Getting started with soldering

In this resource you will learn the basics of how to solder components together.

Electronic components

Step 1 What you will make

In this resource you will learn the basics of how to solder components together.

What you will learn

By following this resource you will learn:

- How to solder components together
- Important safety precautions to take when soldering

Step 2 What you will need

Hardware

- Soldering Iron
- Solder
- Desoldering wick
- Components you want to solder together

Step 3 Video tutorial

In the following steps, you will find a transcript of this video.

Step 4 Your setup

In this video you will learn how to solder which is a really useful skill for digital makers. Soldering is joining together electronic components by melting a filler metal into the joints.

To start soldering you will need:

- A soldering iron
- Solder
- Desoldering wick
- Components you want to solder together

There are lots of different types of **soldering iron** - different wattages, different nibs and certainly a big difference in price. I would recommend that you would buy a soldering iron from a reputable maker store, within a price range that you can afford.

You will also need some **solder**. Solder comes in two different types - there's leaded solder and lead-free solder. Lead-free solder has a slightly higher melting point, so some people find it more difficult to work with. However, leaded solder obviously contains lead which is a poisonous metal, so you need to be careful about how you handle it.

Regardless of which kind of solder you choose, **the area in which you solder should be very well ventilated**. Here at Pi Towers we have an extractor fan to take away all of the fumes, but you probably don't have one of these at home, so I would advise that you solder in a very well-ventilated area such as a garage or by an open window.

You might want to have some **desoldering wick** handy in case you make a mistake.

And finally you will need the **components** you want to solder together. In this case we're going to show you how to solder a header to a Raspberry Pi Zero.

Step 5 How to solder

Take your components and position them ready for soldering. You want the header to sit flush against the Raspberry Pi Zero as you solder it, and you don't want it to move. I'm going to use a blob of blu tack to keep the components in place so that both of my hands will be free to do the soldering.

Turn on your soldering iron and wait for it to warm up. The tip of the soldering iron will get really hot, so you have to be careful. Make sure that the area where you are soldering is away from other people, small children, and pets - anyone who might trip over the wires or bump into you while you are soldering and cause an accident. It is also a good idea to wear safety goggles and to tie back long hair.

First, make sure that the tip of your soldering iron is clean. Wet the sponge and then wipe the tip on it to clean it. Next, you need to tin the soldering iron by applying a small amount of solder to it. Apply the tinned soldering iron to the area you wish to solder, and introduce the solder stick from the other side. The solder should be sucked in, forming a cone-like shape connecting the pad to the pin. Once you have done one pin, stop and have a look. If your header is wonky, it's a lot easier to correct it now than it will be after you've soldered lots of pins on.

You're aiming for enough solder at the base of the pin to form a good connection. Not enough solder and the connection won't be very good, but too much solder is bad as well.

Step 6 Troubleshooting

If you make a mistake and apply too much solder, you can use the desoldering wick to remove the excess. Hold the desoldering wick against the solder you wish to remove. Then, place the tip of the soldering iron onto the wick. You should see the unwanted solder sucking up into the wick so that it can be removed.

And that's it! Now you just need to solder the rest of the pins exactly like this. Don't forget that when you've finished soldering, some parts of the components may still be pretty hot. Also, make sure that you wash your hands to remove any residues that may be left over.

Step 7 What next?

So, now that you've learnt how to solder, what are you going to make?

- **Raspberry Pi Zero time-lapse camera** (https://projects.raspberrypi.org/en/projects/raspberry-pi-zero-time-lapse-cam/)

Don't forget, we love hearing about your makes. Drop us a line on **Instagram** (https://www.instagram.com/raspberrypifoundation/), **tweet us** (https://twitter.com/raspberry_pi) or send us an **email** (https://www.raspberrypi.org/contact/).