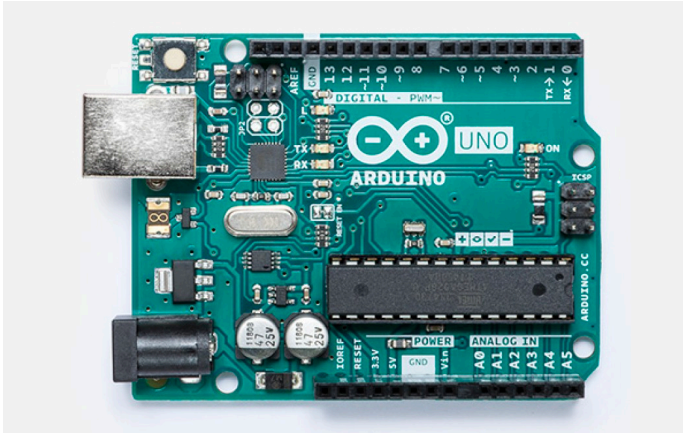
Exit Coding Game

How to code



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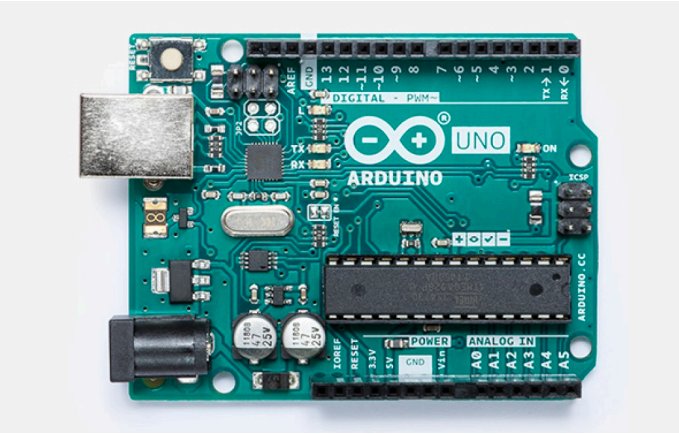
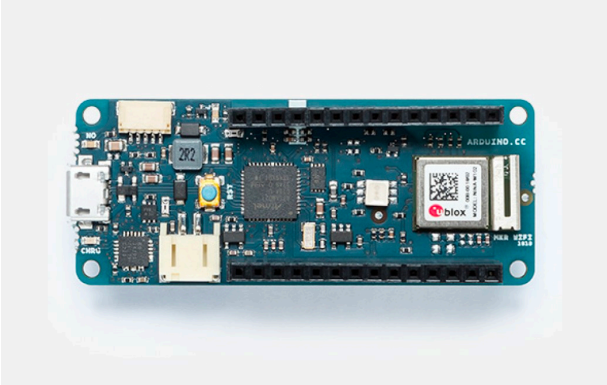
How to code

Arduino is a microcontroller that can be used to create physical interactions



ARDUINO UNO REV3



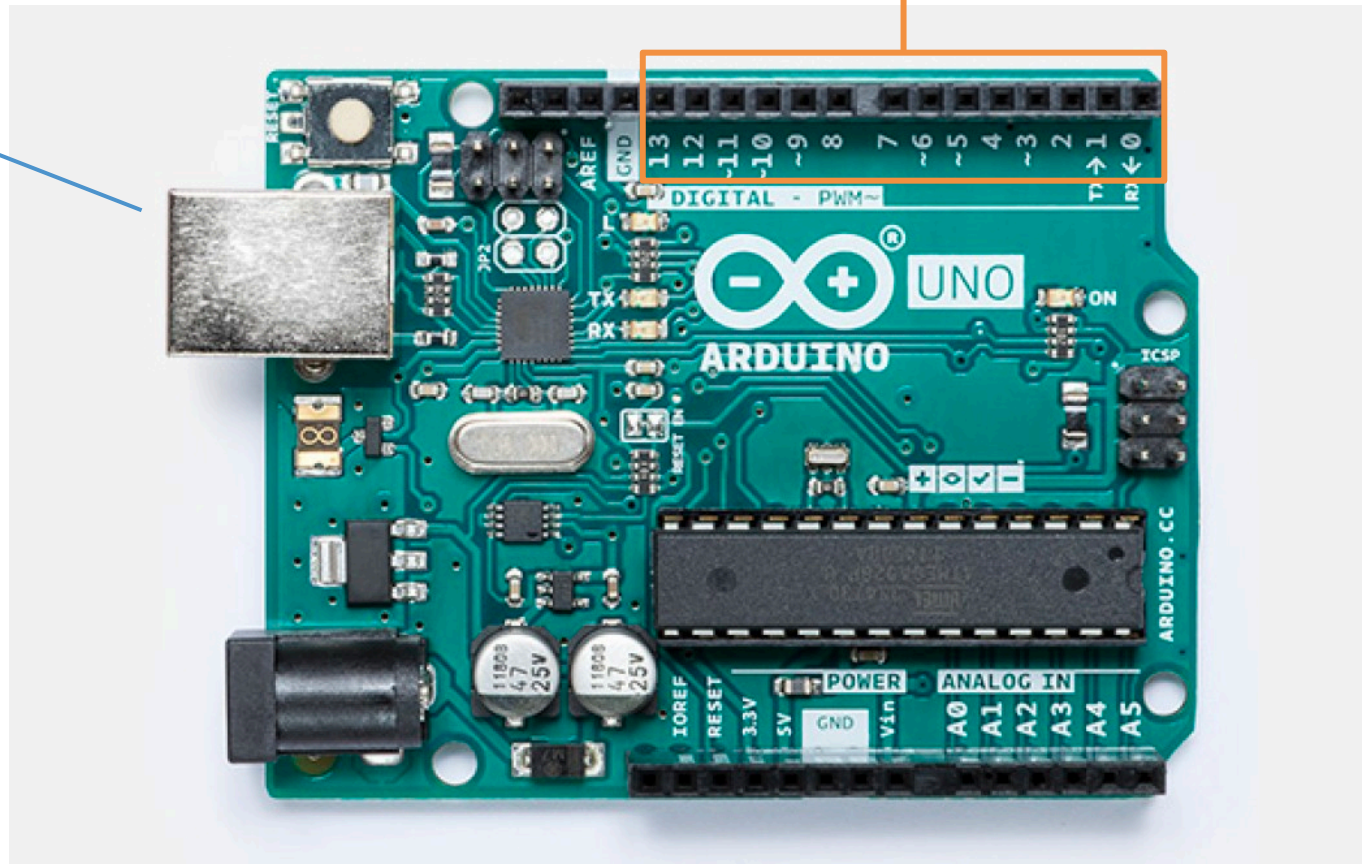
ARDUINO MKR WIFI 1010
(CONCEPTUALLY
SIMILAR TO UNO BUT WITH WIFI)

ARDUINO UNO WIFI REV2
(CONCEPTUALLY
SIMILAR TO UNO BUT WITH WIFI)

How to code

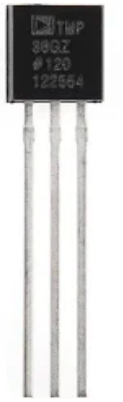
Arduino can read data from sensors, process the data and output data to actuators

USB
- power supply
- upload of programs

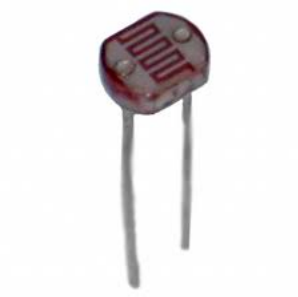


Digital In- and Output Pins
- 0 or 1

Some things Arduino can sense



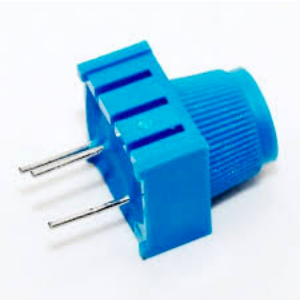
Temperature



Light

Interaction (buttons)

Interactions (joystick)



Interactions (potentiometer)

Proximity (Range detector)

Some things Arduino can do

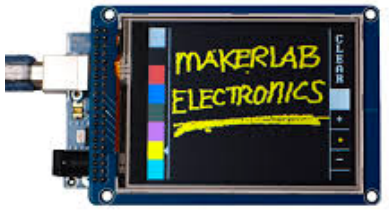
Turn on light

Make noise

Display text

Control motor

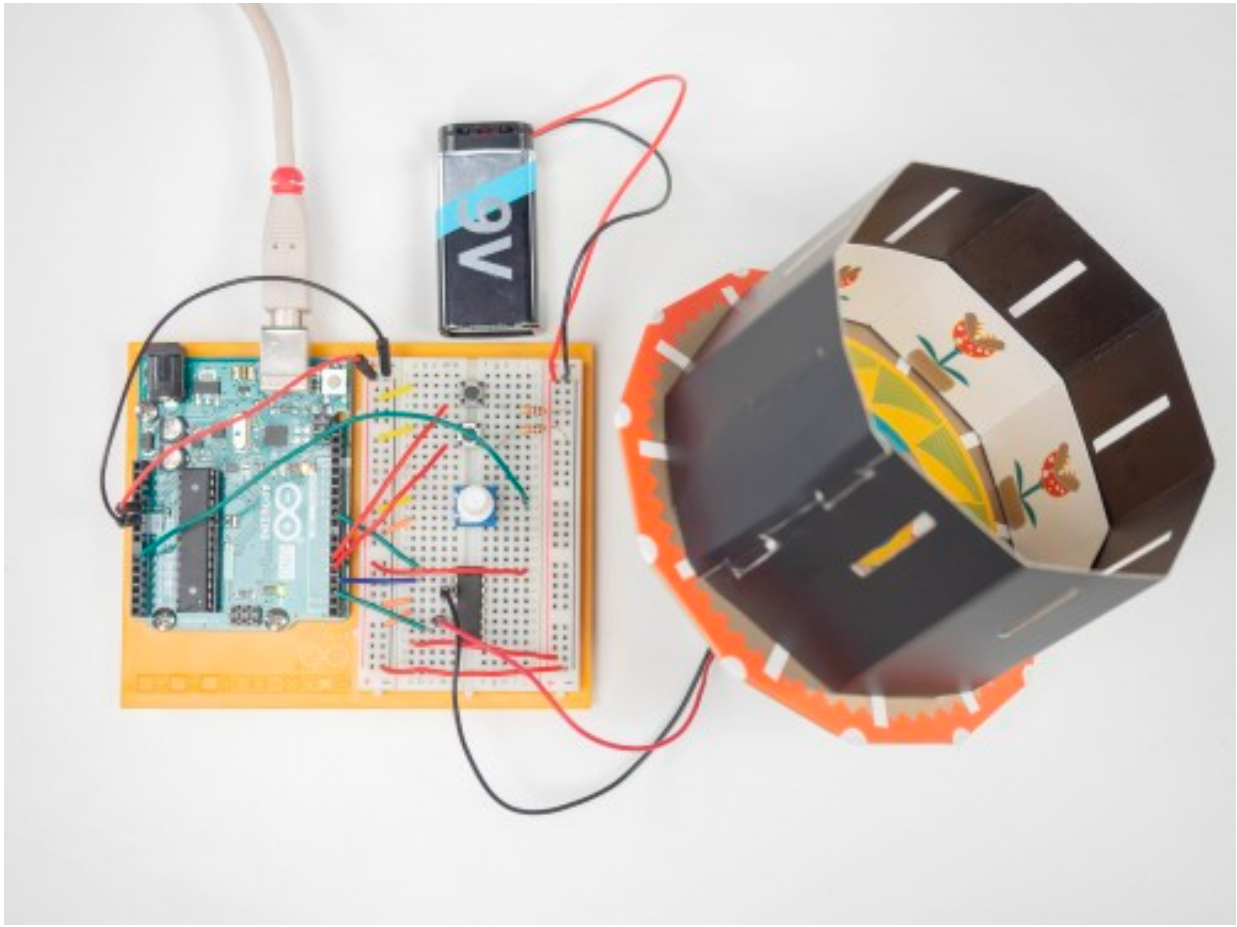
Control servo



Display graphics (Raspberry PI is better at this…)

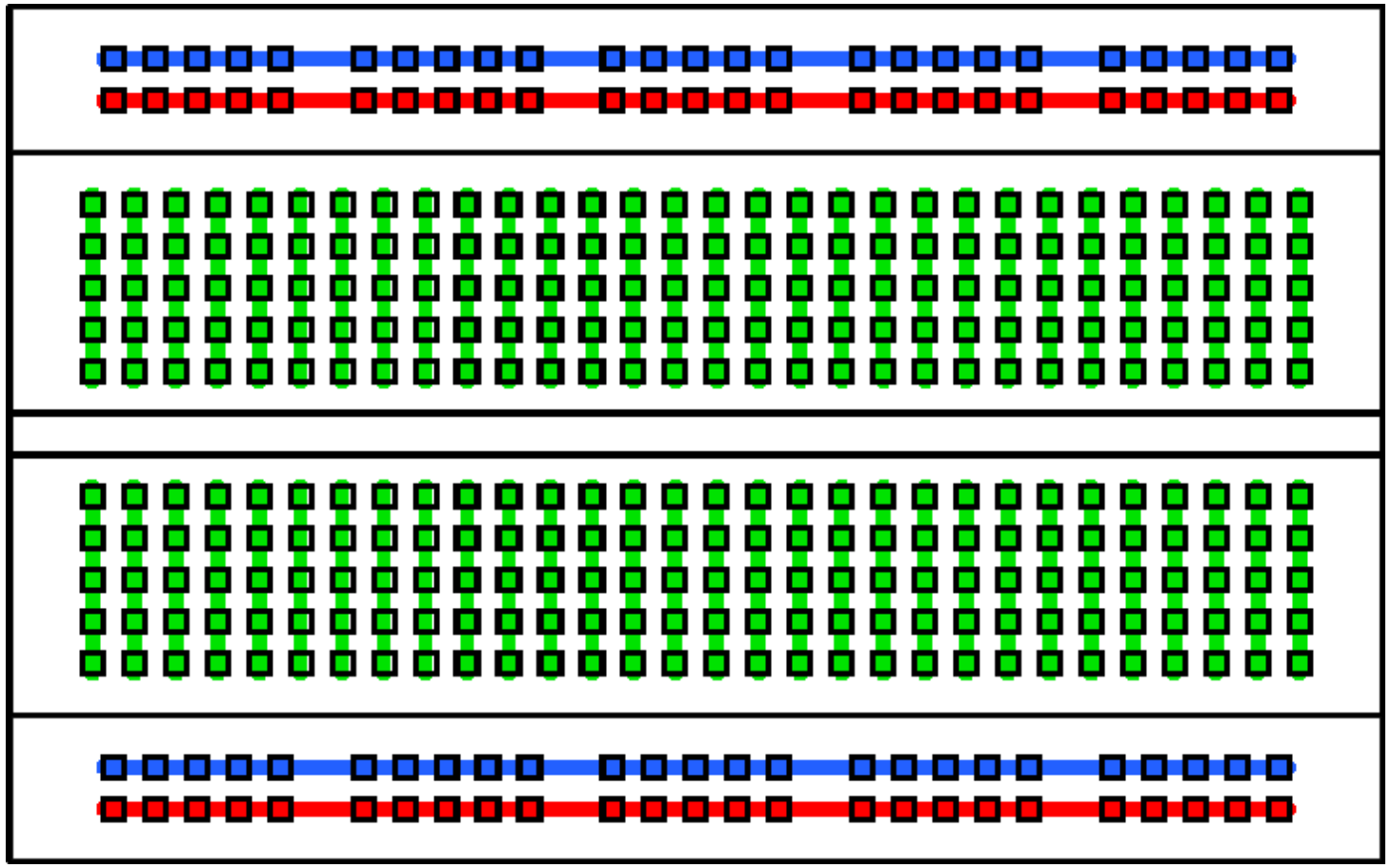
How to code

Connecting sensors and actuators (i.e. creating circuits) is possible through a breadboard and jumper wires



Arduino and breadboard

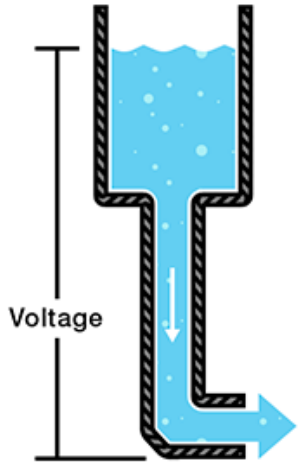
Breadboard – How everything is connected



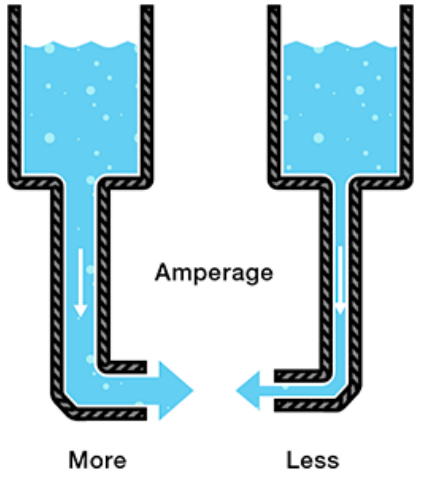
Source: http://designbuildcode.weebly.com/breadboard-circuits.html

Basics of electronic circuits

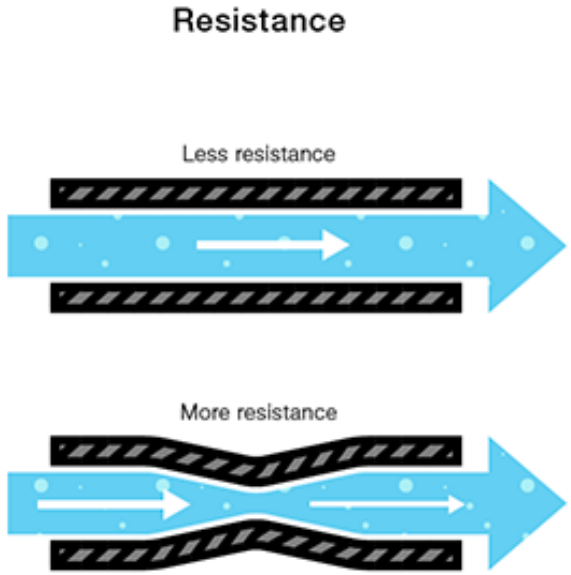
- **Voltage** is the difference in charge between two points.
- **Current** is the rate at which charge is flowing.
- **Resistance** is a material's tendency to resist the flow of charge (current)



Voltage (V) is the pressure at the end of the hose



More current (I) is flowing in wider hose



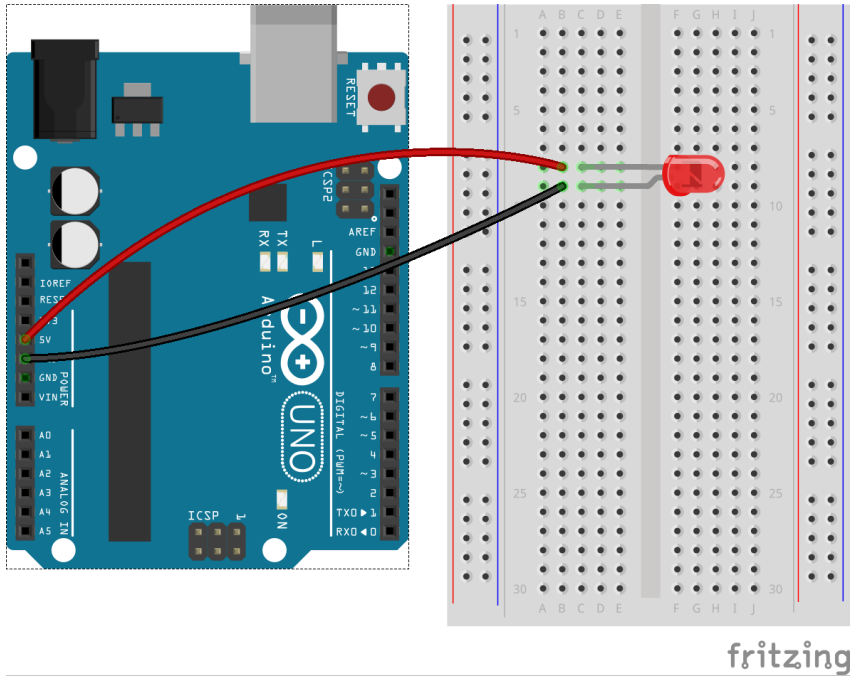
A resistor (R) limits the amount of charge that can flow

Source: https://learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law/all

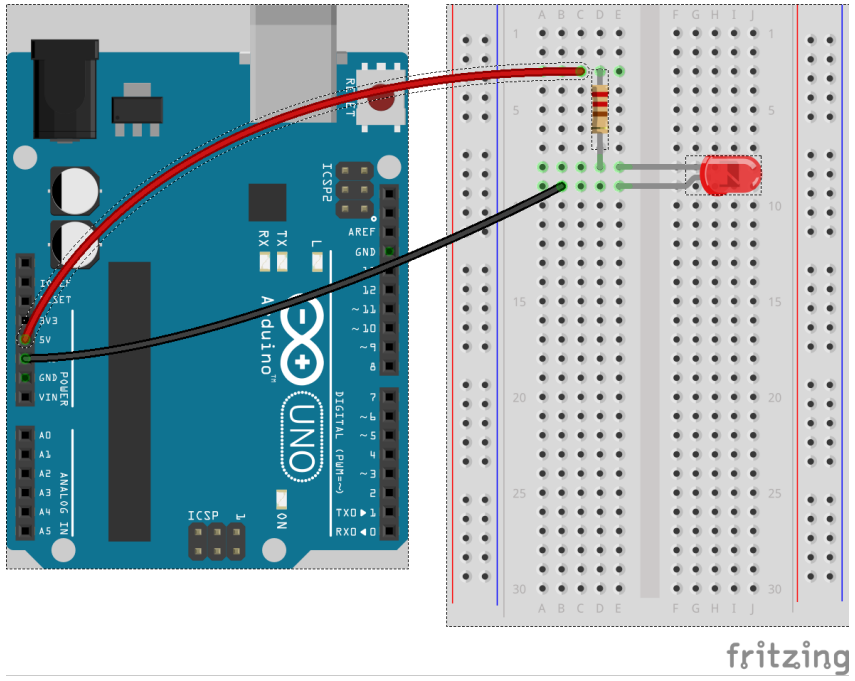
How to code

Some components require a limitation of current through a resistor

The current flows from the 5V pin to the GND pin



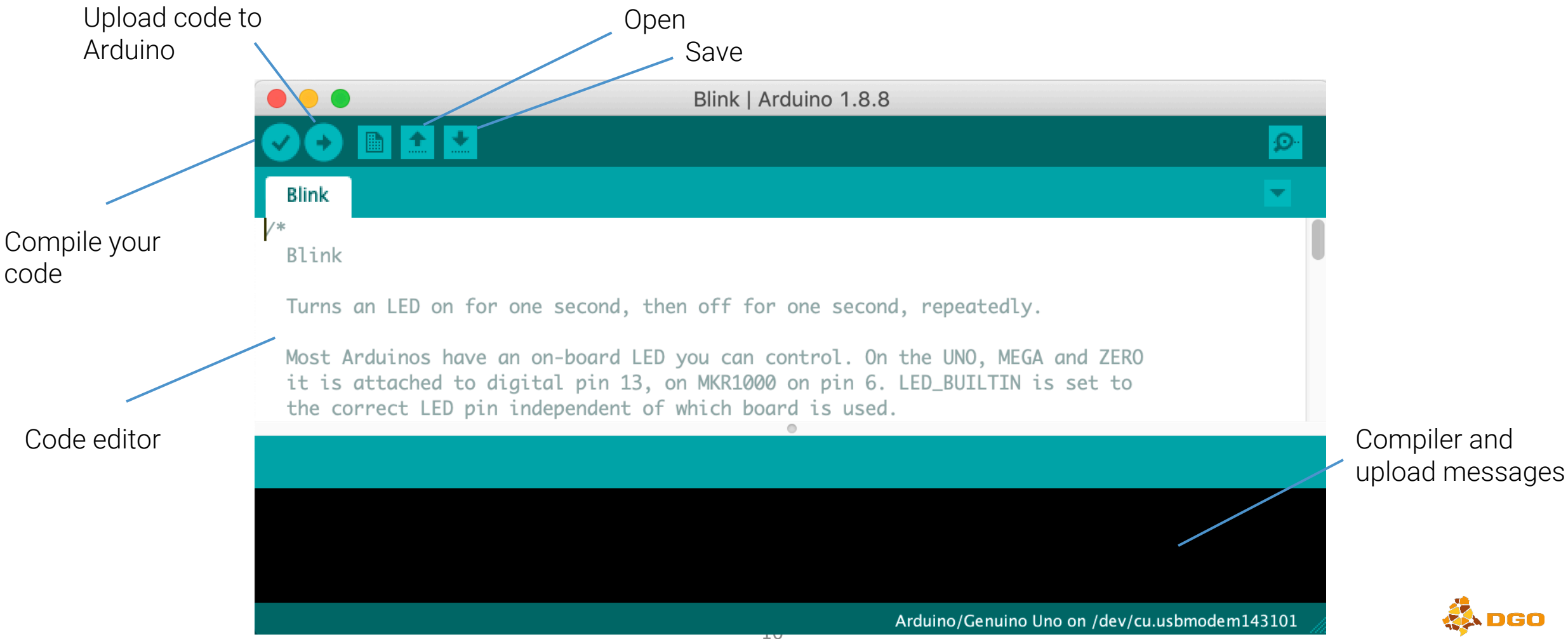
DO NOT TRY THIS
- It will fry your LED



A resistor is needed to limit the amount of current that is flowing through the circuit

How to code

The Arduino IDE is a deliberately simple tool to create programs (sketches) for your microcontroller



How to code

Arduino

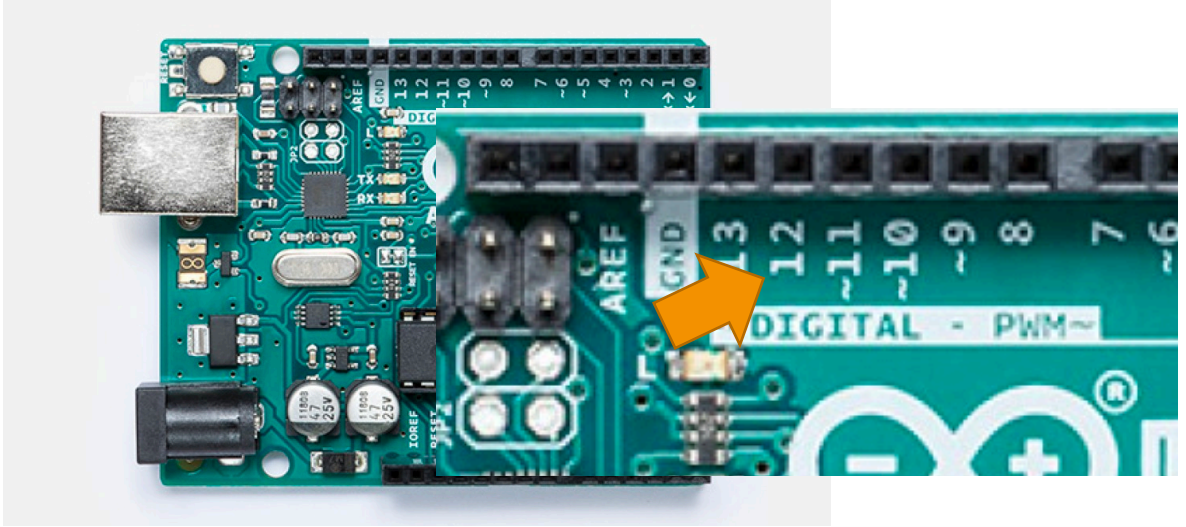
Legt eine Variable `LED_PIN` an – Variablen sind “Schachteln im Computer”.
in denen Werte abgespeichert werden, die man später wieder auslesen kann.

```
int LED_PIN = 12;

void setup() {
  pinMode(LED_PIN, OUTPUT);
}

void loop() {
  digitalWrite(LED_PIN, HIGH);
  delay(1000);
  digitalWrite(LED_PIN, LOW);
  delay(1000);
}
```

Speichert den Wert 12 in der Variable `LED_PIN`
(12 ist der PIN, an dem die LED angeschlossen ist)



How to code

Arduino

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  delay(1000);
}
```

`setup` ist eine Funktion, d.h. eine Anweisung, die der Computer
ausführen kann – Funktionen können weitere Funktionen enthalten

`pinMode` ist eine weitere Funktion – Hier wird für den PIN
12, der Wert `OUTPUT` gesetzt, d.h. PIN 12 wird am Arduino in diesem Programm für die Ausgabe (Aktor) verwendet…

How to code

Arduino

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}
```

Loop wird von Arduino laufend aufgerufen, d.h. alle Funktionen innerhalb von loop werden aufgerufen, dann geht es wieder von vorne los…

„Schaltet PIN 12 ein“ – LED leuchtet

Wartet eine Sekunde (PIN, d.h. LED bleibt „an“)

Schaltet LED aus

Wartet eine Sekunde (PIN, d.h. LED bleibt „aus“)

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Los gehts… Öffnen Sie jetzt den Umschlag *Infomaterial*