Giant Breadboard

// Setting Up:

Most electronics companies are always trying to make everything smaller and smaller. At SparkFun we do that, but we also like to make super sized teaching tools. This tutorial shows you how to make a gigantic breadboard. We used scrap aluminum to connect the holes, but you can use any type of conductive material that does a good job of somehow holding the giant leads (wires) coming out of the giant components you are going to plug into your breadboard. This breadboard is a great teaching tool for all ages. If you make the giant components that go with the breadboard you can light up giant LEDs using giant sensors and even a multimeter! The materials depend on how large you want to make your breadboard, if you decide to go bigger than 2 X 4 feet bear in mind that you will need to buy bigger parts.

Materials:

Peg board (2' x 4'), square wood strip (1" x 1" x 16'), styrofoam (1" x 2' x 4'), 125 sheets of pliable conductive material (aluminum flashing works well) (1' x 1.25"), screws (1" x ¼", 40ish in number), 2' x 4' section of ¼" plywood and glue.

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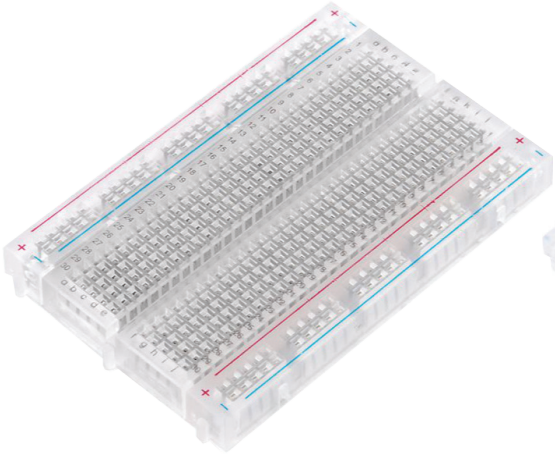
Tools:

Xacto knife, drill, tape, screwdriver, 4 C-Clamps and something to cut your conductive material. In some case scissors or tin snips will work, but if you need to cut a lot you may want to find an easier way to cut the stuff.

Breadboard:

Basically you are going to be making a 2' by 4' version of a regular breadboard. To get you thinking about what that will look like, here are some images of a regular breadboard with the back exposed so you can see the conductive "traces" in the board. The conductive traces you make will look like the third and fourth image; this is so that you can plug components into your giant breadboard holes. (See additional tutorial on how to create giant components).



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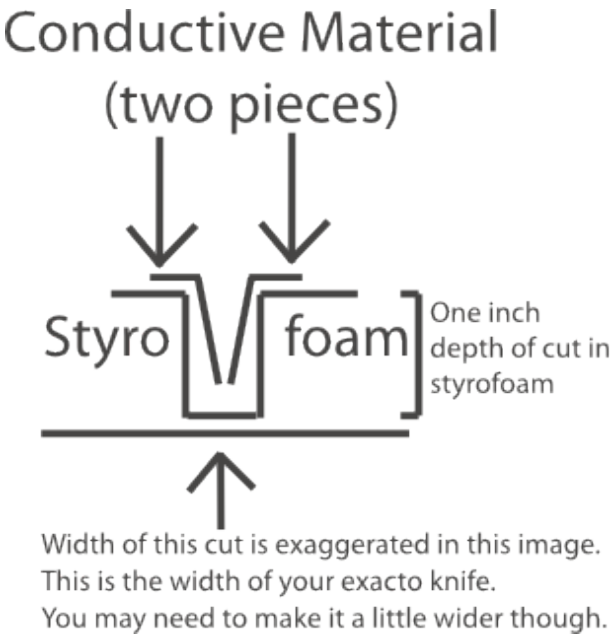
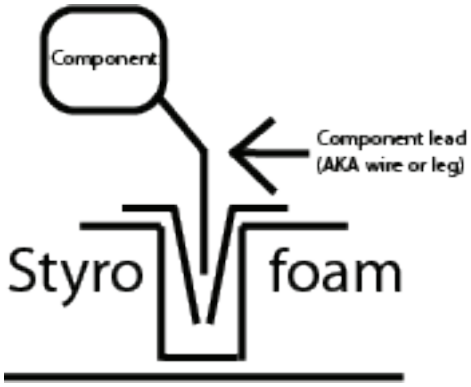


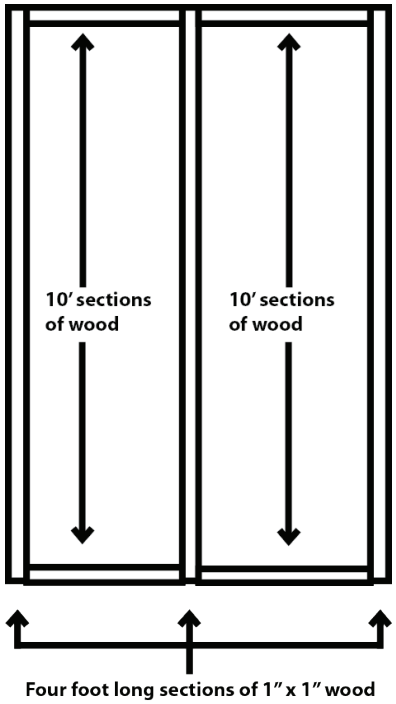


Assembly:

1. Cut a 2’ by 4’ section of pegboard.

2. Cut your 1” x 1” wood strips into 3 4’ long sections and 4 10” long sections.

3. Place your wood strips as shown in the image. Secure the wood strips to the pegboard, flip the pegboard over and use the pegboard to mark every third hole on your wood strips with a pencil. This is where you will drill holes in the next step. (Or you can skip a step and drill every third hole using the pegboard as a template, just make sure you don’t drill the pegboard while you’re at it.)



Name:
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4. Take the wood strips off the pegboard and drill holes where you marked the wood strips. Make sure the holes are slightly smaller than the screws that you bought. In this case we bought ¼" screws, so we should drill 1/8" holes.

5. Screw the wood strips onto the pegboard.

6. Cut Styrofoam to fit the two spaces underneath the pegboard. These pieces should be about 10.5" x 3' 10", but really you want to make sure they fit your pegboard snugly rather than relying on measurements. After the Styrofoam is cut, place it in the pegboard. Don't secure the Styrofoam to the pegboard, you want to be able to take it out after the next step.

7. Use a pencil to mark the holes you intend to use to plug components into your breadboard by pushing the pencil lightly through the pegboard holes. Don't forget to do all four power rails as well as all the horizontal rails. (Rails are the rows of holes that are connected on the breadboard.)

8. Take the Styrofoam out of the pegboard and connect the dots you have created so you know where the rails will go.

9. Using the xacto knife cut slits where you have marked the rails. Make sure you cut straight lines, only where you have marked, and that the slits go down almost (if not all the way) to the other side of the Styrofoam.

10. Cut your conductive material into 125 1' x 1.25" strips. You can do this all at once, or strip by strip, as you need it.

11. Bend your conductive strips so that there is a 90 degree angle running lengthwise about 1" in from the side.

12. Slide the conductive strips into the slits you made in the Styrofoam. Make sure conductive strips in the same slit overlap slightly because electricity needs to be able to conduct along the entire rail. Orient the conductive strips so that the 1" section slides into the Styrofoam and the ¼" section rests on the surface of the Styrofoam. You will need to do this twice for each section of Styrofoam slit because there needs to be a piece of conductive material lining both sides of each Styrofoam slit.

13. Once you have filled all the slits you created with conductive material fit the Styrofoam back into the pegboard with the conductive material facing the pegboard.

14. Make sure everything lines up by looking through the pegboard holes. This will be your last chance to change anything.

15. Put glue on your plywood backing and place it on the back of the breadboard. Hold it in place with the C-Clamps. If you're really zealous you can even put some screws through the plywood into the wood strips on the sides, just make sure to drill holes first (see steps 4 and 5).

16. Now you are ready to draw your multimeter markings on your giant breadboard so it looks like a regular breadboard. After that all you need to do is plug some components into the breadboard and see if it works!