Practical Guide To Soldering

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Motivation

I know you already know everything that could possibly be known about soldering, but a little reminder just in case won't harm anyone, right?

(better) Results

Tip size

increase tip size for:
- faster heat transfer
- larger parts

Choose the largest tip that you can fit next to your parts

Solder parts grouped by size, switch tip inbetween

Temperature

Start around 270° C for lead free solder, increase as far as needed in steps of 10°.

For larger pads/metal pins/pads connected to GND conducting heat away, you may need to wait for several seconds before solder will melt on them. This is normal, no need to increase temperature!

Increase temperature slightly for
- pads that need a large amount of solder
- heat transfer problems with tiny tips
- faster damage to parts and tip
- faster evaporation and thus waste of flux

400° C is definitely too much!!!

Whilst the solder we use is lead-free, it still contains a lot of unhealthy chemicals. Avoid inhaling the rising smoke. Against popular practice, your nose does not actually need to be less than 5 cm from the solder tip for a good connection!

Finished... cleaning up!

- Wipe tip one last time, add a thin coating of solder, e.g. by gently stroking the tip through the tip cleaner paste, switch off soldering iron
- Empty your small waste container
- Cut off section of solderwick you saturated with solder
- Wash your hands

References

http://cornfieldelectronics.com/cfe/images/mfaire/soldercomic.jpg
https://learn.sparkfun.com/tutorials/how-to-solder-through-hole-soldering
https://www.sparkfun.com/tutorials/category/2
https://www.elexp.com/Images/Weller_Coping_with_Lead_Free.pdf
http://www.mouser.com/pdfdocs/TechspraySolderTips.pdf

Novelty

You will leave the soldering area in a usable state for the next person and the stuff you solder might actually work for a while!

Soldering Iron

Use the tip to heat your parts

Parts are hot when the solder seems to get 'sucked' onto them

Solder

Hot glue for making circuits

Most solder have a flux core, flux is only needed for repairs

Safety Goggles

Keep your eyesight!

Not always but sometimes small hot solder spheres splash around, don't catch them with your eyes

Small Waste Container

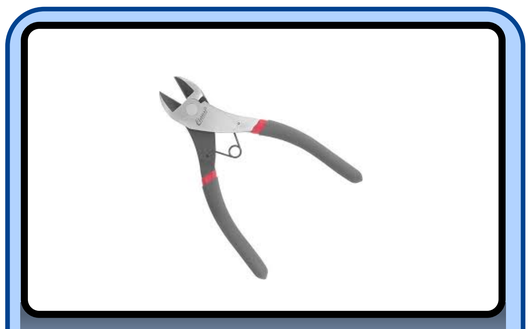
Collect bits you cut off

Keep a small waste container in your work area to keep your work area clean

Silver Wire

Looks like solder, does not melt

Used especially on breadboard for making connections that look like nice clean lines



Wire Clippers

Use one hand to catch the bits you're cutting of

Place cuttings in the small waste container

Sponge

Remove flux residues, oxidation

Metal sponges are ready to go

All other sponges need to be kept humid by adding water

Flux

Increases surface tension of solder

Solder forms smooth surfaces

Don't confuse w/ tip cleaner paste

Removes oxidation from pads

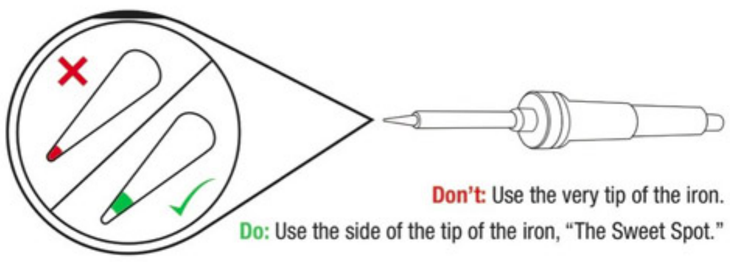
Solder Wick

Ctrl+Z for soldering

Place over solder, heat with tip to suck up solder

Remove whilst hot, or it gets stuck

Making good connections



Don't: Use the very tip of the iron.

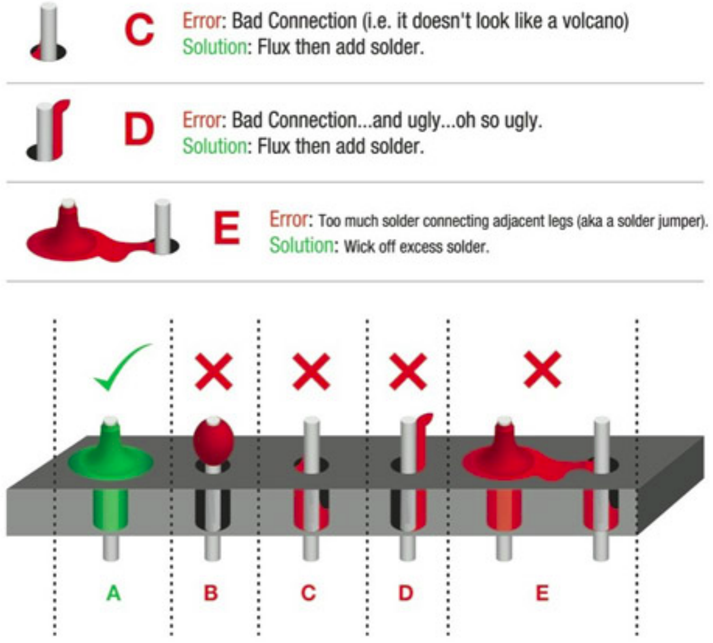
Do: Use the side of the tip of the iron, "The Sweet Spot."

Do: Touch the iron to the component leg and metal ring at the same time.

Do: While continuing to hold the iron in contact with the leg and metal ring, feed solder into the joint.

Don't: Glob the solder straight onto the iron and try to apply the solder with the iron.

Do: Use a sponge to clean your iron whenever black oxidization builds up on the tip.



From: https://learn.sparkfun.com/tutorials/how-to-solder-through-hole-soldering