For those of you who don’t know Sifu Jerry,

* + He has around 3 decades of practicing and teaching Kung Fu.
	+ He is a Chiropractic Doctor with many years of clinical experience and is a certified yoga instructor.

What this means is he has a profound understanding of what motions students need to perform and what stretches and exercises they should do.

He also recognises that Students are a diverse group,

* + not only in age, but that some have a limited range of motion, mobility, balance, strength, size of hand grip, history of chronic injuries and so on.

 He explained to me that the existing benches were:

* + too low to do leg stretches with,
	+ the benches were too heavy, and the tops were too wide for many students to lift and grip.
	+ They were easily tipped on end and unstable.

What he wanted was a re-design of a standard bench to make it lighter, more stable so that it could be also used to:

* + support their weight and prevent injuries as they stretched
	+ as a training aid by people with different body types and levels of strength and grips

So, we made a proto-type bench that was those things. We used softwoods for the tops and legs, such as Spruce, Fir, Pine. We tried it out, and then came up with this modified bench you see here.

* + I’ll point out some of the features and design points.
	+ I’ll do a sketch with rough dimensions and maybe Jerry will add it to the video or attach it to the notes later.

Short top, that has the width and thickness reduced from a standard 2 x 4 (which is really 1 ½ x 3 ½ ) to 1 ¼ x 3 ¼ .

* + I used a thickness planner, but if you don’t have one, you could rip it on a table saw, or carefully cut with a skill or hand saw or even reduce it with a belt sander (last resort)
	+ All edges on the top and the legs have been rounded over so there are no sharp edges, even the bottom of the feet so that they won’t cut or damage floor mats.
	+ The legs and tops are joined with mortis and tenon joints and
	+ The legs are glued and pinned through the top and through the dowels with small doweling for added strength.
	+ The bench was sanded with fine sandpaper and finished with 2 coats of varathane varnish.

The key things you need to achieve as you build the bench is consistency in the angle of every cut, hole and mortise. The original bench was cut at an angle of 17 degrees, I cut everything at 22.5 degrees because that is a standard detent position on my chop saw, table saw and drill presses.

* + This means the top of the leg, at the base of the tenon
	+ The bottom of the leg where it meets the floor
	+ The through holes for the dowels

I built 13 benches, (1 prototype, a 1st and 2nd final try for my wife and I, and 10 for Green Dragon), I wanted each one to be the same.

This meant 13 tops, with 52 mortises, 52 legs with angled tenon cuts, 104 holes for dowels.

* + I made jigs to ensure that each angle was absolutely consistent on each hole or mortise, cut and hole and,
	+ The jigs positioned everything at a consistent place or point on the work piece. Cutting the leg length from the floor to the bottom on the tenon is critical and must be all the same length or you bench will wobble.

Even with jigs, I had to ream out the large and small dowel holes and mortise holes a bit oversize. I used a drill with a small bit for the small holes and a drill with a rasp and also made a sanding tool with dowel and sanding spindles.

* + Before gluing, it is very important to dry fit everything. If it is tight and hard to put together when dry, it will be impossible when sticky with wet glue. Take the time now to get a fit.
	+ A slightly loose and sloppy fit in these holes will help during gluing, alignment and assembly.
	+ The glue will plug the small pinning dowel holes, so make all your pinning dowels ahead of time and have them ready to go, make sure you round and sand the tips or they will be hard to insert.
	+ You will likely have to tap them in with a hammer and will break some. Have extra dowels ready, drill out broken one and try again.

Work quicky to glue, there is a specific order.

* + Glue legs to tops.
	+ Glue and insert pinning dowels in tops
	+ Glue and Insert large dowels through leg holes
	+ Glue and insert pinning dowels in legs
	+ Once glued, put 50 Lbs. or more on the bench to help the feet make contact with the level floor. Leave for 24 hrs. This will help eliminate bench wobble caused by misalignments.

If you are only making 1 for yourself, I’d still:

* + make a jig to hold the top at 22.5 degrees to drill out the mortises.
	+ Make a jig to hold the legs for the position of the large dowel holes.
	+ Use a pencil to mark your lines and angles and map out your cut positions.

At minimum, you can build one with just a hand saw, a drill, a chisel, a good square, glue and clamps. It takes a lot of patience, but it is rewarding and satisfying when done. Good Luck! 