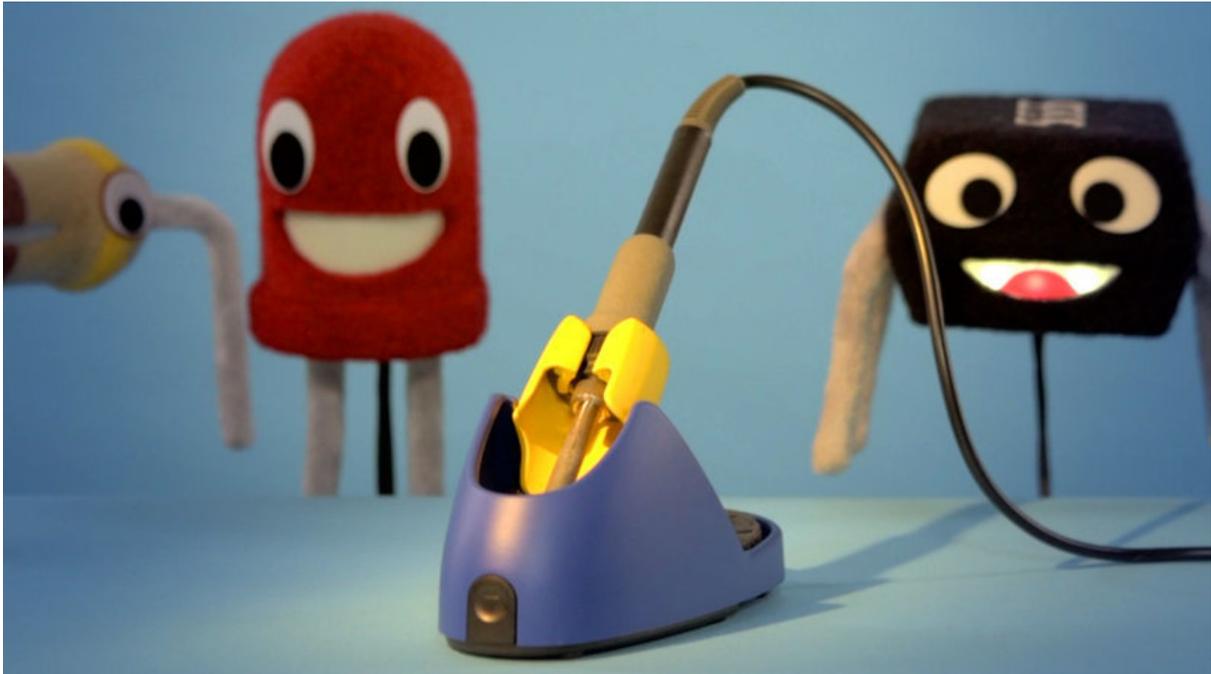




# Circuit Playground: S is for Soldering Iron

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<https://learn.adafruit.com/circuit-playground-s-is-for-soldering-iron>

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# Video

Ladyada teaches how to wield the legendary soldering iron – safely!

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## Transcript



**Hans:** Behold! The almighty soldering iron!

**Ruby:** It fuses metal!

**Hans:** Combines conductors!

**Mho:** So powerful!

**Ruby:** Oooh!



**Ladyada:** Umm - excuse me, guys...

**Ruby:** She picked it up - !

**Hans:** ... Like the sword from the stone!

**Mho:** She is the chosen one!

**Ladyada:** Ha - you guys - a soldering iron isn't magic. But it is pretty powerful - it uses the power of heat to bond components together with a material called "solder."

**Ruby:** Well ... – it must use a lot of heating power then!

**Ladyada:** It definitely does ... in fact, This iron uses 65 Watts of power. And of course, with great power comes great responsibility.

**Mho:** Hmm ... what, exactly, does that mean?

**Ladyada:** It means you have to be careful when using a soldering iron and follow some basic rules.

**Ruby:** What sort of rules?



**Ladyada:** For starters, soldering irons are not toys. They're special tools that get very hot very fast and you can't tell how hot they are just by looking at them.



**Ruby:** Oh - like an electric stove. They can be dangerous!

**Ladyada:** Exactly - it's easy to burn yourself if you aren't sure what you're doing. Young people and beginners shouldn't use a soldering iron without an experienced adult around.



**Mho:** So - how dost thou wield such a dangerous tool?!

**Ladyada:** Well for starters, you need to use the right safety gear.

**Hans:** Such as?



**Ladyada:** When solder is heated up quickly, it can sometimes “spit” little drops of liquid called “flux”.

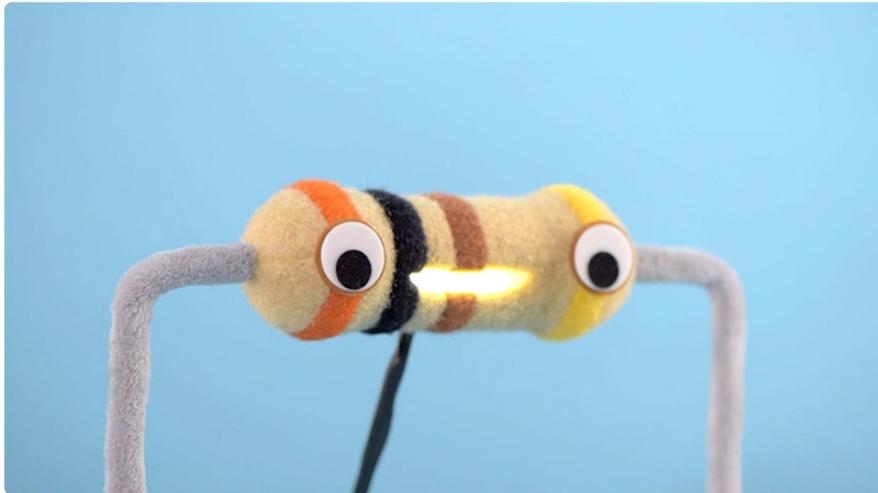
**Ladyada:** So it’s important to protect your eyes with a good pair of safety glasses.

**Ruby:** Gross - no spitting!





**Ladyada:** When solder melts, it releases smoke that you definitely don't want to breathe. A fume extractor, like this one, uses a fan to capture that smoke inside a filter – leaving you with fresh, clean air to breathe.



**Mho:** (breathes deeply) Aaaahhh ... that's *\*much\** better





**Ladyada:** You should only hold a soldering iron by the handle – and never touch the heating element.

**Ruby:** Yikes - no way! Total burnsville!

**Ladyada:** And of course – you can't just put a hot iron down just anywhere. You need a good stand that can resist a lot of heat

**Hans:** Like this one?

**Ladyada:** Exactly - this metal stand can safely hold a hot iron and it has a wide flat base the helps to keep it from tipping over or falling.

**Hans:** So a stand holds the iron, what holds the thing you're soldering?





**Ladyada:** That's where a vise comes in. This panavise is designed to hold small circuit boards during soldering.

**Ladyada:** You just slide the board into the slotted jaws, tighten the vise securely, and you're ready to work.

**Ruby:** What if you're soldering really big circuit boards?

**Ladyada:** Oh - there are vises for big boards too ...

**Mho:** Woah - it's a super vise!

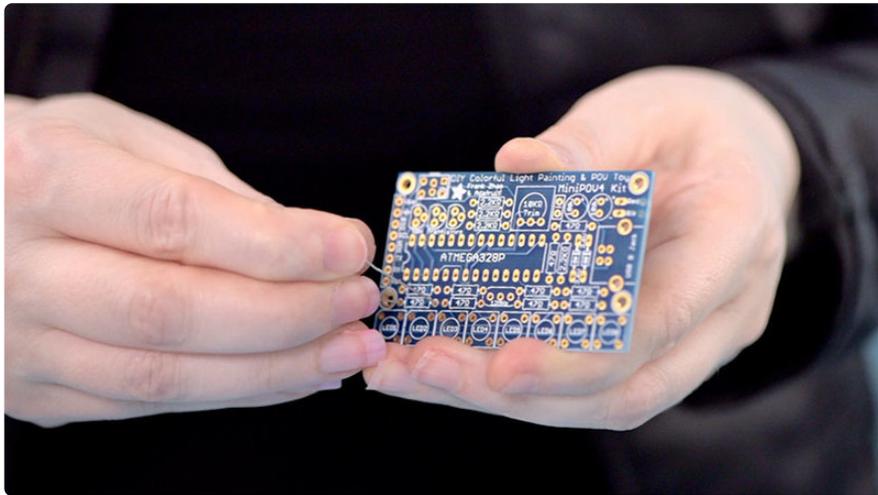


**Ruby:** So, once you have all the important safety gear taken care of – how do you start soldering?!

**Ladyada:** The actual soldering part is pretty simple:



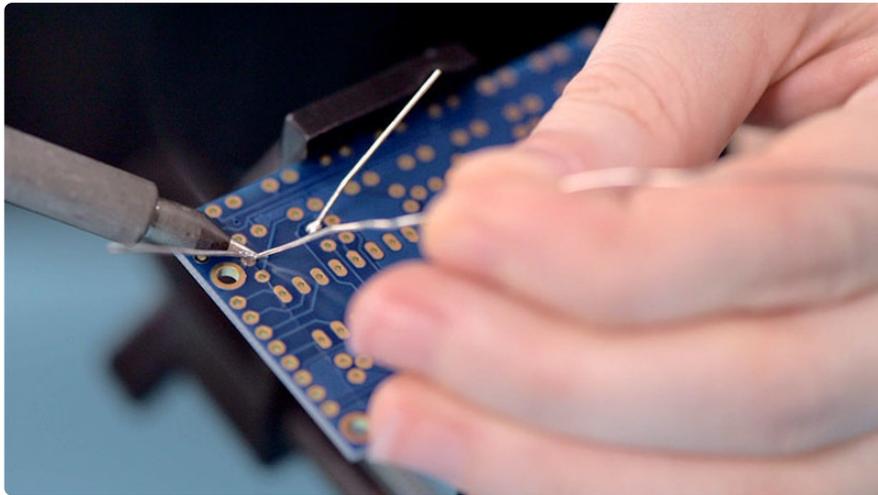
Ladyada: First - turn on the iron and wait for it to heat up.



Ladyada: Place the components you want to solder on the PCB.



Ladyada: Place the PCB in vise.



**Ladyada:** Place iron tip between component lead and solder pad. Feed solder into joint – and voila!



**Ruby:** It's a miracle!

**Mho:** Amazing!

**Hans:** Wunderbar!

**Ladyada:** Then clean the iron's tip using some brass wool or a damp sponge

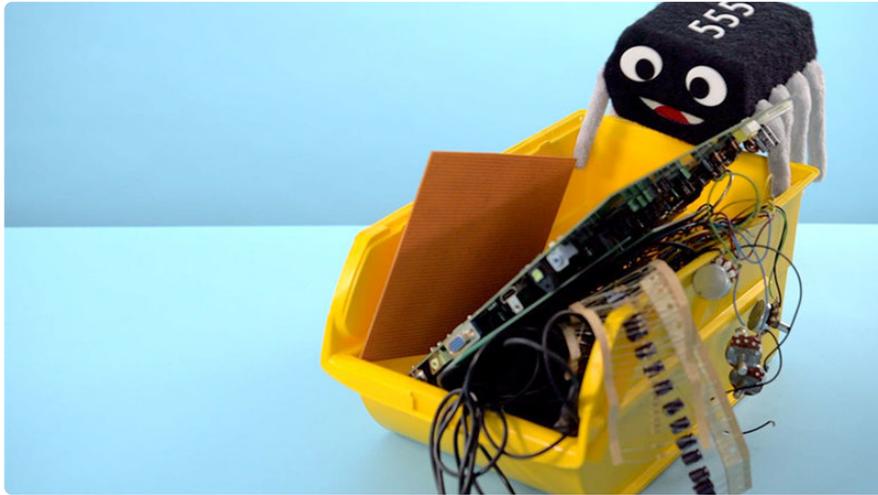
**Ladyada:** ... and place it back on the stand.

**Ladyada:** When you're done soldering – and this is very important – be sure to turn off your iron.

**Ruby:** You make it look easy!

**Ladyada:** Thanks - It's not hard, but it does take some practice to get it right. Just remember - noobody uses the soldering iron unless I'm around to help, ok?

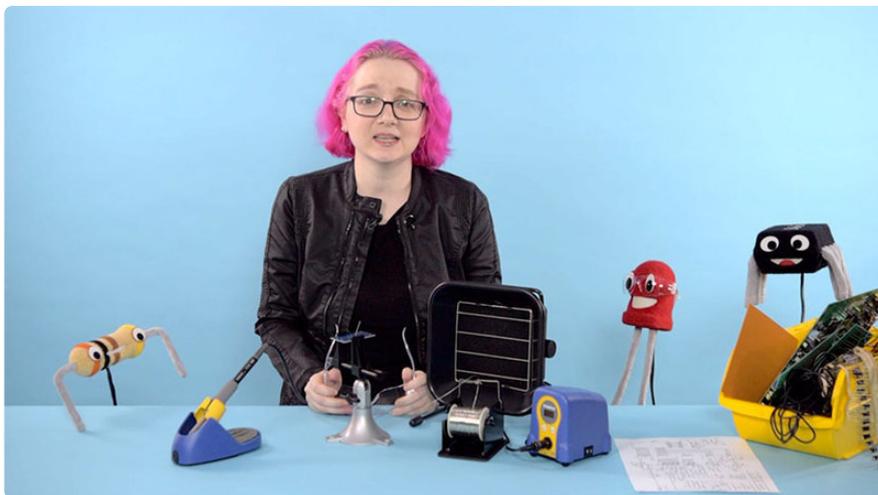
**Mho:** Ya - no sweat.



**Hans:** Well, since you're here .... maybe you can help us with this project

**Ruby:** It's not too complicated

**Mho:** Should only take a few hours.



**Ladyada:** Oh no – what have I done?!

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# Learn More

## What is a soldering iron?



From [Wikipedia \(https://adafru.it/Huf\)](https://adafru.it/Huf)

A soldering iron is a hand tool used in soldering. It supplies heat to melt solder so that it can flow into the joint between two workpieces.

A soldering iron is composed of a heated metal tip and an insulated handle. Heating is often achieved electrically, by passing an electric current (supplied through an electrical cord or battery cables) through a resistive heating element. Cordless irons can be heated by combustion of gas stored in a small tank, often using a catalytic heater rather than a flame. Simple irons less commonly used today than in the past were simply a large copper bit on a handle, heated in a flame.

# History



From [Kurtz Ersa \(https://adafru.it/HuA\)](https://adafru.it/HuA)

Today, it is difficult to say who first discovered how to "glue" metals. One thing is certain; the goldsmiths of ancient Egypt knew how to join gold more than 5,000 years ago. Their colleagues in Troy were also masters of soldering long before the ancient Teutons could even dream of such handicraft. Soldering "came of age" when tin was discovered as a soldering metal - and that was 4,000 years ago!

From then on, the world's soldering technology was on its way upwards. It first spread around the Mediterranean. The Cretans showed it to the Etruscans, who then taught it to the Romans, Tunisians and Spanish, followed by many others, including the less developed cultures of the time - the Swiss, Bohemians, Hungarians, Teutons and Scandinavians.

Also see:

- [Brief History of the Soldering Iron and Soldering Gun \(https://adafru.it/HuB\)](https://adafru.it/HuB)
- [History 101 – The Modern Soldering Iron \(https://adafru.it/HuC\)](https://adafru.it/HuC)
- [How's Your Soldering Technique? \(https://adafru.it/HuD\)](https://adafru.it/HuD)

## Adafruit Soldering Videos