

Designing Interactions

About myself

Michihito Mizutani

www.michihito.com

Brief introductions by participants

Your background

Why you joined the workshop

What would you like to do in your thesis

Schedule for the course

Monday

- Programming on microcontrollers (Arduino)

Tuesday

- Controlling sensors and actuators

Wednesday

- Adobe Flash workshop by Nuno Correia

Thursday

- Adobe Flash workshop by Nuno Correia

Friday

- Integrating sensors and actuators into Adobe Flash on Nokia N900

September

- Theme introduction, discussions, concept development and planning

October

- First prototyping and presentations of work in progress

November

- Second prototyping

December

- Xmas Demoday

The goal of this workshop

This workshop gives you tools to prototype interactive systems. It is **NOT** aiming to **UNDERSTAND** technical tools **BUT USE THEM** in research projects and design practices of your own.

It requires your **CREATIVE MINDS** otherwise you cannot use them.

My role in this workshop

I am an **INTERACTION DESIGNER**, not engineer. So I will not be able to instruct all technical details.

The workshop focuses on introducing the tools and giving instructions how to make **RAPID PROTOTYPES**.

Your participations in this workshop

You don't need to prototype everything from scratch. By sharing knowledge and experiences, we can prototype things even more rapidly.

You can **SEARCH SNIPPETS** online. But please also **SHARE YOUR CODES AND SCHEMATICS** online.

Create an account on mlab.taik.fi/paja blog

Please put your **FIRST AND FAMILY NAME in your profile page
otherwise I will not know who you are.**

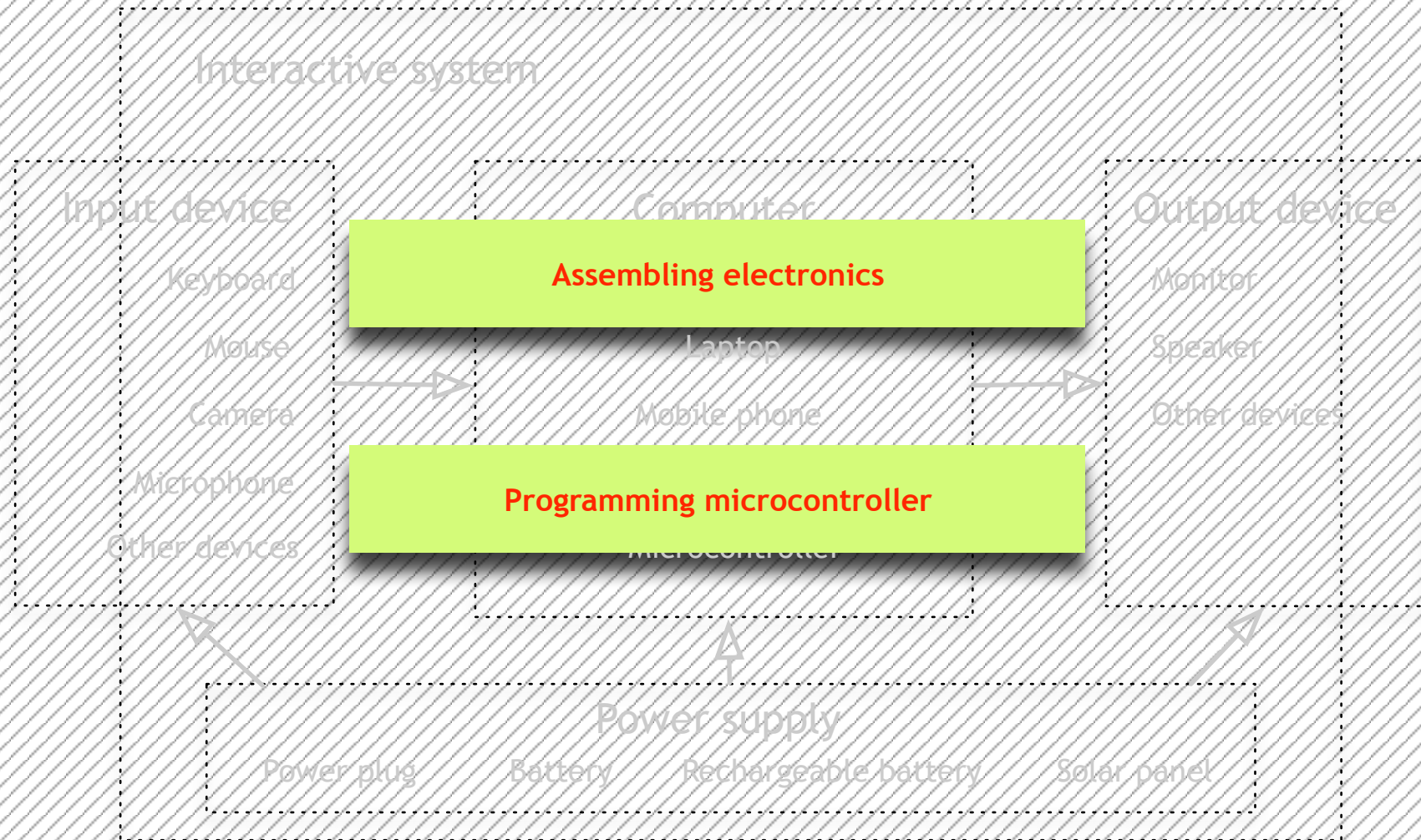
Final demos from previous workshops

Expected activity during the course to get credits

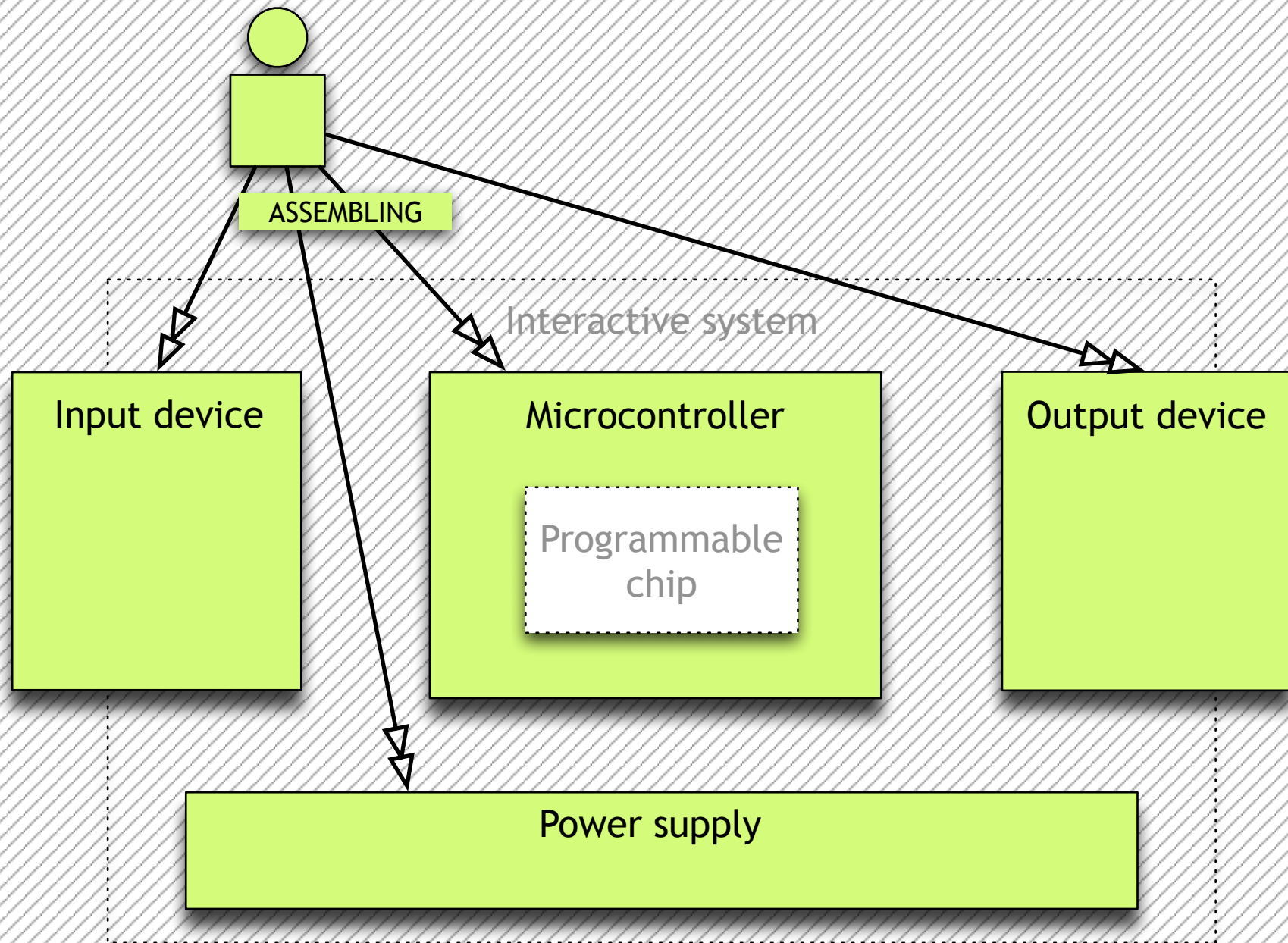
- Sharing your experience to Paja blog
(Descriptions of your project, codes, photos and videos)**
- Participations in group works**
- Presentations of your work based on assignments and themes**
- Presentations in Xmas Demoday (Mid December)**
- At least 40 hours of individual (group) work**

What are we going to do in this workshop?

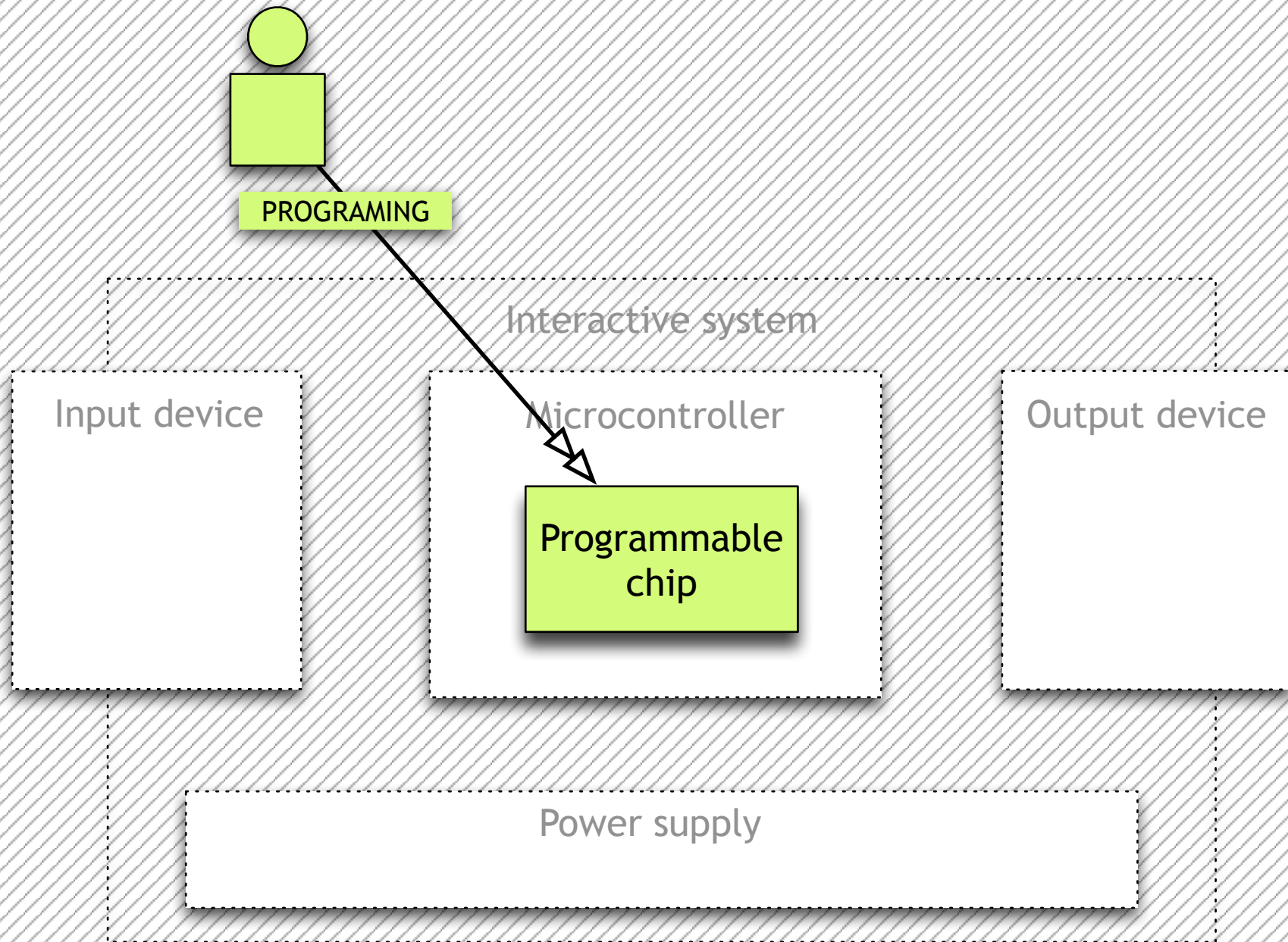
What are we going to do in this workshop?



Assembling Electronics



Programming Microcontroller



Assembling electronics

Tools and electronic components

You will receive following bags. It has all you need.

**One Candy bag A or B for each of you
One Arduino bag for each of you
One Mobile bag for each group**

**PLEASE RETURN THE CANDY BAG AS IT IS NOW
WHEN THIS INTENSIVE WORKSHOP ENDS.**

You can keep the rest bags during the course.

Arduino NG

Ground pin

Digital pins (2-13)

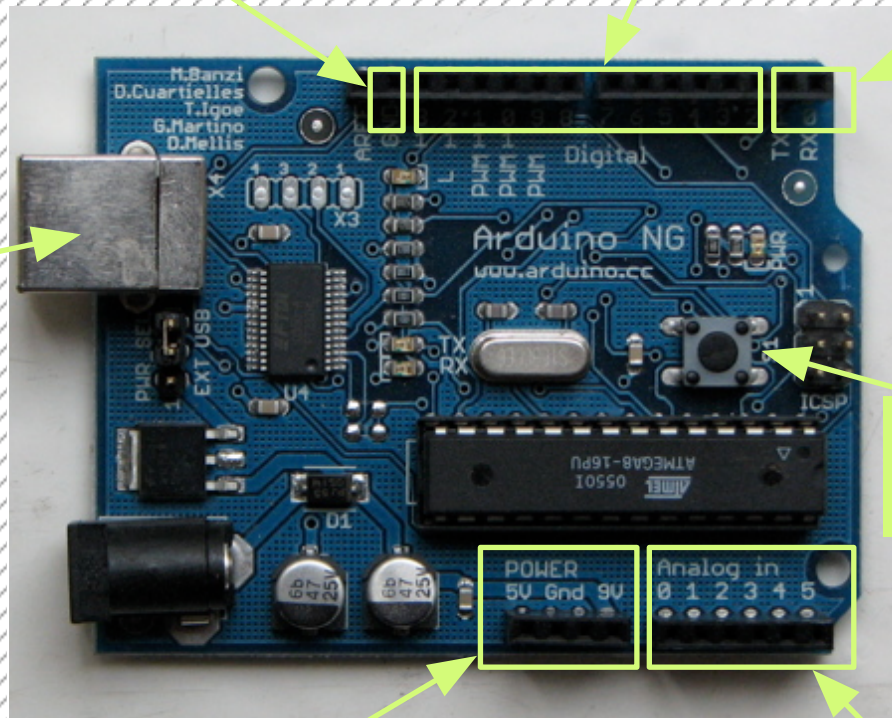
Digital pins (0-1)
shared with USB

Plug a USB cable
(5V is also supplied)

Reset button (click when
you upload program)

5V output, Ground and 9V output pins
(9V output is not in use)

Pins for analog in pins (0 - 5). These
can used as digital pins (14 - 19)



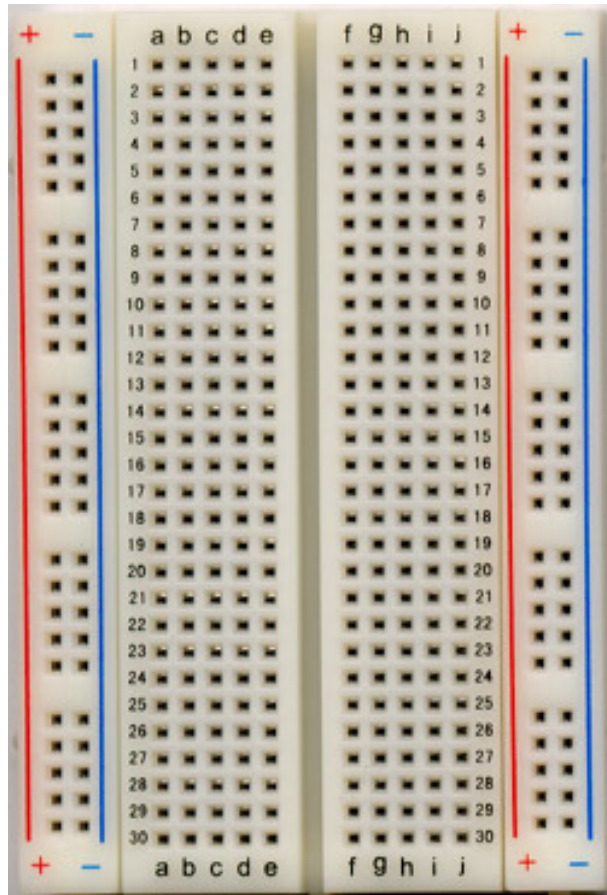
USB cable



USB A-B cable

Breadboard

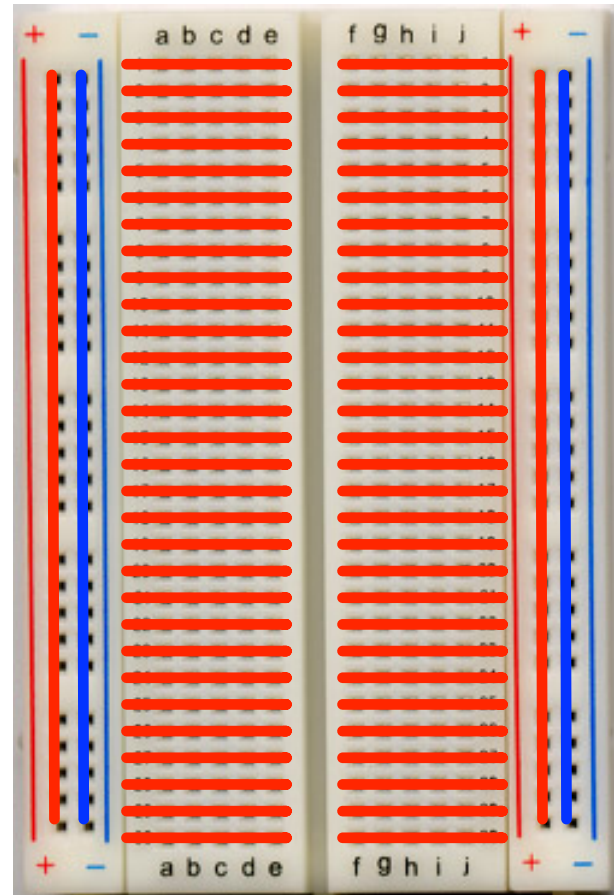
Breadboard (photo)



Video and Website © 2004 ClarkZapper.net

Breadboard (schematic)

5V GND 5V GND



Video and Website © 2004 ClarkZapper.net

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Vdd

GND

5V

Vss



Jumper wires

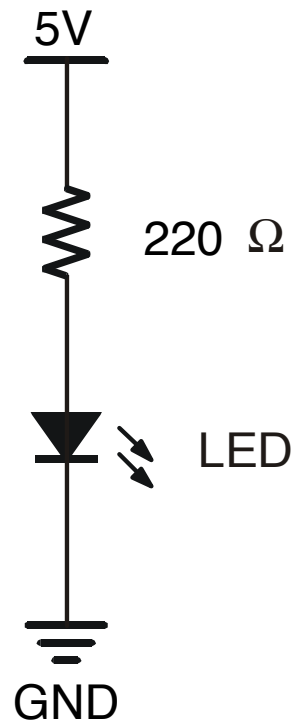


Multimeter

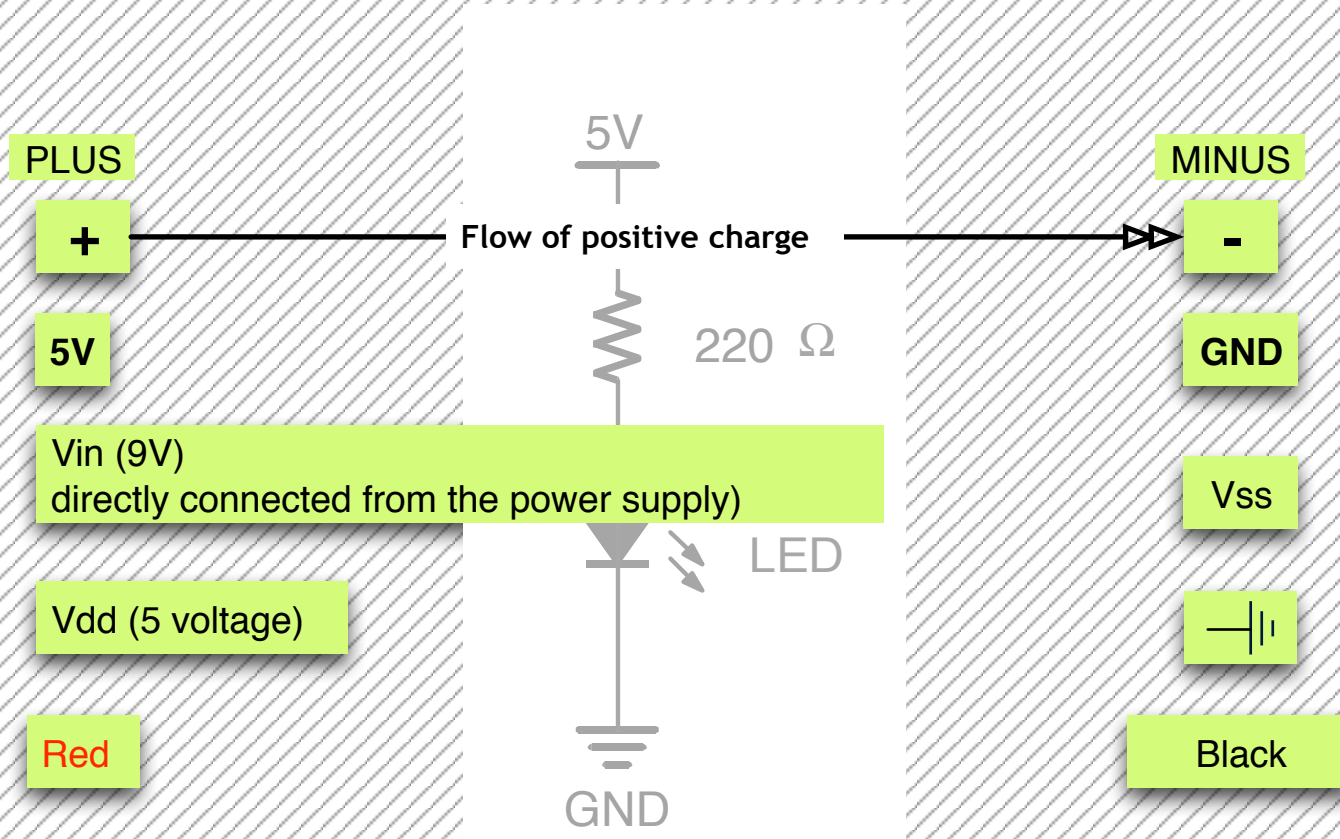


Understanding schematics

What does this mean?

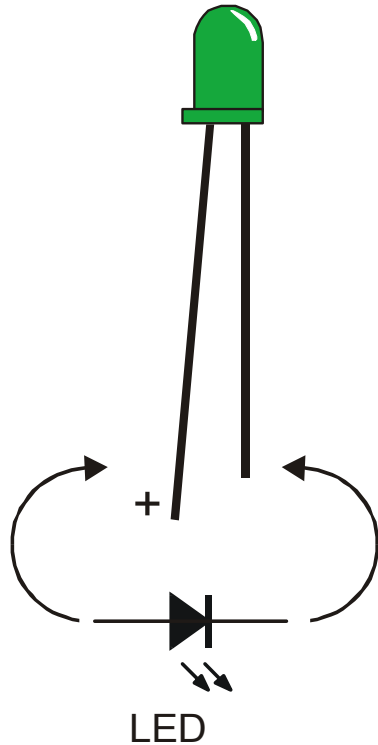


Flow of positive charge



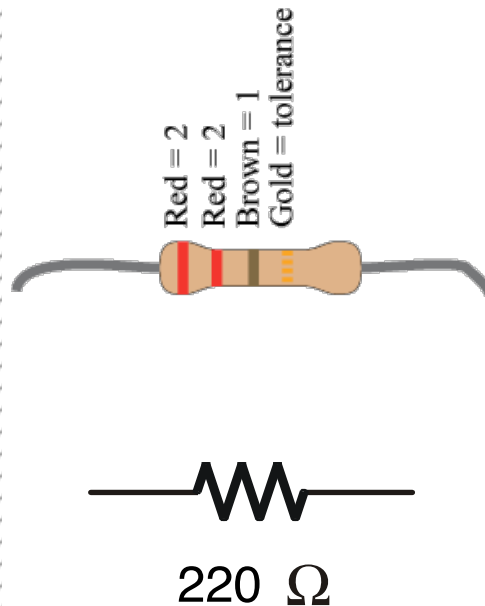
Most Popular components

LED (Light emitting diode)



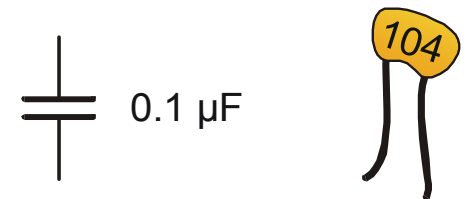
a semiconductor device with two terminals, typically allowing the flow of current in one direction only. LED has polarity

Resistor



a device having a designed resistance to the passage of an electric current.

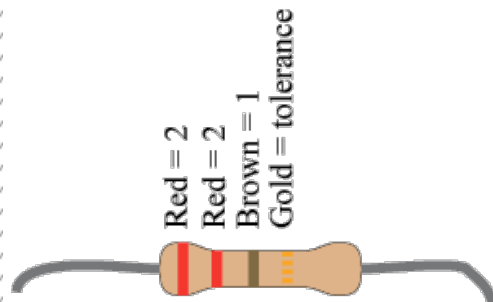
Capacitor



a device used to store an electric charge

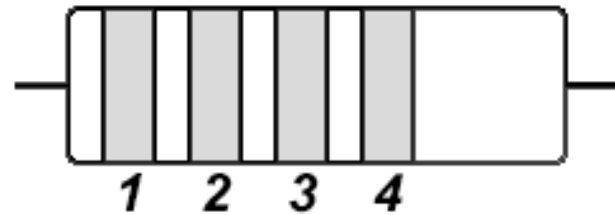
Markings for resistors

Resistor



220 Ω

a device having a designed resistance to the passage of an electric current.



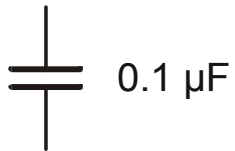
1, 2 3 4

Color	Number	Multiplier	Tolerance
Black	0	1	-
Brown	1	10	$\pm 1\%$
Red	2	10^2	$\pm 2\%$
Orange	3	10^3	$\pm 0.05\%$
Yellow	4	10^4	-
Green	5	10^5	$\pm 0.5\%$
Blue	6	10^6	$\pm 0.25\%$
Purple	7	10^7	$\pm 0.1\%$
Gray	8	10^8	-
White	9	10^9	-
Shiver	-	10^{-2}	$\pm 10\%$
Gold	-	10^{-1}	$\pm 5\%$
No color	-	-	$\pm 20\%$

Download a widget called "Resistulator" in your Mac

Markings for capacitors

Capacitor



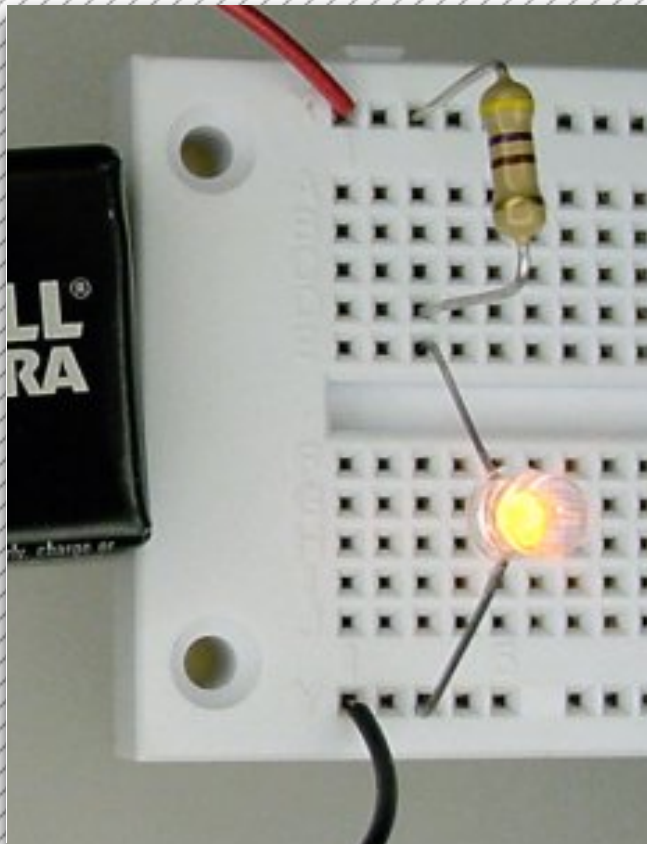
a device used to store an electric charge

Capacitor three digit markings

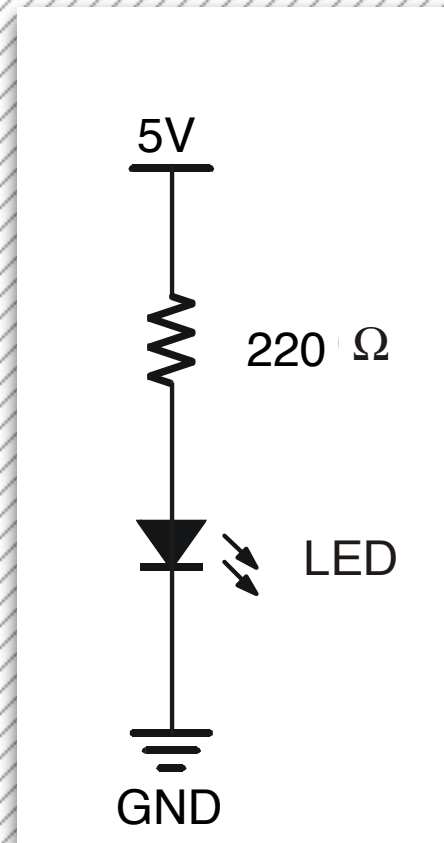
CODE / Marking	μ F microfarads	nF nanofarads	pF picofarads
1R0	0.000001	0.001	1
100	0.00001	0.01	10
101	0.0001	0.1	100
102	0.001	1	1,000
103	0.01	10	10,000
104	0.1	100	100,000
105	1	1,000	1,000,000
106	10	10,000	10,000,000
107	100	100,000	100,000,000

Assemble electronics

Breadboard (photo)



Breadboard (schematic)



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Vdd

GND

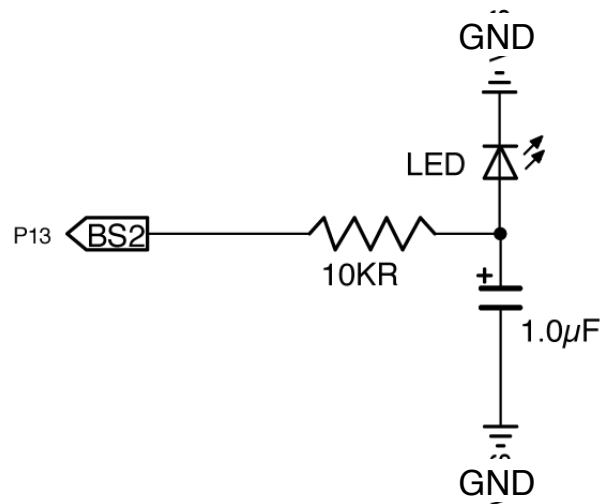
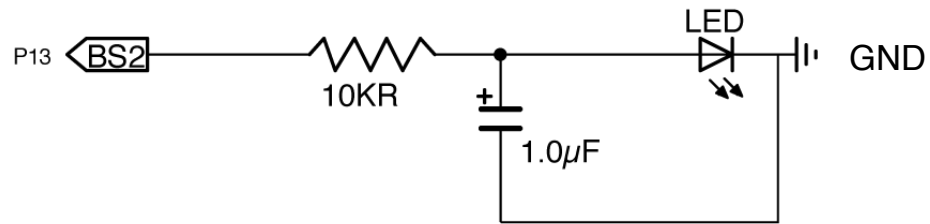
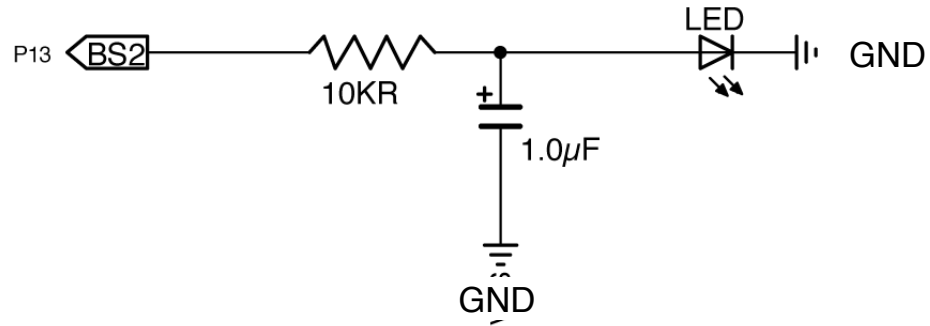
5V

Vss



Schematic plans

These are all same schematics.



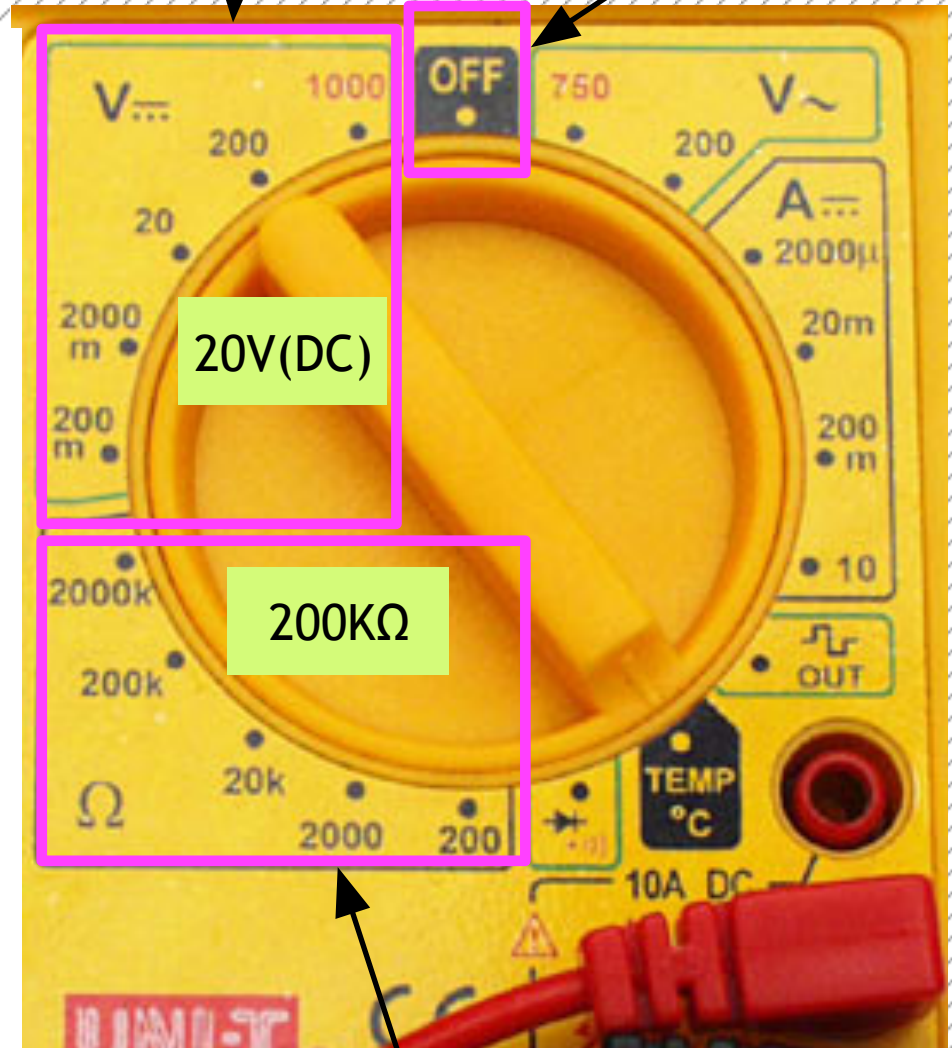
Checking your circuit

Multimeter



Measuring voltages

Off switch



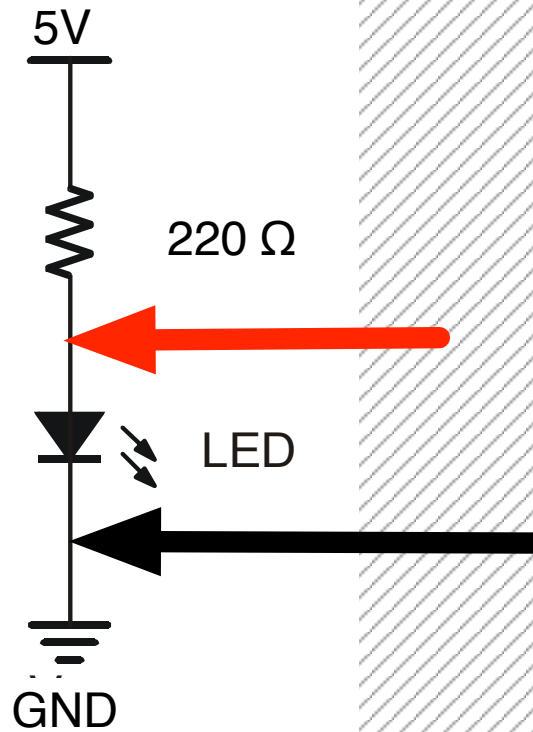
20V(DC)

200KΩ

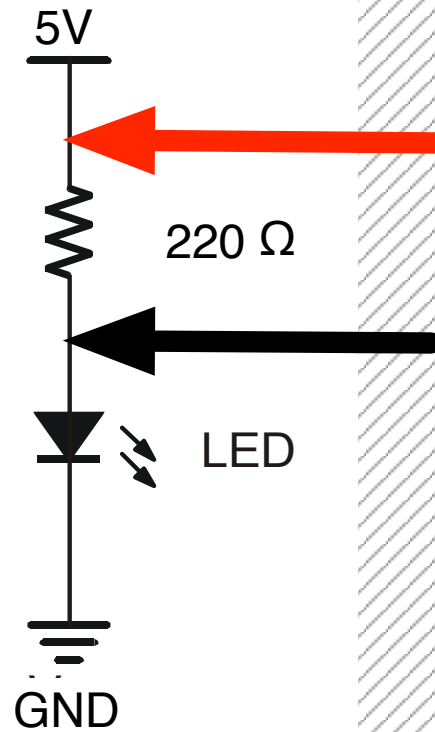
Measuring conductivity and resistance

Measuring electricity with multimeter

Voltage

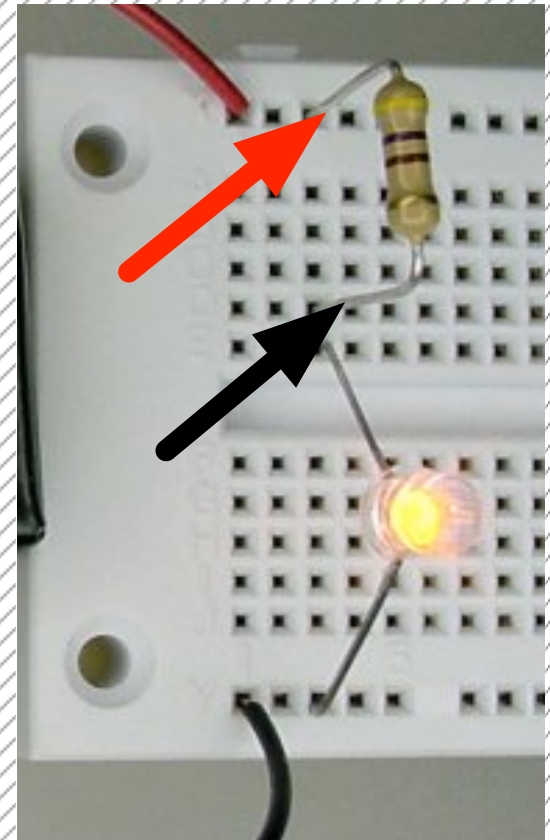


Resistance



Turn off power.

Conductivity



Turn off power.