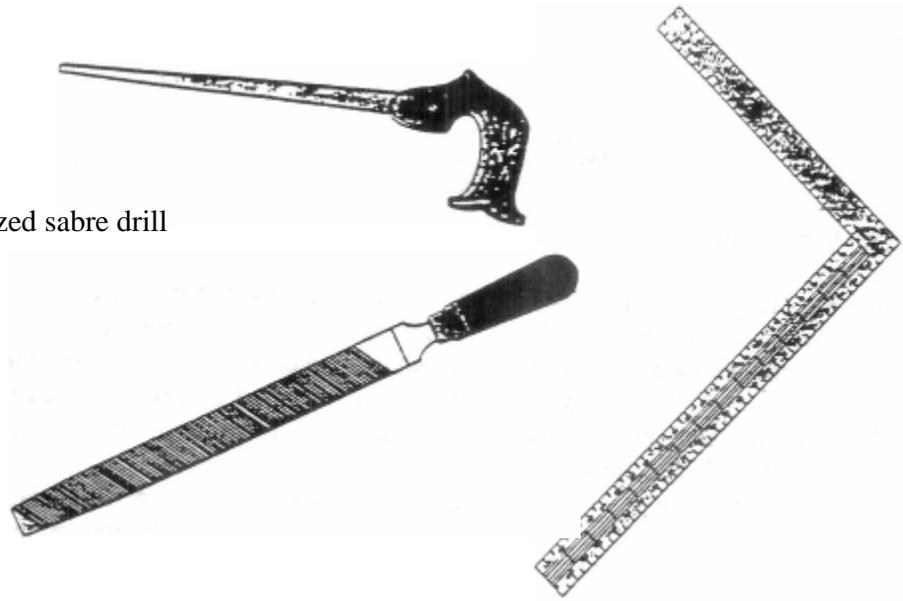
Specialized Tools

drafting compass

keyhole saw or motorized sabre drill

metal file

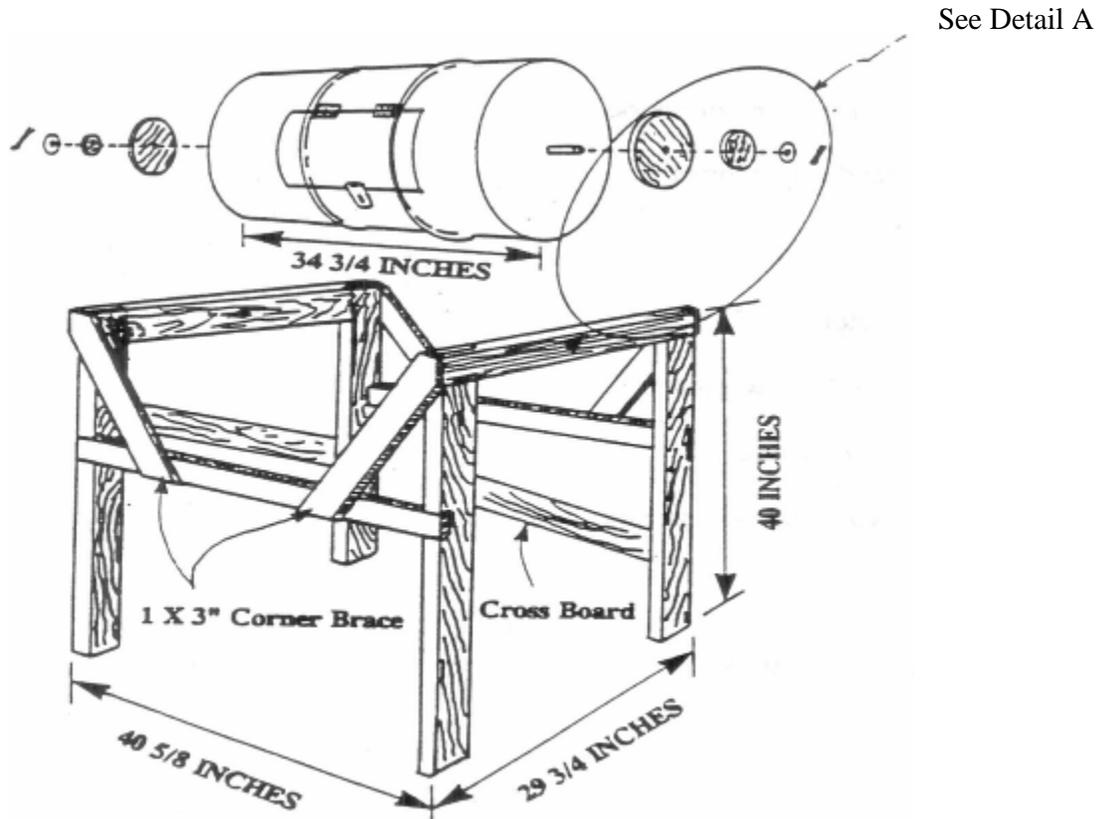
centre punch



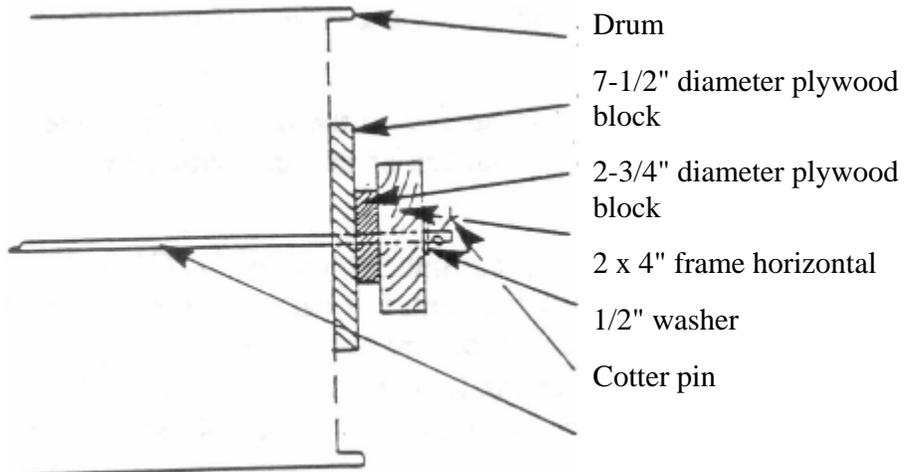
hammer and wood chisel

6" adjustable wrench

Hand or power drill with 1/2" spade bit and 1/4" and 3/16" bits



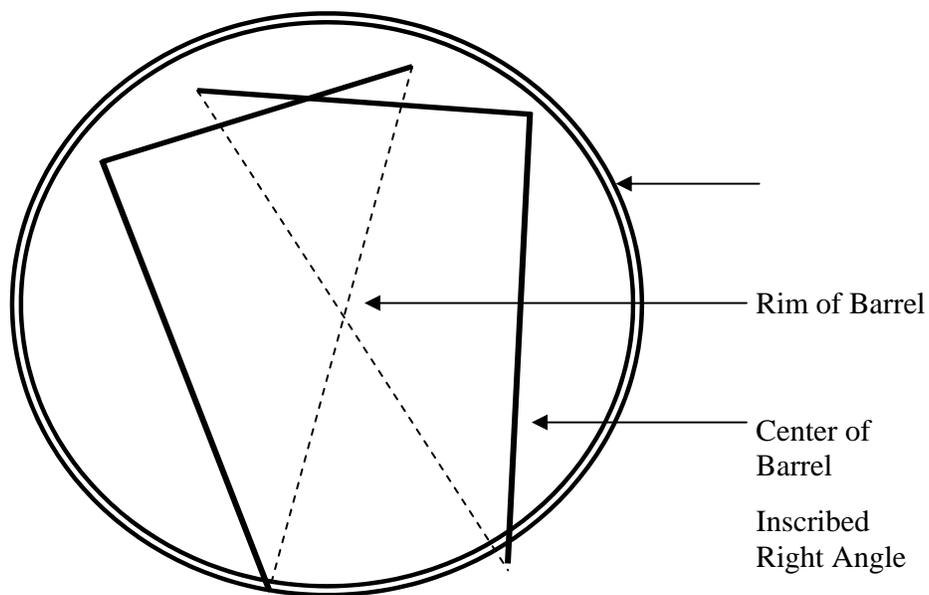
Detail A



1/2" Rod 42" long

Construction Sequence

1. Obtain a good 45 gallon drum that has not been used to hold any toxic chemicals. Those designated 'food grade' are the best choice. If the barrel is metal, it should be unpainted on the inside and free of rust. Plastic barrels may also be used.
2. To accommodate the steel axial rod, a 1/2" hole must be drilled through the exact center of the barrel at both ends. There are a number of ways of finding the center of the top and bottom of a circular barrel. One simple method (see illustration) is to use a carpenter's square to inscribe two right angles on the circular surface. The lines join the ends of the right angles will intersect at the center of the circle.



3. Mark the outline of the door opening on the outside of the barrel. The opening should be large enough (8"-10" x 16"-20" is good) to accommodate easy loading and unloading of material. For easier cutting, round the corners of the opening slightly. Drill a 1/4" hole on one of the lines to start the keyhole saw or sabre saw. If the door cuts across a rib on the barrel, a 1" vee notch must also be cut out on the rib to facilitate opening the door. Once the door has been cut out, re-attach it to the barrel using the hinges and hasp and the 1/4" x 1" stove bolts.
4. For ventilation, drill several rows of 1/4" holes into the barrel on the side opposite the door. To aid in heat retention, paint the entire outside of the unit with a flat black rust paint.
5. On the 3/4" piece of plywood, scribe and cut out two circles 7-1/2" in diameter and two 2-3/4" in diameter. Drill a 1/2" hole through the center of each. Center and glue each small circle to its larger counterpart. Slipping each set of circles temporarily over the 1/2" steel rod prior to gluing will ensure that they remain centered. After the glue has dried, attach the large circles to the ends of the barrel, as illustrated, with four 1/4" x 1-1/4" stove bolts per circle. Keep all the holes aligned.
6. File down each end of the steel rod by 1/2" to provide two flat parallel surfaces for drilling. Drill a 3/16" hole in each flattened end of the rod. Center punching the holes first will make them easier to drill.
7. For the support frame, take the 8' 2x4s and cut 4 pieces 40" long for the uprights, 2 pieces 29-3/4" long for the frame horizontal pieces and 2 pieces 27" long for the crossboards. On the horizontal pieces, drill a 1/2" hole in the exact center of the board (14-7/8" from each end) to accommodate the steel rod. On the outer narrow side of the uprights, mark and chisel out horizontal dado cuts for 1x3 side bracing. Start these 23" up from the bottom. The cuts should be 2-1/2" wide by 3/4" deep.
8. Assemble the two ends of the frame as illustrated with glue and two 1-1/2" No. 10 screws per joint. Use a corner lap joint between the uprights and the frame horizontal pieces. For additional support, brace the two U-shaped ends with the cross boards set at angle as shown. Pilot drill all screw holes with a 3/16" bit.
9. For the 1x3 side supports, cut 2 pieces 41" long and 4 pieces 23-3/4" long. Slip the steel rod through the wooden bearing pieces on the barrel and fit the barrel assembly through the holes on the support frame ends. Insert a washer and steel cotter pin through each end of the steel rod and bend back the pin to keep the barrel in place.
10. Stand up the end frames and insert and fasten the two 1x3 side braces to the dadoed uprights with glue and 1-1/2" No. 10 screws. Attach the corner braces in the same manner and trim the ends to fit. Pilot drill all No. 10 screw holes with a 3/16" bit.
11. In order to keep material properly turning in the barrel and not simply sliding along the bottom as it is rotated, take one or two remaining 2x4 scrap pieces, cut them to fit and wedge them into the barrel at an angle.

COMPOST SCREEN

A compost screen is a handy device for separating out the finely textured finished compost for immediate use from the remaining coarser, incompletely de-composted materials such as twigs, large lumps and nut shells. The latter can then be returned to the compost pile for further breakdown.

A compost screen can be constructed and sized to suit individual requirements and preferences. This design measures 20 inches by 18 inches and is adapted from one prepared by the Recycling Council of Ontario. A number of mesh sizes can be used depending on the end uses for the compost passing the screen. Finer, 1/4 inch mesh is suitable for finished compost to be used as lawn top dressing or in a seed starter mix.

List of Materials

- 1 6' 2x4
- 1 6' 1x2
- 1 2' x 2' piece of 1/4" galvanized wire mesh
- 8 3" common nails
- 16 1-1/2" common nails

carpenter's glue

Specialized Tools

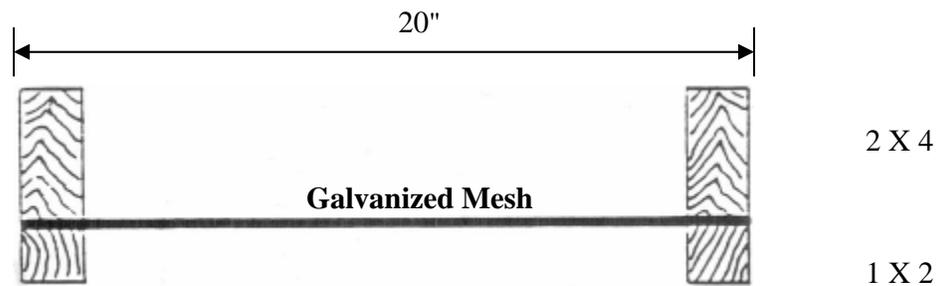
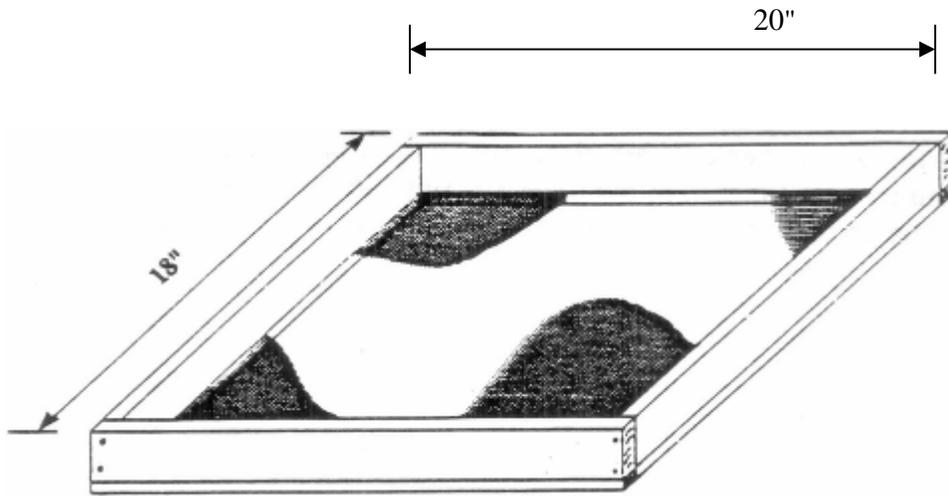
tinsnips

staple gun or power stapler

Construction Sequence

1. Cut the 6' 2x4 and the 6' 1x2 each into four pieces, two at 20", two at 15". With the 2x4 pieces on edge, form them into a rectangular butt joint frame and connect the frame together using carpenter's glue and two 3" nails at each joint. If required, the joints can be made more secure with screws and corner braces.

2. Cut the galvanized mesh to fit the frame and staple the two together. Use a staple every 4" around the edge. Tension the mesh so that it will not sag when filled with compost.
3. Once the mesh is secure on the bottom of the frame, nail the 1x2 strapping pieces over top of it.



HOMEMADE FOOD WASTE COMPOSTER

Properly composted food scraps can turn into an excellent fertilizer for gardens. However, composting food scraps in an open pile or mixed with yard waste can attract some unwanted urban pests - rats, mice, raccoons and possums! Here's how to easily make your own pest-proof food waste composter that avoids that problem.

Making the Composter and Getting Started

One of the simplest ways to compost food waste is in a sunken garbage can. The can should have a tight-fitting lid and holes punched in the bottom. A galvanized metal can (about \$15 new) works well. Drill or punch about 20 drain holes, 1/4 or 3/8 inch diameter, in the bottom of the can. Then drill 10 air holes in the side, spaced around the upper lip of the can. If the lid is not tight, make a lid out of a piece of plywood, with a handle on the top and some wood blocks underneath to fit the lip of the can and help hold the lid on.



Dig a hole about 15 inches deep in a well-drained corner of your yard and set the can into the hole. Then push the soil back in around the sides. Your new composter is ready to use! If odor or fruit flies are a problem you can stockpile bags of brown leaves, sawdust, straw, or shredded paper near the composter and place a thin layer of them on each new addition to the can.

Harvesting the Compost

Depending on your household's food habits, the composter will fill in 4-8 months. Now it's time to harvest some compost. You can shovel the upper foot or so of under-composed food off to one side and shovel the dark, soil-like compost out of the bottom. If the finished compost is wet and smelly, mix it with some soil and wait a week for it to turn drier and sweet smelling. Replace the top layer in the can. You can also bury the top layer in a trench in the garden, making more room for food scraps in the can. If you choose to use a second can, you can just let the food scraps sit until the worms move in and finish the composting!

Using Compost

The most common uses of compost are as a mulch on established plants, as a soil en-richer at planting time, and in potting mixes. Food waste compost contains more nutrients than yard waste compost, and should be used more sparingly. It can be applied as one-inch mulch around plants or up to two inches can be dug into garden soil. For a potting mix, add up to 20% food waste compost to a commercial or homemade potting mix.

Do Compost	Don't Compost
<ul style="list-style-type: none">• Vegetable Scraps• Grains and pasta• Fruit rinds and peels• Breads• Coffee grounds, filters• Tea Bags• Paper napkins, towels• Egg shells	<ul style="list-style-type: none">• Meat• Fish and poultry• Cheese• Oily foods• Butter• Other animal products

Problems?

Here are some common problems and how to fix them:

▪ **Odors and fruit flies**

Stir in leaves or sawdust to keep the pile aerobic. Cover the fresh food waste with leaves, sawdust, straw or shredded newspaper to exclude fruit flies. If you prefer to use grass clippings as a covering material, first leave them in the sun for a week until they turn brown. Once a health worm population is established in the composter, they will help reduce odors by aerating the pile. Always keep the lid closed.

▪ **Raccoons or dogs knock the lid off**

It's important to keep the lid on your composter to keep rodents out. Place a rock on the lid or tie a bungee cord from the can handle up through the lid handle and down to the other can handle to hold the lid on. And be sure to keep mean waste out! It smells bad and attracts animals, so it is better to put it in the garbage.