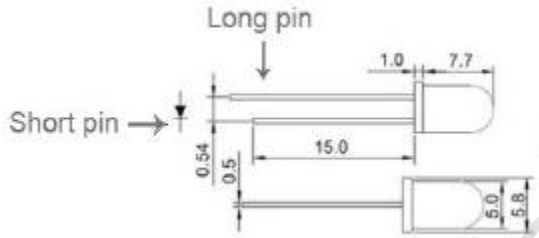
LED blink

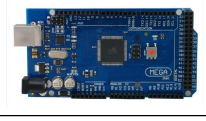
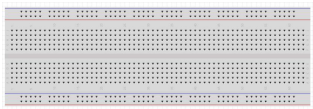
Overview

This example shows the simplest thing you can do with an Arduino to see physical output: it blinks an LED.

Specification



Hardware required

Material diagram	Material name	Number
	220/330Ω resistor	1
	LED	1
	USB Cable	1
	MEGA 2560	1
	Breadboard	1
	Jumper wires	Several

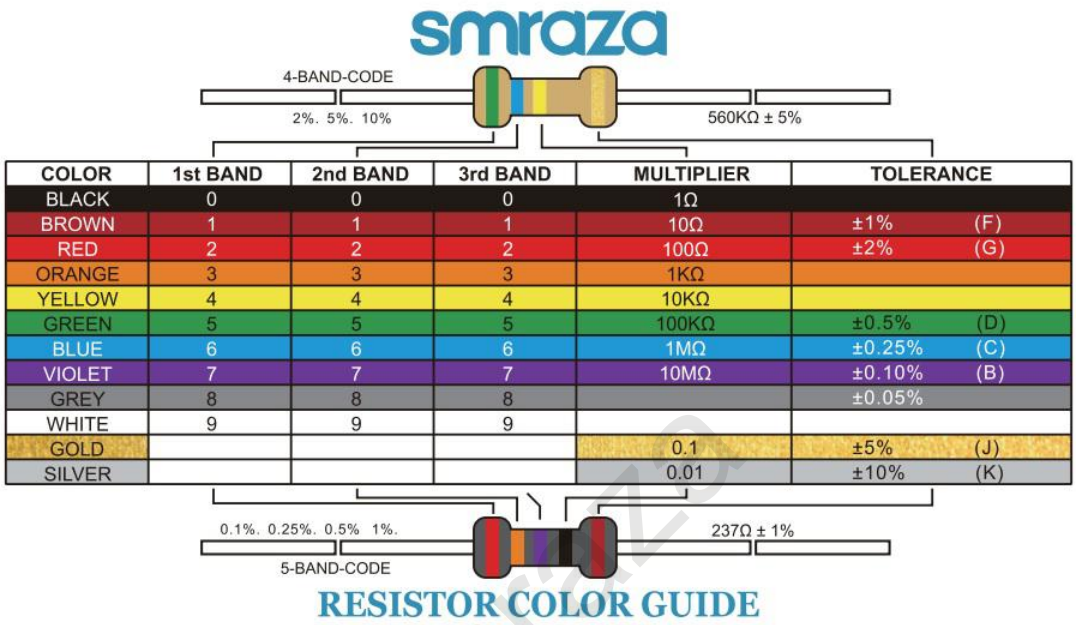
Component Introduction

LED:

In this lesson, you will use perhaps the most common of all LEDs: a 5mm red LED. 5mm refers to the diameter of the LED. Other common sizes are 3mm and 10mm. You cannot directly connect an LED to a battery or voltage source because 1) the LED has a positive and a negative lead and will not light if placed the wrong way and 2) an LED must be used with a resistor to limit or 'choke' the amount of current flowing through it; otherwise, it will burn out!

If you do not use a resistor with an LED, then it may well be destroyed almost immediately, as too much current will flow through, heating it and destroying the 'junction' where the light is produced.

RESISTORS:



COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERANCE	
BLACK	0	0	0	1Ω		
BROWN	1	1	1	10Ω	±1%	(F)
RED	2	2	2	100Ω	±2%	(G)
ORANGE	3	3	3	1KΩ		
YELLOW	4	4	4	10KΩ		
GREEN	5	5	5	100KΩ	±0.5%	(D)
BLUE	6	6	6	1MΩ	±0.25%	(C)
VIOLET	7	7	7	10MΩ	±0.10%	(B)
GREY	8	8	8		±0.05%	
WHITE	9	9	9			
GOLD				0.1	±5%	(J)
SILVER				0.01	±10%	(K)

RESISTOR COLOR GUIDE

As the name suggests, resistors resist the flow of electricity. The higher the value of the resistor, the more it resists and the less electrical current will flow through it.

We are going to use this to control how much electricity flows through the LED and therefore, how brightly it shines.

The unit of resistance is called the Ohm, which is usually shortened to Ω the Greek letter Omega. Because an Ohm is a low value of resistance, we also denote the values of resistors in kΩ (1,000 Ω) and MΩ (1,000,000 Ω).These are called kilo-ohms and mega-ohms.

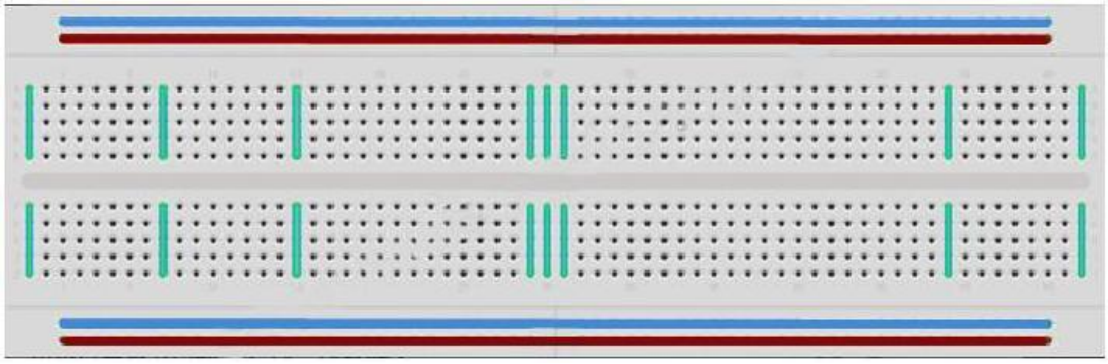
The resistor color code has three colored stripes and then a gold stripe at one end.

Unlike LEDs, resistors do not have a positive and negative lead. They can be connected either way around.

If you find this approach method too complicated, you can read the color ring flag on our resistors directly to determine its resistance value. Or you may use a digital multimeter instead.

BREADBOARD :

A breadboard enables you to prototype circuits quickly, without having to solder the connections. Below is an example.

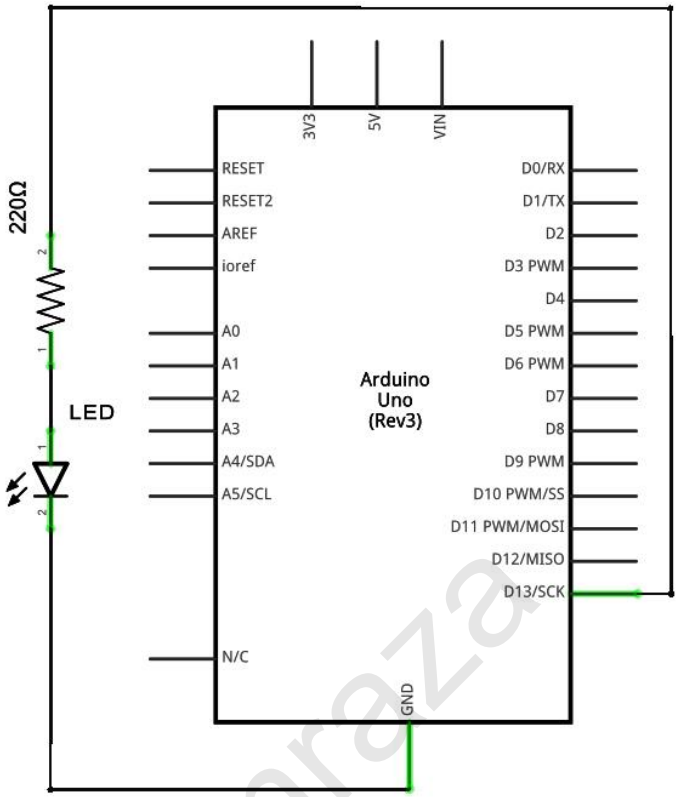


Breadboards come in various sizes and configurations. The simplest kind is just a grid of holes in a plastic block. Inside are strips of metal that provide electrical connection between holes in the shorter rows. Pushing the legs of two different components into the same row joins them together electrically. A deep channel running down the middle indicates that there is a break in connections there, meaning, you can push a chip in with the legs at either side of the channel without connecting them together. Some breadboards have two strips of holes running along the long edges of the board that are separated from the main grid. These have strips running down the length of the board inside and provide a way to connect a common voltage. They are usually in pairs for +5 volts and ground. These strips are referred to as rails and they enable you to connect power to many components or points in the board.

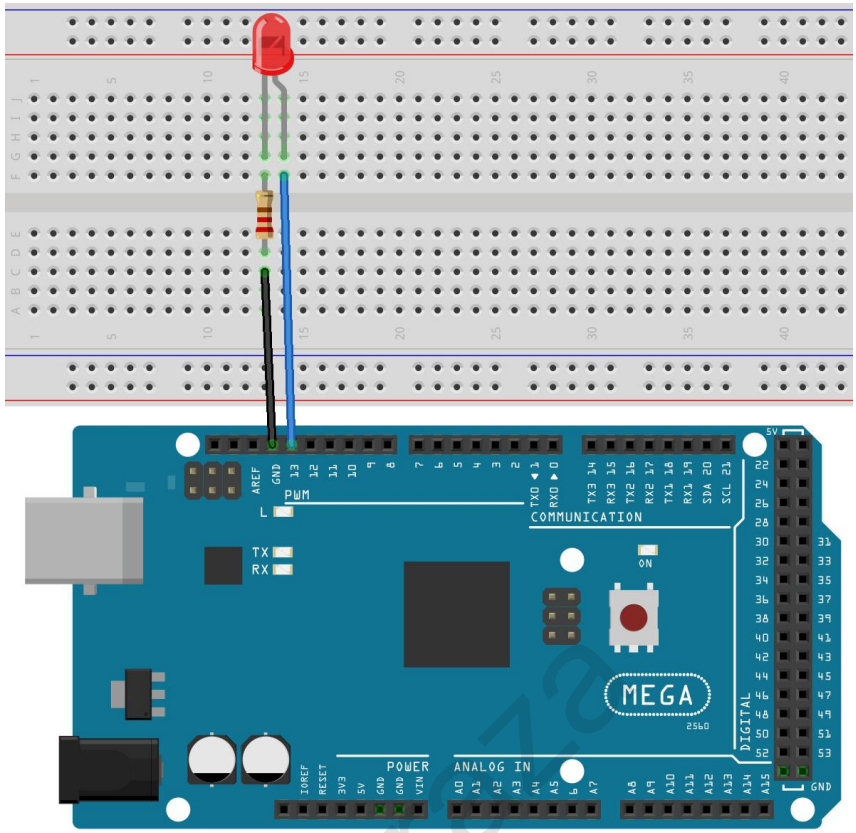
While breadboards are great for prototyping, they have some limitations. Because the connections are push-fit and temporary, they are not as reliable as soldered connections. If you are having intermittent problems with a circuit, it could be due to a poor connection on a breadboard.

Connection

Schematic



Connection diagram



Note：The longest LED of the pin is connected to the digital signal port 13(D13).

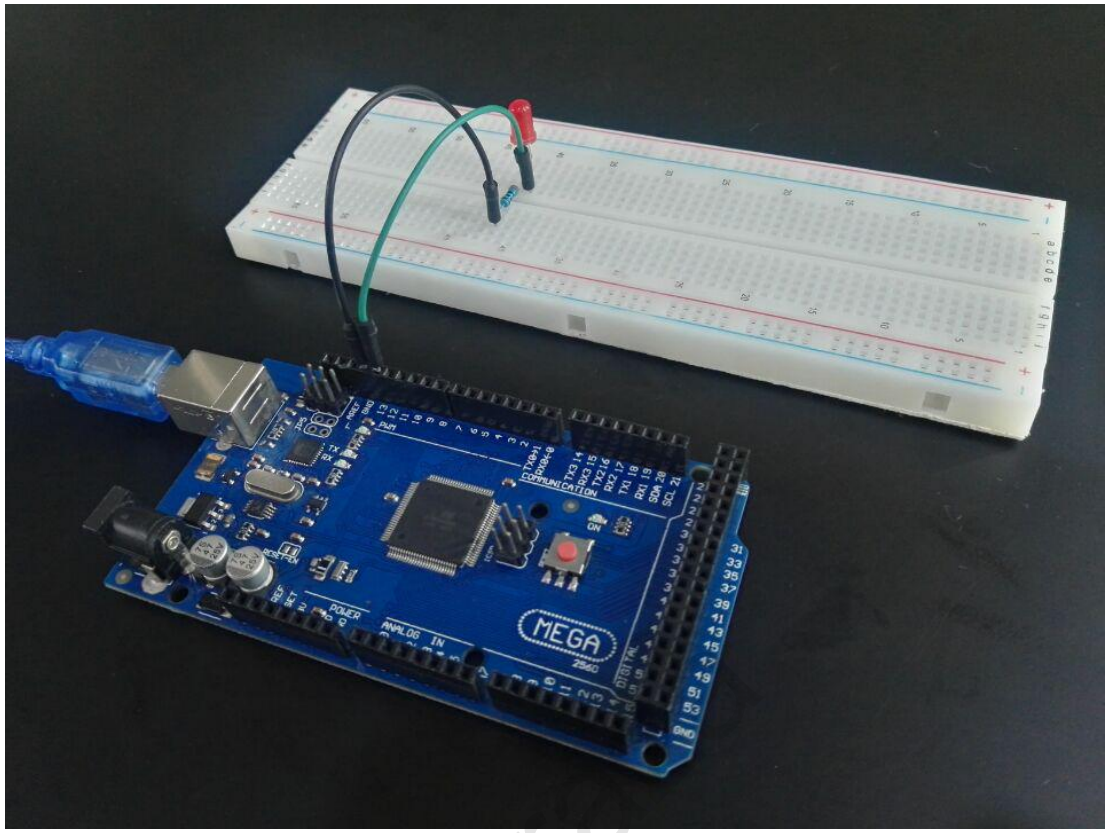
Sample code

Note: sample code under the **Sample code** folder

```
// Pin 13 has an LED connected on most Arduino boards.
// give it a name:
int led = 13;
// the setup routine runs once when you press reset:
void setup()
{
      // initialize the digital pin as an output.
      pinMode(led, OUTPUT);
}

// the loop routine runs over and over again forever:
void loop()
{
      digitalWrite(led, HIGH);
      delay(1000);                  // wait for a second
      digitalWrite(led, LOW);
      delay(1000);
}
```

Example picture



Language reference

Tips：click on the following name to jump to the web page.
If you fail to open, use the Adobe reader to open this document.

int
setup()
pinMode()
OUTPUT
loop()
HIGH
LOW
digitalWrite()
digitalRead()
delay()
; (semicolon)
{} (curly braces)
= (assign)
// (comment)

Application effect

Turns on an LED on for one second, then off for one second, repeatedly.

****
* About Smraza:
* We are a leading manufacturer of electronic components for Arduino and Raspberry Pi.
* Official website: http://www.smraza.com/
* We have a professional engineering team dedicated to providing tutorials and support to help you get started.
* If you have any technical questions, please feel free to contact our support staff via email at support@smraza.com
* We truly hope you enjoy the product, for more great products please visit our
Amazon US store: http://www.amazon.com/shops/smraza
Amazon CA store: https://www.amazon.ca/shops/AMIHZKLK542FQ
Amazon UK store: http://www.amazon.co.uk/shops/AVEAJYX3AHG8Q
Amazon DE store: http://www.amazon.de/shops/AVEAJYX3AHG8Q
Amazon FR store: http://www.amazon.fr/shops/AVEAJYX3AHG8Q
Amazon IT store: http://www.amazon.it/shops/AVEAJYX3AHG8Q
Amazon ES store: https://www.amazon.es/shops/AVEAJYX3AHG8Q
****