

# Building the IoT, the DIY way

- Arduino Basic



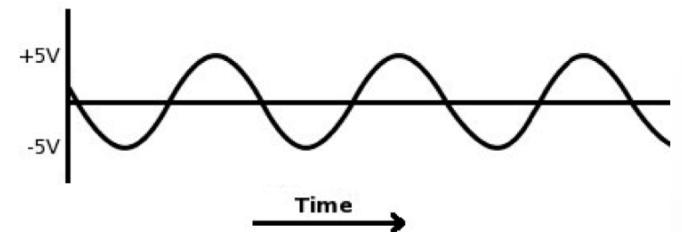
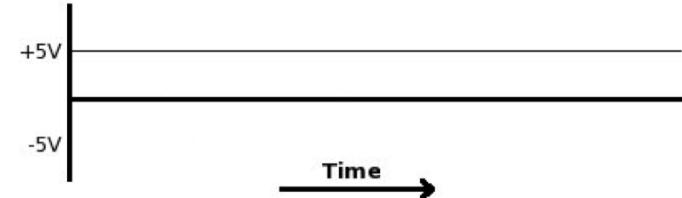
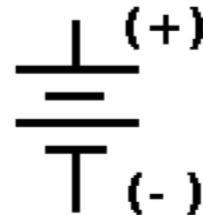


# Voltage and Current

**Voltages** are classified as :-

Constant Voltage (DC)

Alternating Voltage (AC)



**Current** is a flow of **electric** charge.

Is always in relation with voltage,

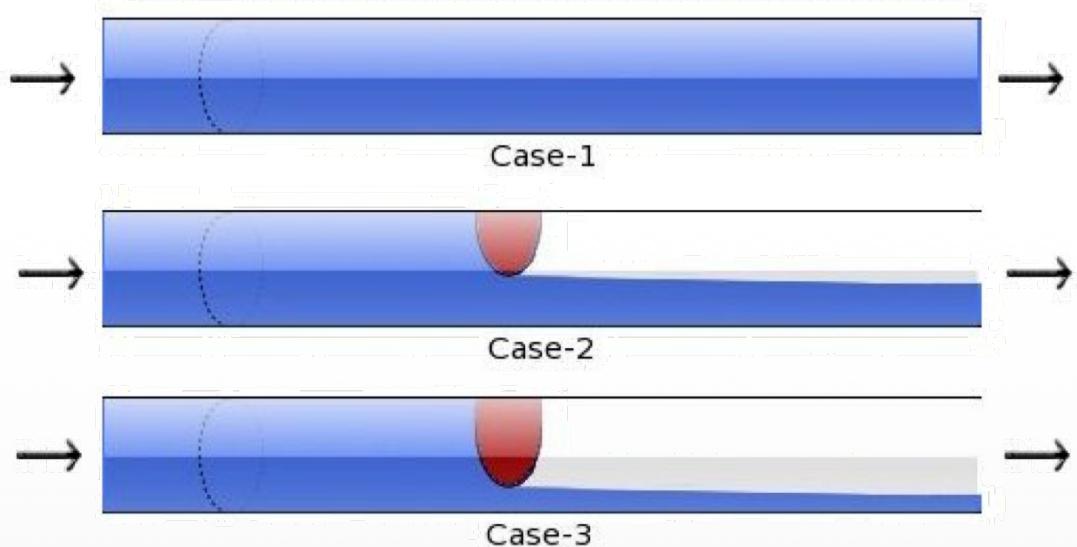
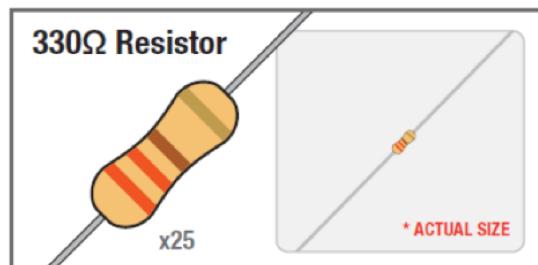
one can think voltage as a cause and current as its effect.





# Components

**Resistors** : a component that limits the flow of current.

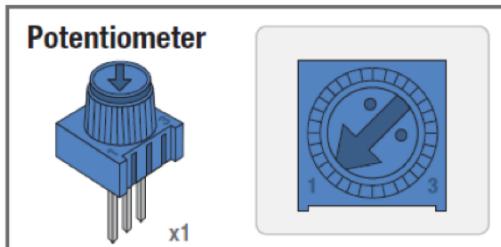


- Resistor reduces the flow of current by providing blockage.
- More Blockage will result into less flow of current.
- These blockages in electronics domain are measured in ohms, more ohms means more blockage.

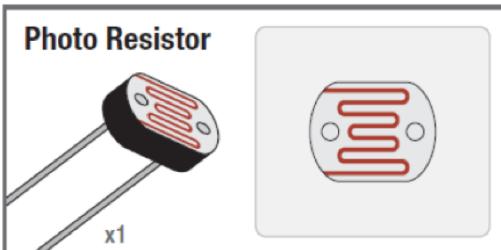


# Components

**Potentiometer** : a manually adjustable variable resistor with 3 terminals.  
an adjustable voltage divider.



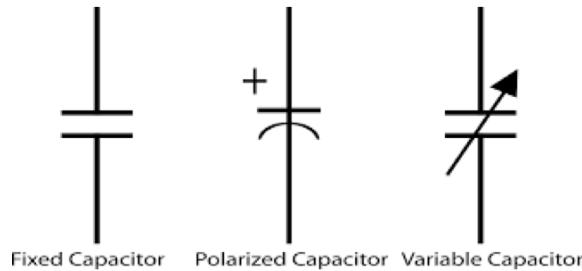
**Photoresistor** : also known as Light Dependent Resistor (LDR)  
is a light-controlled variable resistor.





# Components

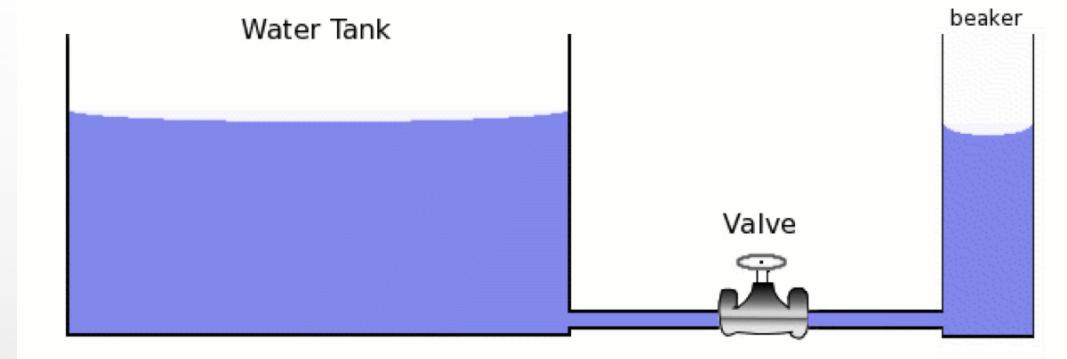
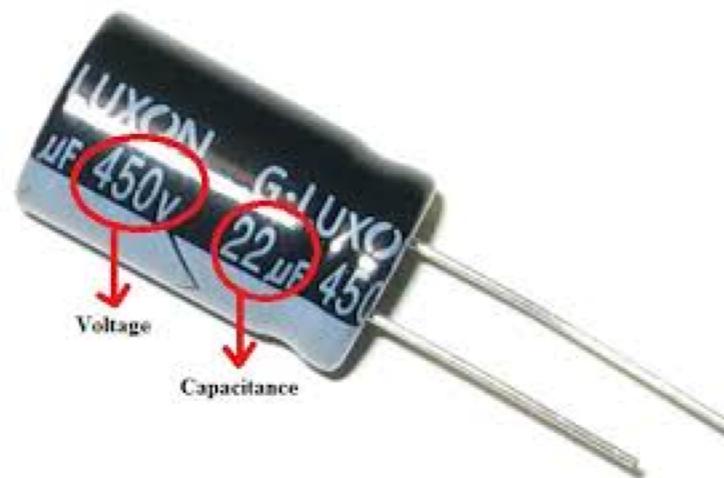
**Capacitors** : stores potential energy in an electric field



Fixed Capacitor

Polarized Capacitor

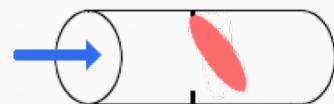
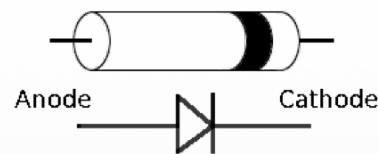
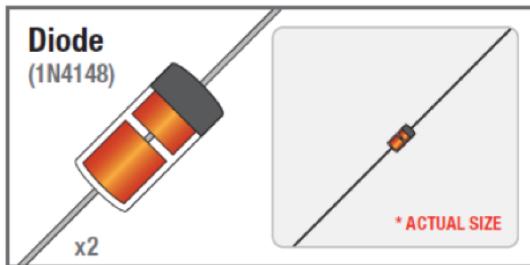
Variable Capacitor





# Components

**Diodes** : is a one way street for electric current.



**LEDs** : are Light emitting Diodes.

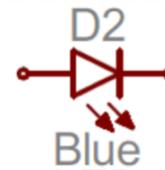
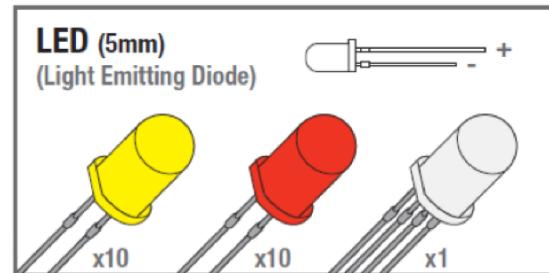
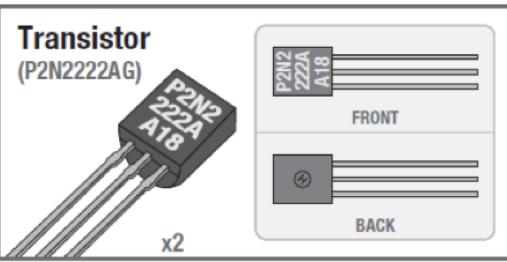
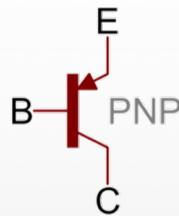
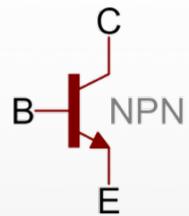
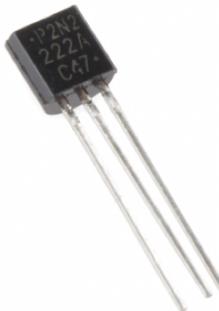
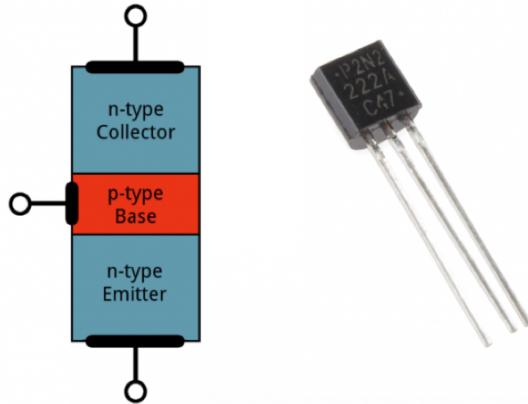


Fig 1



# Components

**Transistor** : is a semiconductor device used to amplify or switch electronic signals and electrical power.

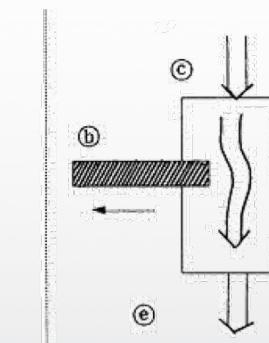
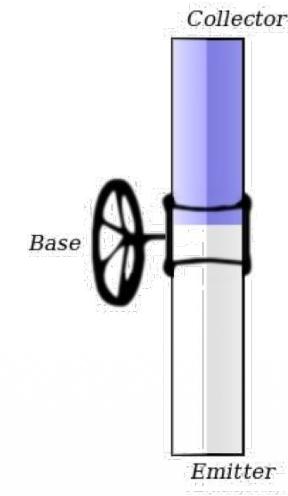
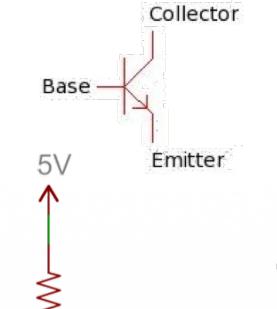
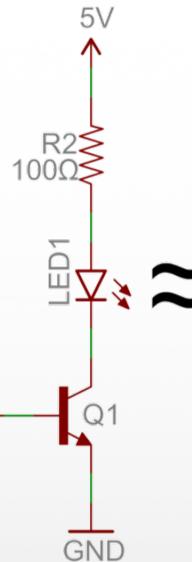


Control = 5V ~ ON  
Control = 0V ~ OFF

CONTROL

R1

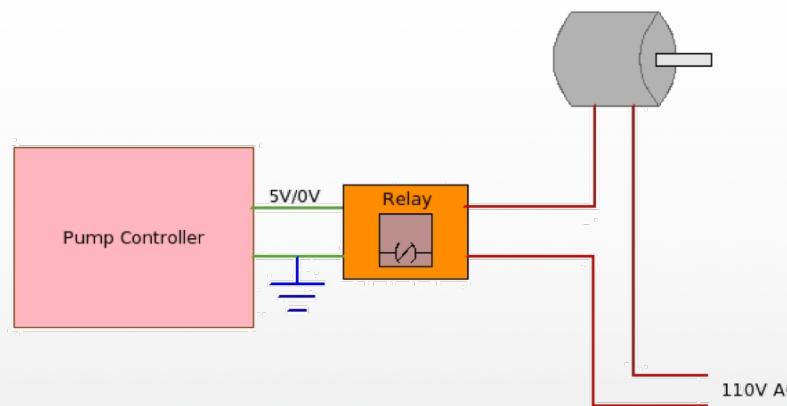
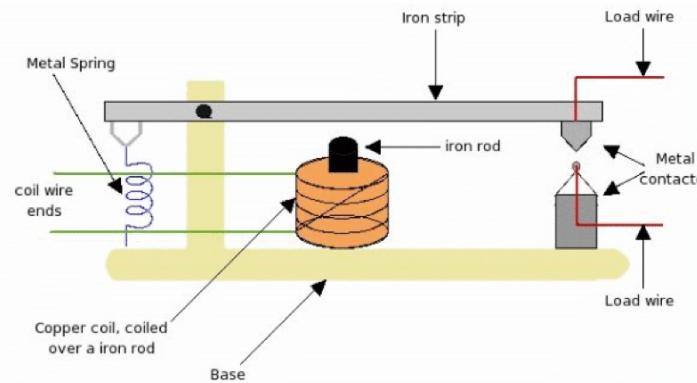
1kΩ





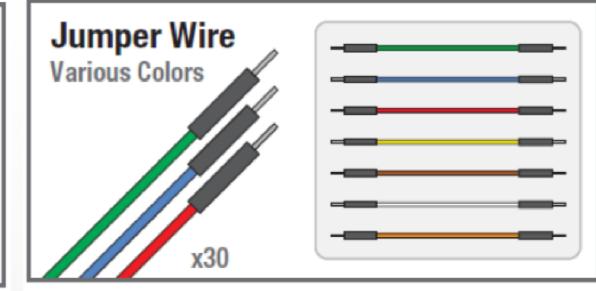
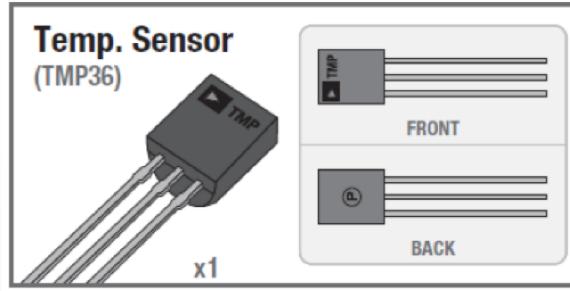
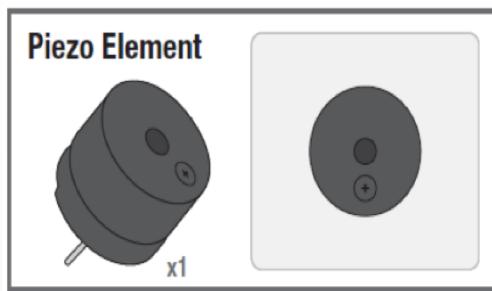
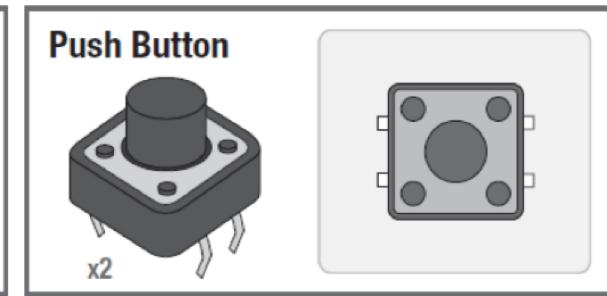
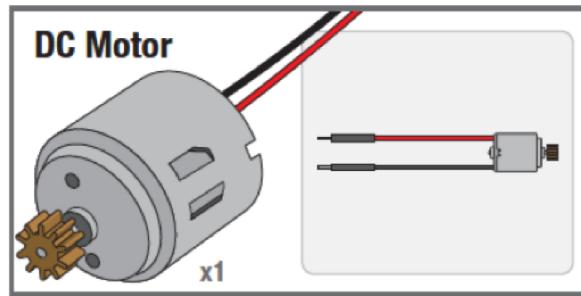
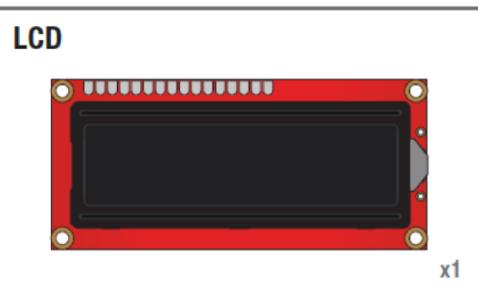
# Components

**Relays** : is an electrically operated switch.





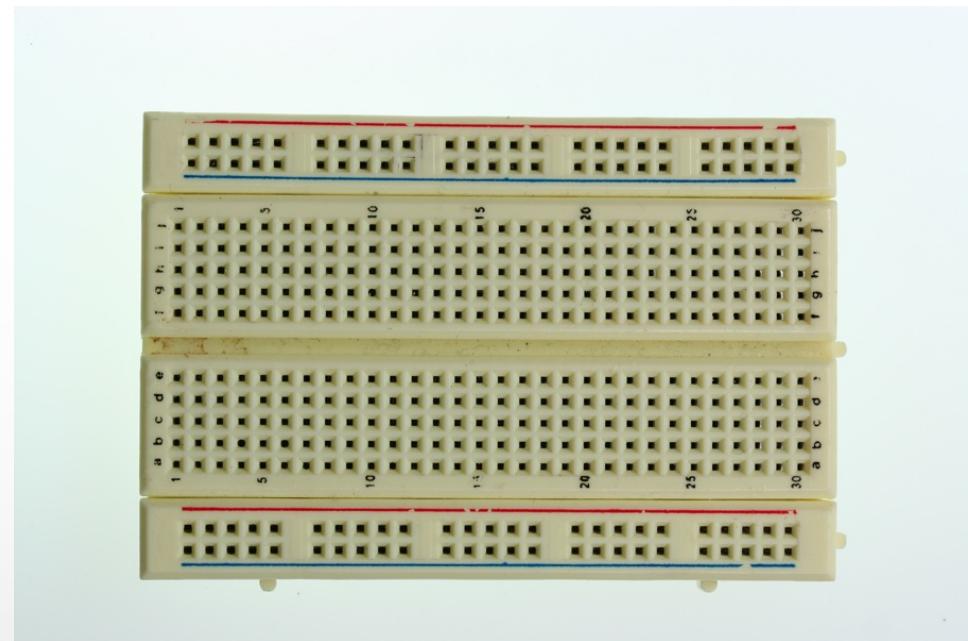
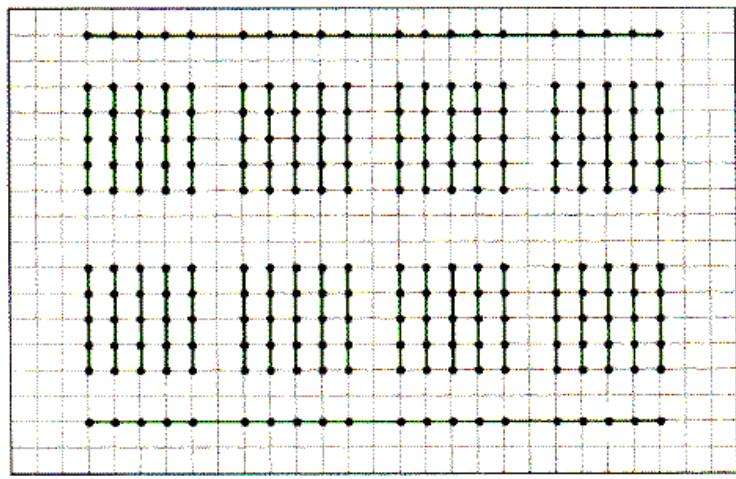
# Components





# Solderless Breadboard

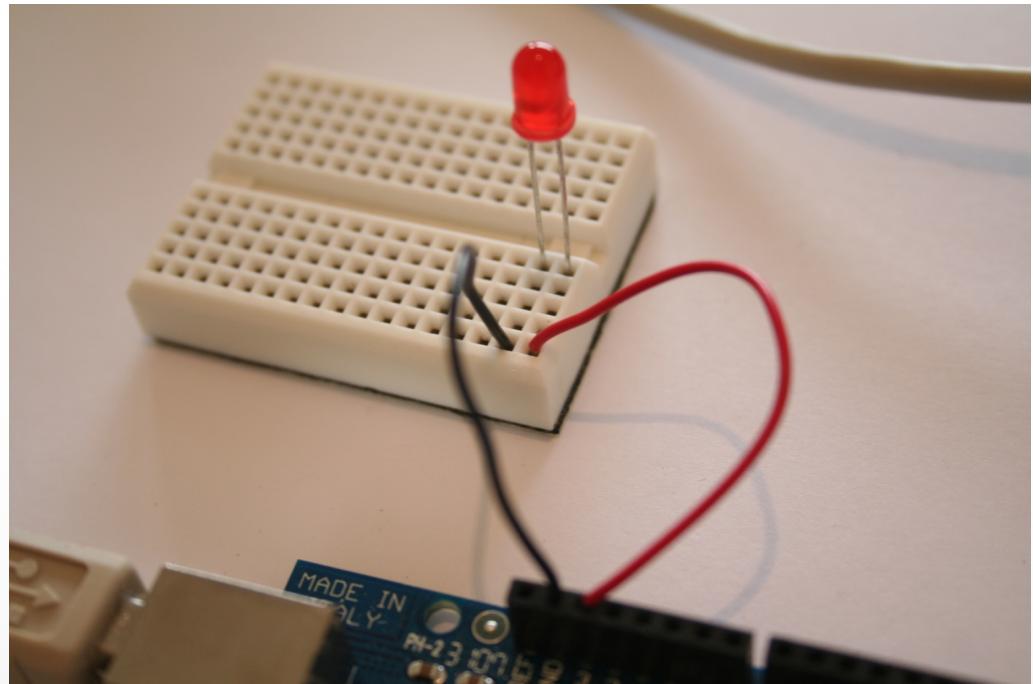
Solderless Board is useful to build prototypes, as fast as possible without going through tiresome and time consuming process of soldering parts together to make connections





# Solderless Breadboard

For example this is how an LED can be connected to an Arduino board using a solderless breadboard.

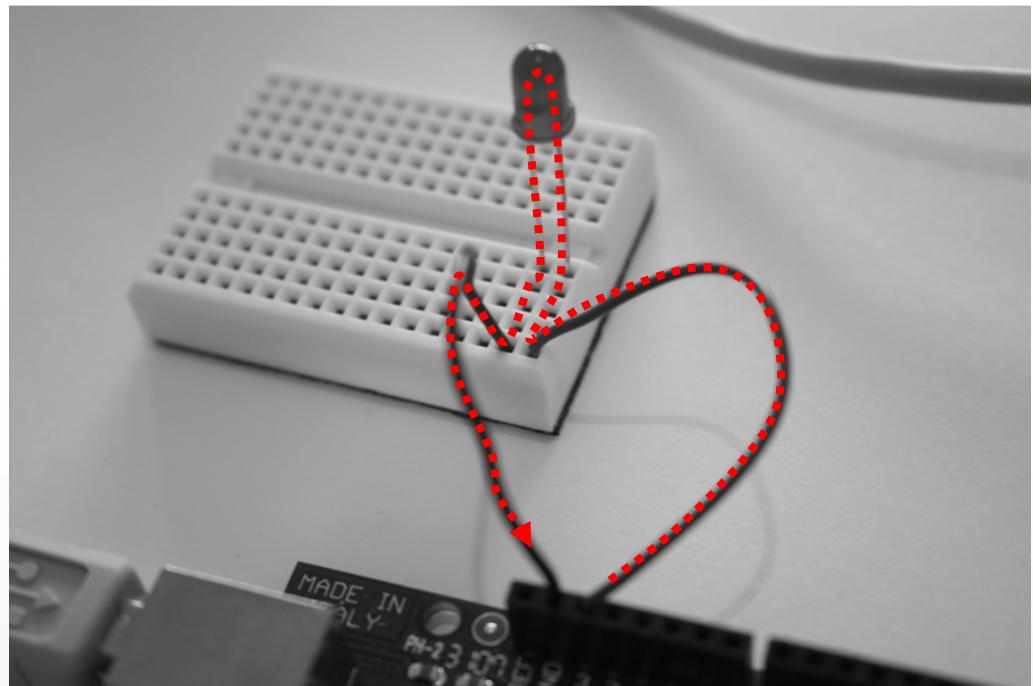


\*we are using color codes in wiring. Red wire is connected to output pin and black wire is connected to Ground



# Solderless Breadboard

For example this is how an LED can be connected to an Arduino board using a solderless breadboard.



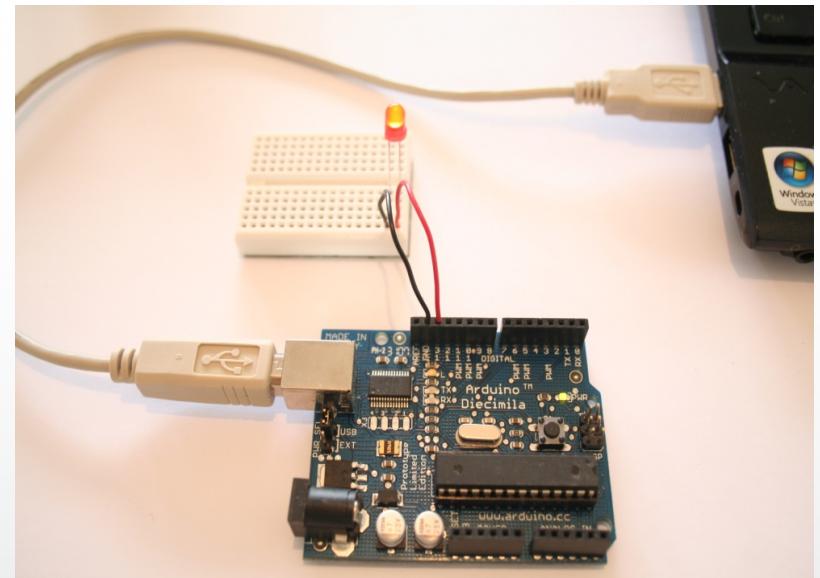
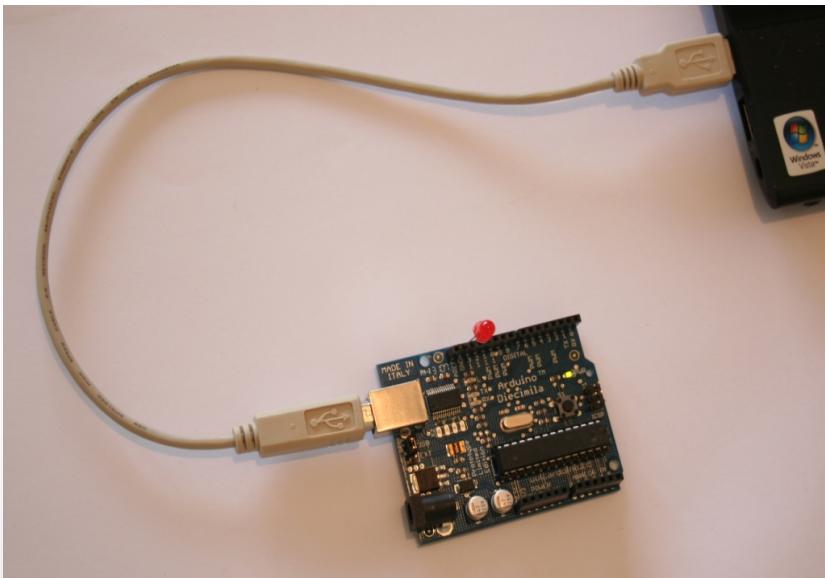
\*we are using color codes in wiring. Red wire is connected to output pin and black wire is connected to Ground



# Solderless Breadboard

Using a Solderless breadboard does not make that much of sense if we are only connecting one LED to the board with one in and one out wire connected to it. It is best suited when we want to have multiple elements connected to one or multiple pins.

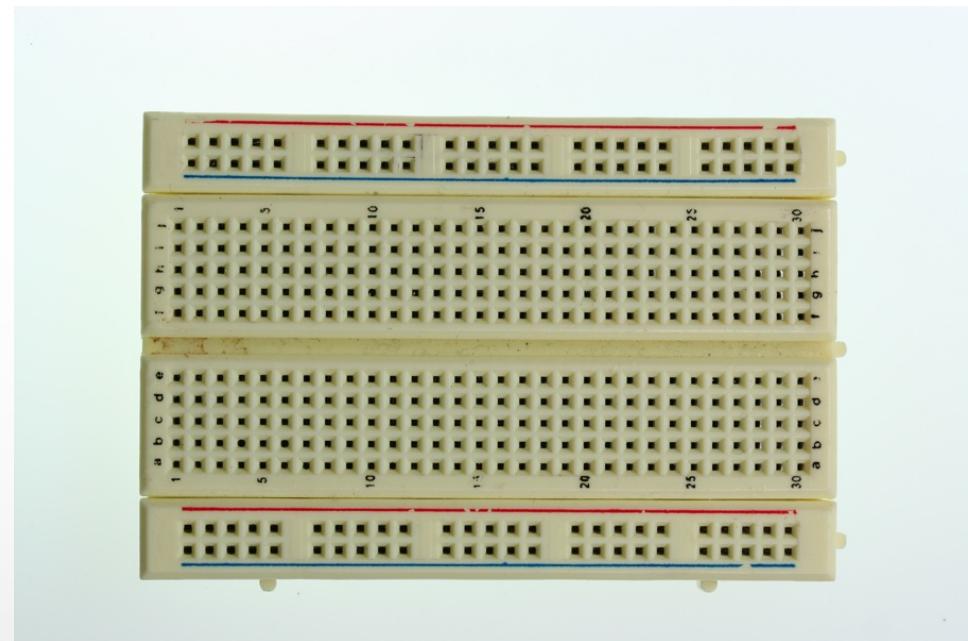
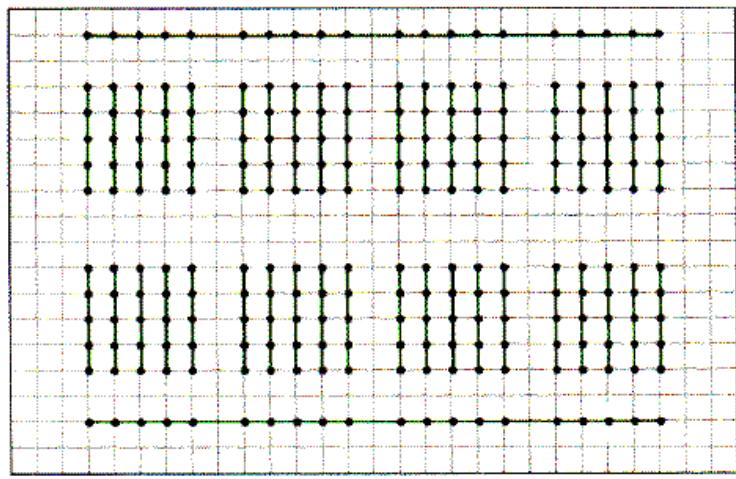
For example what if we want to control multiple LEDs from one digital output pin on Arduino board?





# Solderless Breadboard

Solderless Board is useful to build prototypes, as fast as possible without going through tiresome and time consuming process of soldering parts together to make connections





# How to read schematic

<https://learn.sparkfun.com/tutorials/how-to-read-a-schematic>

