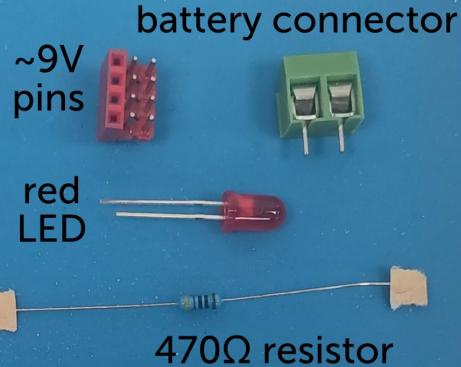


## STEP 1

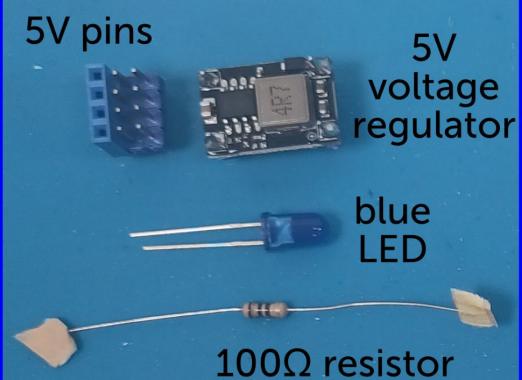
Check that you have all of the components you need.  
A *text list* is on the next page.

**ADD  
PICTURE  
OF UNUSED  
PCB**

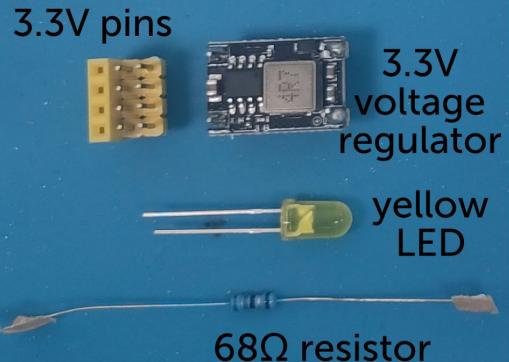
### Red ~9V Section



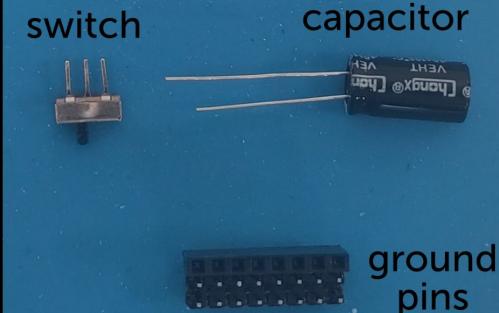
### Blue 5V Section



### Yellow 3.3V Section



### Other Components



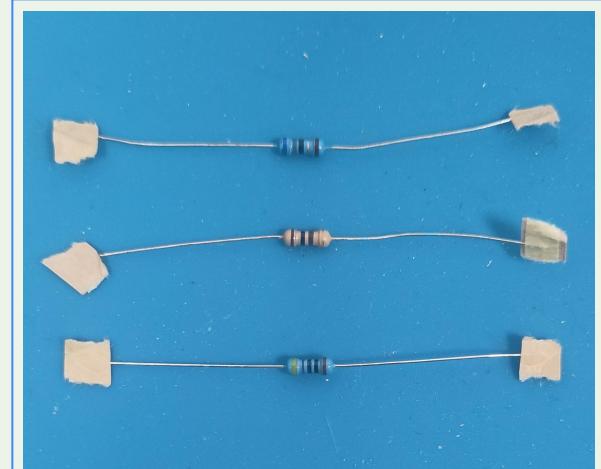
# STEP 1

Check that you have all of the components.

*A picture list is on the previous page.*

- Printed circuit board
- Resistors (3)
  - $470\Omega$
  - $100\Omega$
  - $68\Omega$
- Switch
- Voltage regulators (2)
  - Blue 5V
  - Yellow 3.3V
- Capacitor

- LEDs (3)
  - Red
  - Blue
  - Yellow
- Pin headers (4)
  - Red
  - Blue
  - Yellow
  - Black
- Battery connector



*If your resistors do not have labels, work out which is which from the colours.*

**Resistor Calculator**

## STEP 2

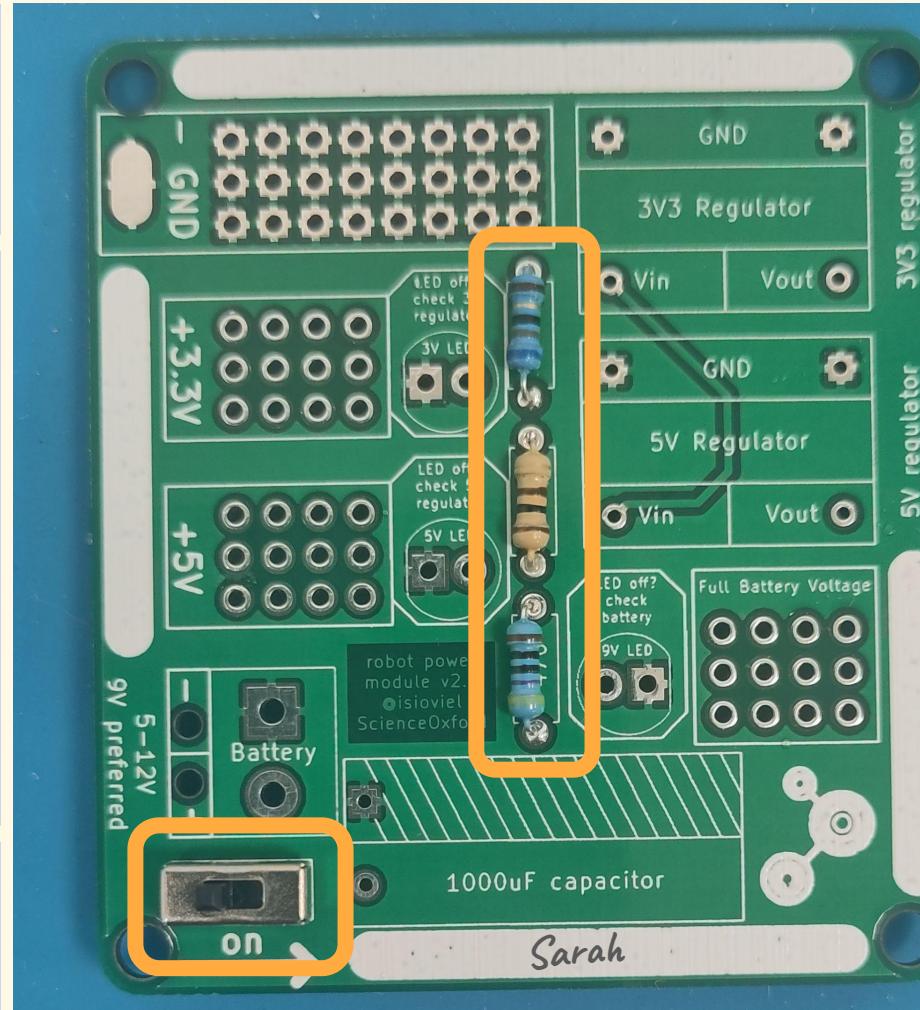
- Write your name on a white space with marker.

## STEP 3

- Solder the three resistors.
  - 68Ω resistor to the space labelled **68R**
  - 100Ω resistor to the space labelled **100R**
  - 470Ω resistor to the space labelled **470R**

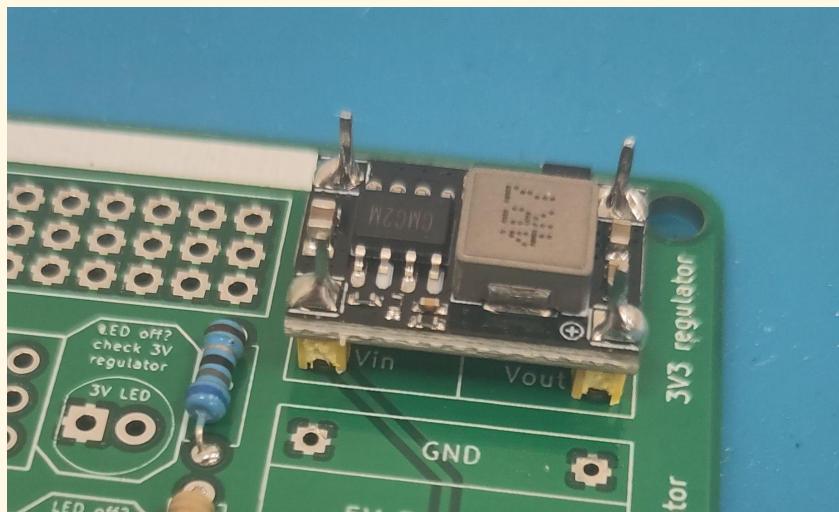
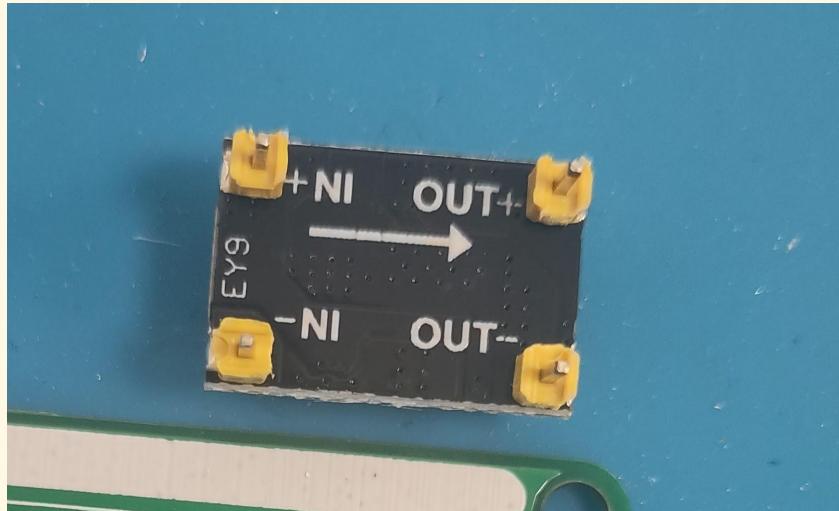
## STEP 4

- Solder the switch.



## STEP 5

- ❑ Find the 3.3V voltage regulator (yellow pins).
- ❑ It is **very important** that this is the right way round.
  - ❑ One side is labelled IN, to match **V<sub>in</sub>** on the board.
  - ❑ One side is labelled OUT, to match **V<sub>out</sub>** on the board.
- ❑ Check that it lines up like the picture, then solder to the **3V3 Regulator** space on the board.

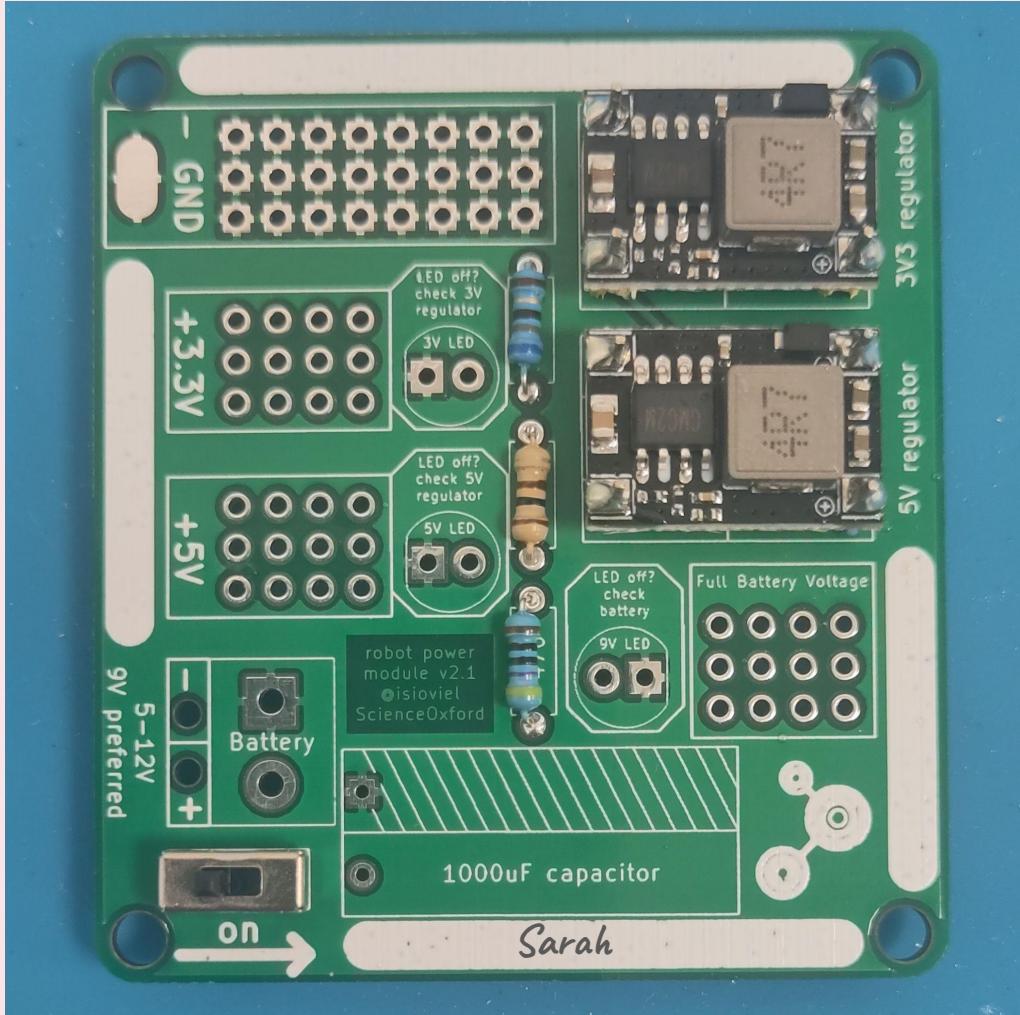


## STEP 6

- ❑ Repeat for the 5V regulator (blue pins) in the **5V Regulator** space.

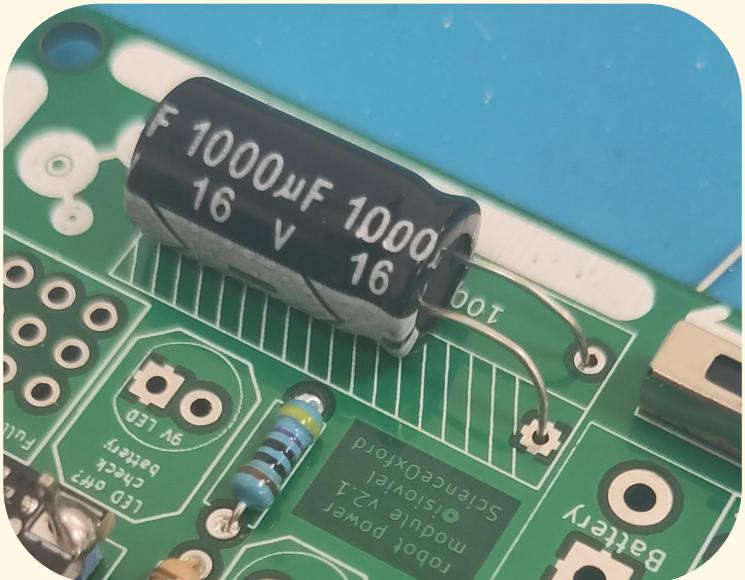
# Your board so far...

- ✓ Resistors (3)
  - ✓ 470Ω
  - ✓ 100Ω
  - ✓ 68Ω
- ✓ Switch
- ✓ Voltage regulators (2)
  - ✓ Blue 5V
  - ✓ Yellow 3.3V

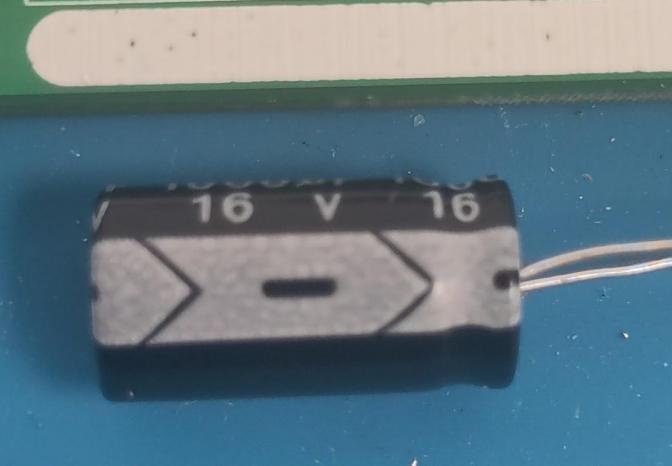
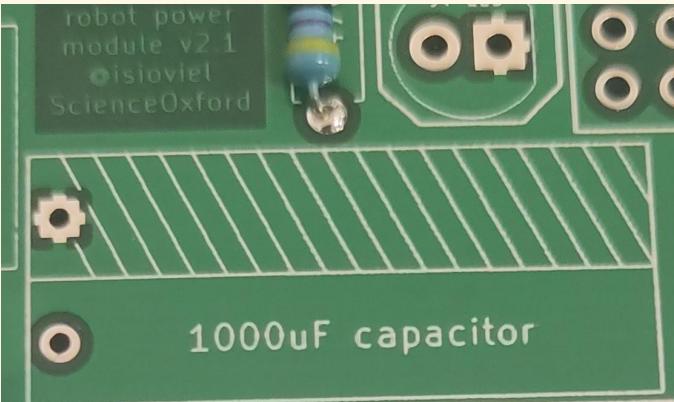


## STEP 7

- Find the capacitor.
- It is **important** that this is the right way round.
  - The white stripe in the negative side.
  - This matches the stripy part of the board.



- Bend the legs, as in the picture on the left.
- Attach to the board with the stripes lined up.

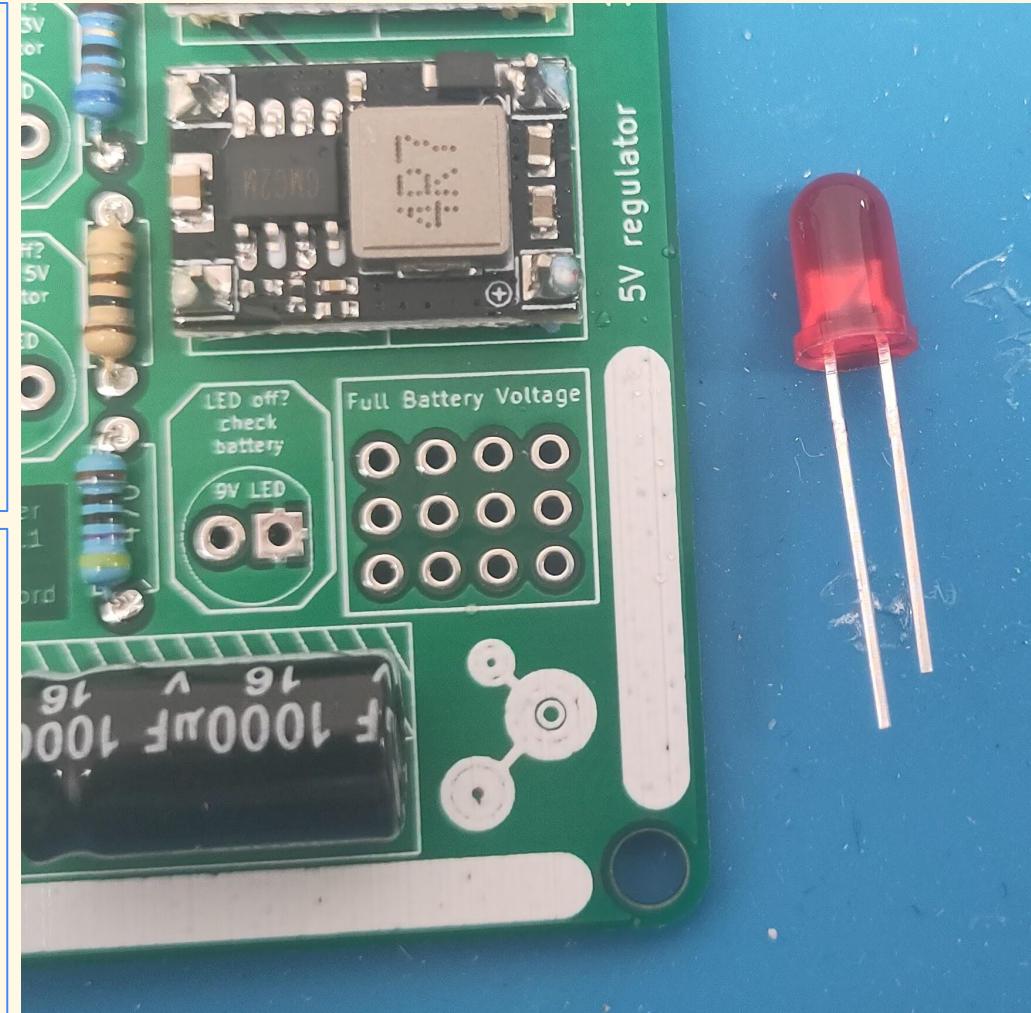


## STEP 8

- ❑ Take your **red LED**, this goes into the **9V LED** space on the board.
- ❑ Remember, LEDs only work one way round - the **short leg** goes into the **square hole**.

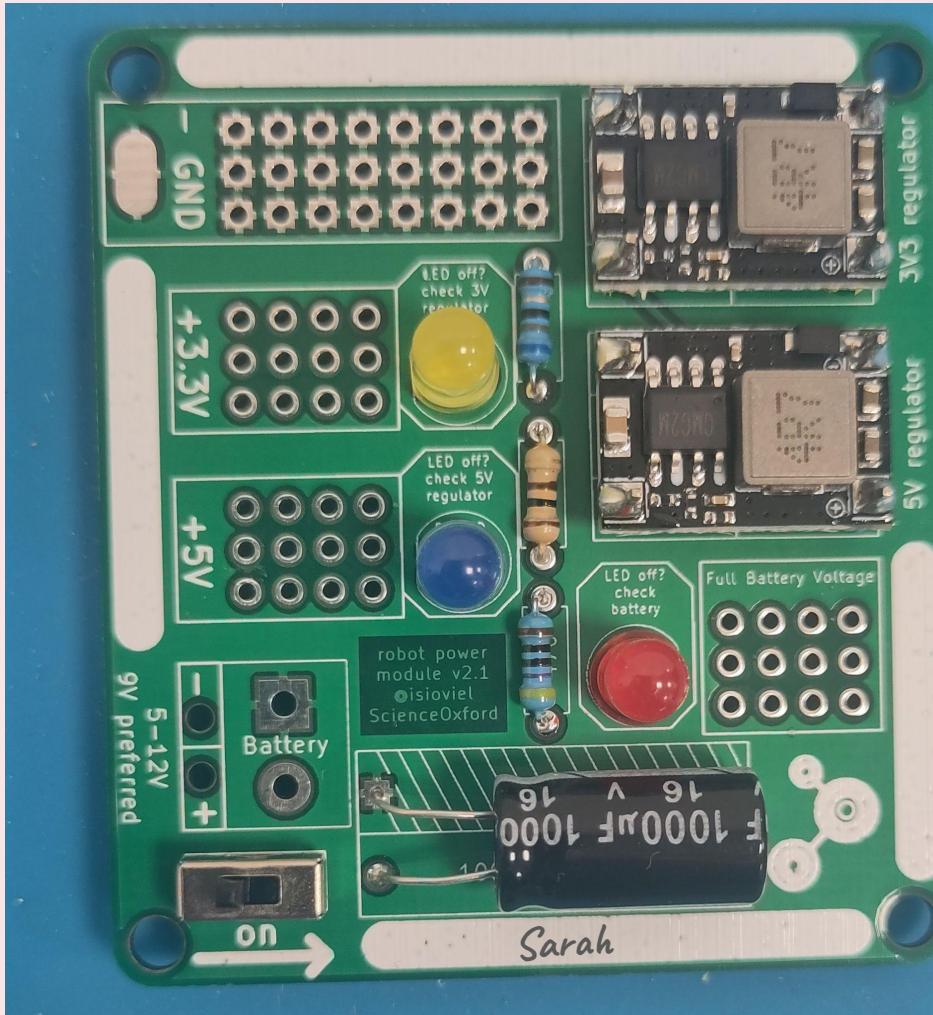
## STEP 9

- ❑ Repeat for the other two LEDs.
  - ❑ **Blue LED** into the **5V LED** space on the board.
  - ❑ **Yellow LED** into the **3V LED** space on the board.



# Your board so far...

- ✓ Resistors (3)
- ✓ Switch
- ✓ Voltage regulators (2)
- ✓ Capacitor
- ✓ LEDs
  - ✓ Red
  - ✓ Blue
  - ✓ Yellow

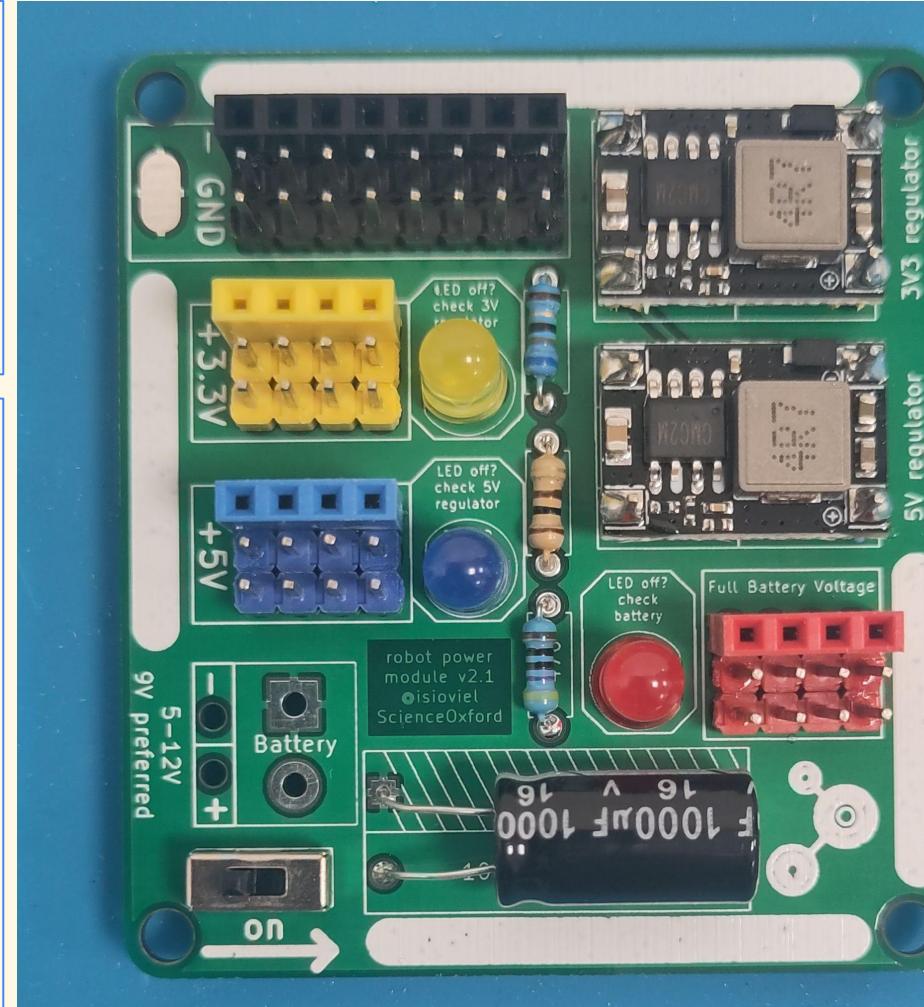


## STEP 10

- Take your **red** pin headers, these go into the **Full Battery Voltage** space on the board.

## STEP 11

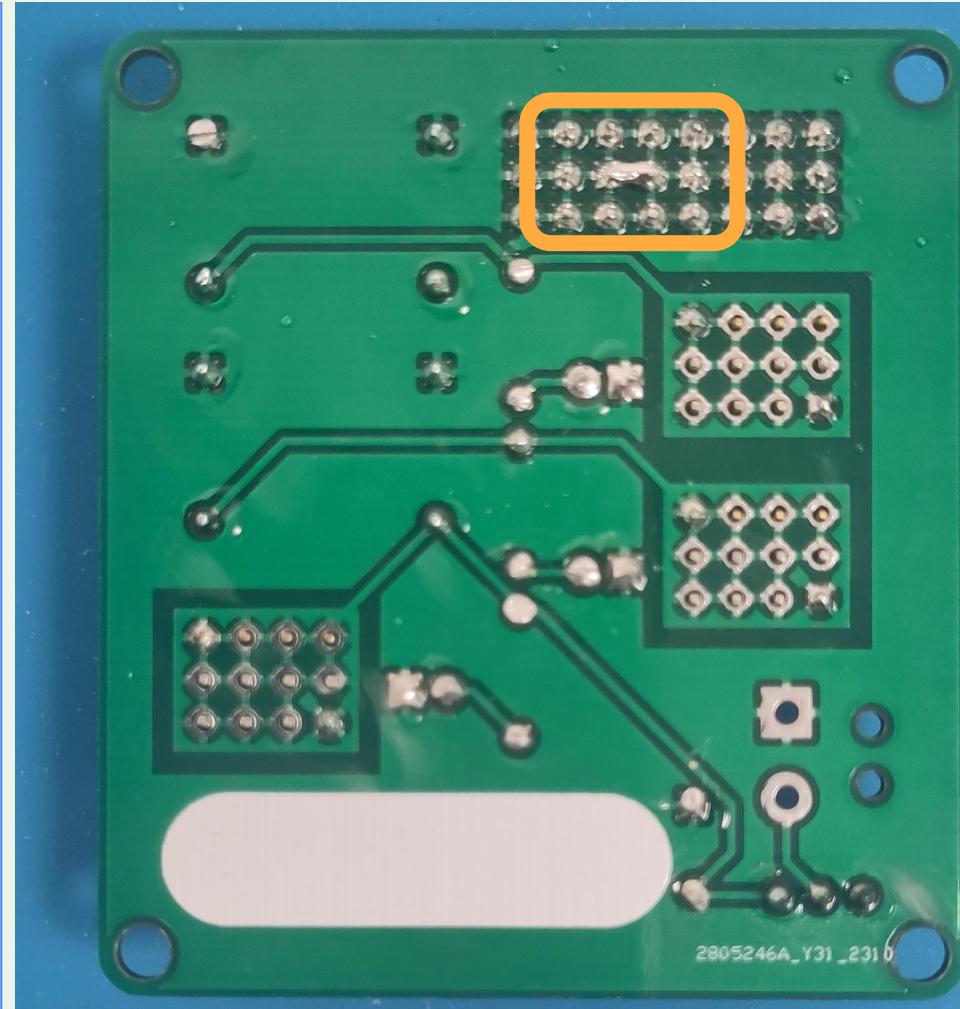
- Repeat for the other three sections.
  - **Blue** pin headers into the **+5V** space on the board.
  - **Yellow** pin headers into the **+3.3V** space.
  - **Black** pin headers into the **-GND** space.



*Adding all of these pin headers takes a long time, but you do not need to be as careful as the other sections.*

*It does not matter if there is too much solder in each section, connecting more than one pin together.*

*This is because every pin in the section is connected together inside the board.*

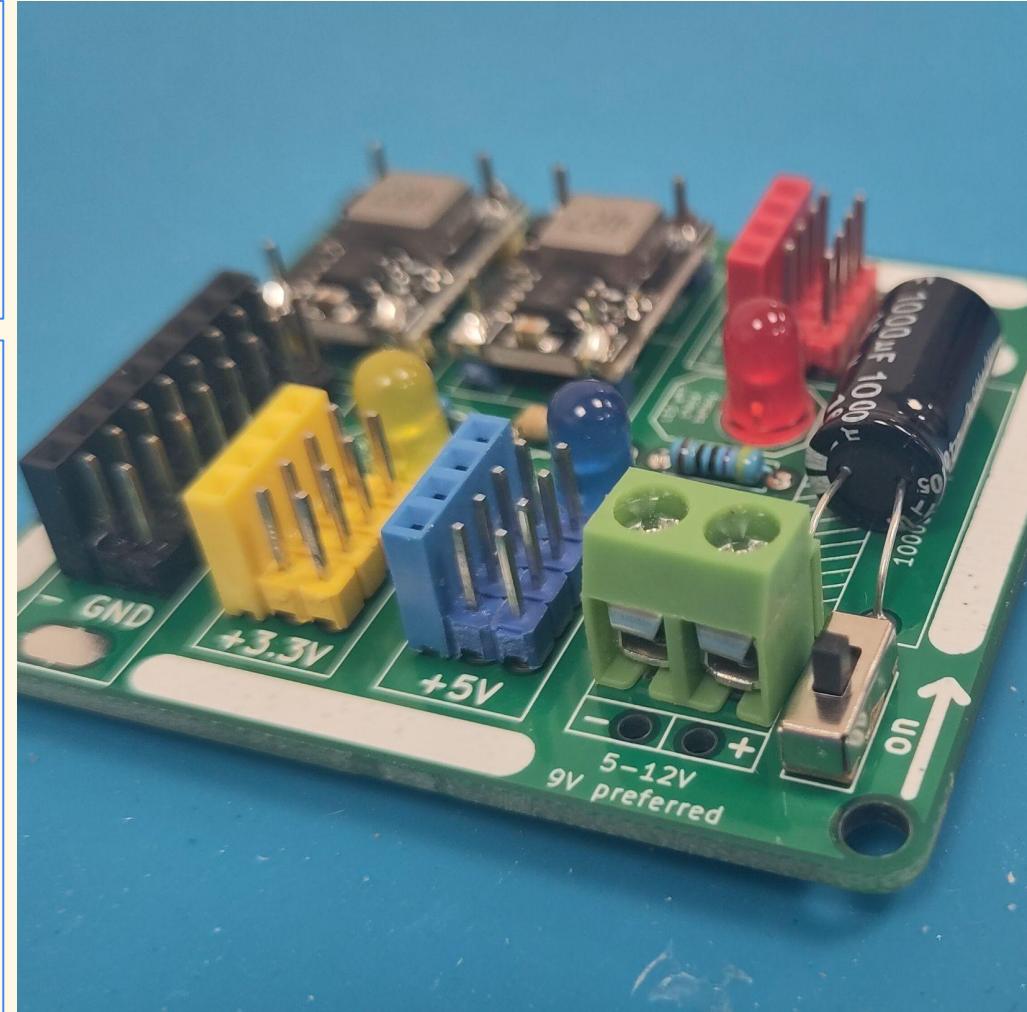


## STEP 12

- Solder your battery connector, with the metal parts facing outwards.

Your board *is now ready to be connected to a battery!*

**A workshop leader will check your soldering** - if there is a short circuit, components can get damaged, so it is safest to fix any problems before connecting it to power.



# Your finished board...

- ✓ Resistors (3)
- ✓ Switch
- ✓ Voltage regulators (2)
- ✓ Capacitor
- ✓ LEDs (3)
- ✓ Pin headers (4)
- ✓ Battery connector
- ✓ 9V battery

