Tools Required

- Tape measure
- Straight edge
- Pencil/pen
- Jigsaw
- Table Saw
- Circular Saw
- Electric drill
- 1” Hole saw bit
- Saw horses/table
- Protractor
- Staple gun
- Caulk gun
- Paint brush
- Wrenches
- Tin snips
- Router
- Clamps

*Note: All cuts can be done with hand tools and no electricity

Materials

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 sheets of 4x8 ¾” exterior Plywood</td>
<td>-Staple gun</td>
</tr>
<tr>
<td>-2 sheets of 4x8 ¼” Plywood</td>
<td>-Staple gun</td>
</tr>
<tr>
<td>-Four 8’ 2x4s</td>
<td>-8 bolts ½” x 5”</td>
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<tr>
<td>-One 8’ 2x3s</td>
<td>-8 nuts (goes on bolts)</td>
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<tr>
<td>-Two 8’ 2x2s</td>
<td>-16 washers (goes over bolts)</td>
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<tr>
<td>-Four 8’ 1x2s</td>
<td>-Two 8’ 4x4s (exterior grade)</td>
</tr>
<tr>
<td>-Matte black paint</td>
<td>-3 door hinges</td>
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<tr>
<td>-Water Sealant</td>
<td>-Flat black spray paint</td>
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<tr>
<td>-2 tubes of silicone caulk</td>
<td>-Food safe screen</td>
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<tr>
<td>-1 ½” wood screws</td>
<td>-Plexiglas or clear plastic sheet (must be large enough to lay over heat collector)</td>
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<tr>
<td>-3” wood screws</td>
<td>-Metal lattice/mesh</td>
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<tr>
<td>-1” wood screws</td>
<td>-6 screw hooks</td>
</tr>
<tr>
<td>-Metal sheet (must be large enough to cover length of heat collector to drying chamber and width of the heat collector)</td>
<td>-Plastic bags</td>
</tr>
</tbody>
</table>
Step 1: Cut the outer panels out of ¾” plywood, and inner walls out of ¼” plywood

Details: Cut two sides out of ¾” plywood and two sides of ¼” plywood, all of the exact same dimensions (from the diagram, or altered to meet your desired size and production.) First, use a ruler and straight edge to mark the dimensions on the board. Then proceed to cut out the pieces using whatever method is readily available (we used a jigsaw and were careful to cut straight lines). After completing each additional piece, lay it on top of the previous piece to make sure they are the same size. Cut away any excess material.

*Note: Be careful to factor in the width of the blade when you are cutting.
Step 2: Cut holes in ¼” plywood sides for the 2x4 and 2x3 supports

Details: Referring to the diagram, using a ruler and a straight edge, draw the dimensions that need to be cut to fit the supports. Then carefully cut them out (again we carefully used a jigsaw.) These cuts do not have to be as precise. But a more precise cut the better, because these holes will potentially allow the warm air to escape from the inner drying chamber.

Step 3: Cut seven 30 in. segments 2x4s as well as three 30 in. 2x3s
Details(1): Do not measure all segments and then cut all at once. This will result in segments that are not the same length of 30”

Details(2): Some of the supports need to have at least a ½” slot cut in them to allow the vents to slide back and forth. The supports that need to be cut are the ones that stick out.

Step 4: Waterproof all sides and supports using sealant

Details: Sealing/waterproofing the wood is important to the lifespan of the dehydrator. Water is a dehydrators worst enemy as the wood absorbs more moisture, the quicker it will warp. Simply paint on any type of wood sealant/water proofer to all sides of the wood. (Paint can also be used as a sealant if it is more easily accessed.)

*Note: Make sure that the sealer/water proofer allows it to be painted after it dries

Step 5: Connect the sides using 2x3 and 2x4 struts in the appropriate places.
Details: Follow the diagram in step 2 for proper placement of the supports. In order to avoid splitting the wood, predrill the holes into the plywood and supports. Then proceed to screw all the supports together using 3” wood screws.

*Note: The ¼” in panels need to be put into place before screwing on the supports.

**Step 6:** Cut 1” wide blocks out as many as deemed necessary.

Details: 1” 2x2s were cut to separate the ¼” plywood from the ¾” plywood to make room for the insulation. Use 1 ½“ nails to secure the ¼” plywood through the spacer to the ¾ “plywood.

*Note: Depending on how well you cut the ¼” side panels, you might need to sand the ¼” to make sure all of the panels cut in later steps fit flat on the ¾”.

**Step 7:** Installing the bottom of the dehydrator

Details: Using a straightedge and a ruler, mark the dimensions of the bottom on your ¾ inch plywood. Measure the full width of the dehydrator and the length of the bottom. Then cut the shape out (again we used a jigsaw.) Finally, pre drill holes every 6 inches and screw into the ¾ inch plywood.
**Step 8:** Cut the front and back of the dehydrator

Details: Using a straightedge and a ruler, mark the dimensions of the front on your ¾ inch plywood from the bottom of the vent to the top of the heat collector. Then cut the shape out. Do the same thing for the back and measure from the bottom of the back vent to the bottom of the dehydrator. Then cut the shape out, but do not attach the front panels. We will attach them later.

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**Step 9:** Create and install vents for bottom and top and install the front panel.

Details(1): Take two pieces of ¼” plywood for each vent and measure out the width of the dehydrator and the height of the desired vent. The vent should overlap the height of the opening because they are designed to slide. Cut out the overall shape of the vent.
*Note: Bond the overall vent shape with tape. It makes the later processes easier.

Details(2): Drill " holes as pictured left. Each hole needs to be in line with each other. Cut the slots to create the vents. Cutting two at a time allows for identical holes with no gaps when you slide them. Sand to remove rough edges.

Details(3): ½ "Slots must be cut in the supports to allow the vents to slide. This is why the vents are cut larger than the opening on the top and bottom. Last, cut/sand to allow the vents to slide with minimal force.

*Note: The top front vent uses the front ¾ " panel as the bottom slide.

Details(4): We temporarily nailed in the front panel to install the top front vent. After you have the front vent sliding, 1” screws are used to attach the front panel to the ¾” side panels. One screw every 6” around the perimeter of the front panel. Attach knobs to all sliding portions of the vents.
Step 10: Installing screen for vents.

Details: Before nailing the fixed portion of the vents wrap the backside in window screen to prevent bugs from entering the dehydrator. Make sure you cut the screen larger than the vent.

*Note: There are different ways to do this. We placed two pieces of wood on the top and bottom and glued them down on the screen.

Step 11: Install metal sheet supports with 1x2s.

Details: Measure the length of the heat collector from the bottom of the large vent to the back of the drying chamber. Cut two 1x2s and nail them into the ¼” side panels. Make sure the rails are at an angle to allow room for thermal mass. When nailing in the rails be sure to have your 1” spacer so the rails have something to be nailed to.

Step 12: Install shelf supports with 1x2s.

Details(1): Cut 1” strip to allow shelf supports to be nailed to the ¼” side panels. We cut a 2x2 lengthwise to 1” thick. Nail in the 1” spacers before nailing in the shelf supports to hold the spacers into place.

Details(2): Measure the length of the drying chamber and cut 1x2s according to your measurements. Make sure you have room for 5 trays that will be spaced out about ¾” to 1”. Keep in mind the rails for the metal sheet.

*Note: Mark with pencil with all the projected placements of the tray supports to make sure they are evenly spaced.

Step 13: Cut and install the door.
Details(1): Measure out a 2" border inside of the back panel. Drill holes in the corners of the border using a wood drill bit that is large enough to accommodate a jig saw blade.

Details(2): Using a jig saw cut the door out keeping in mind that there will be no waste on this cut.

Details(3): Measure out the placement for the hinges and locking mechanism. We marked all the holes for the screws first, pilot drilled the holes, then attached the hardware.

Details(4): Using 1" screws spaced 6" around the perimeter attach the door and frame to the back of the drying chamber.

*Note: After the door is cut sanding may be necessary for the door the open and close smoothly. Also it is not necessary to use three hinges.

Step 14: Installing the metal sheet for above the thermal mass.

Details(1): Measure the width and length of the heat collector going all the way to the door to the drying chamber. Cut a metal sheet to fit inside to separate the thermal mass from the rest of the dehydrator.

*Note: If a large enough sheet is not found, like with our dehydrator, one must be put together is pieces.

Details(2): The pieces must overlap to be bolted together. Line up your metal and drill holes 3” to 4” apart through both sheets. The holes should be just large enough so small bolts are able to fit through the holes.

Details(3): Attach the two sheets with small bolts and nuts to create a large enough sheet to be placed on top of the thermal mass rails. Lay the sheet on the rails you installed in the previous step. Drill holes in the metal sheet about 6” apart from each other. Take 1” screws and attach the metal sheet to the rails.

Step 15: Installing legs.
Details(1): Measure and cut 2 legs at 5 ½ feet and 2 legs that are 2 ½ feet for the dehydrator to stand. The length of the legs needs to be tall enough for the dehydrator to be off the ground.

Details(2): Drill holes through the 4x4s and all the way through the side panels. Using ½“bolts and nuts attach the legs.

*Note: You may need more than one person for this.

Step 16: Installing metal mesh.

Details: Measure the from the bottom corner of the vent to the top of the heat collector. Cut the metal mesh to fit inside. Cut as many pieces as desired (we used 4). Take 6 screw hooks (3 on each side) and hand screw them into the sides of the ¼“ plywood. Before installing the mesh, spray paint each layer of the mesh flat black to allow for better heat absorption.
Step 17: Create the drying racks.

Details: This dehydrator can fit 5 racks. To create these, we split 1x4 wood in half, and cut them to the two needed lengths (27.5 inches long and 22.5 inches long.) Once you have the wood cut to size, create an overlapping joint for strength. This requires cutting halfway into both ends of each piece so they can lock together as shown. We did this using a table saw, but it could also be done with any sort of hand tools. Then, use waterproof glue and screws to secure the corners. Last, staple food safe screening down to the wood.

Step 18: Paint the dehydrator and caulk outside in

Details: All the sun facing panels need to be painted black and all gaps need to be caulked to weather the dehydrator.

*Note: You do not need to paint the underside. We also caulked the metal sheet to protect the thermal mass
Step 19: Insert plastic bags/insulation.
Details: Insert plastic bags. We used grocery bags.

Step 20: Installing roof.
Details: Measure two roof panels to go on both sides of the top of the drying chamber. The measurements should be from the peak the vent supports. Make the roof larger than the space that needs to be covered in order for rain to be directed away from the dehydrator.

Step 21: Installing the Plexiglas cover.
Details: Measure the top of the heat collector from each edge. Cut your cover accordingly and lay on top to make sure it fits. Drill holes for screws to fit into about every 6” on the perimeter. Use 1” screws to fix the covert to the dehydrator.
*Note: We used screws with little to no bevel head on them so as not to crack the Plexiglas.

**Note: If you do not have a full sheet like we did not. Section the Plexiglas and caulk to finish weathering.

Step 22: Cut fruit and enjoy.

Details: You now have a dehydrator built. Place your trays inside with fruit cut. Angle your dehydrator in direct sunlight wait for about 10-16 hours, depending on the fruit type and thickness, and enjoy.