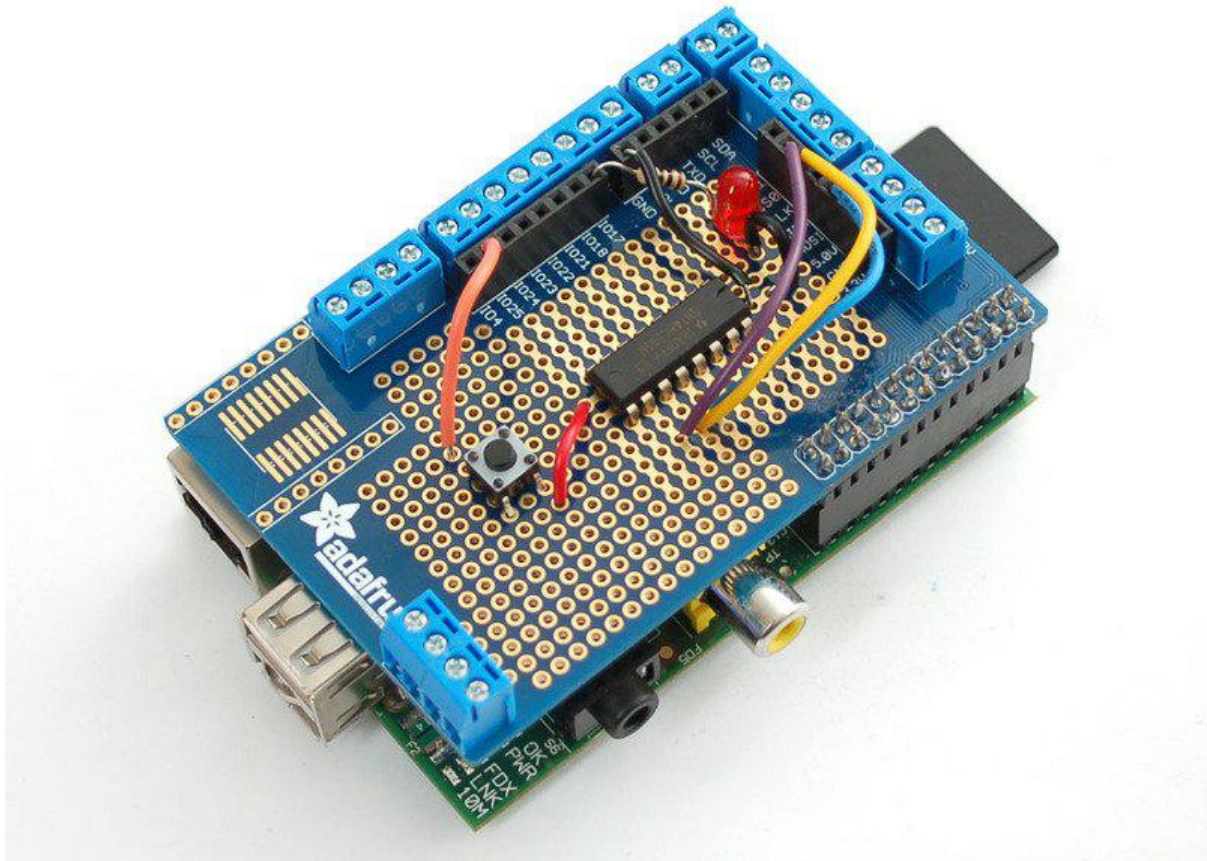




# Adafruit Prototyping Pi Plate

Created by lady ada



<https://learn.adafruit.com/adafruit-prototyping-pi-plate>

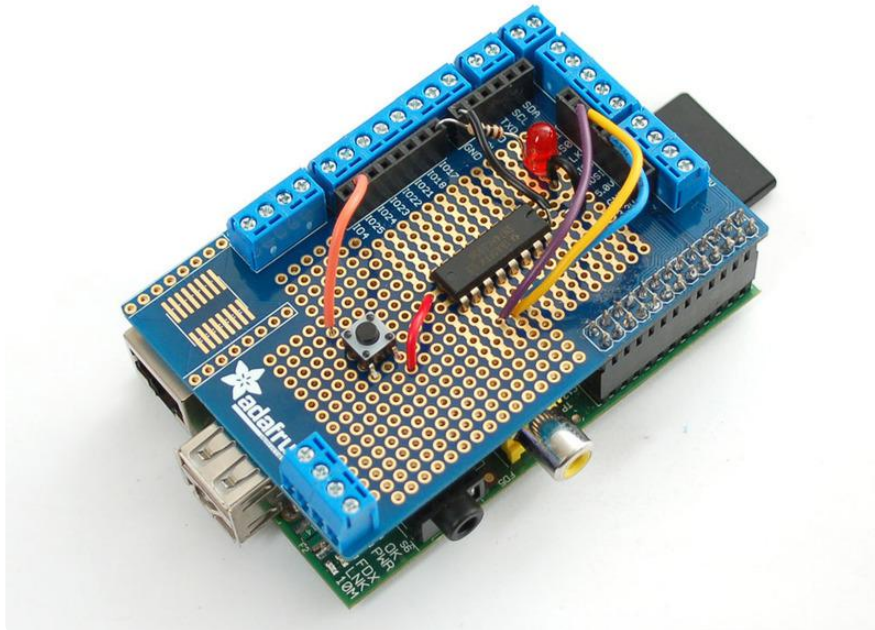
Last updated on 2021-11-15 05:48:25 PM EST

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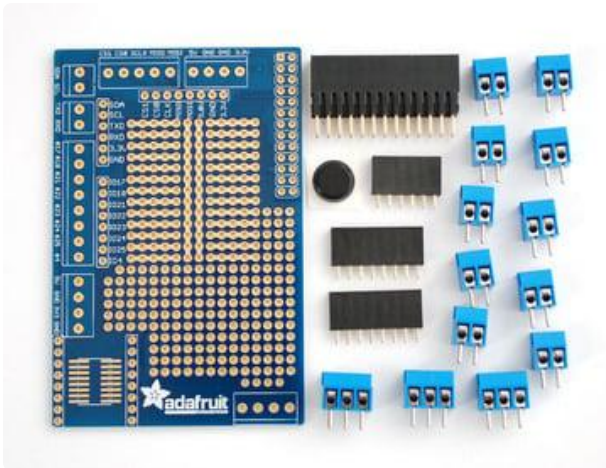
# Overview



Now that you've finally got your hands on a [Raspberry Pi®](https://adafruit.it/aHx) (<https://adafruit.it/aHx>), you're probably itching to make some fun embedded computer projects with it. What you need is an add on prototyping Pi Plate from Adafruit, which can snap onto the Pi main board assembly (and is removable later if you wish) and gives you all sorts of prototyping goodness to make building on top of the Pi super easy.

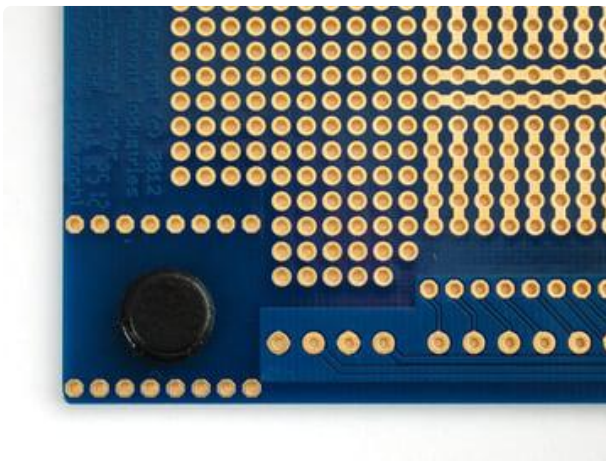
We added lots of basic but essential goodies. First up, there's a big prototyping area, half of which is 'breadboard' style and half of which is 'perfboard' style so you can wire up DIP chips, sensors, and the like. Along the edges of the proto area, all the GPIO/I2C/SPI and power pins are broken out to 0.1" strips so you can easily connect to them. On the edges of the prototyping area, all of the breakout pins are also connected to labeled 3.5mm screw-terminal blocks. This makes it easy to semi-permanently wire in sensors, LEDs, etc. There's also a 4-block terminal block broken out to 0.1" pads for general non-GPIO wiring. Finally, we had a little space remaining over the metal connectors so we put in an SOIC surface mount chip breakout area, for those chips that don't come in DIP format.

# Solder it!



Check that you have all the parts - a PCB, a 2x13 female header, a 1x6 female header, two 1x8 female headers, bumper, three 3-pin terminal blocks and ten 2-pin terminal blocks

You will also need a soldering iron and solder to assemble the kit

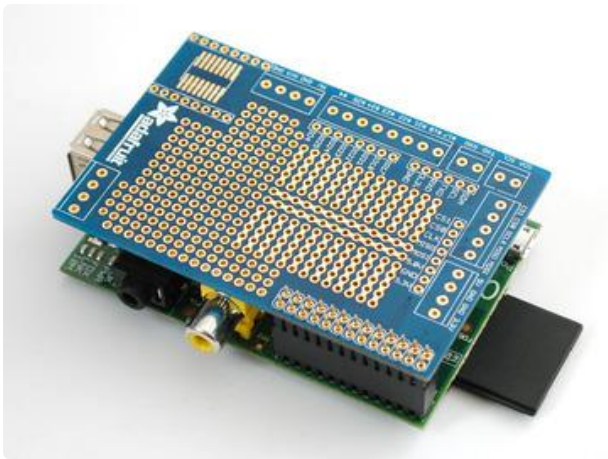


Place the single bumper underneath the SOIC breakout area. This will make the plate sit nicely on the Ethernet port

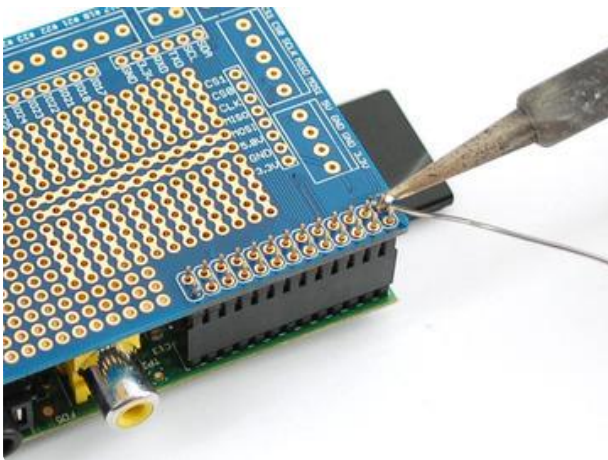


Place the big 2x13 pin header onto the Raspberry Pi GPIO breakouts so that it covers every pin. The connector is symmetric so it will fit on either way.

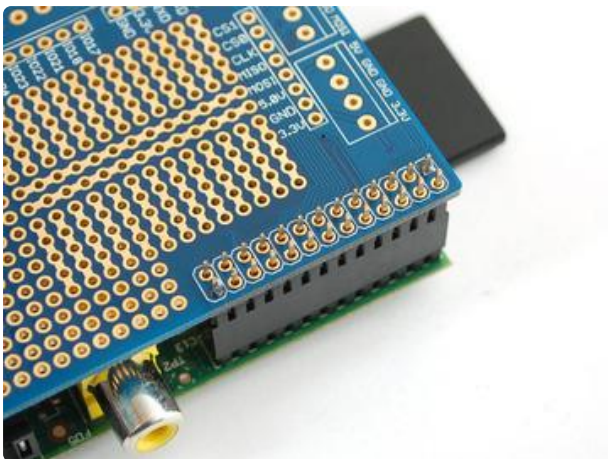




Place the proto plate PCB on so that the 2x13 header pins poke out through the matching 2x13 pads in the corner.

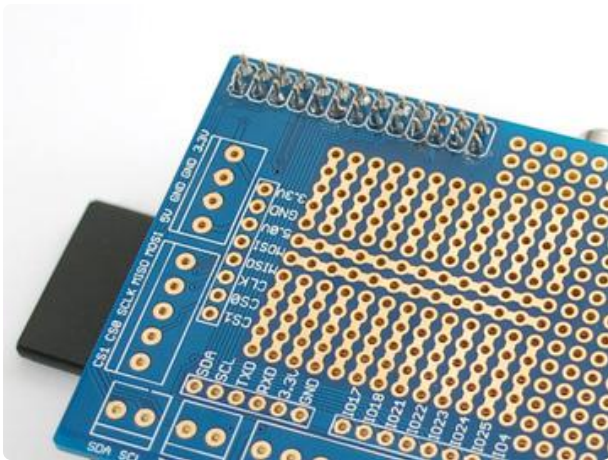
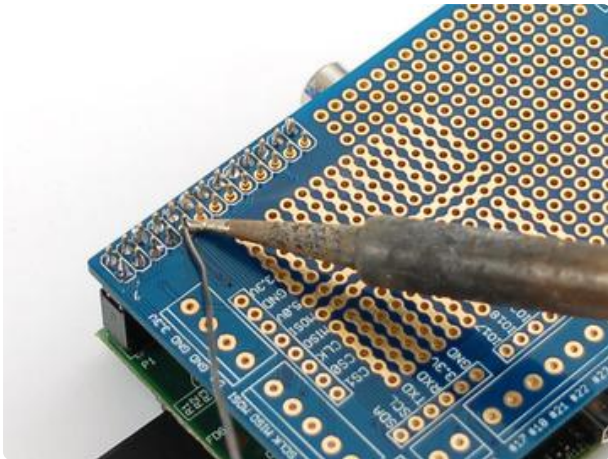
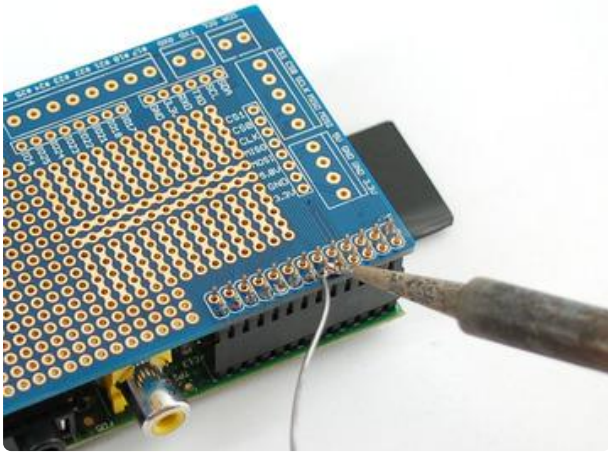


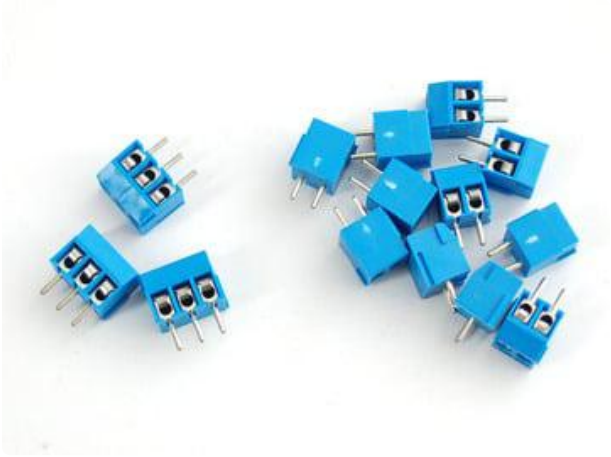
Heat up the soldering iron to 650 °F and wait for it to get up to temperature. Then heat a corner pad/pin with the iron tip and after two seconds poke in a small amount of solder. After the solder has melted into the pad/pin remove the iron.



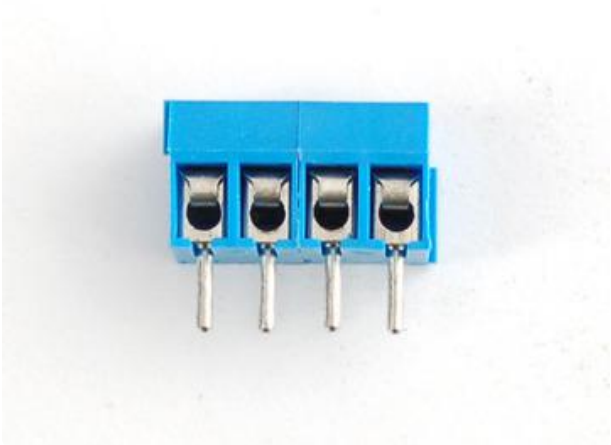
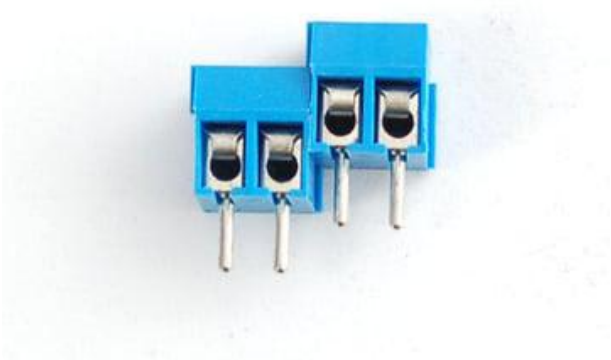
Start by soldering the two corner pins. This will allow you to make sure the plate is aligned properly and fix it if its crooked.

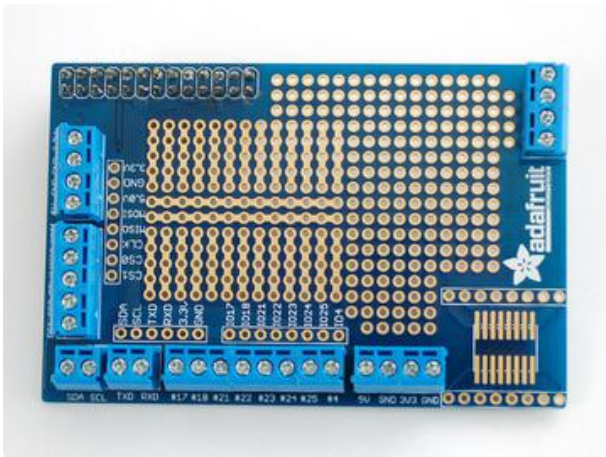
Continue to solder all 26 pins!



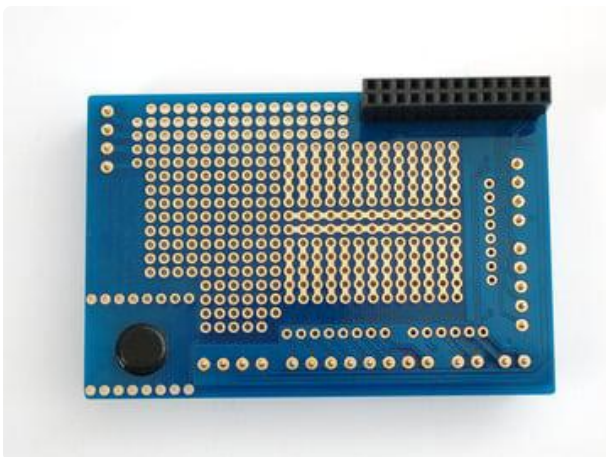
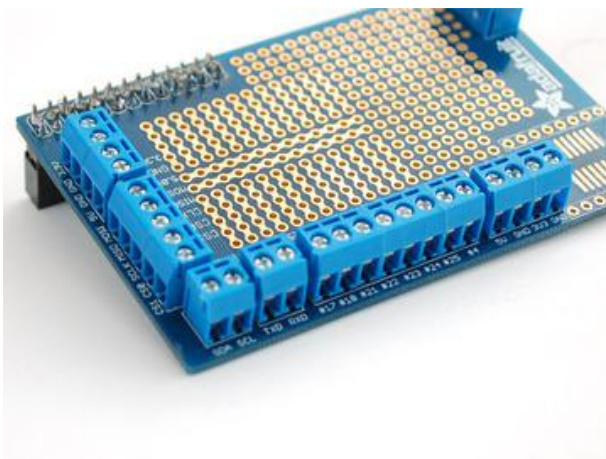


Find the terminal blocks, they're blue and come in 3-pin and 2-pin shapes. We'll need to slide the blocks together for the next step where we put the blocks into the proto plate. Slide them together to make 1x8 pin, 1x5 pin, and 3x4pin terminal blocks



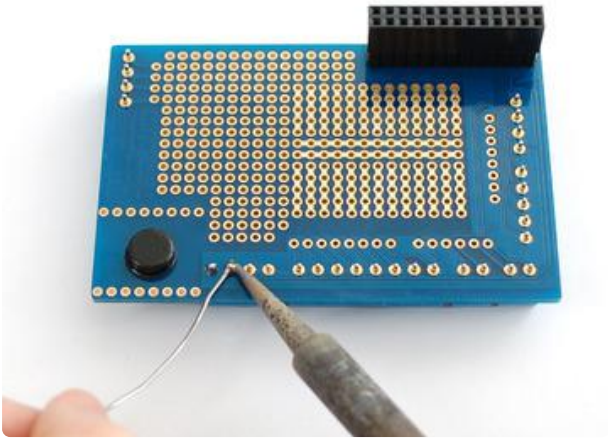


Place the blue terminal blocks around the perimeter of the Proto Plate PCB. Make sure you place them so that the open ends are facing out as shown.

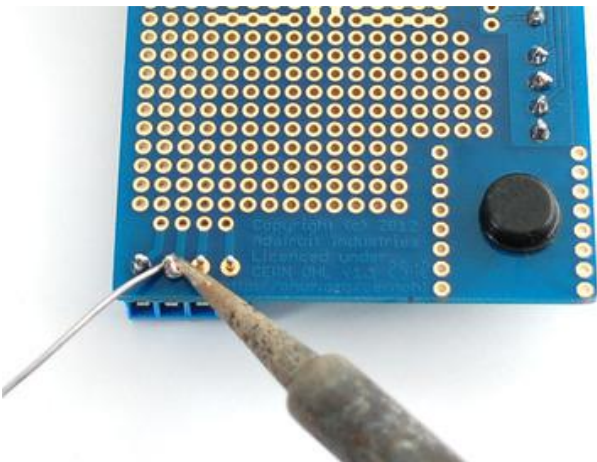
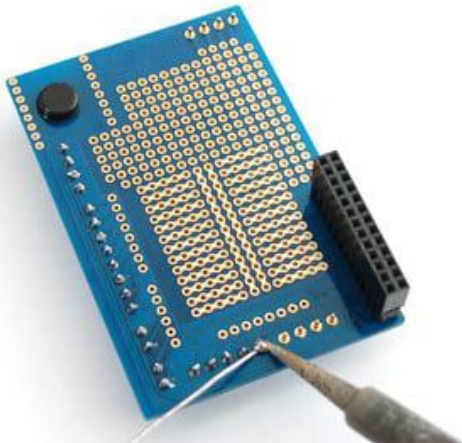


Carefully flip over the PCB, you may need to tape down the terminal blocks with scotch tape if they seem to fall out. With all the terminal blocks in place, it should sit flat on a table.



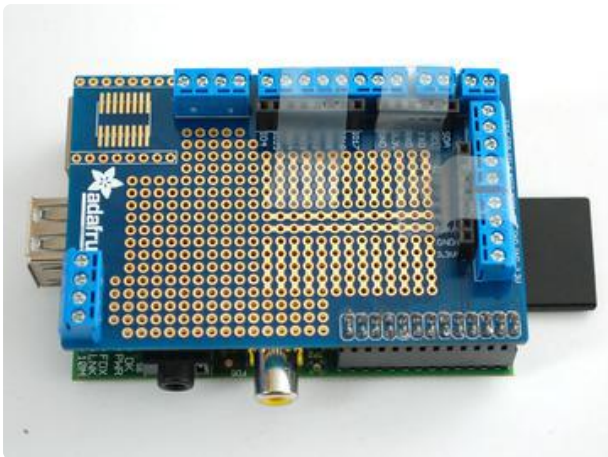


Solder each terminal block connection to the PCB using plenty of solder to make a strong mechanical connection

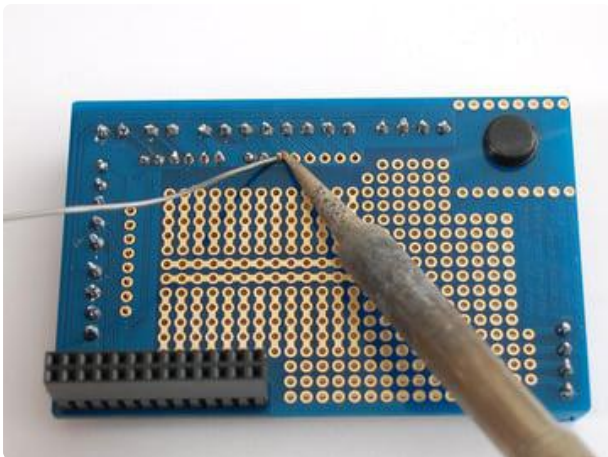




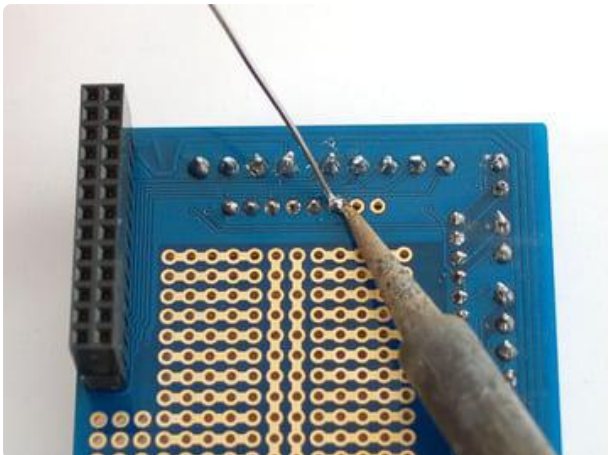
This part is optional, but if you want to have sockets for the GPIO pins so you can plug wires in and out easily, you can solder in the two 8-pin and single 6-pin header.



Place the headers in the slots right next to the terminal blocks. You'll want to tape them in place so they don't fall over when you flip the PCB.



Solder in all 3 sockets



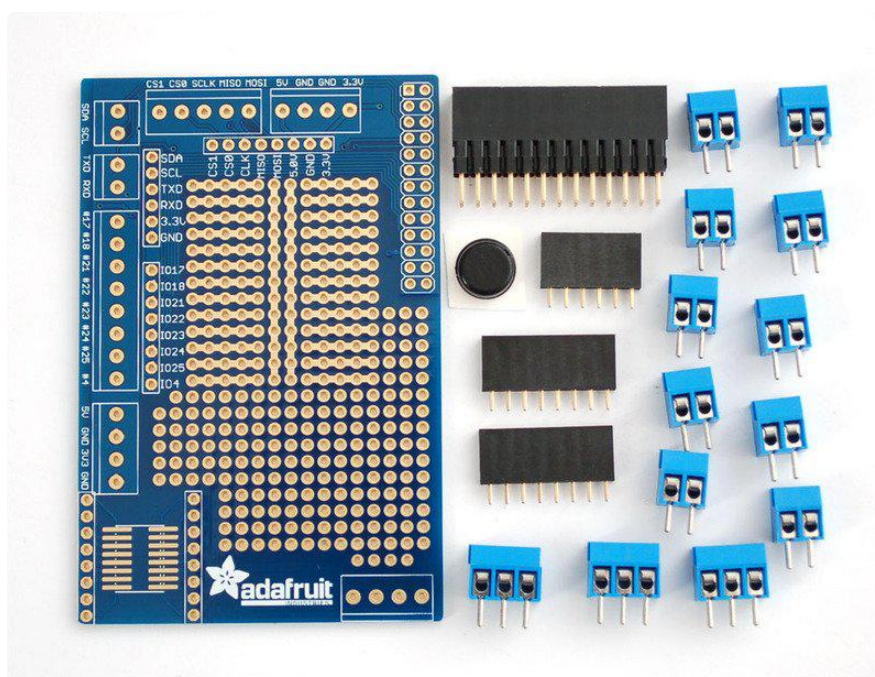


That's it! You're done assembling the proto plate, next up check the User manual for some ideas on how to use

## User Manual

Using the Prototyping Pi Plate is really easy and we designed to to be as simple as possible so it should work for any sort of Pi project. First up, keep in mind we did not add any extra power regulator systems or pin buffers. We did this because we wanted to keep the design simple and inexpensive: there's plenty of space to add any extra circuitry that you desire!

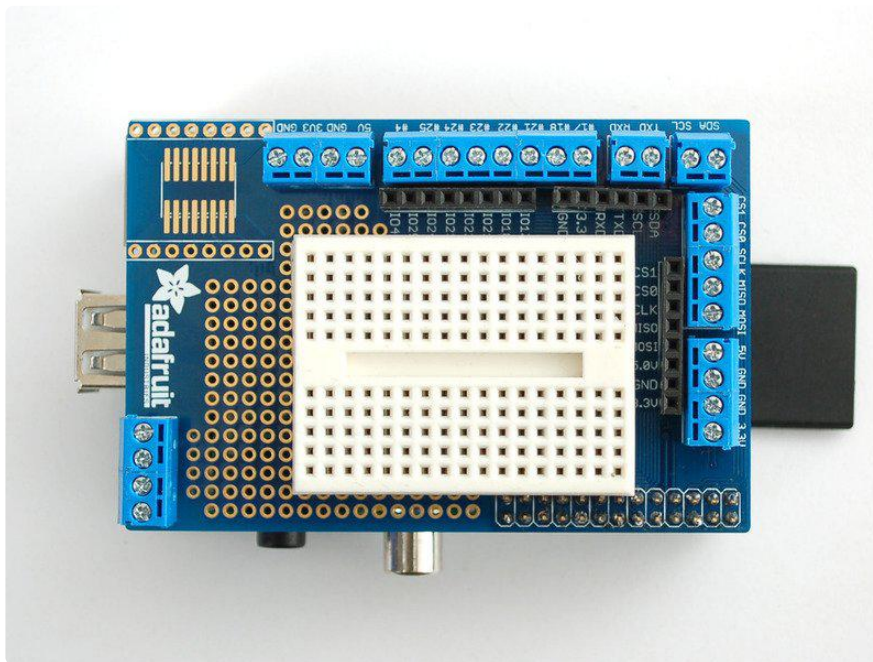
All the GPIO (General Purpose Input/Output) pins are broken in into two locations. The pins are connected to the 0.1" breakout pins as well as the terminal blocks. The pins are labeled by their 'names' if available and their GPIO # if not. [http://elinux.org/Rpi\\_Low-level\\_peripherals](http://elinux.org/Rpi_Low-level_peripherals) (<https://adafru.it/aJQ>) has a lot more details on what pins can be used for additional purposes (for example, the SPI pins can turn into GPIO's if desired).





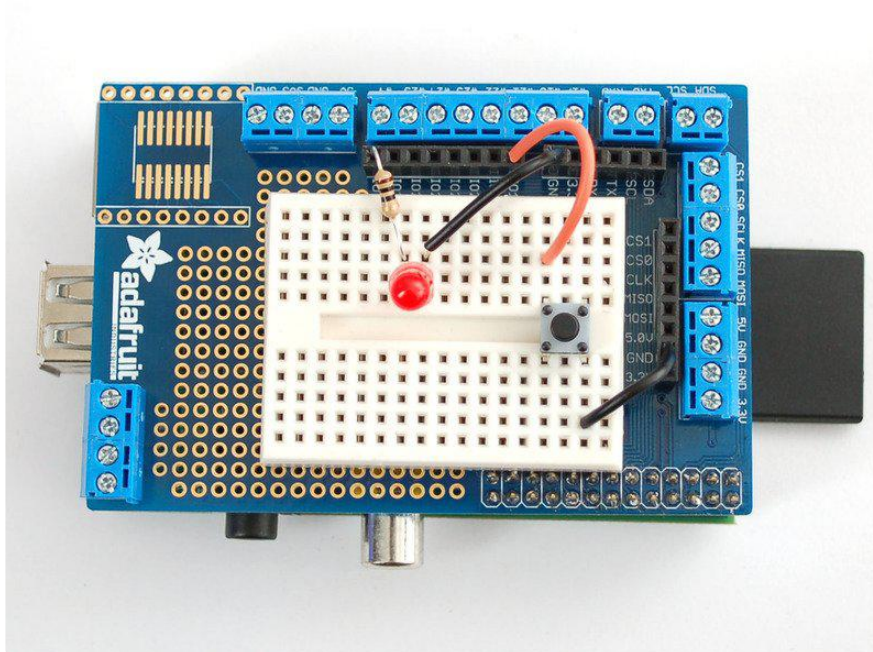
The layout of the board is a mix between 'breadboard style' (top middle) - with two 'rails' down the center and then 5-pin connected rows along-side. This layout is familiar for anyone who has used a breadboard. The remaining holes are 'perf' style - no connection between them. This allows for more flexibility.

There's an SOIC breakout area in the bottom left, handy if you have an SOIC part you want to add. In the bottom right there's a 4-pin terminal block with 4 x 0.1" spaced pads right above it, these are for 'free wiring' - they aren't connected to any GPIO so useful if you want to simply connect some wires or sensors that don't go directly to a GPIO/power pin

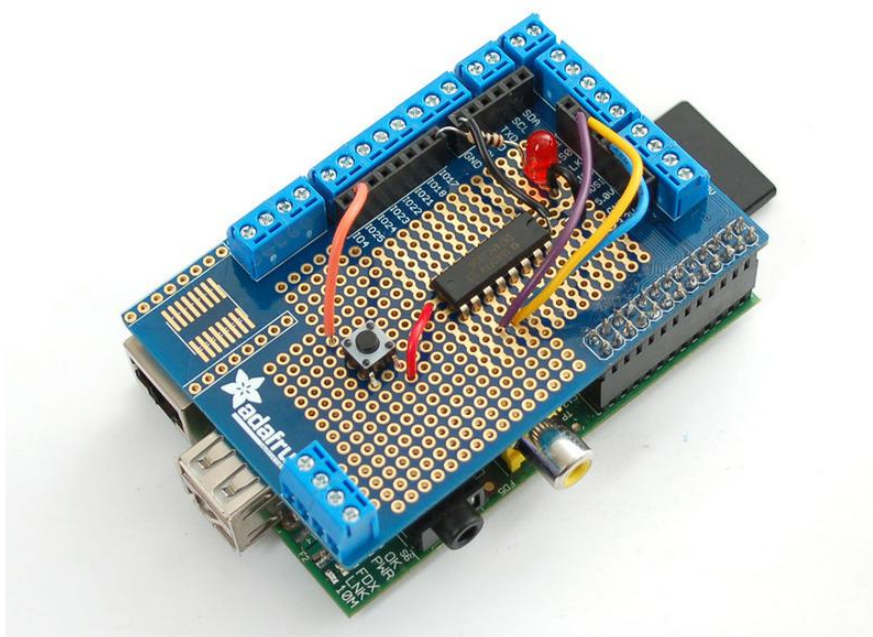


We designed the plates so you can fit a ['tiny breadboard'](http://adafru.it/65) (http://adafru.it/65) on top and still see the pin labels on the breakouts. This makes it easy to do fast prototyping!



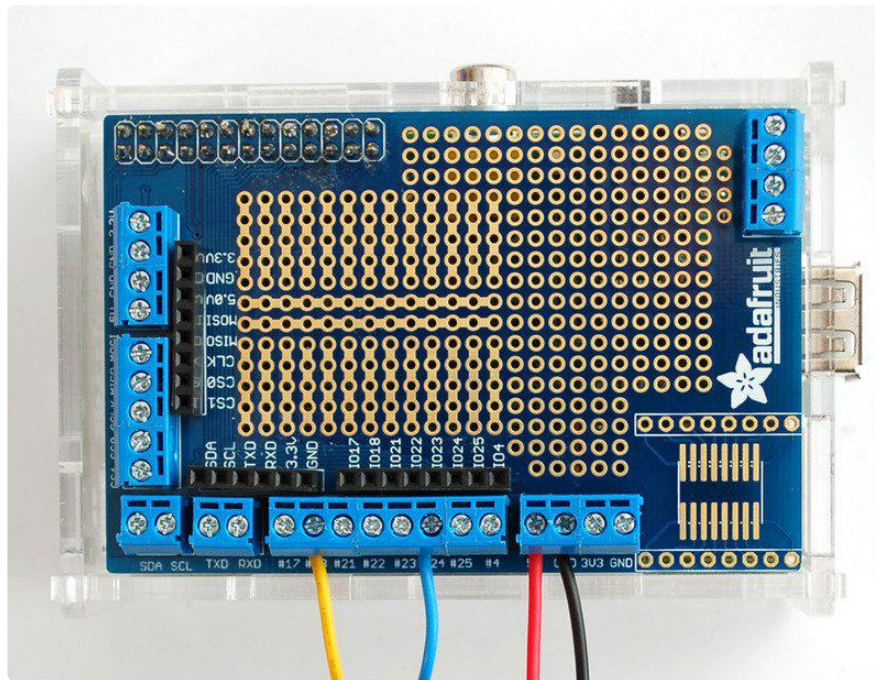


For more permanent projects, you can just place parts in and solder directly into the proto plate



The terminal blocks make it easy to connect to wires for installations. Simply use a small Pliers or flathead to open up the block, insert a stranded or solid core wire, then tighten it down.

If you want have it inside a case, we suggest one of our [Adafruit Pi boxes](http://adafru.it/859) (<http://adafru.it/859>)(as long as the top is removed)



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## Downloads

## Files

- [EagleCAD PCB files available on GitHub \(https://adafru.it/rPB\)](https://adafru.it/rPB)
- [Fritzing object in the Adafruit library \(https://adafru.it/aP3\)](https://adafru.it/aP3)

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