

An Introduction to Arduino

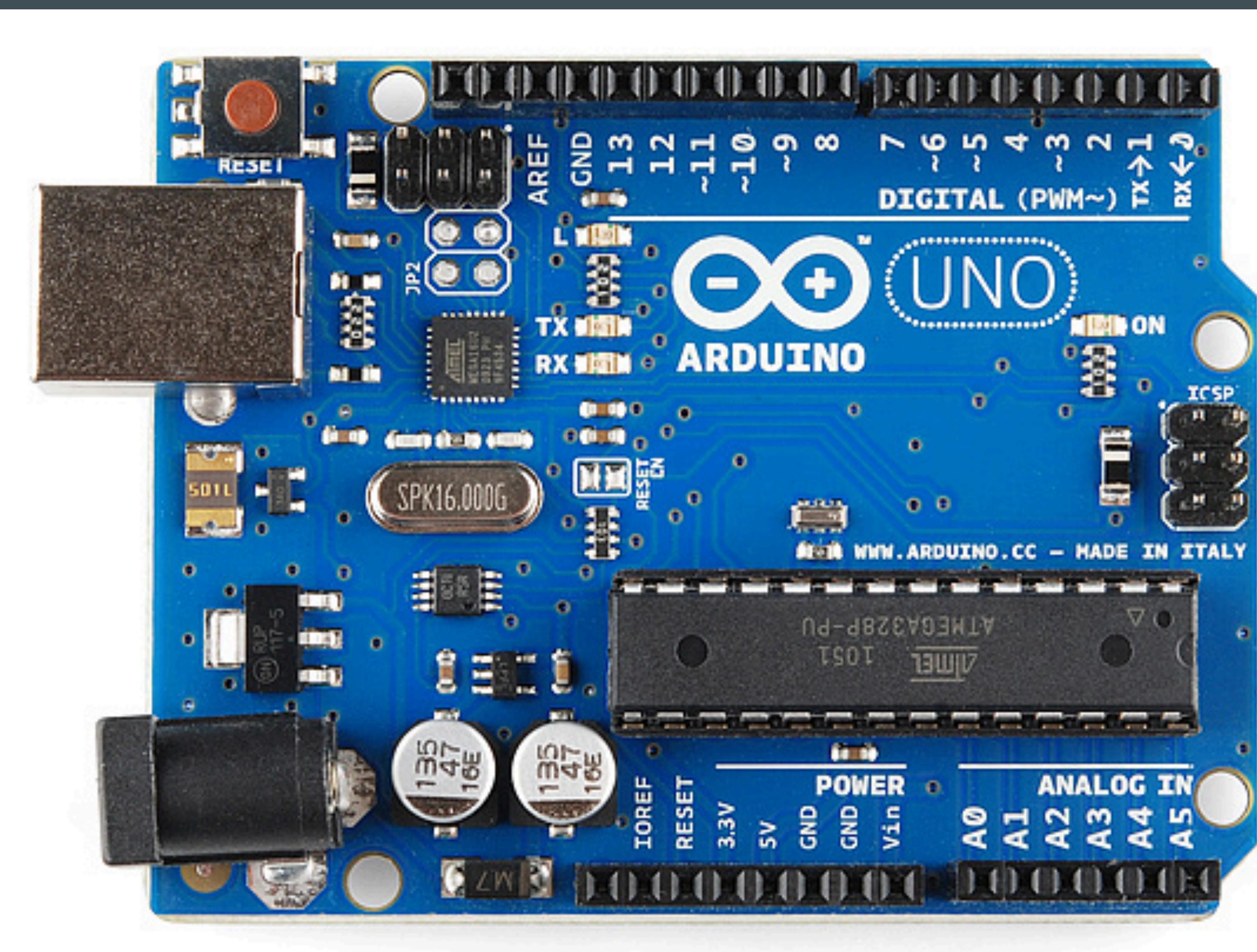
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What are we going to cover?

1. What is an Arduino
2. How to make a circuit
3. How to tell an Arduino what to do
 1. Working with examples
 2. Live Coding
 3. Controlling NeoPixels
 4. Reading Sensors

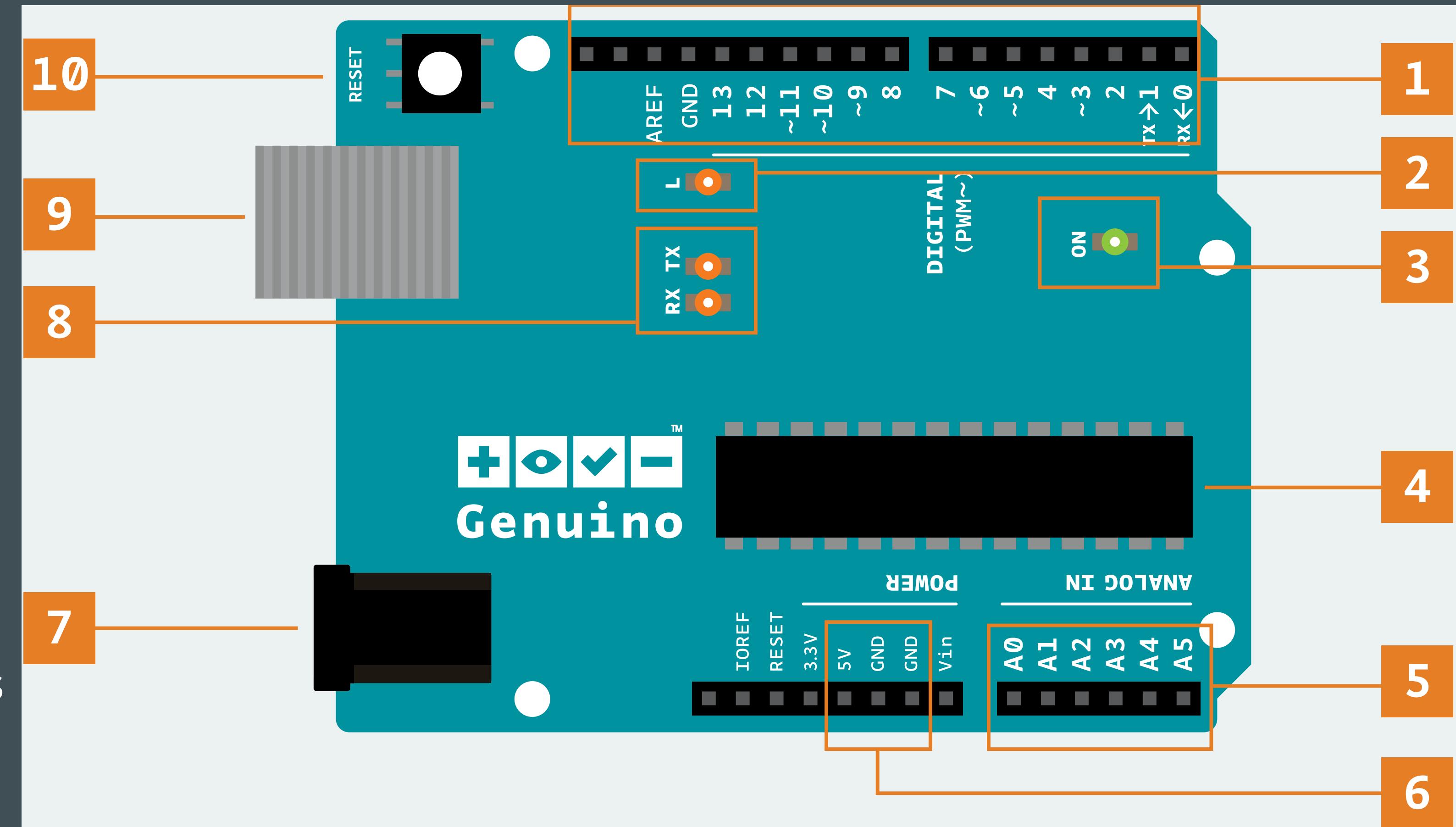
1. What is an Arduino

- A Micro Control Unit (MCU)
- Re-Programmable
- Fast Prototyping



1. What is an Arduino

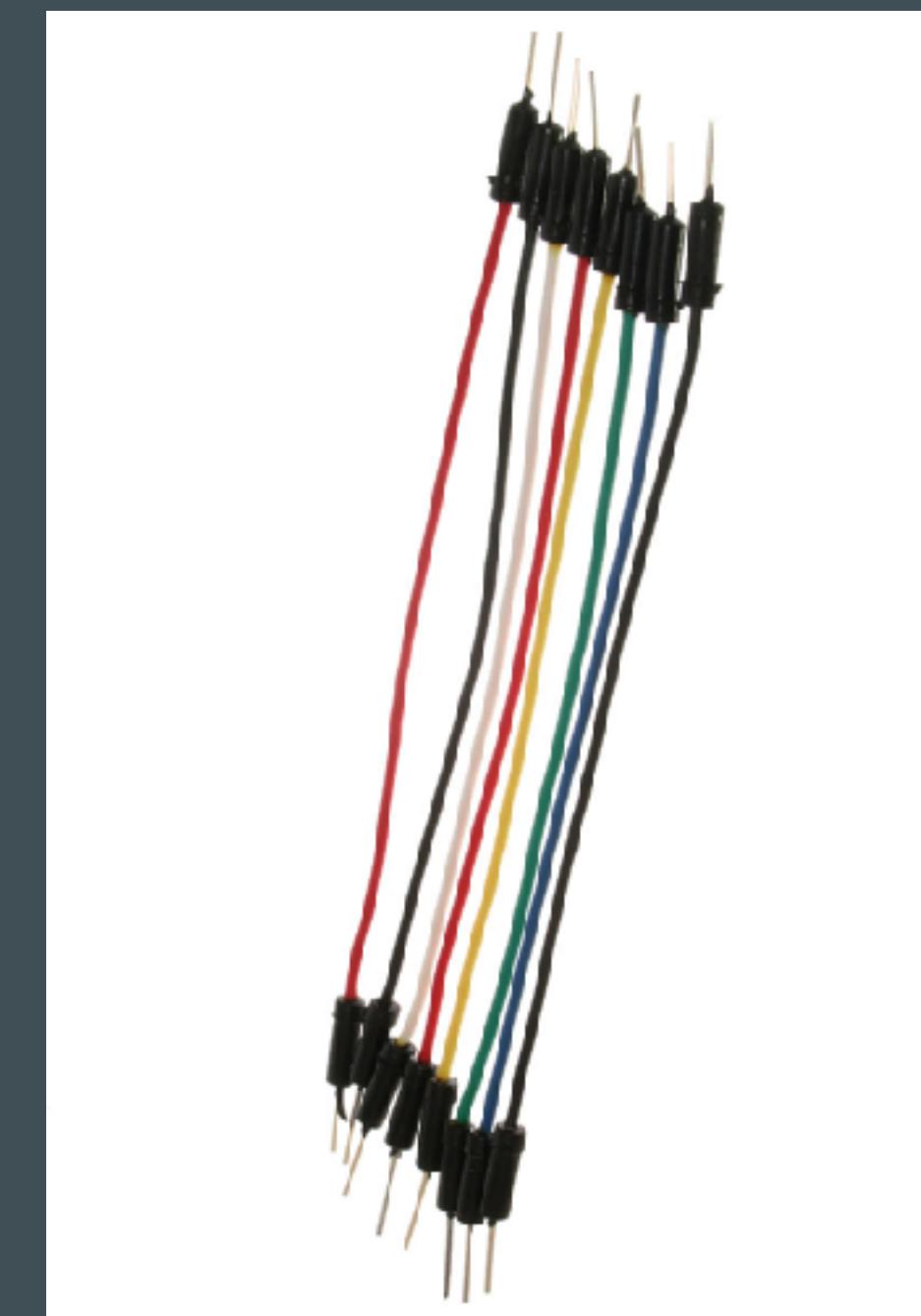
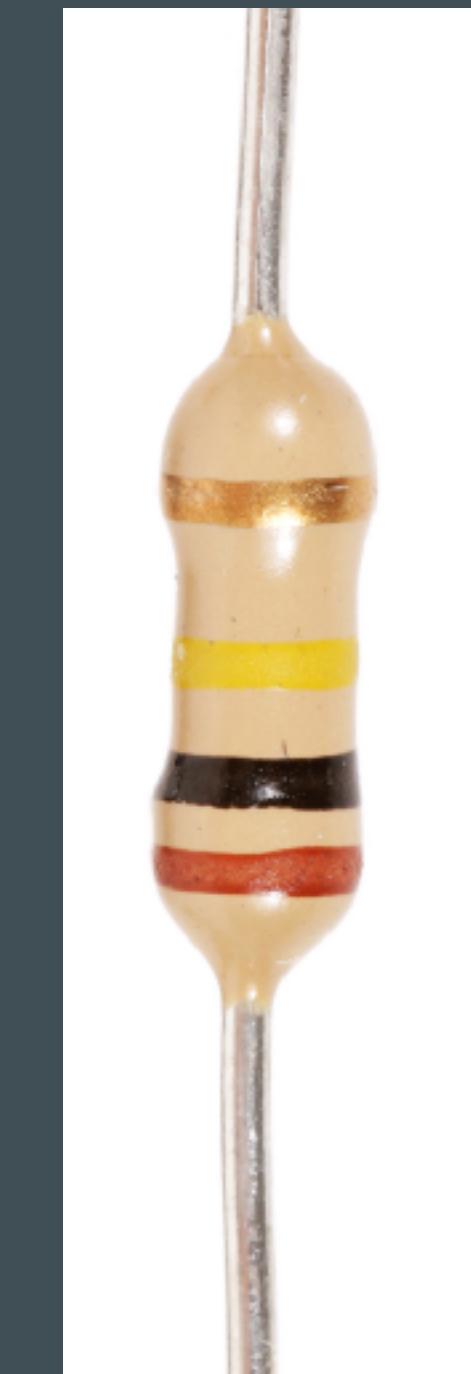
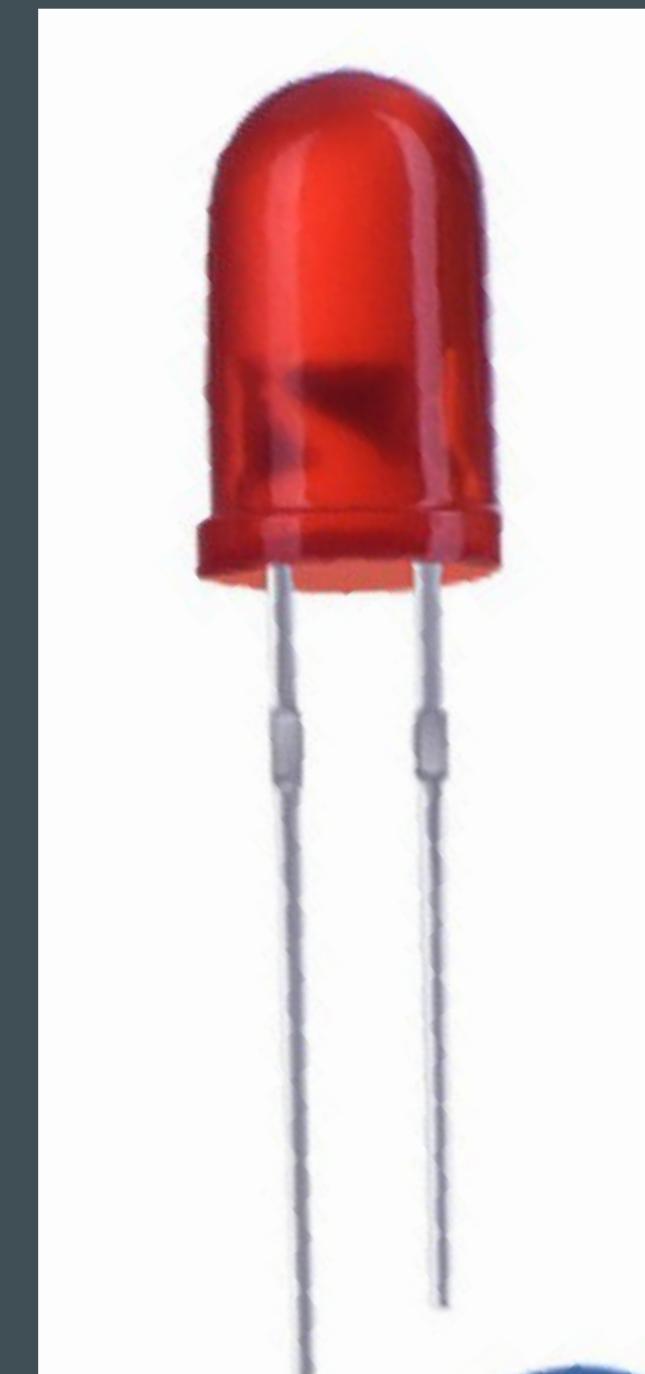
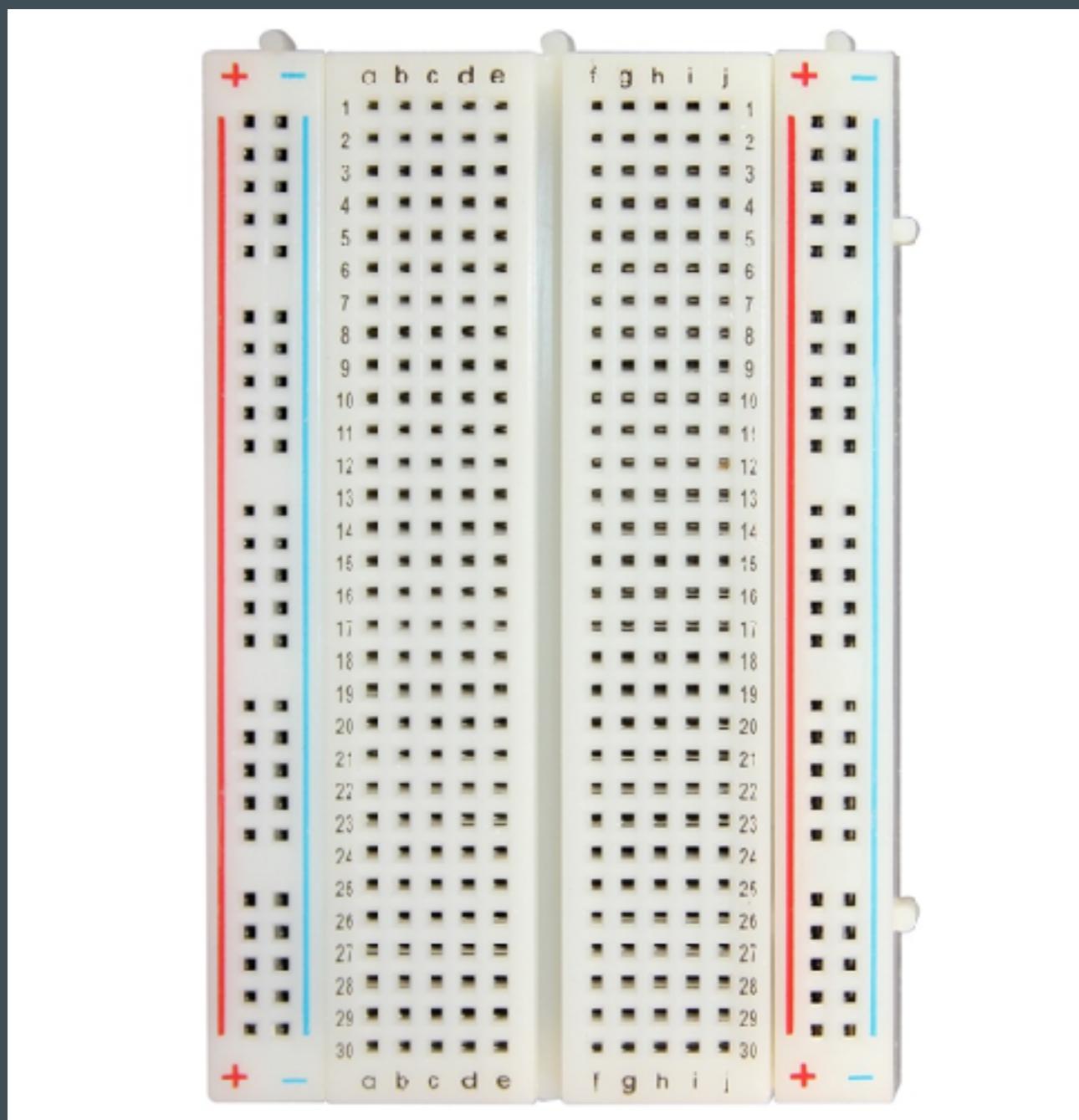
- 1 Digital Pins
- 2 Pin 13 LED
- 3 Power LED
- 4 ATmega microcontroller
- 5 Analog Pins
- 6 GND and 5V pins
- 7 External Power connector
- 8 Transmit and Recieve LEDs
- 9 USB port
- 10 Reset button



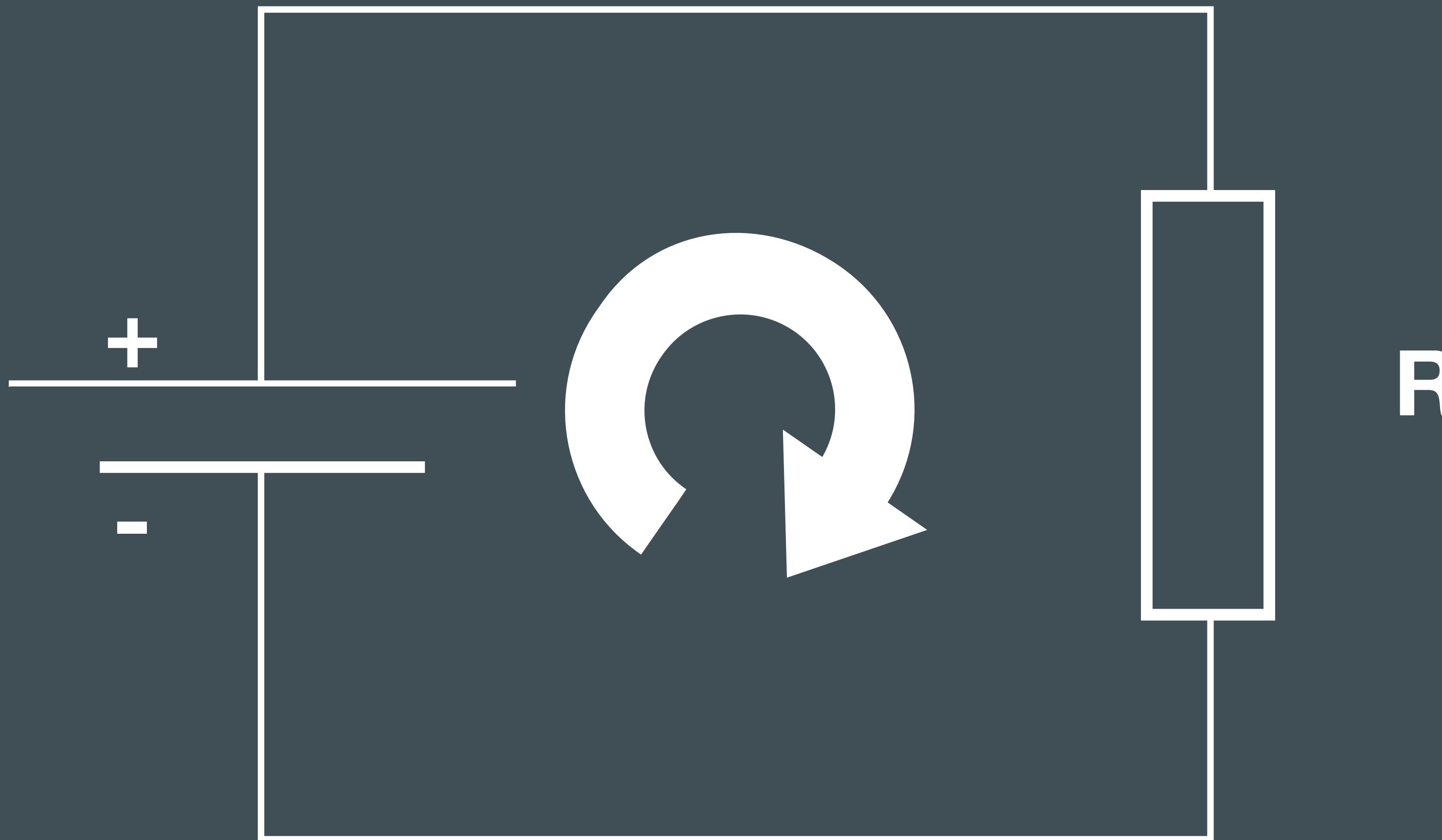
Setup Arduino IDE

1. Go to arduino.cc
2. Download IDE
3. Open IDE
4. Set Board
 - Tools->Board->Uno
5. Set Port
 - Tools->Port

2. Making a Circuit

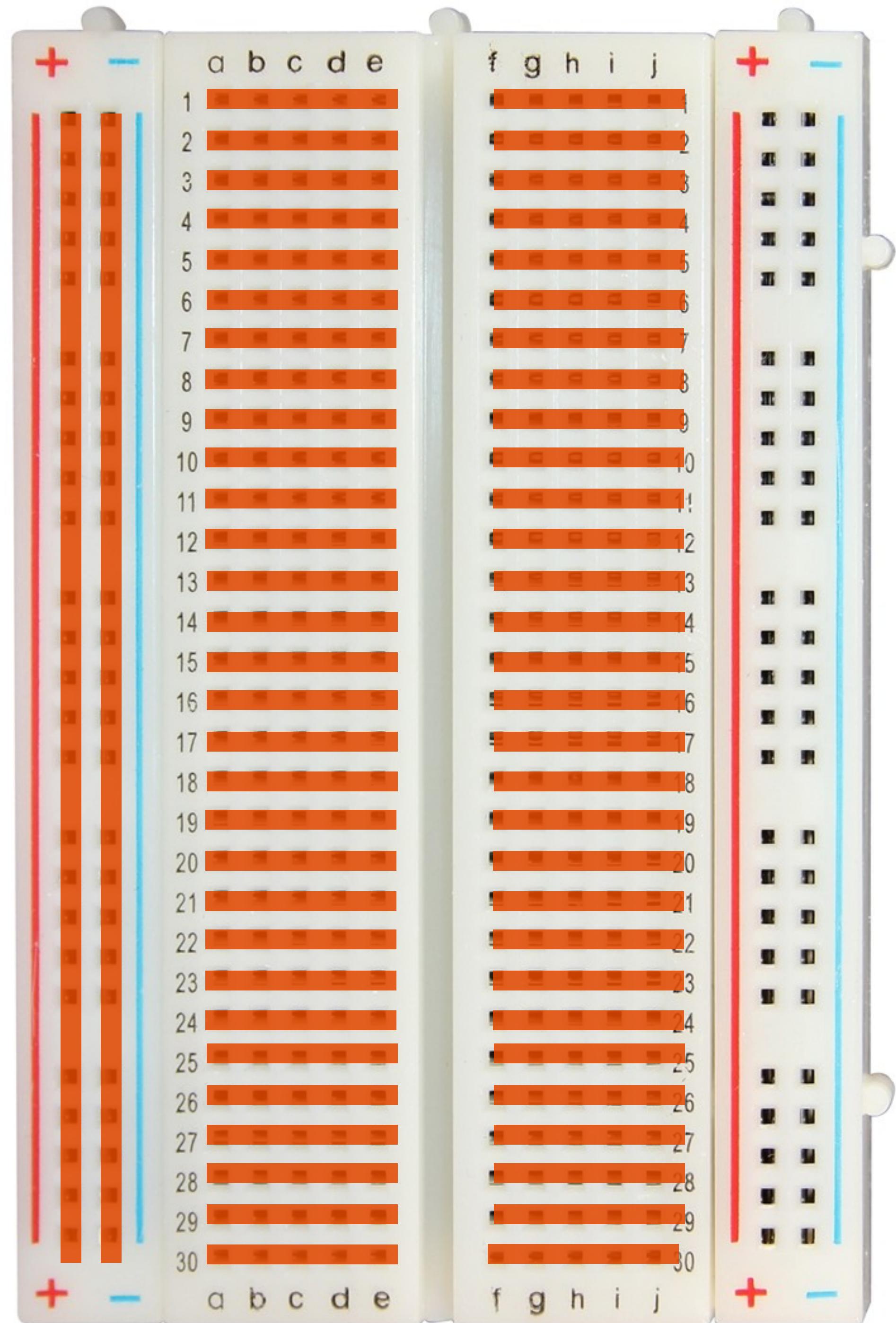


Current Flow



Breadboards

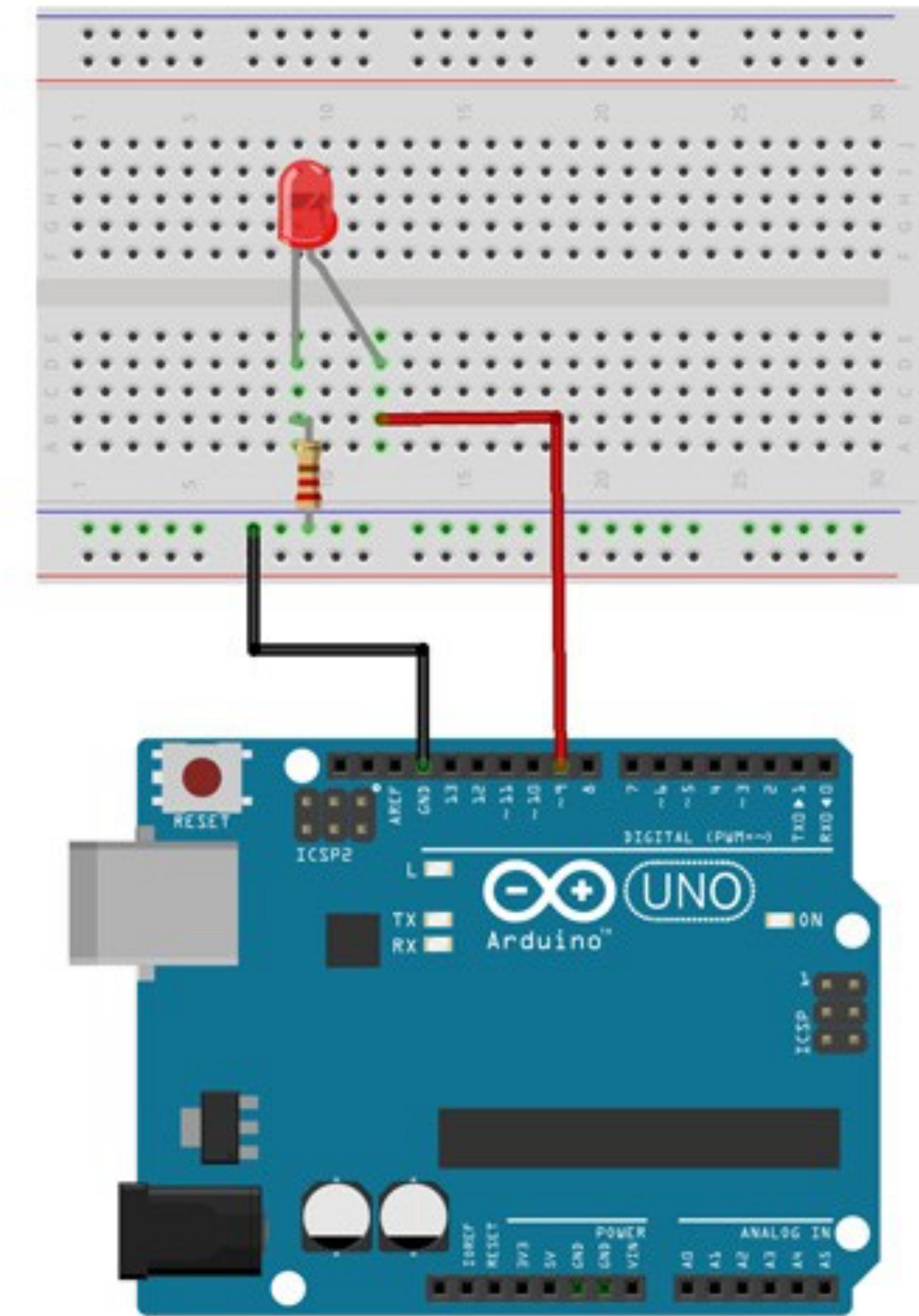
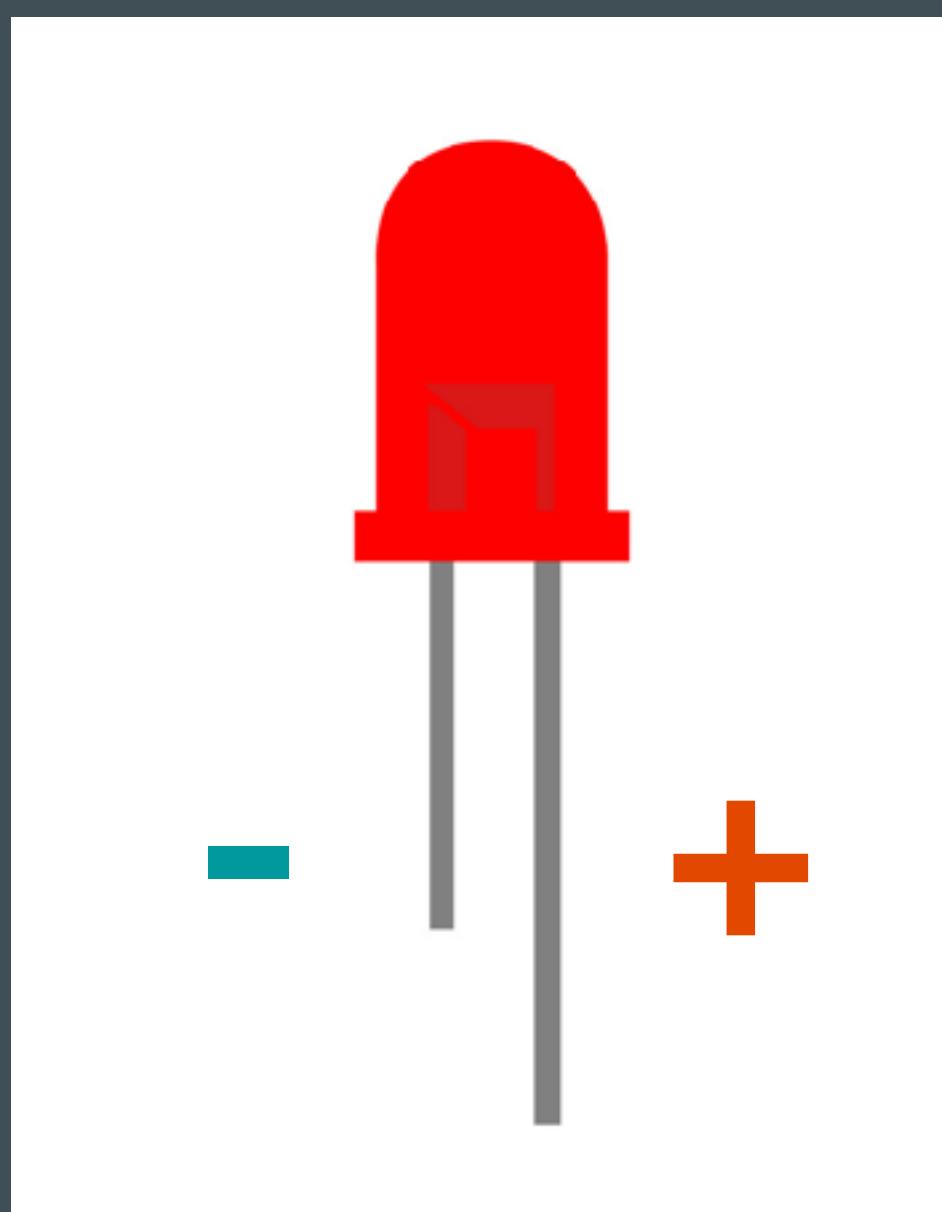
- Power Rails **+(VCC)** / **-(GND)**
- Numbered Rows Connected



Setup Arduino IDE

1. Set Board
 - Tools->Board->Uno
2. Set Port
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Lets Blink an LED

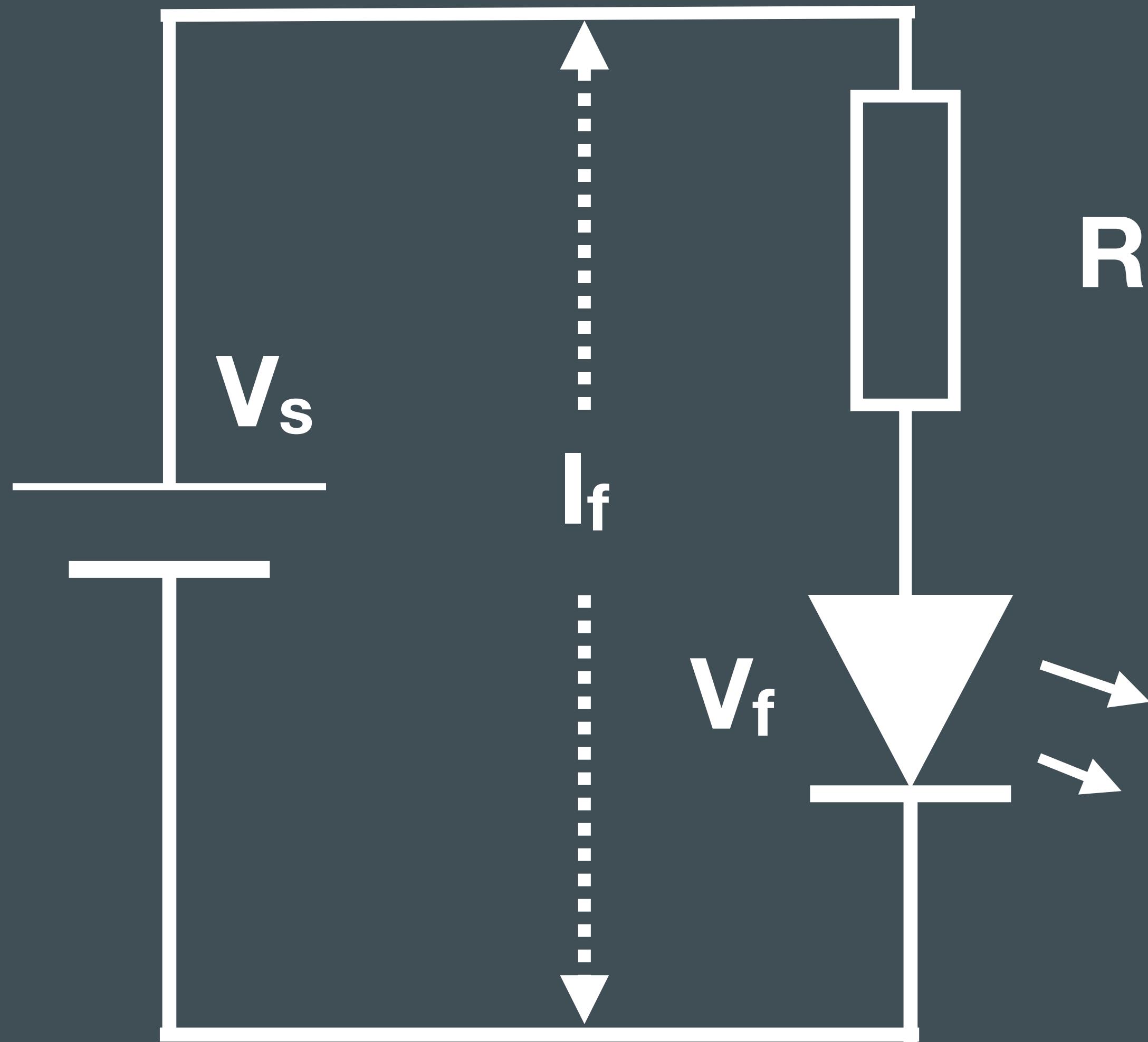


3. How to tell an Arduino what to Do

Ohm's Law: $V = IR$

Ohm's Law

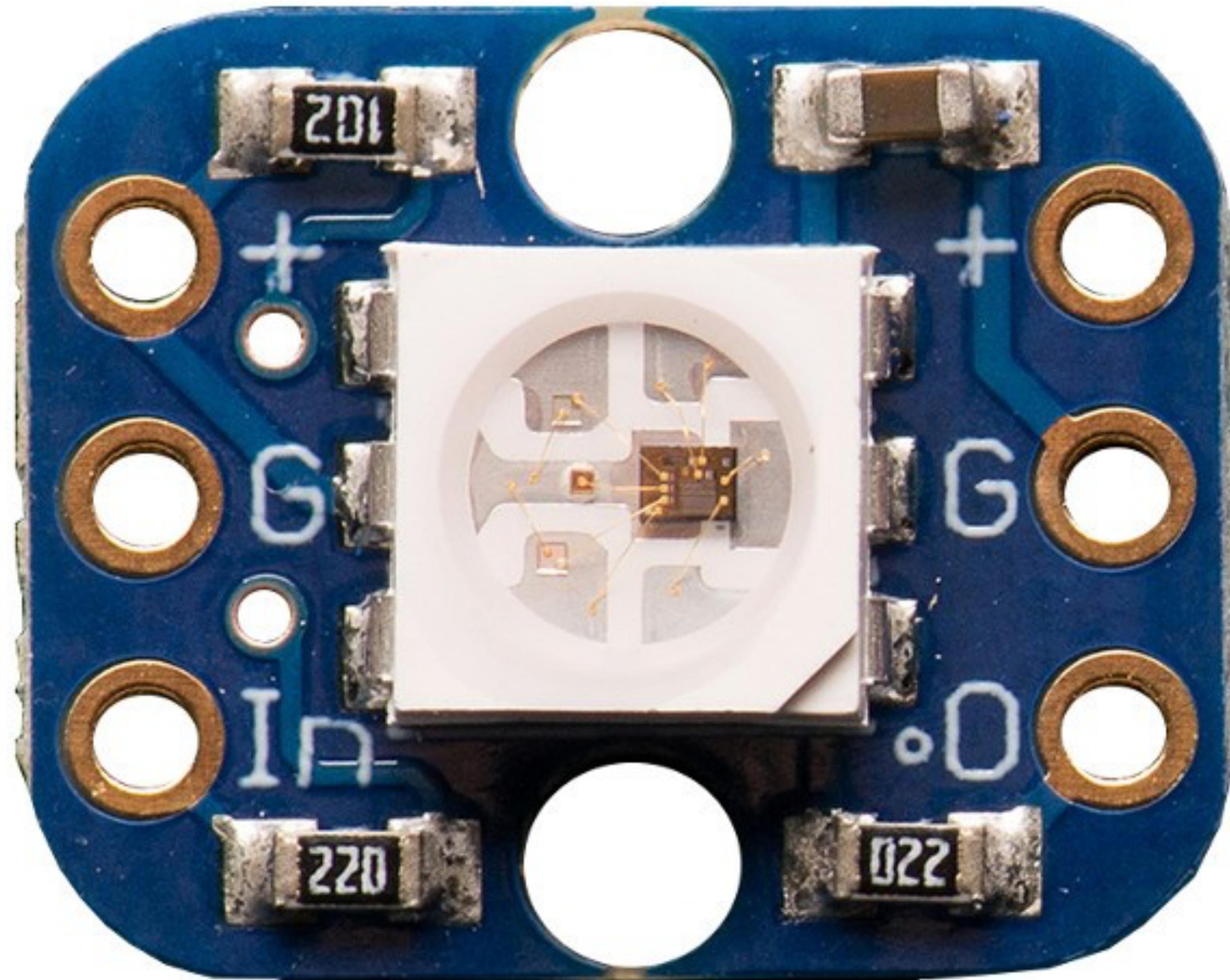
$$V = IR$$



$$R = V_s - V_f / I_f$$

- V_s : Supply Voltage
- R : Value of Resistor
- V_f : Voltage drop across LED
- I_f : Current through LED

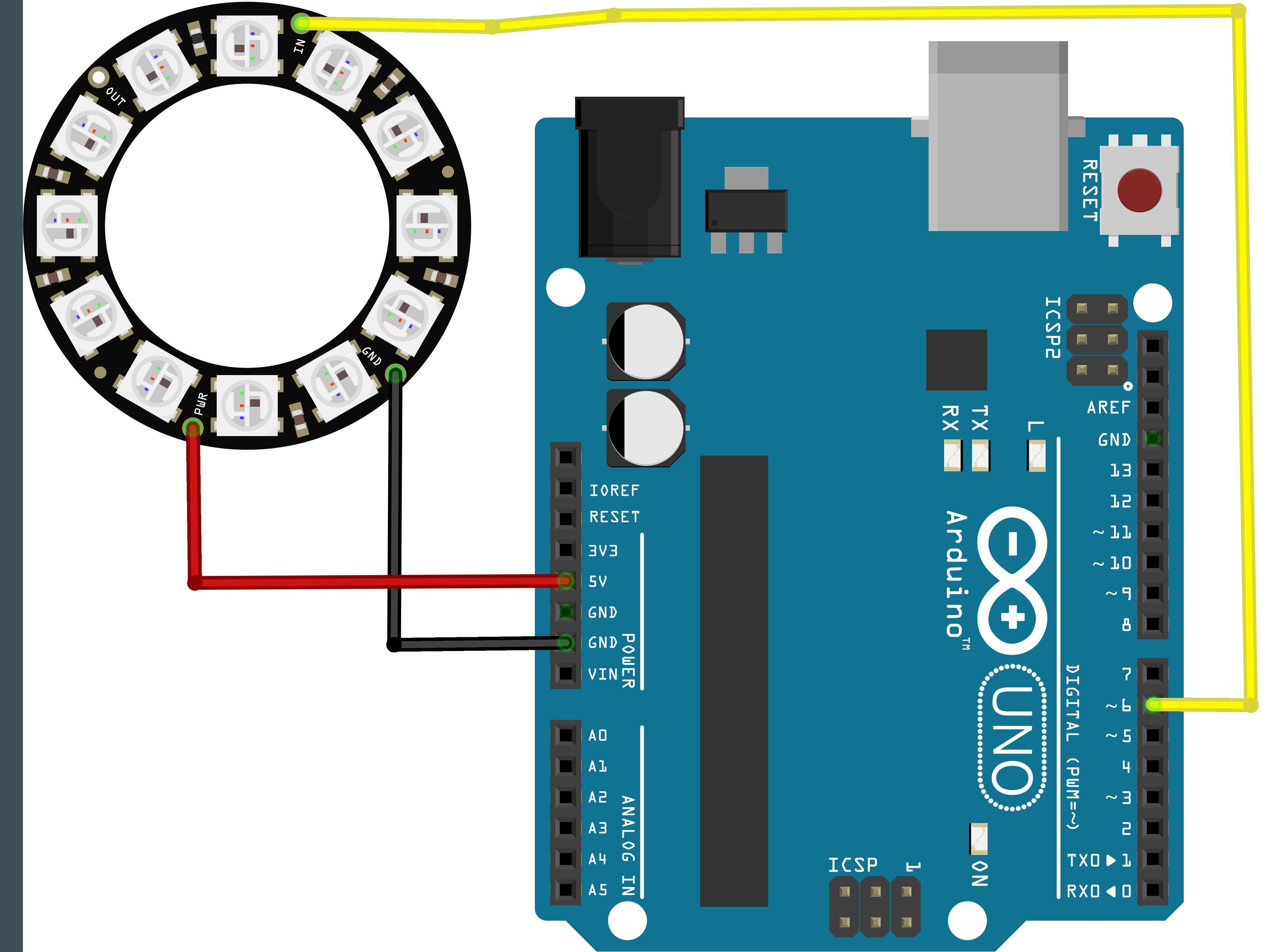
Controlling NeoPixels



NeoPixel Wiring

in
PWR
GND

6
5v
GND

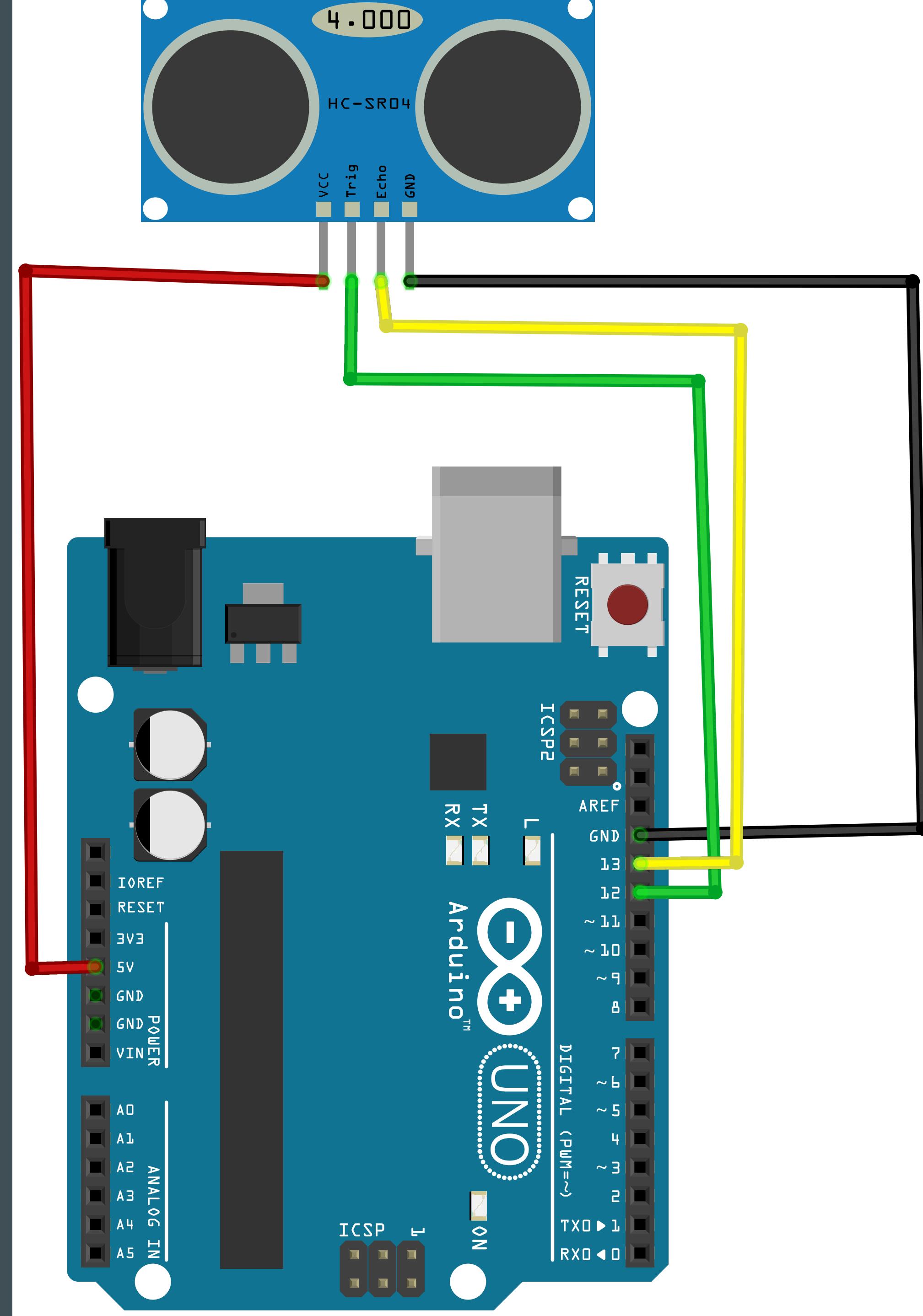


Let's Turn on Some Lights!

Reading Sensors

UltraSound Sensor

Trig - 12
Echo - 13
VCC - 5v
GND - GND



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