

I Can Solder Badge kit

Assembly Instructions
mitch@CornfieldElectronics.com

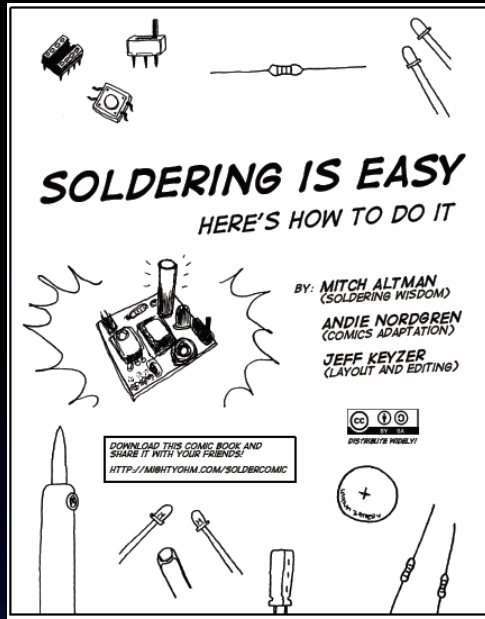


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Blinky light and White flashlight

Learn To Solder



The following photos will show you how to solder.

But feel free to download the “Soldering Is Easy” comic book for free!

(In many different languages.)

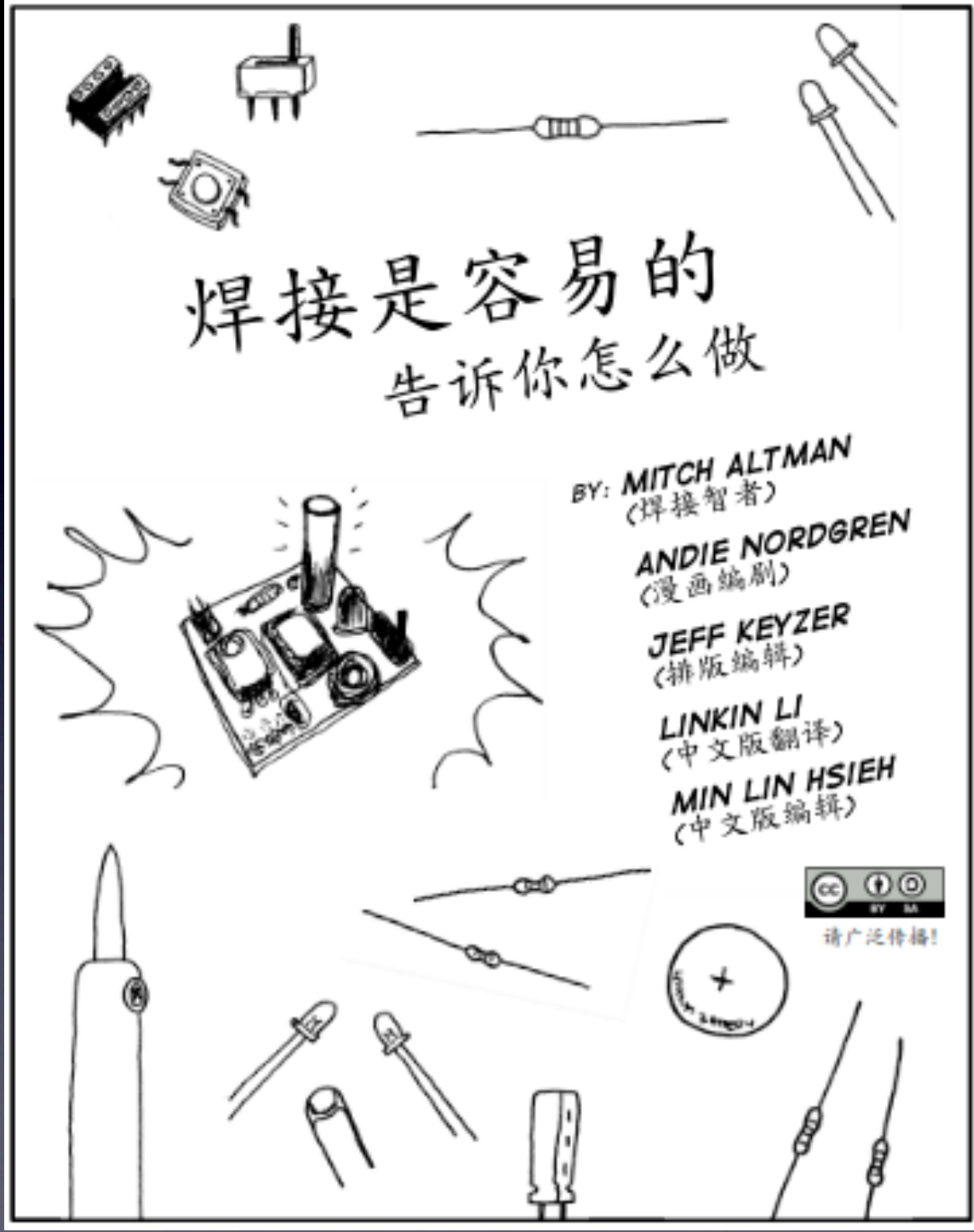
download for free at:
<http://mightyohm.com/soldercomic>

Learn To Solder



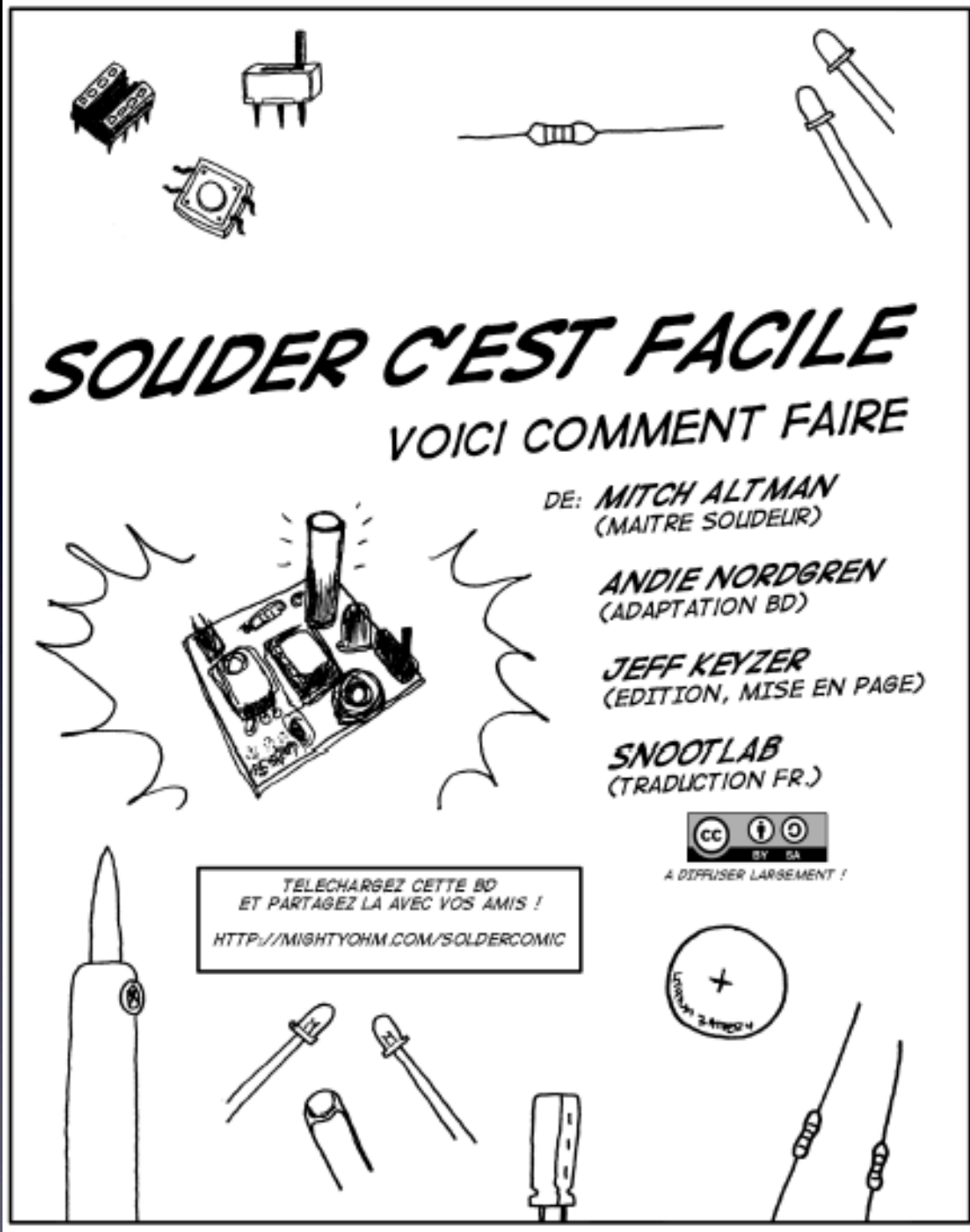
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(In many different languages.)

Learn To Solder

SOLDAR ES FÁCIL! APRENDE CÓMO HACERLO

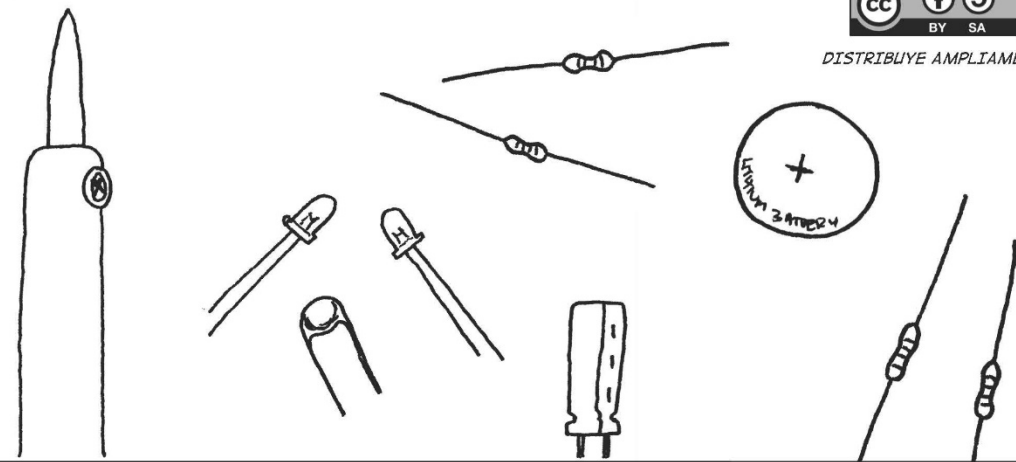
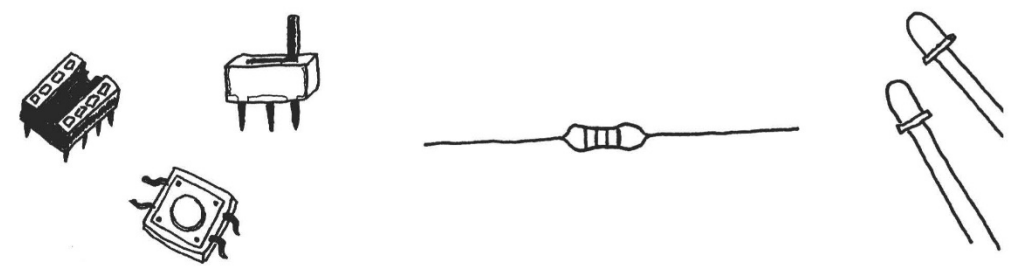
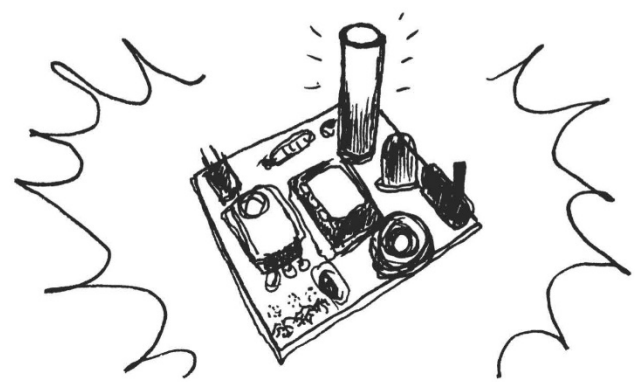
POR: **MITCH ALTMAN**
(SABIDURÍA EN SOLDADO)

ANDIE NORDGREN
(ADAPTACIÓN A COMIC)

JEFF KEYZER
(DISEÑO Y EDICIÓN)



DISTRIBUYE AMPLIAMENTE!



download for free at:
<http://mightyohm.com/soldercomic>
(In many different languages.)

Learn To Solder



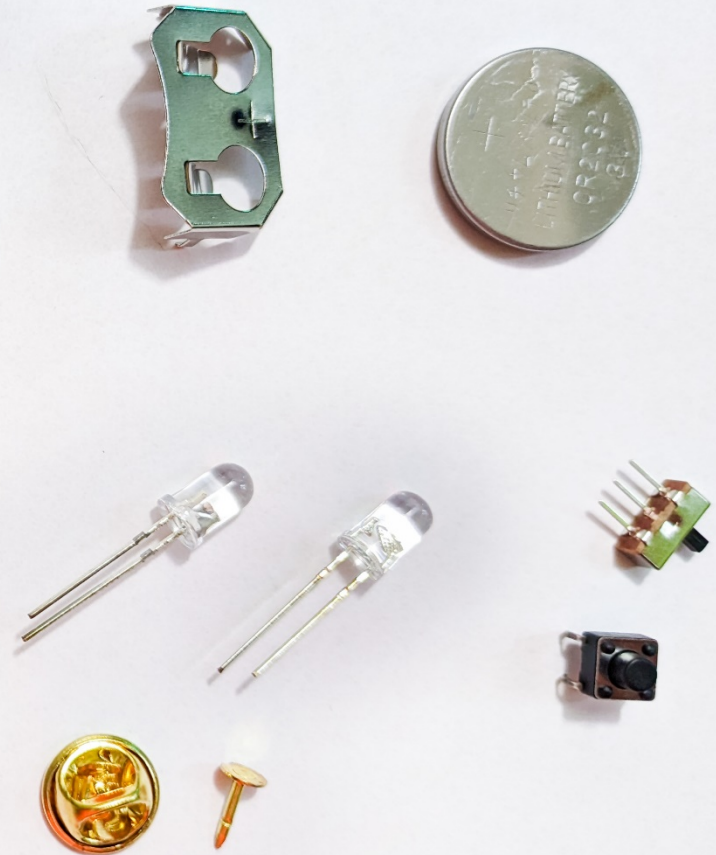
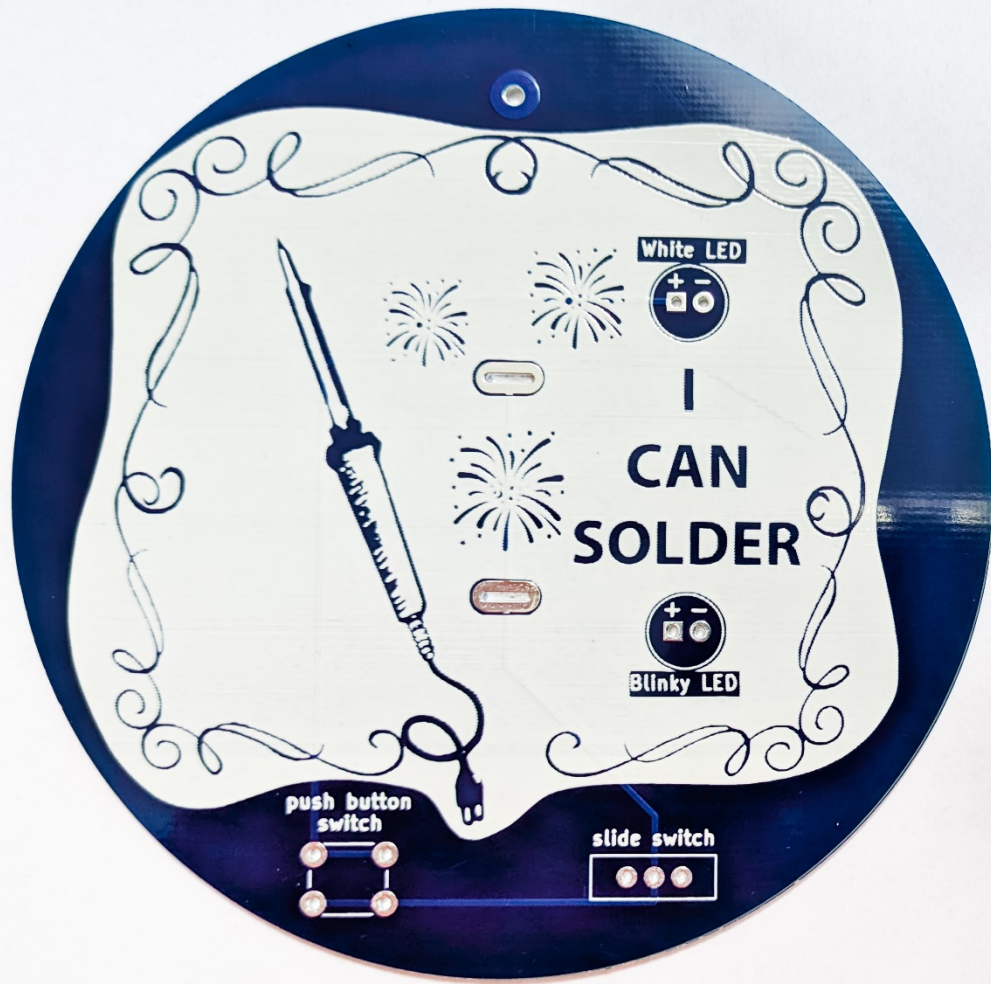
LÖTEN IST EINFACH SO WIRD ES GEMACHT

VON: MITCH ALTMAN
(LÖTWEISHEITEN)
ANDIE NORDGREN
(KOMIK-UMSETZUNG)
JEFF KEYZER
(LAYOUT UND BEARBEITUNG)
ALEXANDER BODORA
(ÜBERSETZUNG UND BEARBEITUNG)
RICHARD MEINSEN
(ÜBERARBEITUNG UND KORREKTUR)



WEITER
VERTEILEN!

download for free at:
<http://mightyohm.com/soldercomic>
(In many different languages.)



All of the parts



The board we'll solder the parts to (front)



I Can Solder Badge v2a

NOTE: This is the back of the board (the other side is the front)

How to:

W285637AS1F1

battery holder

Long leads of LEDs
are (+):

Insert Pin in the front, solder it on the back.

Insert Battery Holder in the back, solder it on the front.

Insert Slide Switch in the front, solder it on the back, and the trim leads.

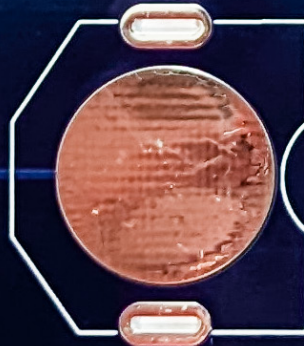
Insert Push Button Switch in the front, solder it on the back.

Insert White LED in the front, solder it on the back, and trim the leads.

Insert Blinky LED in the front, solder it on the back, and trim the leads.

Insert Battery (+) side up.

Enjoy!



The board we'll solder the parts to (back)



Note:

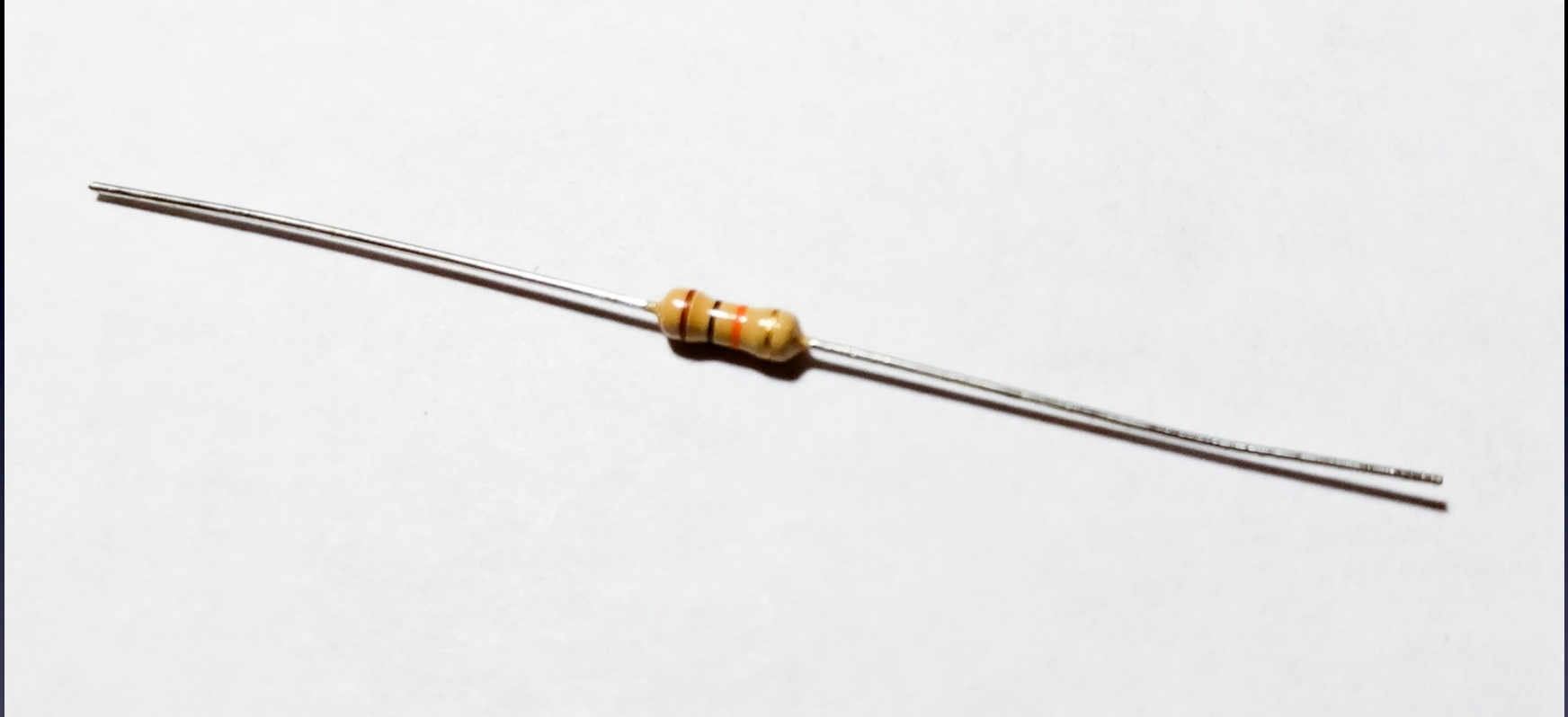
If you use
Lead-Free solder
it is helpful
to also have
flux paste in a syringe
and Isopropyl Alcohol



The tools you'll need:

- soldering Iron (35W or less)
- solder (*more details coming*)
- soldering iron stand
- cellulose kitchen sponge (*not plastic!*)
- *small* wire cutter

The “I Can Solder Badge” kit has no resistors

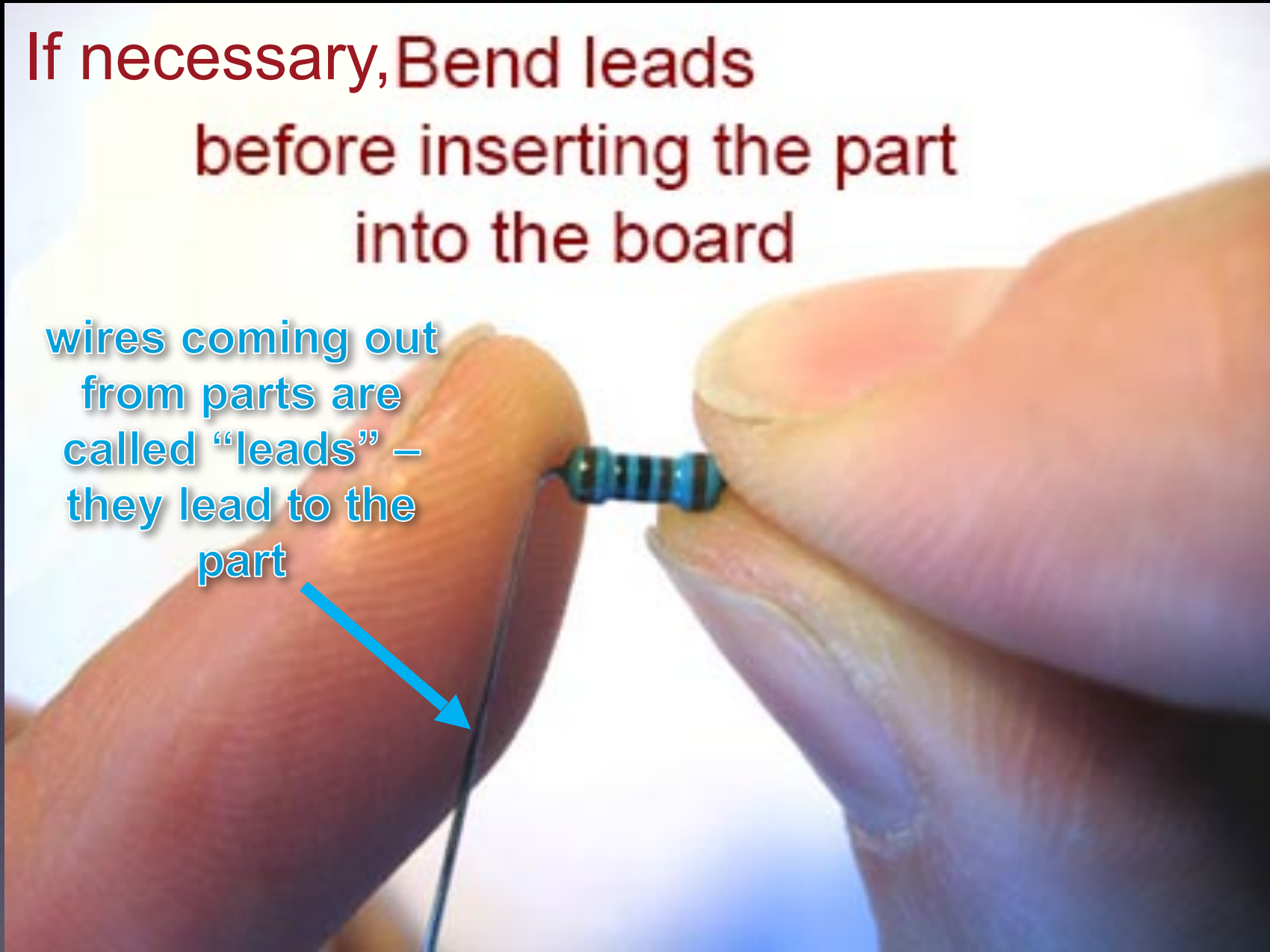


this is how a resistor looks *before*
bending its leads

The “I Can Solder Badge” kit has no resistors

If necessary, Bend leads
before inserting the part
into the board

wires coming out
from parts are
called “leads” –
they lead to the
part



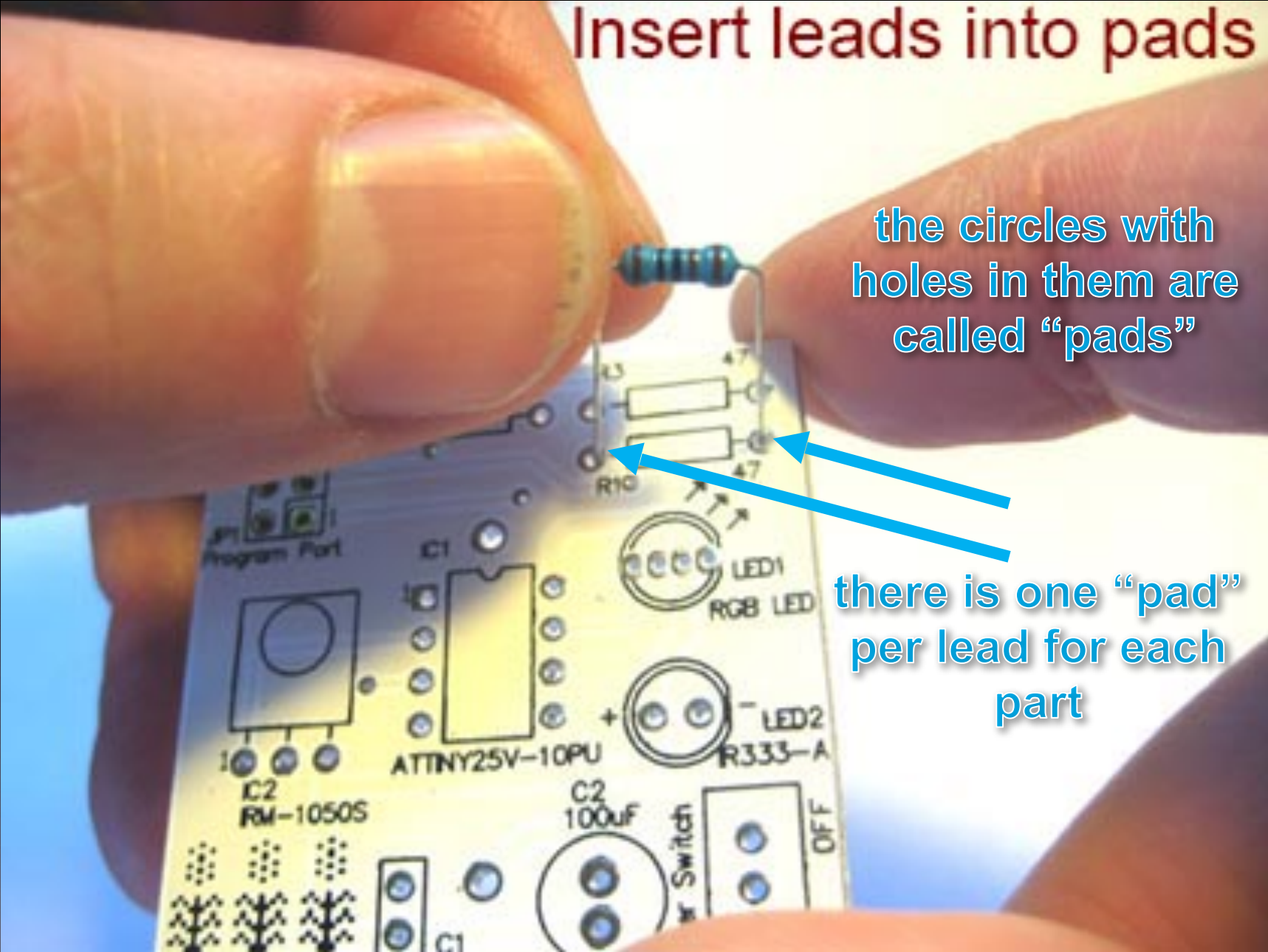
(but, the parts in this kit are soldered the same way)

The “I Can Solder Badge” kit has no resistors

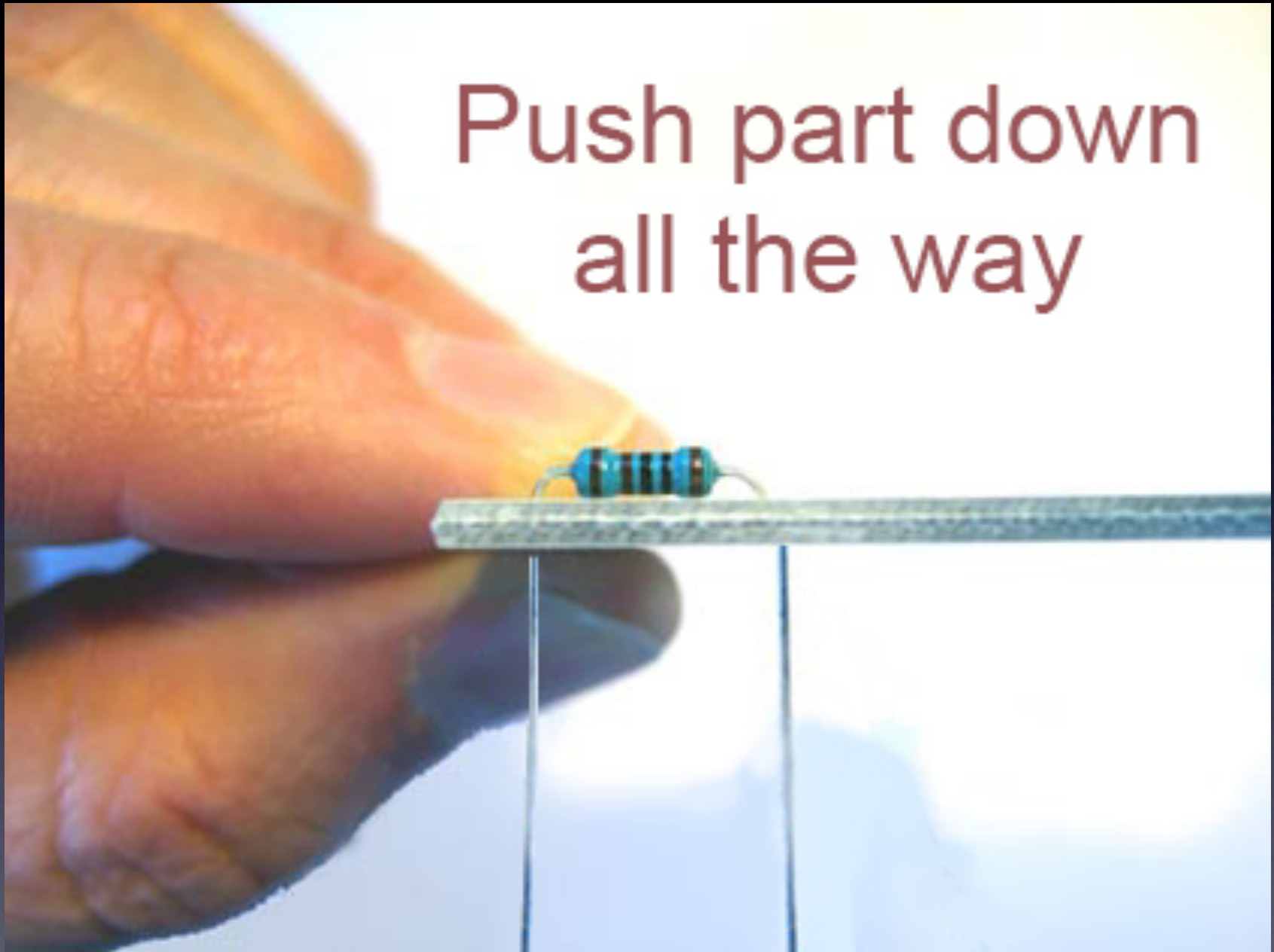


this is how a resistor looks *before* inserting it into the board

LEDs for this kit go into the board like this resistor



Push part down
all the way



A close-up photograph of a person's hand holding a thin metal wire. A small resistor with four color bands (blue, black, orange, brown) is attached to the wire. The wire is bent into a V-shape at the resistor. The background is a bright, slightly blurred sky. Text is overlaid on the image in various colors and fonts.

Upside down

Wires bent
half way
out

(only half way)

like a "V"

so that the part won't fall out while soldering it

A close-up photograph of a person's hand holding a thin metal wire. A small, blue and black resistor is attached to the wire. The wire is bent into a V-shape at the resistor. The background is a bright, slightly blurred sky. The text 'Upside down' is written in a dark red font at the top of the image. Below the wire, the text 'Wires bent half way out (only half way) like a "V"' is written in a dark red font, with 'half' underlined and '(only half way)' in orange. At the bottom, the text 'Ready to Solder !' is written in a large, bold, dark red font.

Upside down

Wires bent
half way
out (only half way)
like a "V"

Ready to Solder !



How to hold a soldering iron

(Like a pencil – held from underneath)

Important

The best kind of solder for DIY electronics:

(Sn – Tin / Pb – Lead)

63/37 rosin core,
0.031" (0.8mm) diameter (or smaller)

(60/40 is also good)

Note:

Most
Lead-Free solder
has poisonous fumes!

A good kind of solder for DIY electronics:

*This is the only good **Lead-Free** solder I have found!*
(after years of searching)



Kester
K100LD Rosin
(not "No Clean")
0.031" diameter (0.8mm)

A good kind of solder for DIY electronics:

This is the only good *Lead-Free* solder I have found!
(after years of searching)



Kester **K100LD Rosin** Solder
0.031" diameter (0.8mm)

Lead-Free

solder I have found!

(after years of searching)

Note:

If you use *Lead-Free* solder

it is *helpful*
to also have

flux paste in a syringe

and *Isopropyl Alcohol*



AMTECH NC-559-ASM

99%



Another good kind of solder for DIY electronics:

*This is another good **Lead-Free** solder I have found!*



**Duratool
D01685 Rosin**

0.7mm diameter

*(as good as the
Kester K100LD Rosin)*

Another good kind of solder for DIY electronics:

This is another good **Lead-Free** solder I have found!



**MG Chemicals
4900 Rosin (112g, 227g, 454g)**

0.8mm diameter

*(as good as the
Kester K100LD Rosin)*

Another good kind of solder for DIY electronics:

*This is another good **Lead-Free** solder I have found!*



iFixit
IF145-077-2 (12g)
1.0mm diameter

*(as good as the
Kester K100LD Rosin)*

3 Safety Tips...

Safety Tip #1:

Hot!!

(When you touch the tip,
you will let go quickly every time!)

Safety Tip #2:
Soldering chemicals
are toxic

But they easily wash off your hands
with soap and water

Safety Tip #3:

(coming soon...)

2 secrets
to good soldering...

Secret #1:

Clean the tip!

(before every solder connection)

Bang (lightly) 3 times,

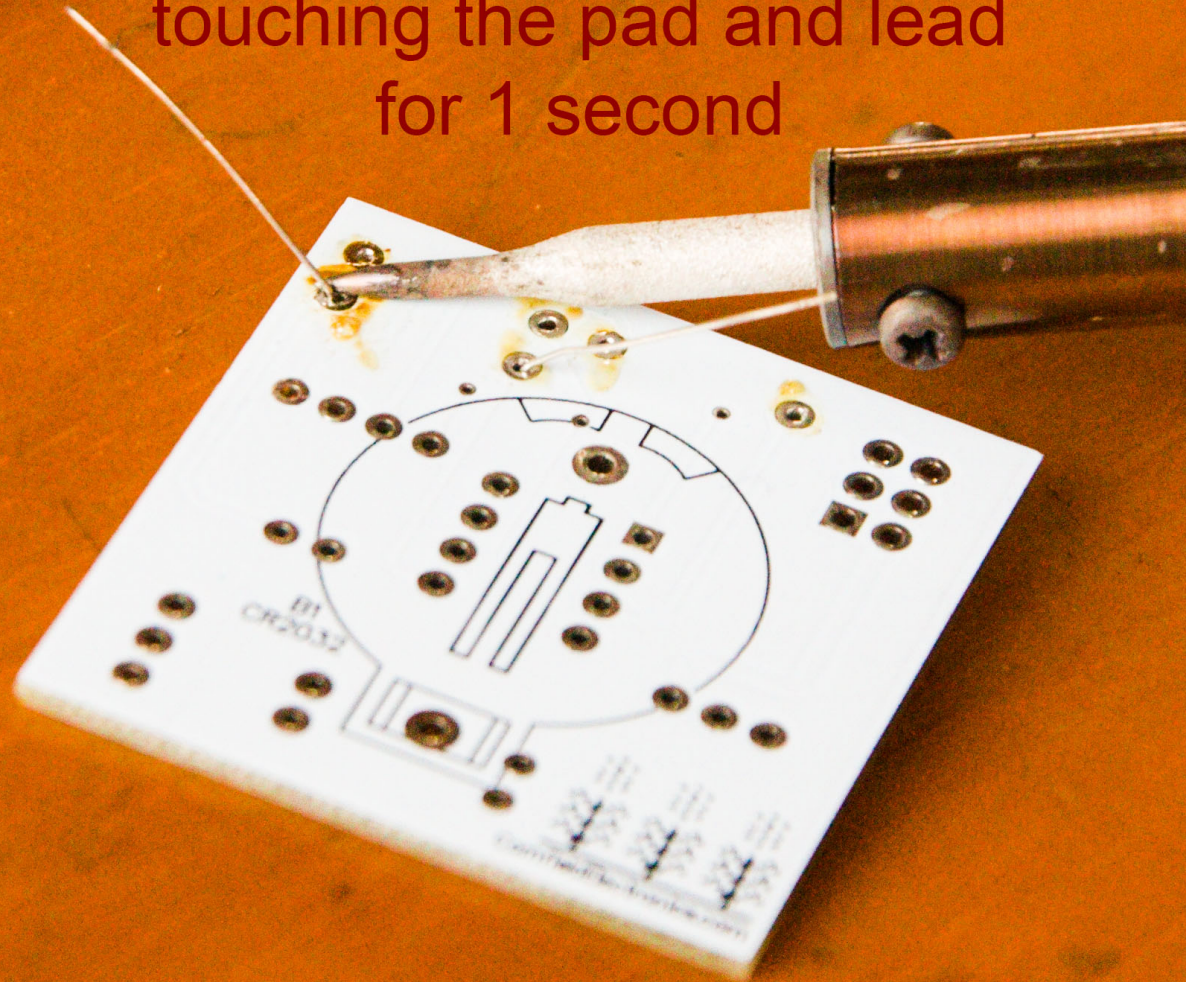
Swipe, Rotate, Swipe (on the sponge):

Keep the tip shiny silver!

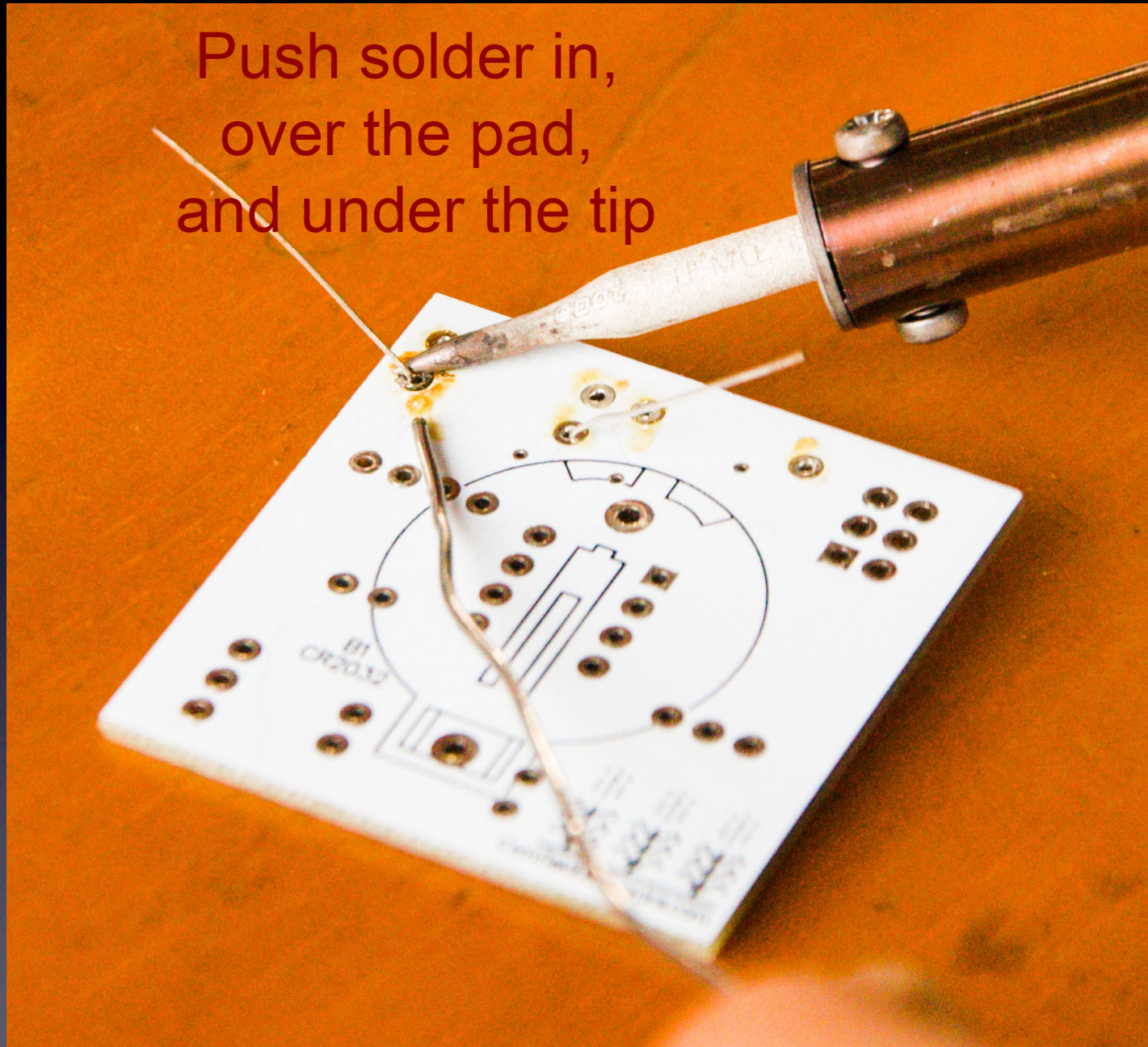
knock solder off the tip



Lay clean tip across half of the pad,
touching the pad and lead
for 1 second

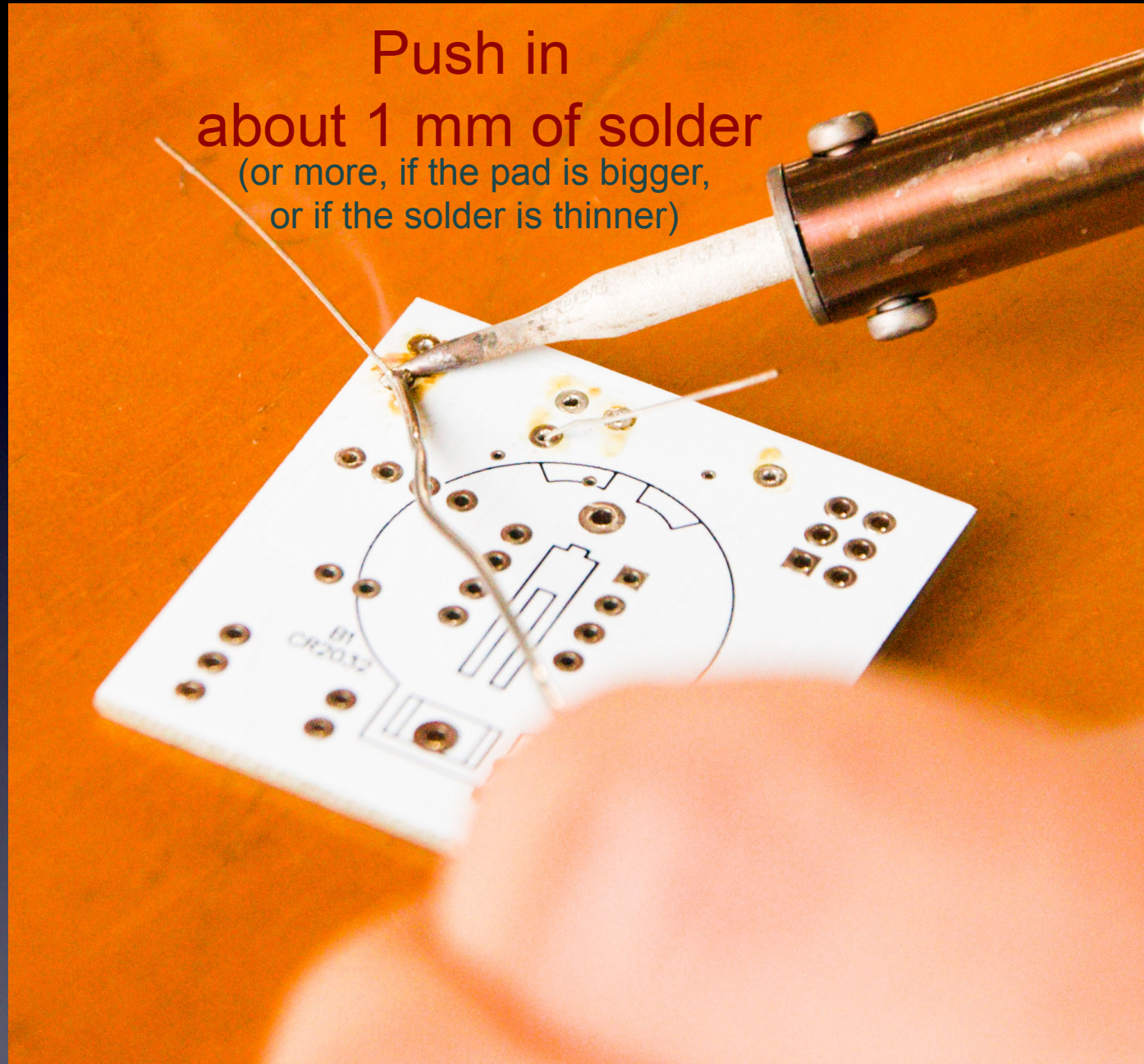


Do this quickly (slowly doesn't work well) – solder in & out in about 1 second



IMPORTANT: Make sure solder melts on the underside of the soldering iron tip (not the side or top of the soldering iron tip)!

Do this quickly (slowly doesn't work well) – solder in & out in about 1 second



Make sure solder melts on the underside of the soldering iron tip
(not the side or top of the soldering iron tip)!

HEY !!!

KEEP HOLDING TIP DOWN FOR 1 MORE SECOND !!



Pull solder away,
But keep holding soldering iron down
for 1 more second !!

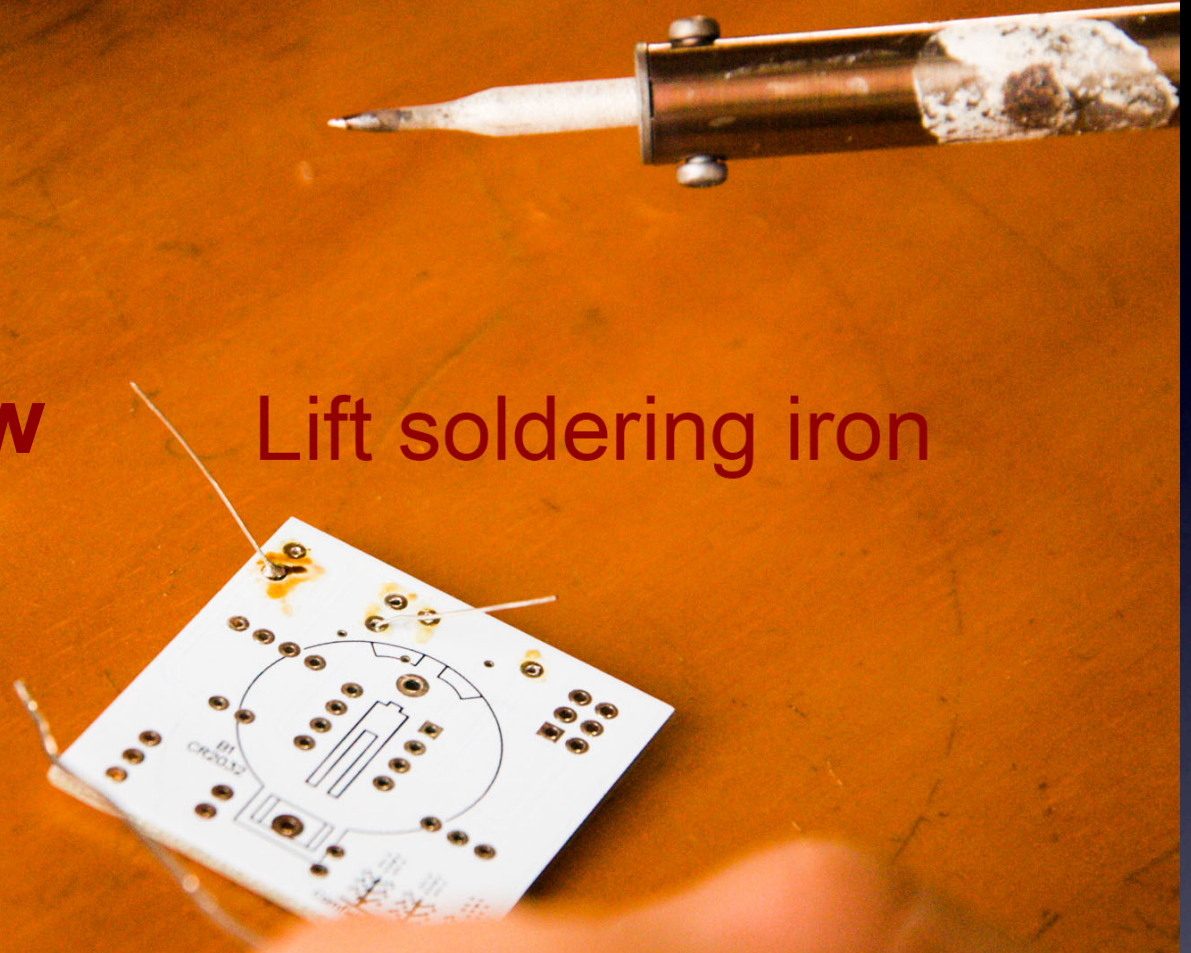
WAIT !!
Don't lift the tip !!

Secret #2:

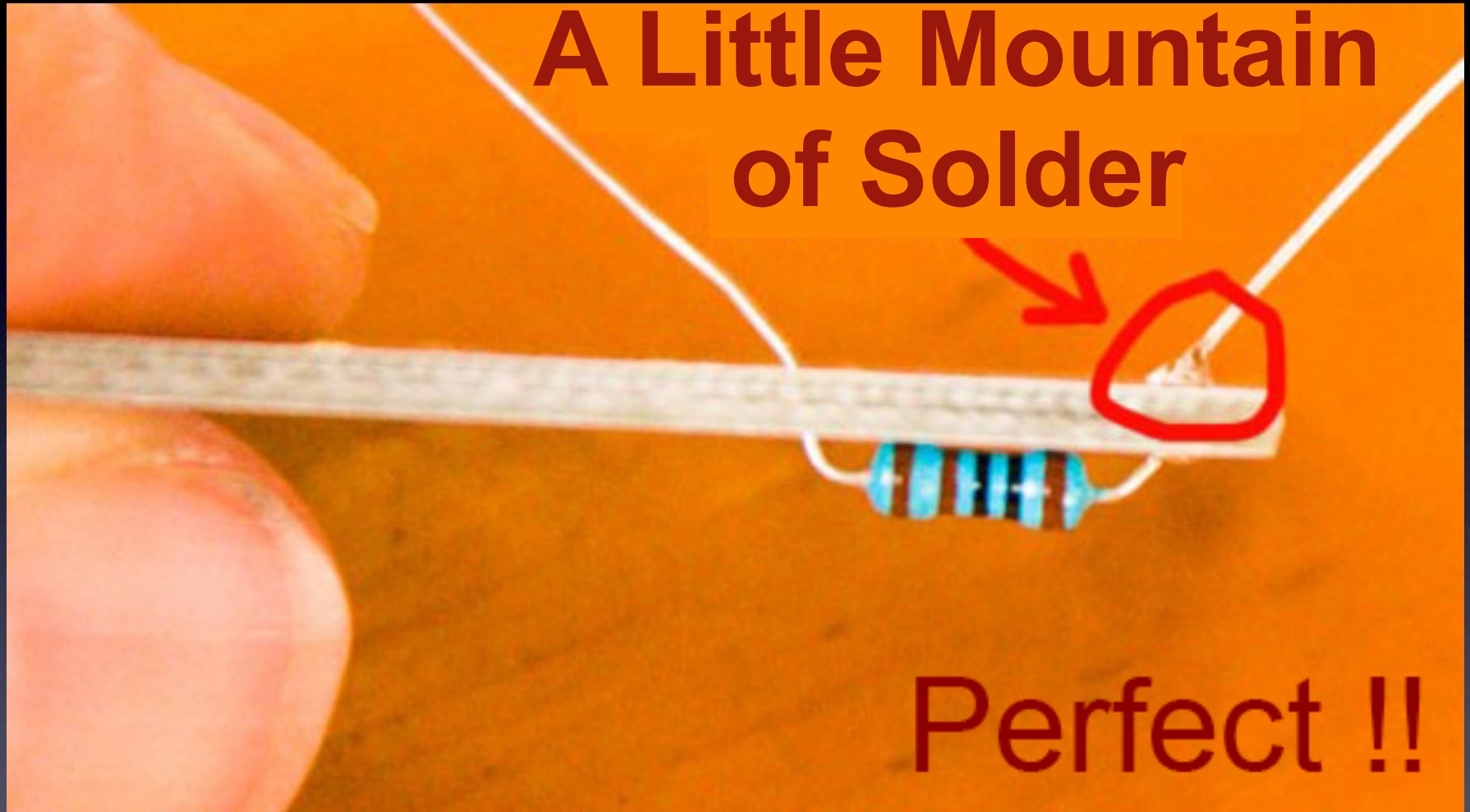
Keep hot tip down
1 second
For solder to flow !!

Now

Lift soldering iron



**A Little Mountain
of Solder**



Perfect !!

If you can see any of the pad, or the hole, you need more solder
– so, just do all the steps again to make it perfect.

The Rhythm !

is just as important as the preceding steps!

The Rhythm !

and speed (about 1 second per step)



The Rhythm !

and speed (about 1 second per step)

Clean the tip



The Rhythm !

and speed (about 1 second per step)



Tip **Down**

The Rhythm !

and speed (about 1 second per step)



Solder In

The Rhythm !

and speed (about 1 second per step)



Solder **Out**

The Rhythm !
and speed (about 1 second per step)



WAIT !

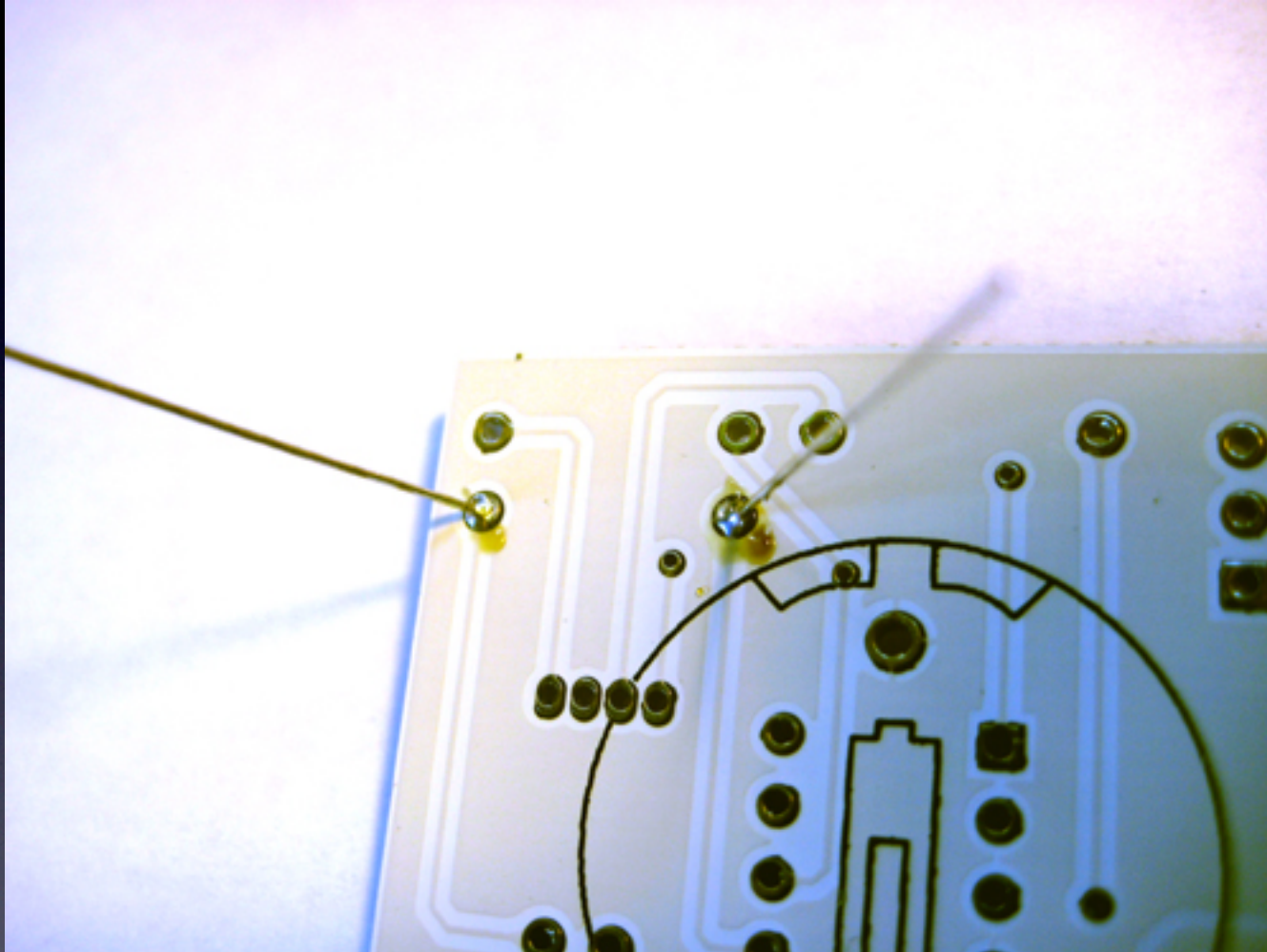
The Rhythm !

and speed (about 1 second per step)



Lift Tip

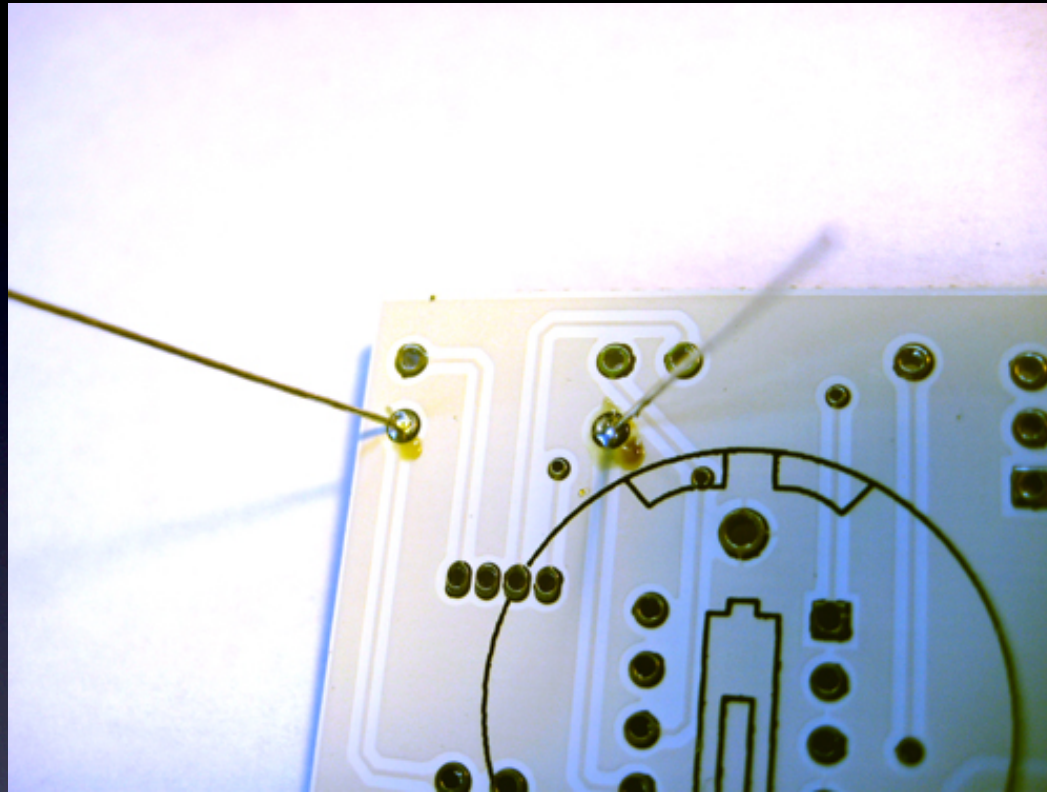
Solder all of the leads of the part to the board



For this part, there are two leads

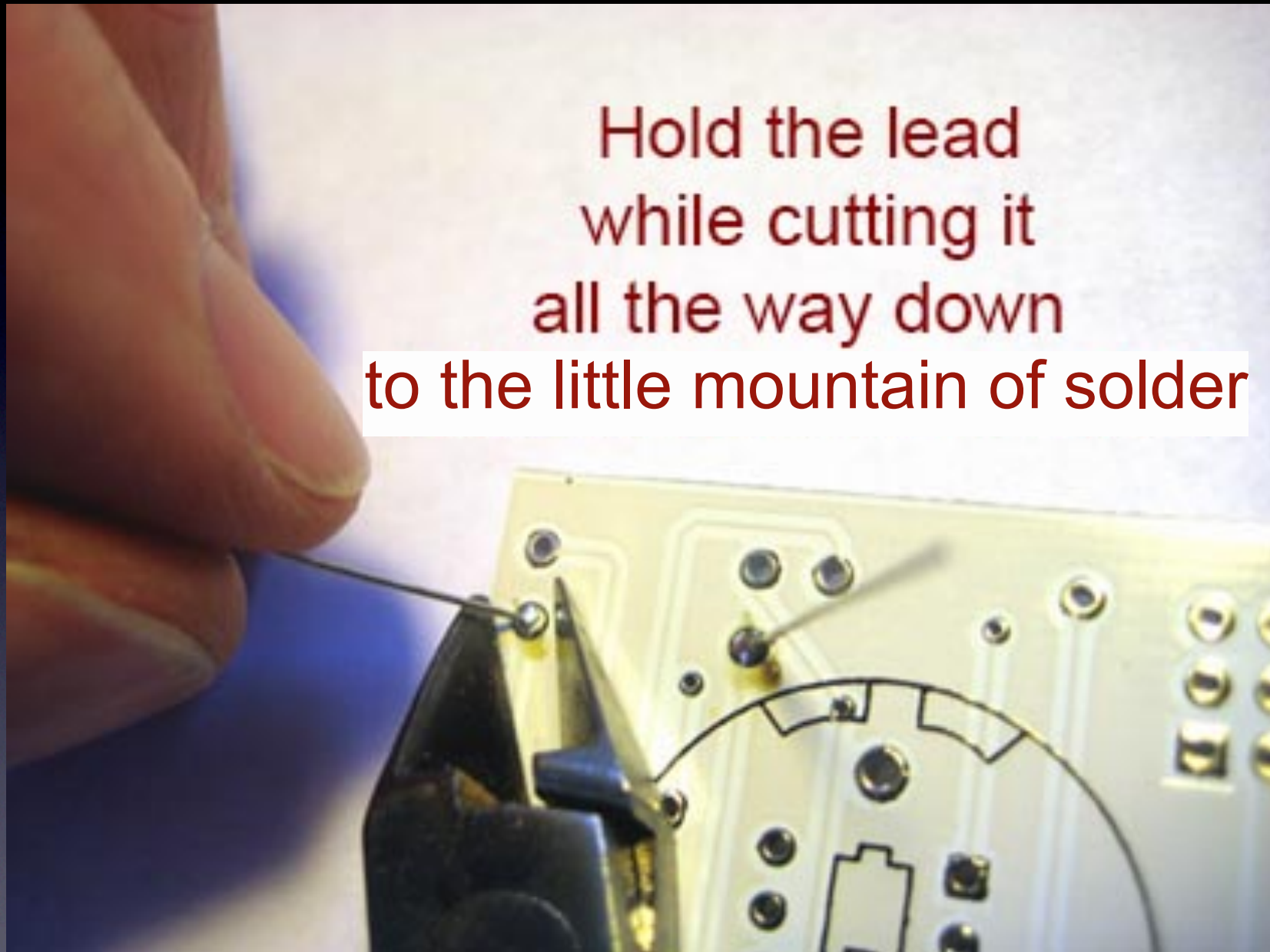
Here you can see two good solder connections

Two good solder connections



- Little mountains (not flat)
- Pads totally covered in solder
- Can't see the hole
- No connections to other pads

Now cut the leads short



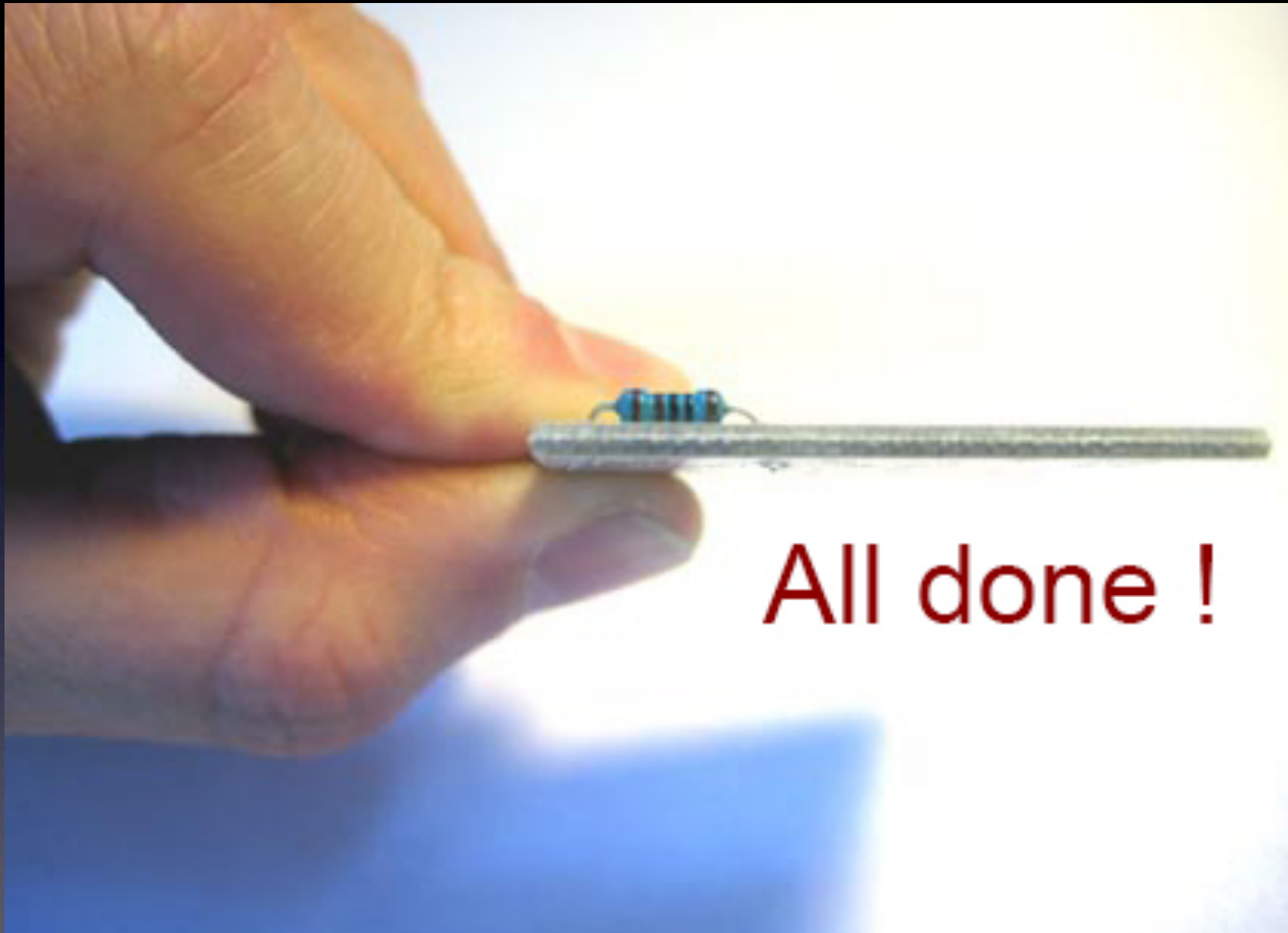
Cutting with the tip of the wire cutter gives you more control

Safety Tip #3:

Hold or cover the lead !

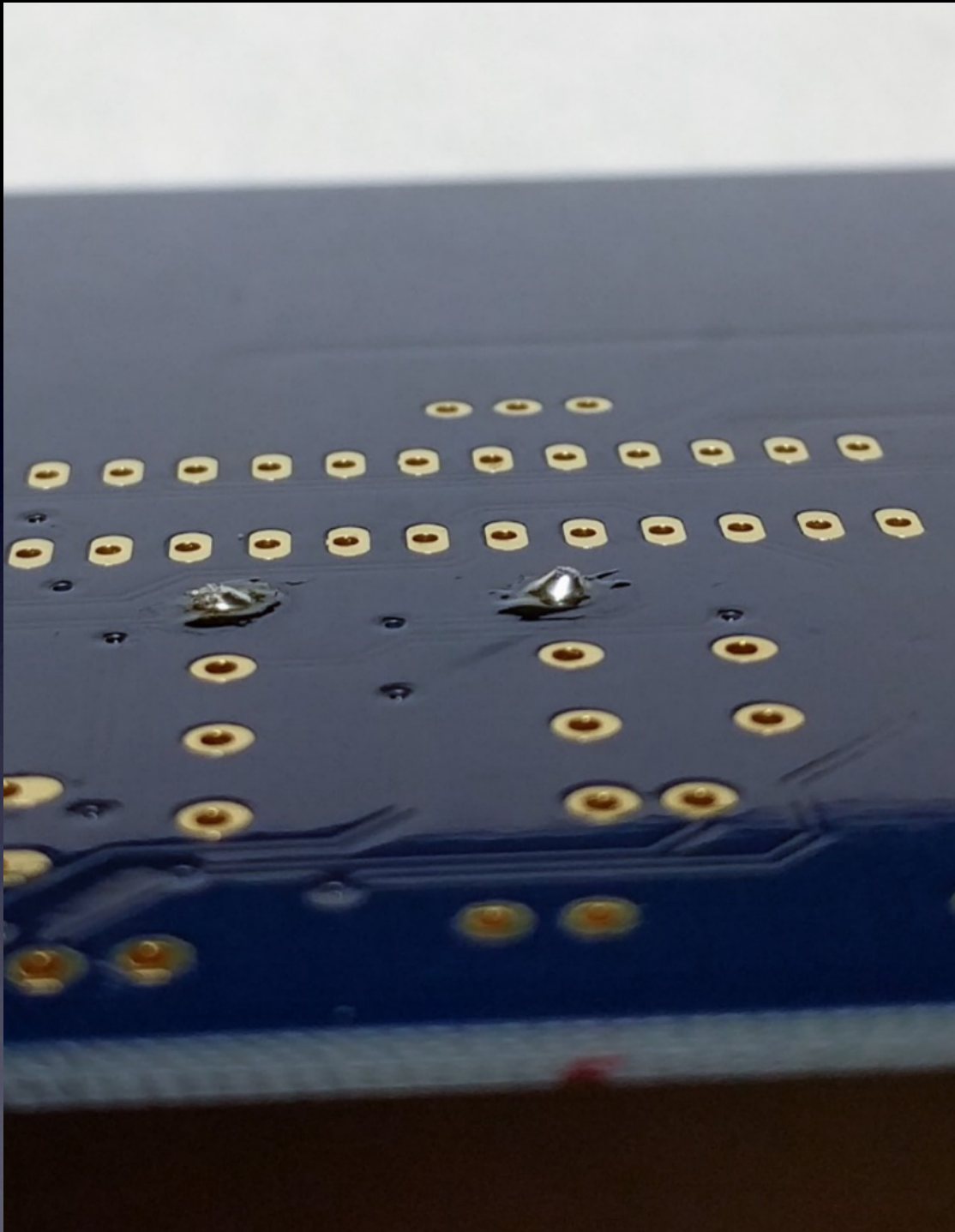
(or it will fly into your eye!)

(They like doing that – so please hold or cover the lead when you cut.)



All done !

No wires sticking out



A closer look at good solder connections

Notice that:

- Each connection is a small mountain (not flat)
- You cannot see any pad (they're totally covered with solder)
- You cannot see the holes (they're totally covered with solder)
- No connections to other pads

One part at a time

Till all the parts are soldered

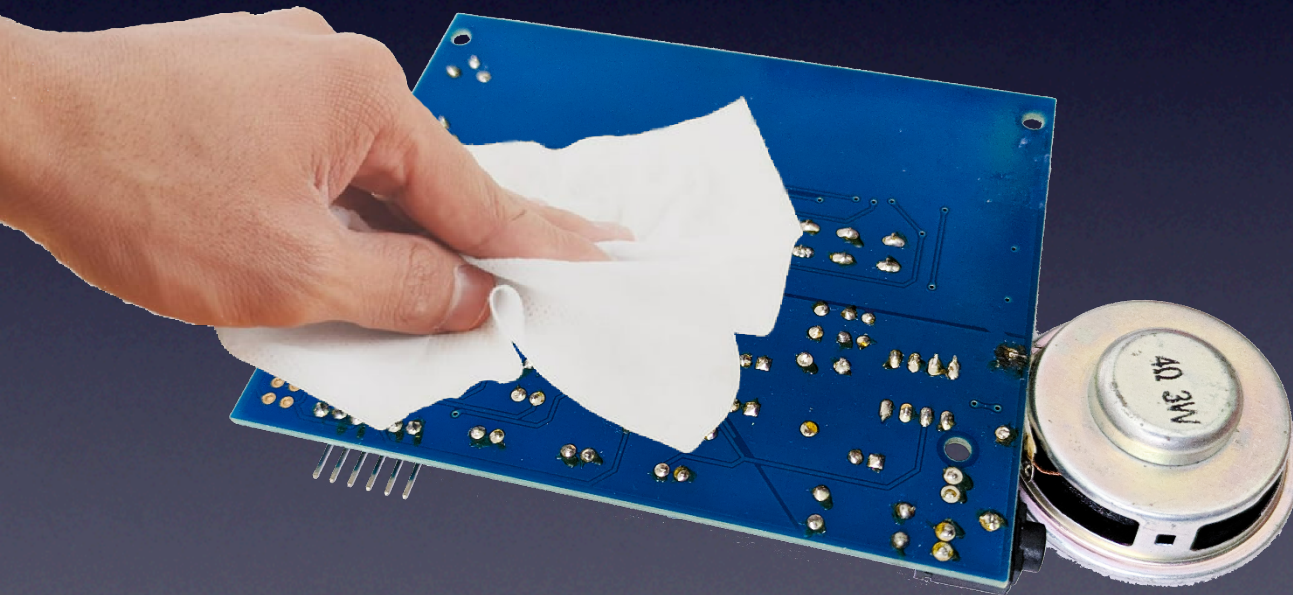


And it will look like this when you're done.

If you used any *flux paste* for re-working problems



The bottom of the PCB will be sticky from the flux



You can clean it with a cloth wet with *Isopropyl Alcohol*

Then put in the batteries,

Turn it on,

And it works!

(Or you start debugging.)

Let's start!

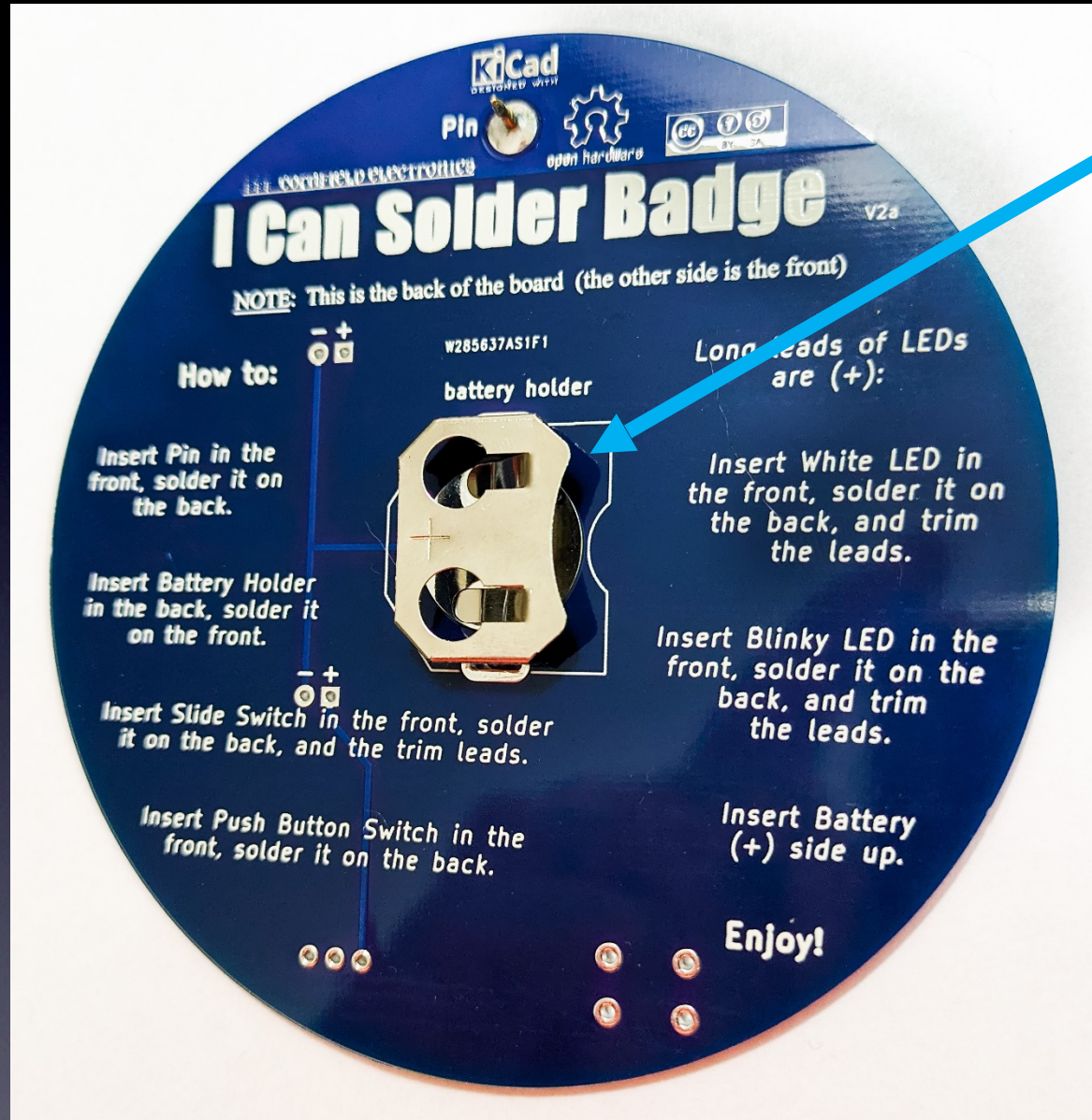
Insert Pin in the front



Solder Pin on the back

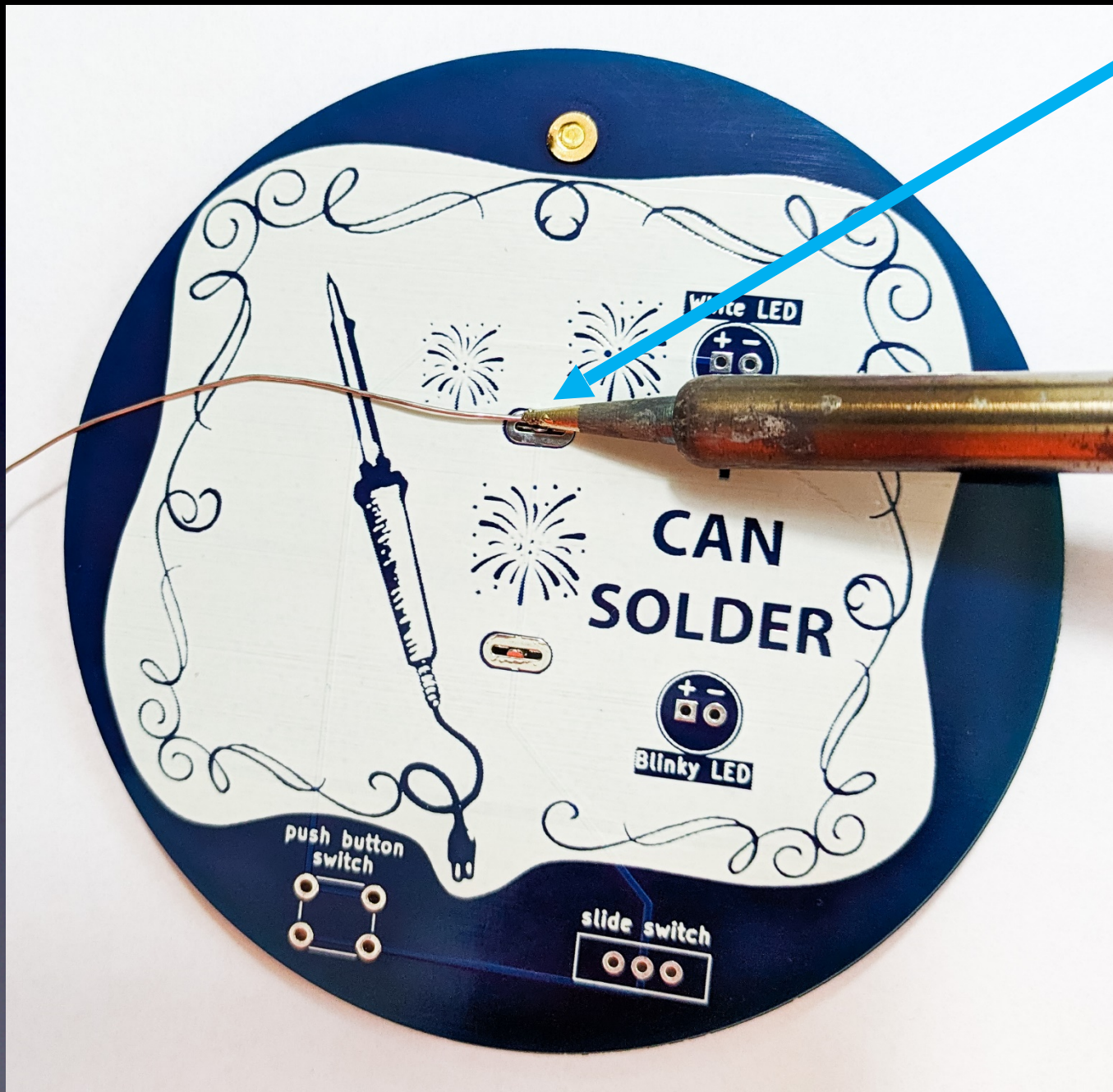


Insert Battery Holder in the back

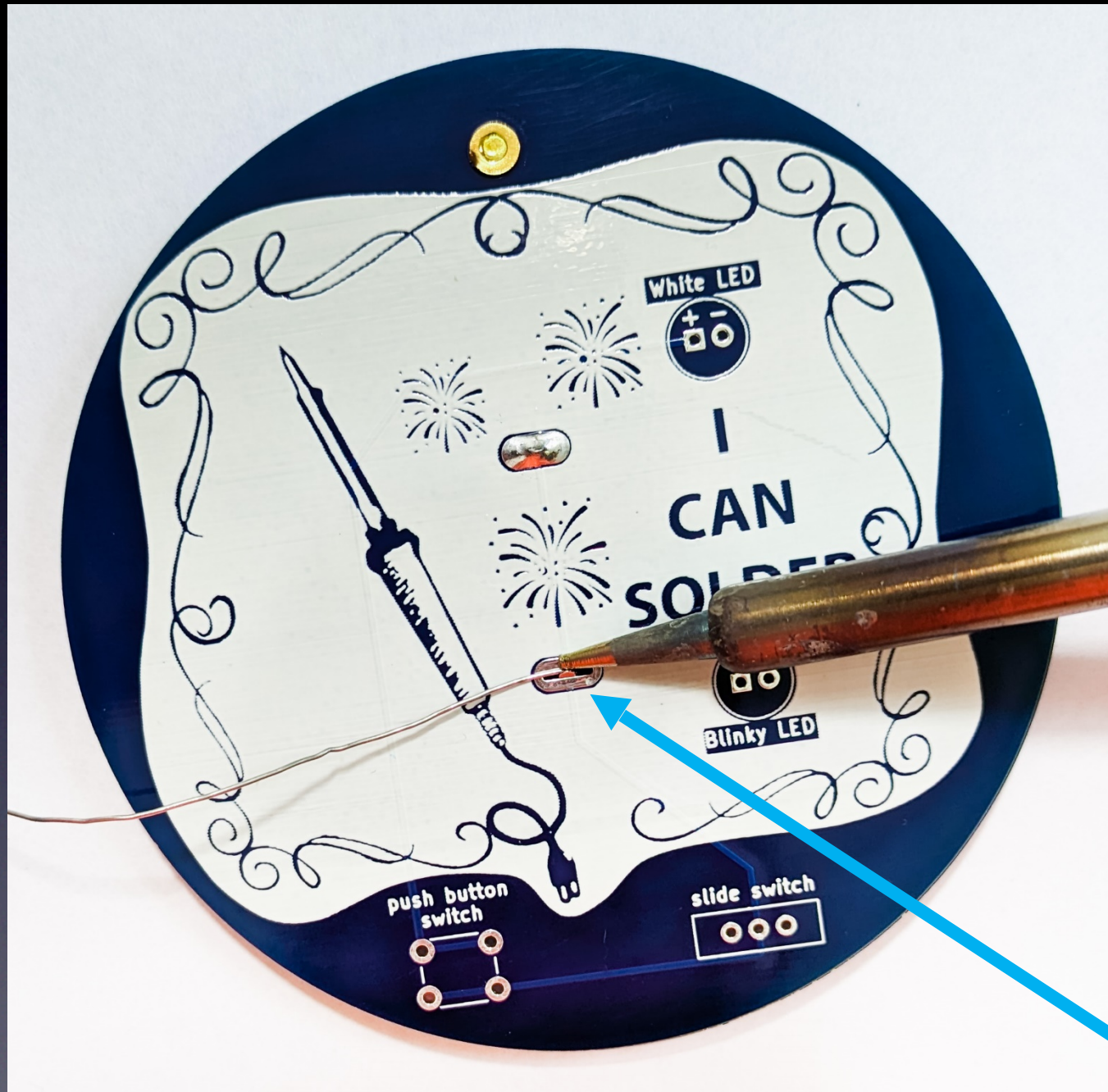


The correct orientation of the battery holder is like this photo

Solder Battery Holder on the front (1st pad)



Solder Battery Holder on the front (2nd pad)



Insert Slide Switch in the front

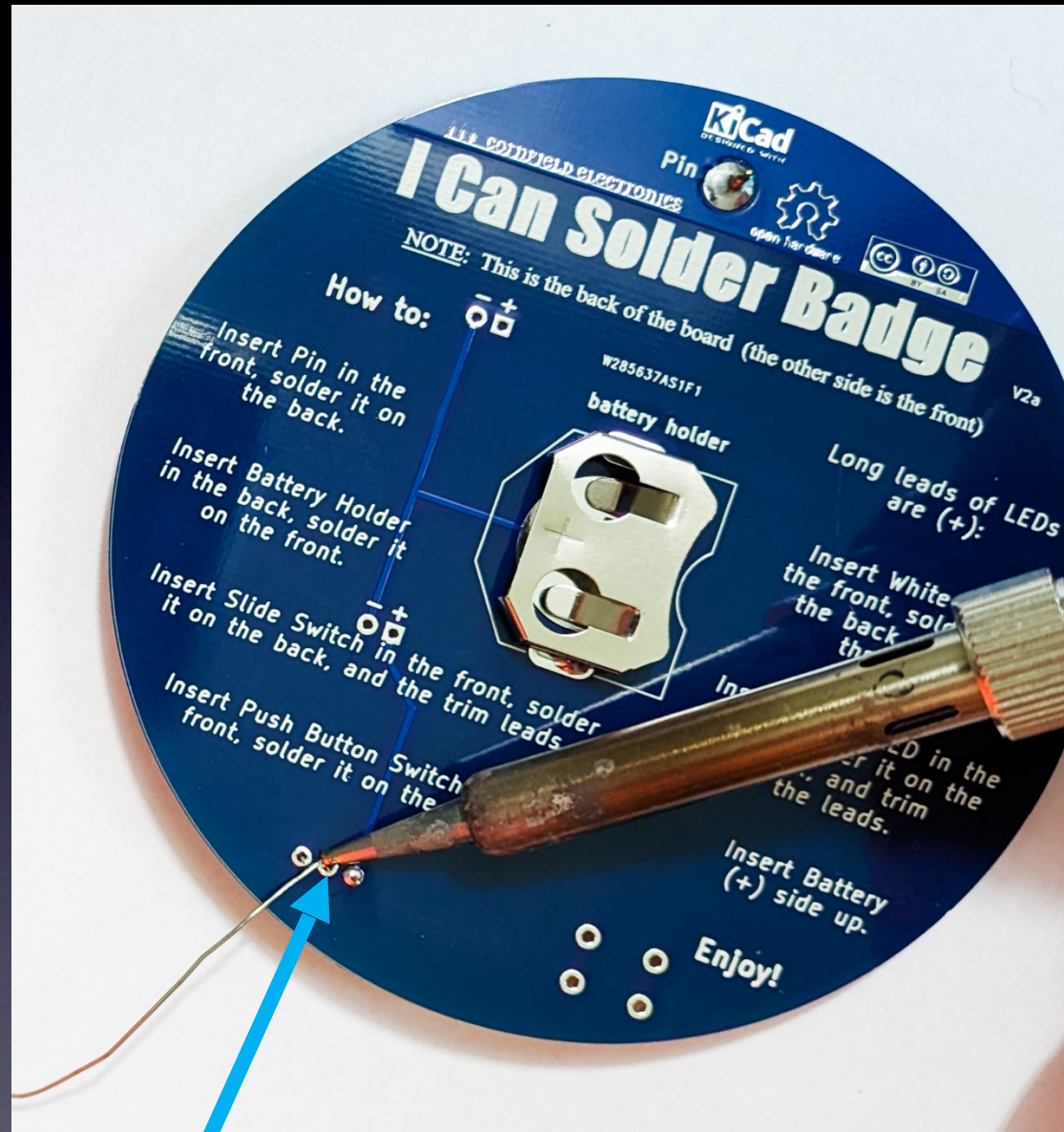


Orientation does not matter

Solder Slide Switch on the back (1st pad)



Solder Slide Switch on the back (2nd pad)



Solder Slide Switch on the back (3rd pad)



Trim Slide Switch leads (1st lead)



REMEMBER:

Cover the lead with your finger when you cut !

Trim Slide Switch leads (2nd lead)



Trim Slide Switch leads (3rd lead)



Insert Push Button Switch in the front



It fits in two ways, and either way is OK

Solder Push Button Switch on the back (1st pad)



Solder Push Button Switch on the back (2nd pad)



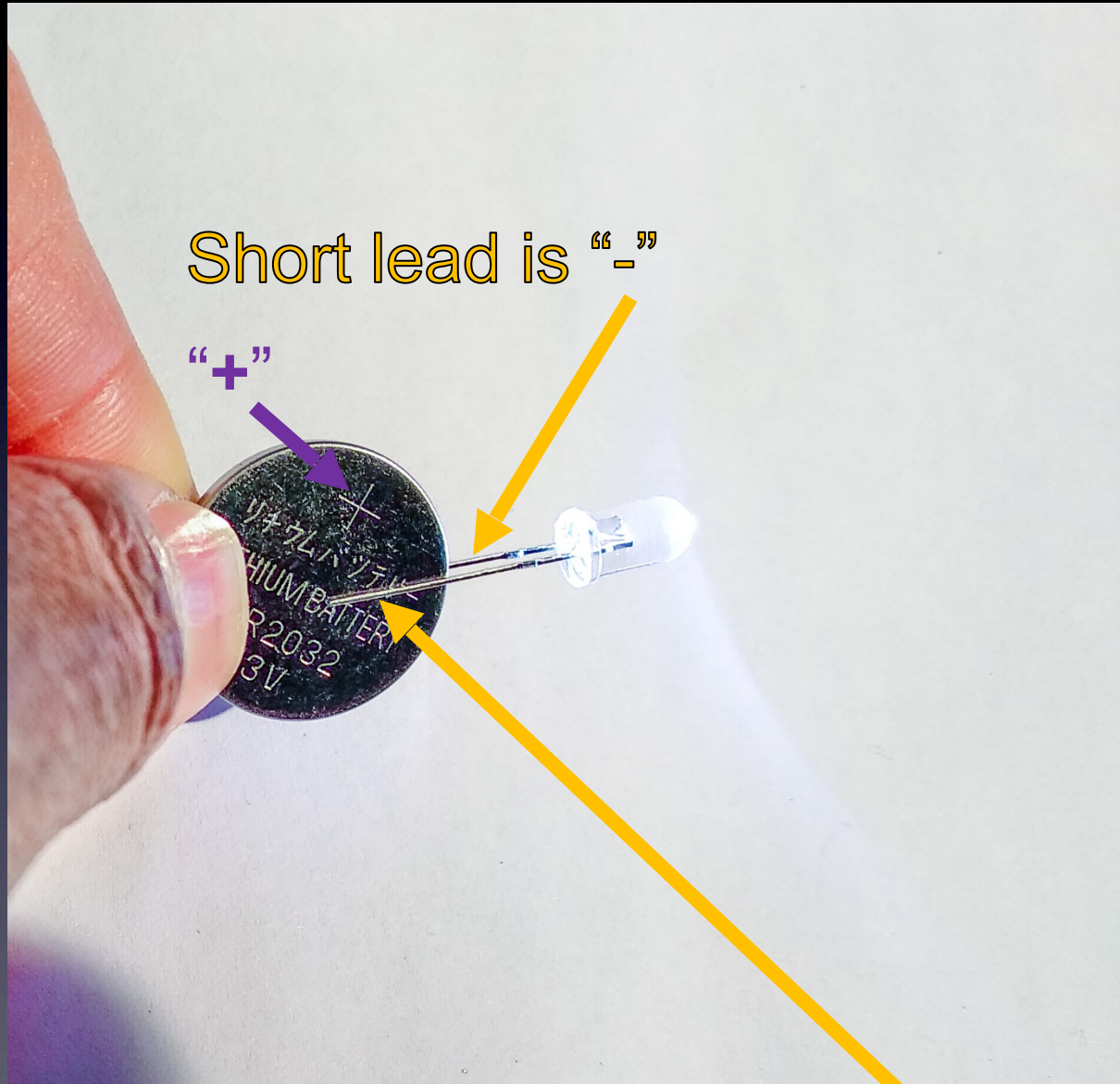
Solder Push Button Switch on the back (3rd pad)



Solder Push Button Switch on the back (4th pad)



Test each LED to see
which is the White LED and which is the Blinky LED



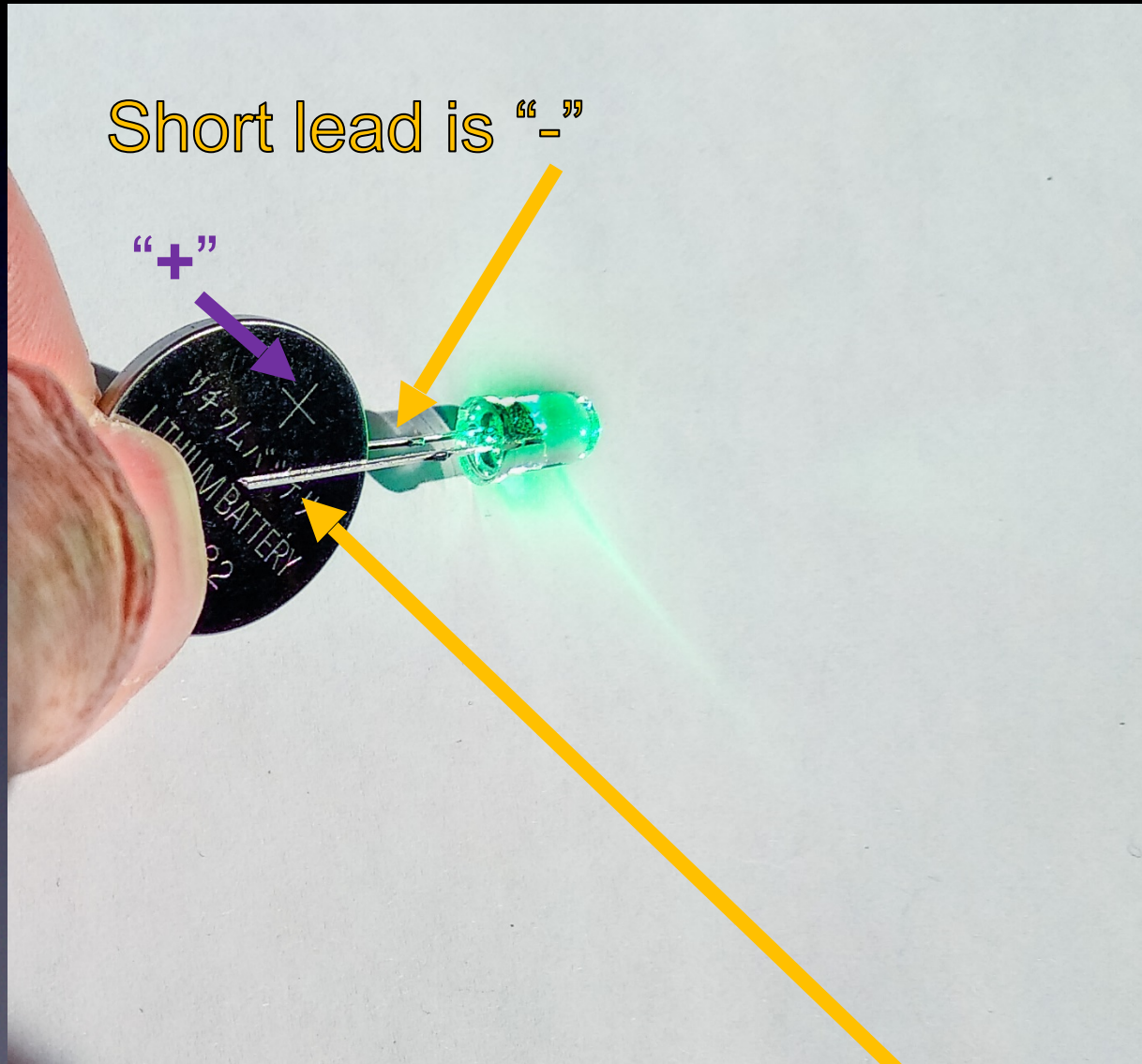
Short lead is “-”

“+”

Long lead is “+”

White LED

Test each LED to see which is the White LED and which is the Blinky LED



Blinky LED

Long lead is "+"

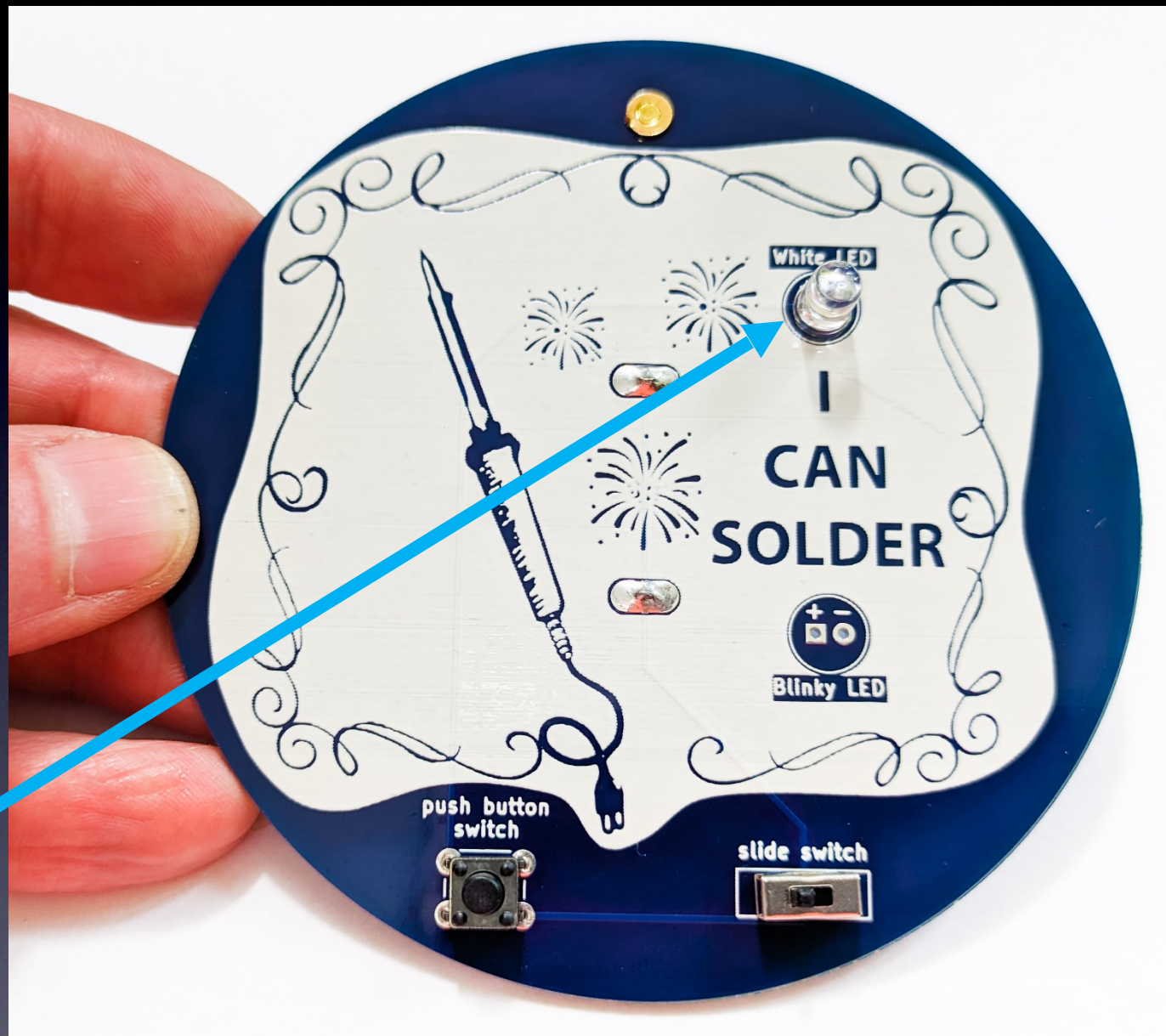
Insert White LED in the front



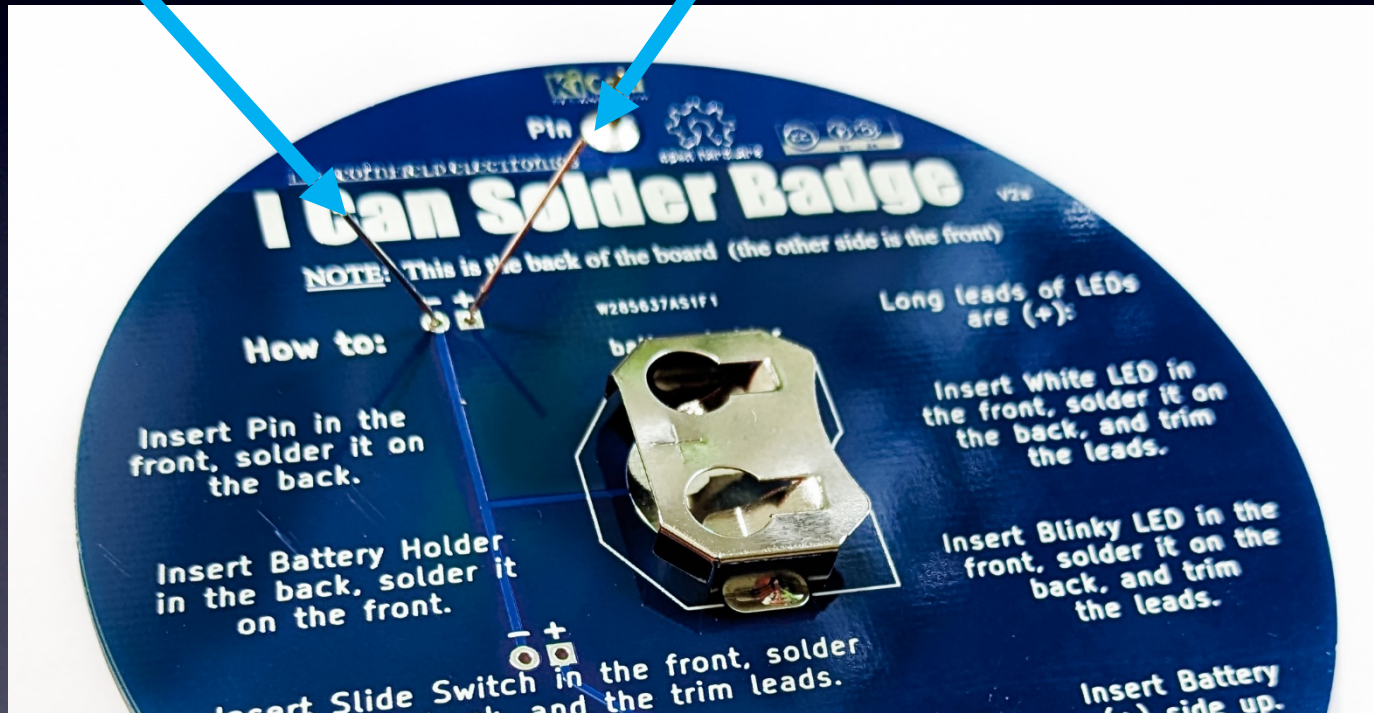
Short lead is “-”

Long lead is “+”

Insert White LED in the front



Leads of White LED bent like a “V”



Solder White LED on the back (1st pad)



Solder White LED on the back (2nd pad)



Trim White LED leads (1st lead)



REMEMBER:

Hold the lead when you cut !

Insert Blinky LED in the front



Short lead is “-”

Long lead is “+”

Insert Blinky LED in the front



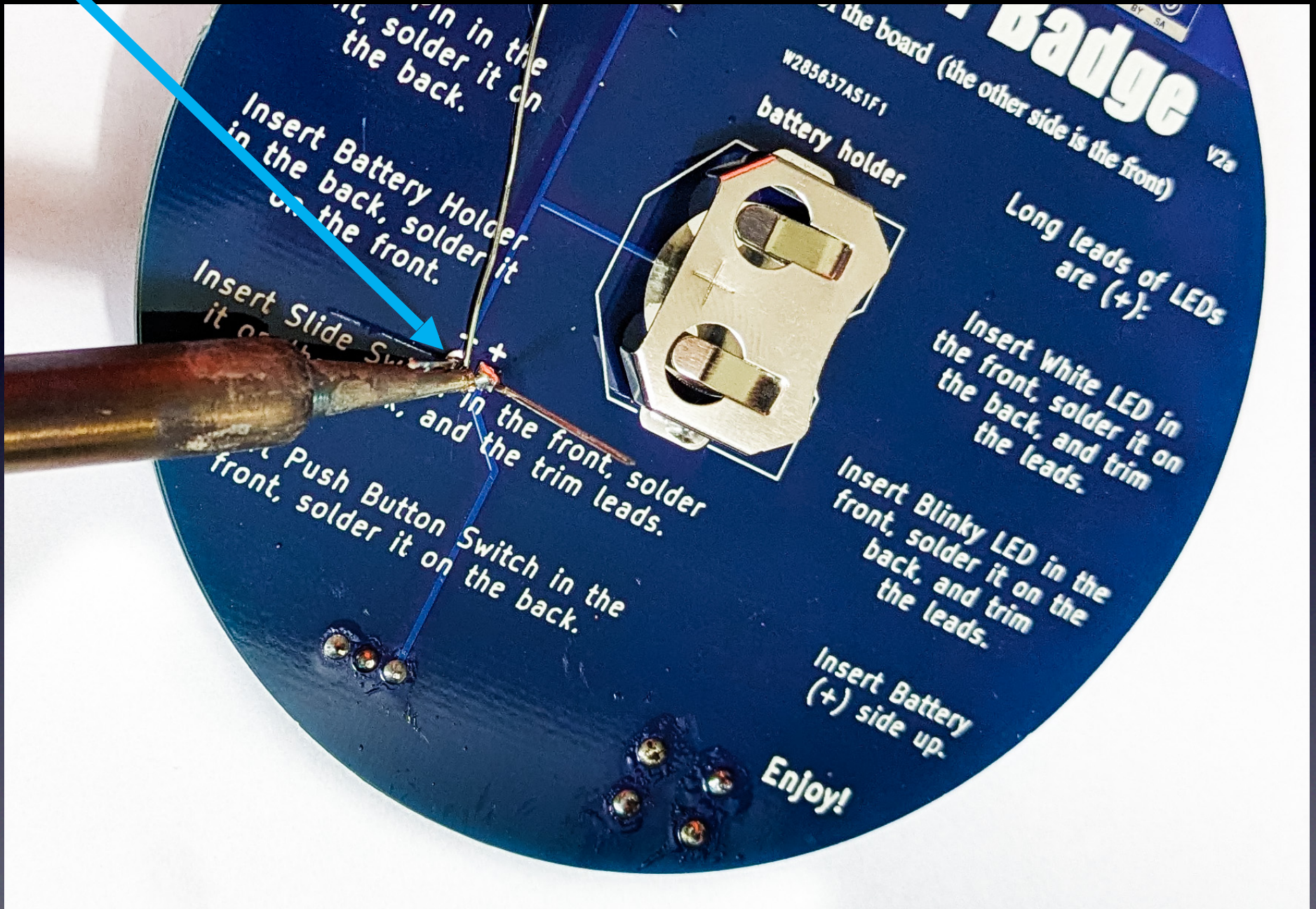
Leads of Blinky LED bent like a "V"



Solder Blinky LED on the back (1st pad)



Solder Blinky LED on the back (2nd pad)



Trim Blinky LED leads (1st lead)



Trim Blinky LED leads (2nd lead)



You are
now

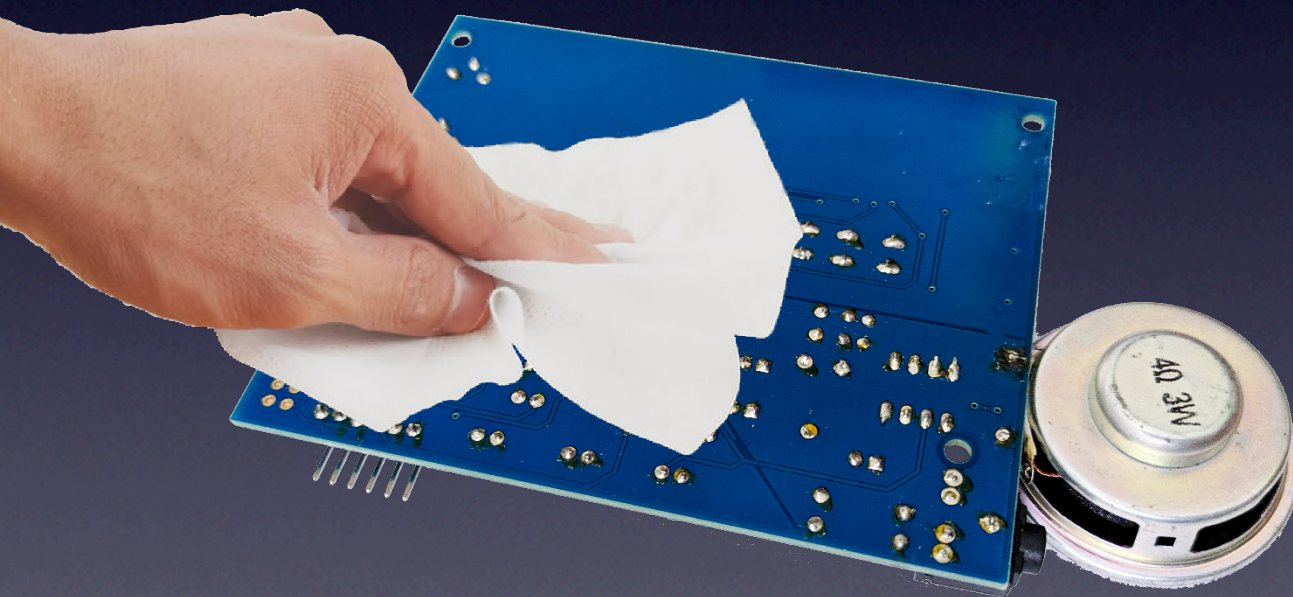
finished

soldering!

If you used any *flux paste* for re-working problems



The bottom of the PCB will be sticky from the flux



You can clean it with a cloth wet with *Isopropyl Alcohol*

Insert Battery (+) side up



“+”

Insert Battery (+) side up



All done!



Turn on Blinky LED !



Move Slide Switch to the left to turn on the Blinky LED

Turn on White LED !



Press Push Button Switch to turn on the White LED

Turn on both White and Blinky LED !



Wear it !



Use the clasp



Please Remember:

to

Wash your hands

after soldering

I Can Solder Badge kit

Assembly Instructions
mitch@CornfieldElectronics.com



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Blinky light and White flashlight