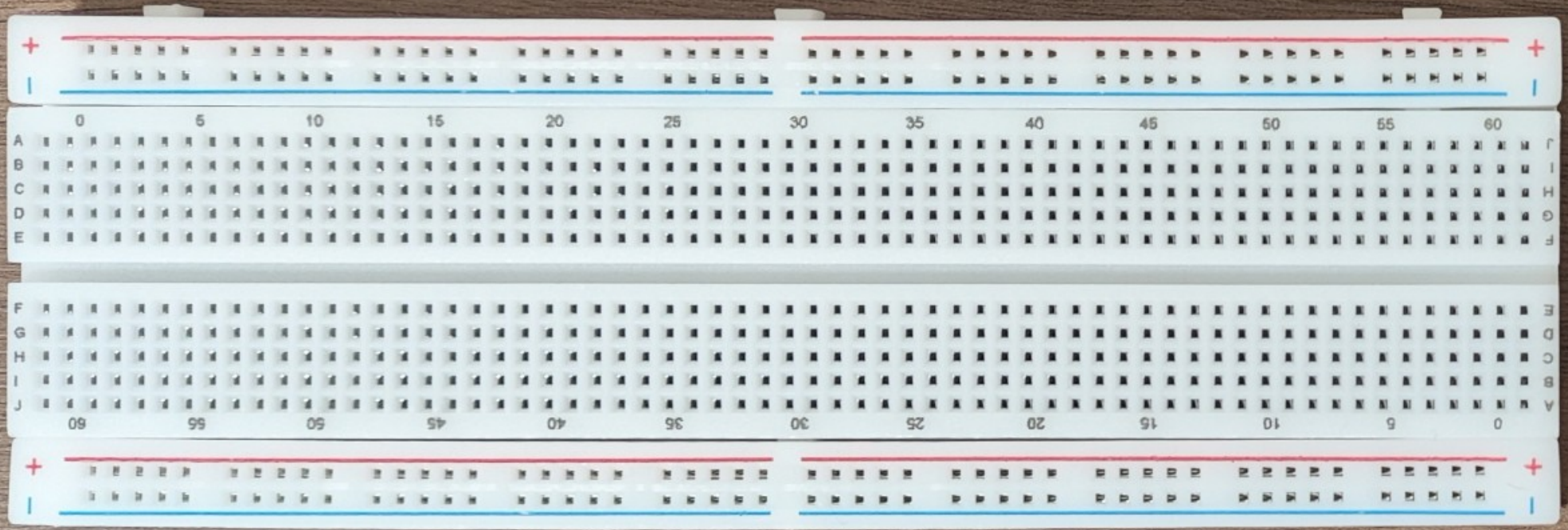
Electronics

Solderless Breadboard

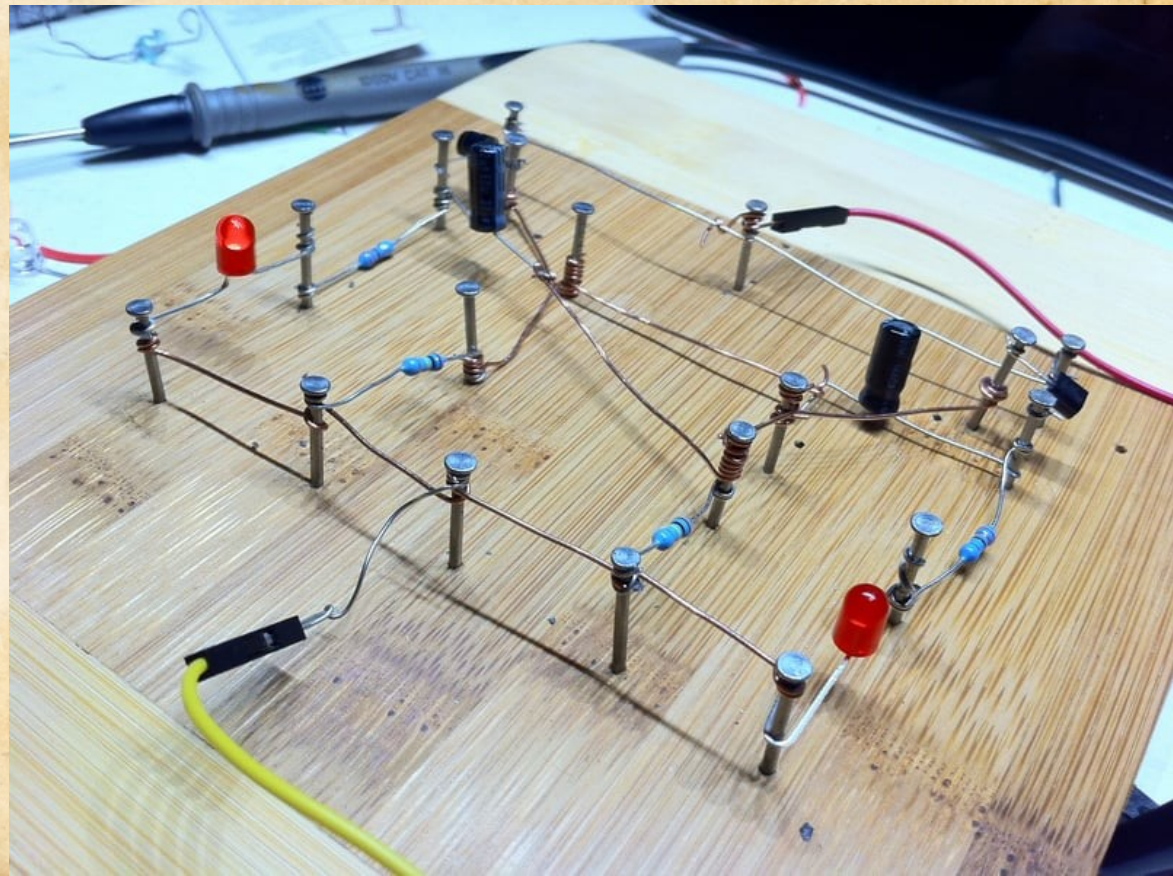
Lecture Contents

- How to use a solderless breadboard



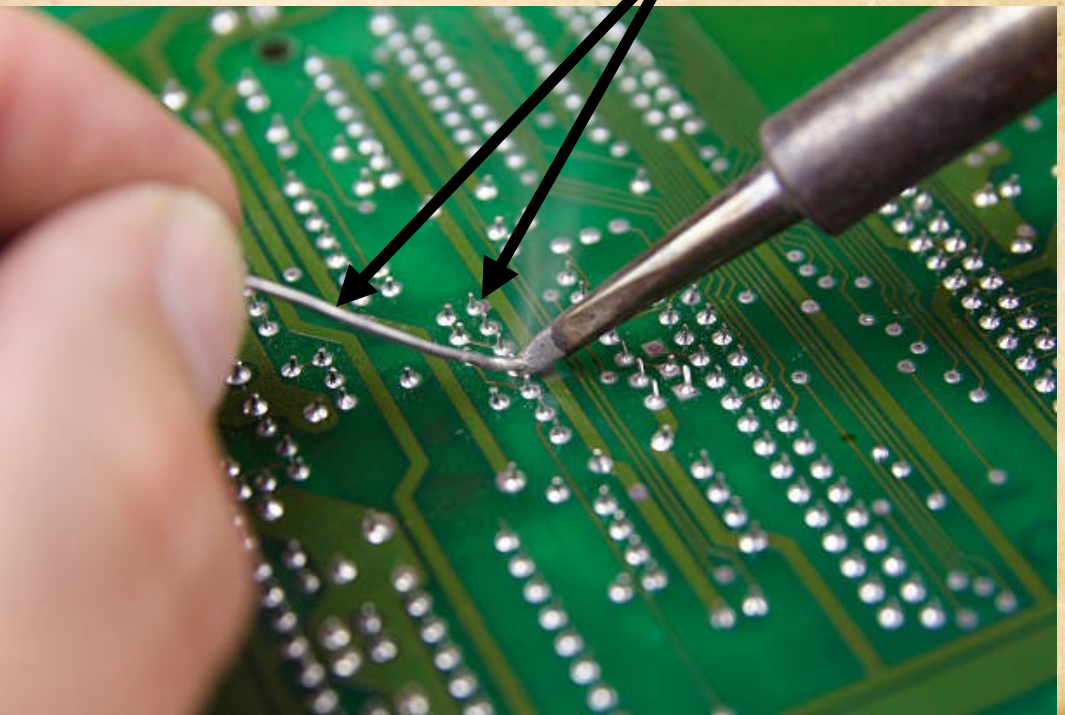
Why is it a “breadboard”?

- Early electronic hobbyists would literally use wooden breadboards to build their experimental circuits on.

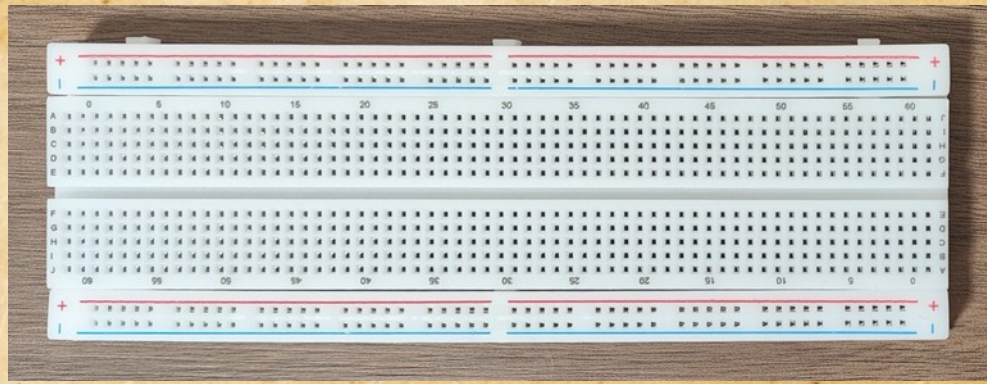


What is meant by “solderless”?

This is solder

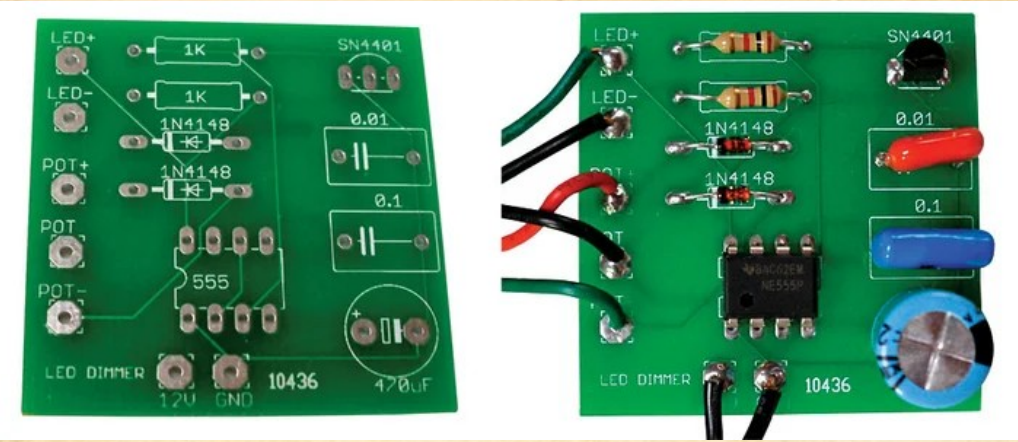


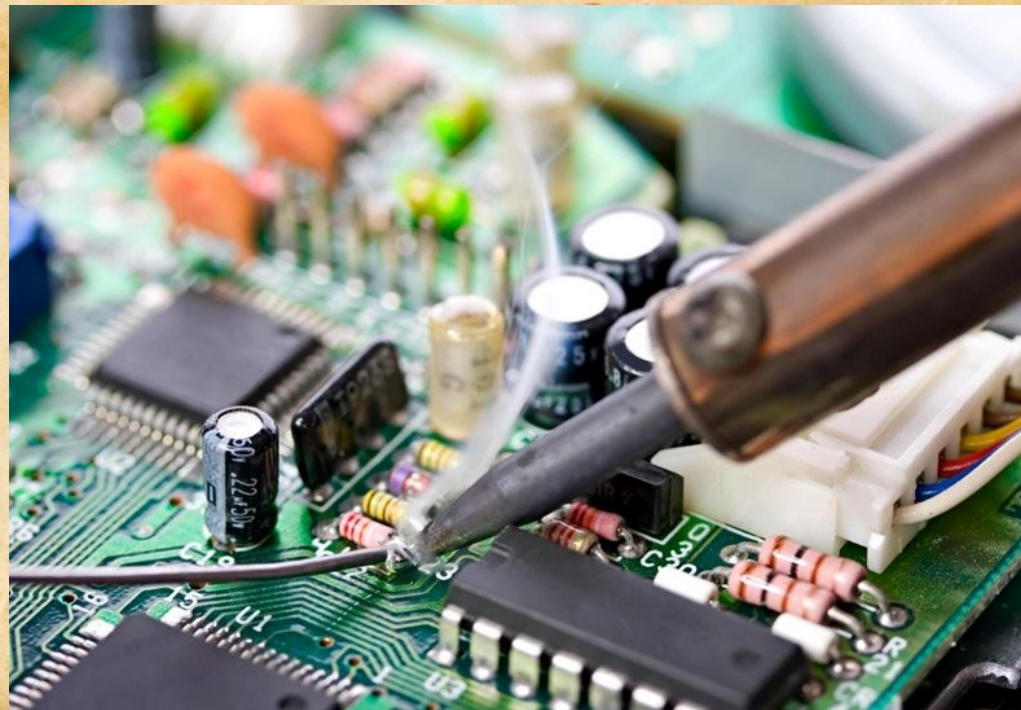
We can make connections without solder when using this breadboard.



Printed Circuit Boards (***PCBs***)

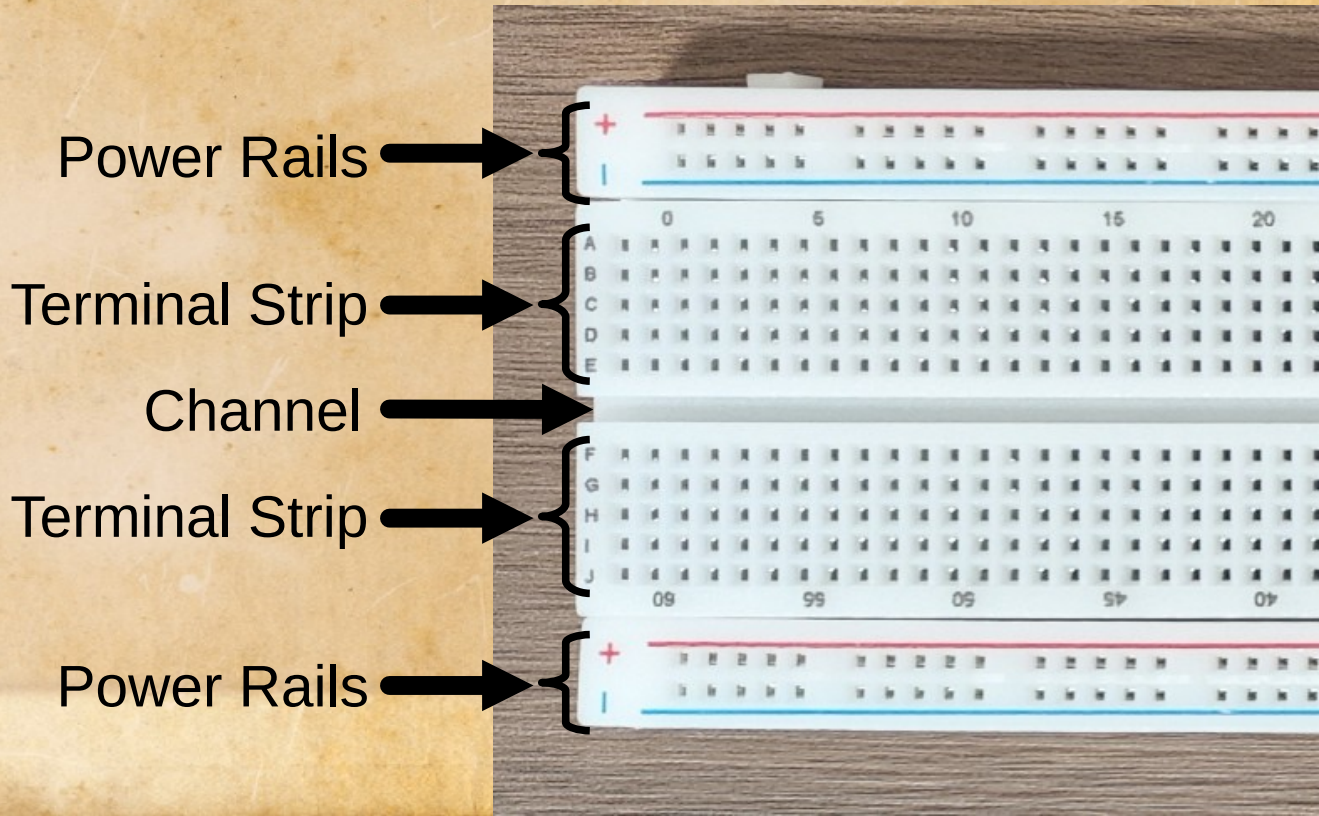
- The ***breadboard*** is used for experimentation and early prototyping.
- For production, a ***printed circuit board*** is used.





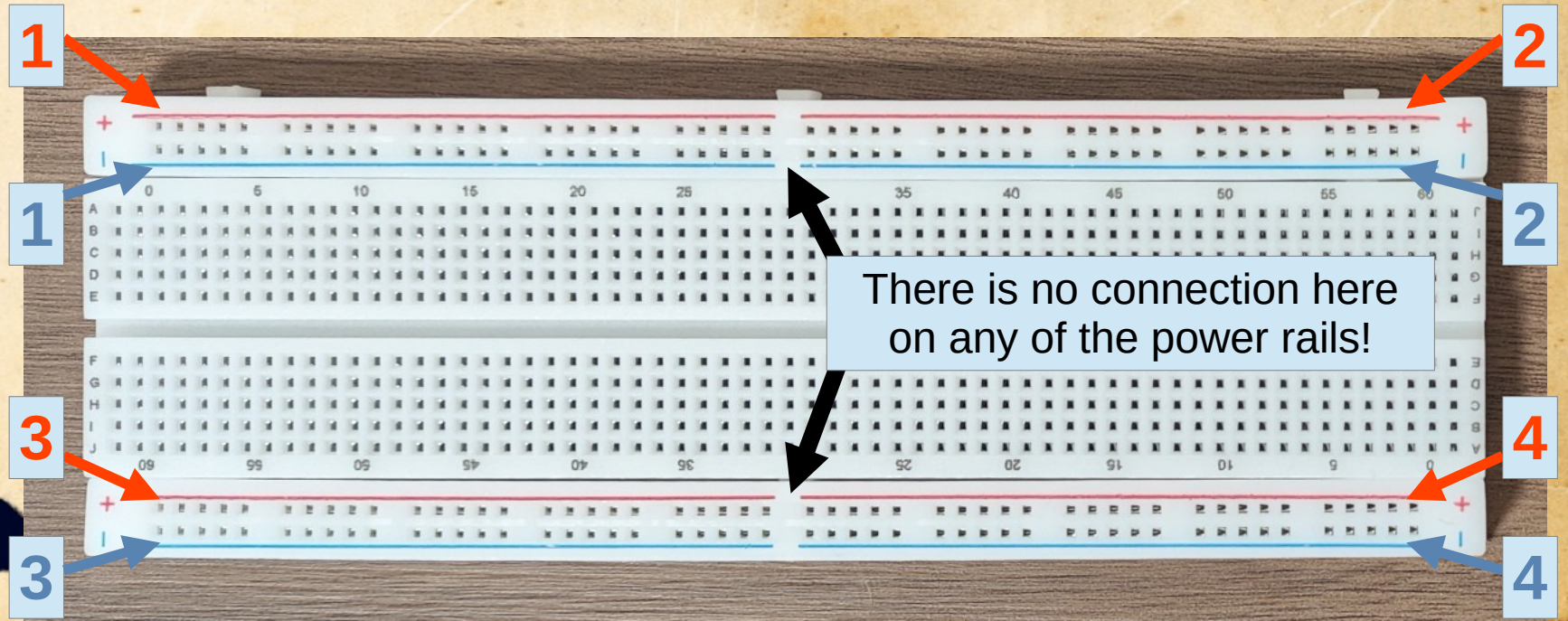
Parts of a Solderless Breadboard

- In each hole, there is a ***terminal*** containing a spring-loaded conductive grip to provide electrical contact.



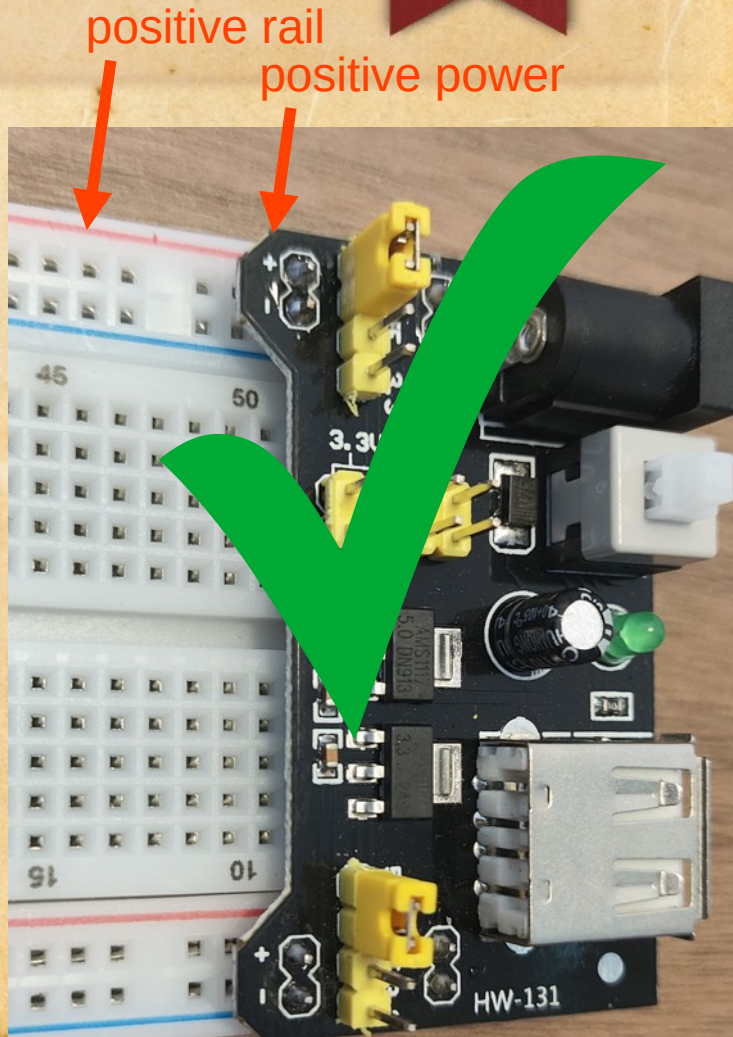
The Power Rails

- There are 4 separate positive and 4 separate negative ***power rails***.
  - The holes next to each red line are connected, and intended for ***positive voltage***
  - The holes next to each blue lines are connected, and intended for ***negative voltage*** (or ***ground***).



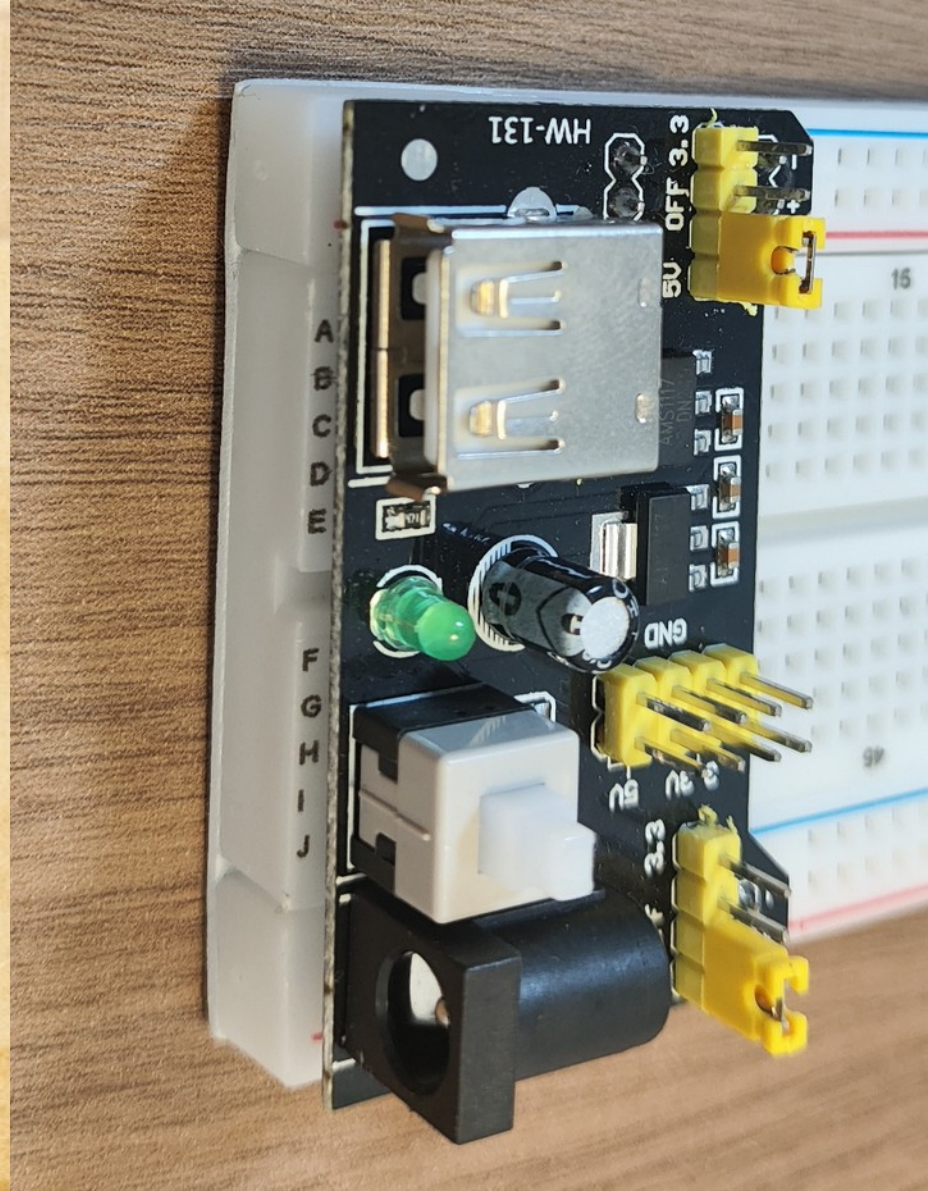
Inserting the Power Supply

When inserting the power supply, to avoid confusion, ensure the positive power is inserted into the correct (`red`) power rail.



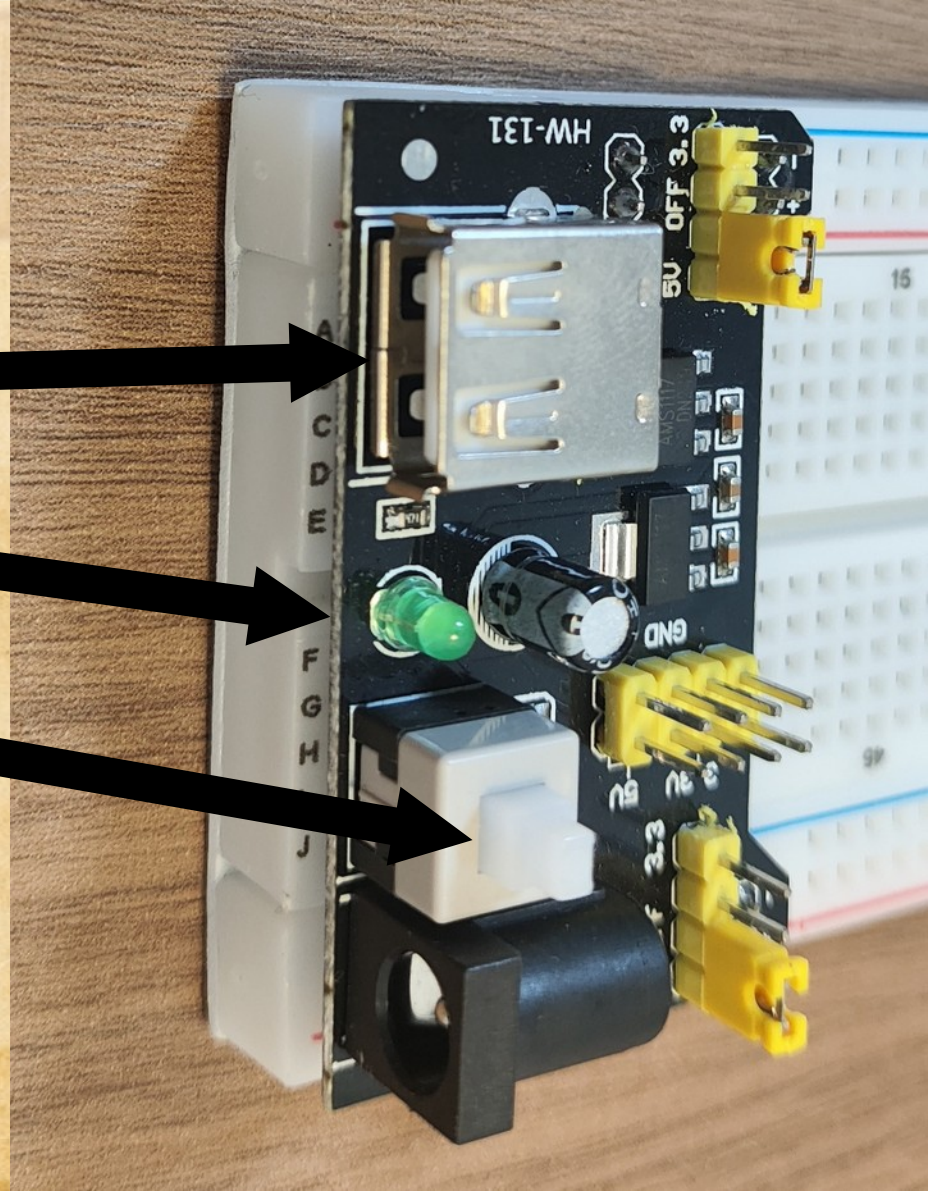
Connecting the Power Supply

- Align the side of the power supply with the side of the board to prevent damage during storage.
- There shouldn’t be a need to remove the power supply during storage.



Connecting the Power Supply

- Connect a USB cable to give power to the power supply.
- The green LED will light when the power is turned on.
- This switch toggles the power on and off.



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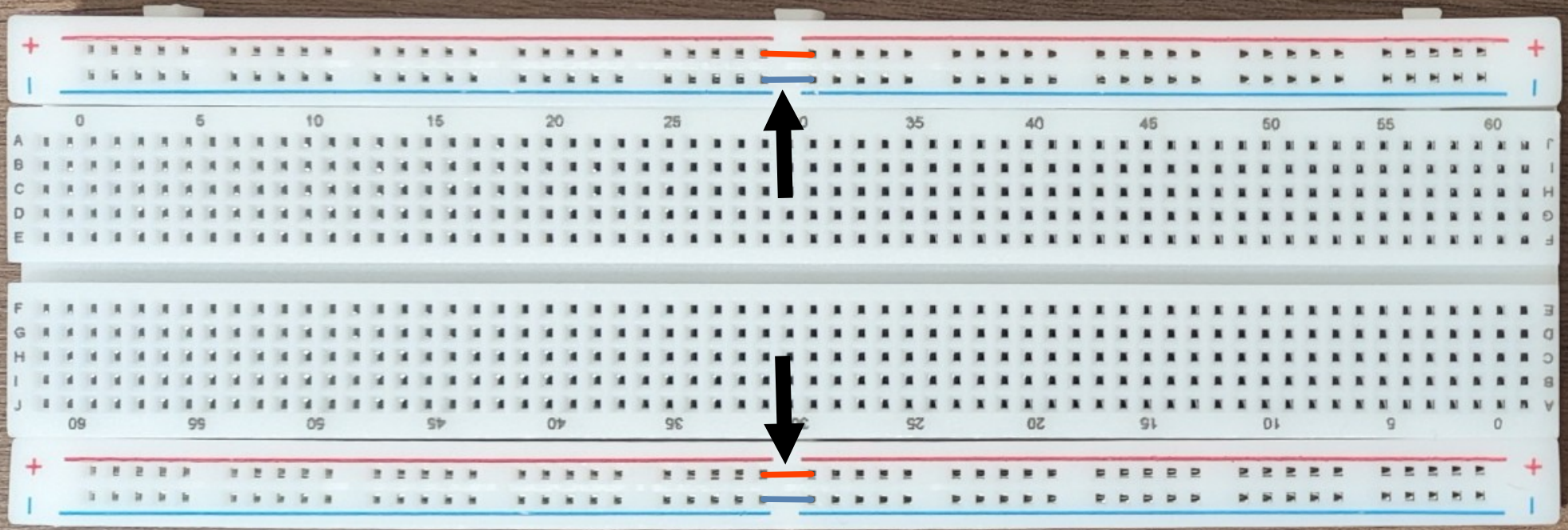
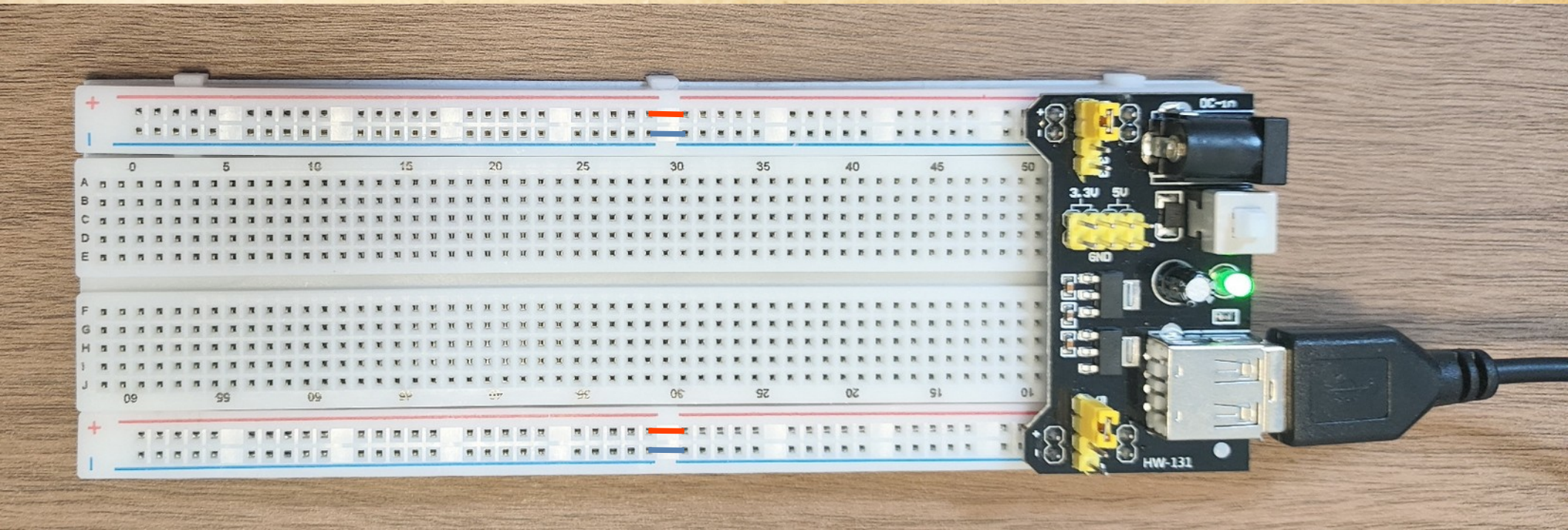
- It may be useful to connect the adjacent power rails with short wires.



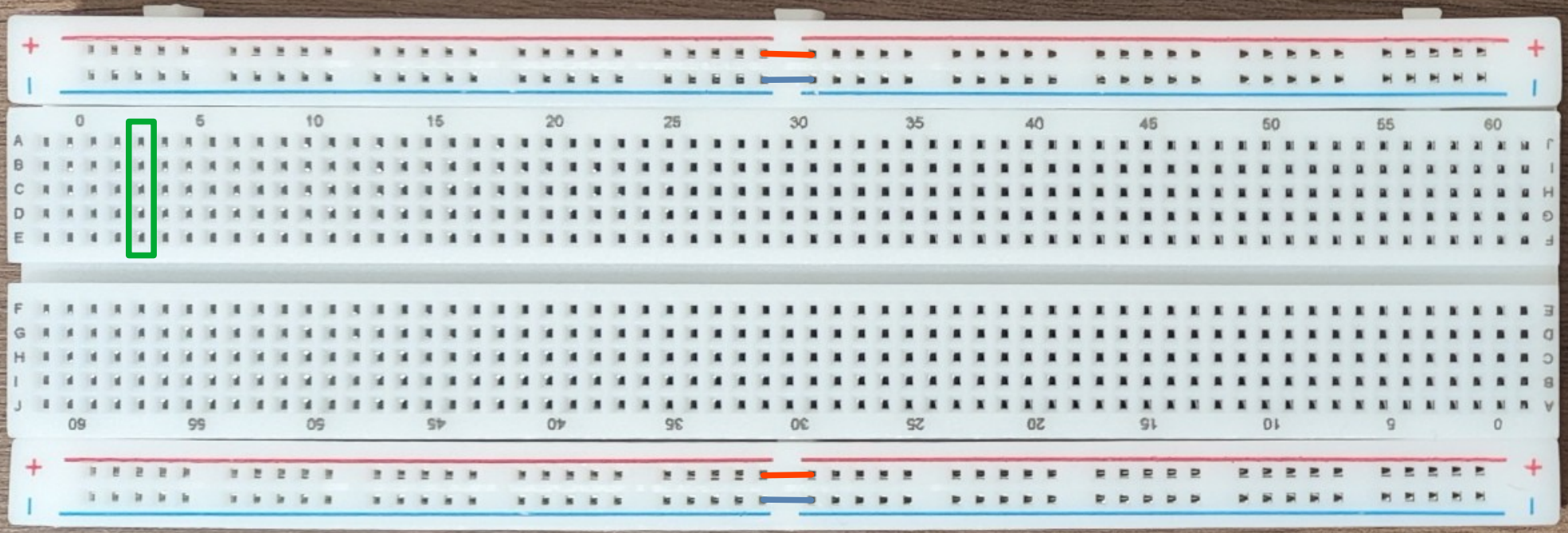
Powered Breadboard

- This shows the breadboard with the power supply inserted, adjacent power rails connected, and the power turned on.



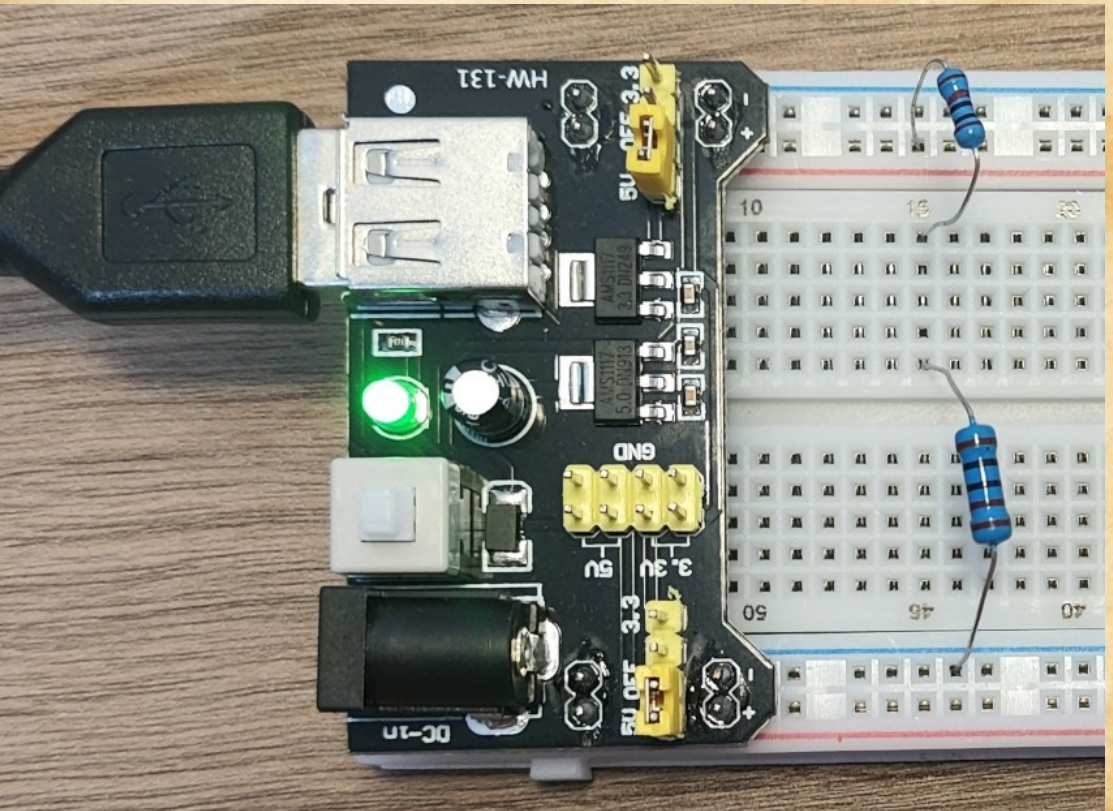
Terminal Strip Connections

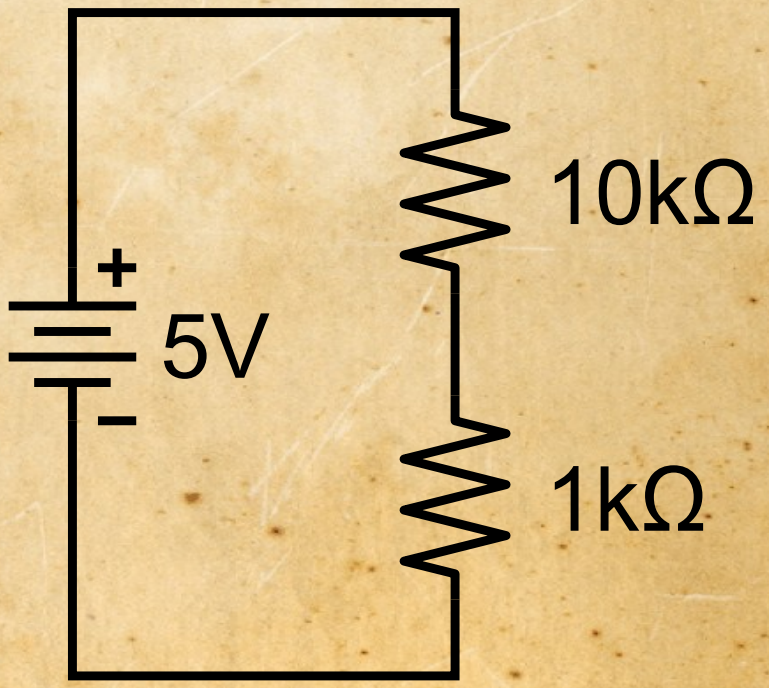
- In the ***terminal strip*** section, the ***terminals*** are connected in vertical columns. There is no connection across the center channel.



Example Circuit

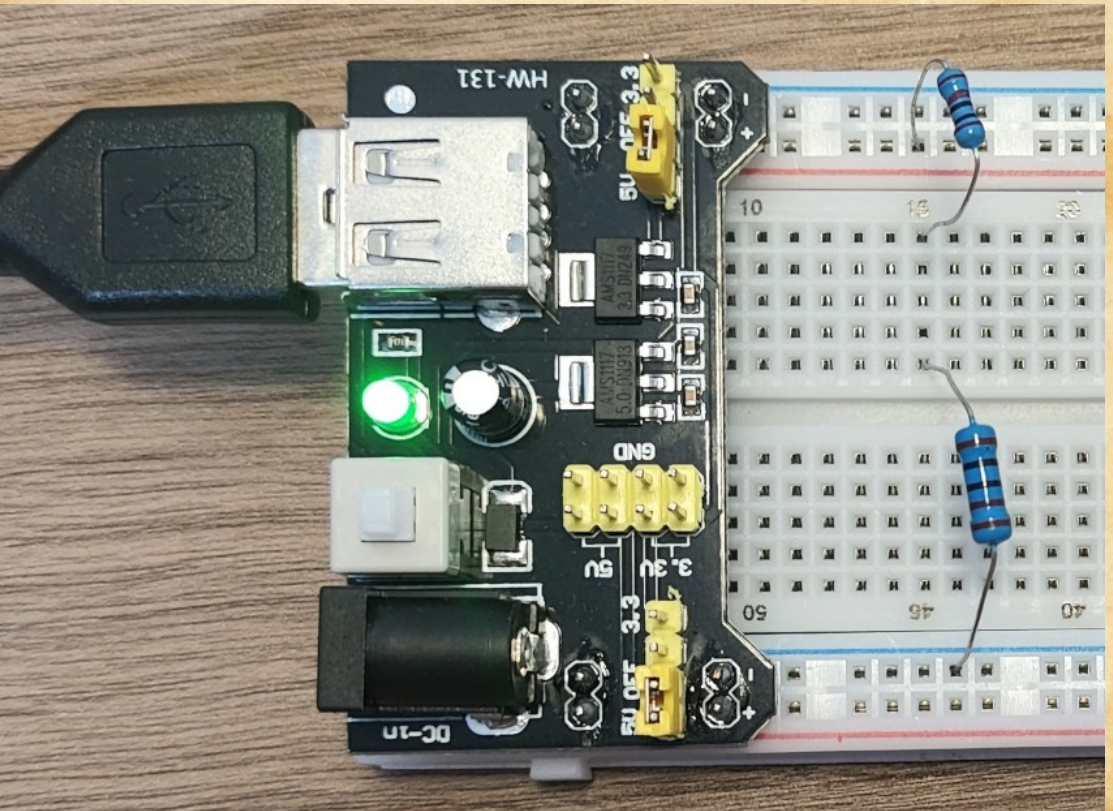
- The circuit on the left is an implementation of the diagram on the right.





Example Circuit

- Current is flowing through the circuit created by these connections:



- The power supply is connected to the positive and negative ***power rails***.
- The upper, smaller resistor is connected to the ***positive power rail***.
- The two resistors are connected together using ***column 15***.
- The lower, larger resistor is connected to the ***negative power rail***.

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