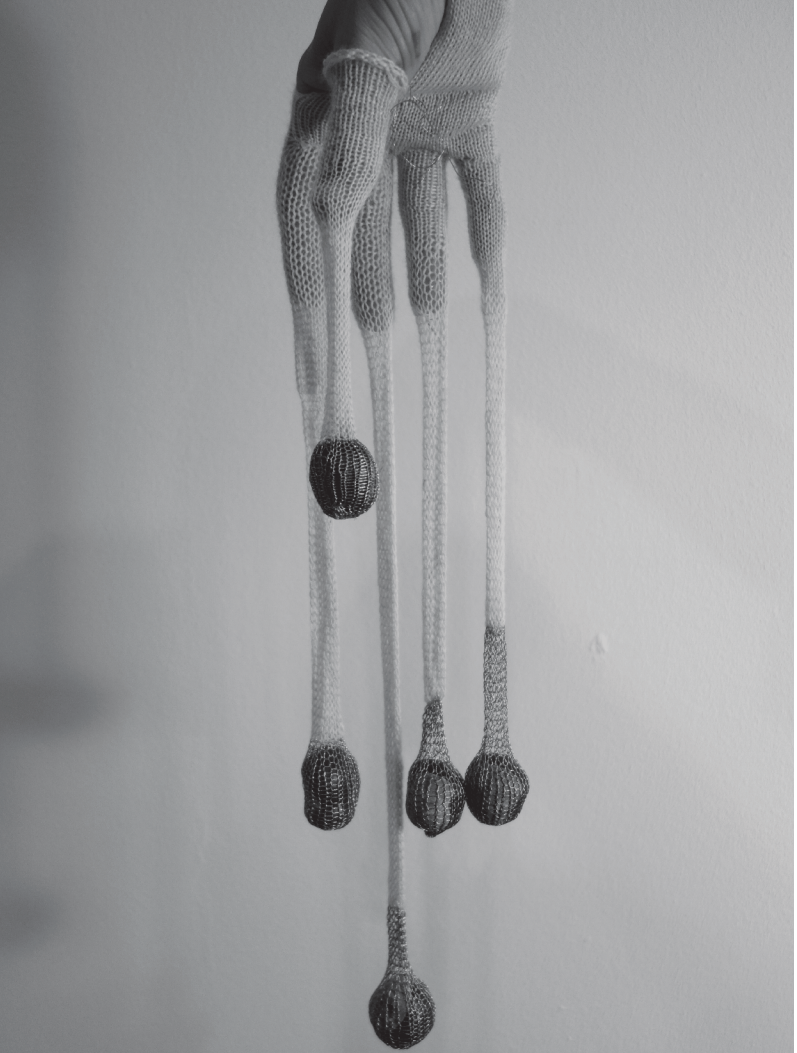
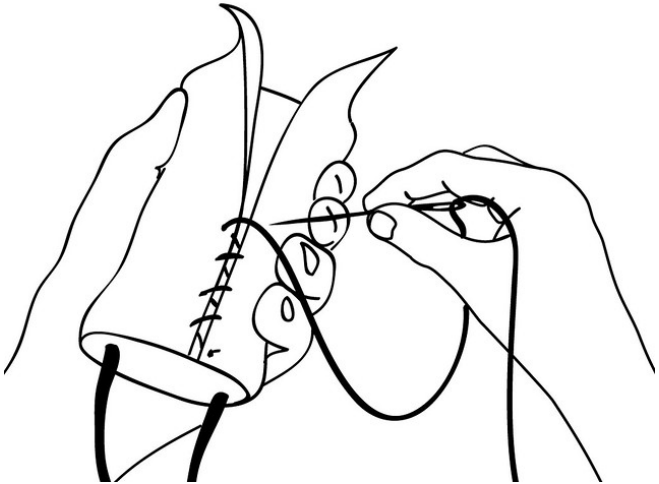
MATERIAL_ADVENTURES

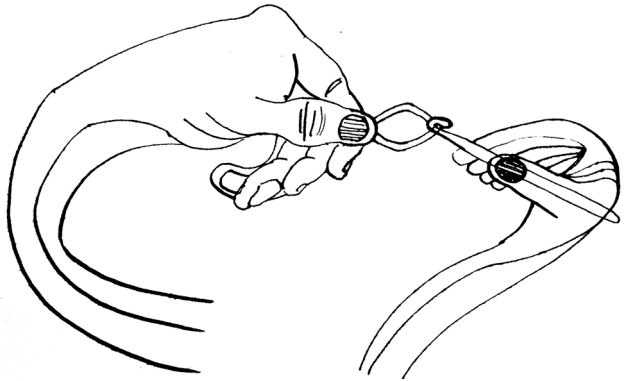
THE_BOARDGAME_V2

AN ADVENTURE GAME FOR HUMANS AND OTHER MATERIALS
TOGETHER YOU SET OFF ON A JOURNEY
HOPING TO DISCOVER SOMETHING INTERESTING
THE GOAL IS TO RETURN FROM YOUR ADVENTURES
FULL OF STORIES TO SHARE

LEVEL2_THE REMAKE







HACKING THINGS OPEN AND
SEWING THEM BACK TOGETHER

LEVEL2_THE REMAKE

EINLEITUNG_

INTRODUCTION_

REMAKE_
TO TAKE APART AND PUT TOGETHER ANEW

Taking parts apart to understand basic electronics then making them SOFT&STRANGE with e-textile materials.

See the FURTHER_READING_WATCHING_LISTENING section at the end of this zine for more.

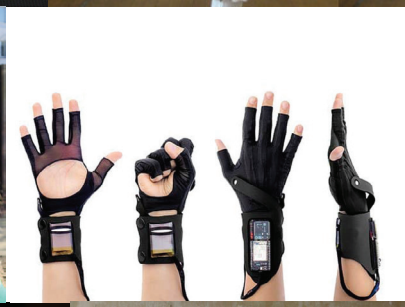
THE_SCHEDULE_

	2woche LEVEL_2: THE REMAKE [textile sensors]			
25KW	DI	MI	DO	FR
10-11	kick-off	play/remake	intro: sensors	project
11-12	take apart (digi)	play/remake	take apart (ana)	project
12-13	PAUSE	PAUSE	PAUSE	PAUSE
13-14	intro: electronics	play/remake	play/remake	document
14-15	meet the materials	play/remake	play/remake	document
15-16	remake	play/remake	play/remake	present&feedback
16-17	remake	publish&exchange	publish&exchange	

legende		
	live video	alle sind im video-call. calls dauern max. 45min, mit 15min pause!
	live chat	hannah ist online und live* erreichbar per chat (und video wo nötig). *hannah antwortet auf fragen innherhalb 1-3 minuten. (((teilnehmer müssen nicht live im chat erreichbar sein)))
	slow chat	hannah schaut 1x pro stunde in den chat um fragen zu beantworten. dringende fragen können per anruf gestellt werden. (((teilnehmer müssen nicht nicht in den chat schauen)))

CONTENTS_

ETEXTILES_



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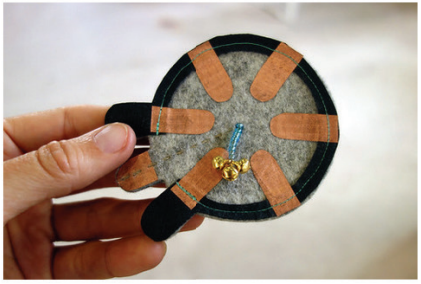
SENSORS

TILT POTENTIOMETER II



Instead of treating each conductive peta
of the this fabric tilt sensor as an indivi
digital input, the petals are connected t
resistive fabric ring. The end petals in th
“resistor ladder” connectto GND and VC
create a voltage divider (just like inside
potentiometer) and the bead makes for
[…]

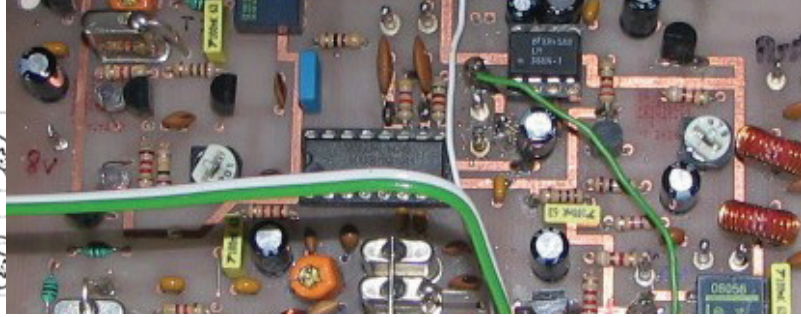
MATRIX: SOFT FABRIC

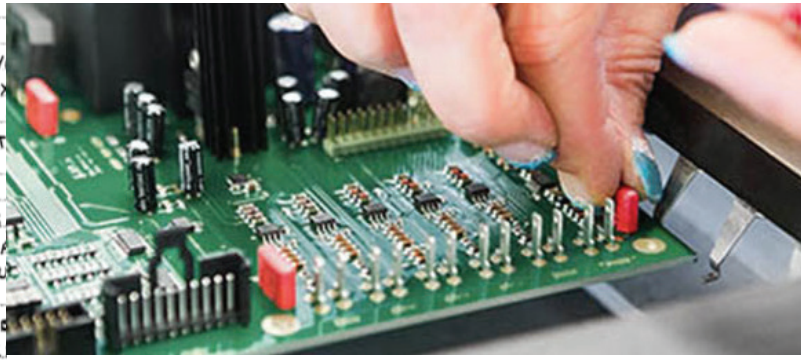
10 x 10 matrix: Photos >>
https://www.flickr.com/photos/plusea
/72157680387415118 TinyTextileTouchp
rSkin Matrix rSkin – Open Source Robot S

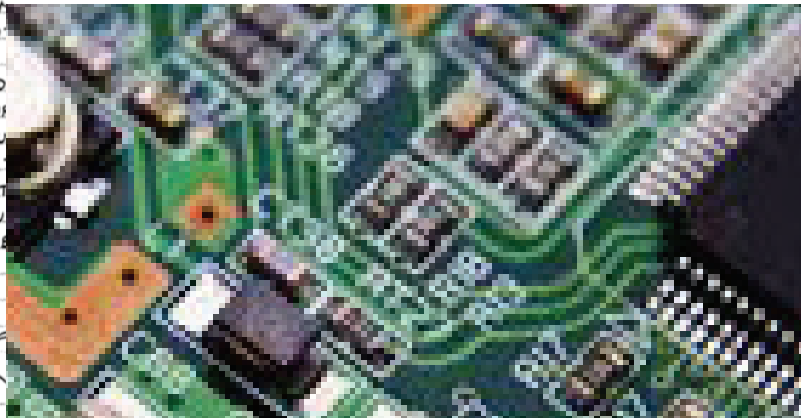
ELECTRONICS

PARTS_


IN THE PAGES THAT FOLLOW YOU'LL FIND OUT HOW THESE AND OTHER ELECTRONIC PARTS WORK. AND YOU'LL LEARN HOW TO USE THEM IN WORKING ELECTRONIC CIRCUITS. LIKE ... LIGHT FLASHERS, TIMERS, AMPLIFIERS, DIGITAL LOGIC CIRCUITS, POWER SUPPLIES, SOUND GENERATORS AND MANY OTHERS. AFTER YOU COMPLETE THIS BOOK, YOU'LL BE ABLE TO IDENTIFY AND USE ALL THE COMPONENTS SHOWN ON THIS PAGE! THEY INCLUDE A TRANSFORMER, DIODES, RESISTORS, CAPACITORS, ZENER DIODES, TRANSISTORS, VOLTAGE REGULATORS AND INTEGRATED
...THE ELECTRONICS AGE.
ELECTRICITY
Y
AN
TO
START
WORKING
ELECTRONIC
AND CIRCUITS
AHEAD TO CHA
TWO. WHEN YOU
TIME, BE SURE
GO OVER THE RE
OF THIS CHAPTE
YOU'LL LEARN SO
BASIC FACTS ABOU
ELECTRICITY THAT
GIVE YOU A SOLID
FOUNDATION FOR FU
LEARNING. AND YOU
FIND OUT HOW
CREATE AND DE
ELECTRICITY W
ORDINARY HOUS
MATERIALS.








FRS1B-S
DC5V
1A/125VAC
0950 c
TAKING_PARTS_APART
A HANDS-ON EXERCISE IN GETTING TO KNOW THE ELECTRONIC PARTS THAT MAKE UP THE TECHNOLOGIES WE USE EVERY DAY.
AFTER UNDERSTANDING HOW THEY WORK, CAN WE RE-IMAGINE THEM TO BE MADE IN DIFFERENT WAYS?

PART 1

NOTICING
&
IMAGING
WHAT PARTS CAN DO . . .

SELECT A PART AND EXAMINE IT USING ONLY YOUR BODY

(YOUR SENSES OF VISION, SMELL, TASTE, TOUCH, YOUR KNOWLEDGE OF OTHER THINGS, YOUR ABILITY TO NOTICE, ANALYZE AND MAKE CONNECTIONS).

GIVE IT A NAME.
DESCRIBE WHAT IT DOES.

WHO MADE IT?
WHEN DID THEY MAKE IT?
WHERE THEY MAKE IT?
WHAT IS IT MADE OF?

WHERE YOUR KNOWLEDGE ENDS, YOUR IMAGINATION BEGINS

CAPTURE ALL THAT YOU SEE
WITH PEN ON PAPER

PART 2

WITH
THE HELP
OF TOOLS . . .

NOW TAKE TOOLS IN YOUR HANDS AND
USE THESE TO
OPEN,
DISMANTLE,
DISTROY
YOUR PART.

DO SO IN ORDER TO FIIND OUT MORE.

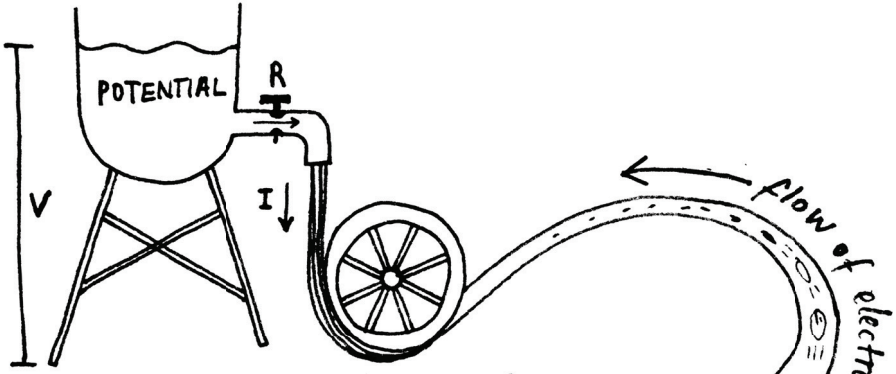
EXAMINE THE INSIDES OF YOUR PART
CLOSELY AND WITH UTTER CURIOSITY.

DO WHAT YOU COULD NOT KNOW WITH
YOUR BODY ALONE.

CAPTURE ALL THAT YOU SEE
WITH PEN ON PAPER

STROM_

elektrischer Strom ist der fluss von Elektronen von einem Bereich mit hohem Potenzial zu einem Bereich mit niedrigem Potenzial



Widerstand (R) - Leiter sind nicht perfekt, sie widerstehen dem Stromfluss bis zu einem gewissen Grad - Ohm (Ω)

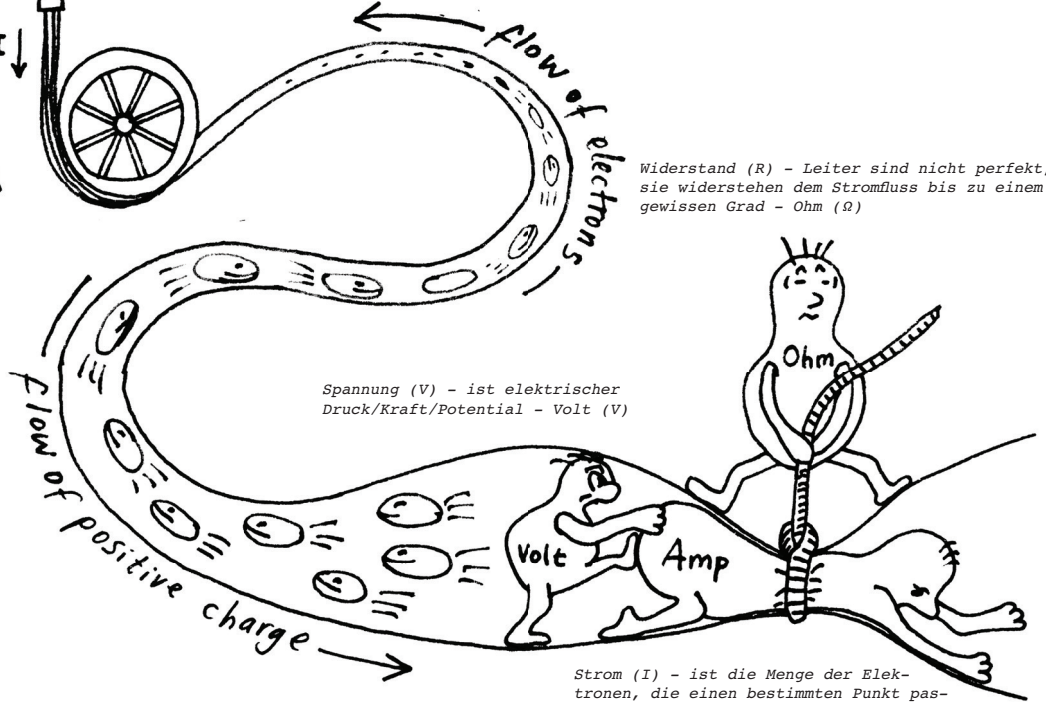
WASSER ANALOGIE

Wenn wir Strom mit Wasser vergleichen, das durch eine Leitung fließt, dann ist:

Spannung = Wasserdruck

Strom = Wasserfluss

Widerstand = Ventil



Spannung (V) - ist elektrischer Druck/Kraft/Potential - Volt (V)

Strom (I) - ist die Menge der Elektronen, die einen bestimmten Punkt passieren - Ampere (A)

1 Ampere = 6.280.000.000.000.000.000.000.000.000.000.000 Elektronen, die einen Punkt in einer Sekunde passieren.

ELEKTRIK_

Elektrik ist alles, was mit elektrischem Strom zu tun hat

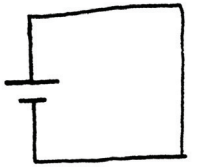
&

ELEKTRONIK_

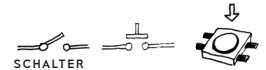
Elektronik ist die Datenverarbeitung mithilfe der Elektrik

CROCO-KLEMME

STROM QUELLE

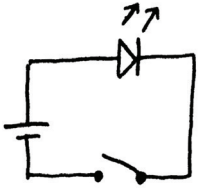


KURZSCHLUSS!!!



SCHALTER

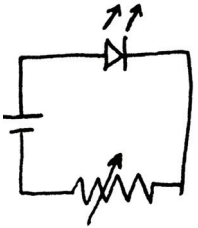
LICHT EMMITIERENDE DIODE (LED)



WIEDERSTAND

SPANNUNGSTEILER (POTENTIOMETER)

VARIABLER WIEDERSTAND (SENSOR)



MEET_THE_MATERIALS_

ETextiles rely on the existence of electrically conductive fibers, threads and fabrics that can be used in textile techniques such as sewing, weaving and knitting.
Most conductive textile materials are based on the blending of metals for their conductive properties, and other fibers (natural or synthetic) for their mechanical properties such as flexibility and tensile strength.

CONDUCTIVE FIBERS, FILAMENTS, WIRES & COATINGS

METAL FIBERS
mostly steel, as these are very strong and can be spun

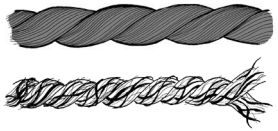
METAL FILAMENTS
very long strands that are extruded (like wire)

FLATTENED METAL FIILAMENTS

METAL PARTICLES
(usually copper or silver) can be applied to non-conductive materials by electroplating and plasma coating

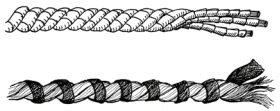
CONDUCTIVE THREADS & YARNS

STEEL THREADS
are spun from long steel fibers. Can also be spun from a mixture with other (non-conductive) fibres to increase resistance.



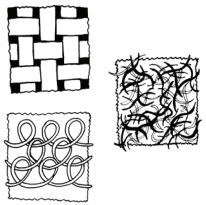
METALLIZED / METAL-COATED THREADS
non-conductive threads can be coated with a very thin layer of metal.

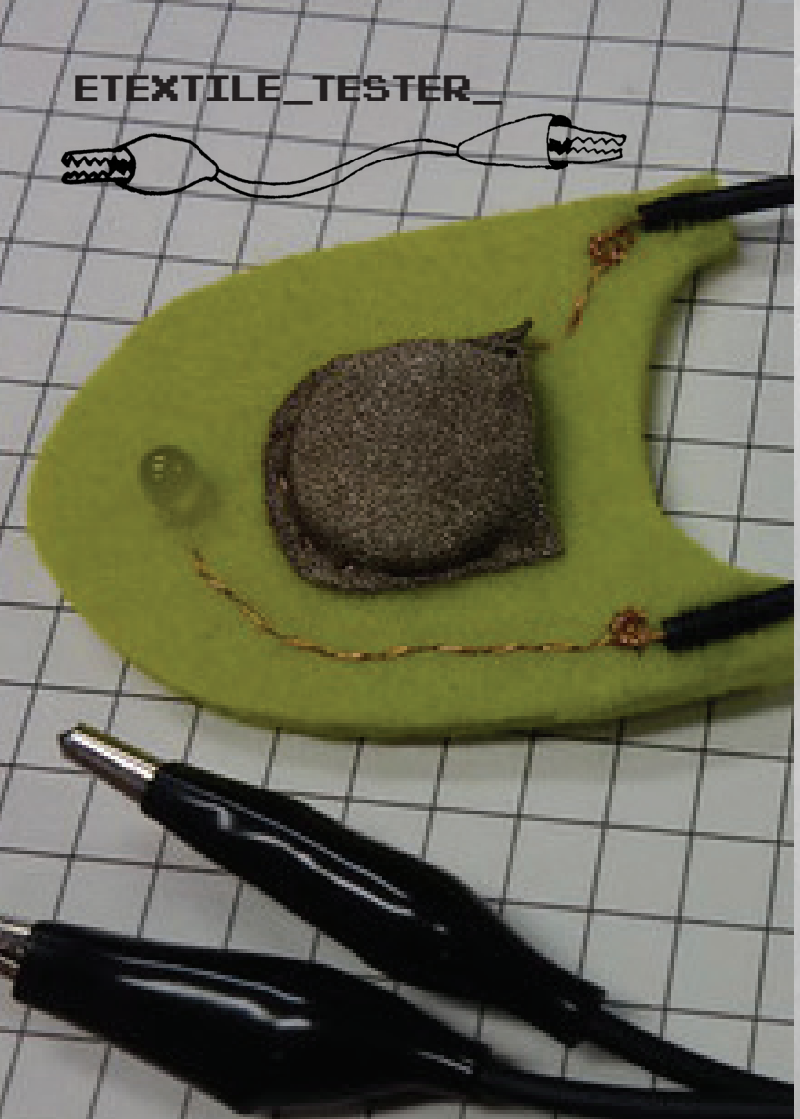
METAL-COATED LAMENTS
non-conductive filaments can be wrapped with a thin-rolled metal wire. These are often made for decorative purposes.

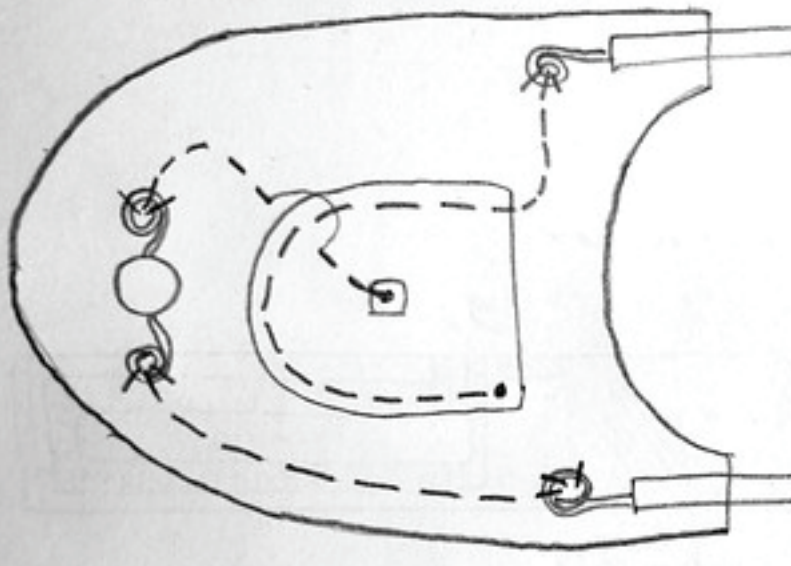


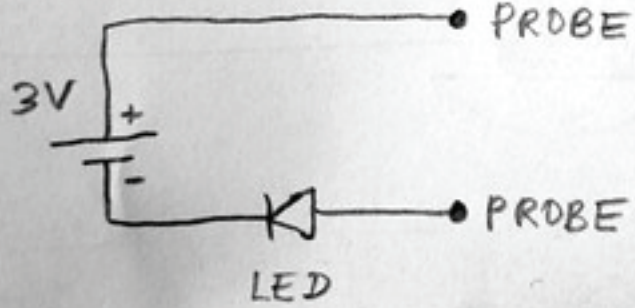
CONDUCTIVE FABRICS

can be woven/knitted from conductive threads or felted from conductive fibres. As with metal-coated threads, non-conductive materials (woven, knitted, felted) can also be coated with a very thin layer of metal.




ETEXTILE_TESTER_

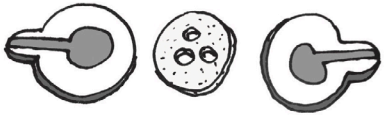



PROBE
3V
+
-
PROBE
LED

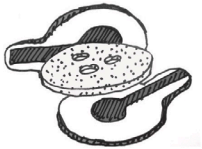
Fabric Pushbutton

Using conductive fabric as the contacts for soft push button and perforated foam as a spacer material, this fabric pushbutton is an extremely basic construction that can be used in many different ways.

Decide on your button shape and cut out two of these shapes from a non-condcutive fabric such as neoprene or felt. You can add tabs to your shape as contact points if fyou like.



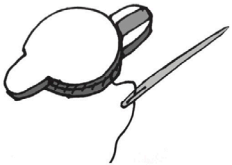
Cut out two pieces of conductive fabric with tabs that reach the edge of your button shape. Fuse these pieces of conductive fabric to your base material.

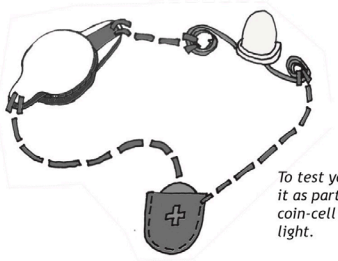


Cut a piece of foam to size so that it covers the conductive fabric but fits inside the button shape. in the center of the foam cut one or more holes.

Layer your materials so that the conductive fabric faces inwards with the perforated foam in between.You can arrange the tabs of your fabric button any which way you want so long as the don't overlap.

Thread a needle with regular sewing thread. Tie a knot in one end and proceed to sew around the edge of your sensor. Be sure to stitch both sides of neoprene together, you do not need to include the foam in your stitch, as it will stay in place.





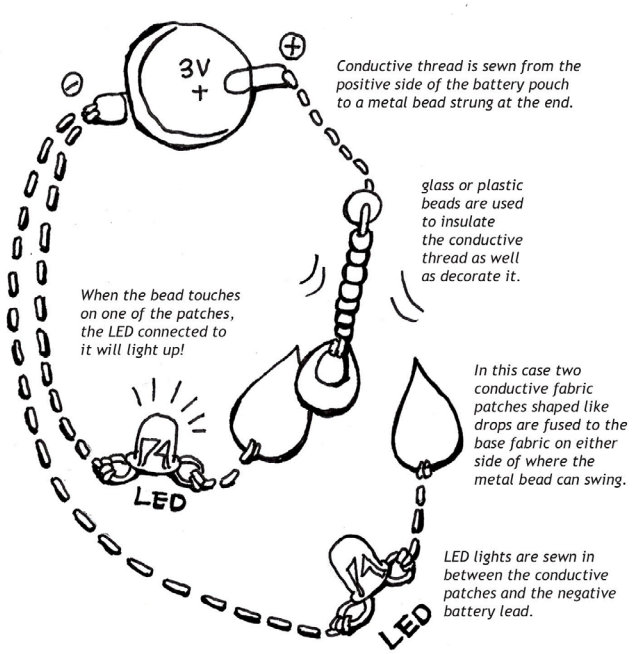
To test your pusbutton you can connect it as part of a simple circuit. Using a coin-cell battery pocket and an LED light.

REMAKE_

Beaded Tilt Switch

A super simple tilt switch made from a metal bead strung on the end of condcutive thread, and a patch of conductive fabric nearby.

This sensor is made by stringing a metal bead to the end of a piece of conductive thread. A patch of conductive fabric is fused to the base fabric so that when the metal bead swings to a certain point it makes contact with the patch, closing the switch.

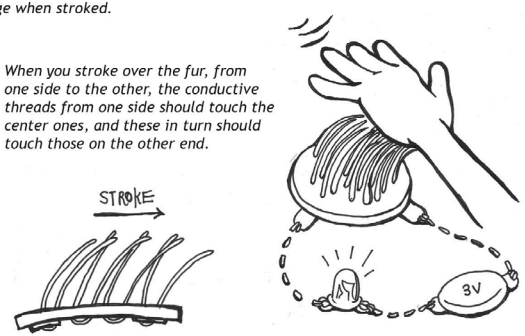


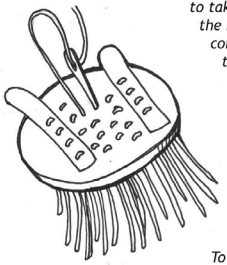
Stitched Stroke Switch

Stitching conductive thread into a neoprene base you can stitch yourself a custom stroke switch. Stroking over the stitched fur causes the hairs of both contacts to touch, closing the switch.

On the peice of neoprene fuse two pieces of conductive fabric to the back side. The distance between the two pieces represents the gap that the conductive fur will need to bridge when stroked.

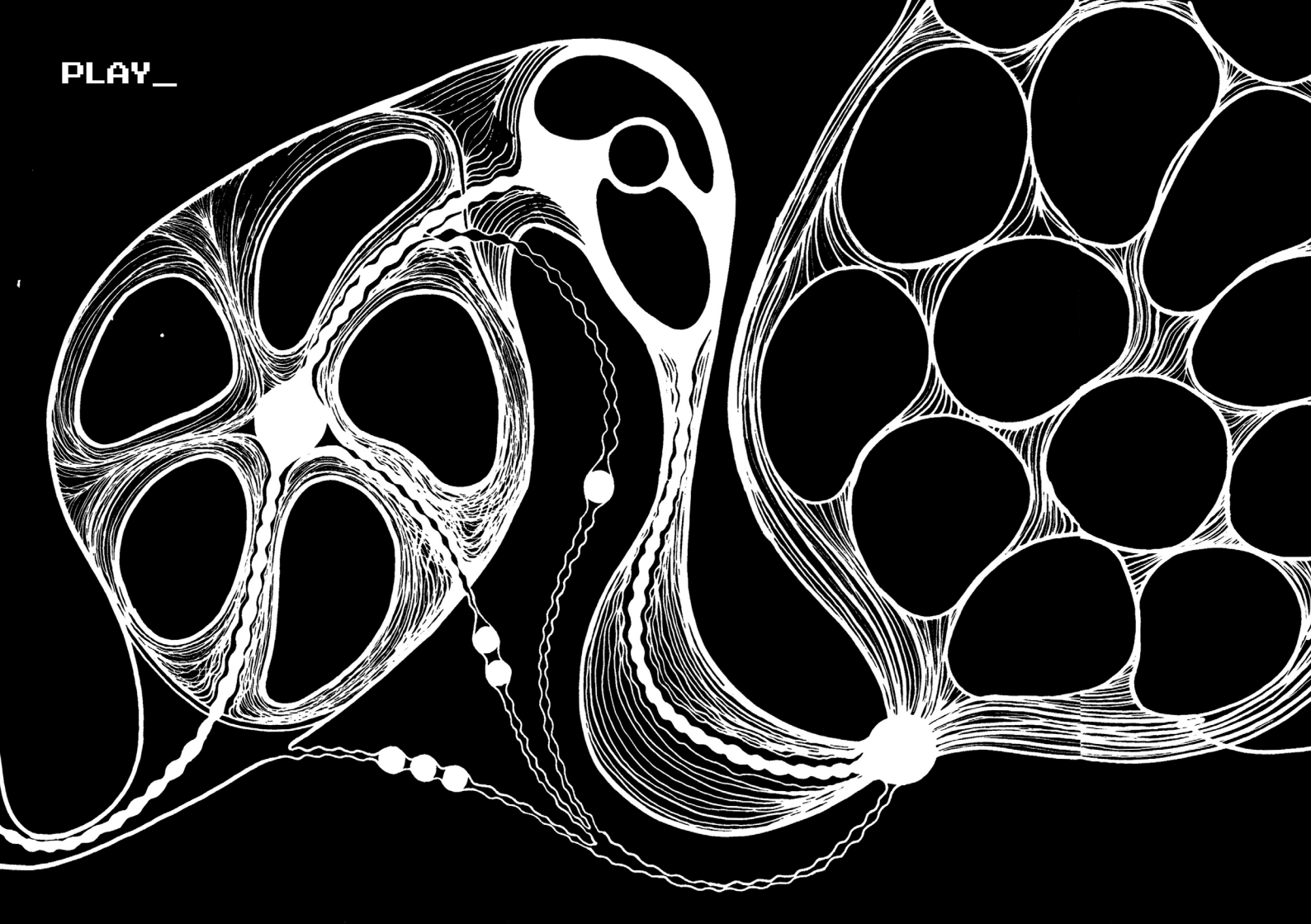
When you stroke over the fur, from one side to the other, the conductive threads from one side should touch the center ones, and these in turn should touch those on the other end.





Thread the needle with conductive thread, feel free to take the thread double or quadruple. Stitch into the neoprene from the top side (the side without conductive fabric), but don't pull the thread all the way through. After stitching cut the thread at desired fur length, roughly 2cm. Repeat 5 or 6 times. Each time the conductive thread should penetrate all the way through the neoprene and make contact with the conductive fabric fused to the reverse side.

To complete the sensor add some non-condcutive fur by stitching with a non conductive thread. Stitch fur until the sensor is dense and the conductive fur contacts are isolated from one another, yet make contact when stroked.


PLAY_

GLOSSARY_

DEFINITIONS TAKEN FROM WIKIPEDIA
AND THE INTERNET

TEXTILE_

TOOL_

FURTHER__READING_ WATCHING_LISTENING_

ELEKTRONISCHE TEXTILIEN ALS MATERIAL UND WERKZEUG_

Hannah Perner-Wilson, Irene Posch, 2020

"Welche Fasern leiten Strom? Wie schauen Fäden aus Metall aus? Welche Flächen können als Sensoren ver- wendet werden? Elektronische Textilien, manchmal auch Smart Textiles genannt, beschreiben die Integration von elektronischen Funktionalitäten in textiles Material. Dadurch lassen sich Sensoren und Schaltkreise aus Textil umsetzen. Diese können weich und kleidsam sein; sie können in Alltagsgegenstände verwebt werden und dadurch neue Funktionen ausführen; und sie bieten durch die neuartige Verbindung von Elektronik und Textil die Möglichkeit, die Qualitäten dieser Disziplinen neu zu denken!"

gtt.ufg.at/e-textilien-material-werkzeug

THE CHARGE AGAINST ELECTRICITY_

MIKE ANUSAS and TIM INGOLD

"Electricity has become such a ubiquitous feature of modern life that most of us would have no idea how to manage without it. Interruptions in supply are experienced as unsustainable moments of crisis. The possibility that the supply of electricity might eventually run dry is every government's worst nightmare and underpins the global politics of energy. Do we blame electricity for having brought us to this state of dependency? Can we hold it responsible for the disempowerment of citizens, for the entrapment of their lives within a state-sponsored grid maintained by corporations? Or does it, on the contrary, hold the potential for emancipation? Is electricity guilty or not guilty? In what follows, we begin with the case for the prosecution. Then we present the case for the defense. You, our readers, are the jury, and we leave the verdict for you to decide."

https://journal.culanth.org/index.php/ca/article/view/ca30.4.03/200

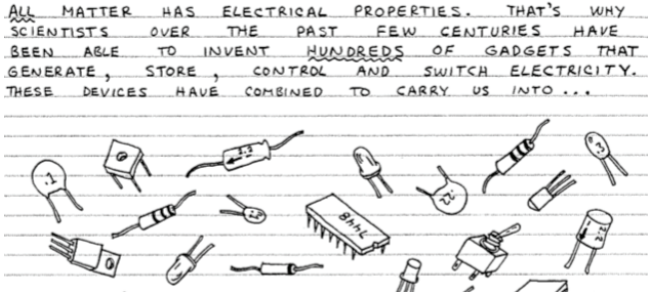
CHIMERA_

"an interactive database for wearables development & information awareness. It includes Research - Tutorials - Patents - Concepts and Aesthetic approaches used by the wearables community to inspire & boost the wearables development from different field perspectives."

chimerawearables.com

GETTING STARTED IN ELECTRONICS_

Forrest M. Mims



https://www.academia.edu/9885504/Getting_Started_In_Electronics_-_Forrest_M._Mims

MORE_

Anna Blumenkranz (2017) Wearables für Maker: Experimentieren, nähen, gestalten. Francis Verlag

Kate Hartman (2014) Make: Wearable Electronics: Design, prototype, and wear your own interactive garments. O'Reilly & Associates.

Leah Buechley, Kanjun Qiu, Sonja de Boer (2013): Sew Electric. HLT Press.

Verena Kuni (2013) Häkeln + Stricken für Geeks. O'Reilly Verlag GmbH & Co

Kobakant, How to get what you want: kobakant.at/DIY/

Lara Grant, Instructables: https://www.instructables.com/class/Wearable-Electronics-Class/

Sparkfun: learn.sparkfun.com/tutorials/tags/e-textiles

Fabricademy:
class.textile-academy.org/classes/
wiki.textile-academy.org/fabricademy2017

Wearic: wearic.com/learn/

werken.ufg.at

RESOURCES_

_PRODUZENTEN_UND_LIEFERANTEN

Elektronik, eTextile Komponenten:
exp-tech.de
sparkfun.com
adafruit.com
segor.de
semag.at (BERLIN!)
conrad.at
ehajo.de/ewear/ (nähbare LEDs, leitender Faden in Kleinmenge)

ETextiles:
karl-grimm.com (leitende Fäden, ab 1 kg)
statex.de (leitende Stoffe und Fäden)
cekaert.com (leitende Stahlfasern und -fäden, ab 1 bzw. 5 kg)

THE_END?

GESTALTUNGSPROJEKT PUPPE
3.JHG
SS 2020
HFS-BERLIN.DE

SPIEL&&OBJEKT
SPIELUNDOBJEKT.DE

HANNAH PERNER-WILSON
PLUSEA.AT