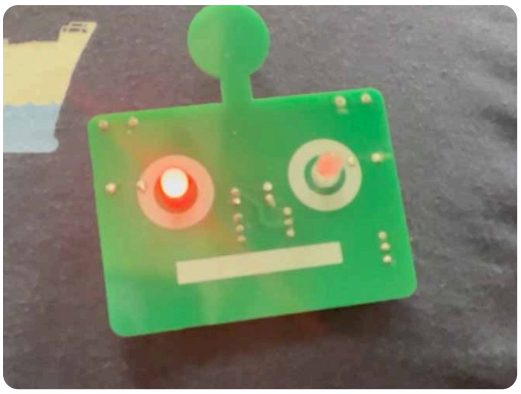


Blinking robot badge

Create your very own blinking robot badge! You will be making a 'flip-flop' cirquit to make the lights blink one after the other.

Scan for the online version

AGE	TIME
9+ yrs	45-60 min

electronics

What do you need?

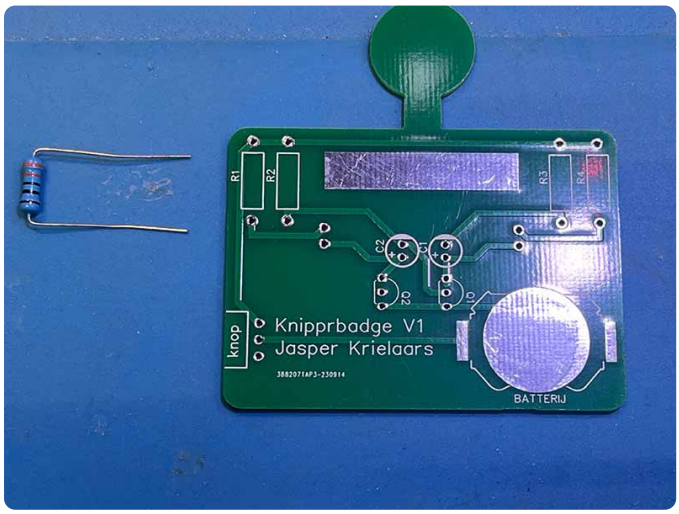
MATERIALS

- [ ] Robot circuit board
- [ ] 2x LED's
- [ ] 2x xxxOhm resistors
- [ ] 2x xxxOhm resistors
- [ ] 2x BC547 transistors
- [ ] 2x ...uF capacitors
- [ ] Toggle switch
- [ ] Coin cell battery holder
- [ ] Badge pin
- [ ] CR2032 battery

TOOLS

- [ ] Soldering iron
- [ ] Flush cutter
- [ ] Glue gun
- [ ] Tweezers

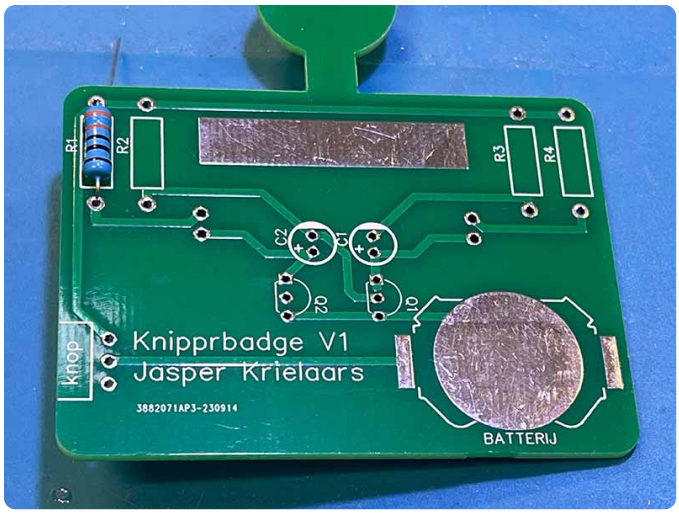
Steps

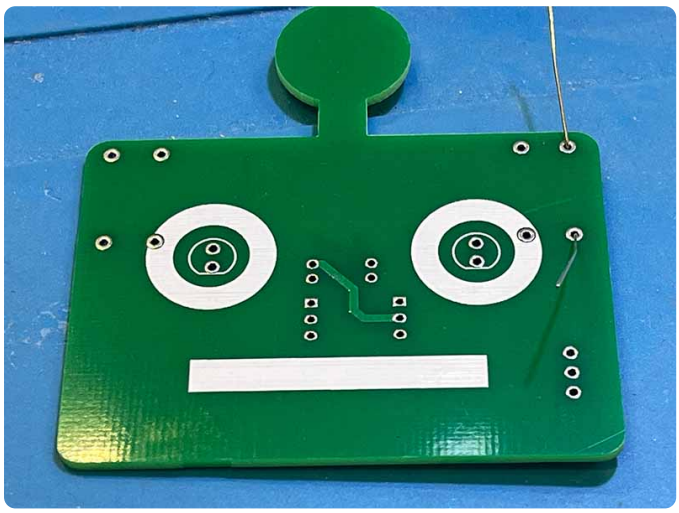


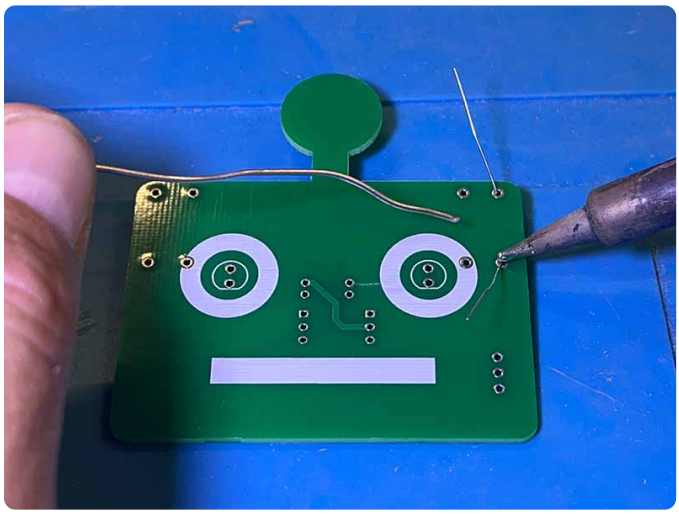
1 Resistors

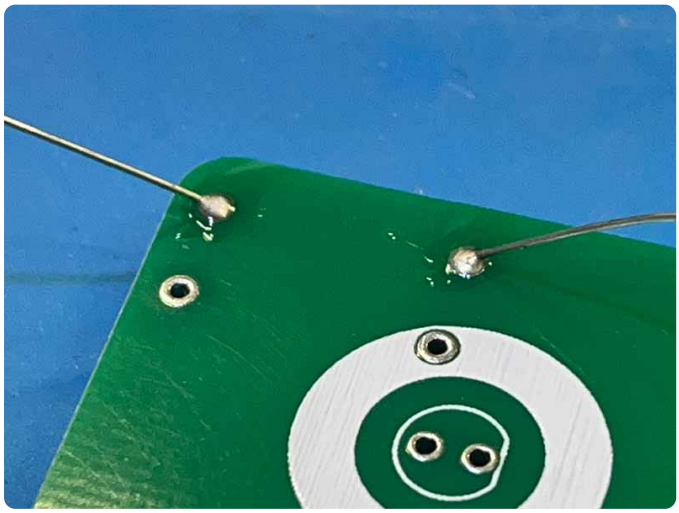
GOOD TO KNOW
When soldering PCB boards it's good practice to start with the lowest components. If you do taller components first they might get in the way later on.

- Place the resistors in the holes. The ones with the red band go in R1 and R3, the ones with the orange band go in R2 and R4.
- Bend the legs from the other side so they don't fall out
- Solder the resistors to the PCB board
- Use the flush cutter to trim the resistor legs down to the board

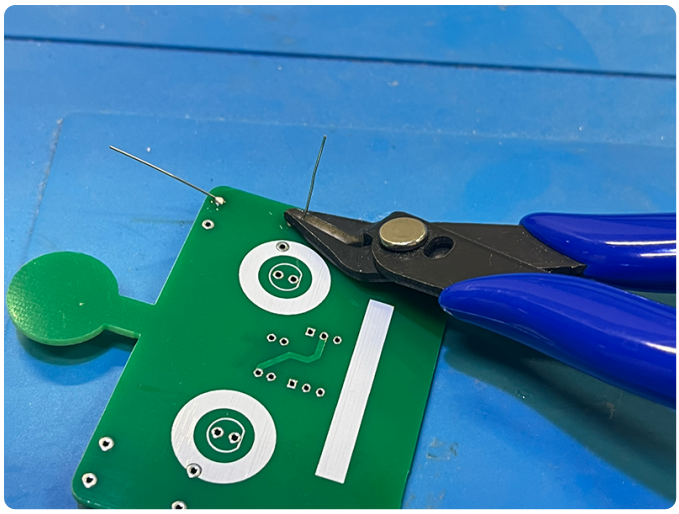




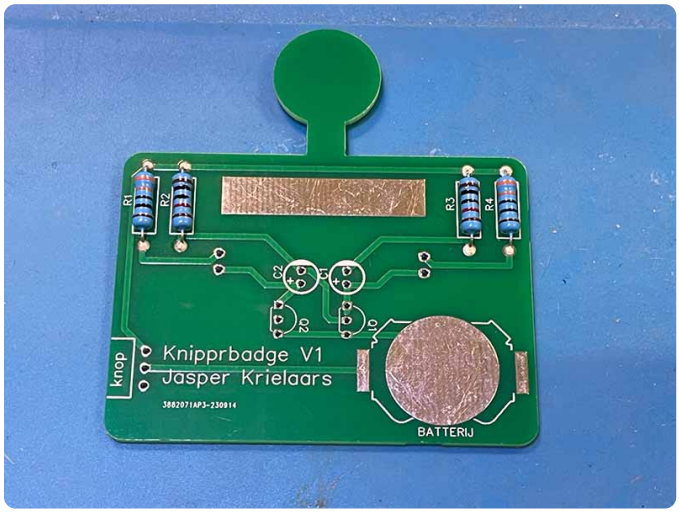




1 Resistors — *continued*



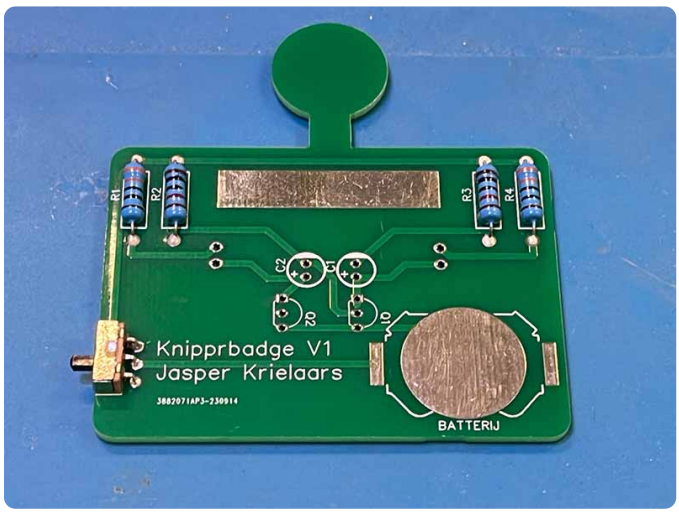
1 Resistors — *continued*



2 Transistors

WATCH OUT
Transistors are polarised. This means that when you place them the wrong way round your circuit won't work.

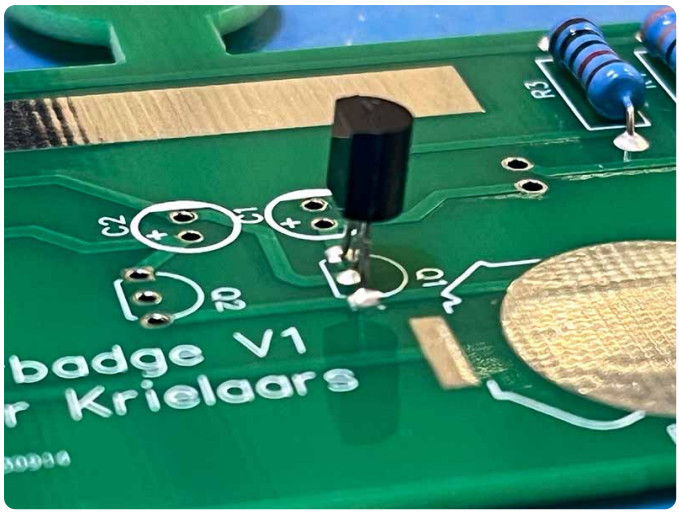
- Place the 2 transistors in the holes marked Q1 and Q2. Make sure to match the shape of the component to the printed shape on the circuit board.
- Bend the legs and solder and trim like you did with the resistors.

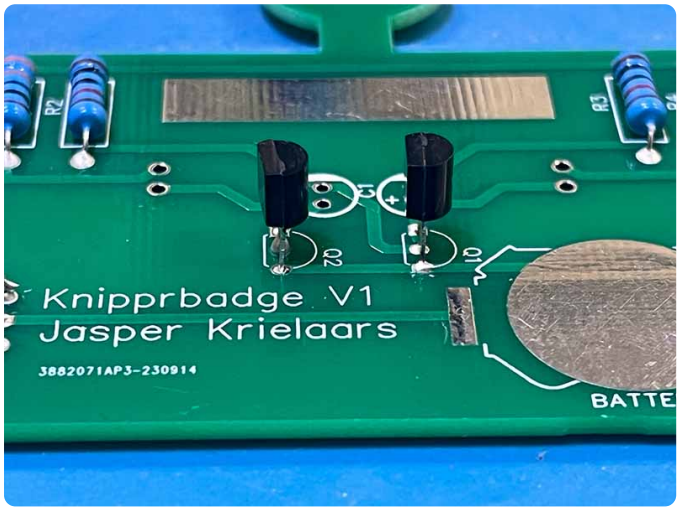


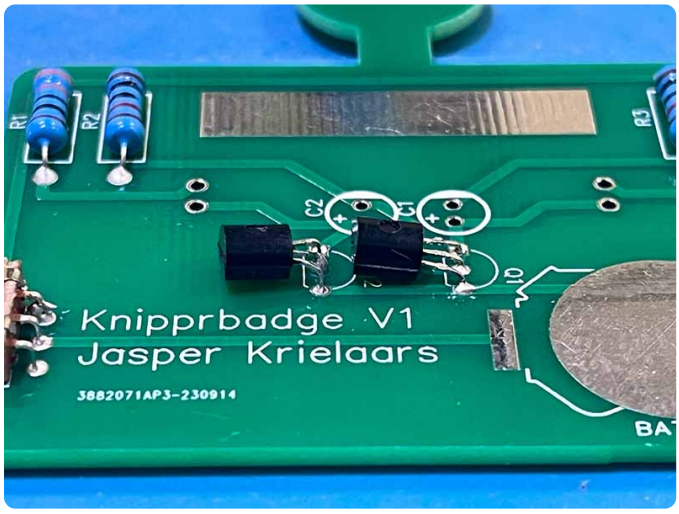
3 Capacitors

WATCH OUT
Capacitors are polarised. This means that when you place them the wrong way round your circuit won't work.

- Place the 2 capacitors in the holes marked C1 and C2. Make sure that the long leg goes in the hole marked with the +.
- Bend the legs and solder and trim like you did with the resistors.

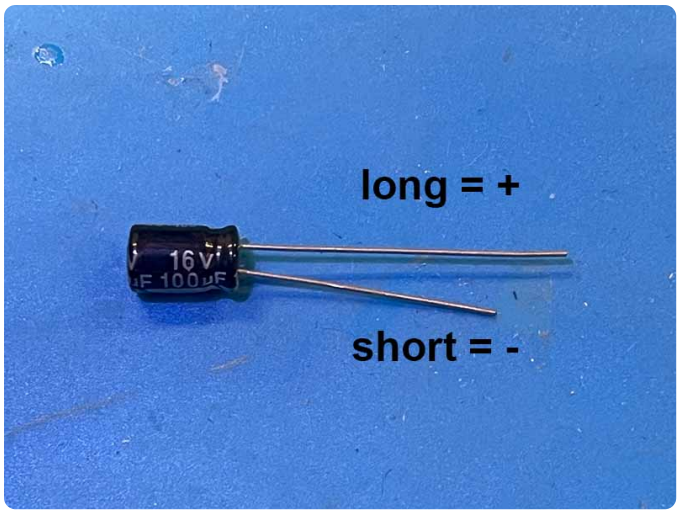


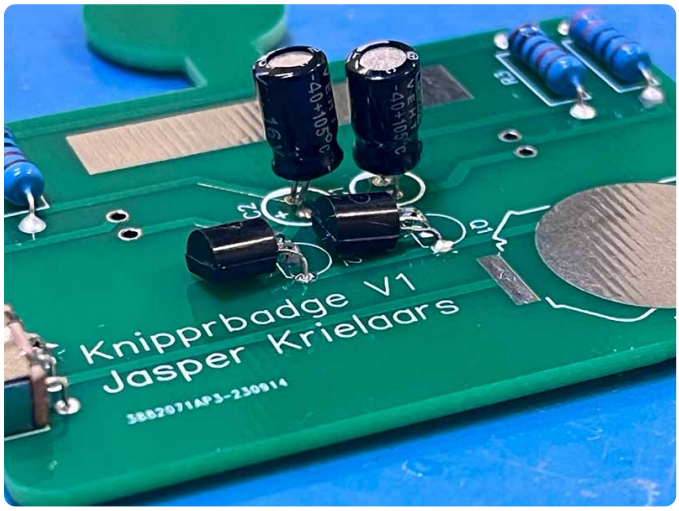




4 Switch

- Place the switch in the holes marked 'knop'. The switch should point outwards.
- Solder and trim like you did with the resistors.

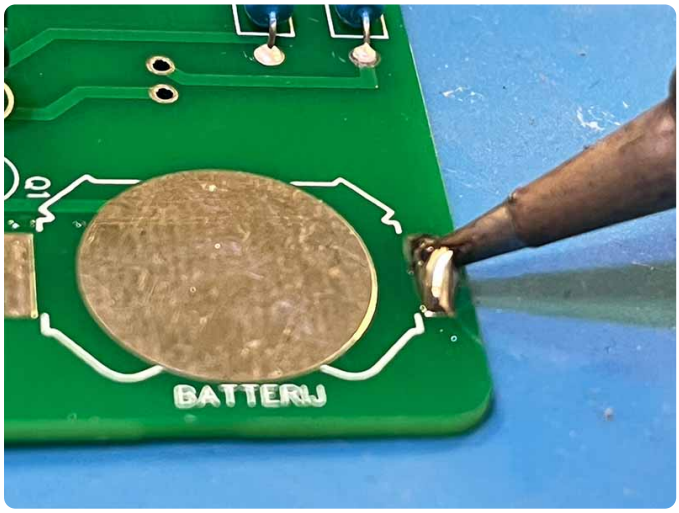




5 Battery holder

WATCH OUT
Make sure to mount the battery holder in such a way that the biggest opening is at the bottom of the board. Otherwise there is not enough room to slide the battery in.

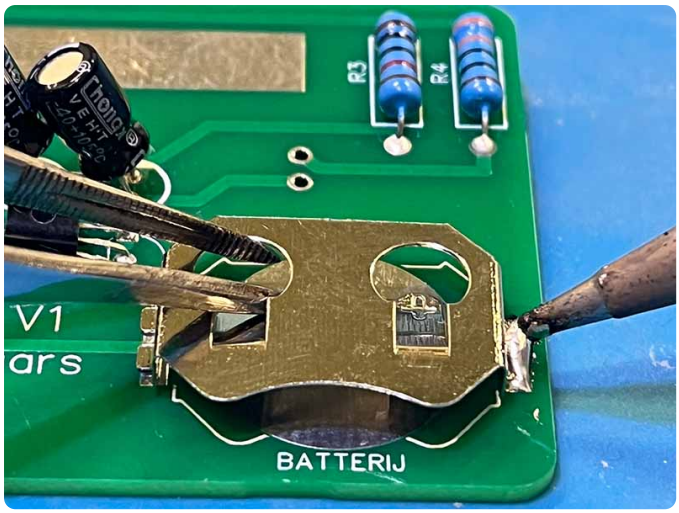
- Melt some soldering tin to one of the battery pads.
- Place the battery holder on the pad and hold it down with a pair of tweezers.
- Attach the battery holder by re-heating the pad with the solder already on it.
- Solder the other side of the battery holder down to the pad.



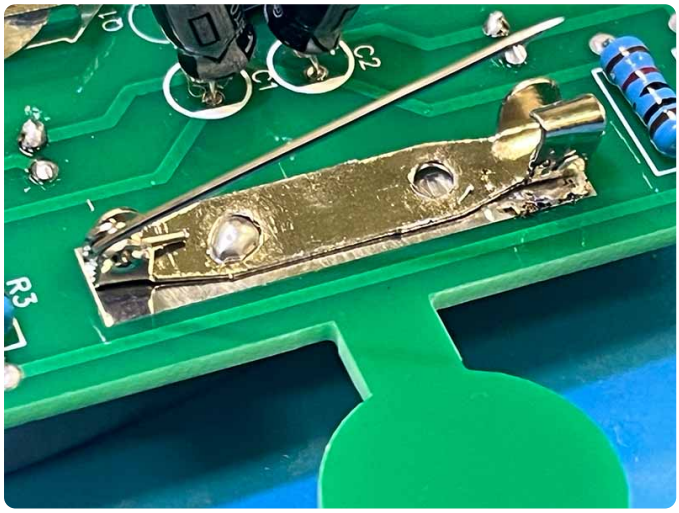
6 LED's

WATCH OUT
LED's are polarised. This means that when you place them the wrong way round your circuit won't work.

- From the other side of the board, place the LED's onto the board. Make sure the longer leg go trough the holes marked with the +
- Bend, solder and trim.



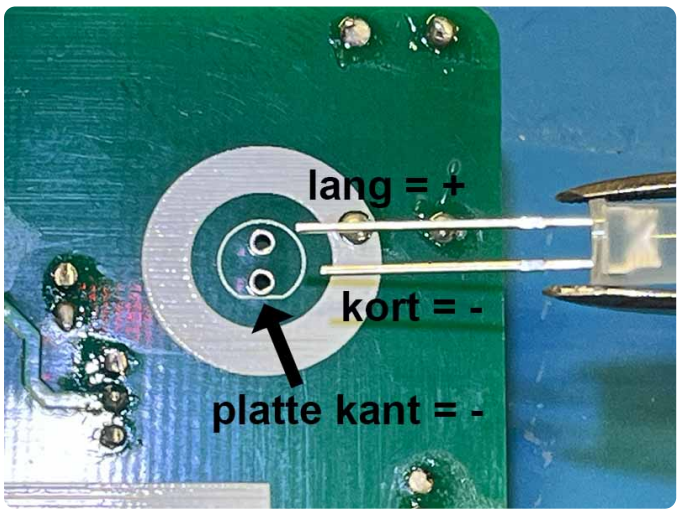
6 LED's — *continued*



7 The Pin

> **GOOD TO KNOW**
> When soldering bigger components, it will take longer for the soldering iron longer to heat up the component.

- Like with the battery holder, place some tin on the pad, than melt it again while holding the pin down with a pair of tweezers

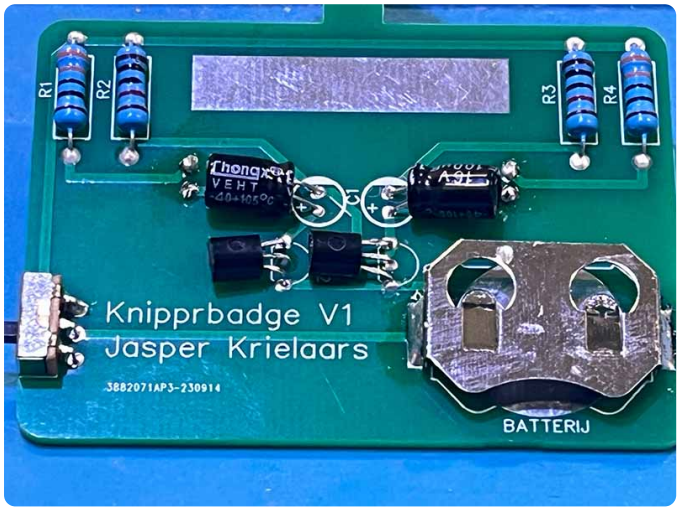


8 Re-inforce

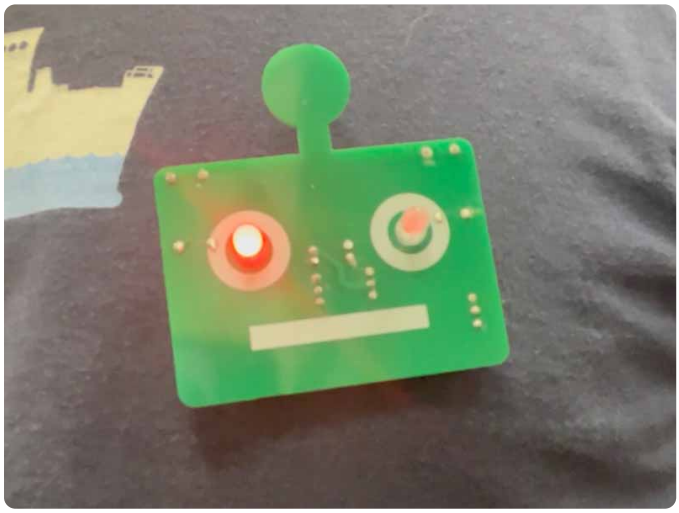
> **GOOD TO KNOW**
> The button is only attached trough 3 small metal legs. They can easily bend or break.

- Use the glue gun to glue the button to the board, thereby making it less likely to break when switching.





8 Re-inforce — *continued*



9 Battery and... DONE!

- Place the battery with the + side away from the circuit board.
- DONE!