

The background of the image is a close-up of a light-colored, textured fabric. It features a repeating pattern of small, overlapping, teardrop-shaped elements. Each element has a central, glowing yellow-green circular spot, giving the fabric a shimmering, futuristic appearance. The lighting is soft, highlighting the texture and the individual glowing points.

# Smart Textiles

*Soft Fabrication Skills*

## What is it?

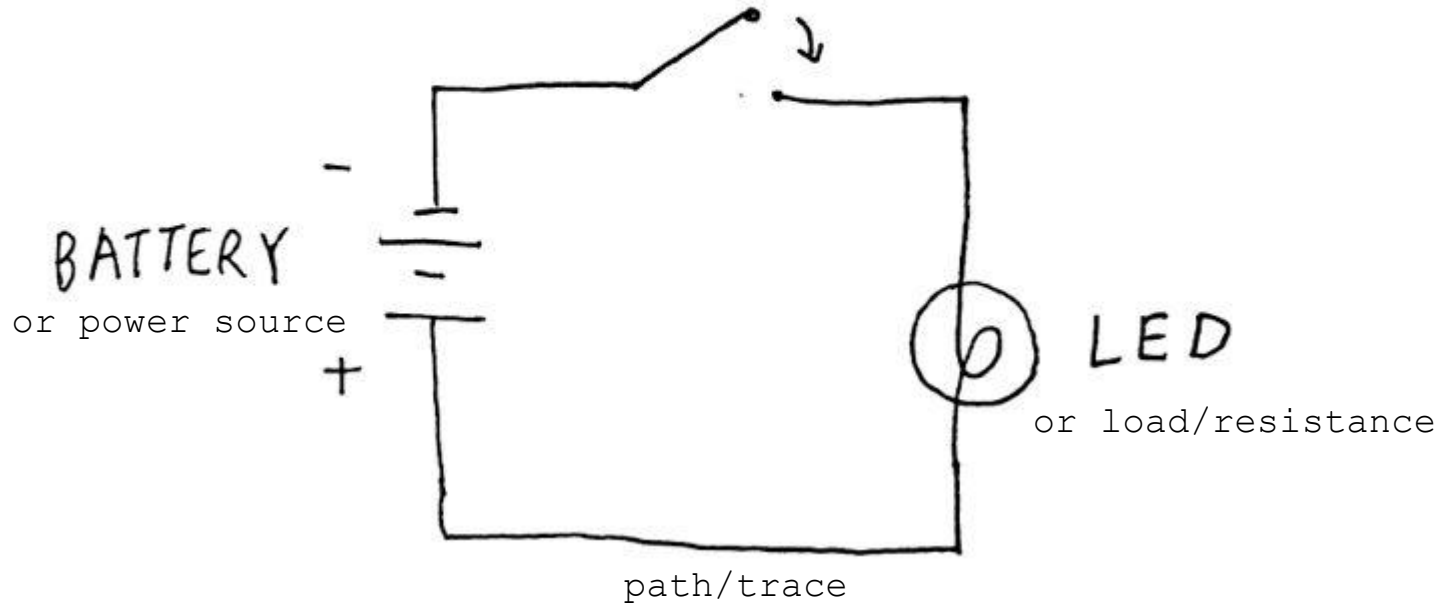
- Textile materials embedded with digital and electronic components
- Textiles that can react to environmental stimuli
- e-textiles, soft circuits, wearable tech, wearable electronics...



# Materials Overview

# Basic Circuit

SWITCH or sensor



# Path: Making Connections



conductive thread  
(stainless steel / silver)



conductive fabric  
(wide variety!)



conductive ink  
(drawing/printing)

# Switches



zippers



beads

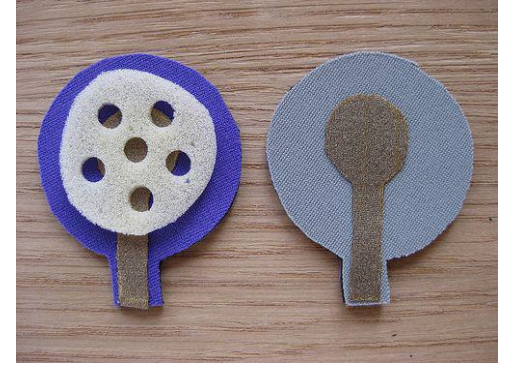


buttons

Make sure you test!



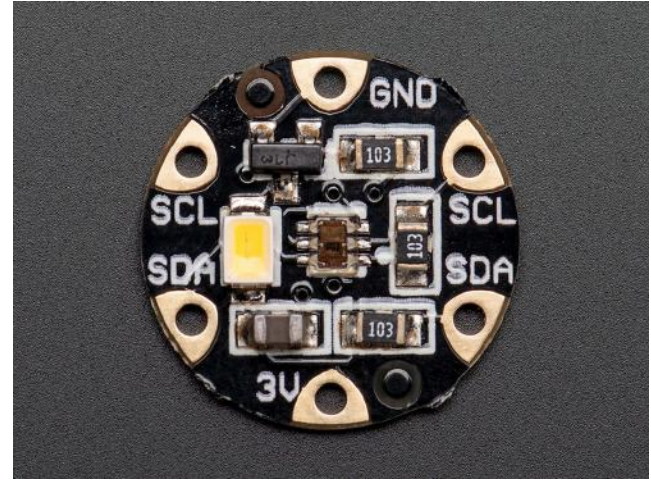
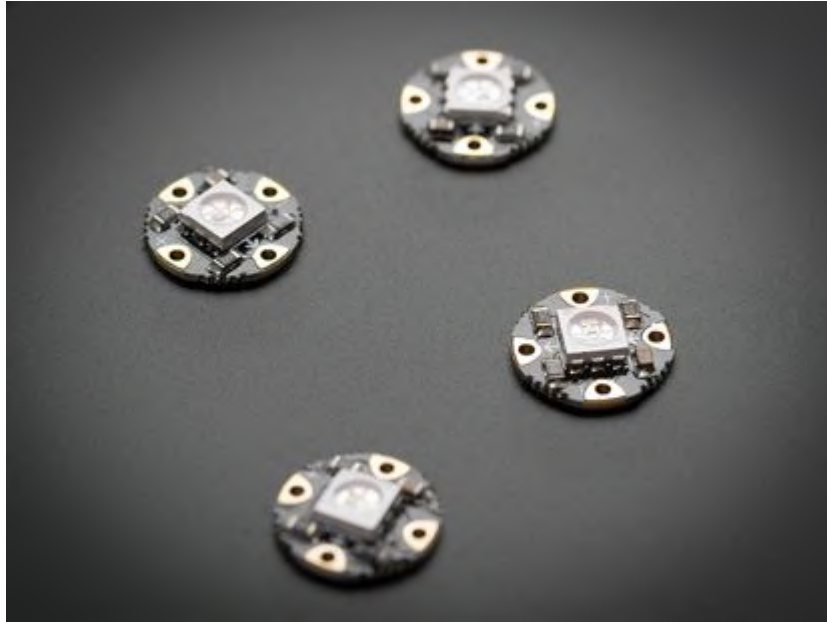
# Sensors



**from top left:**  
stroke sensor,  
knit/crochet sensor,  
soft push button,  
pom pom switch,  
fabric potentiometer

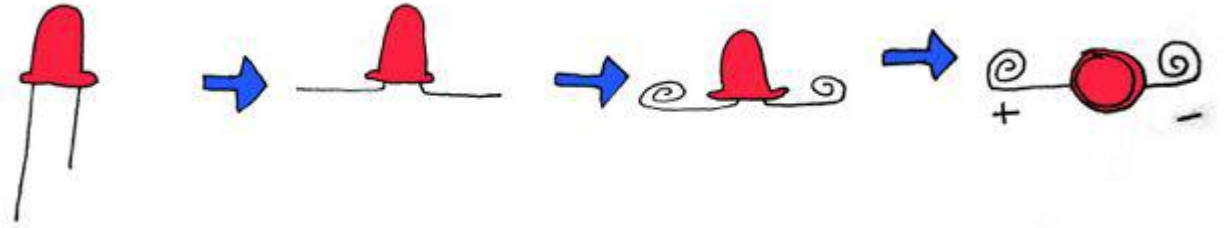
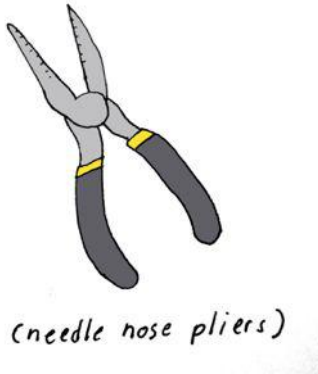


# Adding Electronic Components



sewable components from Adafruit

# DIY Sewable Electronic Components



good for diodes, capacitors and other things with "legs"

For those with soldering experience...



Solder sewable connections onto SMD (surface mount) LEDs

# Shape Memory Alloy



# Thermochromic Ink and Dyes



Maggie Orth - Dynamic Double Weave

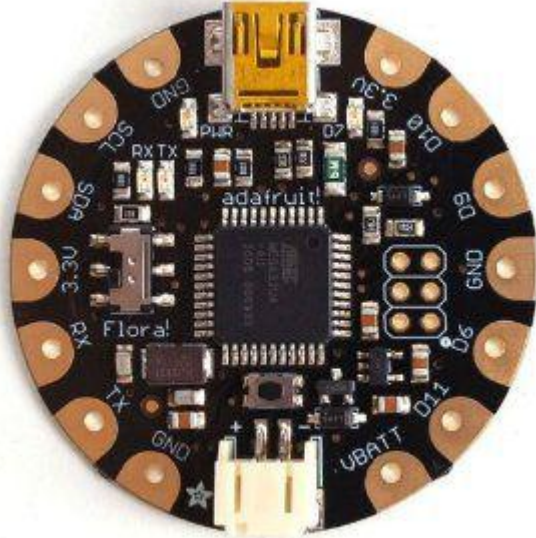


Nikolas Bentel - Aerochromic

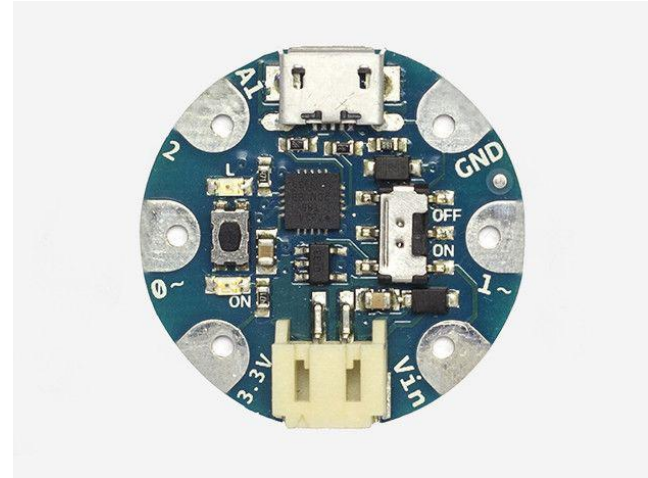


- Leuco dyes- switch between two chemical forms (color and colorless)

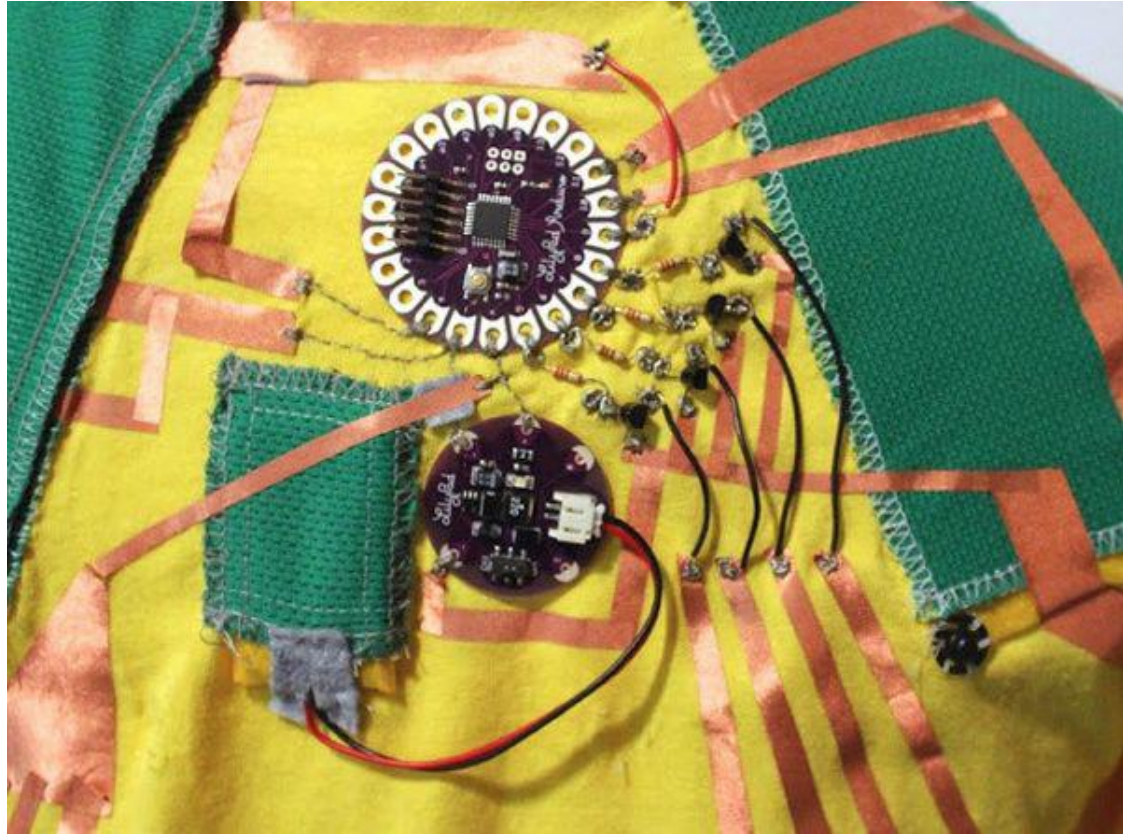
# Sewable Microcontrollers



Adafruit Flora



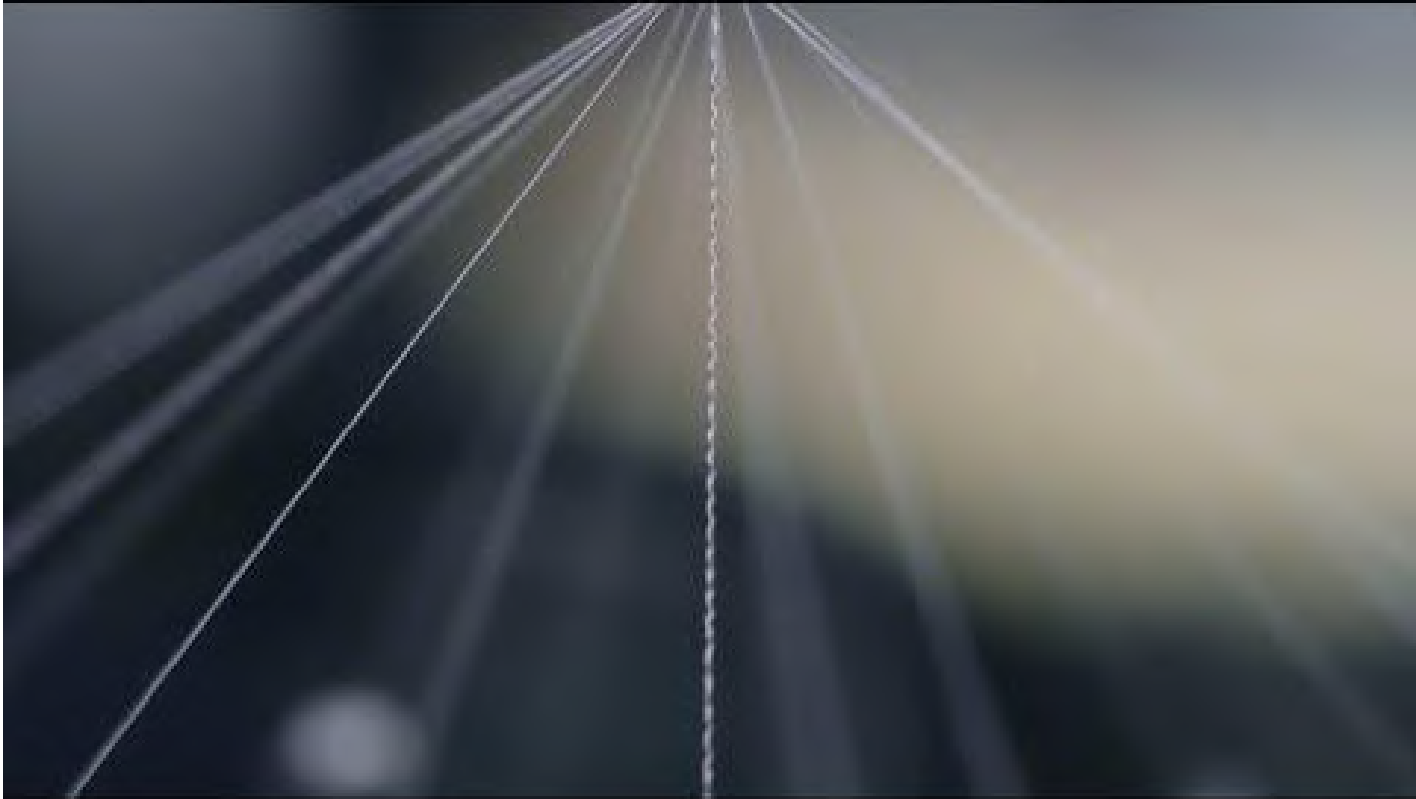
Arduino Gemma



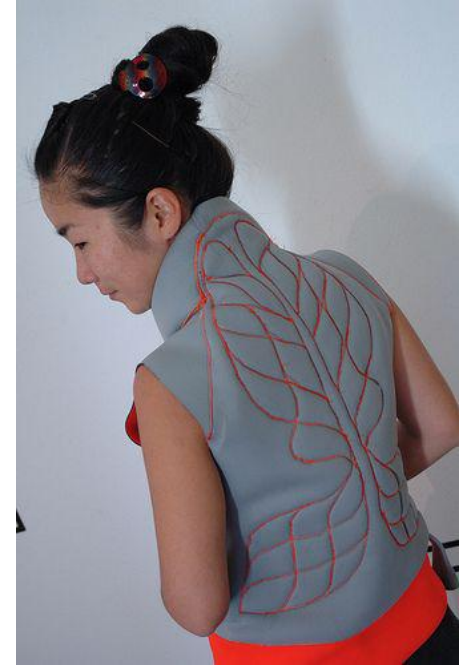
Arduino LilyPad with FTDI plug-in!



Google Jacquard



# Kobakant: *Massage Me*



# Miu miu gloves

## Anatomy of a Glove

### Electronics



### Optimised for Music



# T.Ware's T. Jacket



Social Body Lab: *Prosthetic  
Technologies of Being (Nautilus)*





© Microsoft Research

Haley Profita + Microsoft Research: Lightwear

For Seasonal Affective Disorder



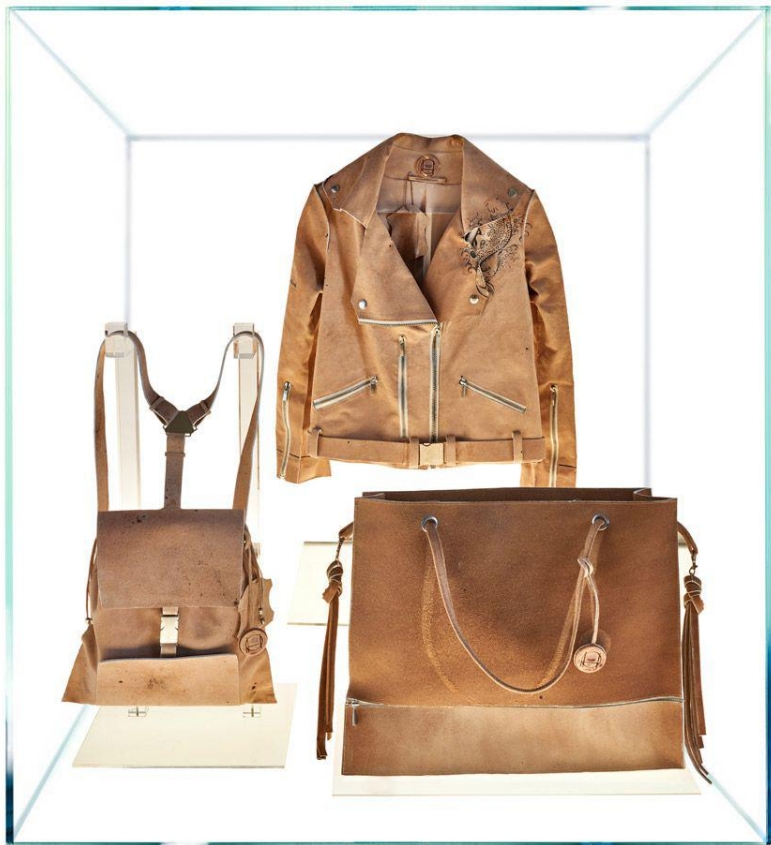
Cute Circuit + EasyJet: Engineer uniforms for airplanes

# Kombucha Leather

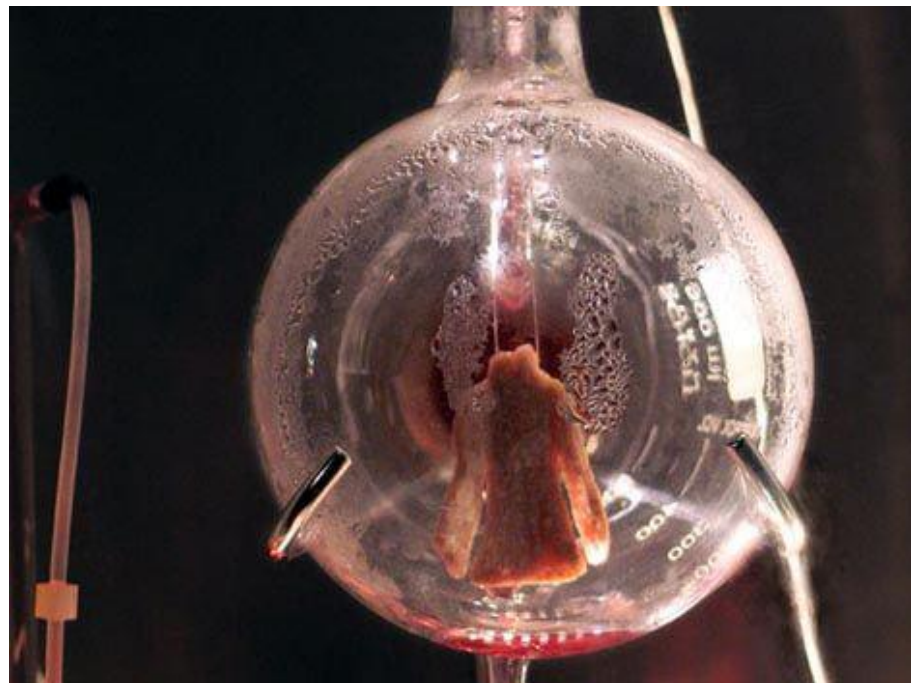
SCOBY: Symbiotic Culture of  
Bacteria and Yeast







Tina Gorjanc: *Pure Human*



Symbiotica: *Victimless Leather*

Jae Rhim Lee: *Mushroom Burial Suit*





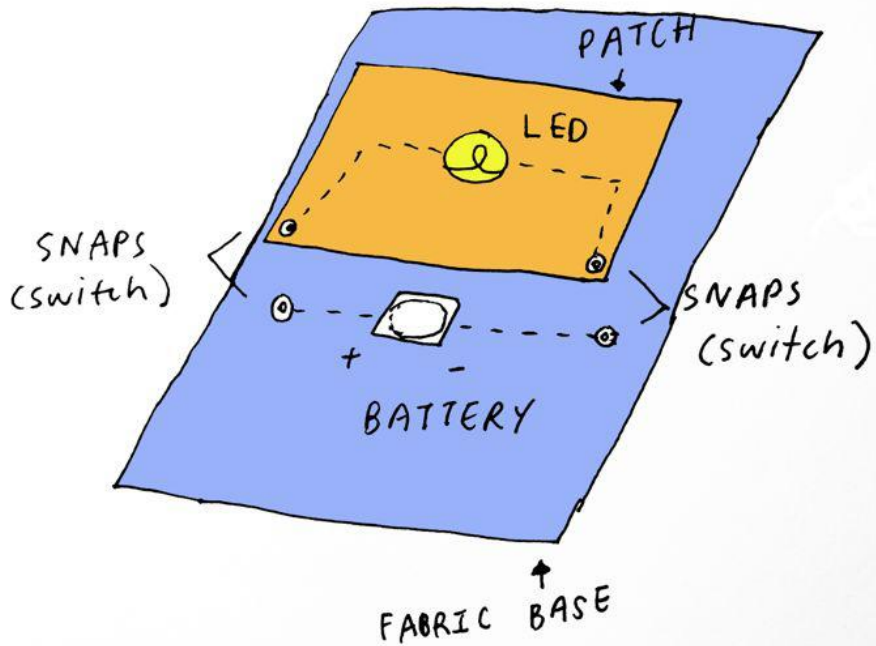
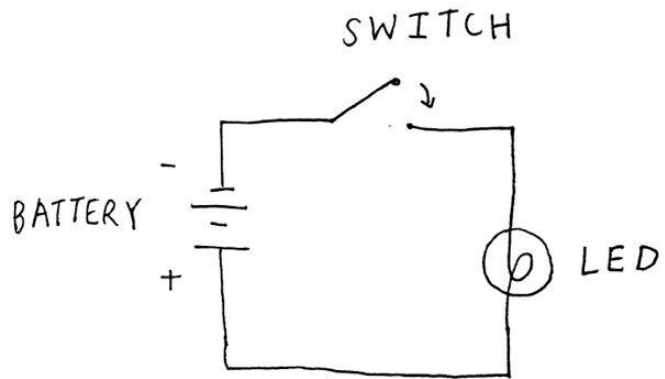
<https://vimeo.com/142208383>

Biologic - Lining Yao

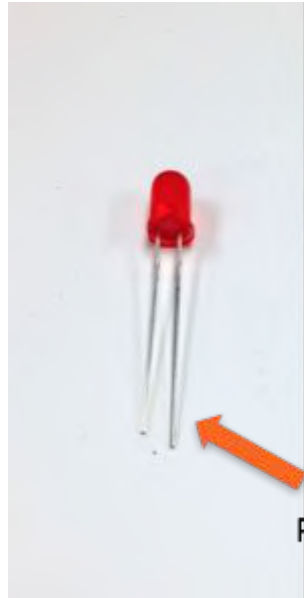
*DEMO TIME !*

# Sewn LED Patch





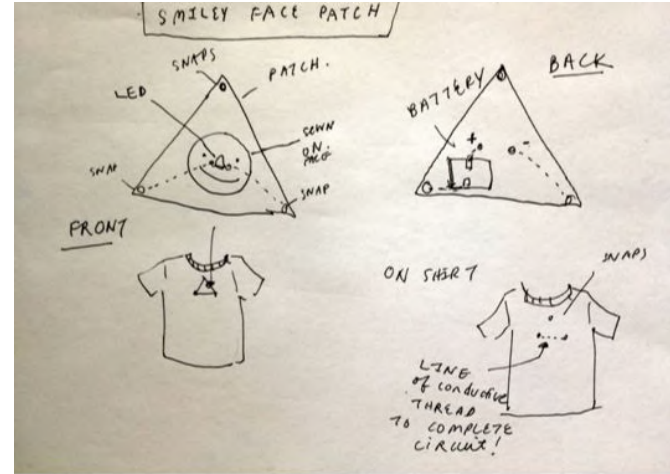
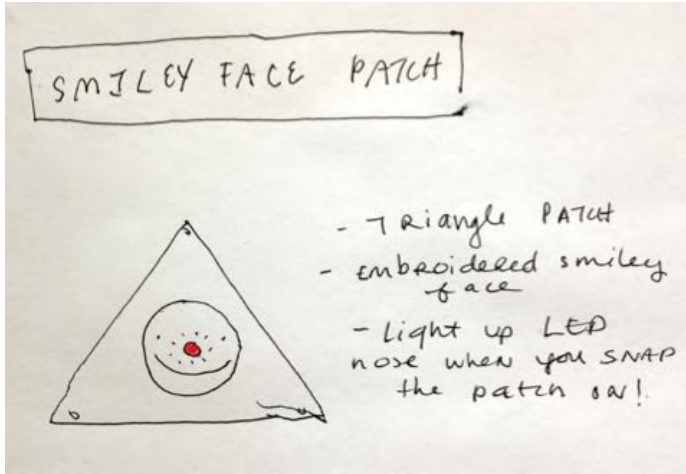
# Important note!



Positive side



# Design it



- Draw out what you want to make!
- Make sure you include placement of traces and components



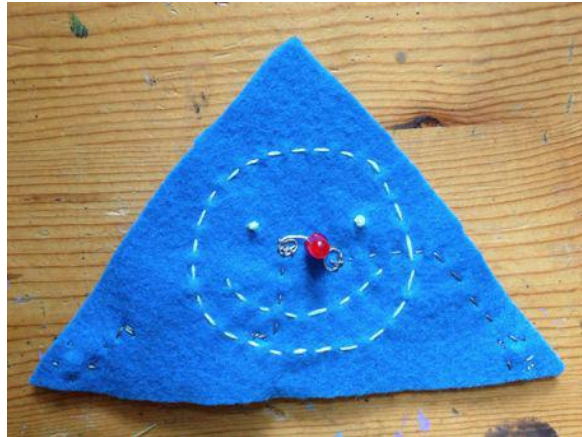
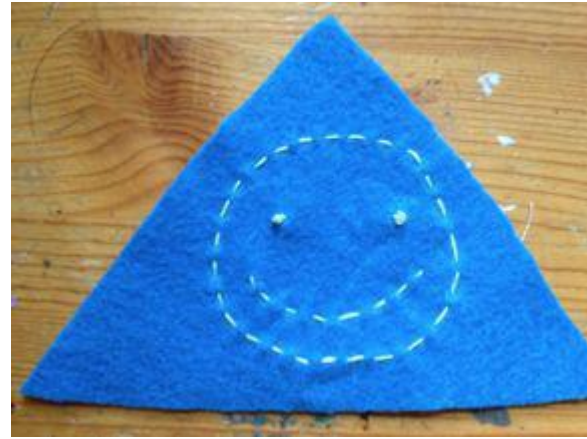
## Important note!

Do not connect the legs of the LEDs or both sides of the battery pack together. When this happens, you are creating a short circuit!

Current likes to the flow through the path of least resistance and will not provide current for your components if they are connected this way!

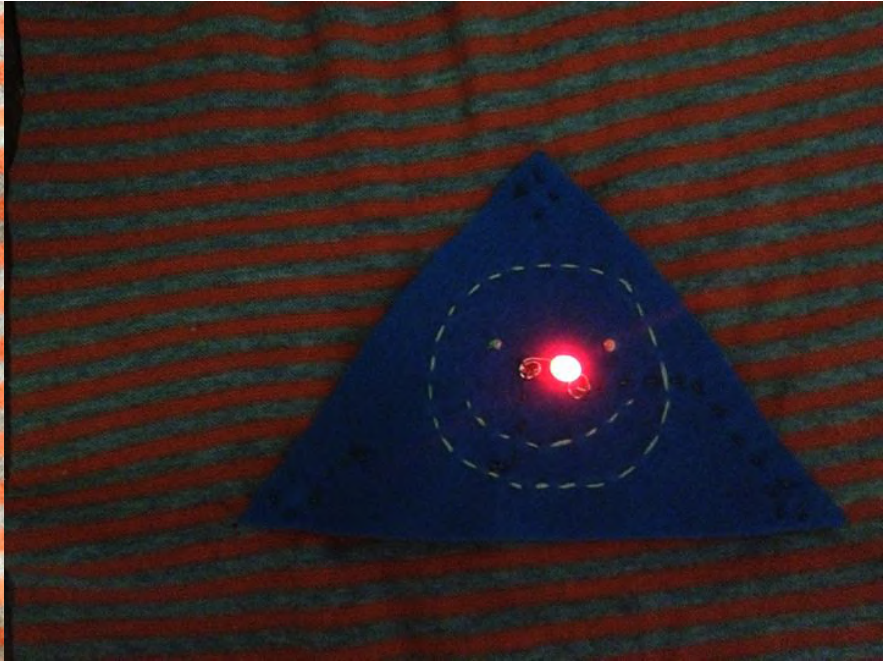
Yes you will have to tie and knot off your thread.

Sew it



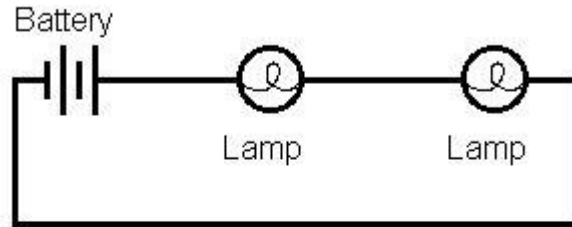
Sew it some more



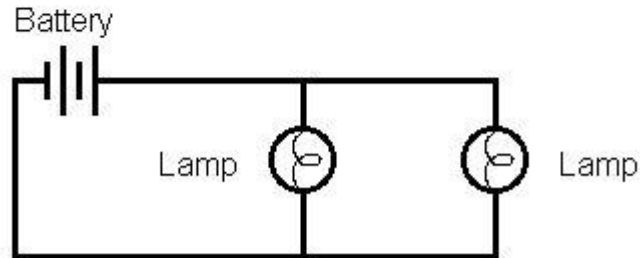


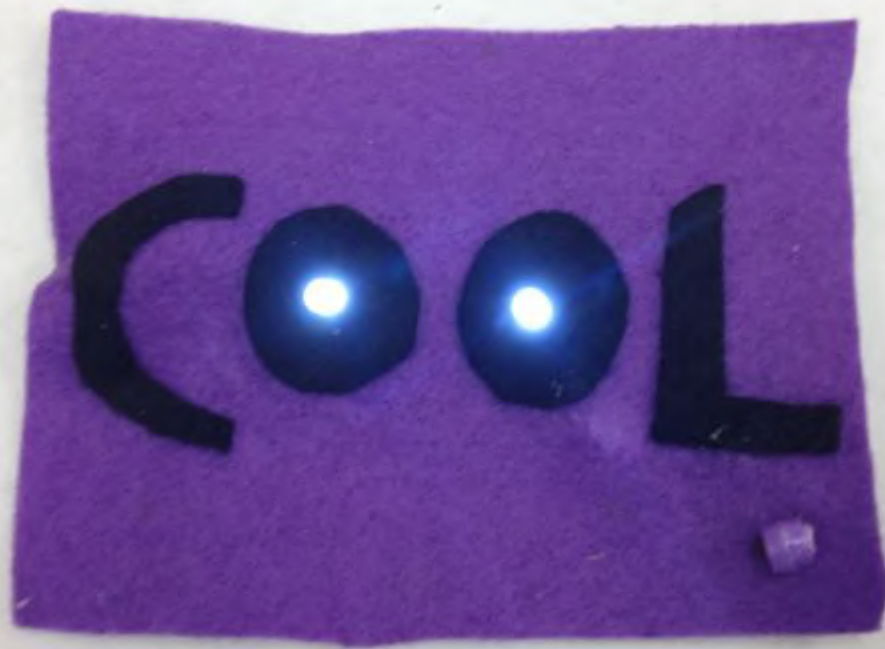
# Adding More Lights: Series & Parallel

## SERIES



## PARALLEL





# Troubleshooting

- Is your battery and/or LED connected the right way?
- Do you have any short circuits? Are any of your threads touching each other?
- Is your thread making secure connections with components?

# Additional Resources

## Tutorials

- [Kobakant: HOW TO GET WHAT YOU WANT](#)
- [Make: Wearable Electronics](#)

## Materials

- [lessEMF](#)
- [adafruit](#)
- [sparkfun \(conductive thread spool\)](#)