Soldering Is Easy!

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Co-founder of **3Ware** (successful Silicon Valley startup)
Pioneer of **VR** (in the mid-1980s)
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Learn To Solder

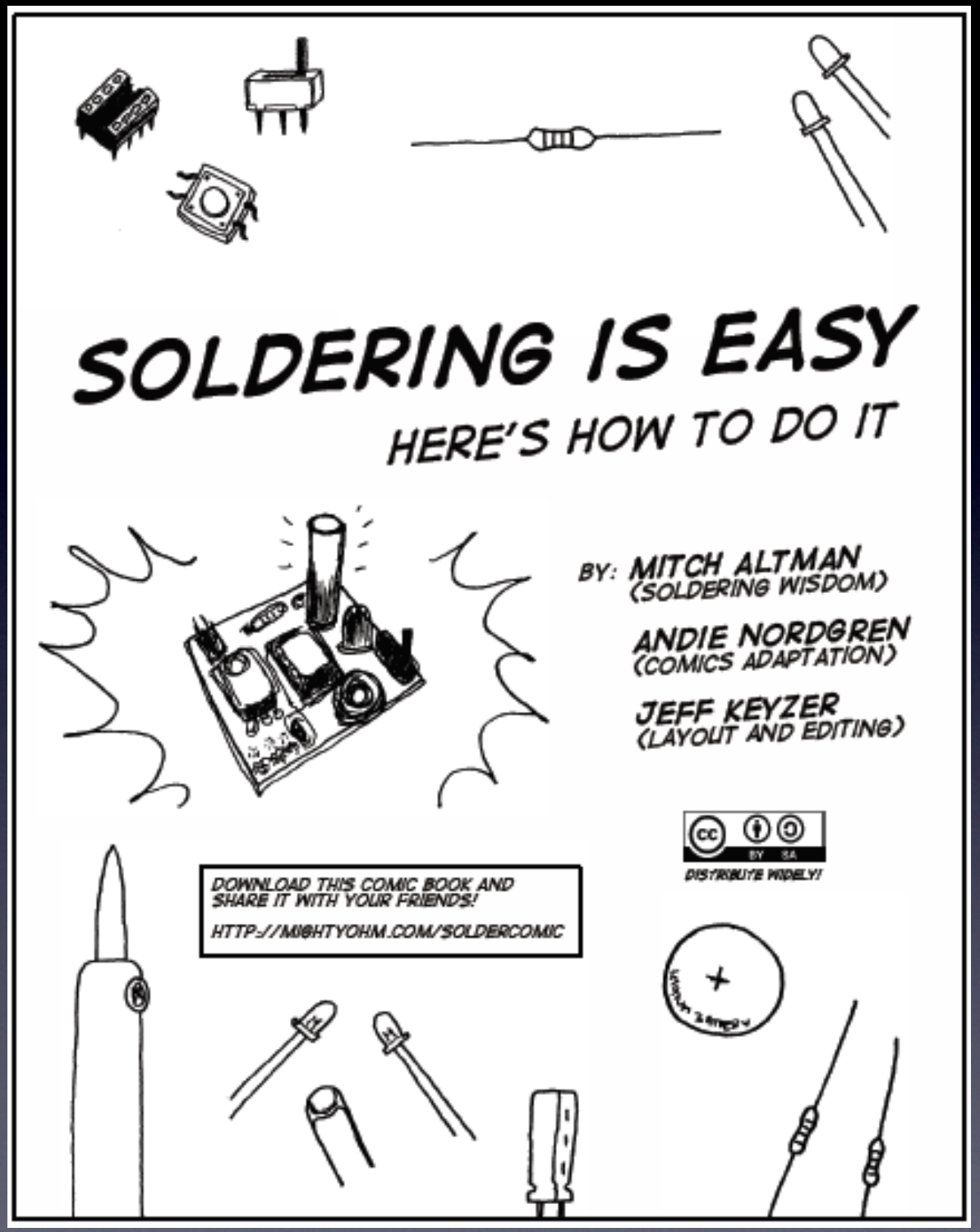
The following photos will show you how to solder.

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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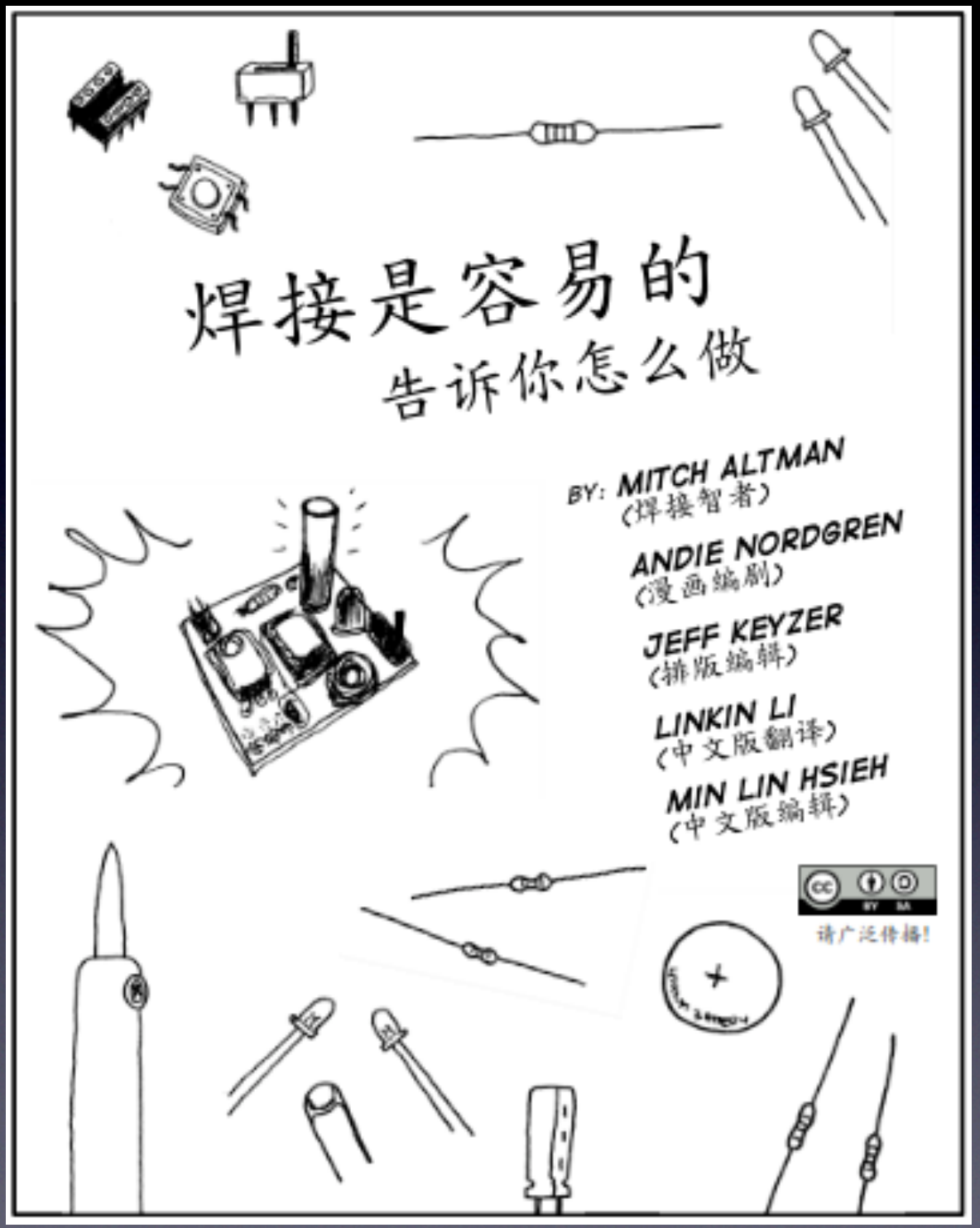
Learn To Solder



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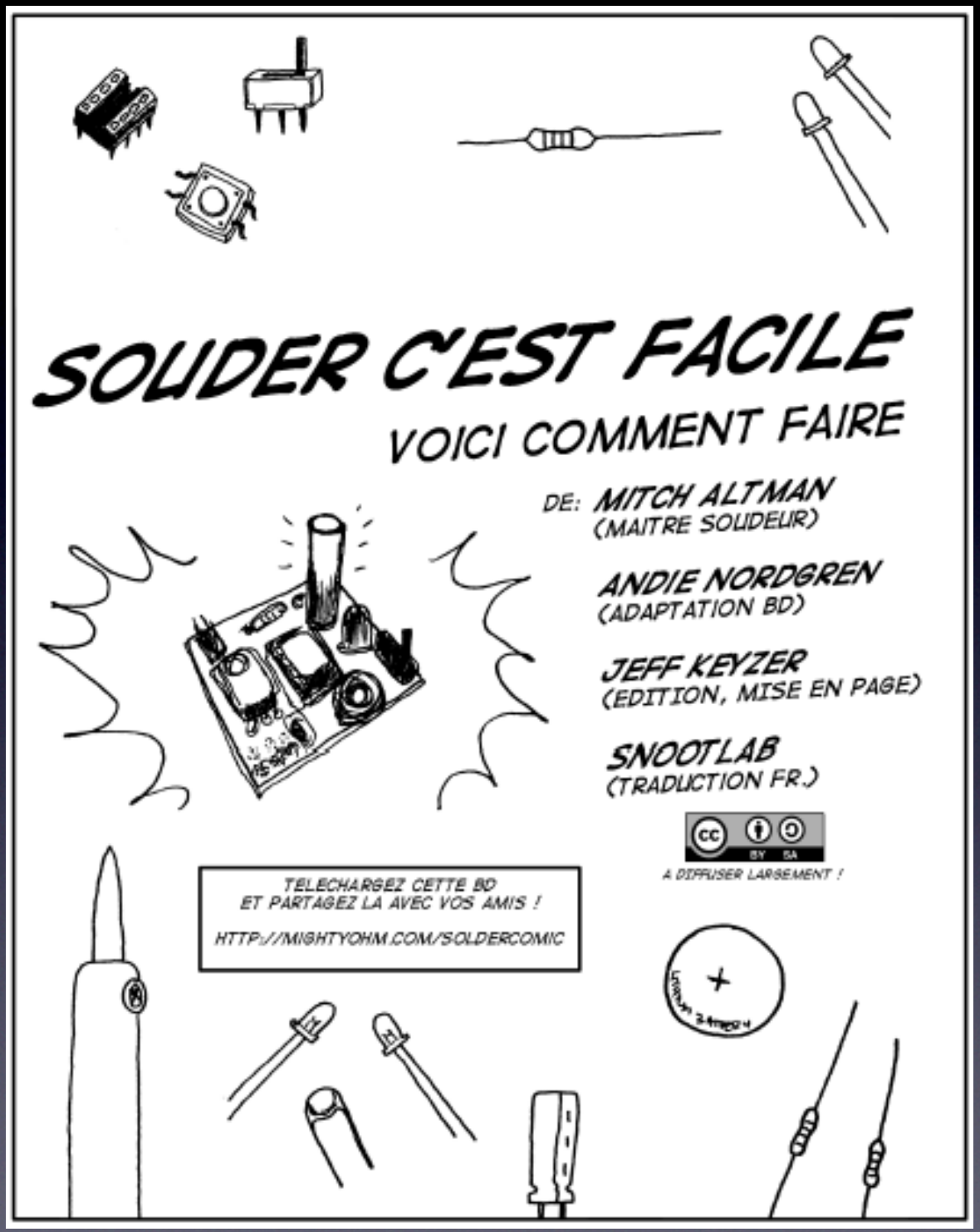

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Note:

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:

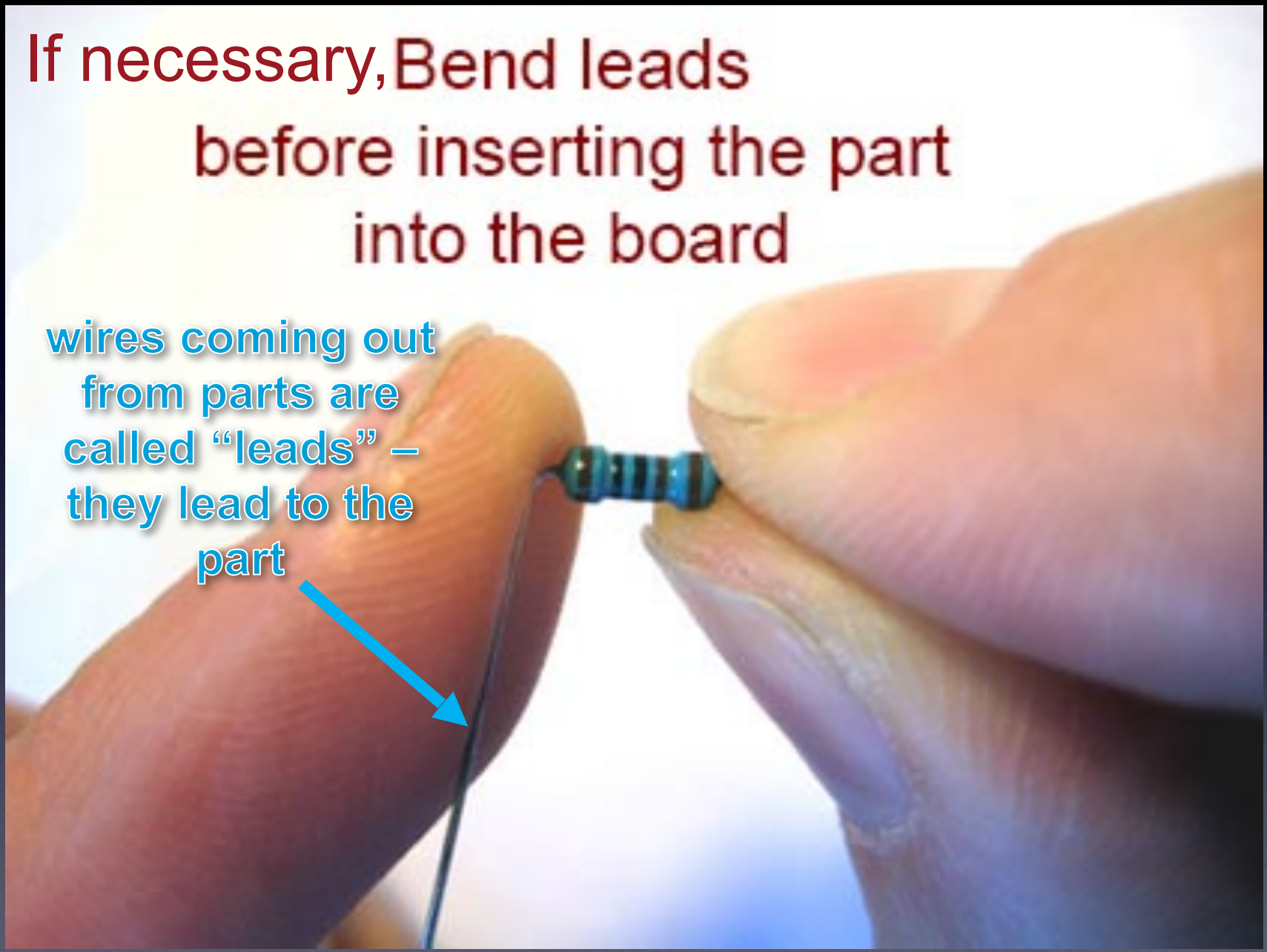
- soldering Iron (35W or less)
- solder (*more details coming*)
- soldering iron stand
- cellulose kitchen sponge *(not plastic!)*
- *small* wire cutter

Learn To Solder

The following photos will
show you how to solder a resistor.

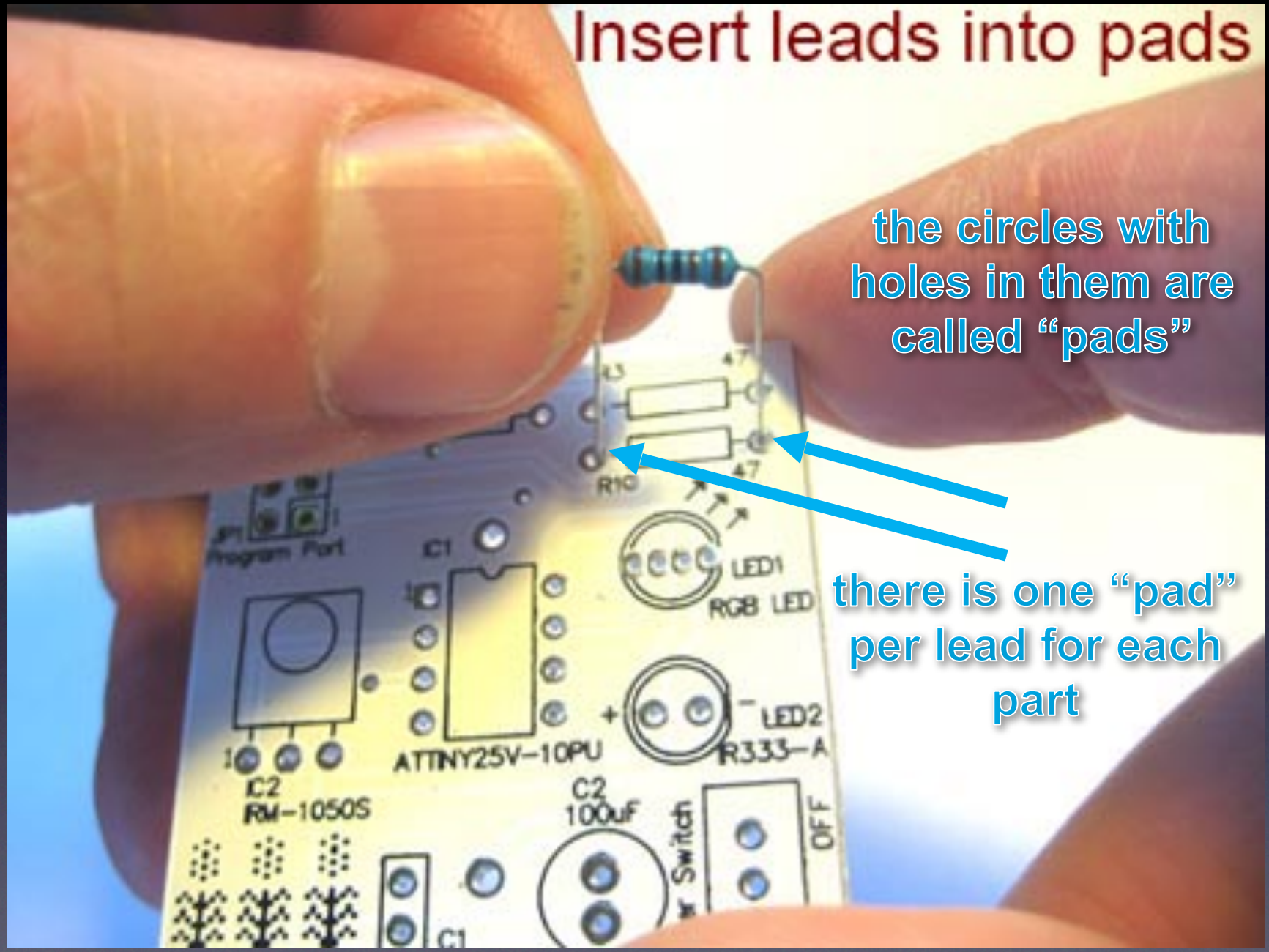
There are no resistors in some kits.
But the soldering procedure is the
same for all parts.

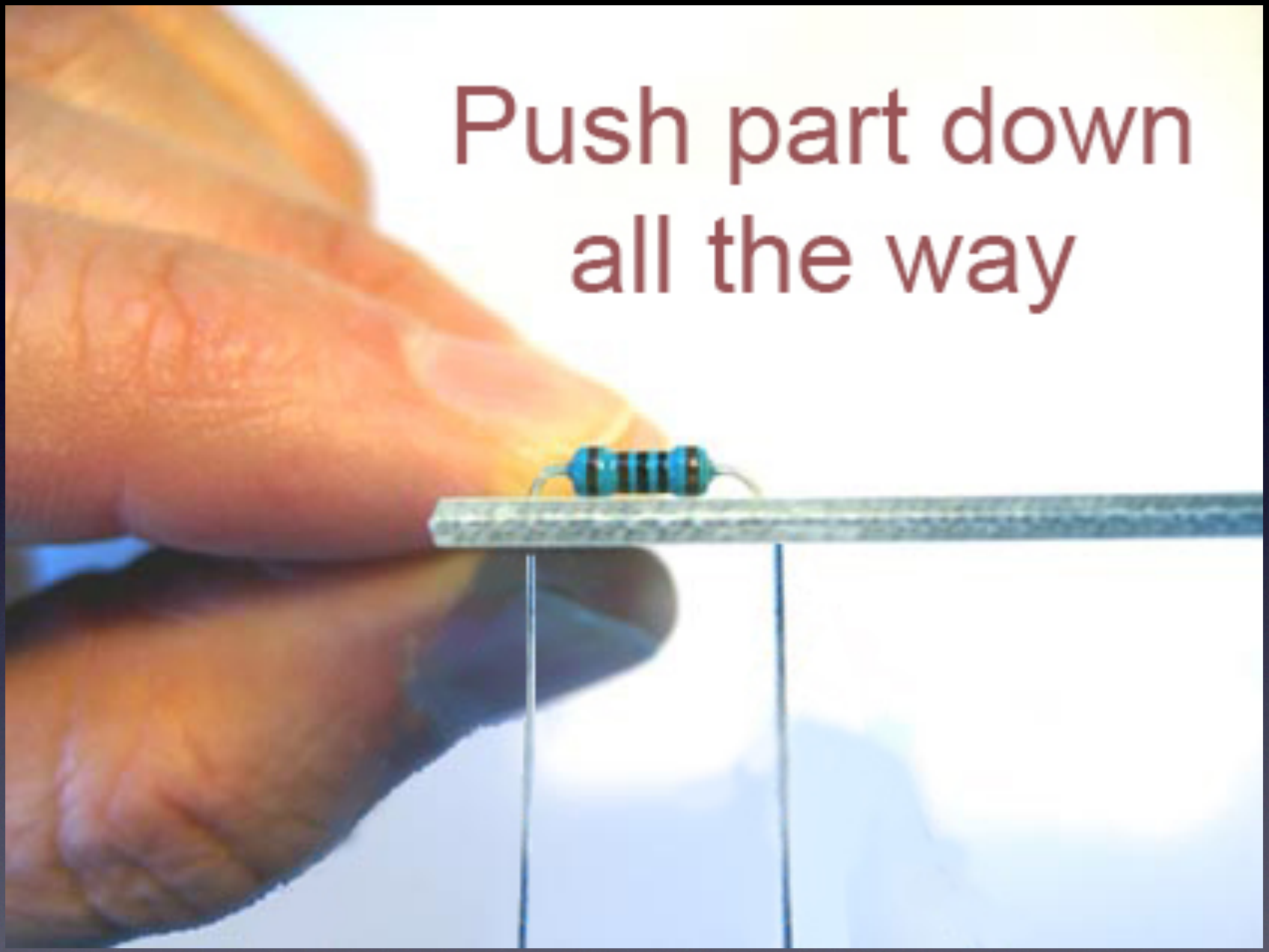
Some parts, such as resistors, need their leads bent first

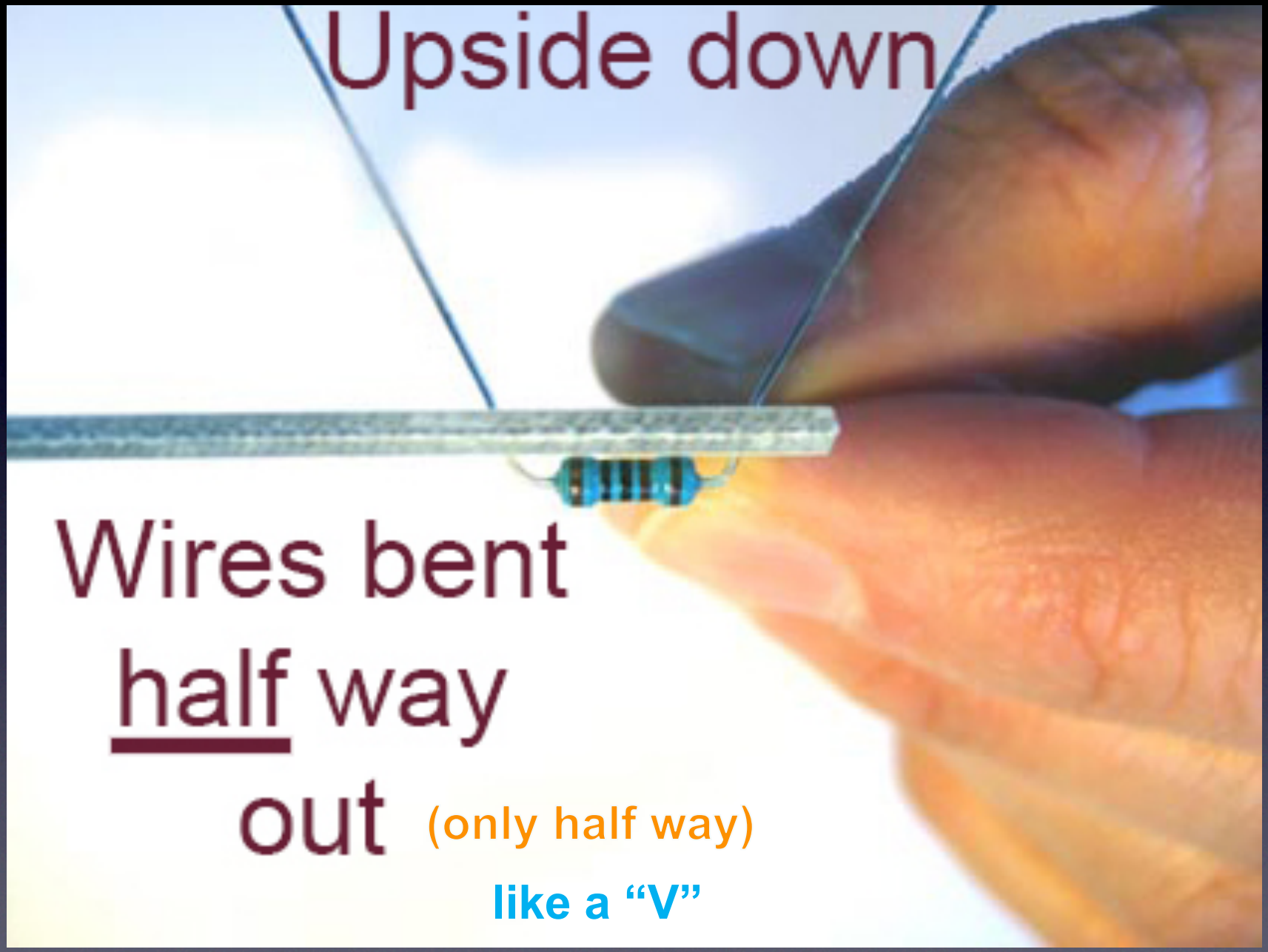


Most kits have resistors, like this part:

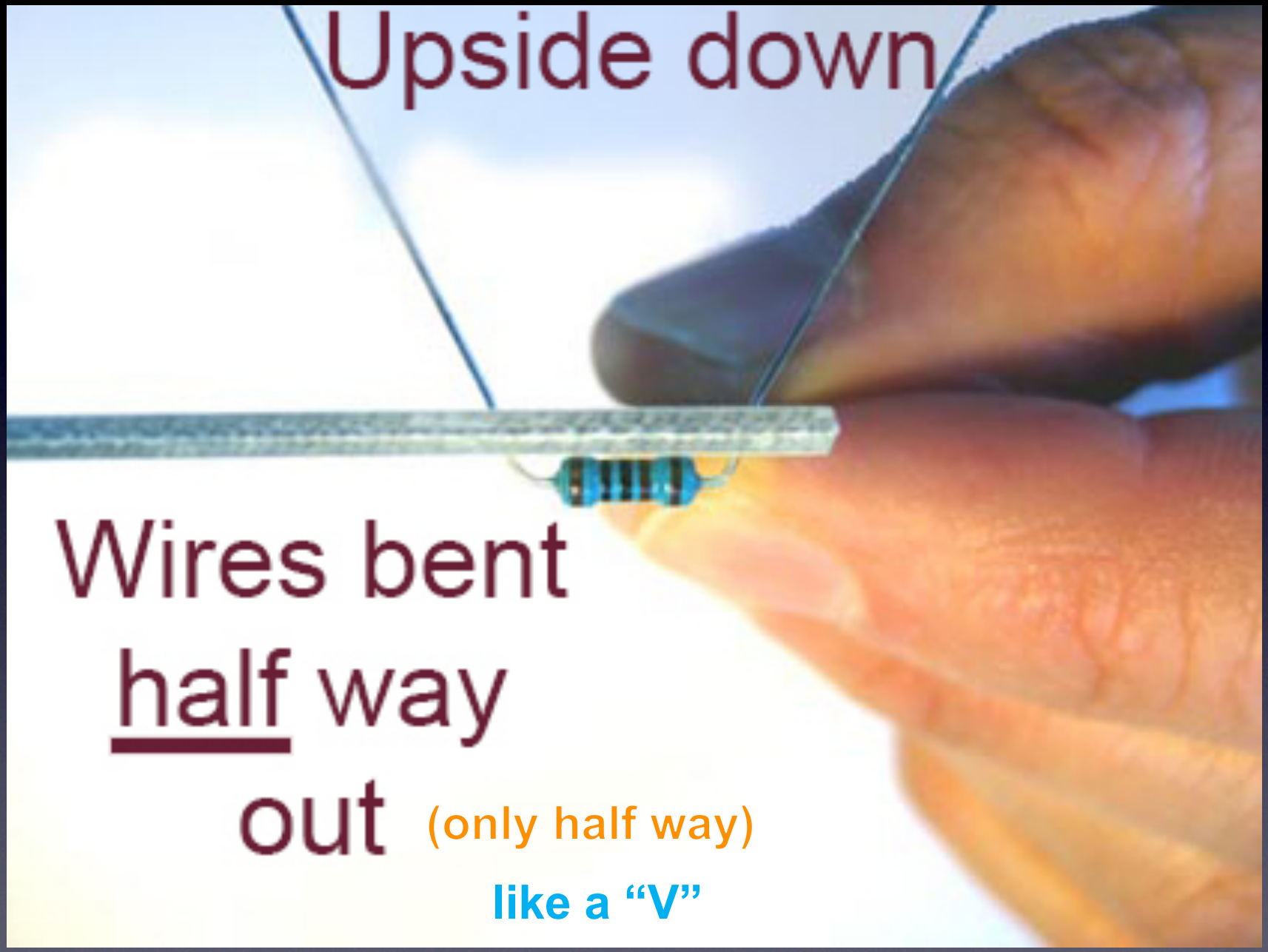
this is how a resistor will look *before* inserting it into the board


Insert leads into pads
the circles with holes in them are called “pads”
there is one “pad” per lead for each part
R3
47
R10
47
IC1
LED1
RGB LED
ATTINY25V-10PU
LED2
IR333-A
IC2
RM-1050S
C2
100uF
Switch
OFF
C1


Push part down
all the way



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



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
(<u>not</u> "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)

AMTECH NC-559-ASM

99%

Note:

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

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…)

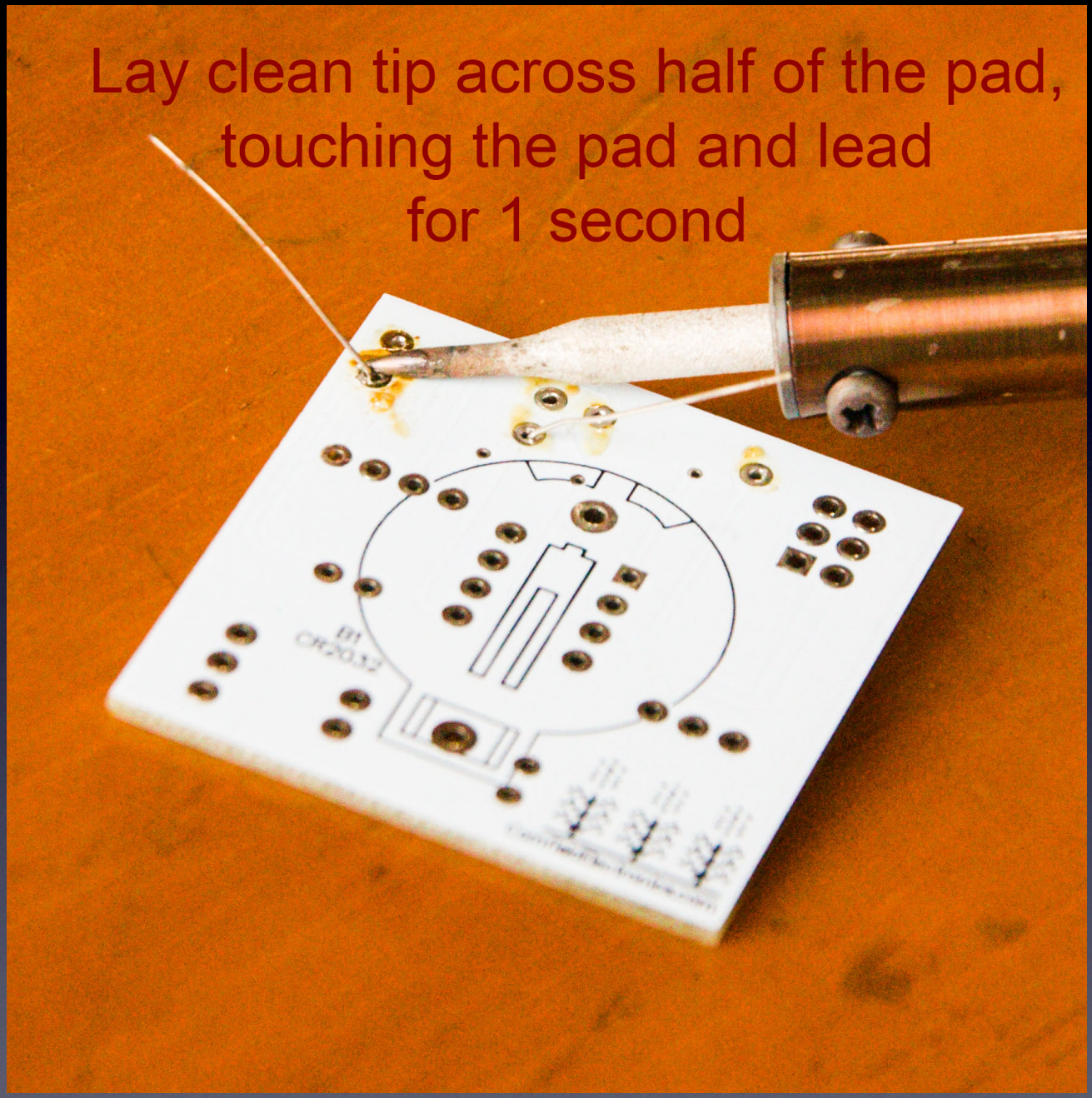
2 secrets
to good soldering…

Secret #1:

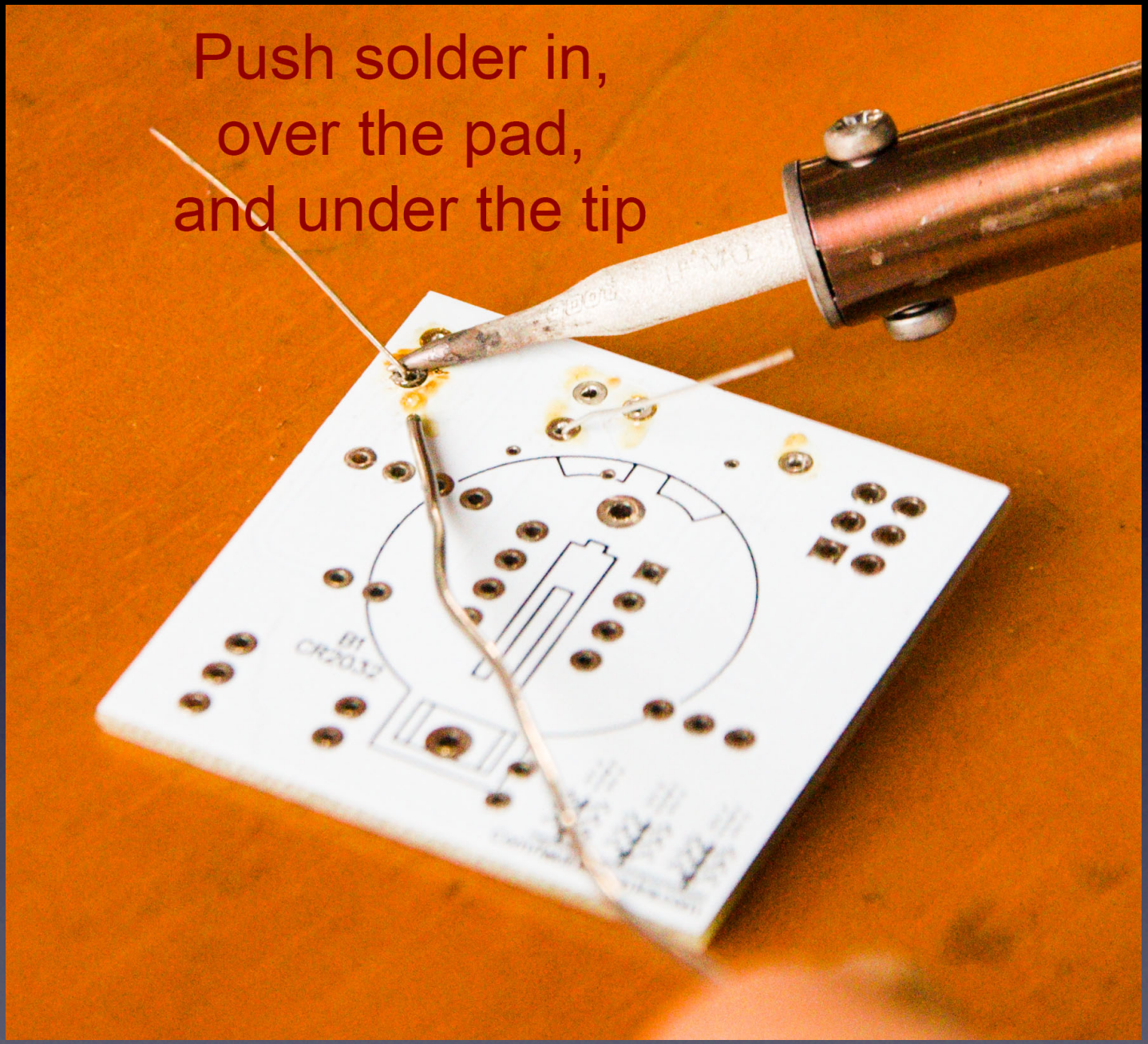
Clean the tip!
(before every solder connection)

Bang (lightly) 3 times,
Swipe, Rotate, Swipe (on the sponge):

Keep the tip shiny silver!

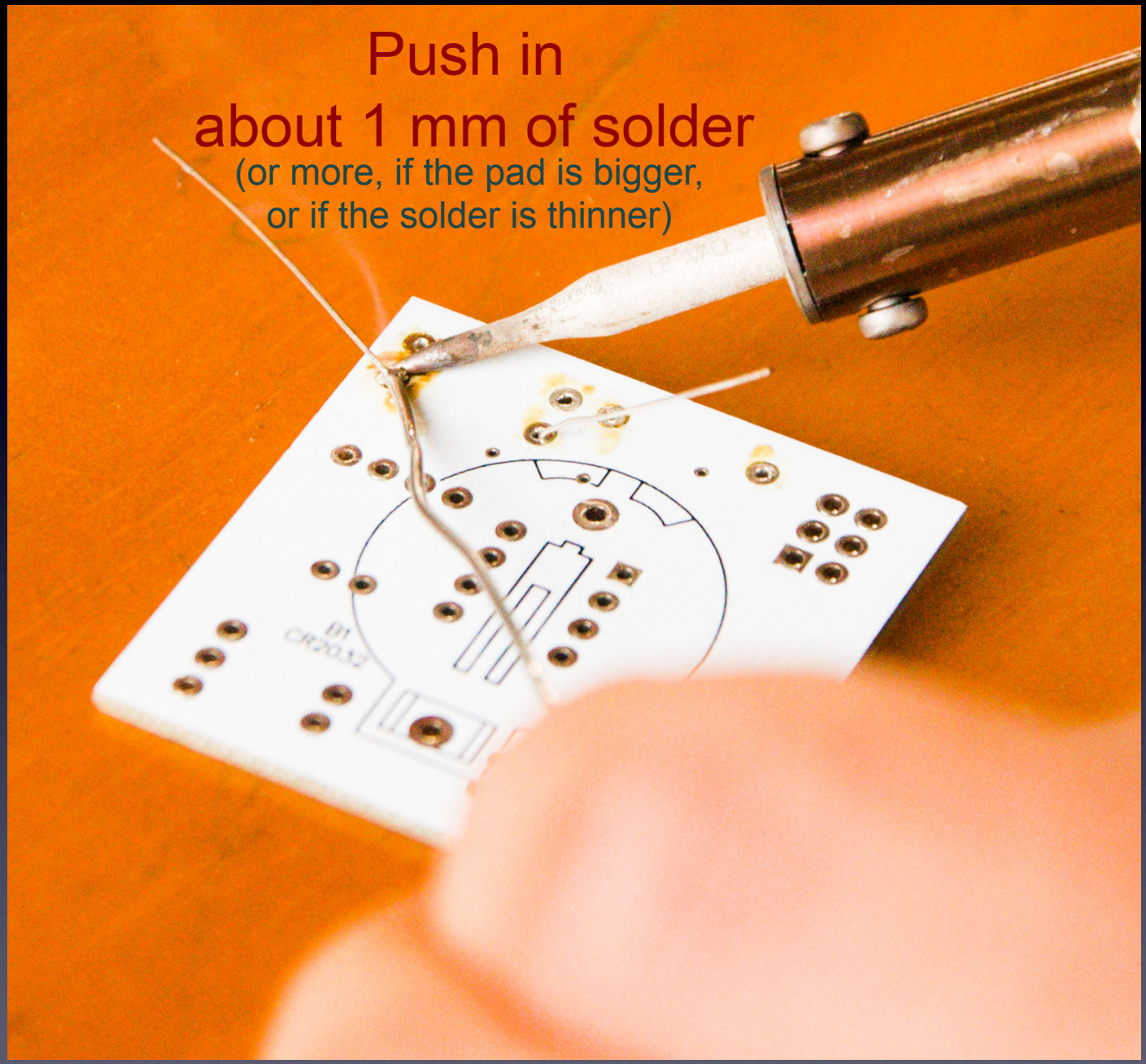

Lay clean tip across half of the pad,
touching the pad and lead
for 1 second

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 <u>underside</u> of the soldering iron tip
(not the side or top of the soldering iron tip)!

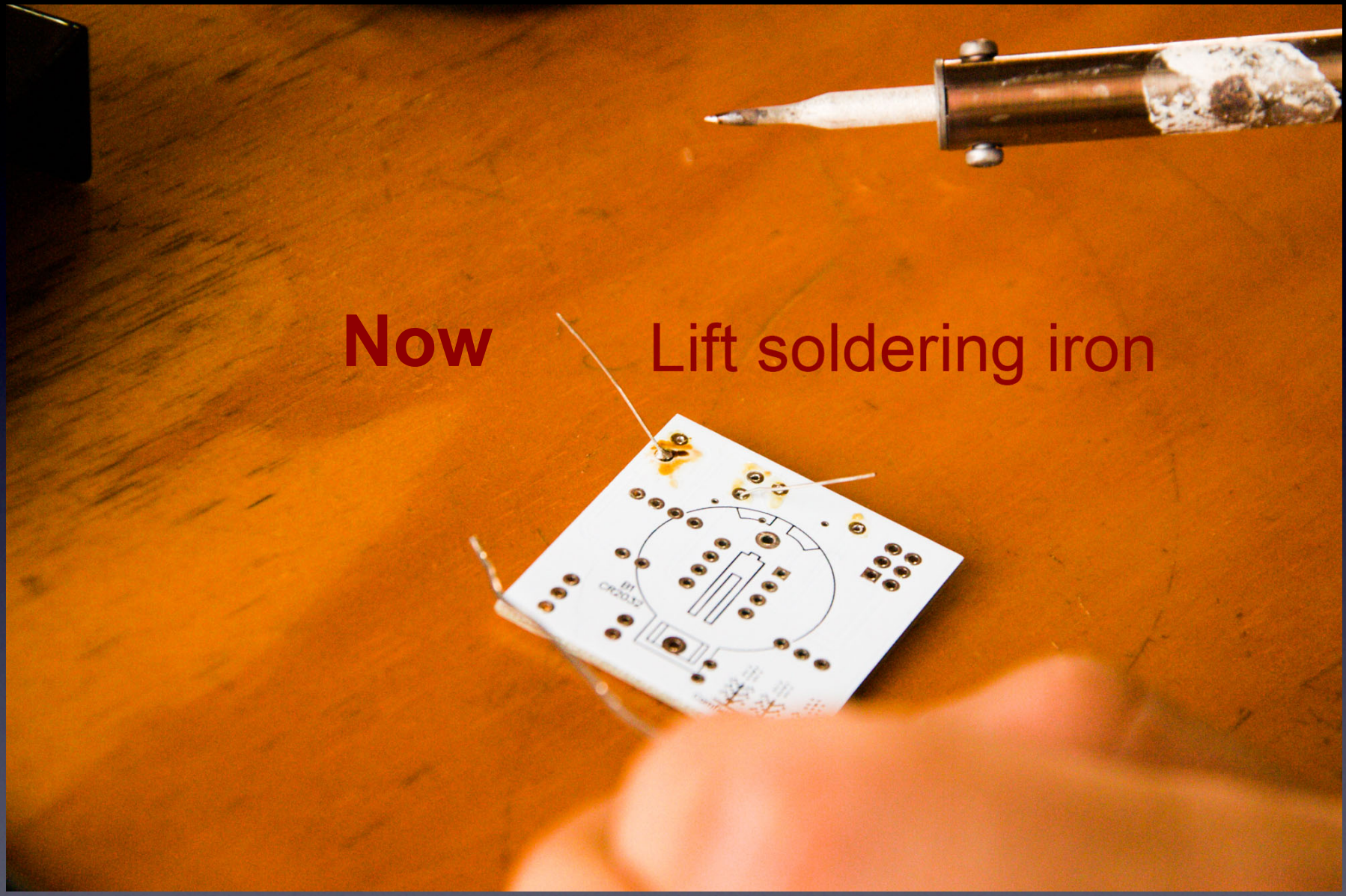
HEY !!!

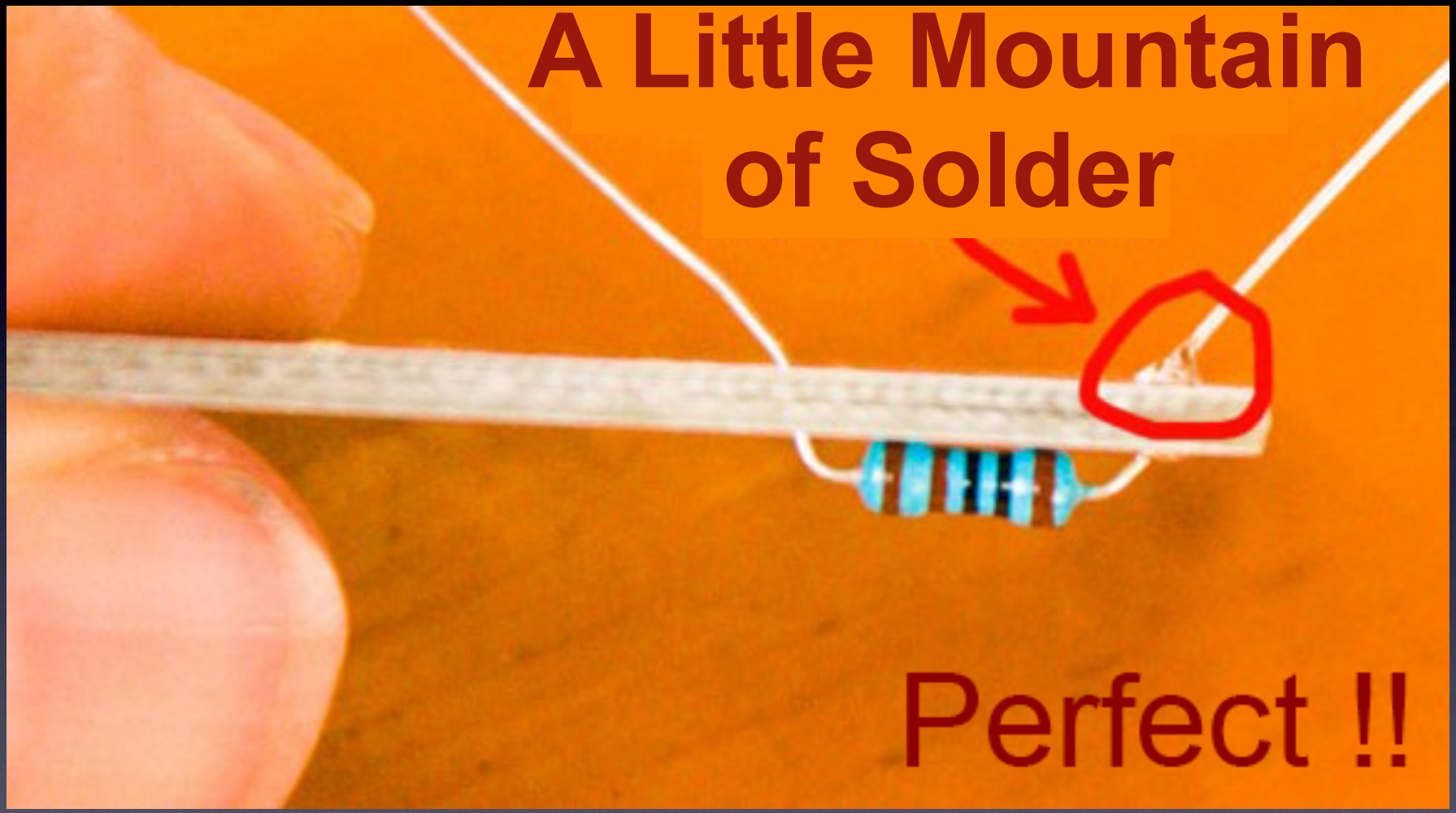
KEEP HOLDING TIP DOWN FOR 1 MORE SECOND !!

WAIT !!
Don’t lift the tip !!

Secret #2:

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


Now
Lift soldering iron



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)

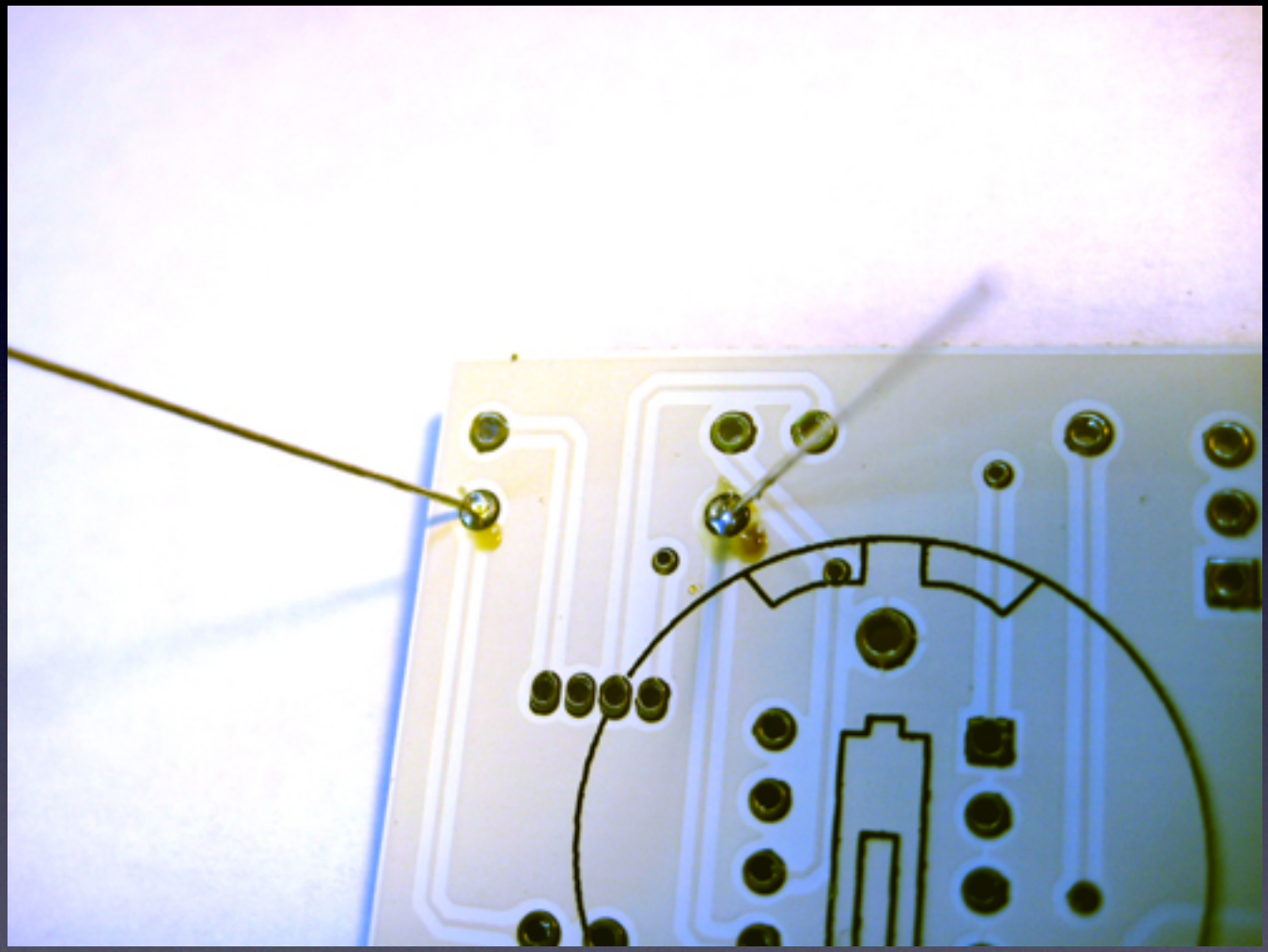
WAIT !

The Rhythm !

and speed (about 1 second per step)

Lift Tip

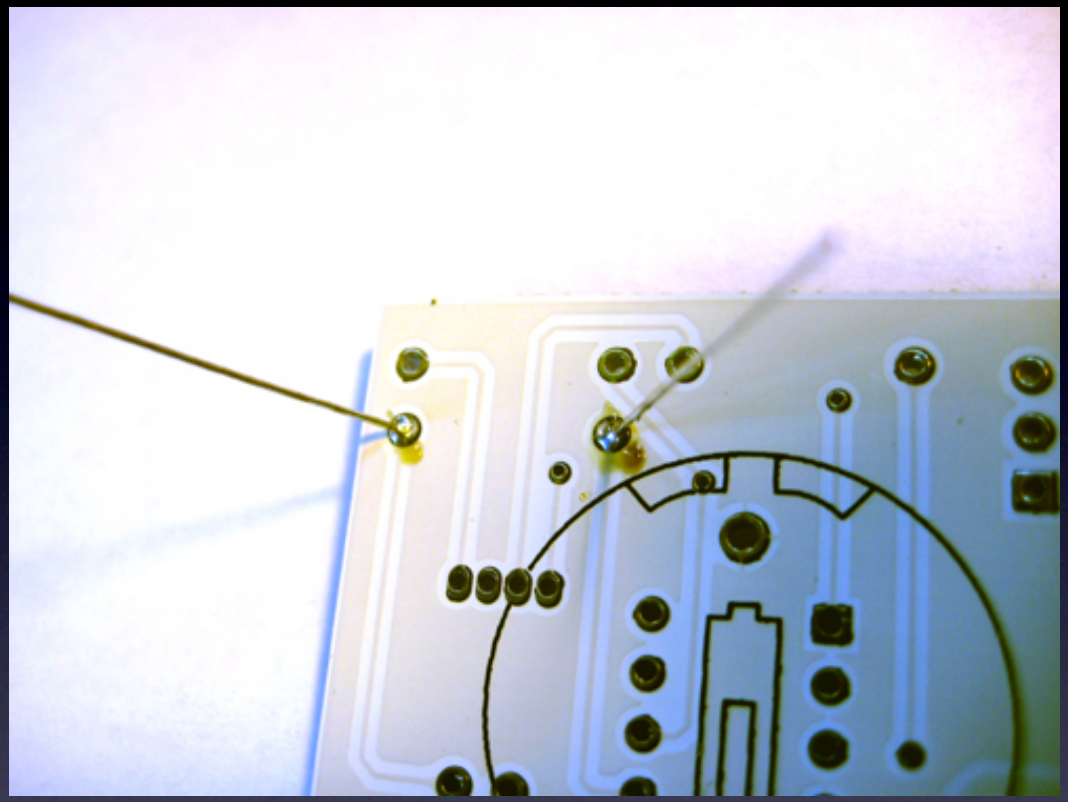
Solder all of the leads of the part to the board



For this part, there are two leads

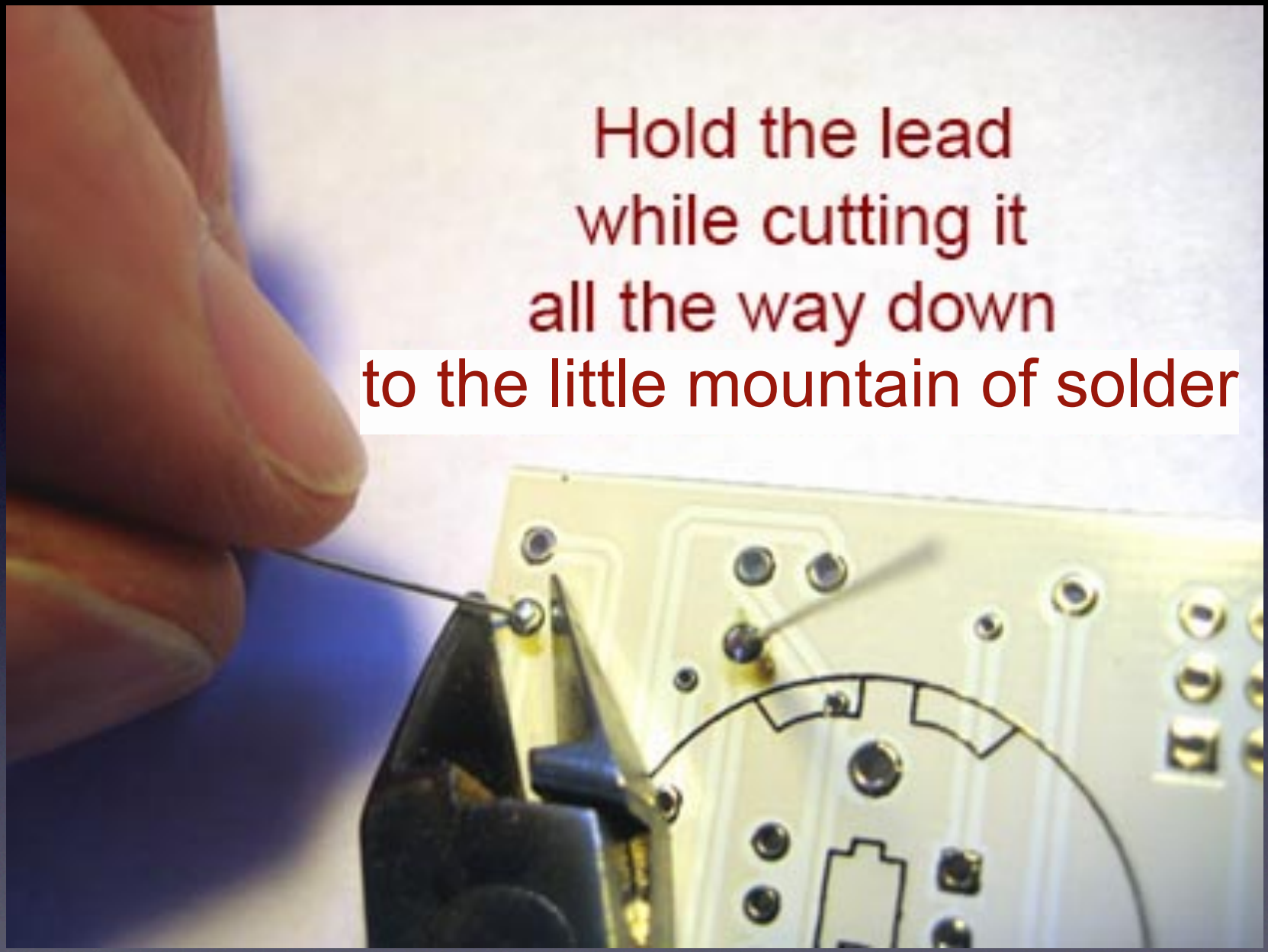
Here you can see two good solder connections

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.)

No wires sticking out

A closer look at good solder connections

Notice that:

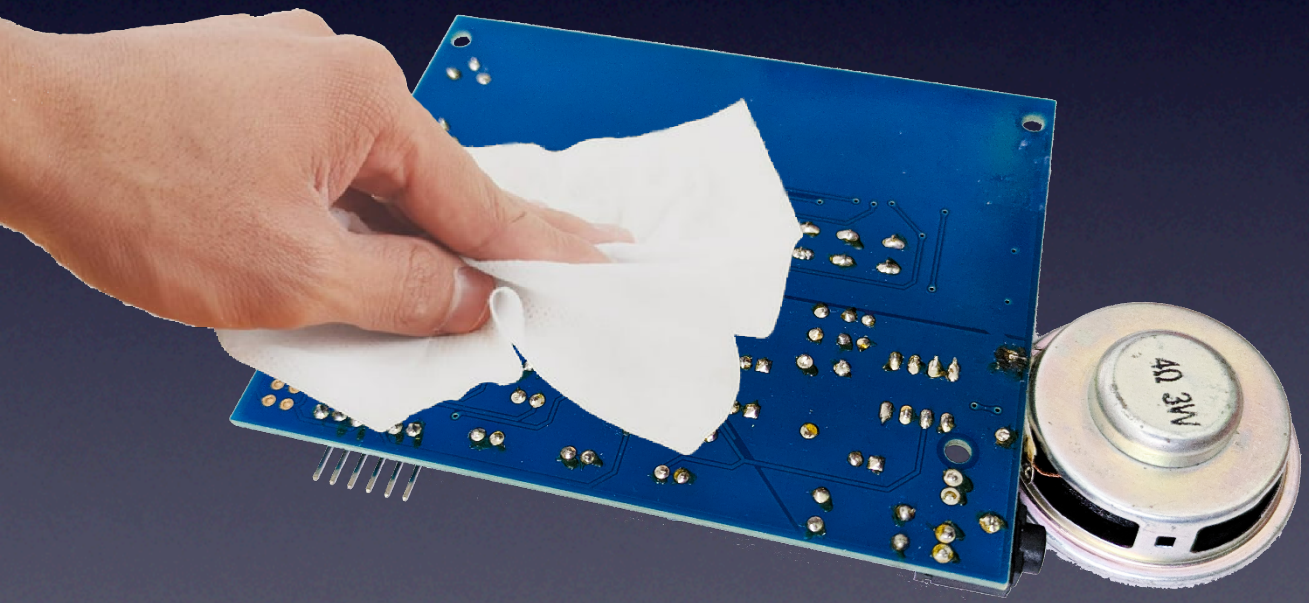
- Each connection is a small mountain (not flat)
- You cannot see any pad (they're totally covered with solder)
- You cannot see the holes (they're totally covered with solder)
- No connections to other pads

One part at a time

Till all the parts are soldered

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.)


White LED
I
CAN
SOLDER
Blinky LED
push button
switch
slide switch

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