

BUILD YOUR OWN BENCH

Everyone needs a place to sit. As public benches become more scarce, having the opportunity to slow down, pause and simply exist in a space without rushing through it becomes invaluable. A place to gather suddenly creates and reinforces a community-driven environment that may have been previously absent with folks constantly on the move.

Tiny WPA has been designing, prototyping and fabricating benches for years to meet these needs with communities. A bench was also the first project Tiny WPA's Building Heroes focused on as a means to improve their design, building and collaboration skills when we first piloted *The Building Hero Project* in 2014. Our initial benches have seen many iterations over the years, constantly improving its beauty, durability and buildability, while making sure the bench is 'perfectly difficult' to build in order to maximize learning and team building.

Creating a place to sit is one of the most important and joyful things to do. We hope you enjoy making our BYO bench(es) for places and spaces that are important to you!

6-8 HOURS

COST \$100-200



Take a seat, hang out a while. The newest incarnation of our easy-to-make bench utilizes a simple and solid design to complement your indoor or outdoor space. The Building Heroes put this version through its paces with their patented jump tests, leaving us confident and secure in knowing we've got your back (side).



WHAT DO YOU NEED?



MATERIALS

- 8 2 x 4 x 8ft common pine, douglas fir or cedar boards
- 1 box of 2 ½” exterior wood screws (minimum 40 screws)
- 1 box of 3” exterior wood screws (minimum 32 screws)
- 3 sheets 100-150 grit sandpaper or orbital sanding discs
- 4 adjustable leveling feet (amazon part# B07M6L172J)
- 1 qt semi-gloss exterior paint with primer (for pine or fir only)

Optional: (if 2x4s aren't available)

- 1 2 x 8 x 10ft to make the seat slabs
- 2 2 x 6 x 8ft to make the legs, diagonal bracing and supports

TOOLS

- 1 table saw
- 1 chop saw (also called a miter saw)
- 1 drill with a driver bit and ⅛” drill bit
- 1 ⅜” drill bit
- 1 tape measure
- 1 speed square
- 1 nail set and hammer
- 1 orbital sander or sanding block
- 1 safety glasses
- 1 pencil
- 1 paint brush or roller
- 1 paint tray
- 1 drop cloth

Optional:

- 1 18-gauge finish nailer (see more in the Tips! section)
- 1 combination square (helpful for marking and pre-drilling)
- 4 speed clamps

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TIPS!

Here are some tips and things you should consider before you head to the hardware store to purchase materials.

Give Yourself Extra Material Length

If you plan to have the store cut your wood, we recommend adding 3" to the measurement of anything you are having the store cut. Then make all final cuts on your own.

Determine Your Wood

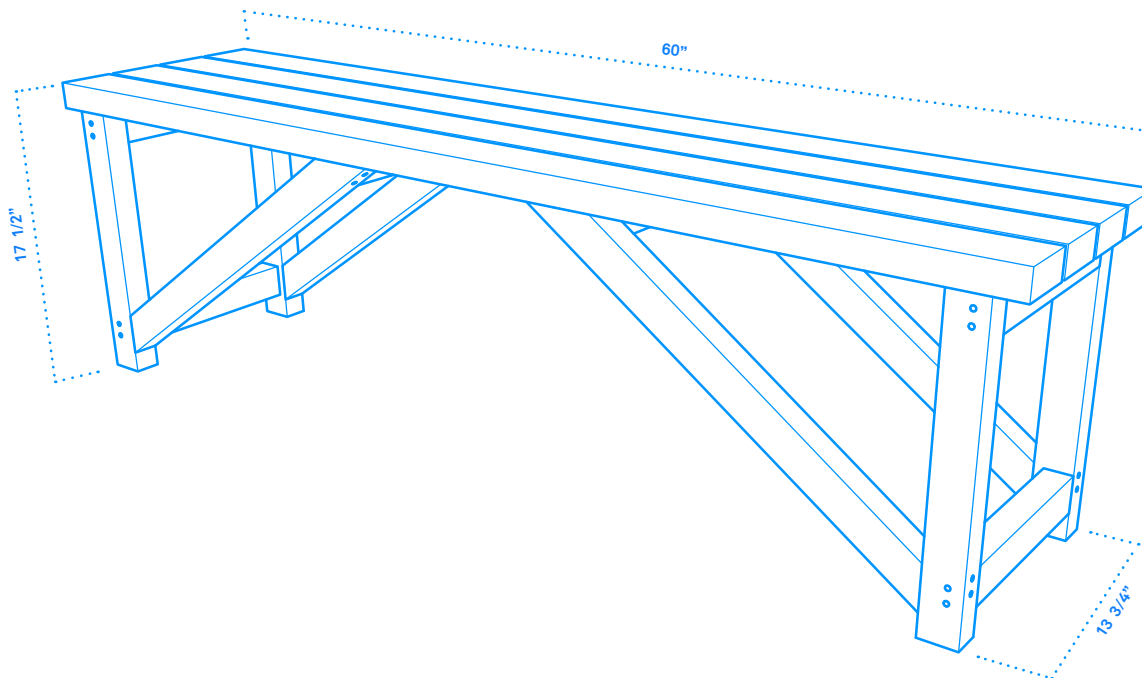
We specifically designed the bench using common 2x4s. Most often, 2x4s are pine, douglas fir or spruce, but this varies from region to region. If you are making an outdoor bench, you will need to paint the 2x4s. The paint "seals" the wood, protecting it from rain and mold. However if you do not have the space or capacity to paint, use cedar. Cedar is less toxic than pressure treated wood and it does not require any additional sealant for outdoor use.

Don't Trust the Factory Ends

The ends of the boards may look straight, but they rarely are. They are crooked and often treated with a waxy coating that won't accept paint. Always cut both ends of your boards to ensure a precise final result.

Use a Table Saw

The table saw plays an essential role in keeping your boards perfect and square. Cut $\frac{1}{8}$ " from all wood sides before finalizing the widths listed



here in the cutlist. If the table saw is not used, you will have to recalculate the width of your bench. The bench will be approximately 1" wider.

Use a Finish Nailer

While not required, a finish nailer will help you 'set' your joints in place as you pre-drill and screw your bench together. Think of a finish nailer as the cousin of pre-drilling. It might feel like an extra step, but it will be worth it when your bench is perfect!

Mind the Gap(s)

A gap of any size between any two boards that you screw together means that the connection is 50% weaker than if the boards were touching. If a gap exists, you will need to remove ALL of the screws, then carefully screw it back together.

Pre-Drill All of Your Screw Holes

To prevent the wood from splitting, always pre-drill holes for your screws. This creates space and a path for the screw. When pre-drilling, an extra set of hands (and clamps) will help hold everything together.

Use a 'Zig-Zag' Pattern with Screws

When screwing across a whole length of wood, a zig-zag pattern will exponentially add strength to anything you're building, and helps to prevent splitting. You're essentially making little triangles, and triangles are one of the strongest shapes out there!

Make Yourself a Stop

Stops are great when you are making identical cuts on the chop saw. Simply clamp a piece of scrap wood to the table or fence at the length you need to cut, and start chopping! As you build an object over and over, you may create your own little tricks to make the job easier.

This is at Least a Two Person Job

Just as seesawing requires two people, building a bench is a lot easier with two people, particularly during assembly.

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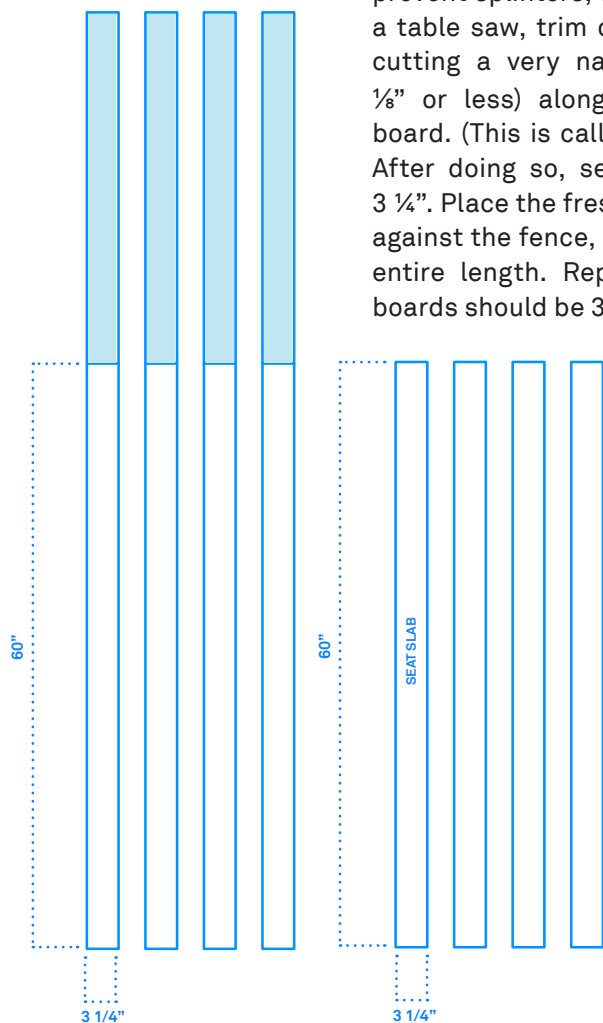


CUTLIST: SEAT SLATS

Start with four 2x4s and a table saw. Please note that the dimensions of most 2x4s are actually 1 ½" x 3 ½". This knowledge is helpful when measuring and cutting down your boards. The bench is designed with 3 ¼" wide seat slabs, which means you will need to cut down the four 2x4s to get to this desired width. Directions are below.

First Cuts

2x4 boards come with rounded edges to prevent splinters, among other reasons. Using a table saw, trim off these rounded edges by cutting a very narrow width (approximately ⅛" or less) along the entire length of the board. (This is called "milling off the radius.") After doing so, set your table saw fence to 3 ¼". Place the fresh cut edge of the 2x4 board against the fence, and cut the board along the entire length. Repeat this process. All four boards should be 3 ¼" wide.



Second Cuts

Using a chop saw (also called a miter saw), cut off the factory ends (highlighted in the TIPS! section) of your four boards. Still using a chop saw, cut all four boards to 60" in length. Your seat slabs are now complete.



CUTLIST: LEG AND BRACING

Gather the four remaining uncut 2x4s. Remember your 2x4s are actually 1 1/2" x 3 1/2". You will be cutting down these four boards so they are 2" wide for your legs and braces. Detailed instructions are below.

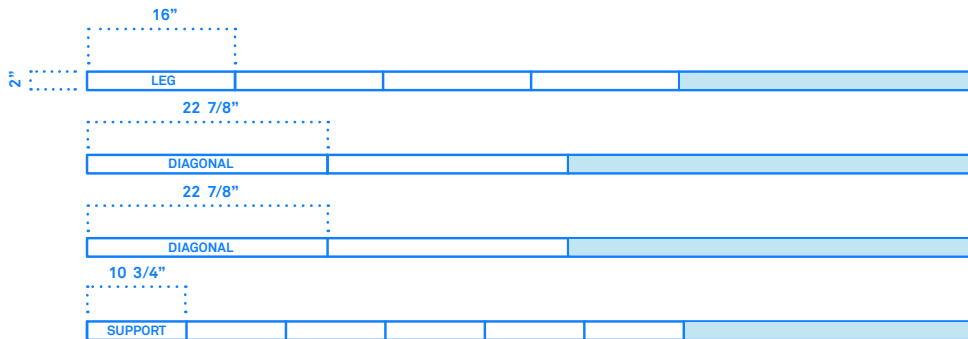
First Cuts

Using the table saw, mill off the radius (see previous page for explanation of milling) along one side of all four boards. Next, set your table saw fence to 2". Place the fresh cut edge of a 2x4 board against the fence, and cut the board along the entire length. Repeat this cut for all four boards. Once complete, all four boards should be 2" wide. Discard the excess.



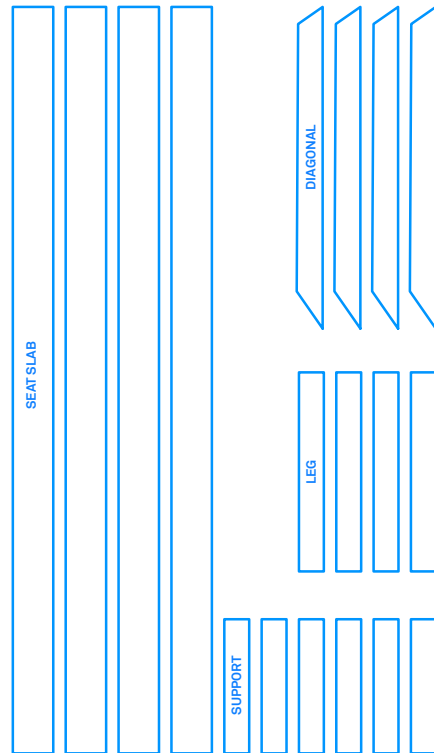
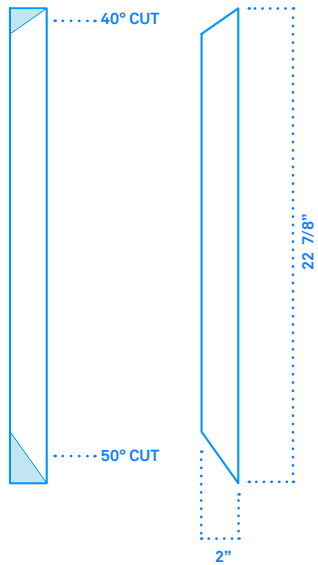
Second Cuts

Cut off the factory ends with the chop saw. Continue to use the chop saw to cut down the four boards to the dimensions below. Save any leftover pieces for "just in case" material. See next page for diagonal cut instructions.



CUTLIST: DIAGONAL BRACING

Your finished diagonal pieces should be 22 7/8" at the longest measurement (point-to-point). If the measurement ends up being a little different, that's okay, but it will affect where the diagonal meets the leg. Setting up a stop on your chop saw as seen in the photo to the right will ensure all your cuts end up being the same.

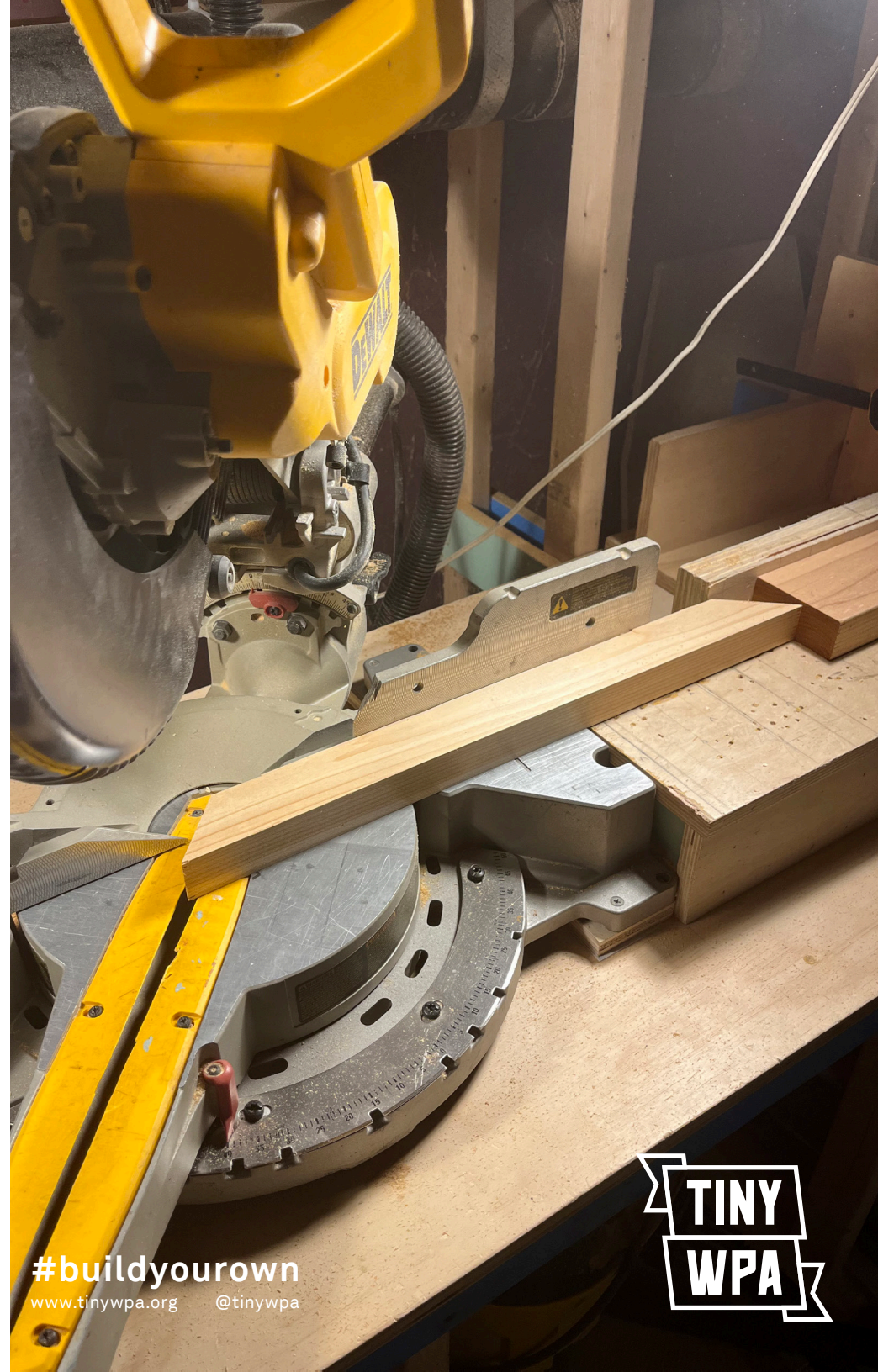


Third Cuts

Set the angle on your chop saw to 40 degrees and cut the first end of your four diagonal pieces. Next, set the angle of the chop saw to 50 degrees, and cut the other ends. Make sure the angles are “pointing” towards each other. See drawing above.

All the Pieces!

Above is what all your final pieces should look like before assembly begins. You should have four seat slabs, four diagonals, four legs, and six supports.



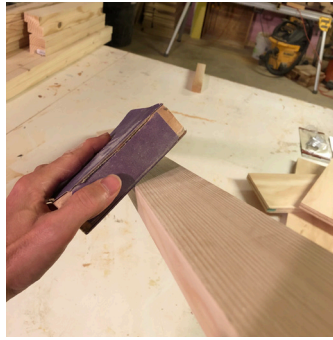
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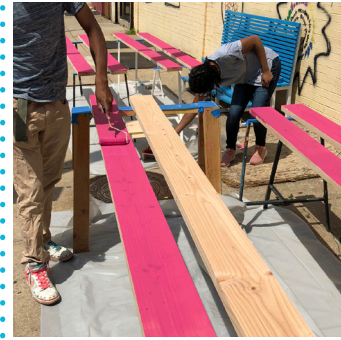
INITIAL STEPS OF ASSEMBLY



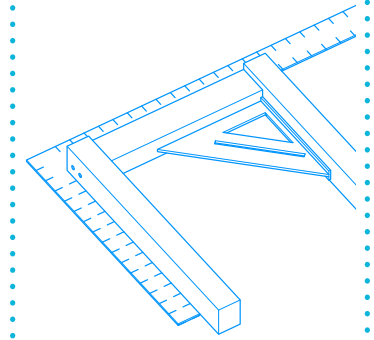
Sand your boards to prevent splintering and injury as you build.



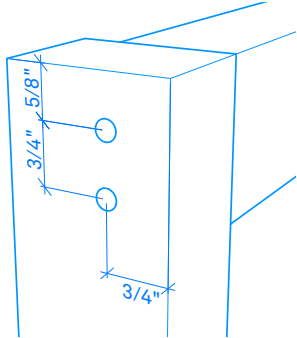
Chamfer (angle) all corners with a sanding block to create comfortable edges.



If you are using pine or douglas fir, paint your final pieces before you start to assemble the bench. Cedar should not be painted.



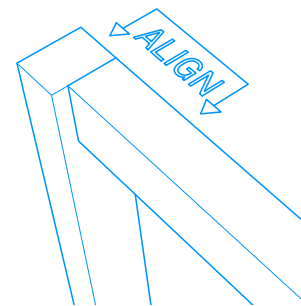
After sanding (& painting), attach two legs to a support. Align all edges. Do this for both set of legs.



Attach with 2 1/2" screws. Recommended measurements for pre-drilling.



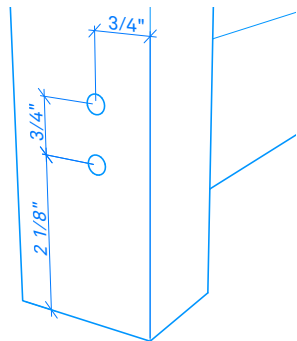
Optional: Use a finish nailer to help 'set' your pieces in place before drilling.



Please note: align top support to the "outside" of the leg assemblies and flush to the top of the leg.



Using some scrap wood as a spacer, attach the bottom support 1 1/2" from the end of the legs to create the "feet."



Attach with 2 1/2" screws. Recommended measurements for pre-drilling.

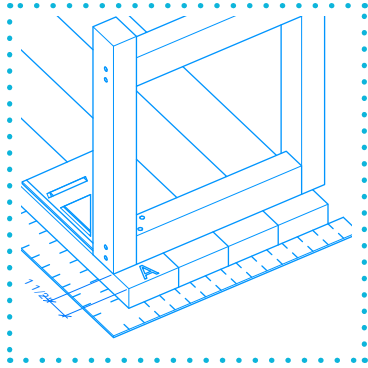


Lay seat slabs on extra wood or blanket to prevent scratches. Lay your 1 1/2" spacer on top, align & mark from ends.

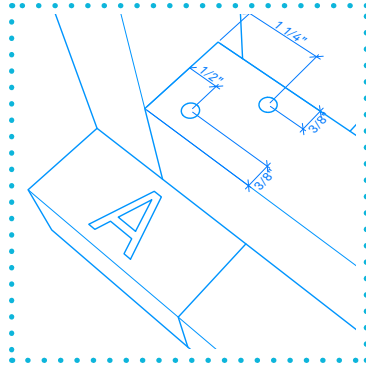
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MORE STEPS... KEEP GOING. YOU GOT THIS!



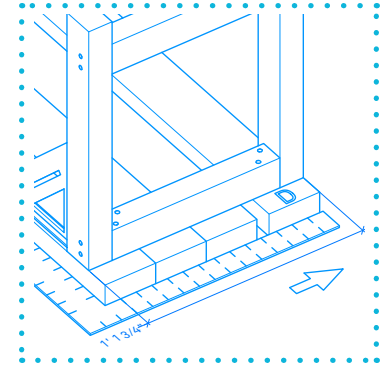
Attach leg assembly to board A at that 1 1/2" mark. Align all edges.



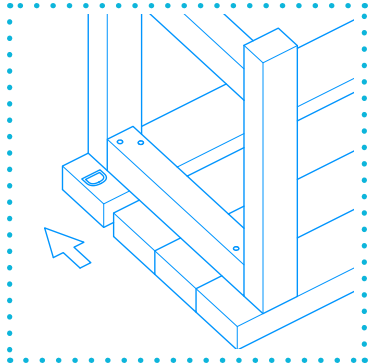
Attach with 3" screws. Recommended measurements for pre-drilling. It is helpful to unscrew bottom support for pre-drilling.



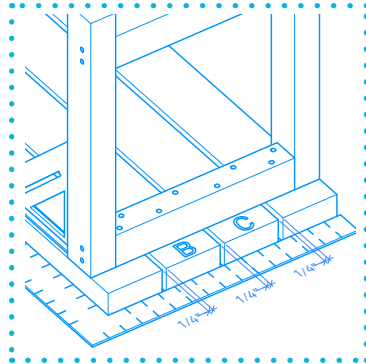
Repeat with the other leg. Attach the other leg to board A.



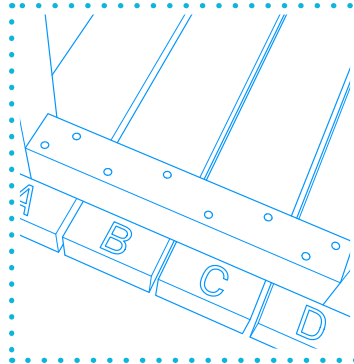
Move board D out so edges are flush with leg assembly. Attach with 3" screws.



Repeat with the other leg. Attach the other leg to board D.



Space boards B & C evenly between boards A & D (about 1/4").



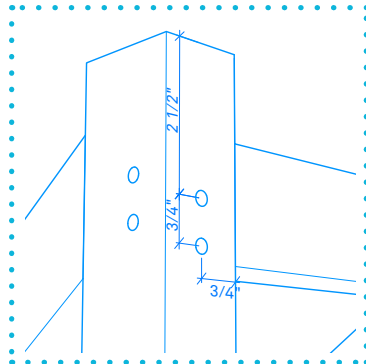
Recommended pre-drilling zig-zag pattern. Attach with 3" screws.



Mark 1 1/4" in from foot edge.



Position 40° cut of diagonal on mark. Confirm angled cuts sit flush with leg. Adjust as needed.



Recommended measurements for pre-drilling of diagonal 40° cut at feet.

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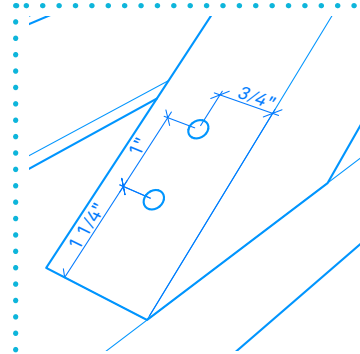
FINAL STEPS OF ASSEMBLY



Attach with 3" screws.



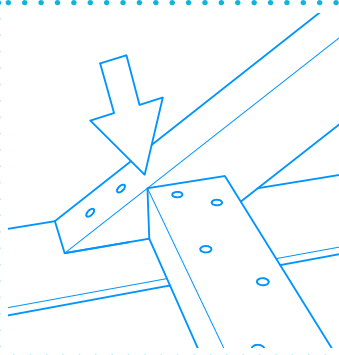
Attach 50° cut to seat slab. Double check that the seat and leg assembly are square.



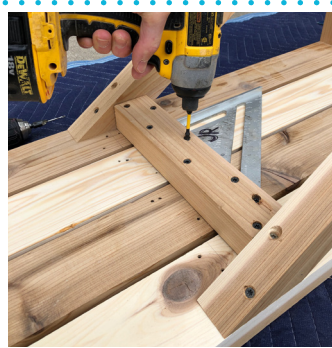
Recommended measurements for pre-drilling of diagonal at seat slab.



Hold a screw at the joint to determine what length to use to secure diagonal pieces.



Place supports between diagonals so they are as hidden as possible.



Attach with 2 1/2" screws. Remember to pre-drill and use a zig-zag pattern.



Repeat with final support.



Final push! The feet!



Mark and punch with nail set the center of legs. Pre-drill a hole (max 1" deep) with 3/8" bit.



Place the leveling foot base in the hole and hammer until flush. Screw in the feet.

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MORE NOTES ON BUILDING YOUR BENCH!

Here are a few more tips for finishing up the beautiful bench that you're making!

Focus Sanding High Touch Areas

We've said it before, but we will say it again: focus your sanding and chamfering on high touch and seating areas, especially if you're using the cedar. It's a wonderful material, but it can chip if the edges are left sharp.

All the Dimensions Matter!

While there is some flexibility in how the bench gets finished, getting the dimensions correct as we've designed it is absolutely important.

Did We Mention Gaps are Bad?

A gap means there is a TINY amount of room for the joint to move. If the joint starts to move it WILL get weaker and weaker over time. Again, you will need to remove ALL of the screws and then screw it back together. And wood glue is magical, by the way.

Maintain your Bench Properly

If you do paint, we recommend repainting every two years to keep your bench looking sharp. When you are ready to repaint, lightly sand your bench to allow new paint to adhere better. It's also important to look for any nicks, scrapes or cracks and do touch-ups as needed. Remember: any exposed wood will absorb water, causing the wood to rot. Paint "seals" the wood, protecting it from rain and mold. Lastly, keep the feet out of standing water or frequently damp

ground by using screw-in adjustable leveling feet to elevate the wood off the ground. The adjustable feet are great at leveling your bench too, since sidewalks, floors, etc. are often uneven.

Run into Problems? We can Help!

Have questions or need help working through a fabrication problem? We are happy to help. Email Tiny WPA at info@tinywpa.org.

Post Pictures of Your Building Process on Instagram and Tiny WPA!

We want to cheerlead for you and give you some visibility for your efforts! Tag us (@tinywpa) and we will happily repost any photos or stories that you share.

Don't have an Instagram account? Send photos to info@tinywpa.org, and we will post them!



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