

Station 1: Final project brainstorming

Goal: Engage in some solid, partner-based brainstorming around your final home improvement project.

Criteria: The criteria for this project is to engage in a project that fits your desired level of ambition and skill development. It should not be something that you feel entirely comfortable doing on your own. Stretching yourself is an important component of the learning process.

The project can be as large or small scale as you'd like. It could take an hour or a week depending on your interest level. It should be presentable to the class in some form, via pictures, carting in stuff, videos, etc.

Prepare to write up a short blurb about your project experience for posting on technologyrediscovery.com, our class site.

Process: Secure a half-sheet planning page and do some brainstorming about projects in each area. Research shows that brainstorming ideas that may seem in the moment to be unrealistic or not desirable leads to a better choice in the long-run. Give it a try!

Final Home Improvement Project Brainstorming Guide

Fill in as many boxes as you can in the table below. Then take this document home with you and work on selecting a project for sharing at the start of week 4.

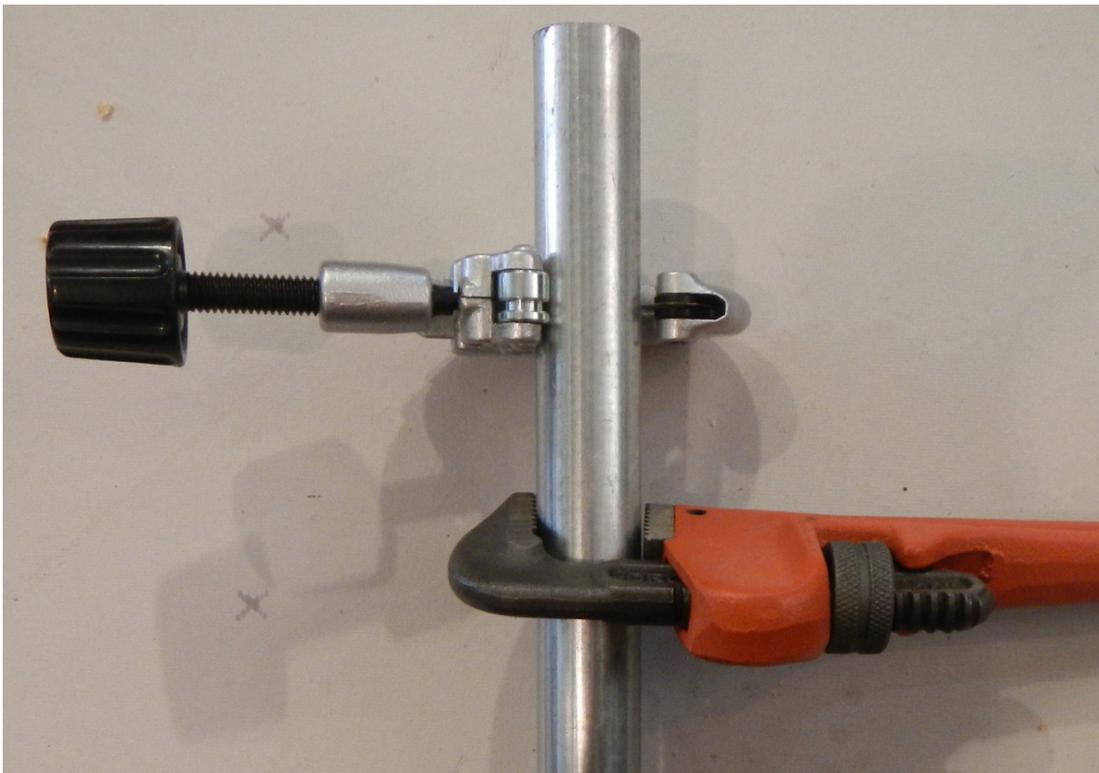
Project Ideas	Skills Needed	Materials needed
Carpentry / Building		
Plumbing		
Appliances / MISC		
Electrical		
Finishing (painting, staining, sealing, sanding, etc.)		

Station 2: Cutting a pipe with a pipe cutter and pipe wrench only

Goal: Become familiar with how a pipe wrench grips pipe and a pipe cutter cuts pipe.

Process:

1. Measure out 1-inch long sections of 1" diameter steel pipe.
2. Position the pipe cutter's blade directly over your first 1-inch mark.
3. Adjust the teeth distance on the pipe wrench so it grips the steel pipe.
4. Make your first revolution of the pipe cutter into the pipe.
5. Now make a goal of not touching the steel pipe anymore: use only the handles of the pipe cutter and the pipe wrench to complete the cut. Your partner could hold the steel pipe for you if that's easier.
6. Change partners.
7. Make cuts until the station time is over or you're tired of cutting pipe.
8. Think of some nifty thing you could do with the 1-inch segments. Perhaps use it in an art project as part of your final project?
9. Use the image below as a guide



Station 3: Assembling a sink drain assembly

Goal: Properly install a sink drain and stopper assembly into our mock-up sink device.

Process:

1. Unpack the bag of supplies. Get familiar with the different little parts. Read through the manufacturer's instructions on how to assemble the drain assembly. Locate the parts listed in the assembly diagram.
2. Work with your partner on assembling the system, being careful not to over-tighten things so we don't break the stuff for the next group.
3. Tinker with it so the drain pole moves up and down smoothly and the drain plug goes up and down as well and cannot be pulled out of the drain.
4. Use the photo below of the completed system for a guide.



Station 4: Using Teflon tape for thread sealing

Goal: Become comfortable using wrenches and threaded pipe fittings coated with Teflon tape to create secure joints in air hoses. This skill applies to water as well as air threading. (Gas fittings should be considered carefully before attempting gas pipe repair on your own. Leaking gas is decidedly a Bad Thing.)

Process:

1. Unpack the gear in the bag. You've got a lot of couplers and fittings for air tools and hose fittings. Try dry fitting the various bits to see how they can go together.
2. Use the image below to assemble each of these three setups. Make sure to use Teflon tape on EACH junction since air fittings are notoriously leaky. Tighten firmly, but don't over tighten, please. 2-3 layers of tape is sufficient for most applications.
3. Be sure that you're wrapping the Teflon tape in the direction such that tightening the joint turns the threads along with the direction the tape is rolled. Imagine the fitting tightening the tape as you tighten the threads. Experiment with winding the Teflon tape the other direction and see how the threads shred the tape.

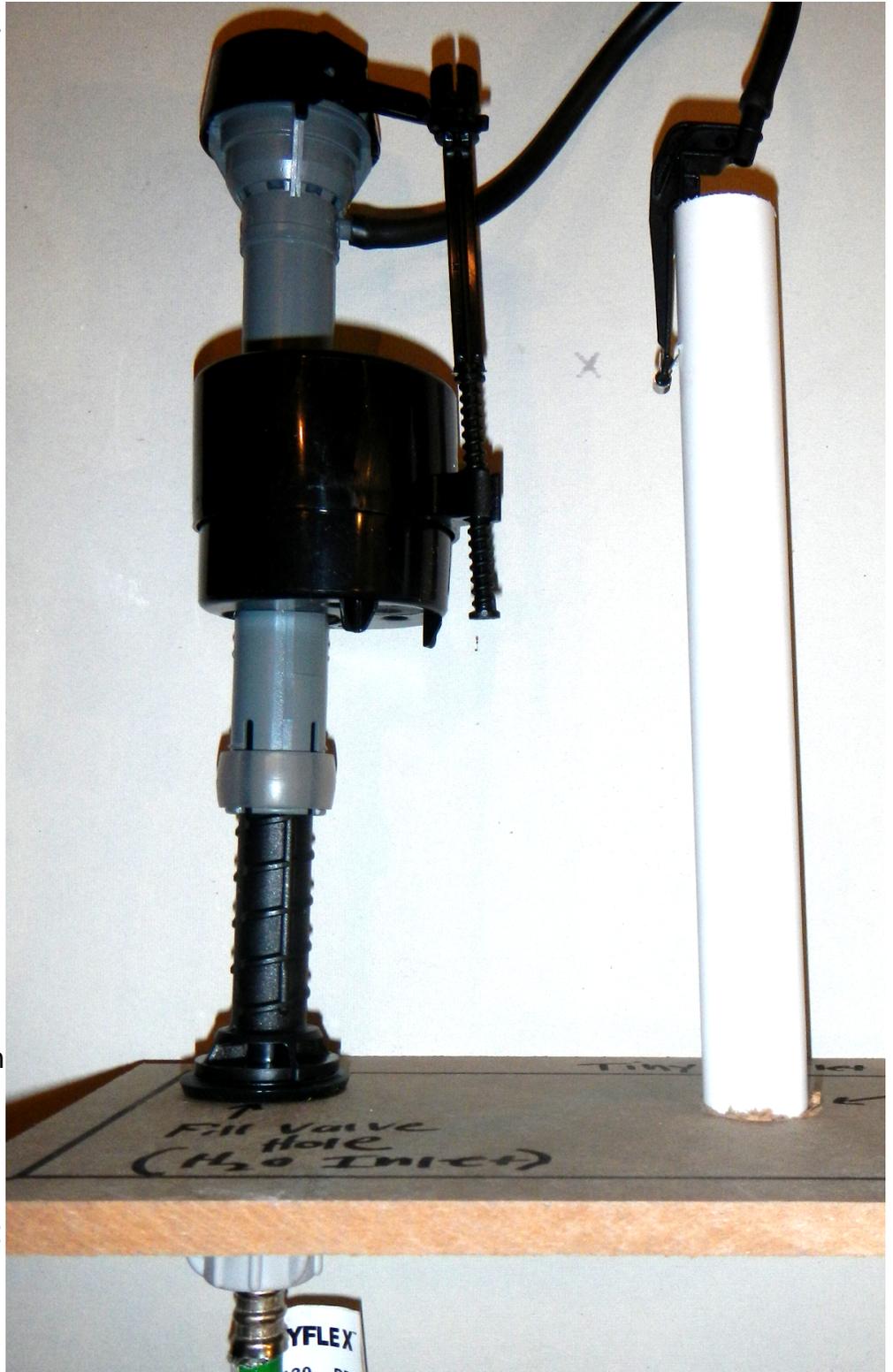


Station 5: Assembling toilet fill valve assembly

Goal: Grow familiar with how a toilet fill valve assembly works and correctly assemble all the necessary parts of this system on our mock-up toilet bowl.

Process:

1. Unload the bag of supplies for this station. Tinker a little bit with the parts to see which ones fit onto what threads, etc.
2. Skim the directions provided by the manufacturer from start to finish. Look at the diagrams it provides and identify the parts by name.
3. Now work on assembling the parts so that the fill valve assembly is positioned at the code requirements with respect to the height of the overflow pipe.
4. Use the image (at right) of the final setup as an aid in your project.



Station 6: PVC Cutting and cement assembly

Goal: Become familiar with how PVC pipe can be cut and glued together to one another to make water-tight joints. Become acquainted with how PVC cement works with PVC primer.

Process:

1. Pull out the various pipe bits from the bag. Inspect the ball valve. Dry fit some sections of pipe to the fittings. Tinker a bit.
2. Design with your partner a CLOSED pipe system such that if the pipes were to be filled with water, no water would spill out. Include the ball valve in this system. This doesn't make sense in a housing application, but it's a constraint for this practice exercise.
3. Cut lengths of PVC pipe with the hack saw and dry fit (no cement) the sections with the couplers to make your closed system. The first folks at the station should start with a simple setup—perhaps a square with four corners. Try to cut the pieces of pipe so the joints are relatively square. No skewed pipes, please!
4. Find the can of primer and cement. Read the bottles instructions one or two times and envision how you'll do the cementing.
5. Choose two joints to cement into place for practice, leaving the other joints for the other teams. Please DO NOT CEMENT INTO THE BALL VALVE since this is an expensive part (\$8 ish). Please only cement pipes into the small fittings, joints, Ts etc.
6. If you are arriving at this station after the first group, you'll find a partially built closed system of pipes. Your goal is to modify the original work to add a few joints to the closed system. You can be crazy with your joints. Just make sure there are no open ends of pipes. Complete step 5 and cement a few more joints.