Day 1: Intro

¡Hola!

Instructores: Pilsoon, Joon

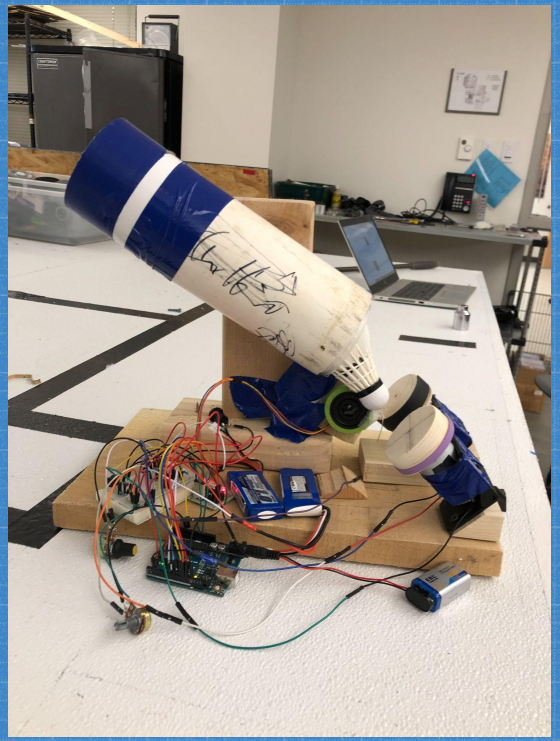
Objetivo a largo plazo

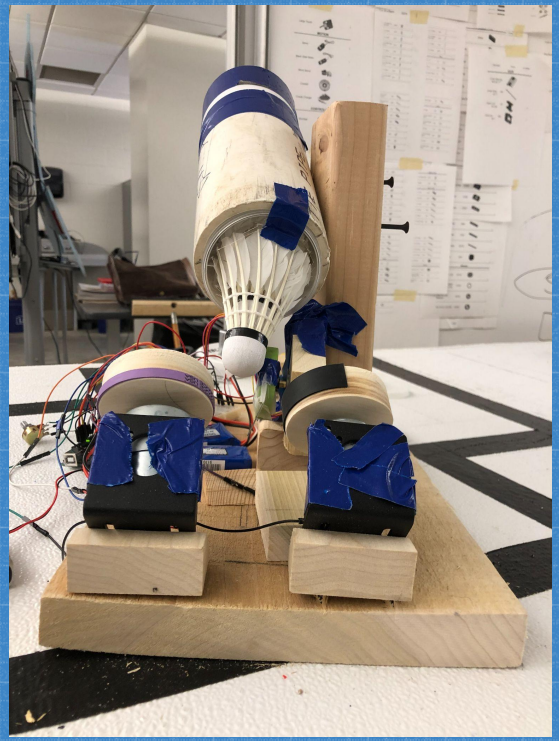
Enseñar a estudiantes más jóvenes en su comunidad local

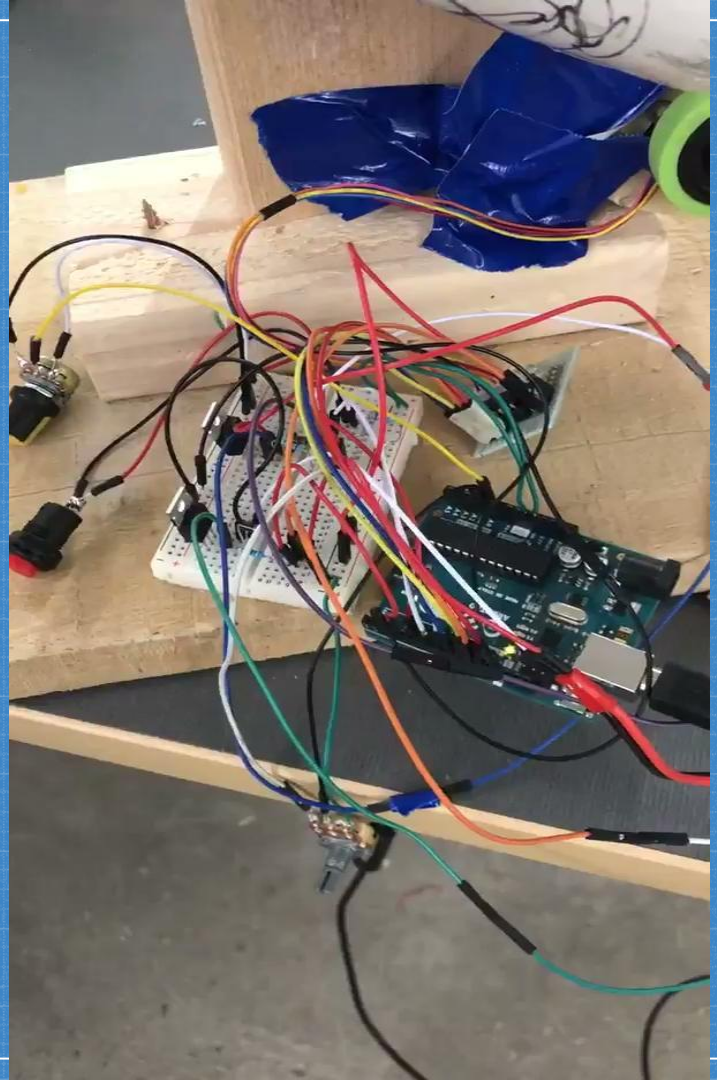
Objetivo a corto plazo

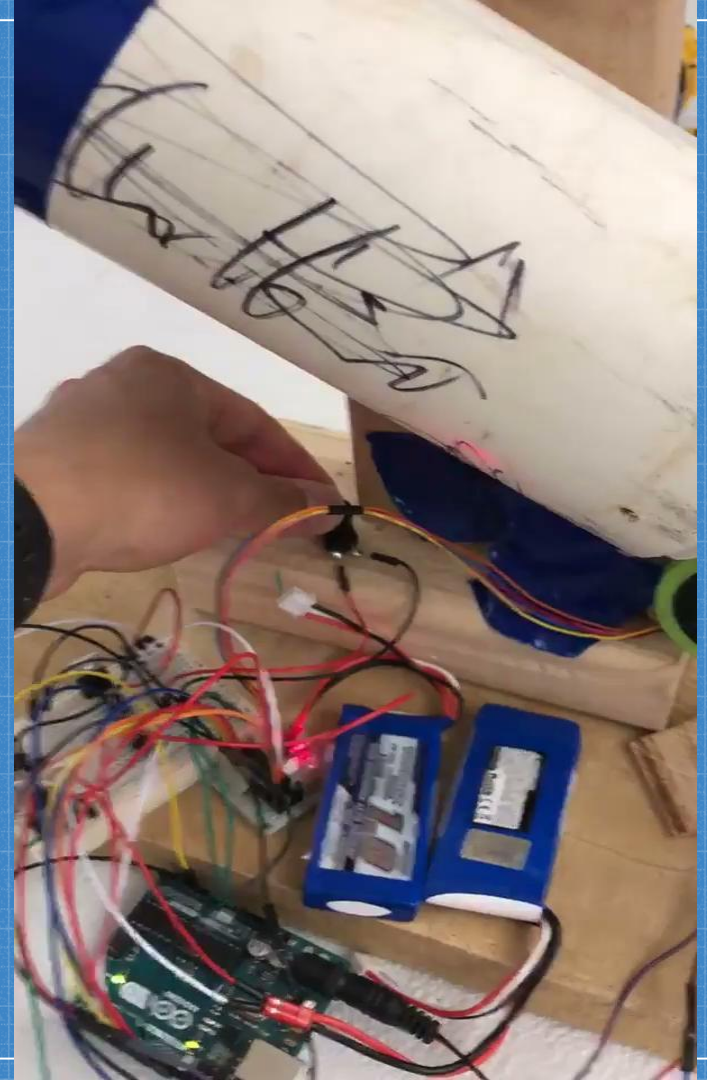
- Ideación
- Diseño conceptual
- “presentación del negocio”

Badminton Launcher (2022)







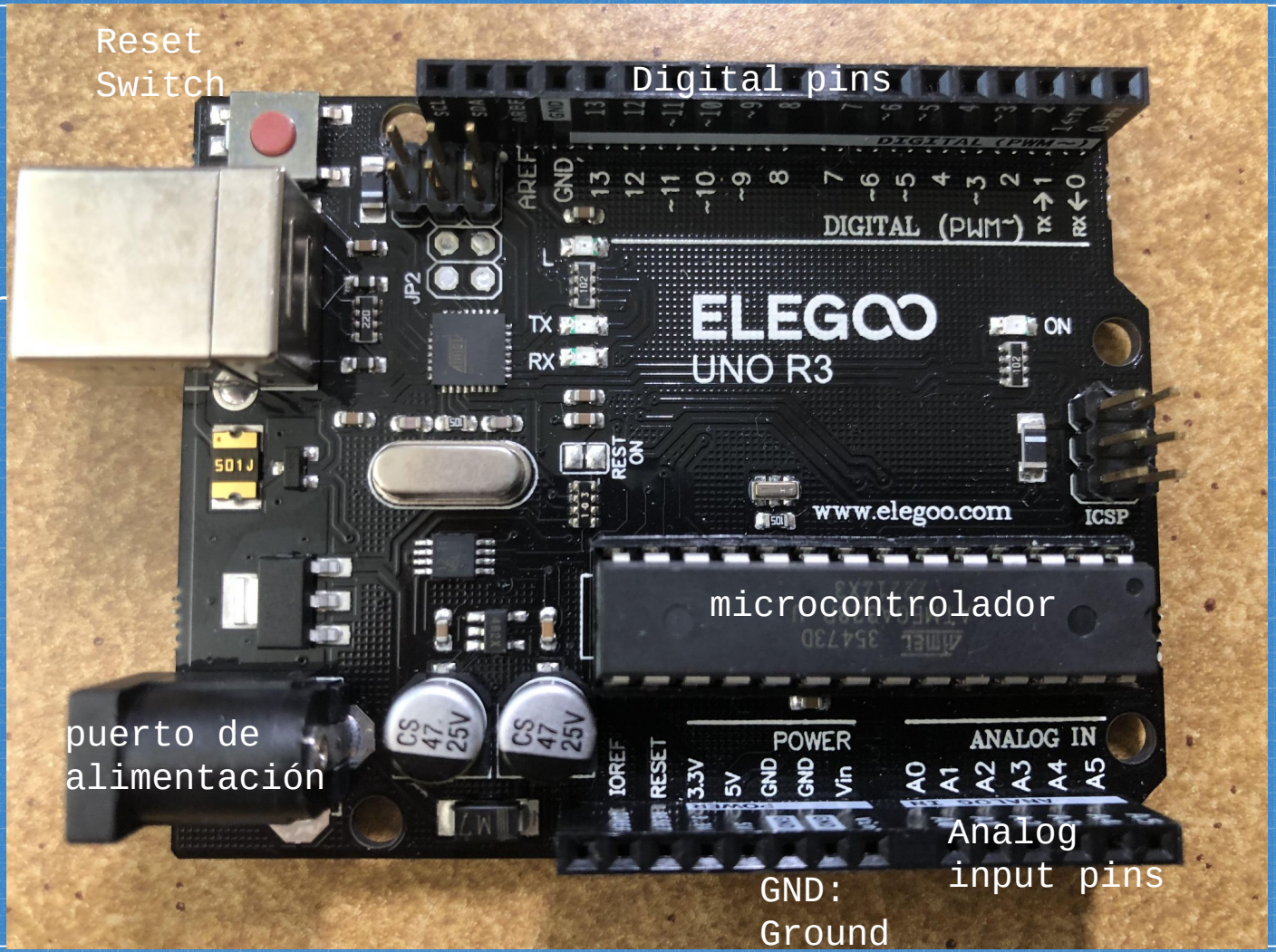


Necesitas:

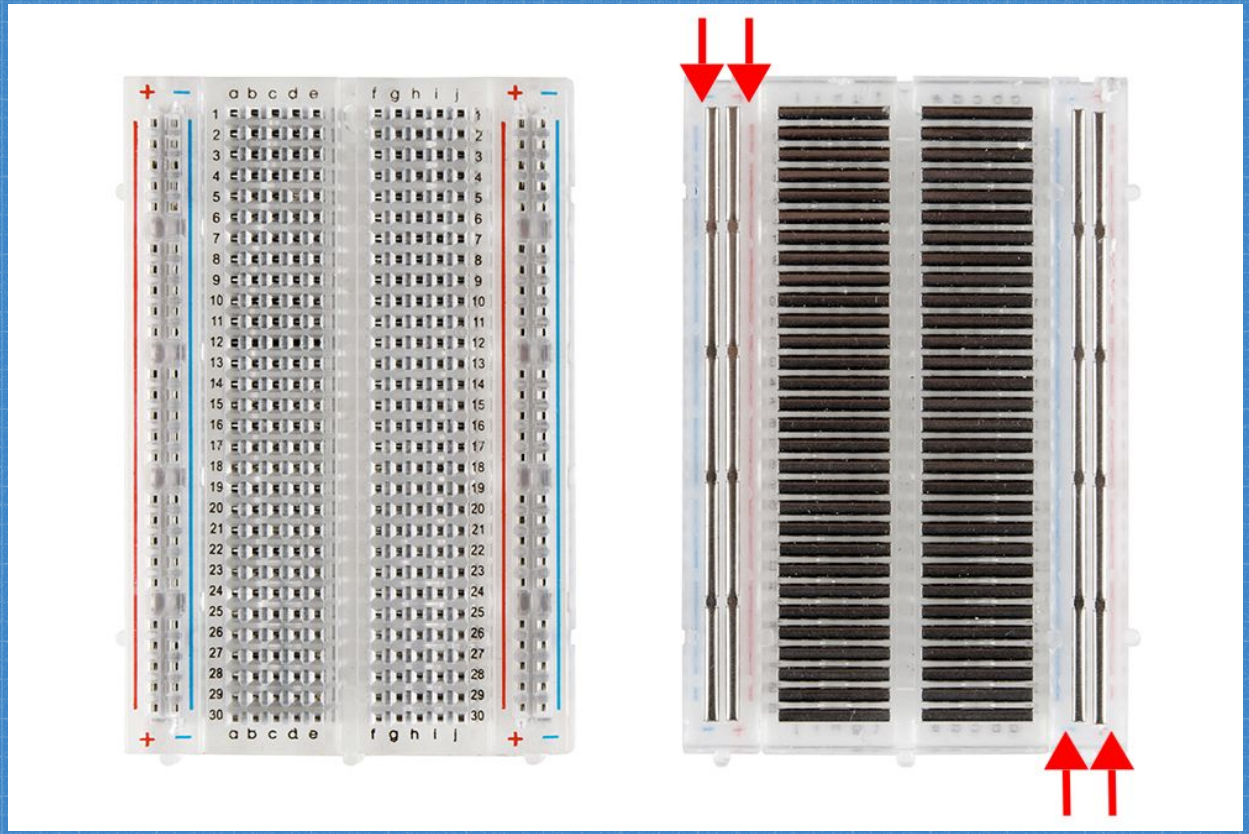
- 1 Arduino Uno R3
- 1 Tablero de circuitos

1

El Arduino


Reset Switch
Digital pins
USB Connector (power + data)
microcontrolador
puerto de alimentación
Analog input pins
GND: Ground
ELEGOO
UNO R3
DIGITAL (PWM~)
POWER
ANALOG IN
www.elegoo.com
ICSP

Protoboard


a b c d e
f g h i j
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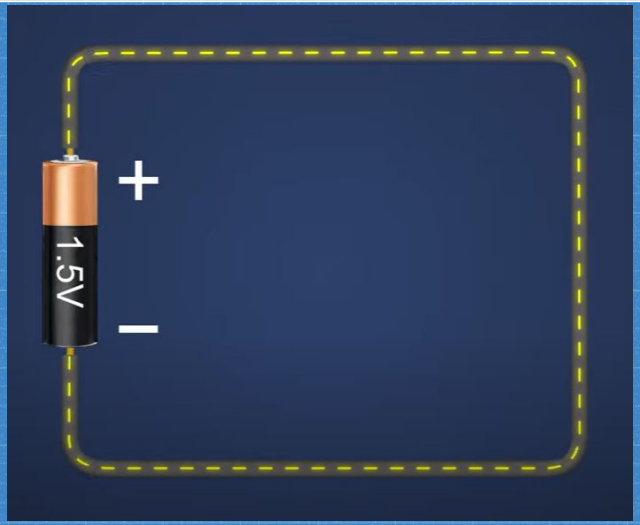
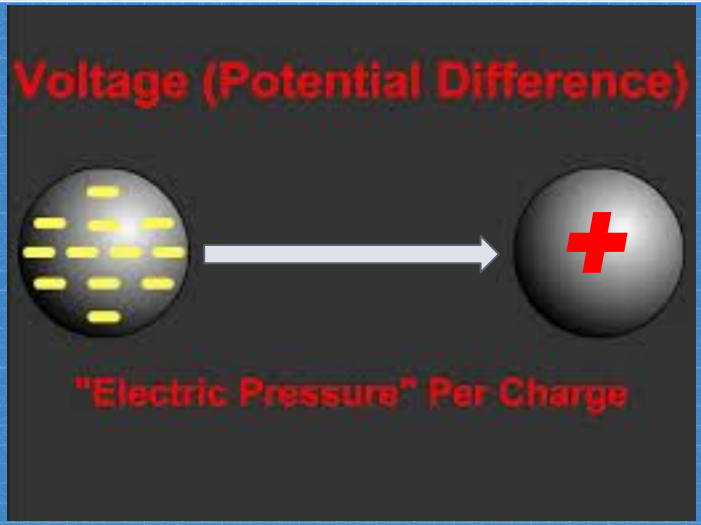
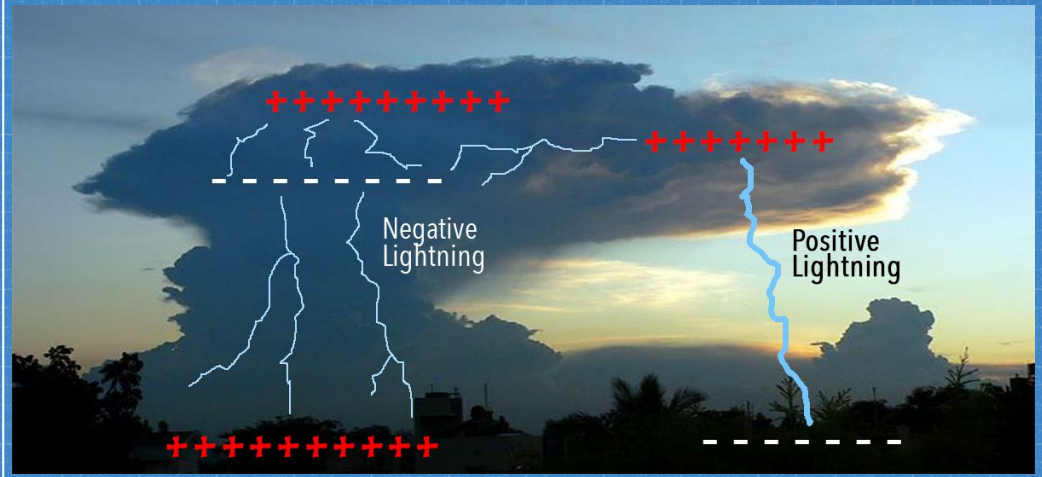
2

Ohm’s Law (Ley de Ohm)


+
1.5V
–

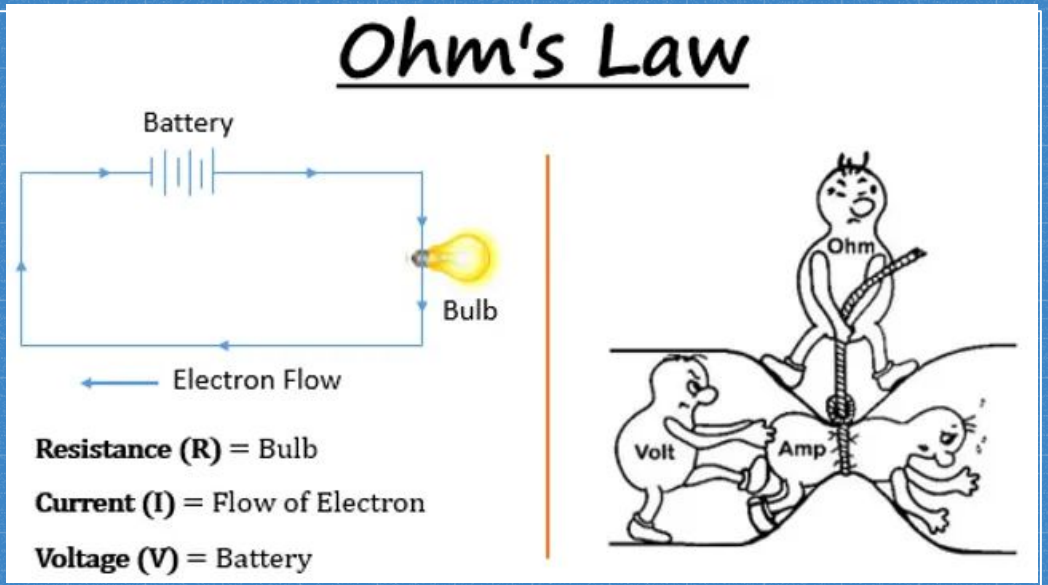
Voltaje


Voltage (Potential Difference)
"Electric Pressure" Per Charge


Negative Lightning
Positive Lightning


Switch
Battery
Lamp

V = IR



V: voltaje (voltios) - difference in electrical potential between two points

I: Corriente (amperios) - electrons/second

R: Resistencia (ohm - Ω)

Necesitas:

- 1 LED
- 220Ω Resistor

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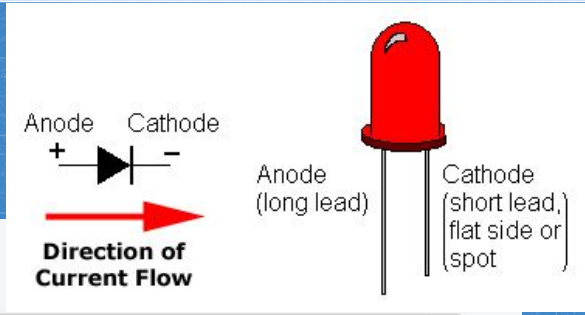
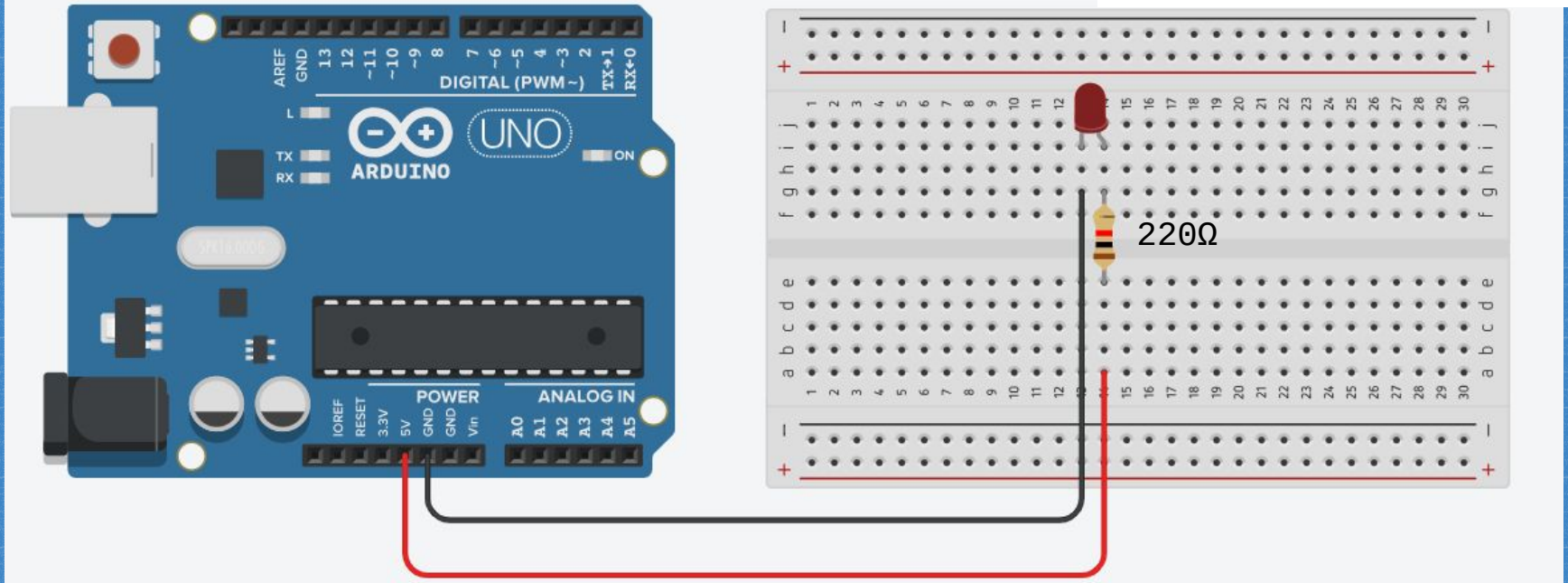
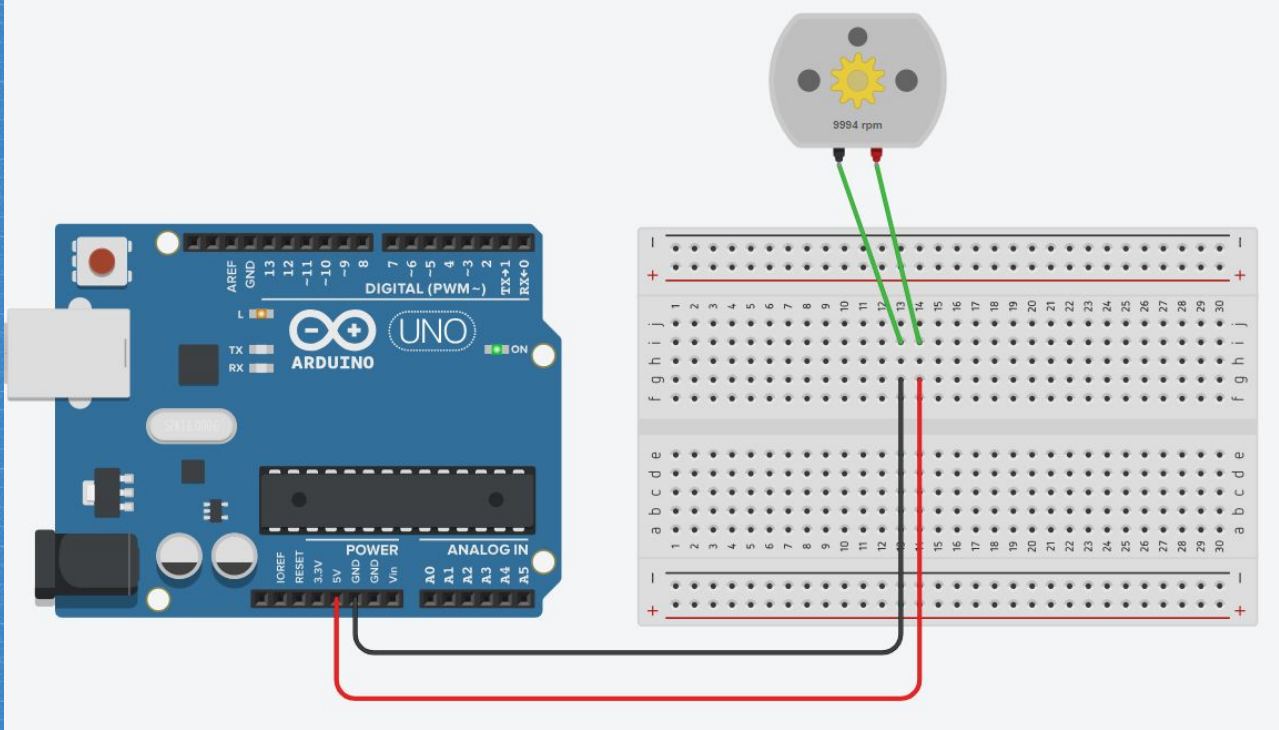
Controlar el LED manualmente

LED circuit schematic





Controlar el motor de DC



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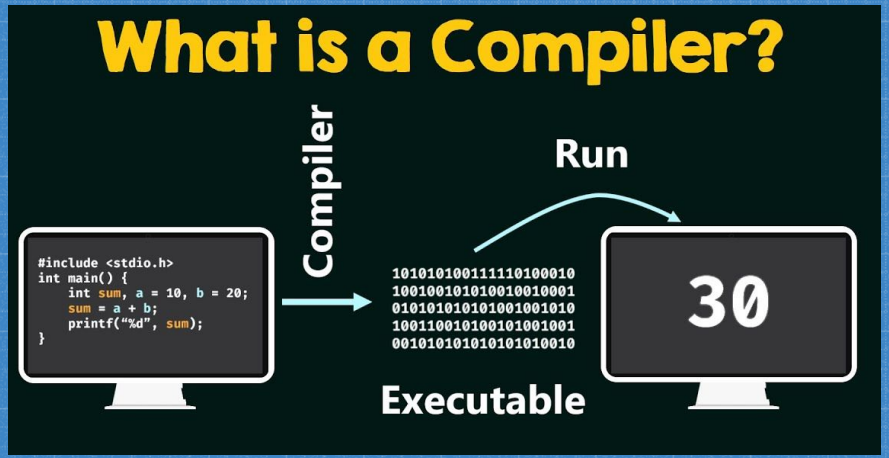
Vamos a programar!

Texto a binario

- Computadoras entienden binario (0s, 1s) - bits
  - Compilador traduce tu código



Los basicos

- C++ programming language
  - Data types
  - variable assignment
  - Operations, comparisons (<, >, ==)
  - pinMode(#, INPUT/OUTPUT)
  - digital/analog output
  - Function: setup(), loop(), for()
    - loop() runs millions times/sec → need delay()
  - ;
  - Serial.begin(9600), Serial.println()

Data Types

- bool (8 bit)- Boolean; lógico simple verdadero/falso.
- byte (8 bit)- número sin signo entre 0 y 255.
- char (8 bit)- carácter de 1 byte
- int (16 bit)- número con signo, entre -32768 y 32767.
- float: variable numérica con coma flotante de 32 bits

Variables

```
int pin = 2;
float number = 5;
char letter = “b”;
bool boolean = False;
```

Necesitas:

- 1 LED
- Resistor: 220Ω, 1kΩ

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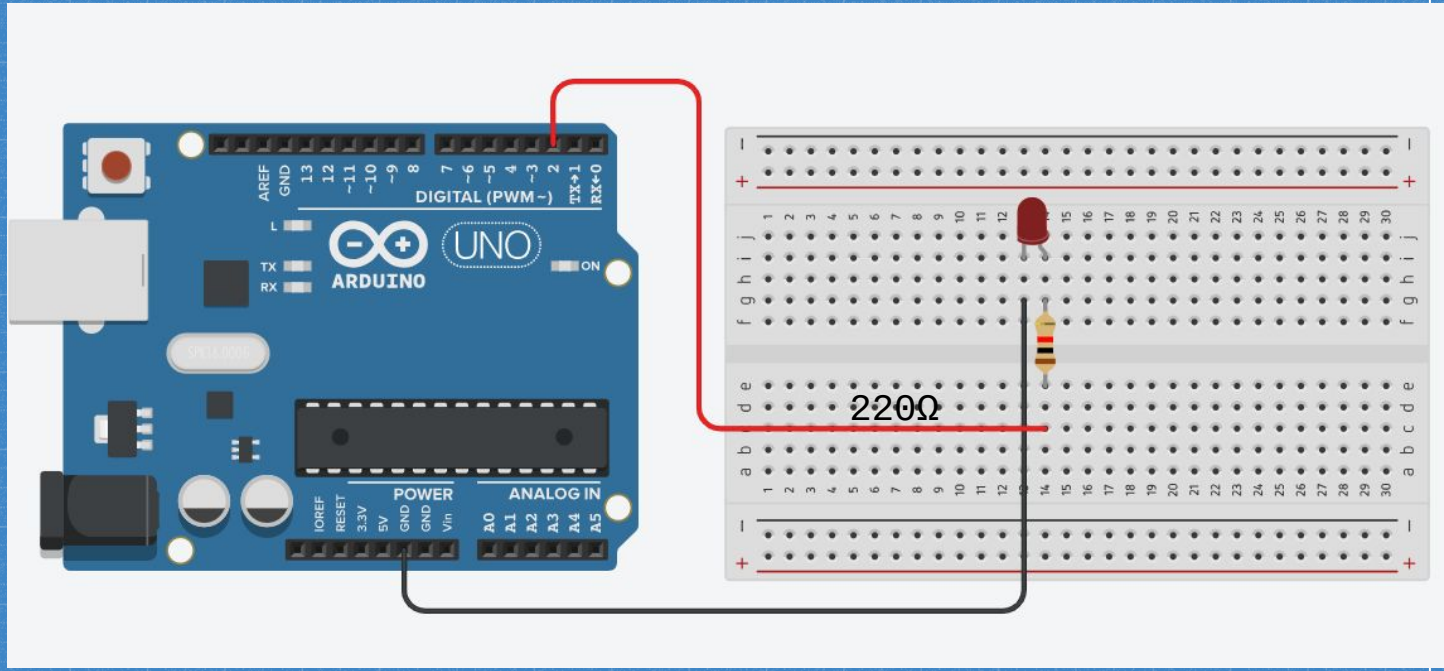
Controlar el LED con digitalWrite()

Encender/apagar cada 2 segundos

Nuevos métodos:

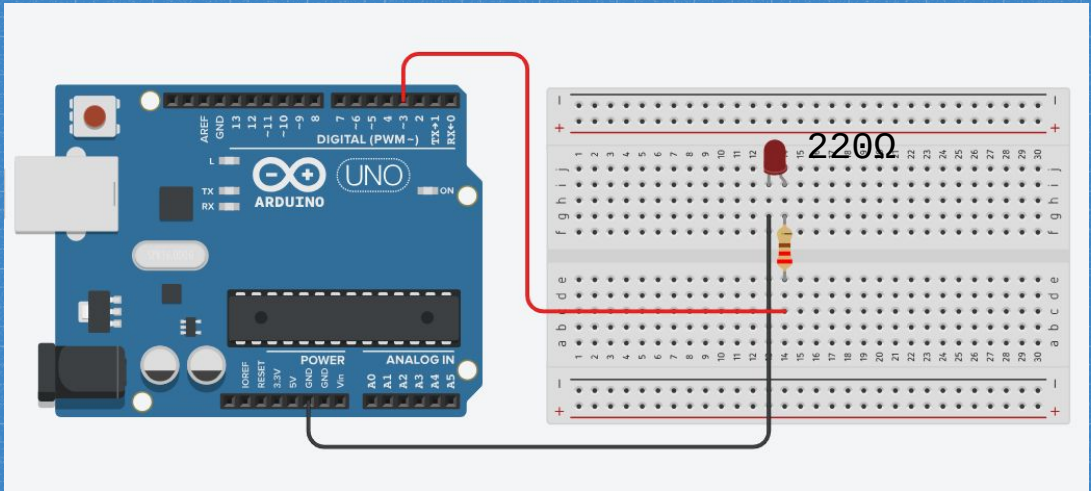
- pinMode()
- digitalWrite()
- delay()

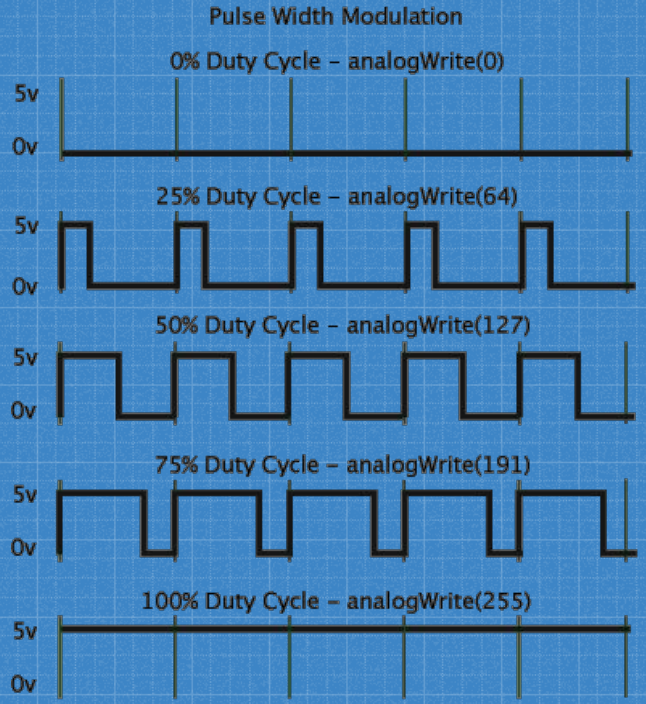


Cambiar el brillo con PWM

Nuevos métodos:

- analogWrite()
- for() loops





Botones

Nuevos métodos:

- if()