

## ONE LAST THING!

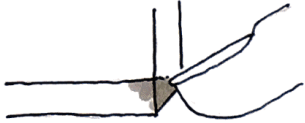
HOW TO FOLD COPPER TAPE



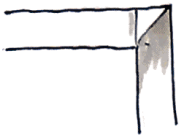
Lay out a piece of copper tape.



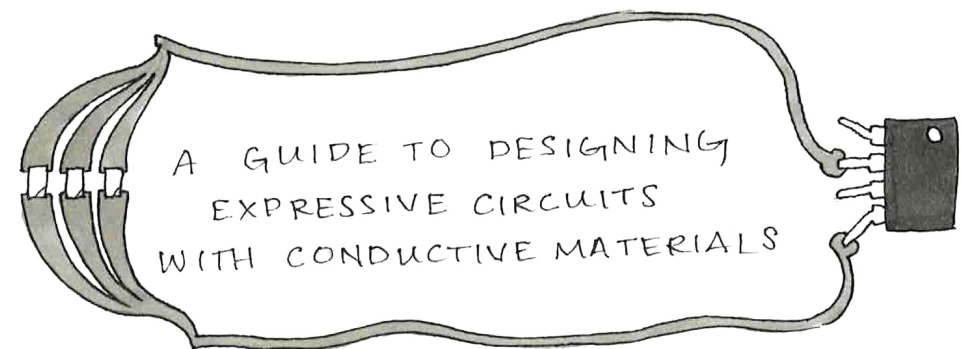
Pull it at a 90° angle




Press the little triangle that forms and hold as you fold it back down.



Press. Voila! A corner with no soldering required.



A GUIDE TO DESIGNING  
EXPRESSIVE CIRCUITS  
WITH CONDUCTIVE MATERIALS

What exactly is a...  

**Circuit**  
 and...

HOW DOES ELECTRICITY MOVE?

ELECTRON

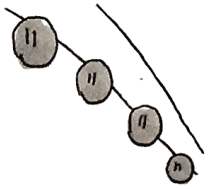
Hi!

A stream of moving electrons creates an ELECTRICAL CURRENT.

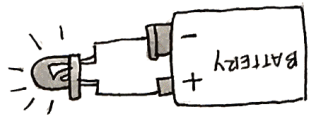
Electrons want to move from a point of GREATER OR LESSER electrical energy (E).

GREATER ELECTRICAL

LOWER ELECTRICAL



A CIRCUIT IS A PATH FOR ELECTRICITY TO FLOW.

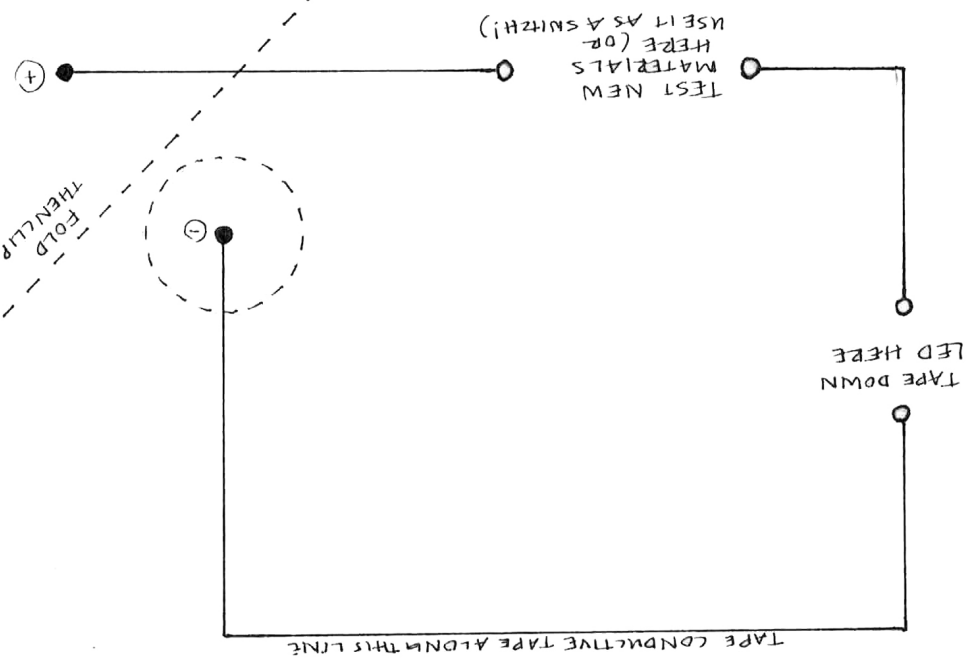


POWER connection positive

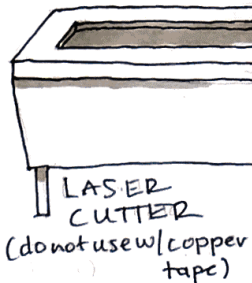
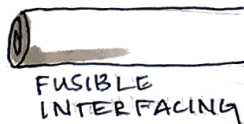
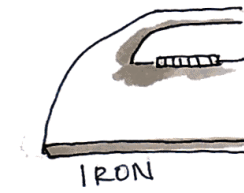
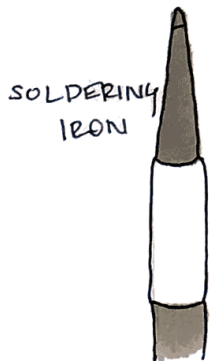
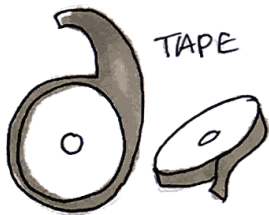
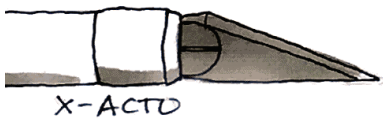
GROUND negative connection

# TROUBLE SHOOTING

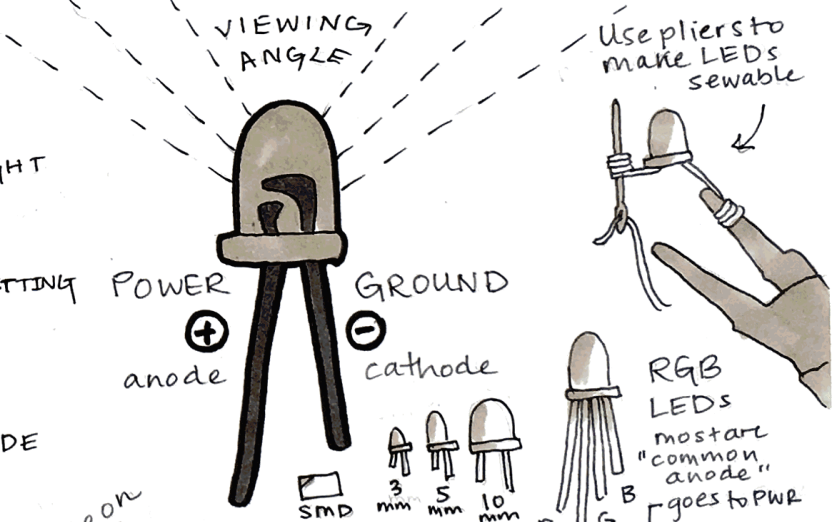
- IS THE CONNECTION STRONG ENOUGH? (SOLDER!)
- IS YOUR LED THE RIGHT WAY?
- IS YOUR BATTERY THE RIGHT WAY?
- IS YOUR BATTERY DEAD?
- DO YOU HAVE A SHORT CIRCUIT? CHECK ANY CROSSED LINES.



# TOOLS + TECHNIQUES ~

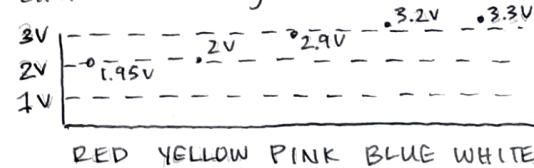


**L**IGHT  
**E**MITTING  
**D**IODE

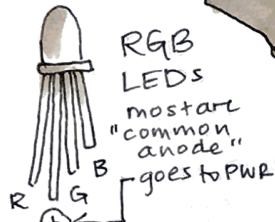


anode on voltage

Different colors have different voltage needs:



Diode means electricity can only flow through it in one direction

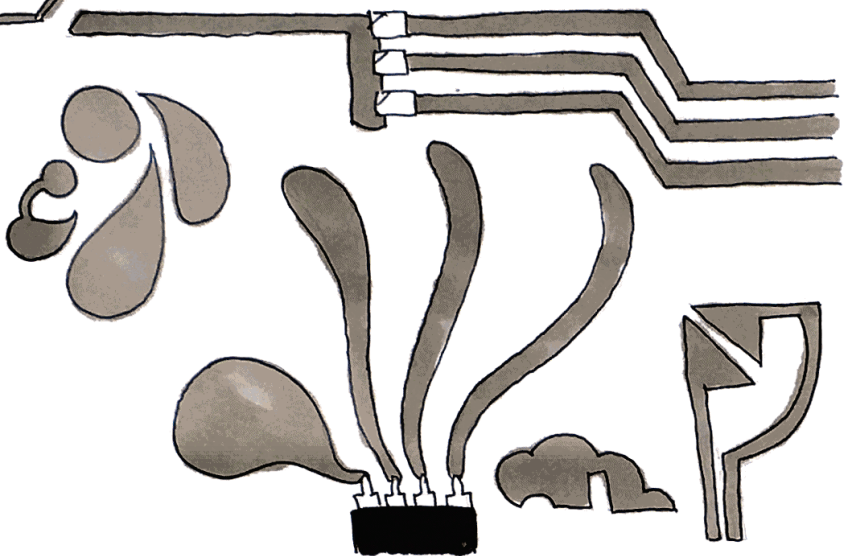


LEDs need 20 mA to be at max brightness

SHAPE + FORM

You are not constrained to the efficiencies of hard PCBs.

AESTHETICS

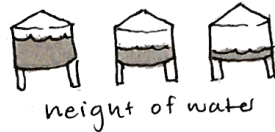


MAKE YOUR CIRCUIT EXPRESSIVE

VOLTAGE

VOLTS V

Electrical pressure or force between two points.



HIGH POTENTIAL

LOW POTENTIAL



CURRENT

AMPS I

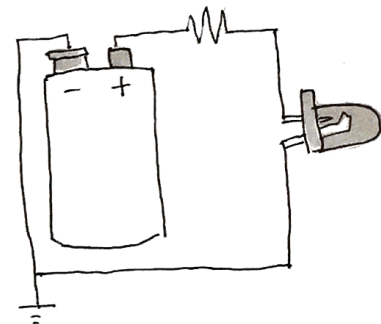
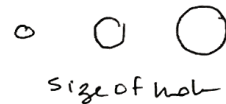
Rate at which electrical charge flows.



RESISTANCE

OHMS R

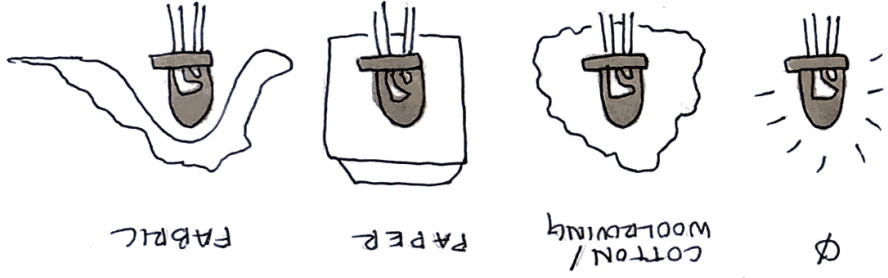
The amount of material that resists the flow of current.



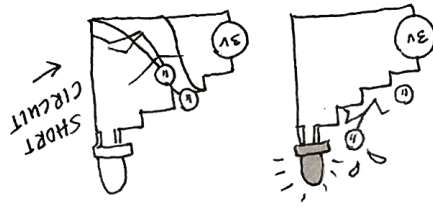
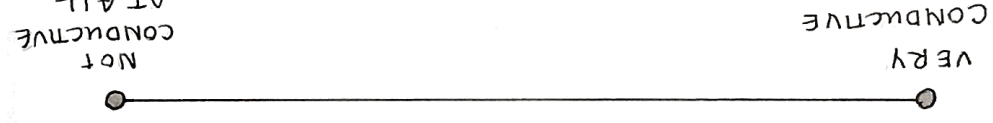


LIGHT IS A POWERFUL SOURCE OF FEEDBACK. Remember that the behavior and look of light can deliver an emotional impact. Play with different materials to get different effects.

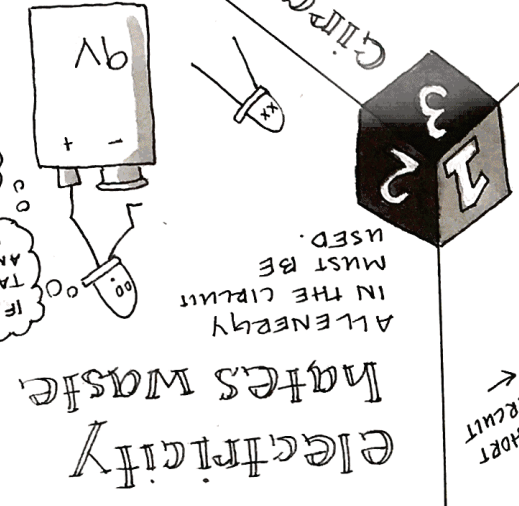
# DIFFUSION



# Conductor INSULATOR



Electrons are LAZY and follow the path of least resistance to GND.

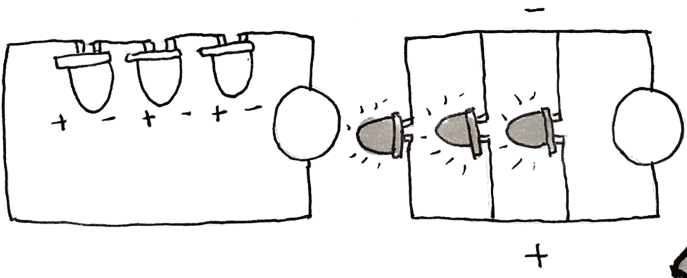


CIRCUITS ARE systems ARE



# MOMM LEDS

You can string LEDs together in 2 ways:



same electrical path	2 different paths
split	same
same	split
CURRENT	VOLTAGE