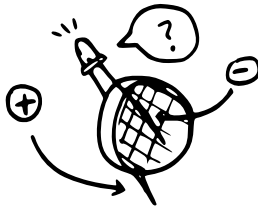


⚠ Troubleshooting Tips for Paper Circuits ⚠

Testing an LED or Battery

An easy way to test if an LED (or battery) is still working is to touch the LED directly to a battery! Make sure the longer LED leg is touching the (+) side and the shorter LED leg is touching the (-) side.



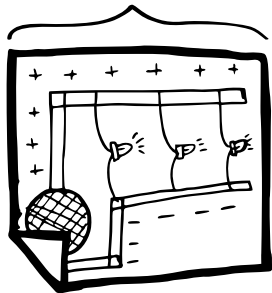
Lighting up more than 1 LED

There are two ways to light up more than 1 LED. If you want to use just 1 battery, you'll need to make a **parallel circuit**, which means that all the LEDs' longer legs are connected to the battery's (+) side and all the LEDs' shorter legs are connected to the battery's (-) side.

You could also chain LEDs together to make a **series circuit**, but this will require extra batteries!

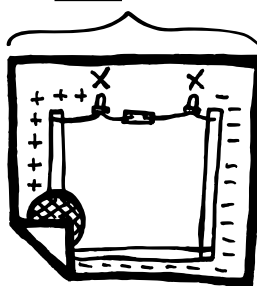
Learn more about parallel and series circuits at: chibitronics.com/parallel-and-series-circuits

Parallel Circuit



This configuration will work with one 3V battery. The battery will drain faster the more LEDs you add in parallel.

Series Circuit



This configuration will not work with one 3V battery. The circuit requires more voltage to complete the loop.

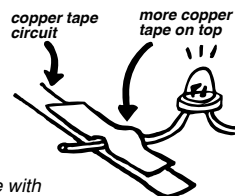
Using Different LED Colors Together

If you're using different color LEDs in your circuit, make sure they require the same voltage! Otherwise, the circuit might not light up very well. Many standard LEDs are split up like so:

- > Green, Blue, White (each 3-3.2 volts)
- > Red, Yellow (each 2-2.2 volts)

Securing LEDs with Copper Tape

Sometimes, a circuit looks completely correct, but the LEDs are flickering, dim, or not lighting up at all. If this happens, **check your connections!** Try patching corners or securing the LEDs with more copper tape*. You can also use a multimeter to find broken connections.

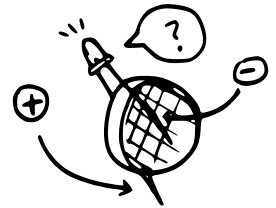


*Copper tape will only work as a patch if it has conductive adhesive. Copper tape with conductive adhesive typically comes on a roll with a green center.

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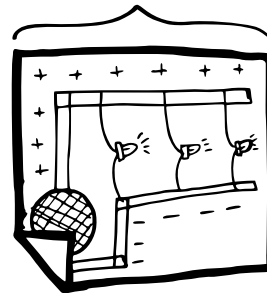
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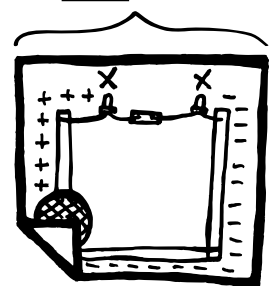
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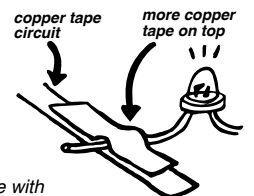
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