



# Garage Storage

Free Plans to build a Wall-Mounted Storage Rack

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FORMALDEHYDE-FREE TECHNOLOGY

## Materials and Tools:

I had one-half of a sheet of plywood left over from building the workbenches. If I didn't have that handy, this lumber rack would cost about \$55, since I would have had to purchase two whole sheets. By eliminating two of the vertical supports and being careful to minimize waste, you can build this rack with only one sheet of plywood, almost cutting the total cost in half.

### MATERIALS:

- 1.5 sheets – 3/4" plywood (for a nicer look, consider cabinet grade PureBond plywood)
- 100 – #8 x 1-1/4" flathead screws
- 8 – 3" x 1/4" lag screws
- 8 – 1/4" washers
- Wood glue

Many of the cuts can be made using a circular saw. If you take that route, I suggest using guides to ensure perfectly straight cuts, because circular saws are otherwise difficult to control. We use our table saw and miter saw, because they make the cuts much easier, since we can use built-in guides.

### TOOLS:

- Miter saw (or circ. saw)
- Table saw (or circ. saw)
- Jig saw
- Drill / driver
- Impact driver (optional)
- Clamps (optional)
- Stud finder
- Level
- Speed square

## Step #1



The entire structure is built out of plywood, and that means this project involves making a lot of rip cuts. A cabinet saw would have been really useful. I don't have one so I made the best out of what I do have.





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## Cut List:

Here are the pieces you'll need to cut with your table saw. I shortened my vertical supports (fourth item below) because I had to work around a garage door.

Leave them at 79" if you have the space. Also, do not rip the entire length of the plywood to make your vertical supports, because you'll be using the excess at the end of the sheet for further shelf supports. (In other words, before cutting the vertical supports, you should cross-cut the plywood at 79").

- 1 - 3" x 96" (lower cleat)
- 1 - 5" x 96" (upper cleat; requires a 45° angle on the table saw; more specifics below)
- 2 - 6" x 96" (to be cut for shelf supports)
- 10 - 4" x 79" (vertical supports)
- 1 - 17" x 24" (this will be leftover from vertical supports, to be cut for more shelf supports)

## TIP:

Using these dimensions, you can have the big box store rip the plywood in half (24" x 96") making it easier for subsequent cuts.

The upper cleat needs to have an angled backside, from which you will hang the vertical supports. You want the width on the longest side to measure 5", and cut it at a 45° angle. This will make the shorter side approximately 4-1/4".

## TIP FROM EXPERIENCE:

Looking back, both the upper and lower cleats could have been identical (5" tall with a 45° angle) to better distribute the weight. The design this lumber rack is derived from used removable dowels to "lock" the vertical support in place. For that reason, the bottom cleat is more of a place holder than anything else. I didn't incorporate the dowels, and would recommend making the bottom cleat angled, which essentially eliminates the need for the dowels in the original design.





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## Step #2



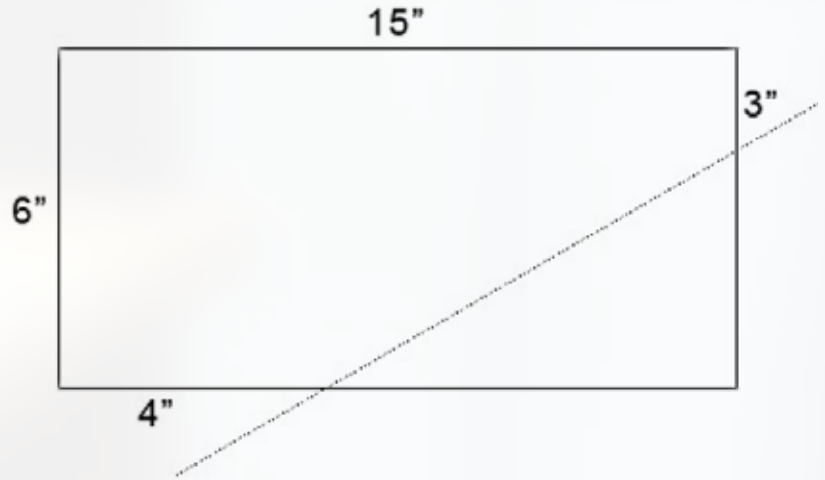
Next, cut the 6" wide pieces with your miter saw into 6" x 15" rectangles. Do the same with the piece of plywood leftover from cutting your vertical supports. Your goal is to create 15 identical shelf supports that look like the example shown on the right.

The easiest way to make the diagonal cut is to setup a jig for your table saw. (And no, the drill/driver wasn't sitting there while I was cutting!)

### TIP FROM EXPERIENCE:

Consider cutting a short lip on the top of each shelf support to prevent materials from sliding off. We omitted this in our first build and have not had problems, but we think it would make a slightly better design.

In some of the pictures you'll see that five of my shelf supports are shorter than 15", and that's because I had to make adjustments to work around the garage door. Just like the vertical supports, keep them full length if you have the space.



Here's several of the shelving supports. Note they are sitting on the table upside-down.



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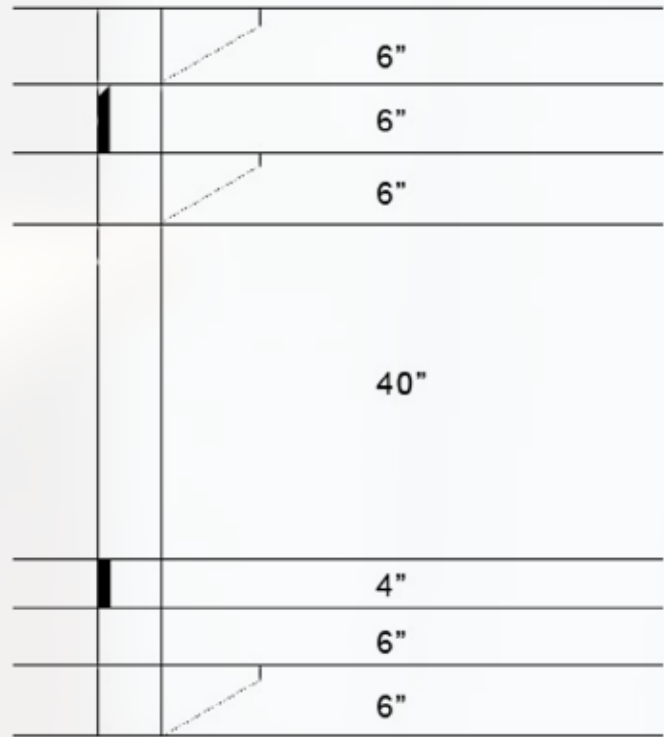
## Step #3



You need to cut two notches on the vertical supports that will accommodate the upper and lower cleats. I placed my upper cleat 6" down from the top and the lower cleat 12" up from the bottom.

With these measurements, I can have a shelf at the very bottom for sheet goods and two shelves at the top for 2x4's and the like. Position your cleats as necessary, but work to keep approximately the same distances from top and bottom. Here's a diagram showing where I planned the cleats and shelves.

To make things easier, I clamped all the vertical supports together and marked lines. The upper notch should measure 6" long and the lower notch should measure 4" long. The extra inch is to allow for clearance below the cleats.





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## Step #4

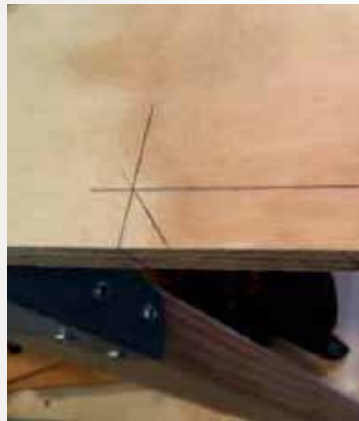


Now it's time to cut the notches in the vertical supports. Using a square, the lines I just marked and a piece of scrap, I traced an outline.

Use your jig saw to cut along the lines. To make the long cut, start midway and curve onto the line like in the picture. Then cut in the opposite direction to carve out the rest. Alternately, you can drill holes at the corners big enough to fit the t-shank blade.

Remember, the upper notch needs be angled to fit the upper cleat. I used a piece of scrap from ripping the upper cleat to mark the angled line.

The angled cut in the supports fits neatly over the upper cleat.





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## Step #5



Each shelf support will be sandwiched between two vertical supports. Glue and screw everything, and remember that the shelf extends away from the notches. Put four screws, staggered on each side.



Here I've got two of the uprights finished. You can see the shelf at the top followed closely by the second shelf. The third shelf is place at the bottom for storing sheet goods.



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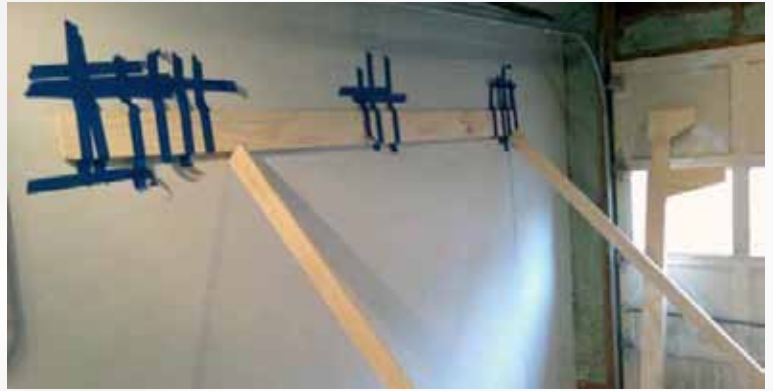
## Step #6



The two cleats are held in place with lag screws. I didn't have my lovely assistant, so I used some spare boards and a lot of blue tape to get things into position. I wanted the bottom of each vertical support to just barely sit on the block below. If you don't have similar concerns, you can hang the upper cleat at whatever height is convenient. I'd recommend positioning it to keep the rack up off the floor for easier cleaning.

Remember to orient the cleat such that the angle is going into the wall (so that the vertical supports will hang from it).

Use the stud finder to locate studs and pre-drill the holes, and put a washer on each lag screw before screwing it in. Use four lag screws per cleat.



Here you can see the lower cleat in position.



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## FINAL PICTURES:

I'm really pleased with how this lumber rack turned out. It's strong enough to hold my weight (and a lot more), and it keeps everything off the floor. The shelves can accommodate sheet goods and dimensional lumber of any length since they can slide left and right. Plus, they can easily be removed.

If I did this project again, I would incorporate the tips to angle the lower cleat and cut a lip into the shelf supports. Even so, this lumber rack will serve us well.



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