# Adafruit Proto Screw Shield

Created by lady ada

https://learn.adafruit.com/adafruit-proto-screw-shield
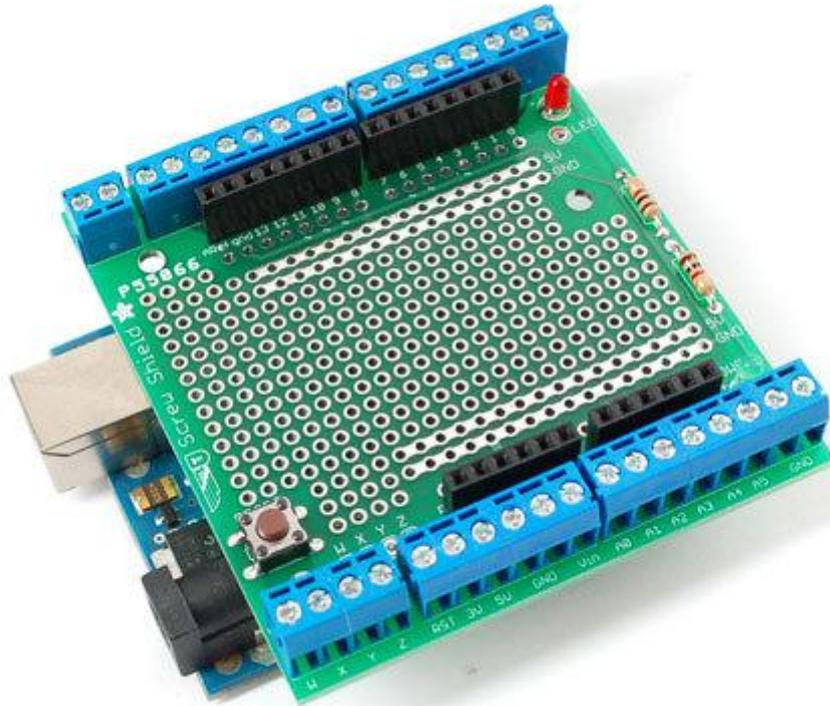
Last updated on 2022-12-01 02:01:27 PM EST

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Introduction

The proto-screwshield () is the ultimate breakout board for an Arduino. It combines a prototyping shield with a full set of 3.5mm screw terminal blocks. The protoshield part lets you build custom circuitry and then you can easily & securely connect wires and sensors to the terminal blocks. Great for panel mounts, buttons, sensors, enclosures etc.
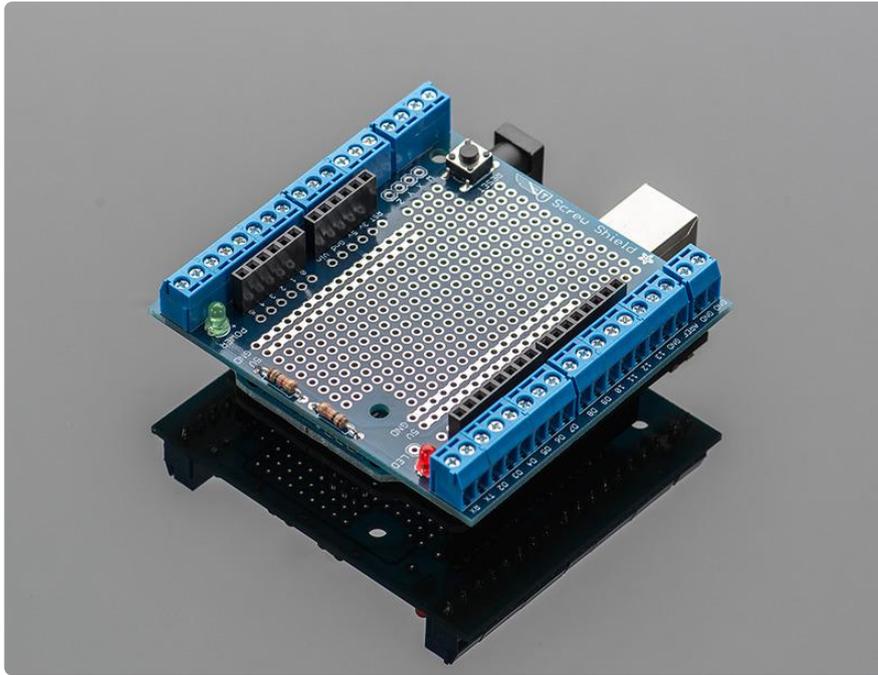
The shield even comes with stacking headers, () which let you plug another shield on top! As shown here, a data logging shield is stacked onto the proto-screwshield.
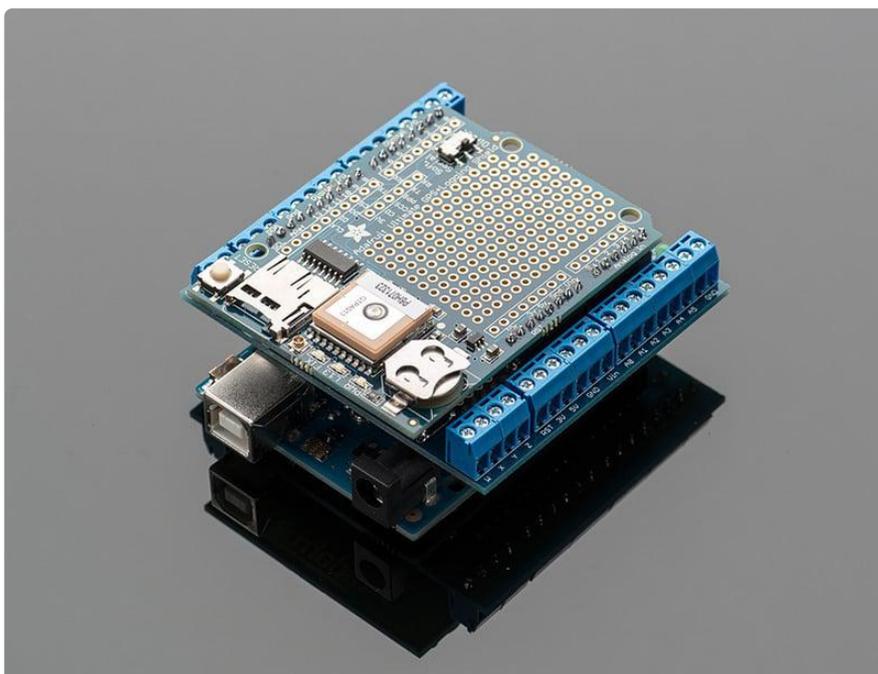
The proto-screwshield is based off of [the Screw Shield by WingShield Industries (we just added a prototype area! ()](#)

Make it!

Let's go!

This is a vey easy kit to make, just go through each of these steps to build the kit.

1. [Tools and preparation ()](#)
2. [Check the parts list ()](#)
3. [Solder it ()](#)

Preparation

Prep

[Learn how to solder with tons of tutorials! ()](#)
[Don't forget to learn how to use your multimeter too! ()](#)

Tools

There are a few tools that are required for assembly. None of these tools are included. If you don't have them, now would be a good time to borrow or purchase them. They are very very handy whenever assembling/fixing/modifying electronic devices! I provide links to buy them, but of course, you should get them whereever is most convenient/inexpensive. Many of these parts are available in a place like Radio Shack or other (higher quality) DIY electronics stores.

Soldering iron

Any entry level 'all-in-one' soldering iron that you might find at your local hardware store should work. As with most things in life, you get what you pay for.

Upgrading to a higher end soldering iron setup, like the Hakko FX-888 that we stock in our store (http://adafru.it/303), will make soldering fun and easy.

Do not use a "ColdHeat" soldering iron! They are not suitable for delicate electronics work and can damage the kit (see here ()).

Click here to buy our entry level adjustable 30W 110V soldering iron (http://adafru.it/180).

Click here to upgrade to a Genuine Hakko FX-888 adjustable temperature soldering iron. (http://adafru.it/303)

Solder

You will want rosin core, 60/40 solder. Good solder is a good thing. Bad solder leads to bridging and cold solder joints which can be tough to find.

Click here to buy a spool of leaded solder (recommended for beginners) (http://adafru.it/145).

Click here to buy a spool of lead-free solder (http://adafru.it/734).

Multimeter

You will need a good quality basic multimeter that can measure voltage and continuity.

Click here to buy a basic multimeter. (http://adafru.it/71)

Click here to buy a top of the line multimeter. (http://adafru.it/308)

Click here to buy a pocket multimeter. (http://adafru.it/850)

Flush Diagonal Cutters

You will need flush diagonal cutters to trim the wires and leads off of components once you have soldered them in place.

Click here to buy our favorite cutters (http://adafru.it/152).

Solder Sucker

Strangely enough, that's the technical term for this desoldering vacuum tool. Useful in cleaning up mistakes, every electrical engineer has one of these on their desk.

Click here to buy a one (http://adafru.it/148).
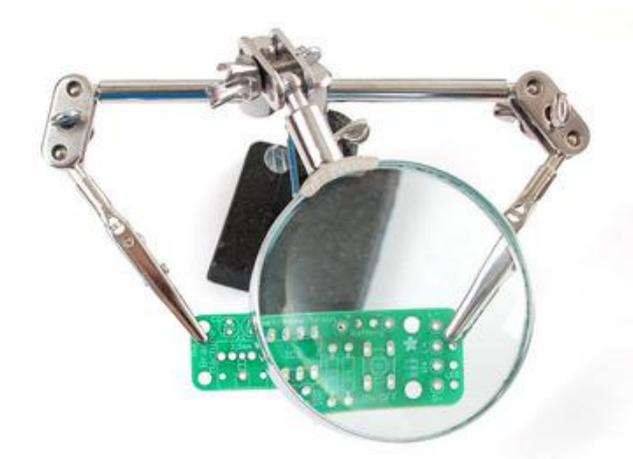
Helping Third Hand With Magnifier

Not absolutely necessary but will make things go much much faster, and it will make soldering much easier.

Pick one up here (http://adafru.it/291).

Good light. More important than you think.

Parts list

Image	Name	Description	Information & Distributor	Qty

		Printed circuit board	Adafruit	1
		2-position 3.5 terminal block	3.5mm terminals	6
		3-position 3.5 terminal block	3.5mm terminals	8
	LED1	3mm Red LED	Generic	1

	LED2	3mm Green LED	Generic	1
	R1 R2	470-1.0K Resistors for LED Carbon 5% 1/4W	Generic	2
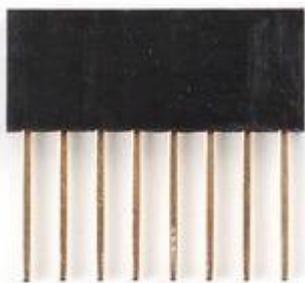
		RESET 6mm tact S1 switch	Generic	1
		8 pin female 0.1" stacky header (1x8)	Generic	2
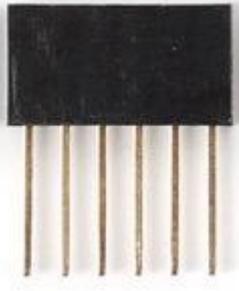
		6 pin female 0.1" stacky header (1x6)	Generic	2
		10-pin stacking header	Generic	1
		2x3 pin stacking header	Generic	1
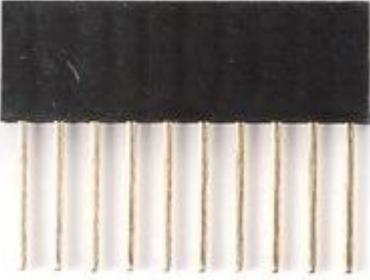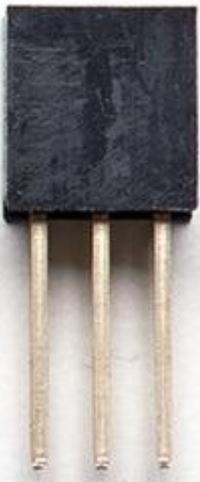
Solder it!

This tutorial page is for the pre-R3 version of the shield, so the photos may be slightly different, however the overall assembly procedure is the same!
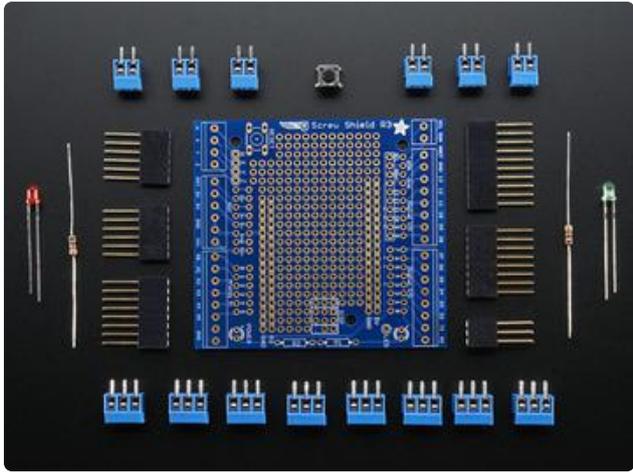
Assembly of the shield is pretty easy and should take you maybe 20 minutes maximum.

First, check you have all the components.

The green-pcb photo shows the older rev of the kit,

The blue-pcb photo shows the R3 version - we now include an extra 10-pin stacking header and a 2x3 stacking header
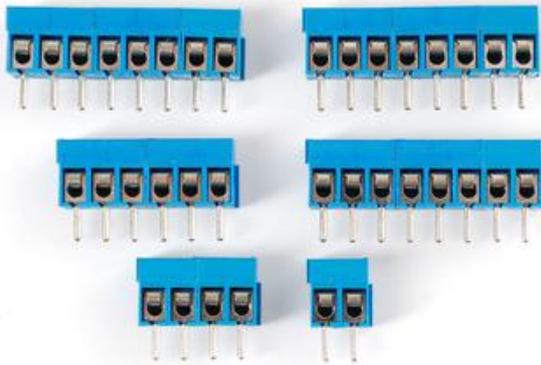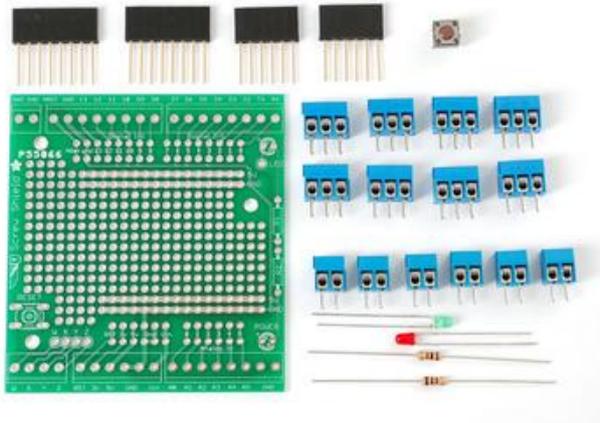
You'll need to slide the terminal blocks together. They come in 2 and 3-piece parts but you can easily connect them to make any size.
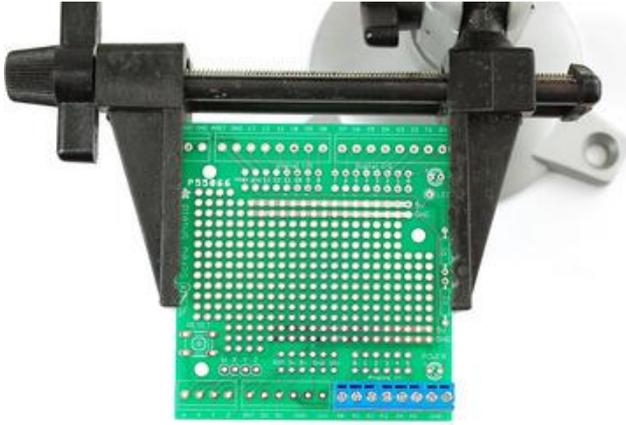
Get ready by putting the PCB in a vise. Then you can start by placing one of the 8-piece terminal blocks in the "Analog" breakout area.
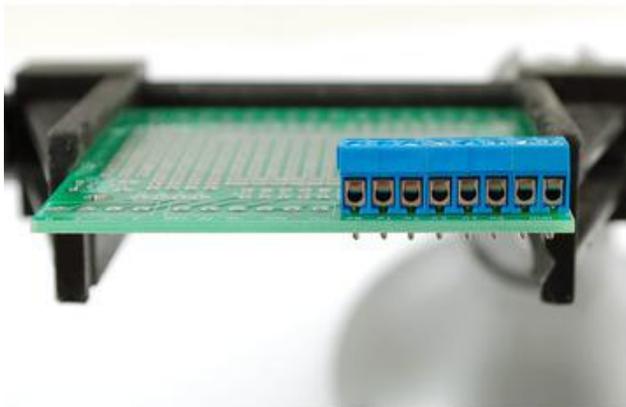
Check to make sure that the terminal blocks are facing the right way! You want the 'mouth' to face outward.

The terminal blocks should 'press fit' pretty nicely so they stay in place. If they seem a little loose, you can use tape to hold down the terminal blocks while you solder them.
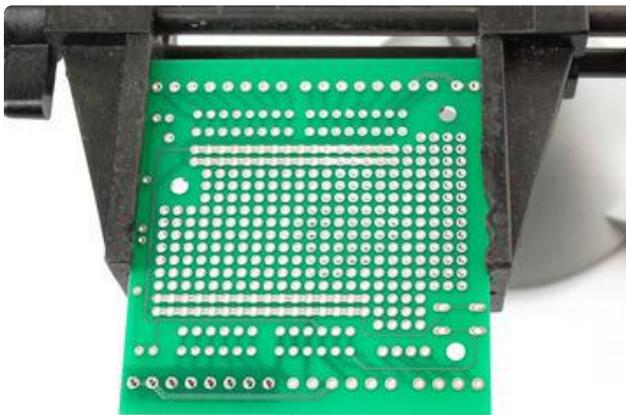

Flip over the PCB.
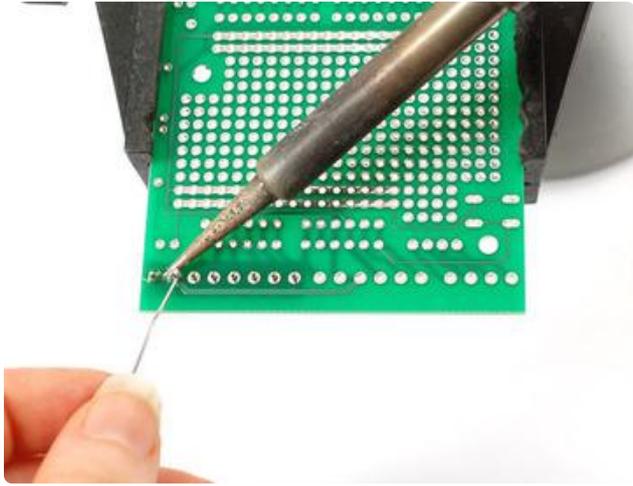
And solder the pins to the pads. Use plenty of solder so that you get the pads completely filled.
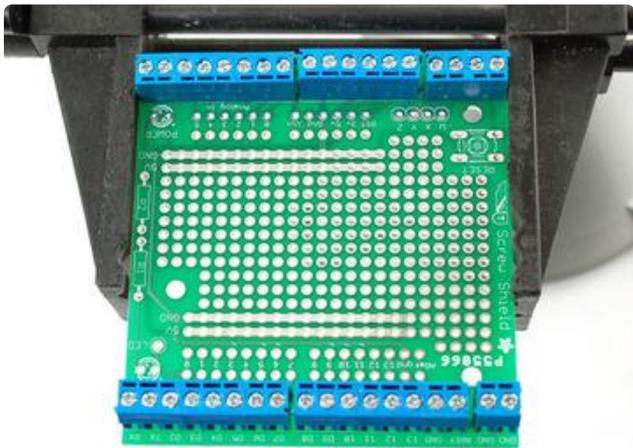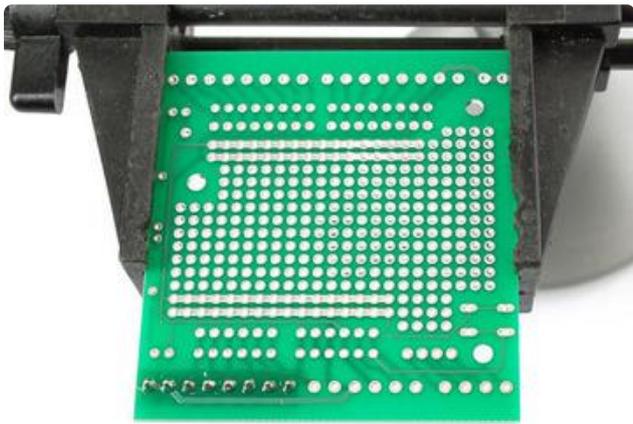
Place the remaining terminal blocks, checking again that they face the right direction!
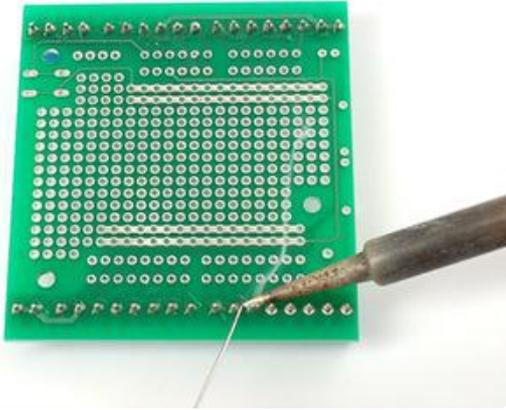
You can also just put the PCB with terminal blocks upside down on a table, which will keep the blocks in place while soldering.
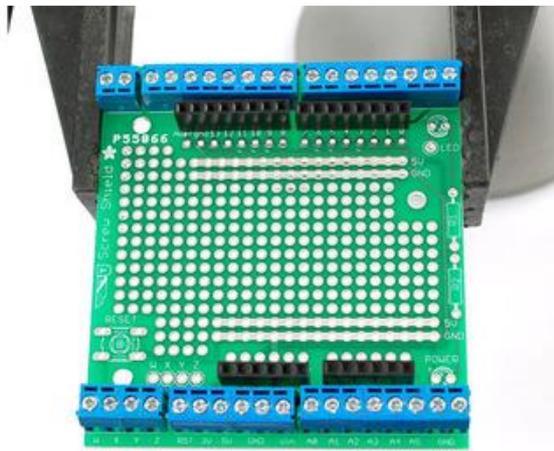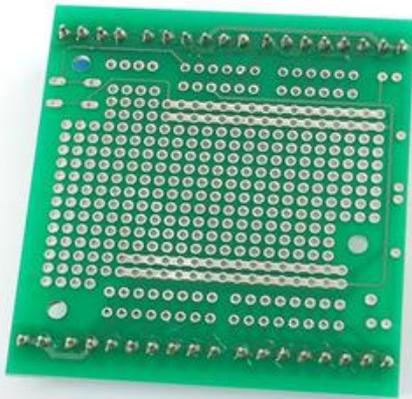

Next you can place the four 'stacking' headers. They go right next to the terminal blocks.

With the new R3 version, you'll use 1 pc 10pin stacking header, 2 pcs 8 stacking header and 1 pc 6 stacking header
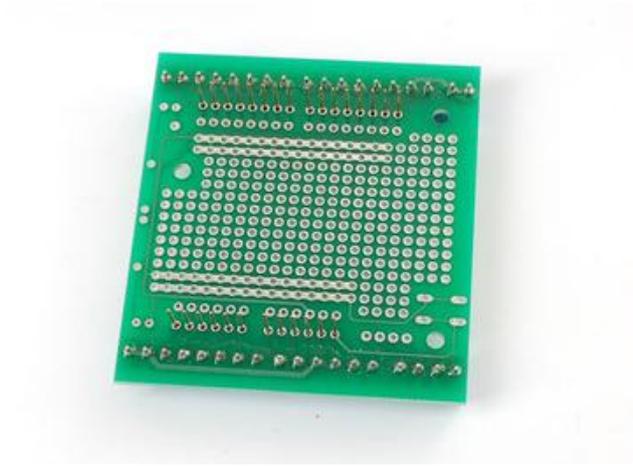
Flip over the PCB, you can lay it down on a table again, just make sure that all the headers are sticking out straight.
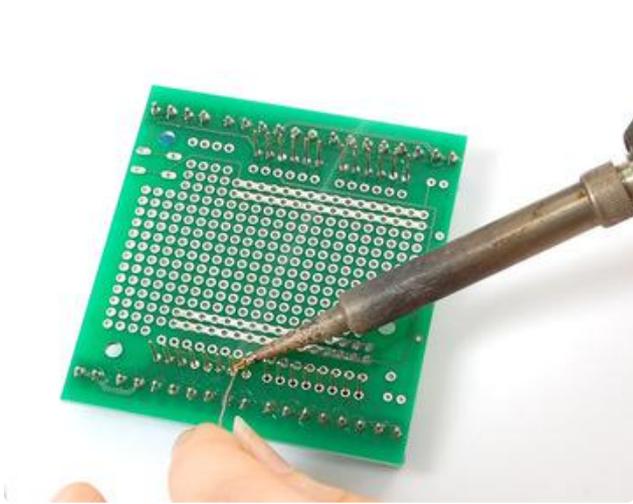
Solder all the pins of the header with plenty of solder.
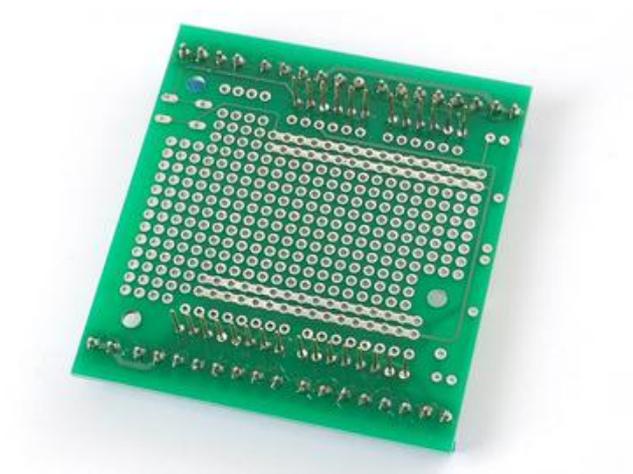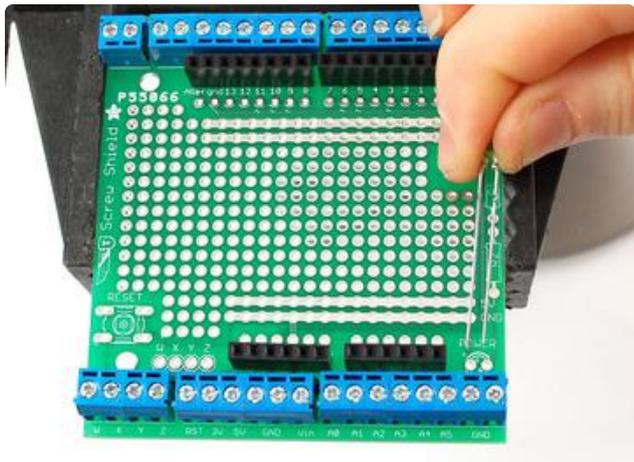
Next we'll place the two LEDs. The first LED is the green-colored one. This will tell us when the Arduino and shields are powered.

LED's are directional which means you need to place it in the right way or it wont work!

Check the LED to find the longer pin. This is the positive lead. That lead goes into the hole closest to the silkscreen '+'

In the image to the left, the longer lead is to the left.
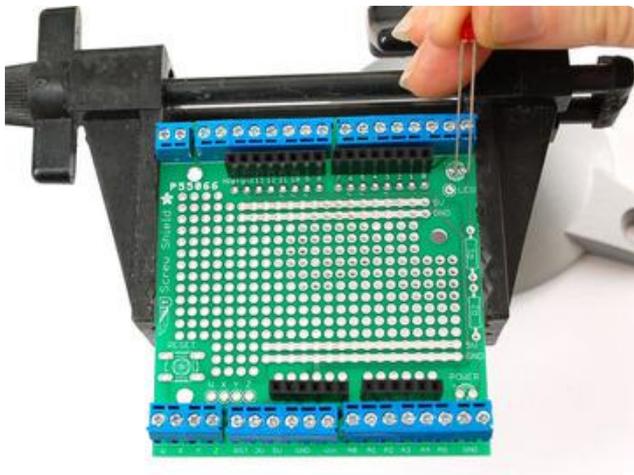
Next is the red LED. This LED can be used for pretty much whatever you want, although we suggest connecting it to pin 13 to act like a debugging LED.

Remember that the LED is directional, and the longer lead is positive. In the image to the left, the longer lead is to the left.
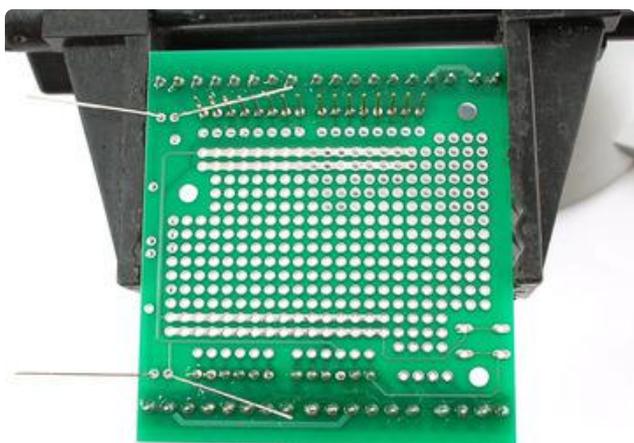
You can bent the LED leads out of the way to keep the LEDs flat against the PCB.
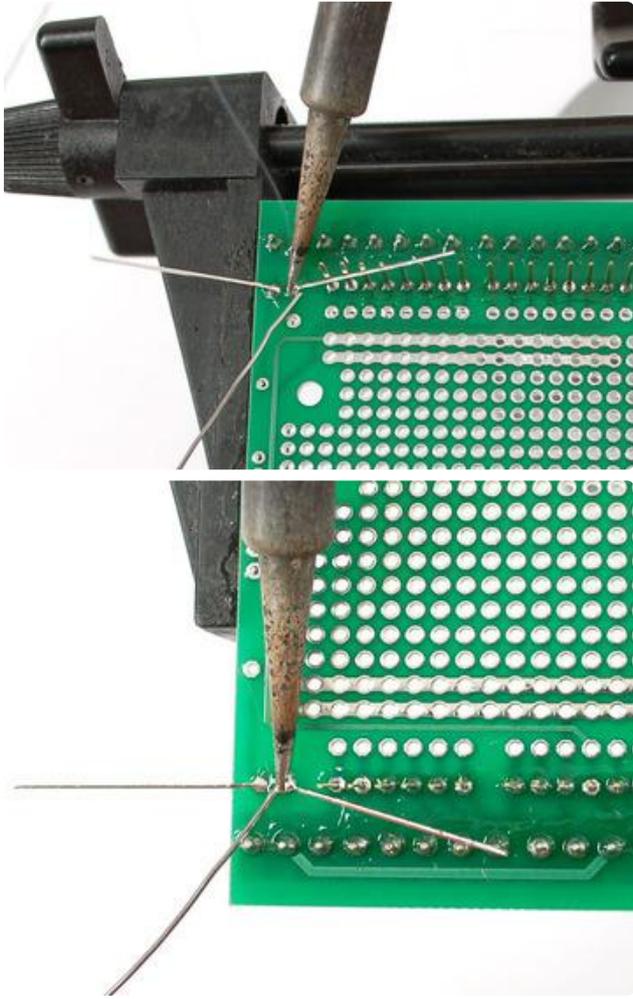
Solder both LEDs in place.
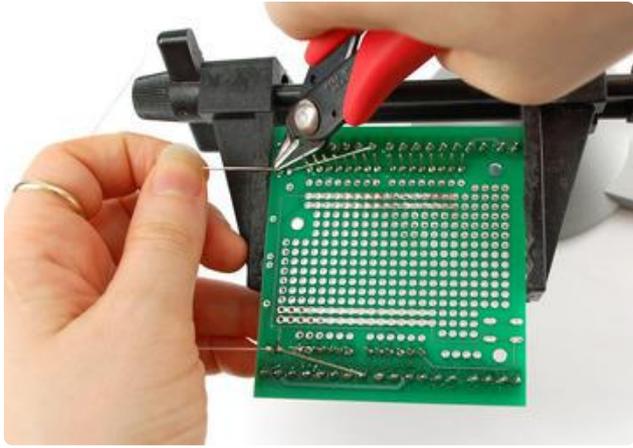
Use the diagonal cutters to clip the long LED legs. They should be cut just above the solder joint.
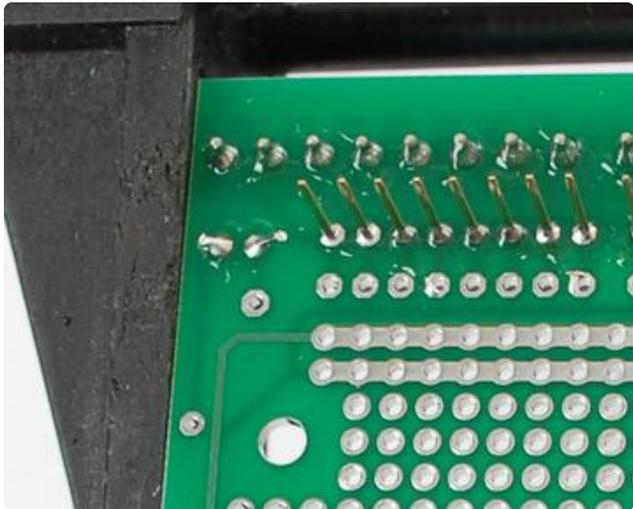
This will keep them from shorting against stuff.
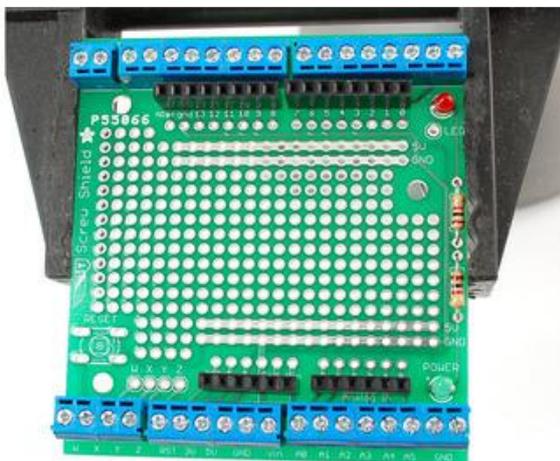
Next we will place the two 1.0Kohm resistors. These resistors are used to set the brightness of the LEDs. If you want brighter LEDs you can substitute 220 ohm resistors. If you want dimmer LEDs, you can use 4.7Kohm.

Resistors do not have 'direction' so they can go either way and work fine. Place the two resistors into the silkscreen slots on the right of the PCB.
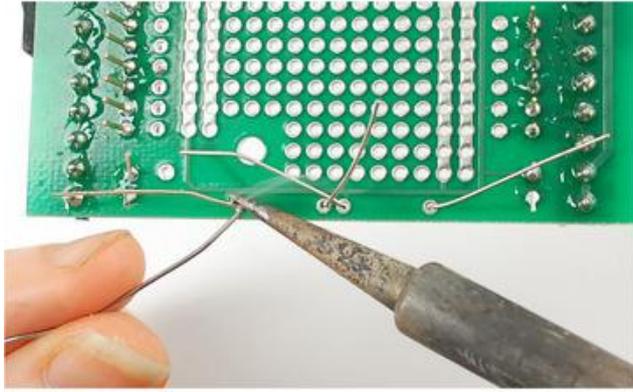
Solder and clip the two resistors.
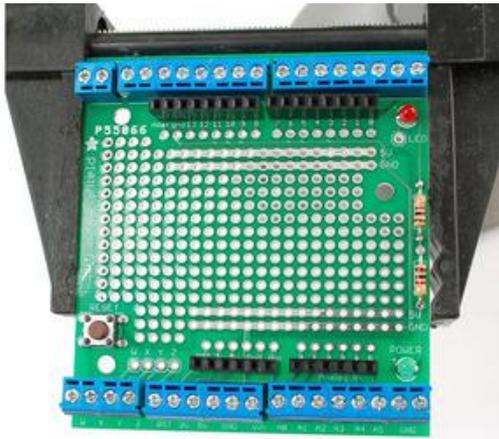
Last we will place the reset switch. This switch will let you easily reset the Arduino.

Tactile switches are symmetric, so you don't have to worry about putting them in wrong, and will snap into place flat against the PCB.

Place the switch next to the RESET text.
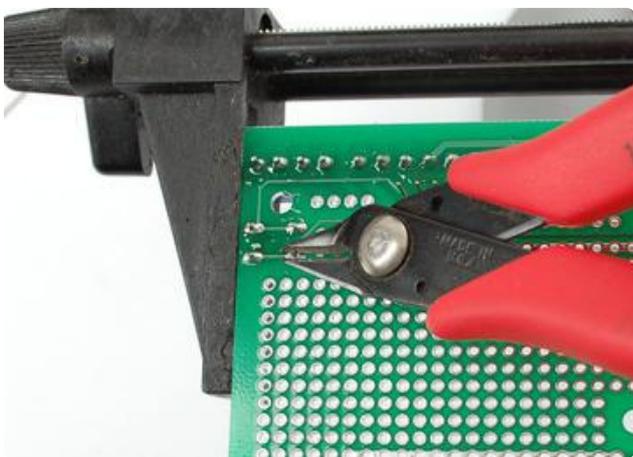
Clip the tactile switch legs. They're pretty short but they are right on top of the DC jack so the shield will sit better if you clip them!
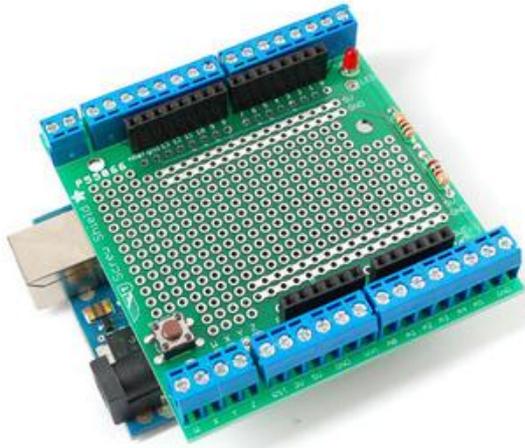
That's it! You can now insert the headers into the Arduino and start using the shield!

Download

You can download the PCB files directly from the github repository here! ()

Fritzing object in the Adafruit Fritzing Library ()

Files are Creative Commons, Share-Alike Attribution and a derivative of the Screw Shield by WingShield Industries. ()