The Habitat ReStore Mini-Greenhouse Construction Plans

The Habitat ReStore mini-greenhouse is constructed from 100% reused materials. This means that there will be some adjustments in dimensions and construction techniques depending on the materials available. You can buy new lumber and other materials if used materials aren't available, but you'll loose some of the rustic charm and adventure of building something from what is at hand.

Most materials used in the mini-greenhouse can be purchased from the Habitat ReStore, but because our inventory is donated, we may not always have everything you need in stock at all times.

The following plans give some tips and a step-by-step description of the building process, but are not designed to be precise instructions. There are too many variables when using used materials.

The following is a general materials list.

Old Wood Windows:

1) You will need one to two windows for each side. If you have fairly tall windows, you may want to use only one on each side. The windows need to be identical in width and when combined, be equal in height.

2) One window is used for the door in the front of the greenhouse. This window should be approximately the same height as the sides. It can be shorter, but not taller.

3) The top lid is made from a single window. This must be wider than the window used for the door by approximately 7 inches. If necessary, trim can be added to the edges of the window to make it wider.

Note: *most old wood windows are coated in lead paint. This can be a health hazard if you are not careful. Avoid sanding lead paint and make sure you clean up any paint chips that might fall off the window. Wear a dust mask if you do sand and wipe surfaces with a damp rag when finished. Always wash your hands after handling an old window and never eat while working with the windows. The best practice is to paint over the window with a good primer and latex paint.*

Greenhouse Frame:

1) You will need 2" x 4" boards for the front and back frames (fir or cedar). The frame lumber needs to be over 6' long.

2) Composite decking or pressure treated lumber. The base of the mini-greenhouse is made from either composite decking (a recycled product made from plastic bags and sawdust) or pressure treated lumber. This helps protect the greenhouse from rot. You will need four pieces that equal the width and depth of the greenhouse frame.

3) Various pieces of 2" x 4" or 2" x 2" lumber (fir or cedar). Most of these are used for the cross pieces that make the frame. These pieces need to be between 24" and 30" long. You will need approximately 3 to 5 pieces depending on the final design.

4) Cedar fence boards for the back and other openings not filled by windows. These can be of any width and the number will be determined by the final size of the mini-greenhouse. For the average sized min-greenhouse, this will be approximately 6 to 8. Other materials, such as exterior plywood, may be used as well.

5) Enough 1" x 2" fir or cedar pieces the same width as the greenhouse to make shelves.

Hardware:

1) You will need a variety of deck screws and nails to put the basic frame together. The best screws to use are either epoxy coated or galvanized, but gold colored construction screws will also work. Nails should be galvanized. You will want to have lengths of 1", 1-1/2", 2-1/2' or 3".

2) If you have access to a pneumatic nail gun or crown staple gun, you will need 3/4" and 1-1/2" staples or nails.

3) Old door hinges work well for the door and the lid. You will need hinge screws (6 to 8 per hinge). Both the door and lid use two hinges.

Tools:

1) A battery powered drill-driver is one tool that will save you a lot of time and energy, but you can substitute nails for screws for most of the construction.

2) A chop saw or hand held power saw is a great labor saving tool and makes your work more accurate, but you can make all the cuts you need with a good hand saw.

3) If you have a table saw available, you will be able to do some aesthetic things to make the mini-greenhouse more attractive, but it is not necessary for basic construction.

4) A hammer – for very obvious uses.

5) A construction square or a tri-square and a protractor (if not using a chop saw).

6) A tape measure.

General Construction:

The overall size of the mini-greenhouse depends on the windows you have available. You will need to find two to four windows for each side. It will be more difficult to build and use the mini-greenhouse if it is over six feet tall, so when you look for windows keep that in mind. You can use two windows per side if the combined height is not more than approximately 4'-6", or you can use one taller window. The lower part of the mini-greenhouse isn't really that useful for starting plants and it can be filled with a solid panel if you use only one window.

The window width needs to be exactly the same, although if you have a table saw, you could cut windows that are slightly different to the same size. Each side needs to be exactly the same height.

Choose a window for the door that is fairly tall. You could also combine two windows together. Like the sides, the door doesn't need to be full length. The bottom part of the mini-greenhouse can be used for storage. The width of the door should not be greater than the depth of the side windows. The door window fits between the two frame 2" x 4"s –which together equal 7" in width.

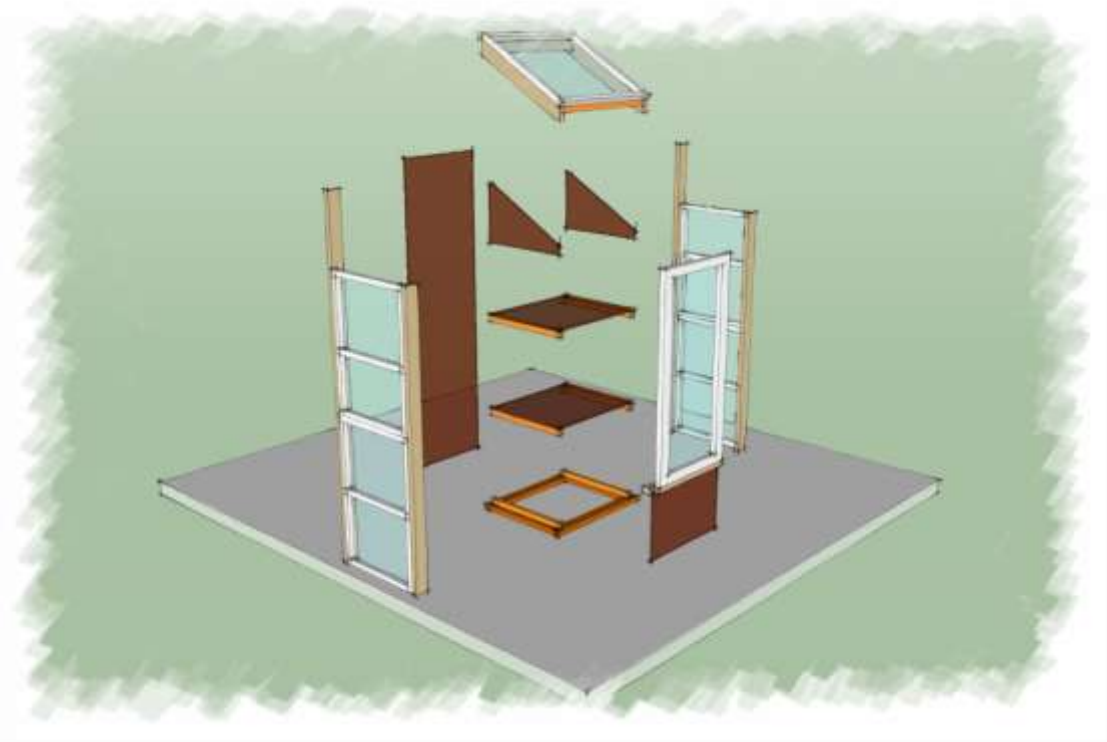
The window used for the top needs to be at least 7" wider than the door window. The overall dimension of this window is flexible and it is possible to use two smaller windows to cover the area. A window that is too small can be trimmed to make it larger.

The base of the mini-greenhouse is made from either composite decking (a recycled product made from plastic bags and sawdust) or pressure treated lumber. This helps protect the greenhouse from rot. You will need four pieces that equal the width and depth of the greenhouse frame. This is approximately four pieces at least 30" long. Pressure treated wood will be 2" x 4". The composite wood can be 2" x 4" or 2" x 2 " baluster pieces, but most often you will find a 2" x 6" deck boards. If you have a table saw, you can rip these deck boards into narrower pieces.

Note: *Lumber such as 2" x 4"s or 2" x 2"s are called "dimensional" lumber. This means they are approximately the dimensions listed. Generally a 2" x 4" piece is actually 1-1/2" x 3-1/2" and a 2" x 2" is actually 1-1/2" x 1-1/2". Since wood can shrink or expand depending on moisture, you should always check the actual dimensions.*

Construction Steps:

Building the Frame



1) Lay the windows for each side on a flat surface with the outside face down (this will be the side with glazing putty on it). If you are using two windows per side, put the windows end to end. If the window frames are wide enough, you can fasten the two windows together with screws. Be careful not to screw into the glass.

2) Cut a 30 degree angle on one end of each frame 2" x 4". The angle is cut across the 4" side. Place these on the front and back sides of the windows. The exact position is not important at this time. You will cut the exact length later. Remember to put them on opposite sides so you have a matched pair. The 30 degree angle cuts face the front of the greenhouse.

3) To figure out the length of the frame pieces, cut a 30 degree angle on one end of a 2" x 4" that is at least 3' long. Place the cut end on the back frame piece and move the back frame piece along the windows until the scrap piece is flat against the 30 degree angle and is even with the front of the windows. Mark the bottom of the 2" x 4" even with the window and cut to length. Attach the back frame to the windows with screws. It is a good idea to drill pilot holes in the 2" x 4"s and the windows since old wood splits easily.

   Note: *If you are using only one window per side, you may want to allow for some extra space at the bottom of the frame for a storage area. To do this*

cut the back and front frames longer than the window. A good size for storage is at least 12". If the window that you will use for the door is taller than the side windows, make sure you allow enough extra length in the frames for it to fit.

4) Make a mark on the 2" x 4" at the front of the windows and make a parallel 30 degree angle cut on it. Attach this piece to the back frame with nails or screws. Remember to add extra length if there will be a storage space at the bottom.

5) Hold the front frame 2" x 4" to the windows and adjust it until the 30 degree cut on the front frame matches with the 2" x 4" that you just attached to the back frame. Repeat this for the other side and fasten the frame piece to the windows (pre-drill holes) and the angled piece.

6) Make the base frame by making the composite or pressure treated wood into a square like you would a picture frame. Measure the width of the side frames and cut two this length with a 45 degree angle on each end.

7) Measure the width of the door window and add 7 – 1/4" inches to this dimension. Remember to check the actual width of the front 2" x 4" frame pieces since they may be slightly different sizes. If the frame pieces together are different than 7", adjust your dimensions.

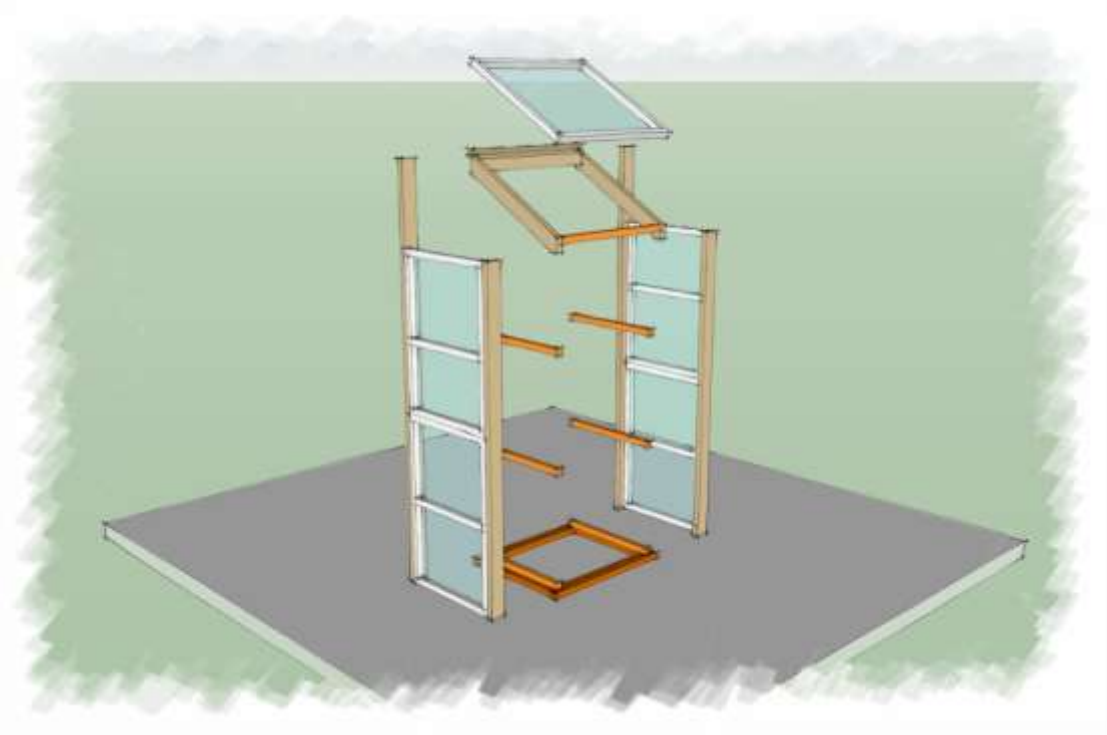
8) Cut two more base frames pieces the width of the door plus 7-1/4" with 45 degree angles on each end. Put the base frame together like a picture frame.

9) Cut four corner blocks from the composite or pressure treated wood. These blocks are short pieces with a 45 degree angle on each end. These corner blocks are fasted to each the inside corner of the base frame. They help square the frame and will make the greenhouse sturdier. Use nails or screws to put the base frame together.

10) With help, lay the two sides parallel to each other on the back frames. Place the base on the bottom of the two side frames and fasten it to the frames with nails or screws. Be sure to pre drill to avoid splitting.

11) Cut a 2" x 4" cross piece to fit inside the angled 2" x 4"s that connect the back and front frame pieces. The length should be 3" less than the length of the base frame. Fasten it with nails or screws.

12) Cut a 2" x 4" the same width as the base frame and nail or screw it across the top of the back frame. Stand the completed frame up.



Finishing the Greenhouse

1) Cut cedar fence boards wide enough to fit between the two frames and nail or staple them horizontally across the inside of the back. Depending on the size of your greenhouse frame, you may need to cut the width of the final board to fit. Options: you can use any material to make the back. An old exterior door or exterior plywood will work. Fence boards could also be used vertically.

2) Fill the triangular spaces between the top frames and the windows with cedar fence boards cut to the correct angle or use clear plastic. Fasten these to the inside.

3) Fill any spaces at the bottom sides and front with similar materials used for the back.

4) Using old door hinges, hang the front and top window. If the top window isn't wide enough to cover the opening, add wood trim.

5) Optional: cut notches in a piece of wood approximately 1" x 2" wide and 16" long. This can be used to hold the top open for ventilation. The stick is fastened to the side of the top window with a screw. Drill a slightly oversized hole, so that the stick can move. The notches rest on another screw fastened to the frame.

6) Paint

Shelving

1) Fasten 1” x 2” pieces of wood that fit between the front and back frames on each side to make ledges for the shelves. The exact placement of these pieces is not important, but they need to be the same on each side so that the shelves sit level. Three shelves will fit inside the greenhouse.

2) Make the shelves from 1” x 2”s or any other available material. Cut the sticks to fit inside the width of the greenhouse and rest on top of the ledge pieces. Cut enough to span the inside from front to back. You can also use half shelves to allow for taller plants on a lower shelf.

3) Cut two connecting pieces of 1” x 2”s for each shelf. Lay out the pieces on a flat surface to form a shelf and staple or nail the connecting pieces approximately 3” in from each end. Use spacer blocks between each 1” x 2” to make it easier to keep everything together while fastening.