

How to Build A Greenhouse, Quickly

By Urban Organics

5 Steps to Build a Greenhouse

Tools

1. Ridgid Cordless Drill with twist bit
2. Crescent Adjustable wrench
3. Eastwing Hammer
4. Small bar clamp
5. Dewalt Jigsaw
6. Wood chisel
7. File
8. Heavy-duty stapler
9. Carpenter's level
10. Bevel
11. Safety goggles
12. Crosscut and circular saw
13. Try square
14. Tape measure
15. Utility knife
16. Chalk line
17. Screwdriver
18. Plane
19. Pencil

Planning

- Estimate the size of the greenhouse
- Place it in location that receives sun

Materials

- Rot-resistant lumber (pressure-treated preferred) 1x2s, 1x4s, 2x4s,2x6s
- Galvanized nails, wood screws and corrugated fastners
- Plastic sheeting
- 1/8"-inch exterior plywood
- 4 x 8' sheet of particle board
- Angle brackets and corner braces
- Waterproof wood glue
- Handle and track for door
- Metal rods for wall vent
- Medium-grit sandpaper
- Screen molding
- Brass or galvanized wood screws

Step-By-Step

1. Layout out dimensions on plywood or particle-board template.
2. Build the roof rafter assembly.
3. Construct foundation and walls.
4. Install the rafter assembly.
5. Enclose the greenhouse.

Keys to Success

- Use rot-resistant lumber such as redwood or cedar. Do not use pressure-treated wood: it can leach toxic agents into the corn post.
- You may choose to weatherproof the planter grow bins with an environmentally safe, water-based wood preservative. Avoid creosote or other potentially toxic materials, which can leach into the compost and eventually enter the garden soil.

Design Considerations

- The greenhouse design should include spaces between the walls to allow air to circulate, which is important.

- for the microorganisms that cause decomposition. To help the ventilation process the greenhouse should also be slightly elevated. A lid serves to keep the compost warm, encouraging decay.
- The greenhouse should be sturdy because snow becomes quite heavy. Because the greenhouse is outside, the wood exposed stays moist, so the framing should be constructed of waterproofed wood to avoid rotting.
- Designing the greenhouse to fit your own needs is important. If the greenhouse is too small, the poor ventilation may generate too much heat, encouraging the growth of weeds and insects; if the greenhouse is too large, that may be poorly ventilate and not retain heat.

In most parts of the country, a greenhouse lets the gardener extend the normal growing season through the cold months of winter. A functional, freestanding greenhouse is easy to construct using readily available materials and basic carpentry skills.

Most greenhouses are straightforward structures with ample space for plants and typically just enough room for the gardener to move around comfortably.

Several factors have to be considered when designing a greenhouse: its location, size, style and the type of framing and glazing.

Location is critical: choose a site that gets plenty of direct sunlight in the winter, when the sun is low in the sky. When figuring the size of your greenhouse, it is wise to plan one bigger than you think you need. Once you start greenhouse gardening, you will probably want to expand your efforts.

There are several styles of free standing greenhouses. *A-frame* structures – consisting of two sloping walls joined at the peak – are easy to build but have less useful space than other styles. *Gothic* greenhouses, with arched roofs, provide maximum space but require more complex construction.

The *snow-countly* greenhouse shown in the following cards has vertical walls and a moderately sloped roof designed to shed snow. It is relatively easy to design and build, and may be improved later with running water, lighting and heating systems.

For glazing, you can choose from glass, clear acrylic sheets, fiberglass panels or plastic sheeting. Glass is easy to clean, inexpensive and permanent. Acrylic panels are lightweight and break-resistant but eventually deteriorate in sunlight.

Fiberglass panels are durable and extremely strong. Plastic sheeting – used to build the

greenhouse shown here – is the easiest and least expensive to install, but be sure to use heavy- gauge plastic that resists deterioration from ultraviolet light.

Greenhouses need strong, rigid frames to support the weight of glazing and to withstand snow, wind and rain. A good choice is construction-grade, pressure- treated softwood, which is easy to handle and long lasting. All fasteners and hardware should be made of weather-resistant brass or galvanized steel, and you should use exterior-grade adhesive.

The key to the construction is making a full-size template to ensure identical frame sections. You make the template from an inexpensive 4x8-foot sheet of particle board, using dimensions that best suit your needs. The template not only ensures accurate measurements, but also serves as an on- site workbench

Making and Building on the Full-sized Template

1. At the center of a sheet of particle board, mark a vertical line equal to the height of the peak.
2. From the base of this line, measure and mark the width of the roof in both directions.

3. Lay a 2x4 on the template from the corner mark to the peak. This will become one of the corner rafters.
4. Scribe lines from both corners to the peak. This defines the size and shape of the rafter assemblies.
5. Stack 2 guide boards along the rafter line. Set a bevel to the angle formed by the line and the rafter.
6. Transfer the angle to 1 end of a 2x4, which will become a roof rafter. Mark and saw the angles.
7. On a scrap piece of 2x4, measure and scribe a center line along 2 adjacent edges.
8. Set the scrap 2x4 on the template, aligning the center line with the mark for the roof peak.
9. Butt 2 rafters against the scrap 2x4 and the guide boards.
10. Place a piece of plywood between the two rafters and against the scrap 2x4. Mark the plywood as shown.
11. Clamp the plywood to a workbench or sawhorse and cut along the marks. Make two more identical pieces.
12. Nail the plywood braces to the rafters below the sdap 2x4, taking care to line up the outside edges exactly.
13. For the end rafters, remove the scrap 2x4, make 2 triangular braces and nail them to the rafters.
14. Set each rafter assembly on the I template, and mark a 1-inch triangle where the rafter meets the wall.
15. Cut triangular notches as I marked. Double-check each rafter assembly against the template.

Making the Wall Studs

1. Using a tape measure or folding I rule, measure the actual width and depth of the 2x6 base joists.
2. Transfer these measurements to the bottom end of a 2x4 wall stud using a marking gauge.
3. Cut the end of the 2x4 so that it will fit over the joist. Repeat for each stud.

Framing the Greenhouse

1. Cut the 4 joists to length and nail them together. Make sure the corners are absolutely square.
2. Lay the joist assembly on the ground. Use scrap pieces of wood to support the assembly so it is level.
3. Cut 8 stakes out of 2x2 lumber. Drive a stake at each corner and
4. Trim the stakes at the height of the joists. Then drive nails through the joists into the stakes.
5. Position a stud in a corner so that the notch fits over the joist. Level the stud and clamp in place.

6. Drill pilot holes through the stud into the joist. Fasten the stud to the joist with wood screws.
7. After securing the other studs along the joist, cut the top plate and attach it to the studs with screws.
8. Nail a 1 x4 brace to each stud between an upper corner and the opposite lower corner.
9. Reinforce the studs with galvanized angle brackets. Repeat these steps for the opposite wall.

Raising the Roof

1. Set one rafter assembly in place. Mark and cut a 1 -inch notch where the rafter joins the top plate.
2. After installing all the rafter assemblies, cut a 2x4 ridge beam to length and fasten it to the rafters.
3. Cut reinforcing studs for the 4 outside corners and nail them to the rafters, joists and other studs.
4. On scrap wood mark the angle a rafter makes with the wall. Bend a bracket to this angle.
5. Hold a bracket in place. Drill pilot holes into the studs and rafters; secure the brackets with screws.
6. Measure and mark the studs for the front and back walls. Toenail the studs to the rafters and joists.
7. Stretch a chalk line along the rafters to designate a uniform overhang for the eaves.
8. Snap the chalk line and mark the eave lines with a try square. Saw each rafter to length.
9. Cut a 1 x4 the length of the wall and nail it to the ends of the rafters. Do the same on the other side.

Reinforcing the Frame

1. Measure the distances between studs on the front wall. Cut three 2x4s to these lengths for headers.
2. Install headers between the studs, with the doorway header at the correct height for the door.
3. Set a 2x4 diagonally between a corner and a stud along the front wall. Mark and cut to length.
4. Nail the 2x4 to the frame as a diagonal support. Install identical . supports at each corner.
5. Measure and cut 2x4s to fit between the studs on the rear wall Toenail the 2x4s to the studs.

Making the Doors

1. Measure the height and width of the door for the stiles and rails and cut 1 x4s to these lengths.
2. Mark the width of a 1 x4 on the ends and center of the stiles and the ends of the door rails
3. Mark the depth of the lap joint –one-half the depth of a 1 x4 –at the location of each joint.

4. At the spot for each lap joint, make several saw cuts and chisel out the notches.
5. Smooth the surface of each notch with a file and sandpaper. Make sure these notches are square.
6. Apply waterproof wood glue to the surfaces of the notches and assemble the components of the door.
7. Before the glue sets, check that the frame assembly is square with a carpenter's square.
8. Reinforce each glued joint with finishing nails. If the tips protrude, clinch them securely.

Making the Window Vents

1. Measure and mark the positions of the door track on the side and edge of the top rail.
2. Drill pilot holes in the top edge of the top rail and then drill holes the correct diameter for the bolts.
3. Bolt the door track to the top rail of the door frame, making sure the track is level.
4. Measure and cut the parts of the exterior frame so that the hinges fit between inside and outside rails.
5. Glue each component of the exterior frame to the interior frame, using waterproof wood glue.
6. Make sure the exterior piece fits squarely. Drive several nails through it and into the interior frame.
7. Continue assembling the exterior frame. Use liberal amounts of glue and nail each piece.
8. Scrape away excess glue once it has dried. Sand the Joints smooth with medium-grit sandpaper.
9. Round the edges of the exterior frame with a plane held at a 45-degree angle to the frame.
10. Install the hinges. Drill pilot holes first to guide the screws and prevent the wood from splitting.
11. Install flat corner braces on the 4 corners of the interior frame. Use wood screws to secure the braces.

Installing the Sliding Door Track

1. Measure and mark the positions of the door track on the side and edge of the top rail.
2. Drill pilot holes in the top edge of the top rail and then drill holes the correct diameter for the bolts.
3. Bolt the door track to the top rail of the door frame, making sure the track is level.

Installing the Window Vent Frame

1. Position the window frame between the rafters near the peak of the roof; mark this location.

2. Cut two 2x4s for headers and nail them in place at the marks for the window frame.
3. Install the window frame so that the edge with the hinges meets the upper header.

Covering the Greenhouse Frame

1. Staple plastic sheeting to the top plate, joist and studs on one side of the greenhouse; trim the excess.
2. Staple sheeting to the opposite side and the front. Pull the sheeting tight at the corners and fasten.
3. Remove the window frame and use one piece of sheeting to cover the entire roof. Staple it to the rafters.
4. Cut away the sheeting at the opening for the window. Staple this piece around the opening.
5. Cover the outside of the frame with sheeting and trim away any excess. Reinstall the window.
6. Cut the sheeting for the door and then staple it to the door rail and stiles.

Mounting the Sliding Door

1. Cut a 1 x4 for mounting the door track and nail it above the door opening. Be sure it is level.
2. Attach the door slide, which is already mounted on the door, to the 1 x4. Adjust as necessary.
3. Fasten 2 angle brackets to the joist below the door so that they form a U-shape for the door to slide into.
4. Install strips of 1-inch wood screen molding. It molding to trim the joists, rafters and studs.
5. Continue installing the covers the staples, improving the appearance of the greenhouse.
6. Install a door handle where the center rail meets the stile. Make sure the door slides smoothly.

Installing the Louvered Wall Vent

1. Install a header joist near the center and base of the rear wall. Measure for the vent frame.
2. Assemble the vent frame from 2x4s. Attach clamps for metal rods to 2 precut plywood louvers.
3. Drill holes in the sides of the frame. Insert the rods through the frame and clamps on each louver.
4. Nail the frame to the studs and the joists. Cover the entire rear wall except for the vent in sheeting.

Flooring Options

Once you have built the greenhouse, you need to decide what kind of flooring to use. Brick floors (*right*) allow water to drain and retain heat from the sun. Wooden planks (*lower right*) are inexpensive, easy to install and also allow water to drain. Concrete floors (*lower left*) are the most permanent and can radiate heat captured from sunlight.

Some homeowners leave the ground bare, but frequent plant watering soon turns the floor to mud. A 3- to 4-inch layer of gravel will prevent mud from forming.