MATTRESS INSIDER®

How to Build a Foundation

By APHawkes

The box-spring on my bed broke, causing sagging and creaking. Here's how I built a new one for around $43 in materials from the local hardware store. Note these are directions to make a queen size foundation, but the dimensions can be tweaked to do almost any size.

Step 1: Materials

In retrospect, this was over-built. I'll tell you what I did, and later I'll clue you in as to what I could have done better.

Hardware:
- Circular Saw (All cuts are cross-cuts, so other saw types will work
- Hammer (Disassembly and frustration venting)
- Electric Drill
- Drill bit (approx 3/32")
- Countersink Drill Bit (to match screws)
- Staple Gun

Software:
- 2x6x12 (2 qty)
- 1x4x8 (12 qty)
- 2x4x8 (1 qty)
- 2" Wood screws (1 box)
- 3/8" staples

Step 2: Getting the materials home

Note that the 2x6x12 pieces are a little long. Longer than my van, anyway. Luckily, most hardware stores will cut pieces for you for no charge.

My bed is queen size, which is nominally 60" x 80" . Thus, with one 2x6x12 I can get a ~64" piece and an 80" piece. We will make more precise cuts at home, but at least this way I can actually GET it home. I certainly could have had them make this cut to the proper size, but I hadn't gotten the precise measurements yet. Whoops.

I suppose you could have them make almost all the cuts, but I feel bad taking advantage. Maybe there's a limit too, but I was happy to get out of there without finding more "projects" to do.

Step 3: Breaking down the old foundation

After removing a ton of staples, stripping off the fabric, foam, and cardboard, I was left with the frame. What junk. Before I got too carried away I managed to grab a tape measure and get the dimensions. 79" x 59-1/2". A few swings of the hammer and it was a pile of refuse.

Step 4: Preparing the pieces

Measurements ready, I decided to make the longest sides of the bed the full length (79"). The shorter pieces would fit inside. The width of the frame is 59.5". Take away 1.5 from each side for the 2x6's and the cross pieces are 56.5" in length. The 2x4 center support is 79" less 3" from the front and back of the bed for a length of 76".

All of these cuts were regular, 90 degree cross-cuts. Nothing fancy here, just measure, draw a line (speed square hand here), measure, draw...then make the cuts (Circular saw). Once you get a system going this part will go surprisingly quickly, but I still wish I had a nice chop saw/radial-arm saw station.

When you're done making your cuts you should end up with this:

- 1x4x56.5" (Qty 12)
- 2x6x79" (Qty 2)
- 2x6x56.5" (Qty 2)
- 2x4x76" (Qty 1)

You'll also have a fair amount of 1x4 scrap, some of which will be put to use.

Step 5: Layout

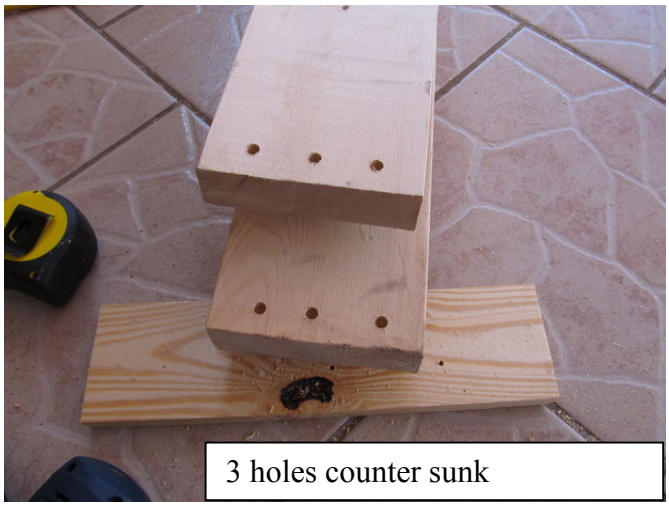
I described this a bit earlier, but perhaps the picture makes more sense. It's a box made from 2x6's on the outer perimeter. A 2x4 is laid length-wise in the center-line to prevent sagging in the middle. The "scrap" 1x4's will be used on the inside of the 2x6's for the slats to sit on. Of the 12 1x4's that were cut, 9 will go on top (for the mattress), and 3 will go on the bottom to prevent bowing out on the bottom).

Step 6: Adding the Lip

The slats are going to be supported on either side by the leftover 1x4's. These get screwed directly to the 2x6's, starting a couple inches from either end. This way there's clearance for the shorter 2x6's to make the outer box. Measure 3/4" from the edge, or use a scrap piece of wood to gauge where these 1x4's will sit. This way the top of the foundation is even from end to end. The old one was bumpy, as thei slats sat on top of the rails.

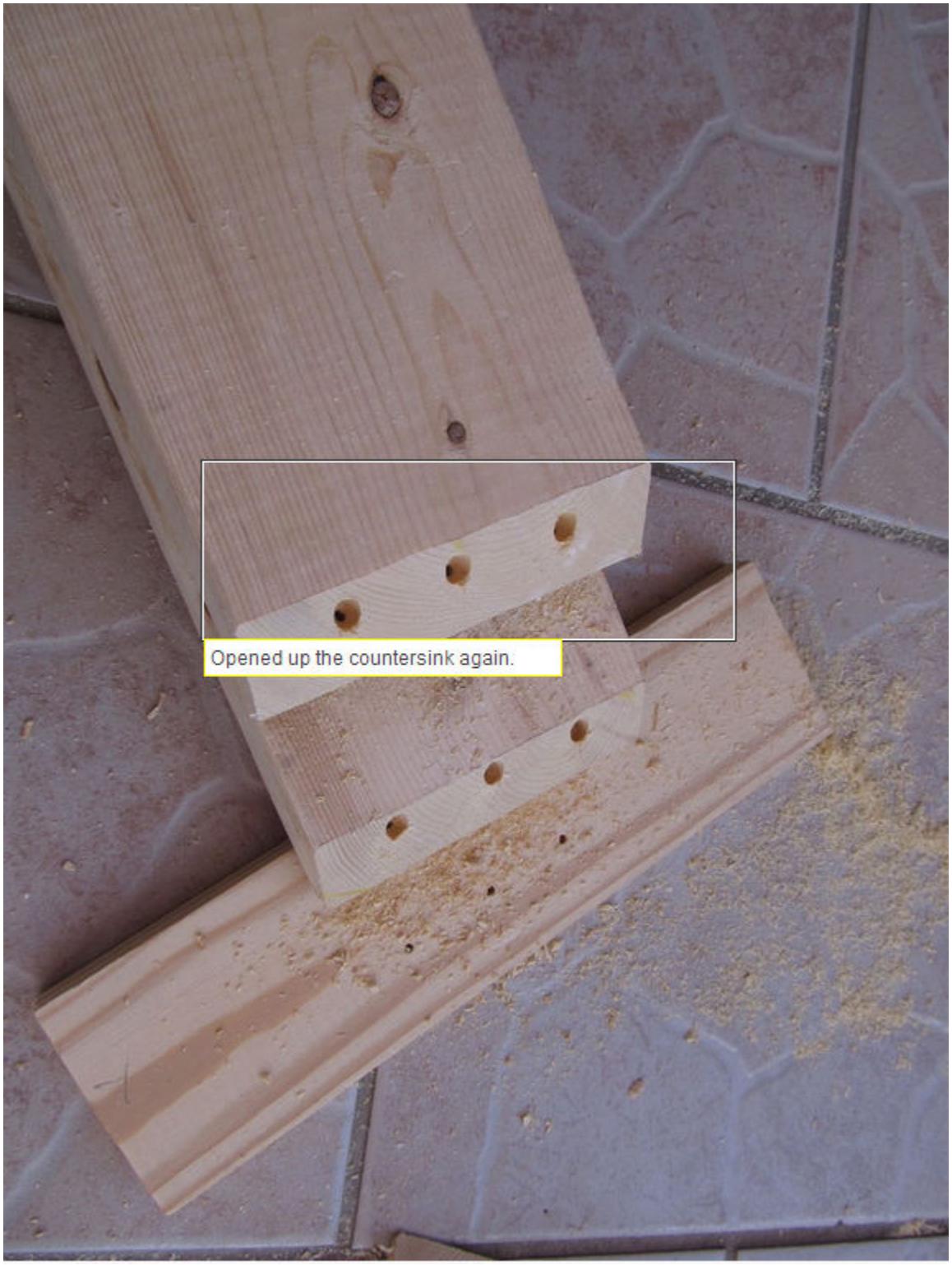
Note the nails. I used these to initially tack the wood in place, thinking that trying to work the drill for the screws would inevitably move the piece. So, I lined up one side of each scrap, drove a nail, lined up the other side, another nail, then maybe one in the center for good measure. Then, use screws to hold securely. The staggered pattern is to prevent splitting and avoid the pieces "rocking" if they were in the middle.

Step 7: Build the Outer Box



3 holes counter sunk


After cutting the 45 degree corner, I lost a bit of my countersinking

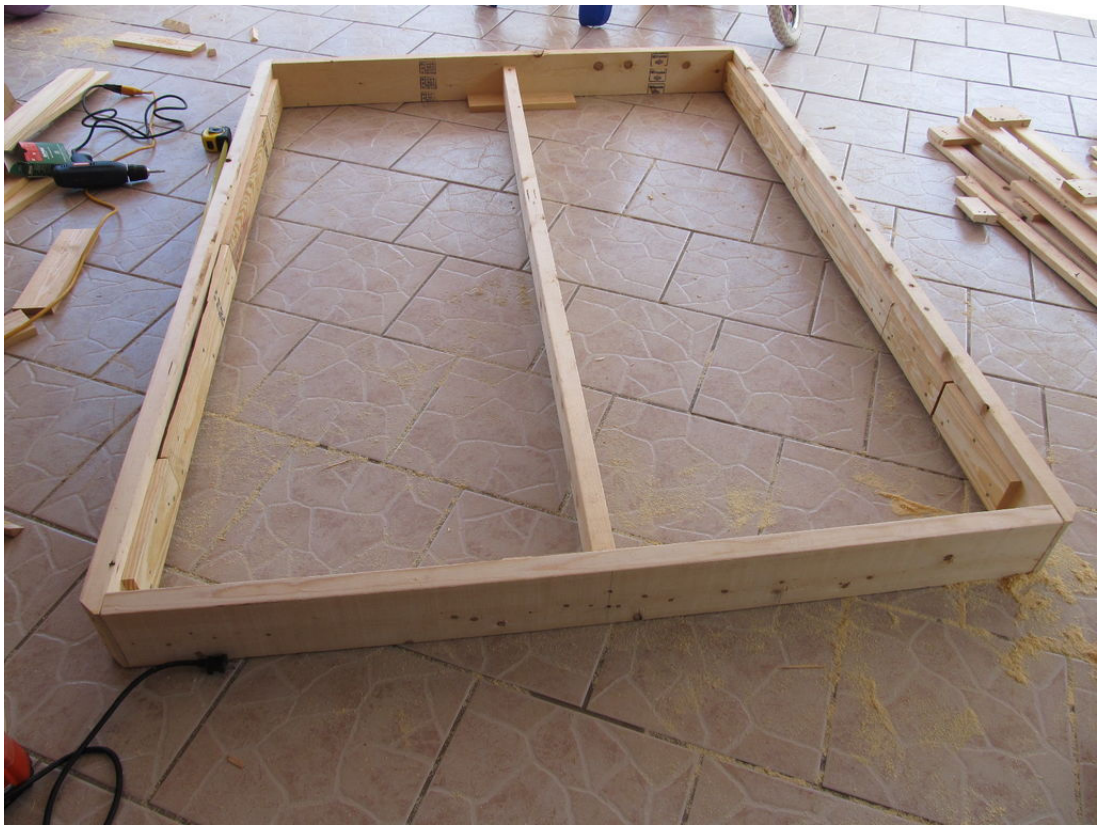


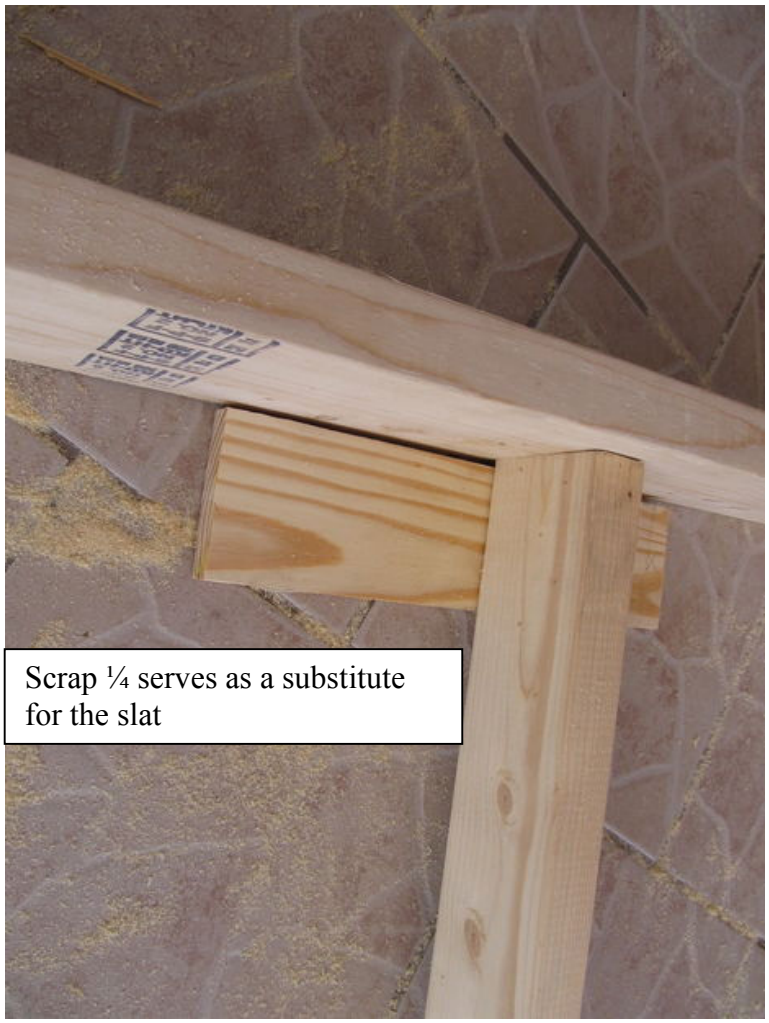
I'm a big fan of pre-drilling, so I started on the end pieces. I figured two screws into each end of the 2x4 ought to be sufficient. So, after a few quick measurements I drilled those holes. Then I pre-drilled the wood for the joints at the 4 corners.

In dismantling the old box spring I noticed that even these lackeys took the time to round off the corners. I didn't have a router handy, but figured putting a 45 degree cut on the end would be better than nothing. Also, since I'm using 2" screws I needed to ensure that they

got enough bite. So the countersinks on the sides (and for the 2x4) were fairly deep. Those screws (3 per joint) managed to get plenty of threads in to hold it secure. If I'd had longer screws laying around I would have used them, though.

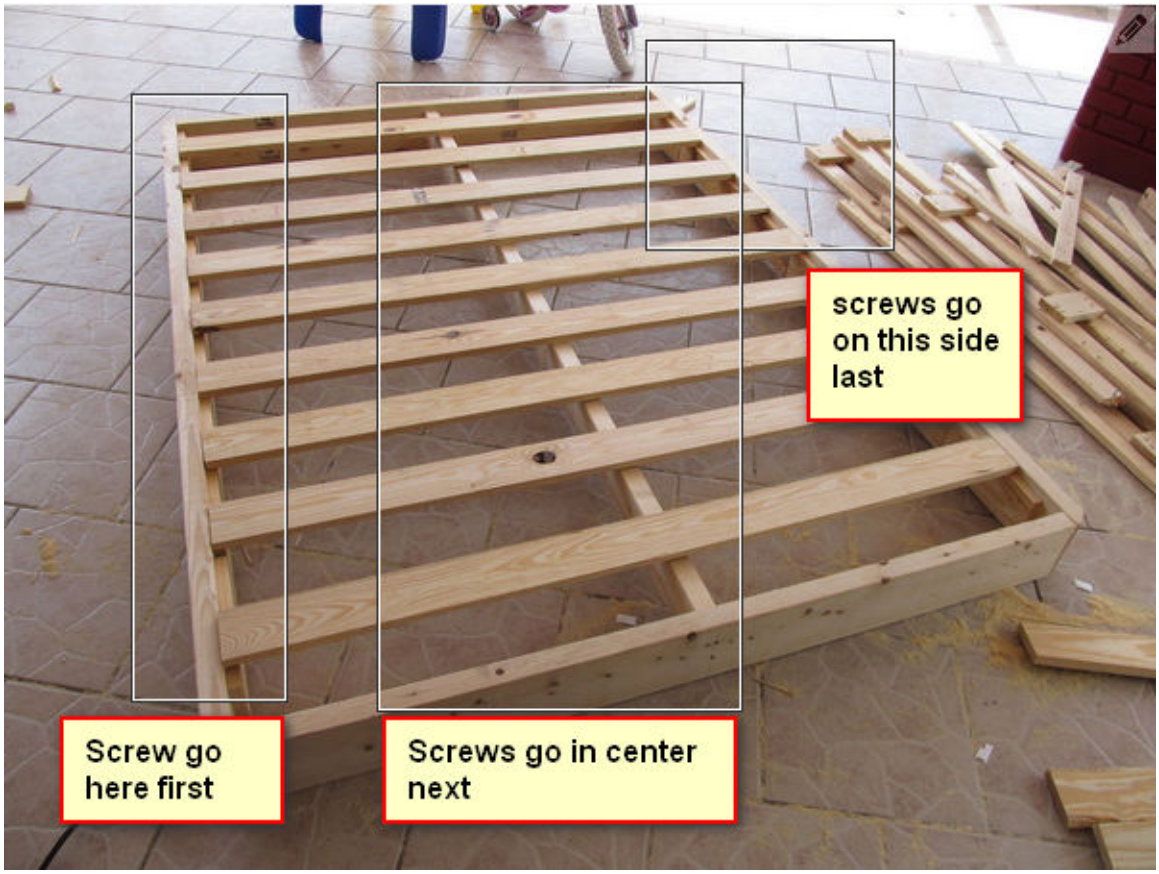
Step 8: Adding the Center Support



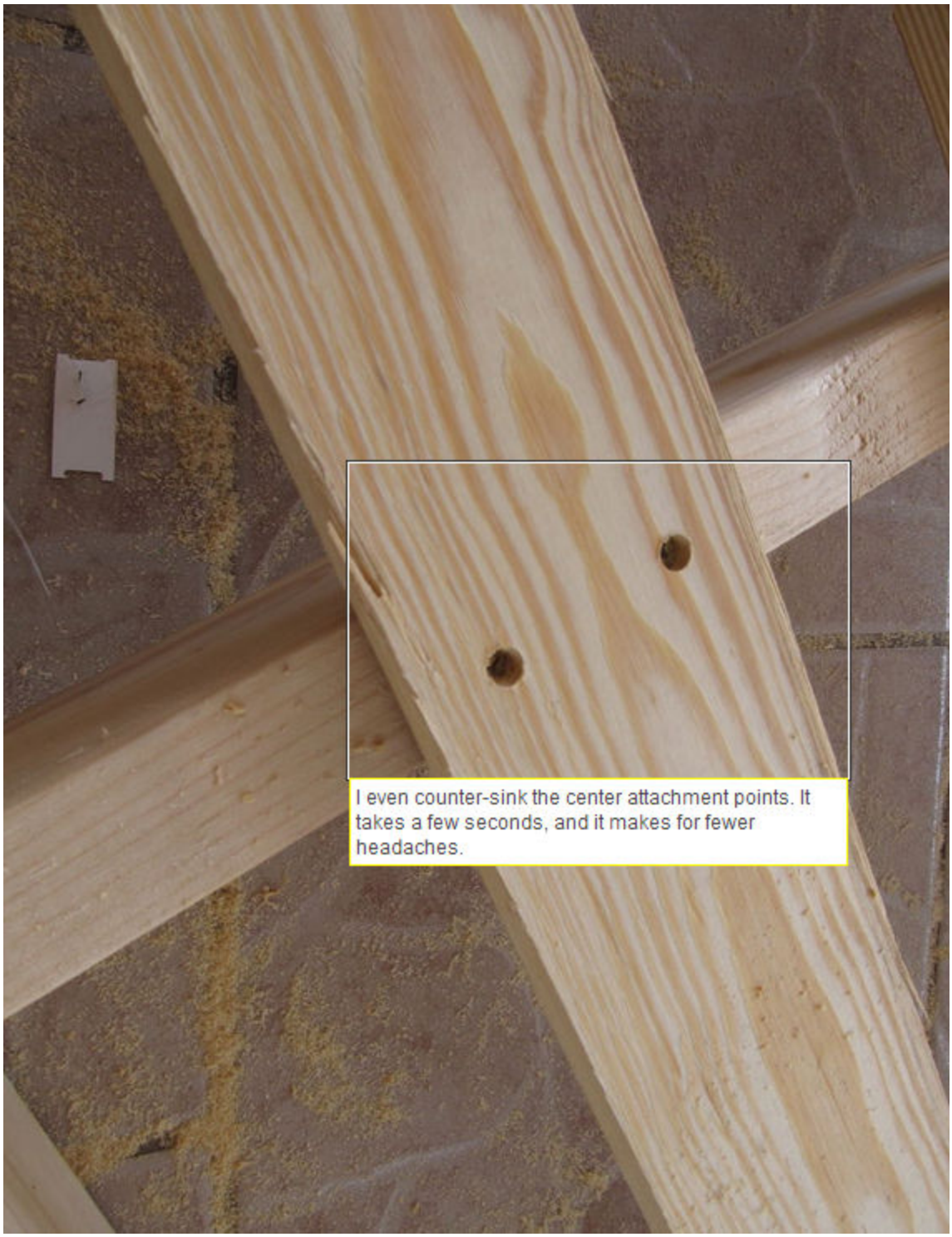


At this point the whole bed is upside-down. That was intentional. By doing this I can set the location for the center support by using some scrap wood underneath (the same thickness as a slat) to adjust the height properly. This made adding the support a breeze. No worries if it was in the right place, or if it was going to wander around (since it was pre-drilled). In hind-sight, maybe a couple extra screws toed in would have been a good idea. It couldn't hurt.

Step 9: Adding the Mattress Slats



All the screws are in. I can walk across the top without it flexing.



I even counter-sink the center attachment points. It takes a few seconds, and it makes for fewer headaches.

This part was a bit boring, but that's better than exciting (or frustrating). Flip the bed right-side-up. Because the 1x4's are so thin, and you're driving screws so close to the edge, pre-drilling is a necessity. I just used my countersink, as it penetrated deep enough with the "bit" part to prevent splitting by the screw, and the countersink kept the head from splitting the wood as well.

The slats (9 of them) were added at 8 in centers, starting from one edge. So, the end result isn't quite symmetrical, but it's close enough. This isn't fine furniture building, it's frame work. A bit one way or the other at this point won't make a difference in the final product.

Once the slats were attached on either side (2 screws each side), I did the countersinks and screws into the middle 2x4. This thing is solid.

Step 10: Adding Additional Supports

Two scrap pieces for diagonal bracing.

45 degree cuts on the ends allow them to fit snug in the corners.


Shorter screws here. 2” would go right through
Longers screws are fine here

First, I flip the foundation again, face-down. Then I check for square. Only off by 1/4". Not bad.

To keep it square, I added a couple cross-braces at opposite corners. The circular saw made quick work getting the 45 degree angles cut, and plenty of screws to hold it snug. Note that the places where I screwed to the slats I used some spare 1-1/4" screws to ensure I didn't go through. The 2" screws are too long (the 1x4's are 2 thick, meaning they are only 1-1/2" total).

To keep the bottom from bowing out, I added 3 slats at the bottom. Going for speed over accuracy, they were placed 20, 40, and 60 inches from one side. Same as the mattress-side: pre-drill for 2 screws on each side, attach, then do the middle pre-drillings and fastenings

Step 11: Upholstery

The old foundation had a piece of cardboard over the top to help distribute the load over the slats. Sounded like a good idea to me. Couldn't hurt right? I didn't put nearly as many staples as there was originally. My staple gun was giving trouble, so I wasn't in the mood.

On top of the cardboard was a thin layer of foam. I don't know how much cushion it really provides, but I saw no point in leaving it out either. Again, the staple gun made quick work of this, even in its poor condition.

Finally, the outer cloth is re-attached. I was a bit impatient here and didn't get the thing centered properly. After pulling all I could to compensate, it doesn't look bad. Considering nobody will ever see it means I lose no sleep over the inaccuracy. The staple gun survived long enough to get through this as well.

Step 12: Conclusion

So it is now complete. To ensure that everything was OK I put it on the bed rails and it was just fine. Mission Completed. So here are a few things I noticed after all was said and done.

1. This thing was HEAVY. I probably could have used 1x6's for the outer box, especially if I had used whole pieces for the rails instead of scrap.

2. Using 2x6's would have been fine if I were making an actual BED and not a box-spring. This thing was solid enough that the only thing missing was 4 decorative feet. In my case it would have been too low, but for some they like the mattress low.

3. Had I been more cautious I could have had even less scrap left over. I didn't do too bad, but could have done with a little less

4. Get a hand when moving this thing around. I was stiff for a couple days from man-handling this beast.

Of course, only time will tell if my design holds up. I'd love to hear what people have to say in the comments. All I can say for now is that I should have done this a long time ago. A sagging box-spring makes for a crowded, uneven, and restless bed.

Comments from other people:

PRO **dmuldoonlla** says: May 2, 2013. 12:29 PM Reply

Awesome. My box spring is sagging, and I've been thinking of doing something along these lines. Being a big dude (hence the sagging box spring), I think something overbuilt like this may be the way for me to go. Thanks!

Dairylander says: Dec 30, 2012. 11:41 AM Reply

Very well done for a DIYer. Very clear and effective instructable.
Two important notes:

Step 7: You made a 45 degree cut on your frame corners to round them off a bit. You took off too much material, which greatly decreases the amount of "meat" the screws have to hold on to, and weakens the joint.

Step 9: Before attaching any slats, measure the outer frame diagonally from corner to corner (like in a big "X" pattern). Tweak the frame until these two measurements are equal. This will ensure that the box is truly square.

Step 10: The slats on the bottom aren't really much help. If you're worried about sag, add two equally spaced center supports in step 8.

Lastly, for people that move often, consider building two smaller boxes like the manufacturers do for king size bed platforms.

naturaldesignchick says: Aug 24, 2012. 10:23 AM Reply

I just purchased a new bed and now need a foundation for it. I will be building my own and wanted to see who had gone before & what they learned. In your Step 9: Image 1 - it shows the slats as the same visual length as the 2X6 widths. However, in your cut list, you say they are 3" longer. :-)

I just wanted to point it out in case someone else wants to build this as well.

Cheers!

APHawkes (author) in reply to naturaldesignchick Aug 24, 2012. 8:23 PM Reply

Good catch. Yes, the 1x4 slats are the same length as the 2x6's. Thanks!

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kill-a-watt says: Jul 10, 2011. 3:06 PM Reply

this is akin to a box-spring, like an icebox is akin to a refrigerator.

That being said, I had the same issue as you and pretty much came to the exact same solution. It served me well until moving day.

My new platform is made of plywood and 2x4s. Absolutely no loss of comfort and plenty of storage space underneath.

APHawkes (author) in reply to kill-a-watt Jul 10, 2011. 9:04 PM Reply

1

I am NOT looking forward to moving with this thing. I joked with the wife that it was now "part of the house" and would not be put on the truck. We'll see.

Forgive me for a terminology mistake, but what is this then if not a box spring?That's what the salesman called my old piece-of-crap, so I assumed that was an accurate name for my piece-of-crap as well! :-)

I'd like to hear how your platform (is this more accurate?) was constructed. I'm guessing it's something similar with 2x4 rails and plywood top instead of slats. Anything you could share would be great in case there's a "next time" I have a similar project.

kill-a-watt in reply to APHawkes Jul 14, 2011. 6:09 AM Reply

"mattress pad" because there are not any springs in it. I sure as heck paid a lot for mine. It's just a cloth covered flimsy box made from wood.

My salesman did not correct my terminology during the sale for obvious reasons.

I also call the 'fridge an icebox on occasion...

PRO **weirdalyanksyou1** says: Jun 30, 2011. 2:34 PM Reply

how much did it all cost for the materials?

APHawkes (author) in reply to weirdalyanksyou1 Jul 2, 2011. 2:49 PM Reply

1

I don't have an exact number to give, unfortunately.The lumber was bought specifically for this task, while other things (staples, screws) were leftovers from other projects. The 1x4's were a couple bucks a piece, the 2x6x12's were about 8 bucks each, the 2x4 was about 3 bucks. So, that's about $43 dollars for the wood. You can definitely price this out with your local hardware supplier. The materials are very common and should be easy to source.

I'll be sure to keep the receipts for the next instructable. Thanks for the question!

I can build it instead says: Jun 27, 2011. 10:41 AM Reply

Ah, Dude'
You just showed EVERYONE your wrinkles.... :D

This reminds me of the 'Kid Proof' bunkbed frame I made years ago for my daughters.
They could not even make it wiggle, until we moved and I had to cut it in half to make twin beds. Then I had to use 1/2" rod for pins when we needed bunks again.

Good Job, I like solid frames.
Jon

tinker234 says: Jun 27, 2011. 7:43 AM Reply

wow my sister bed broke i might make her one of these hey overbuliding is good

A few changes were made to the instructions to make them easier to understand. The original copy of these instructions can be found here:

http://www.instructables.com/id/ReBuilding-a-bed-foundation/?ALLSTEPS