

Making a Makerspace: Building Out the Steamworks

[October 3, 2013](#)

This is the second in my “Making a Makerspace” series. Catch part 1, [Planning the STEAMworks](#), here.

With my planning done, I turned my attention to “building out” the makerspace. My original plan called for a long woodworking bench against a pair of bay windows with two tool cabinets and four mobile workstations with integrated tool storage. I thought the makerspace would look something like this:



As the new school came closer and closer to completion, I realized my room would begin to more like this:



Keep with me after the jump, as I show of my workspace and even provide plans on how to build a Long Bench and Mobile Workstation for your own makerspace.

Two major structural changes occurred between my design and construction phase. First, the large shelving units on the far wall would be replaced by built-in cabinets and with counter space. Secondly, a rather large bookshelf was switched into the design instead of the sewing

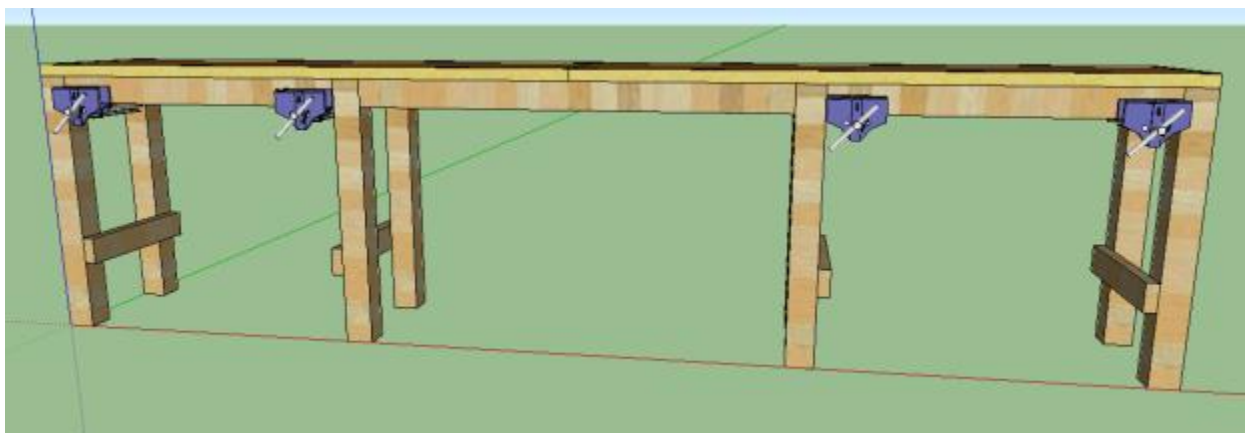
table. This provides space for student stuff storage, pencils, crayons, etc, as well as my “inspiration” shelf.



Luckily, I was able to keep the four workstations and the “long bench” in the design. I’ve included some hastily-sketched plans below with the Sketch Up drawings, along with a few shots of the build process.



The Mobile Workstation with Integrated Toolbox. [Click for plans](#). Pocket hole joinery throughout. Use the casters that come with the tool box. Our tool chests come from Craftsman.



[Click for Plans](#). Vises not included. We used Jorgeson Orange clamps from Home Deopt, special ordered.

Where will the STEAMworks go from here?

- My students will build a [prntrbotSimple](#) this fall. I welcome the addition of a dedicated 3D printing computer to the space.
- Currently, I have no ability to store materials. I have cardboard piled up behind cabinets, hardwood strips laying around everywhere and soon to be organized parts and pieces all over the space. It's a distressing situation for the neatness-in-teaching freak in me. Everyday without a dedicated storage space for materials distresses me to no end.
- Storage cabinets for brooms. How did I miss this? I just need twenty minutes and a 2" section of PVC pipe! Since I wrote this line, I've rectified this situation with twenty minutes and a 2" section of PVC pipe.
- Labels. And more labeling. I have more drawers than an underwear store. They are all unlabeled, just like when I packed for camp by myself in fourth grade. I want to figure out a removable, non-marring label system which works for my students. The only thing I've really learned in my years of organizing other people's workflow is the best organization is the one that works for them, not always me. Right now, my students couldn't find their heads even if they were bolted on. I need to figure out a way to make the purpose of certain spaces and the objects and tools themselves more visible. Cheap, replaceable labels would allow me to change configurations without ruining my new shiny toolboxes.



- Development of a tool library. I've begun wrapping objects in either red, yellow or pink tape. Red tools stay in the Makerspace. Pink tools may be checked out for a period of time with a teacher's permission. Yellow tools may only be used by teachers or certified students. A checkout sheet remains at the door. So far, the experiment has worked well. In the future, I will create checkout tool trays with saws, tape measures, etc. for entire classes to check out at a time.
- Safety certification protocols. I use the [High School Makerspace's Playbook](#) as my safety best practices. Currently students see a demo, watch a video, undergo a supervised visual test and must pass a written exam to be certified in using a power tool. We've completed 2 tools so far. One student has even completed a test on his own for another course! This program needs to be expanded to include more students around the school, not just the few I teach.
- Re-configuring the bookshelves and wall spaces. The Long Bench works great as is. On the other hand, the east wall with the teacher's desk and the north wall containing the Promeathean Board needs some work. In my mind, I have a ton of usable space which is not being utilized well. I'm not sure yet what I will do as I am very attached to the desk and purple cabinet, but I think I need to find something. Perhaps a plywood storage cabinet which also provides some seating.

- Seating. I love stools. Stools are uncomfortable. They make my students stand up. Not a lot of my students can sleep in my room. On the other hand, uncomfortable students can lead to unproductive students. I need a compromise.
- Break area. In my school, “breaks” are a natural occurrence. Remember in school, when the teacher droned on and on and you got bored you would just mentally check out? There’s no such “mental checkout” with students with neurological differences. Many of the academic shutdowns I see in my students occur because they simply can’t tune out – they see, feel, interact and process EVERYTHING around them. So my students shut down completely by sleeping or they break down by leaving the room, yelling, profanity, etc. A break area is simply a safe, acceptable place for a student to tune out – to the world, themselves, friends, me, etc. – for a time, so they can re-enter and learn. In my personal life, my break zone suspiciously looks like the Makerspace I’m designing. This isn’t a room exclusively for me, this is a room for students. It needs a break area, such as a wicked cool chair tucked in next to the 3D printing area.
- More tools, more knowledge, more capabilities. I love making. I love constructivist education. I love this room. I would like to influence my colleagues into using the space more and more in the upcoming months. I plan on figuring out how to sponsor an after-school club in making things. I’m heading to Boston in two months to present on the space and how its used. I’ve put my hat in the ring for a few grants and am currently looking for more funding. Big things are a-foot in my mind. I need to make these dreams reality.

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Make it safe and keep the rubber side down.