



Armstrong

School Program 2023-2024

Lesson 1



Armstrong

entertainment meets education

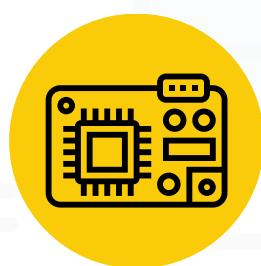
REGISTER NOW



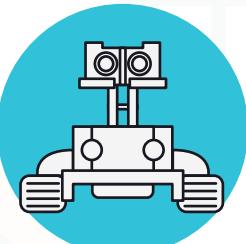
<https://armstrongedu.com/>



Lesson Content



Introduction to Robotics



Robot Parts



Robots Classification



Getting started with mblock

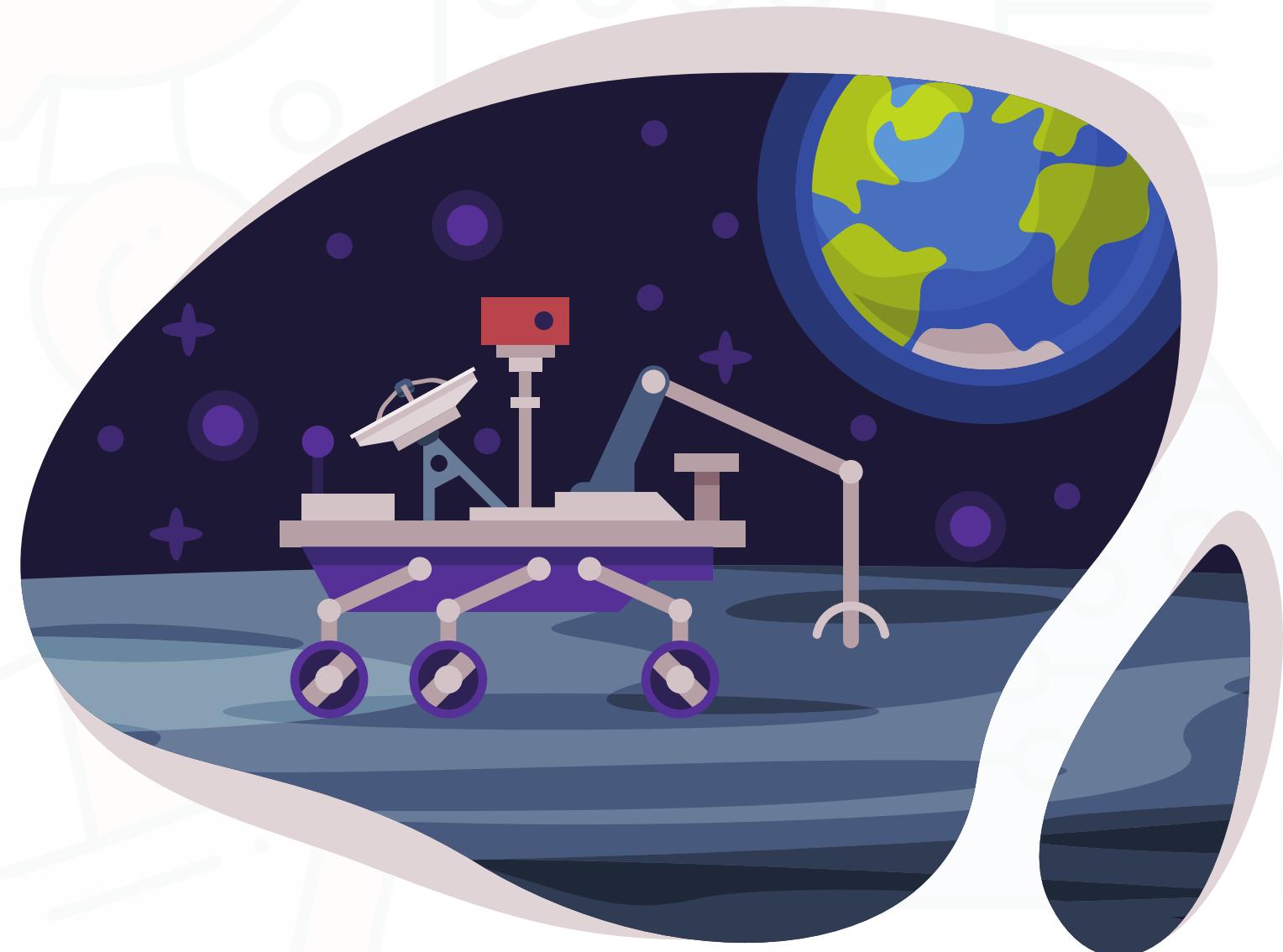
Introduction

What is a robot?

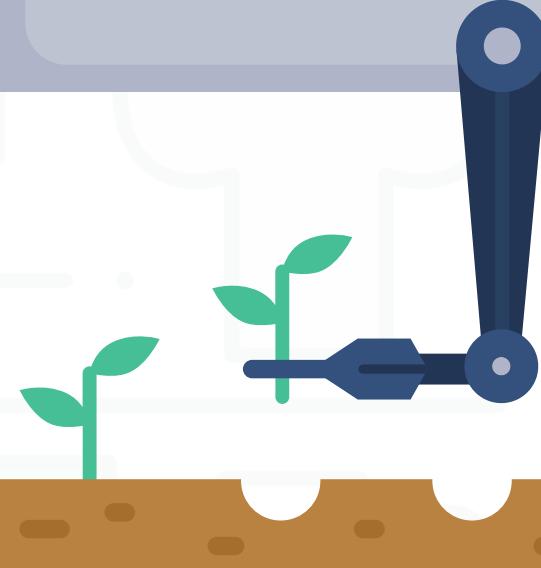
A robot is an electromechanical device that can sense its environment, process it, and react to its environment.

What is robotics?

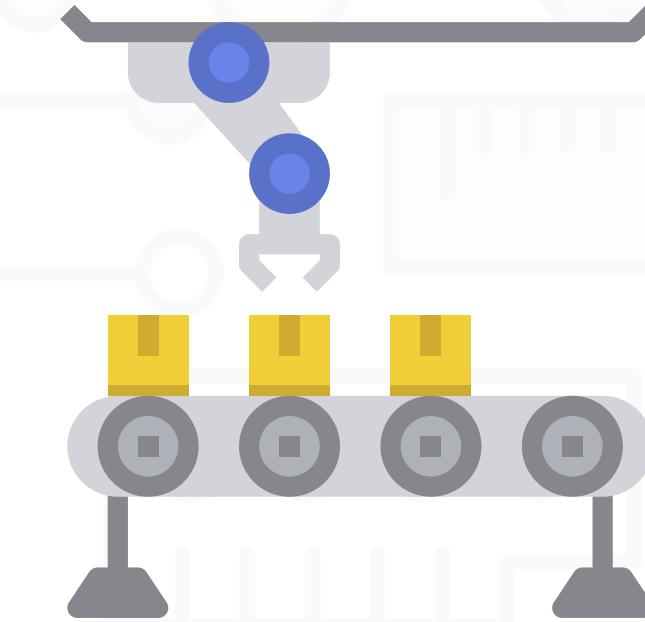
Robotics is the engineering of robots. It combines **mechanics**, **electronics**, and **software**.



Uses of Robots



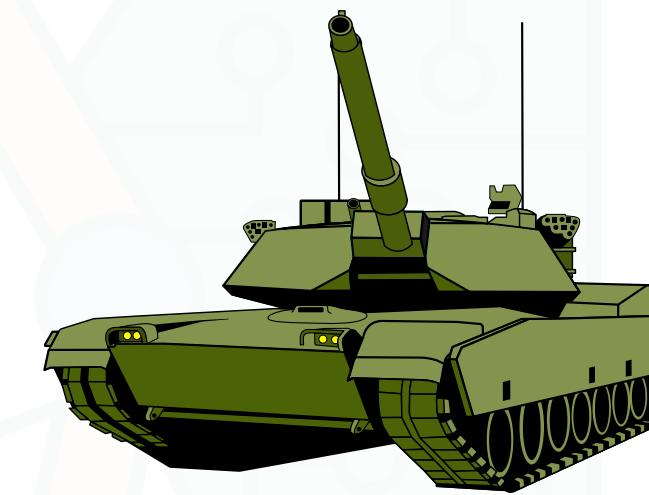
Agriculture



Manufacturing

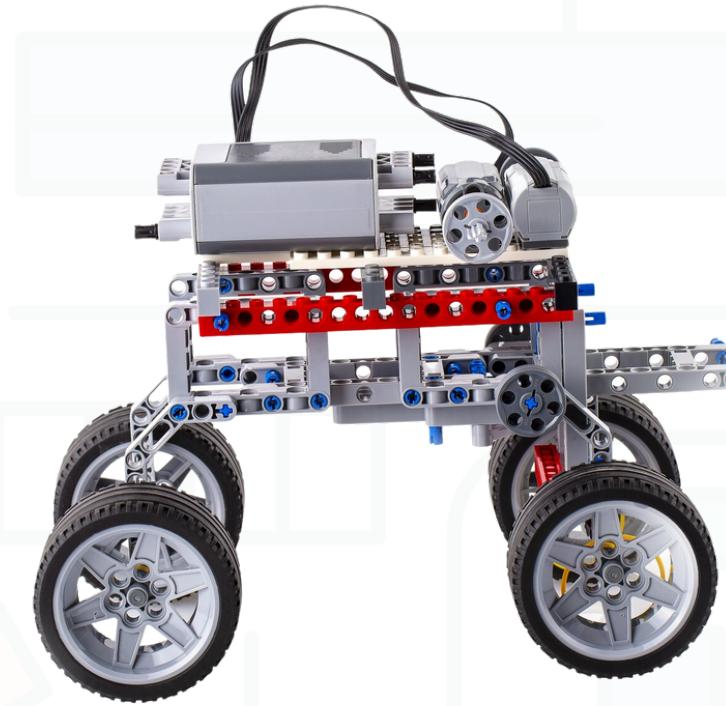


Medical

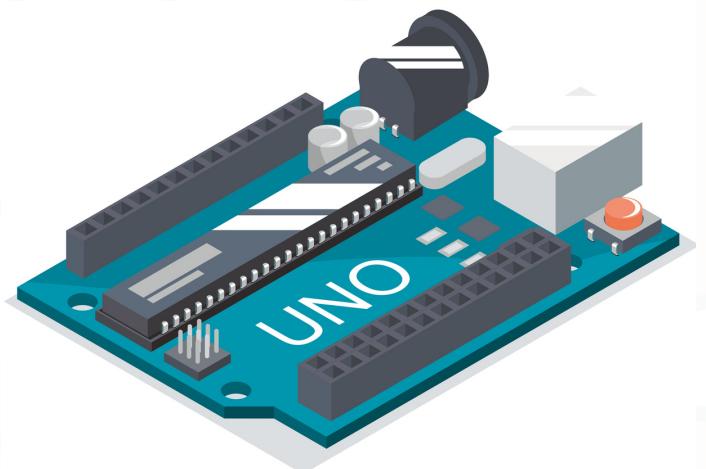


Military

Robot Parts



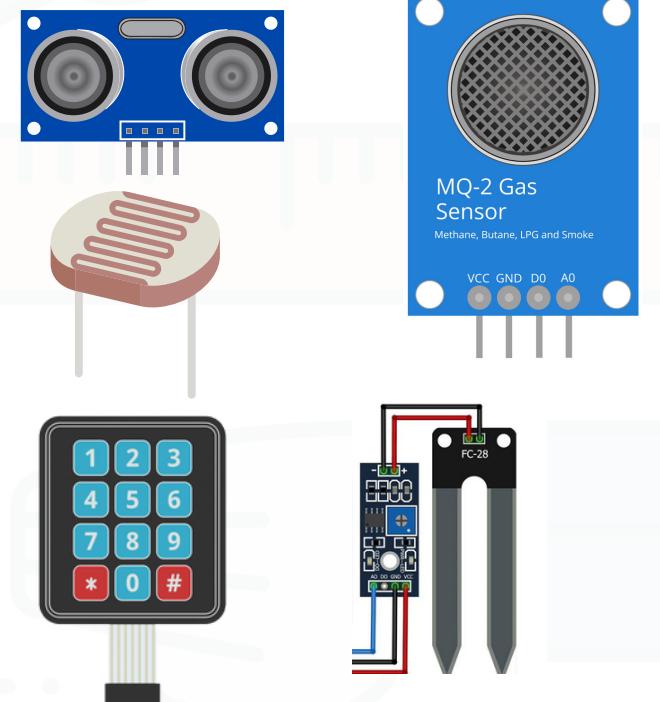
Chassis



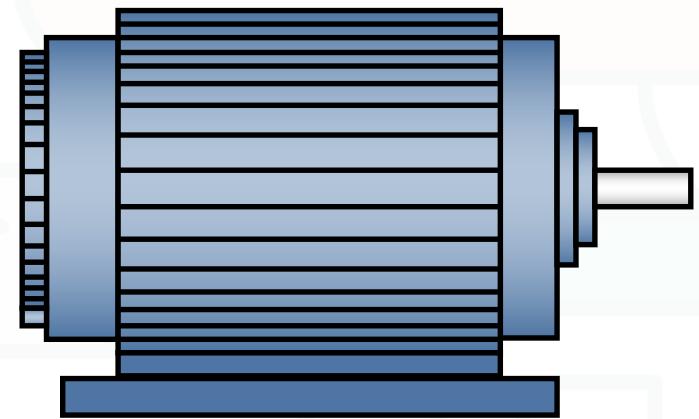
Microcontroller



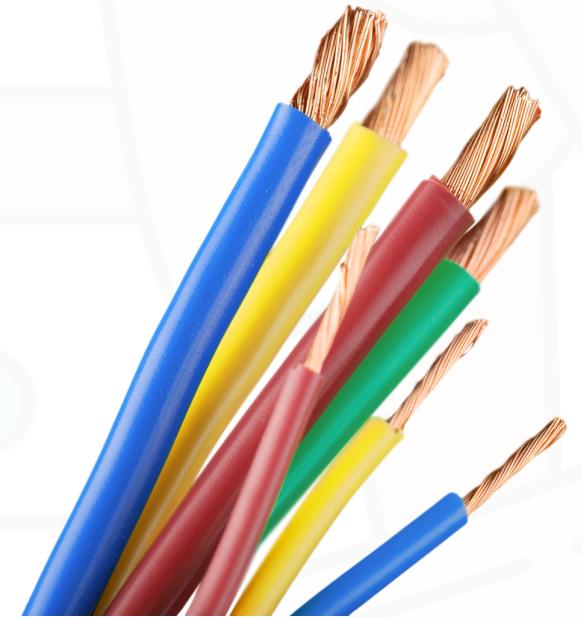
Batteries



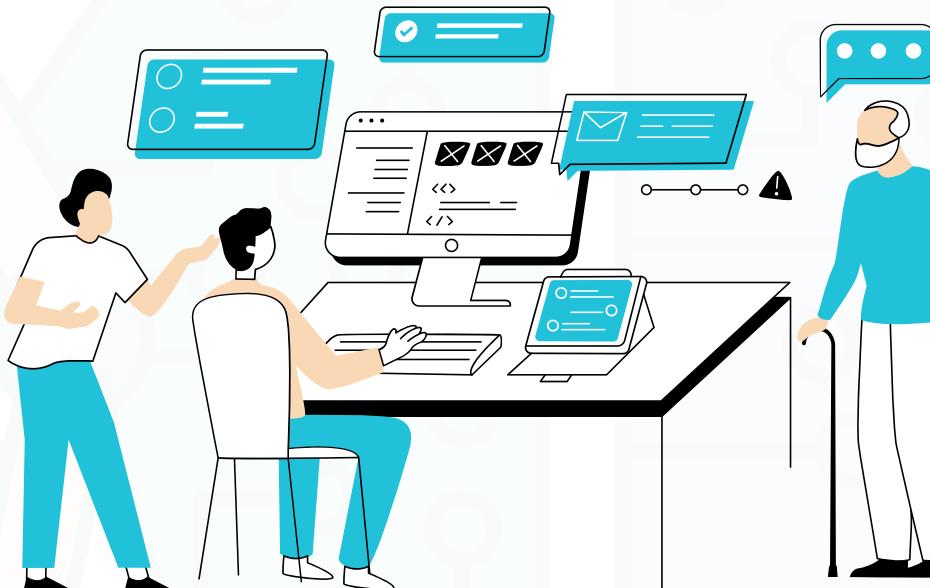
Sensors



Motors

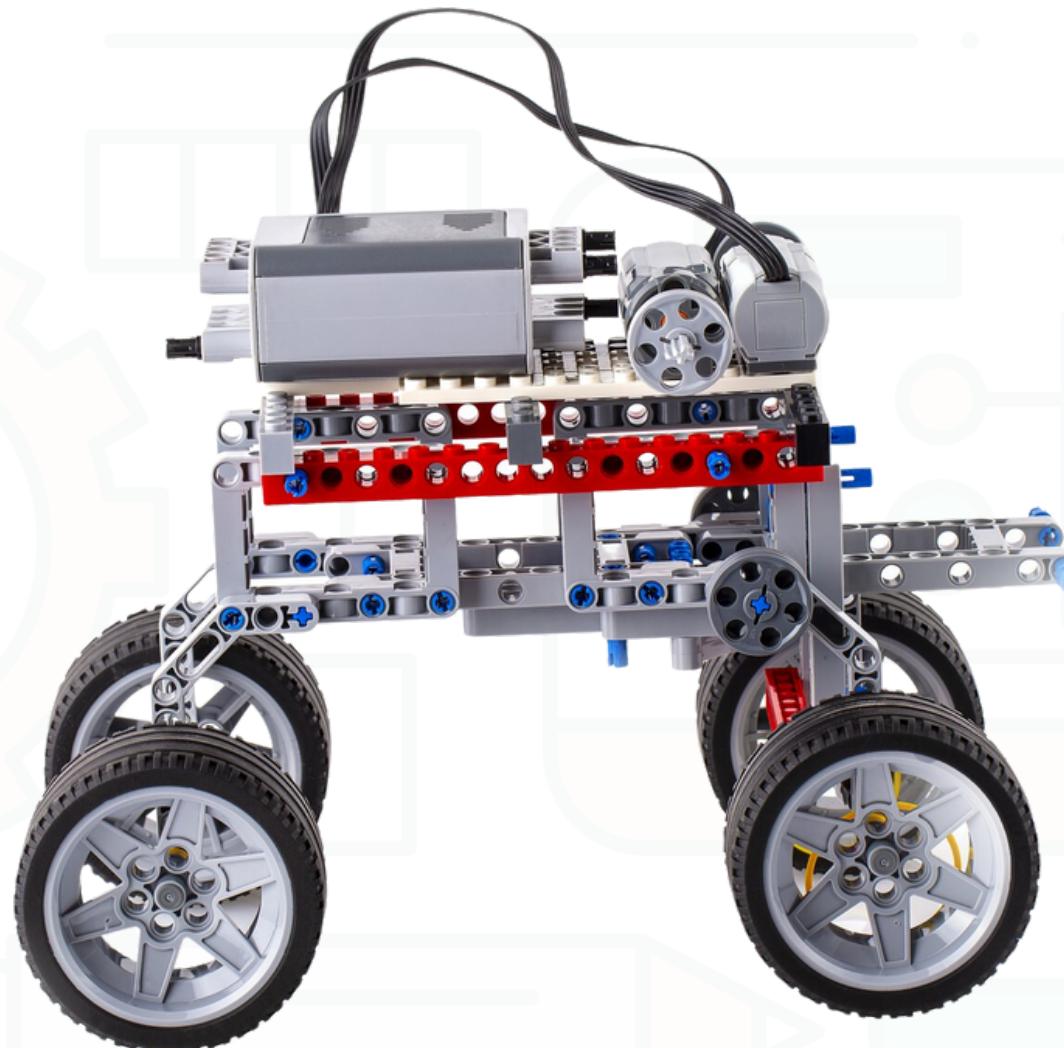


wires

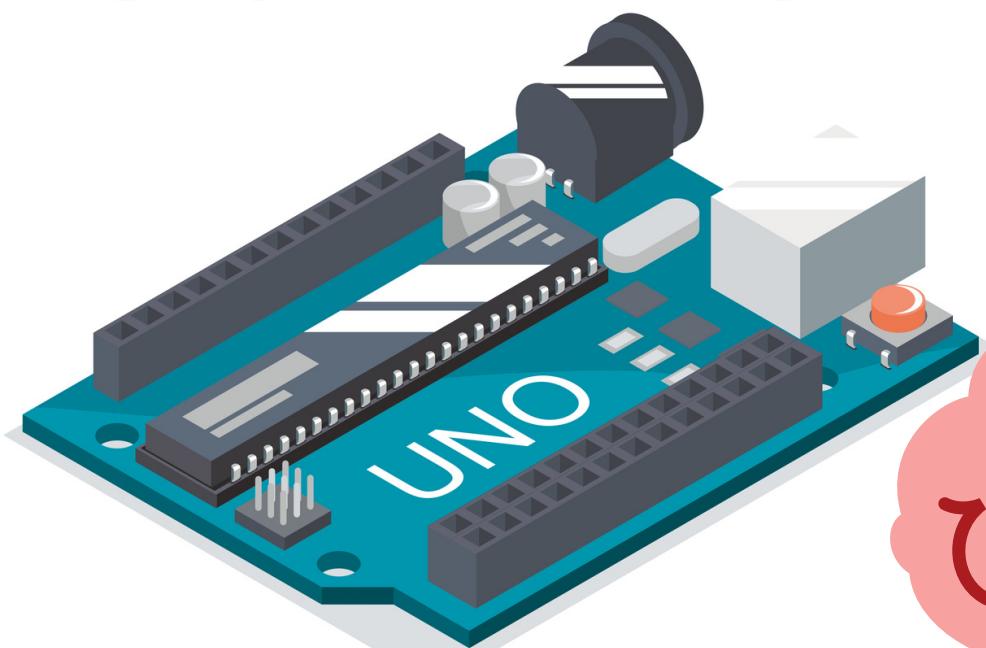
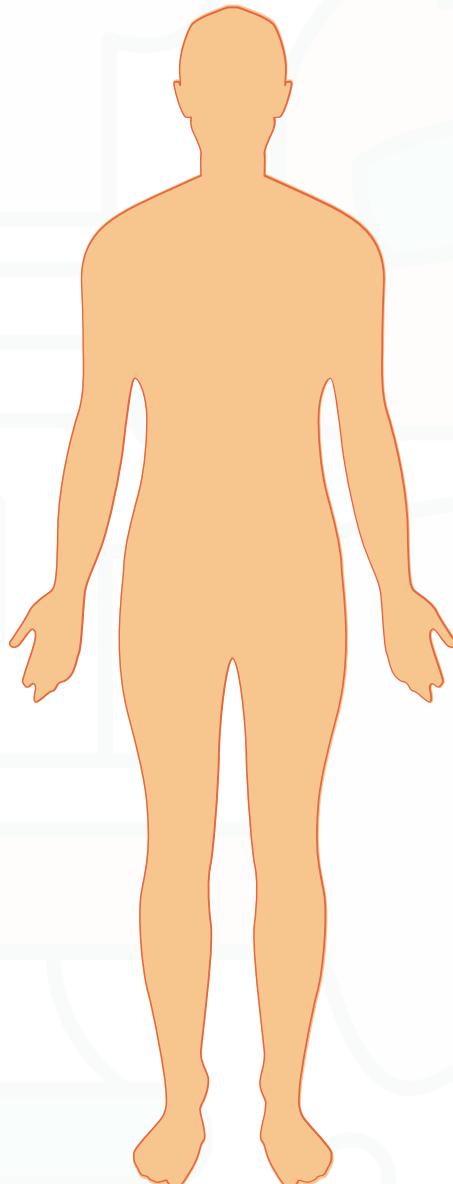


Software

Robot Parts vs Human Body parts



chassis



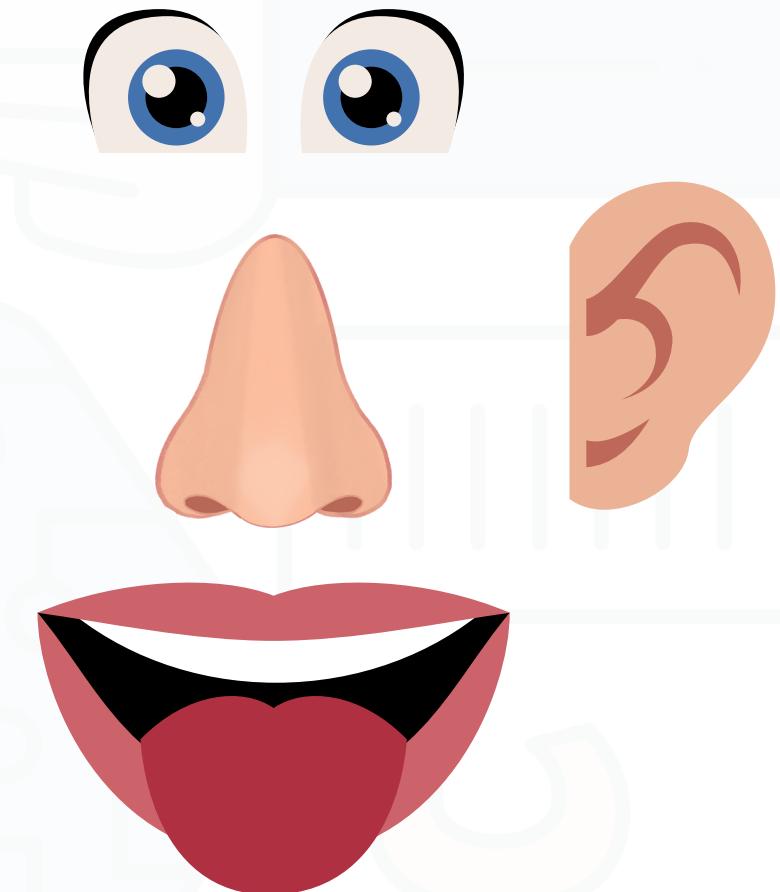
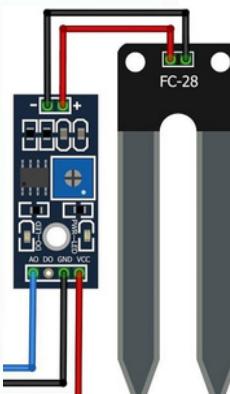
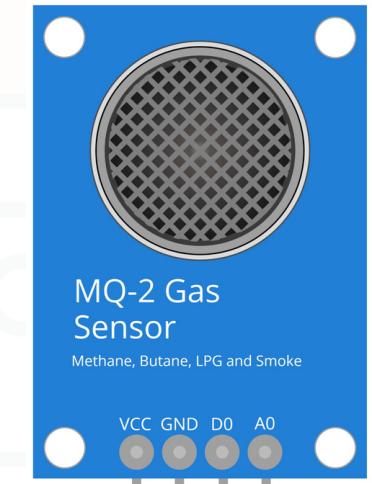
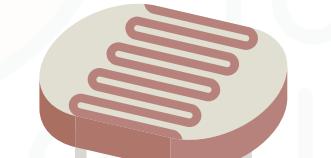
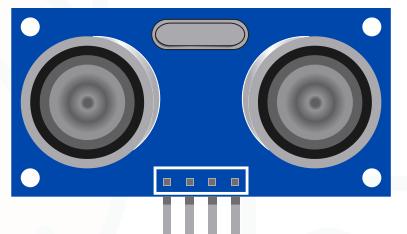
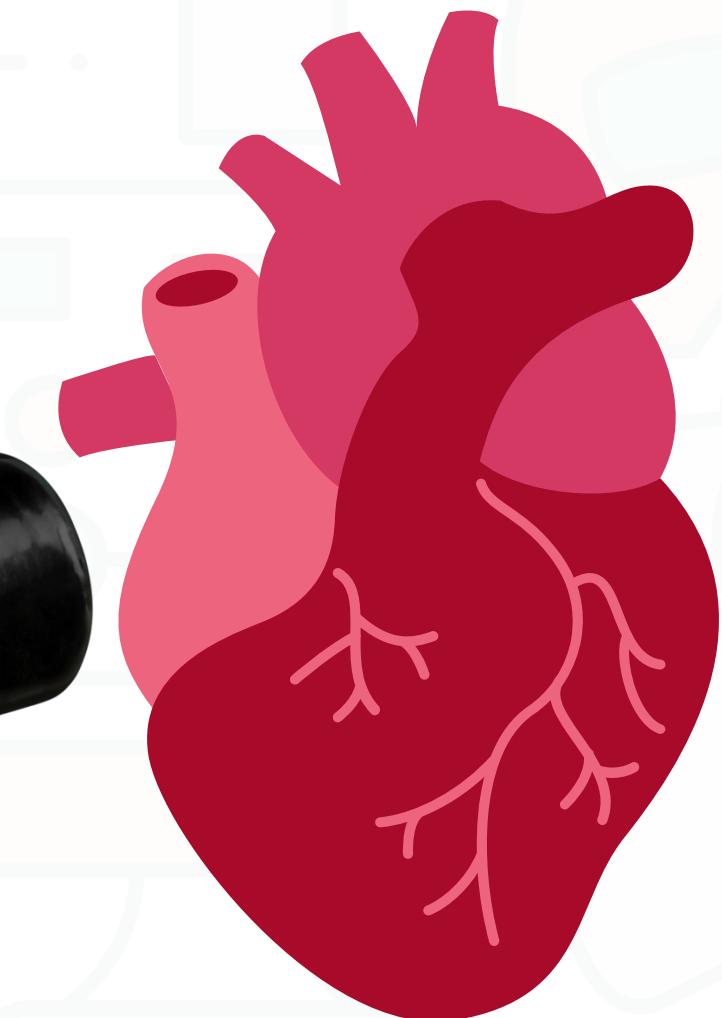
Microcontroller



Robot Parts vs Human Body parts

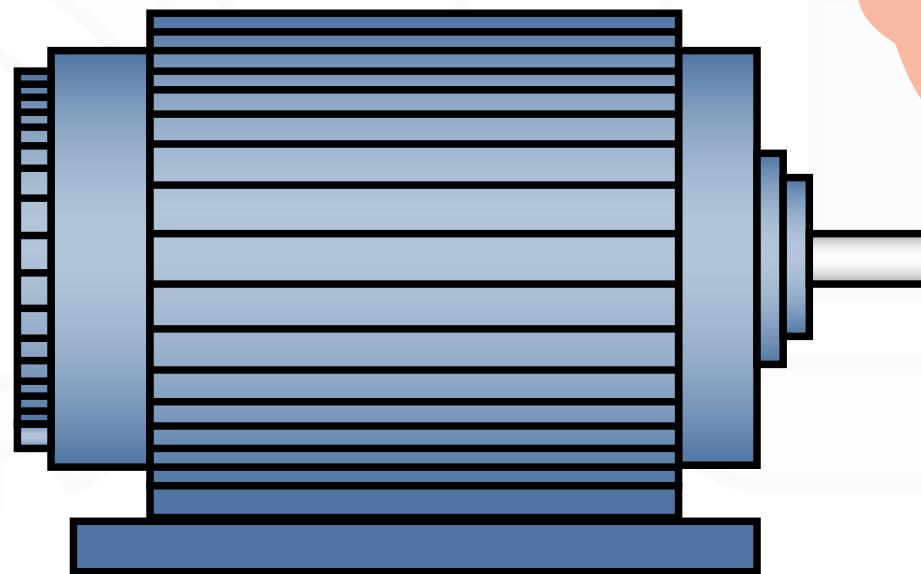


Batteries



Sensors

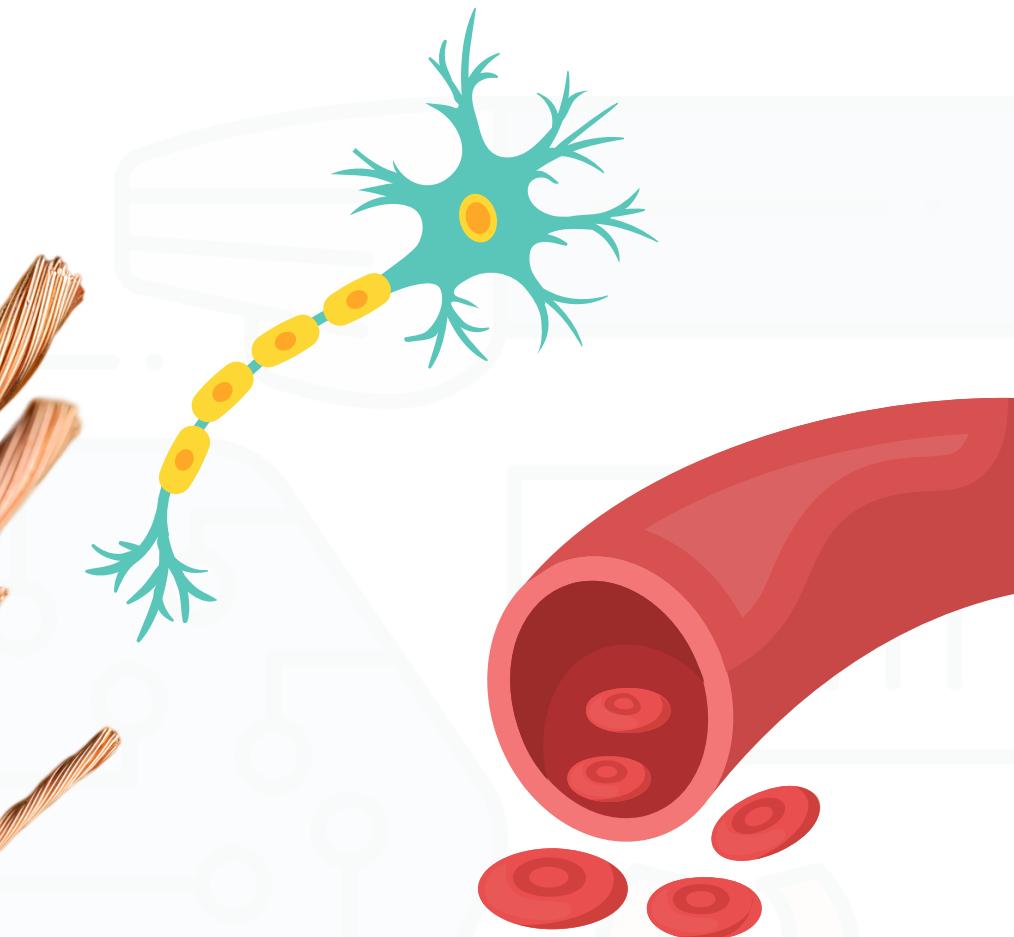
Robot Parts vs Human Body parts



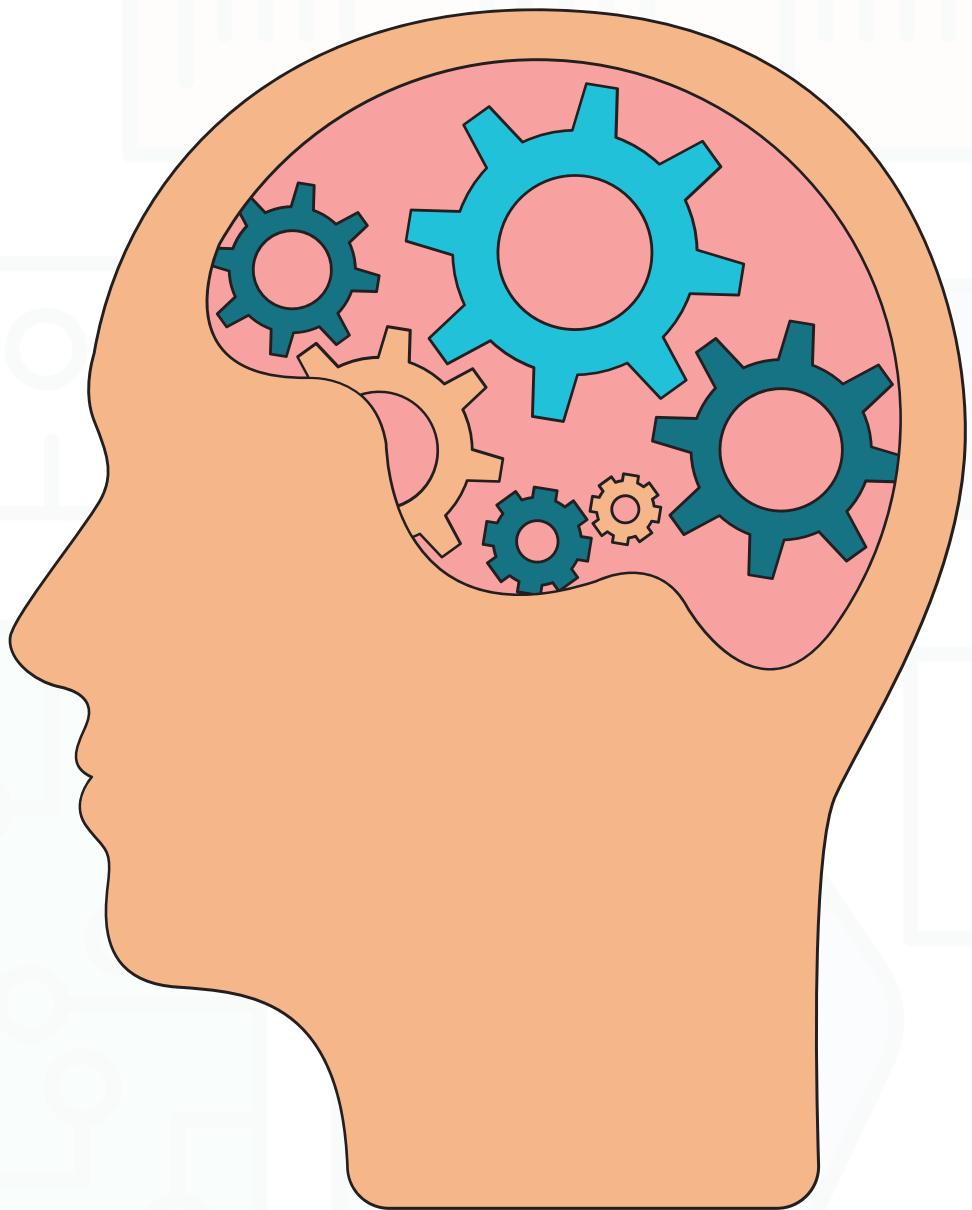
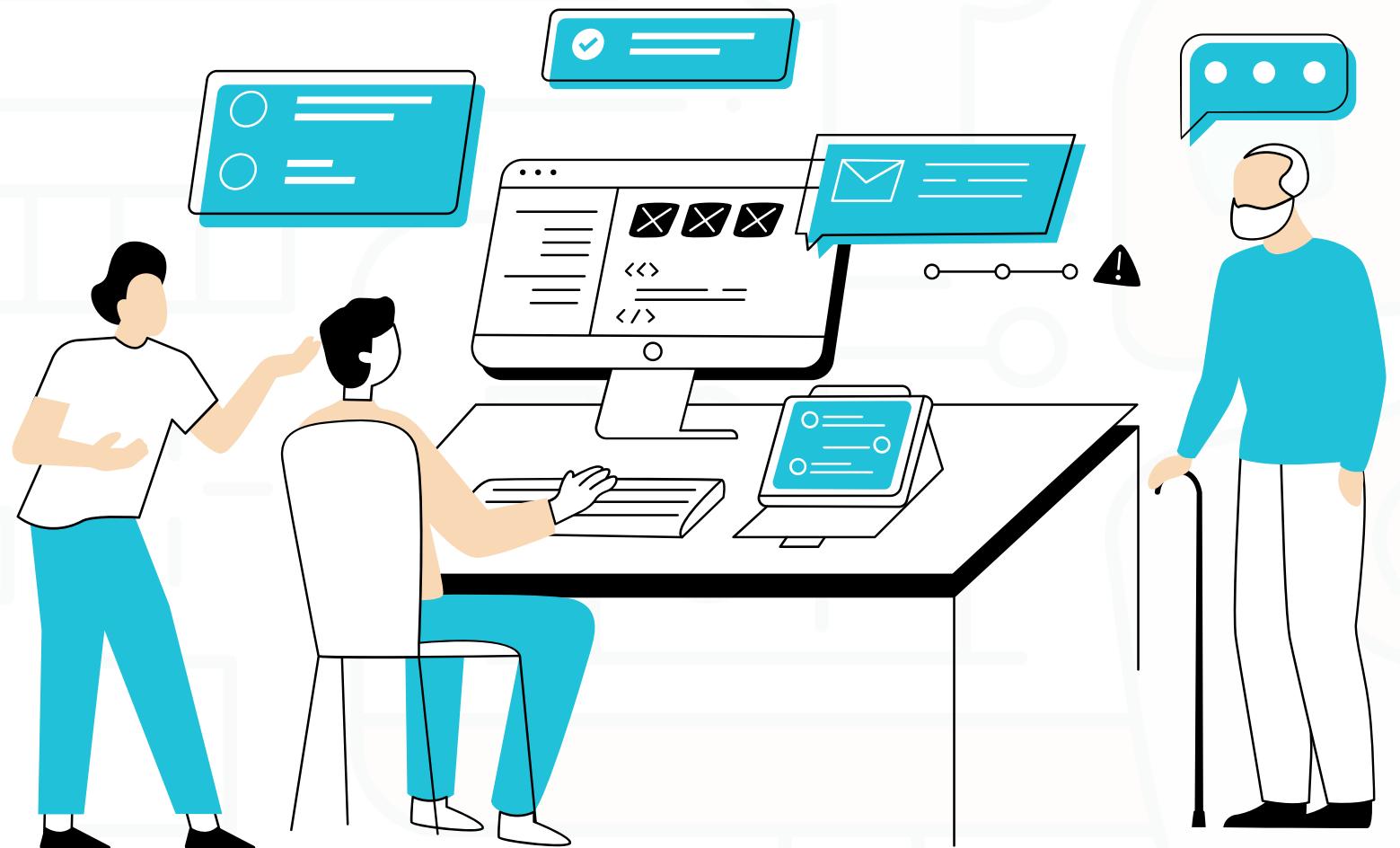
Motors



wires



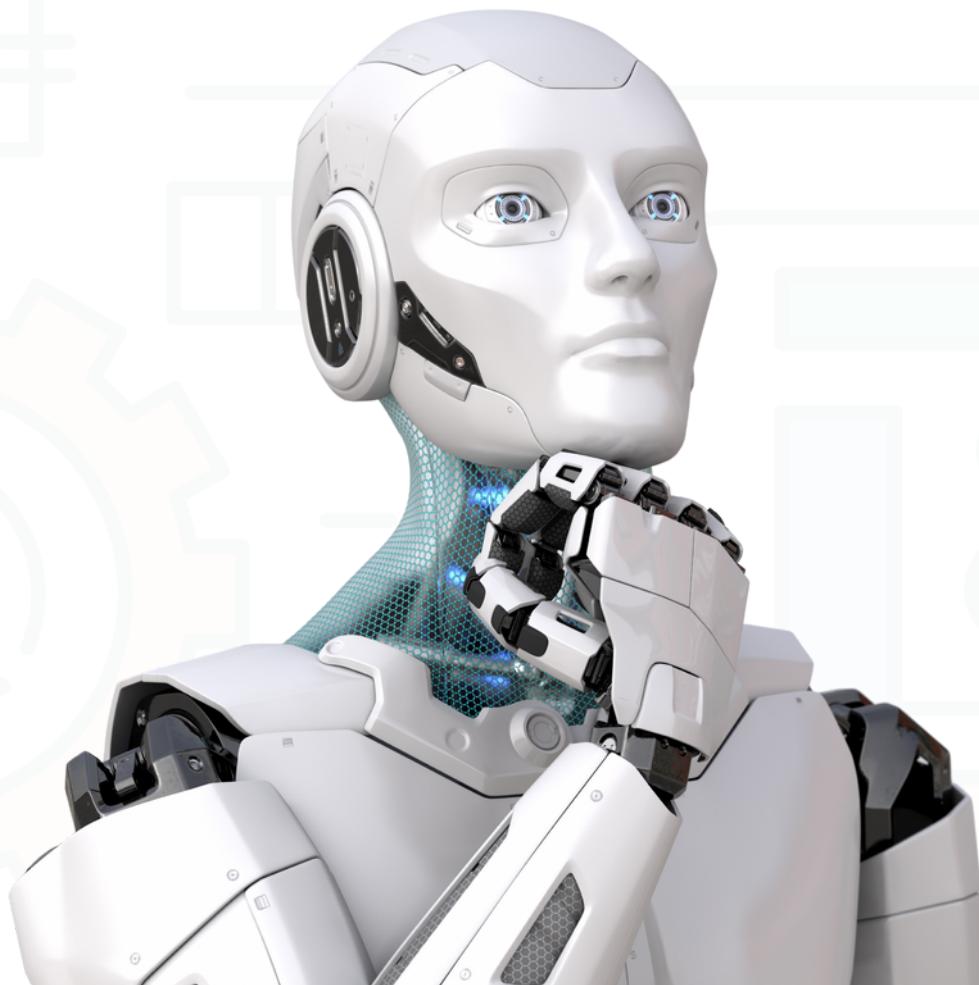
Robot Parts vs Human Body parts



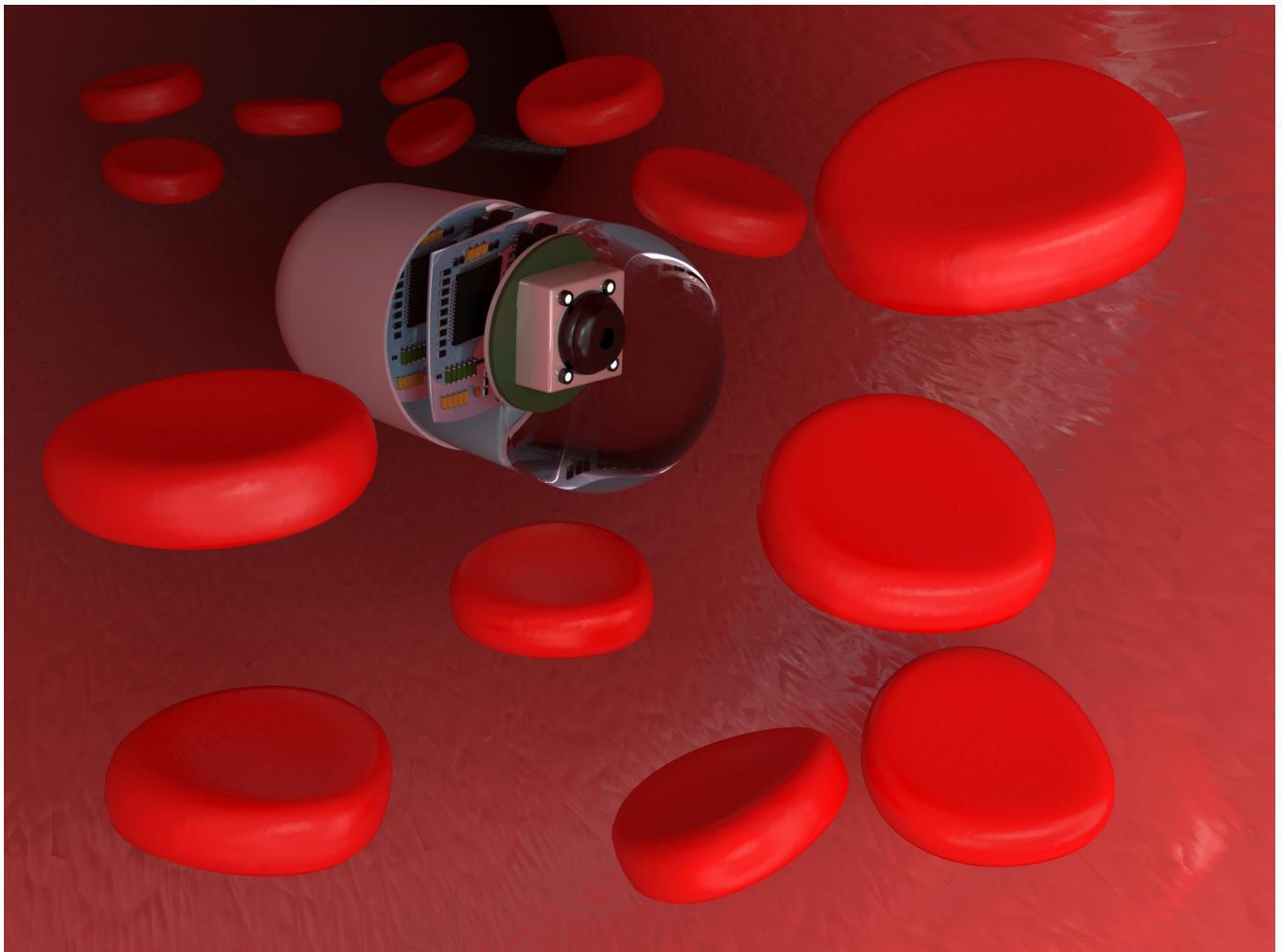
Software

Cognition

Types of Robots



Humanoid

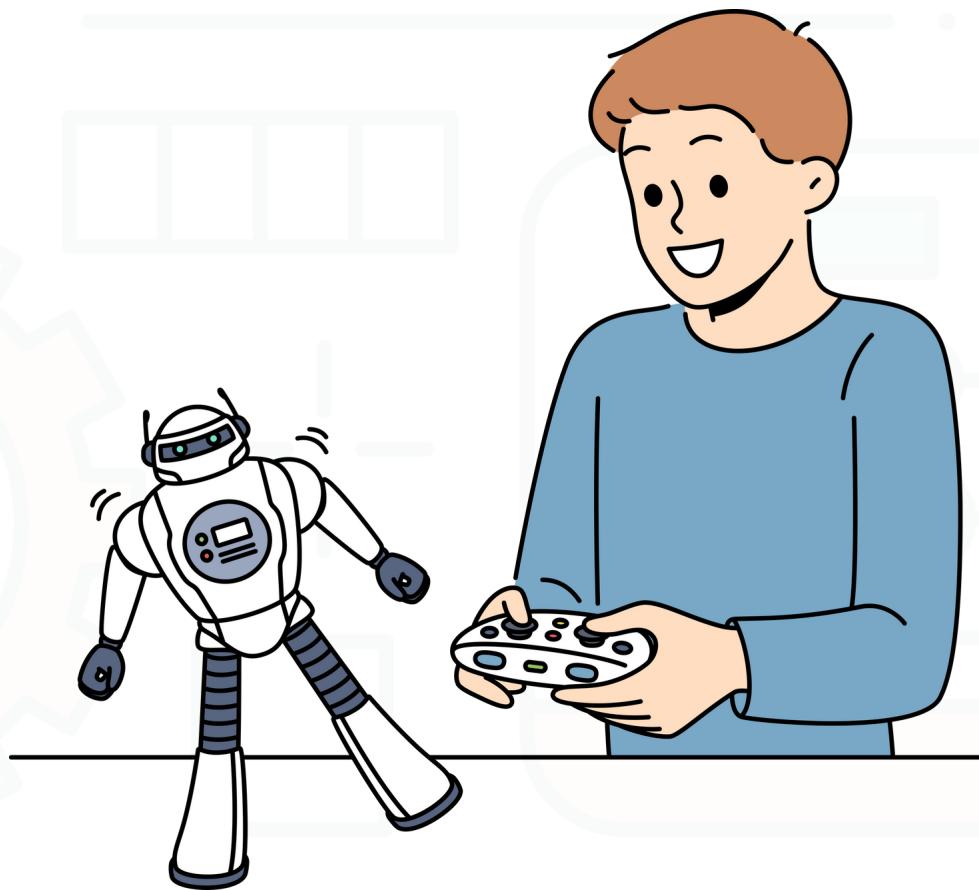


Nano

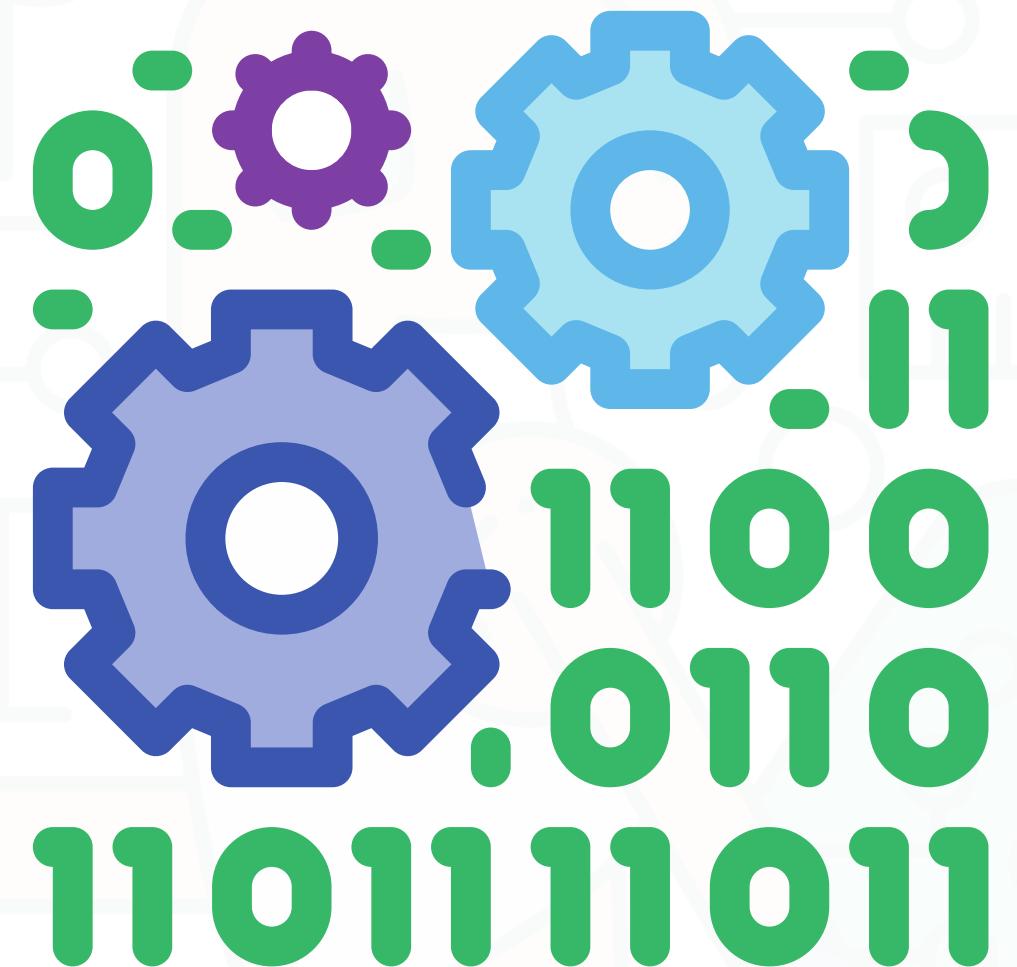


Enormous

Robotics classification



Operated Robots



**Pre-programmed
Robots**

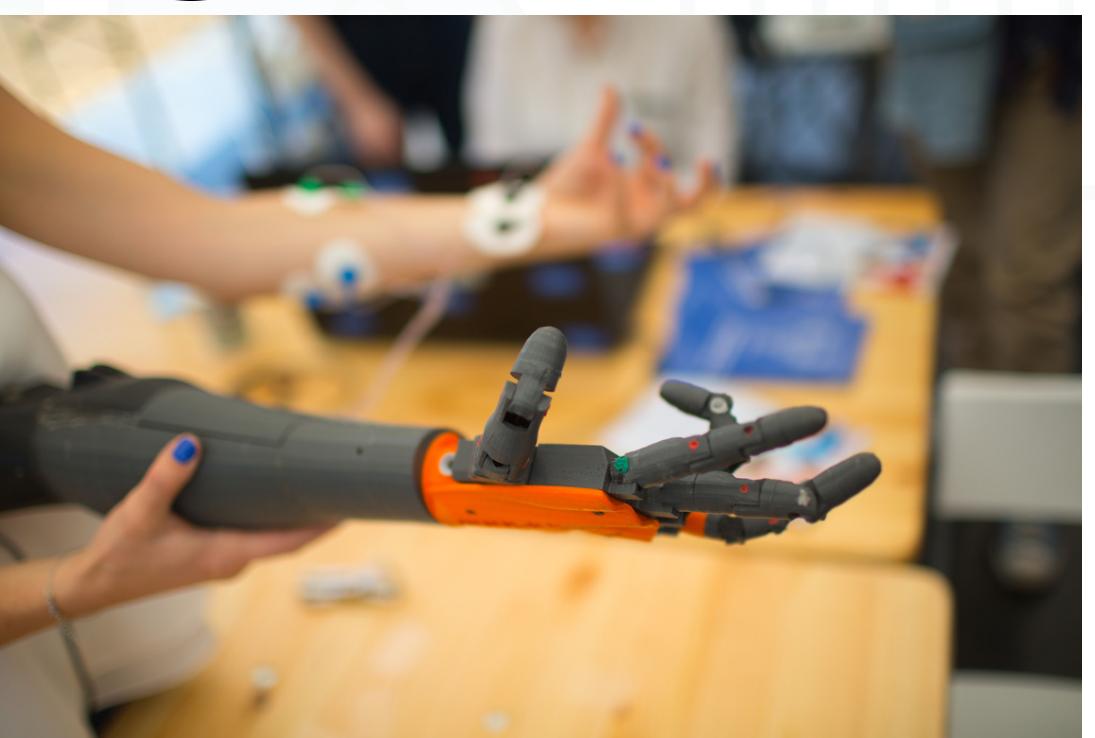
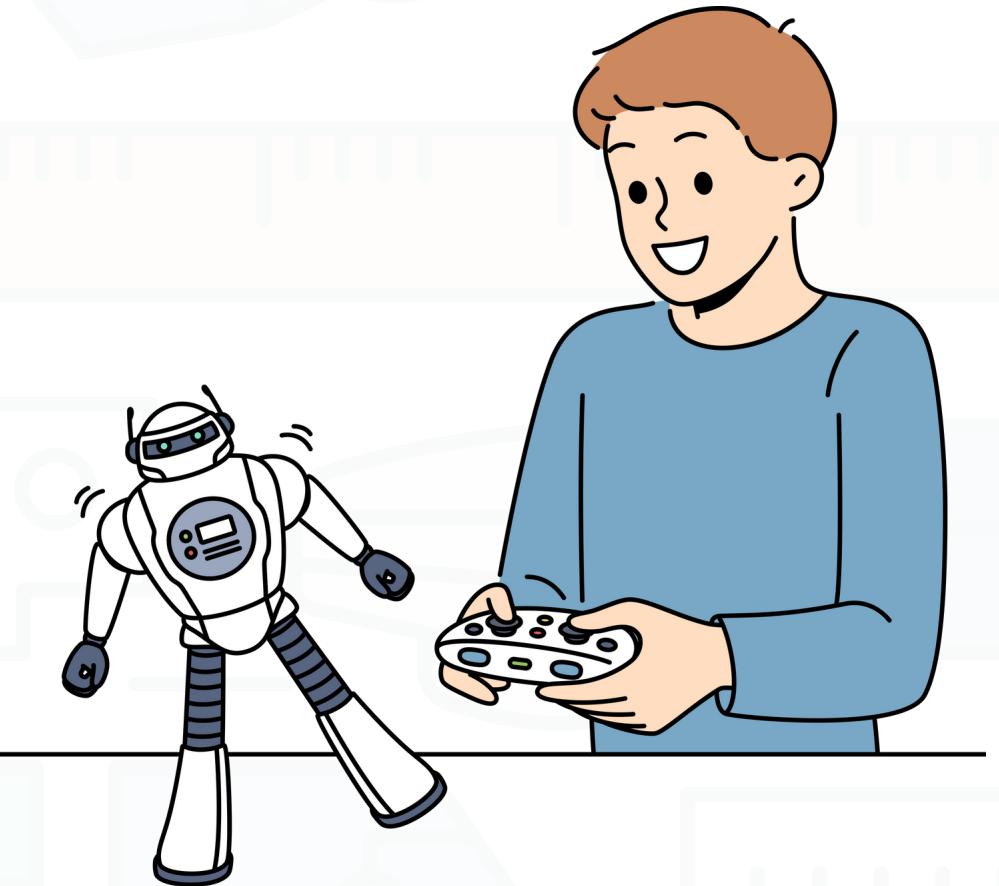


Autonomous

Robotics classification

Operated Robots

- 1. Operate under human control.**
- 2. Work in extreme geographical conditions.**
- 3. Doing dangerous and complex tasks.**
- 4. Use a wired or wireless connection to control from a safe distance.**



Robotics classification

Pre-programmed Robots

1. Perform a specific task in a specific way.
2. Work in a controlled environment.
3. Doing simple and monotonous tasks.
4. Doesn't require human intervention or assistance during their work.



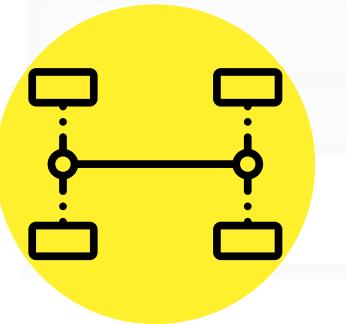
Robotics classification

Autonomous Robots

- 1. Operate itself as they see fit using AI.**
- 2. Work in an open environment.**
- 3. Do tasks that require human expertise.**
- 4. Work without human intervention or even any pre-orders.**



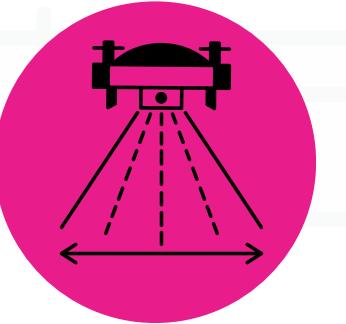
LAB Kit



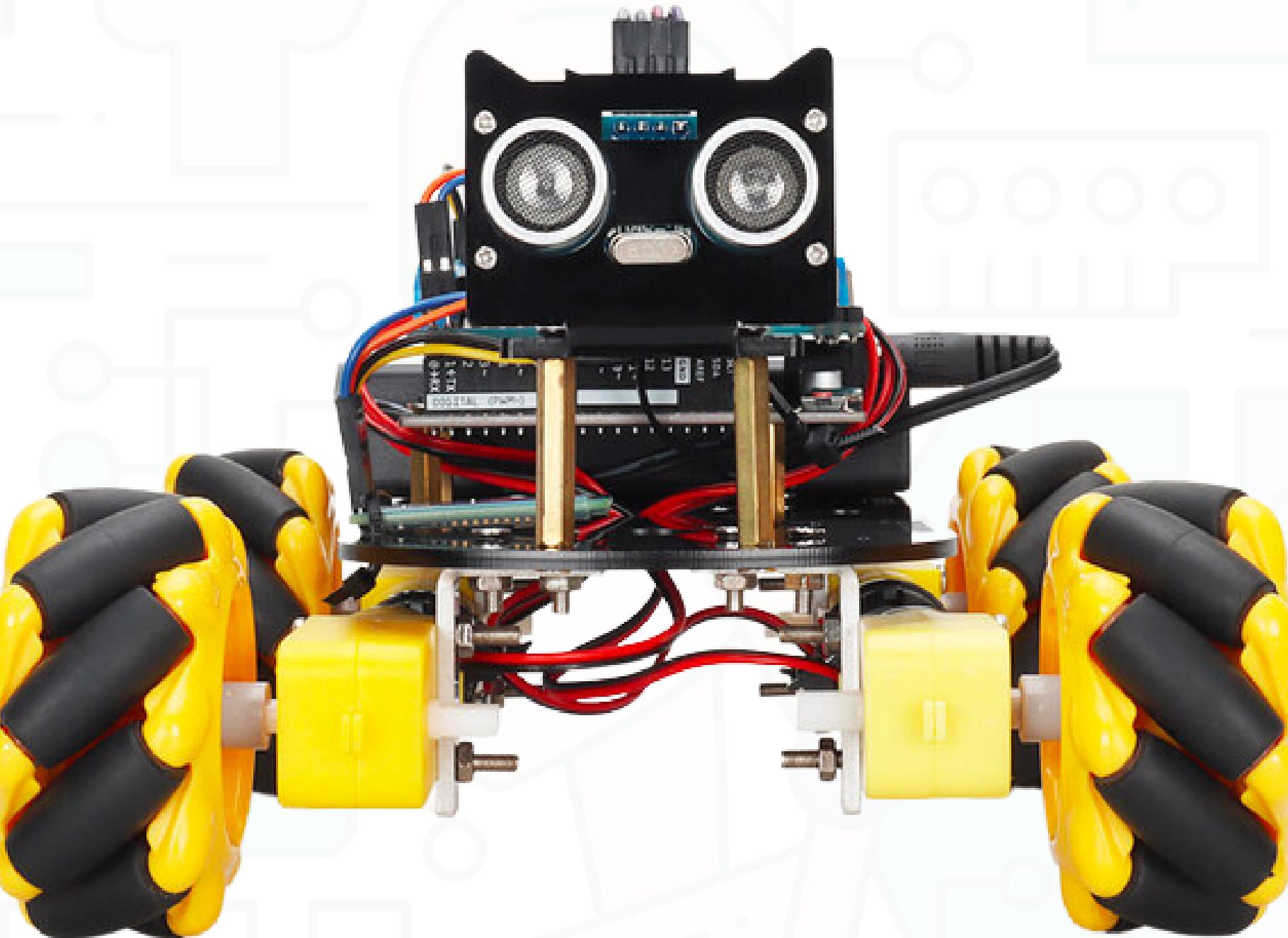
4WD



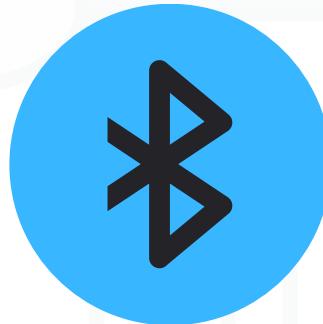
Macnum-Wheels



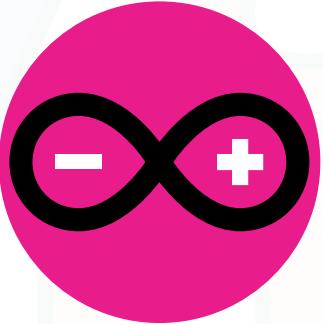
Sensors



Rechargeable

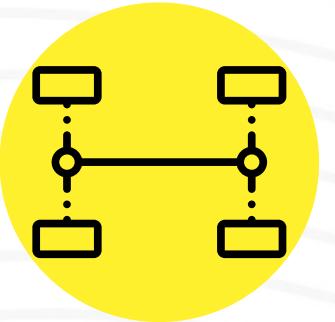


Wireless Control



Arduino
compatible

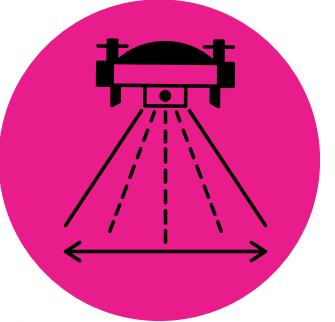
LAB Kit



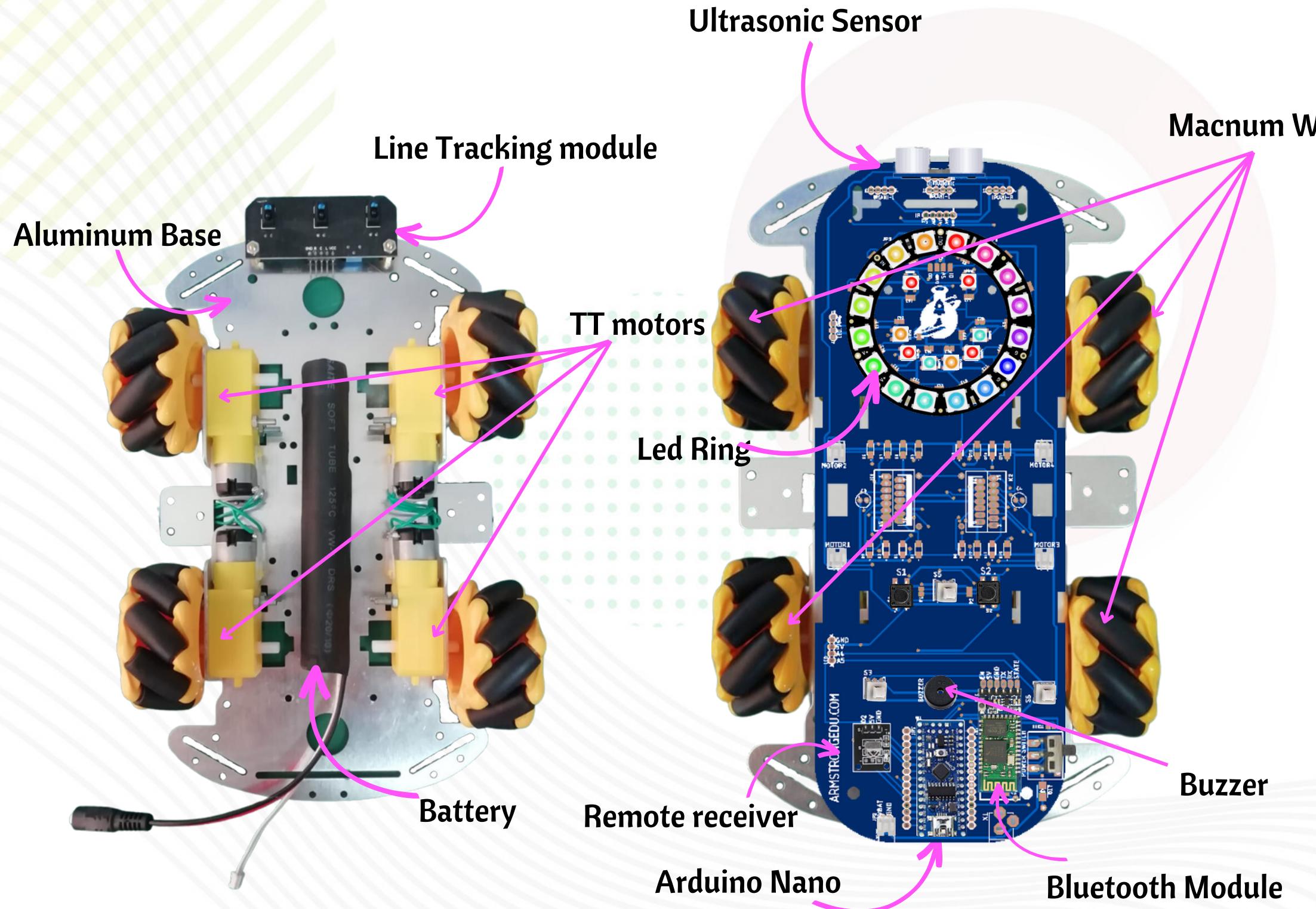
4WD



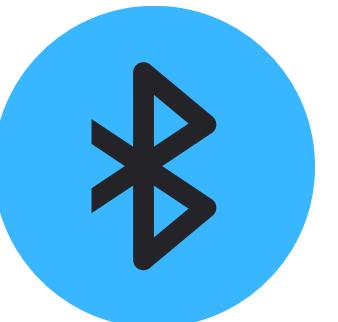
Macnum-Wheels



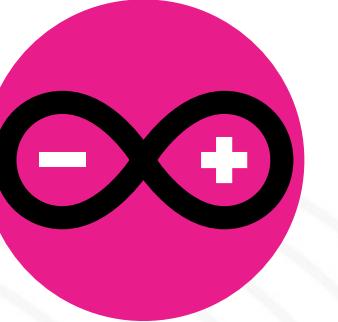
Sensors



Rechargeable



Wireless Control



Arduino
compatible

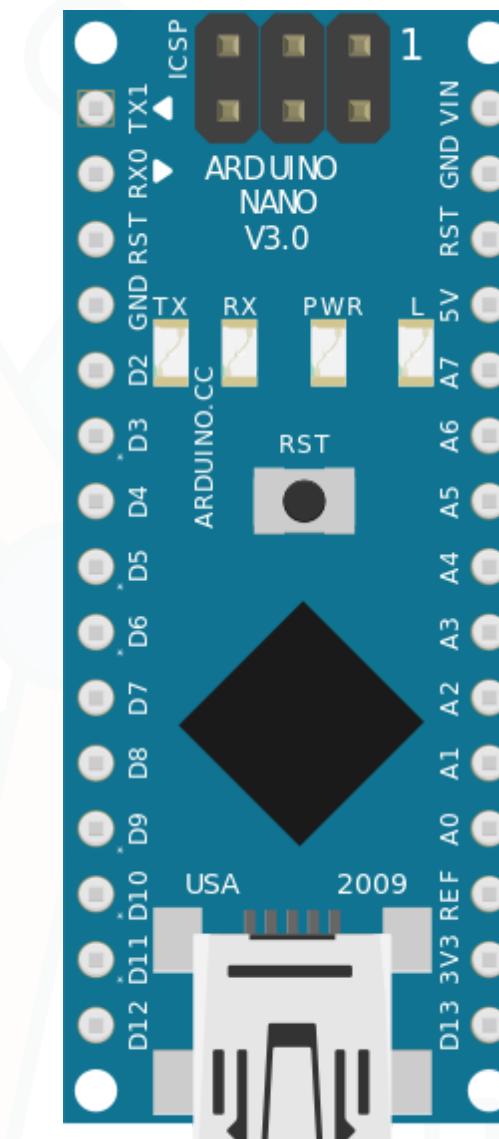
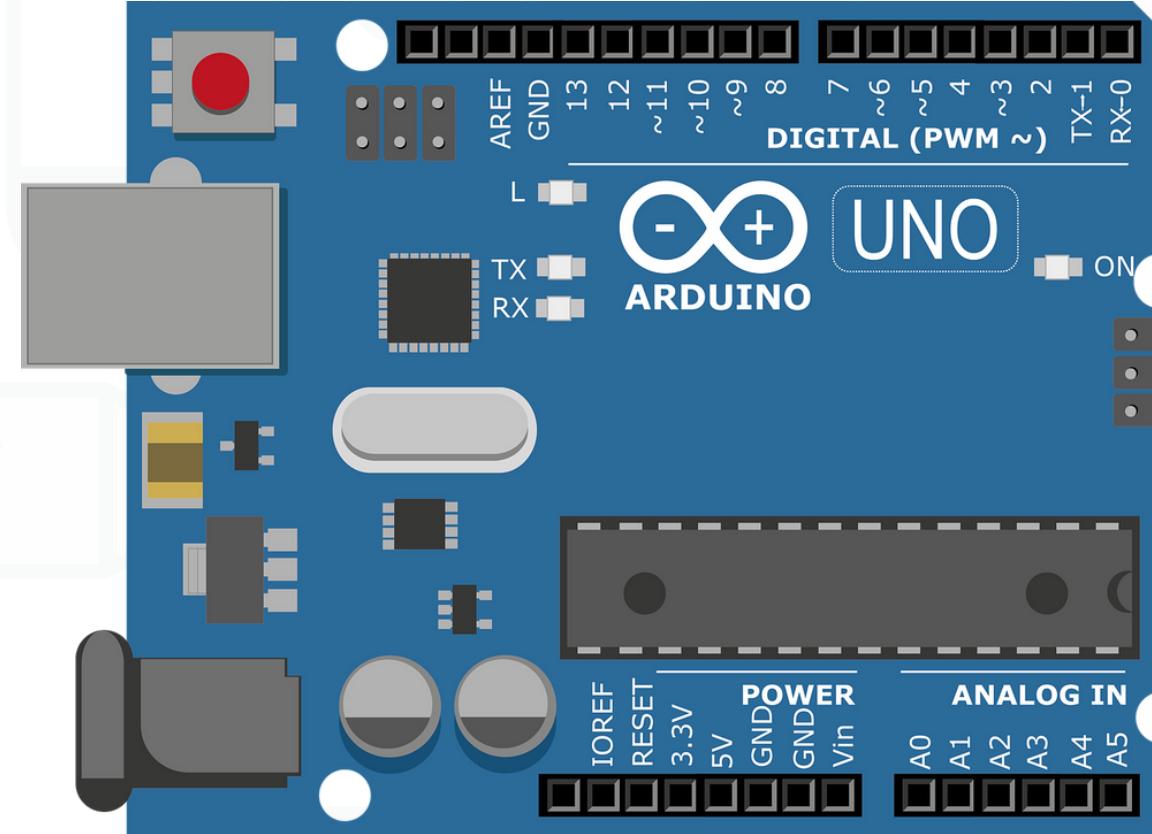
Intro to Arduino

What is a microcontroller?

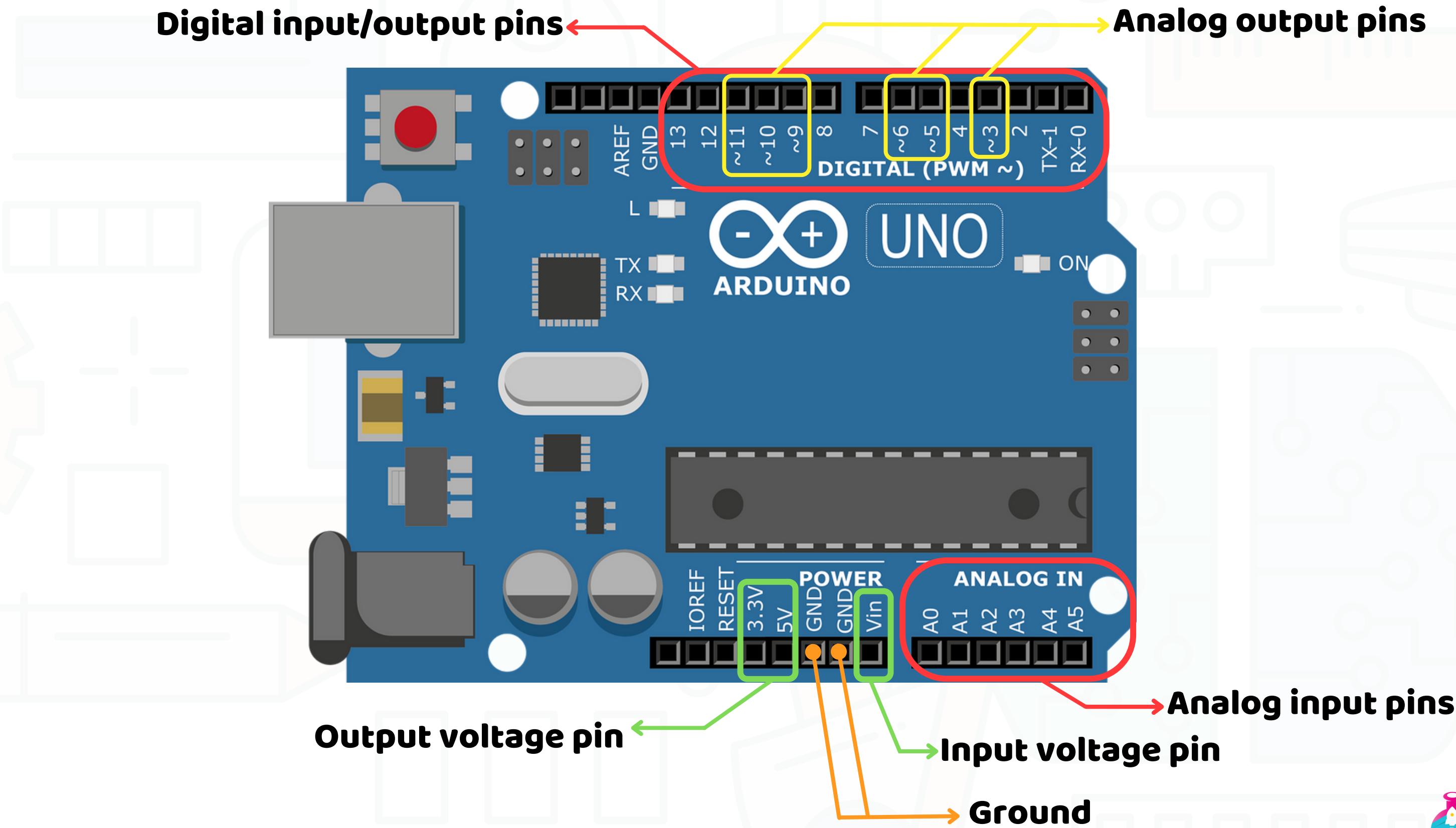
A microcontroller is a computer-on-a-chip optimized to control electronic devices.

An **Arduino board** is a microcontroller that has a user-friendly Ide.

Arduino uno vs Arduino nano



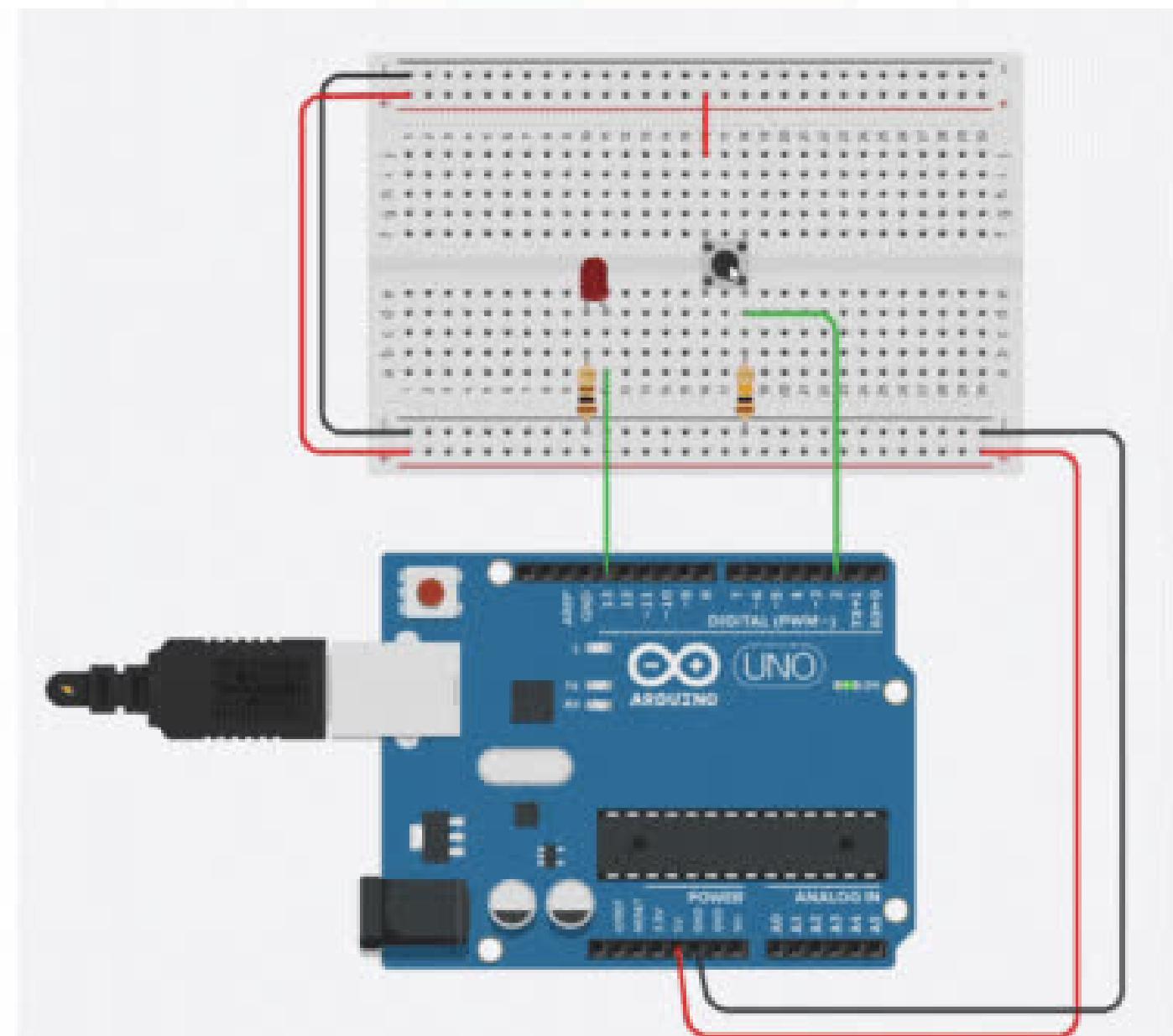
Intro to Arduino



HIGH & LOW

HIGH= on, LOW=off

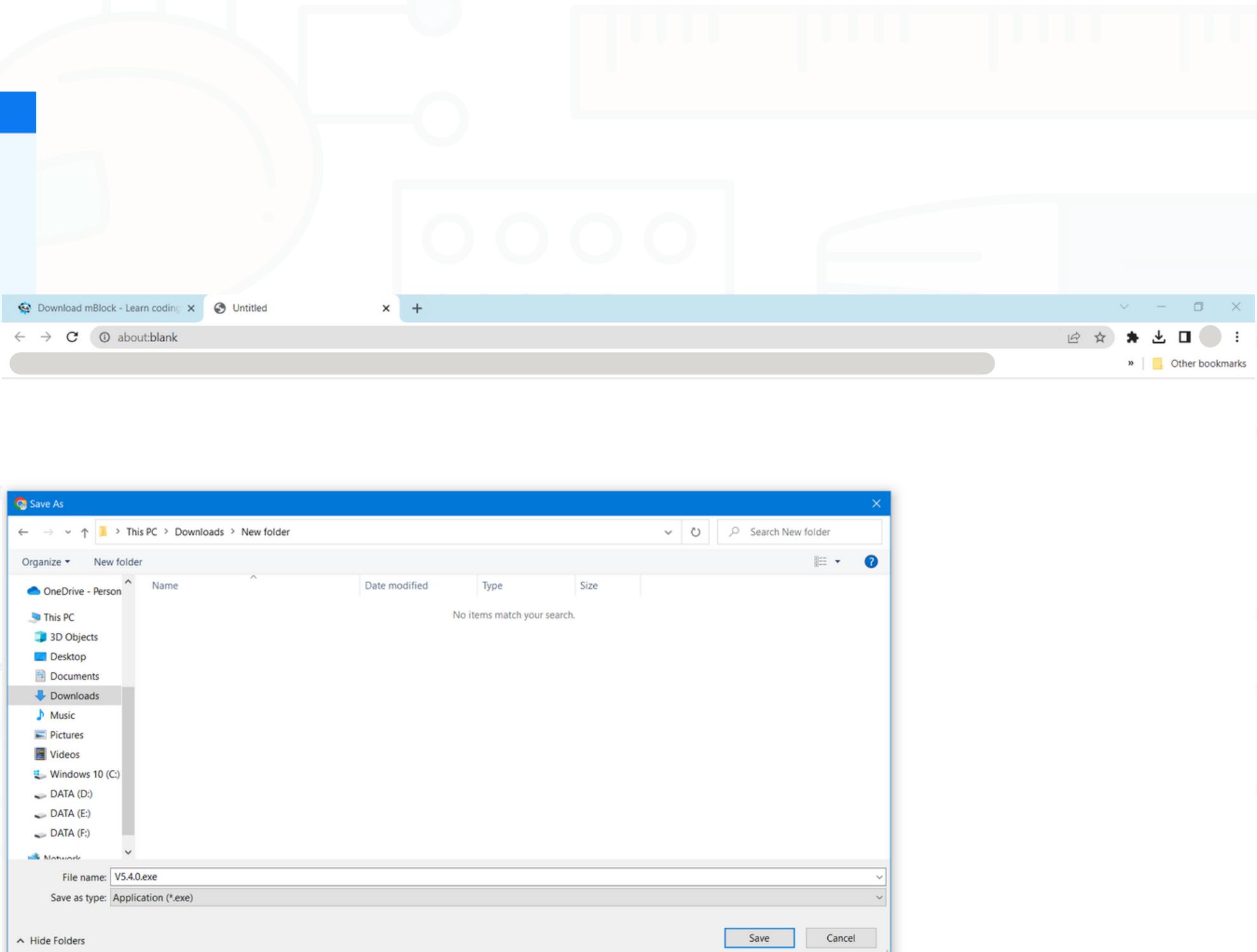
In programming a pin is **HIGH** when it outputs electricity (led on) and **LOW** when it doesn't output electricity.



Getting started with mblock

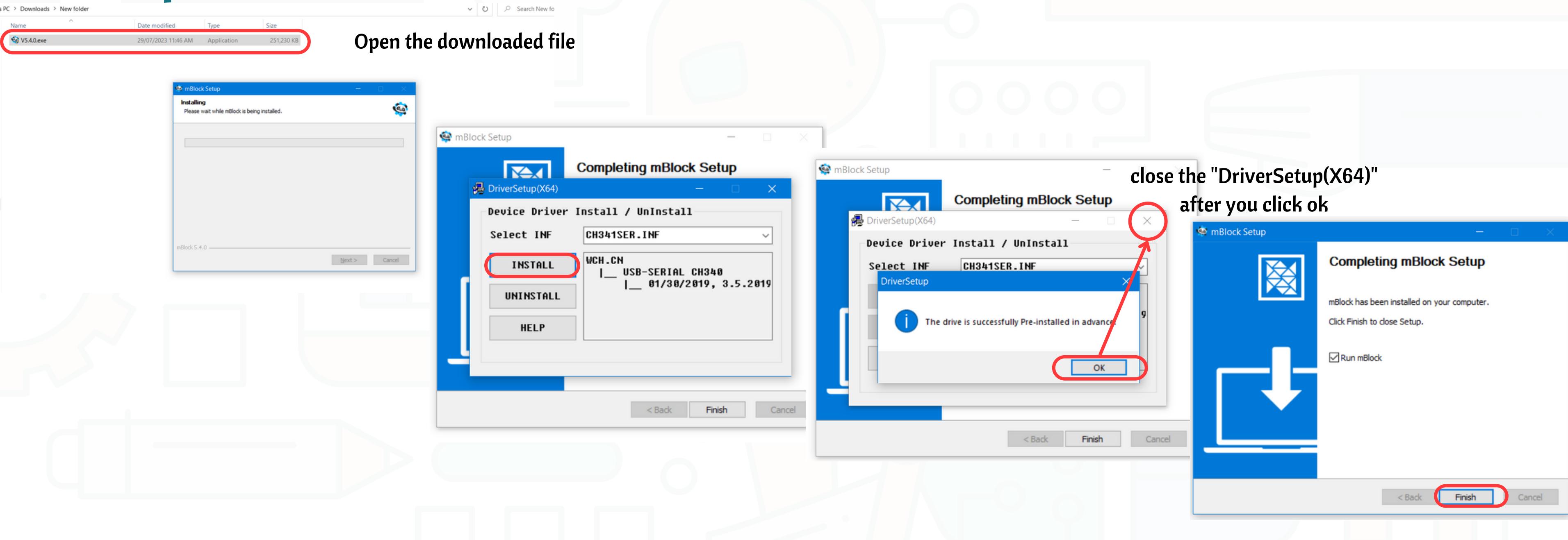
Step 1: Download mblock.

The screenshot shows the mBlock website homepage. At the top, there's a navigation bar with links for "makeblock | mBlock", "Educator", "Subject", "Developer", "Help", "Download", "Store", and "English". Below the navigation, a large section titled "Download mBlock" features a sub-section for "One-stop coding platform tailored to coding education, trusted by 15 million educators, and learners". It includes two main download sections: "mBlock web version" (with a "Code with blocks" button) and "mBlock PC version" (with "Download for Windows" and "Download for Mac" buttons). The PC version section also includes release information: Version: V5.4.0, Released: 2021.11.30, and links for "Released log" and "Previous version".



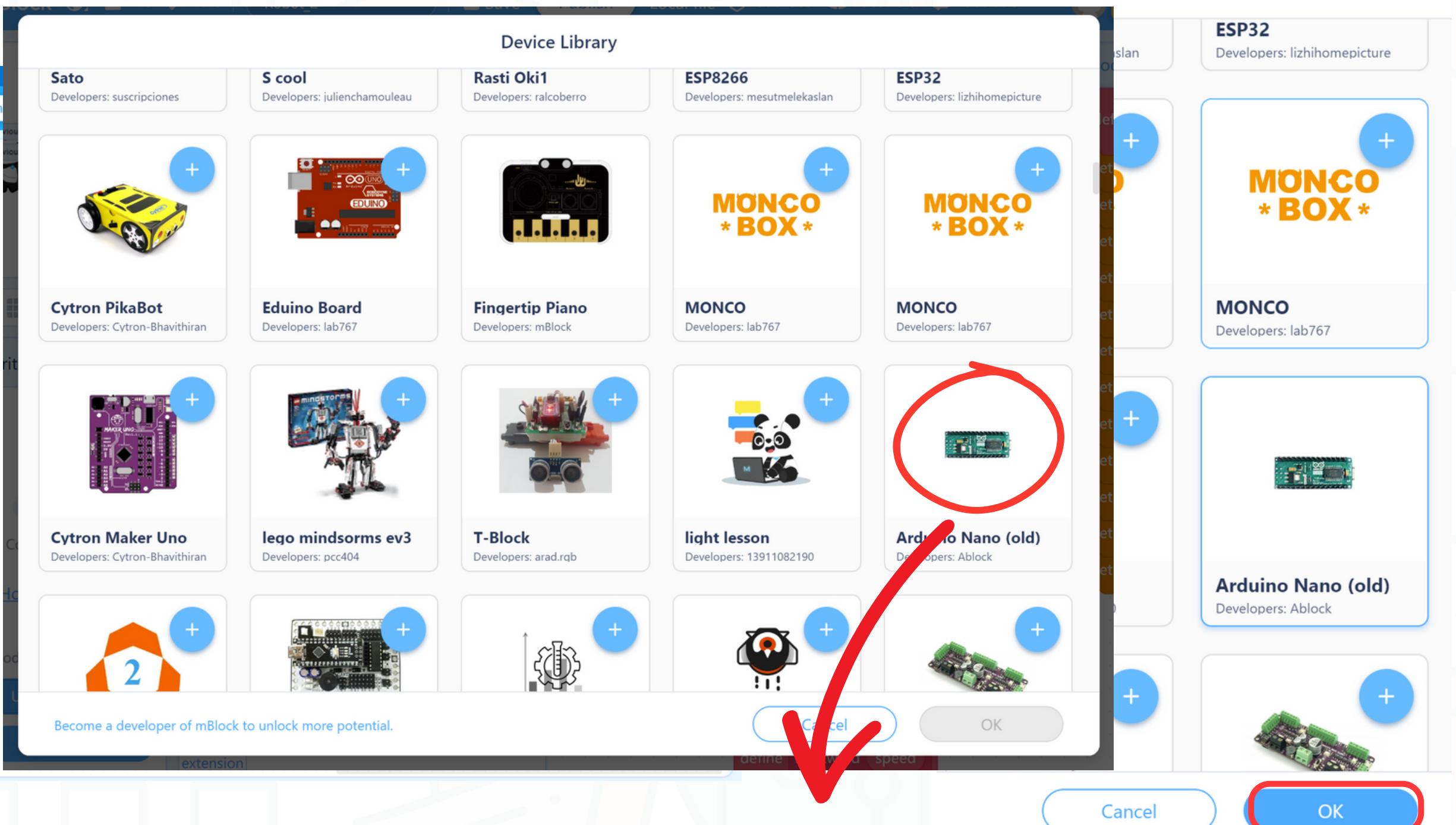
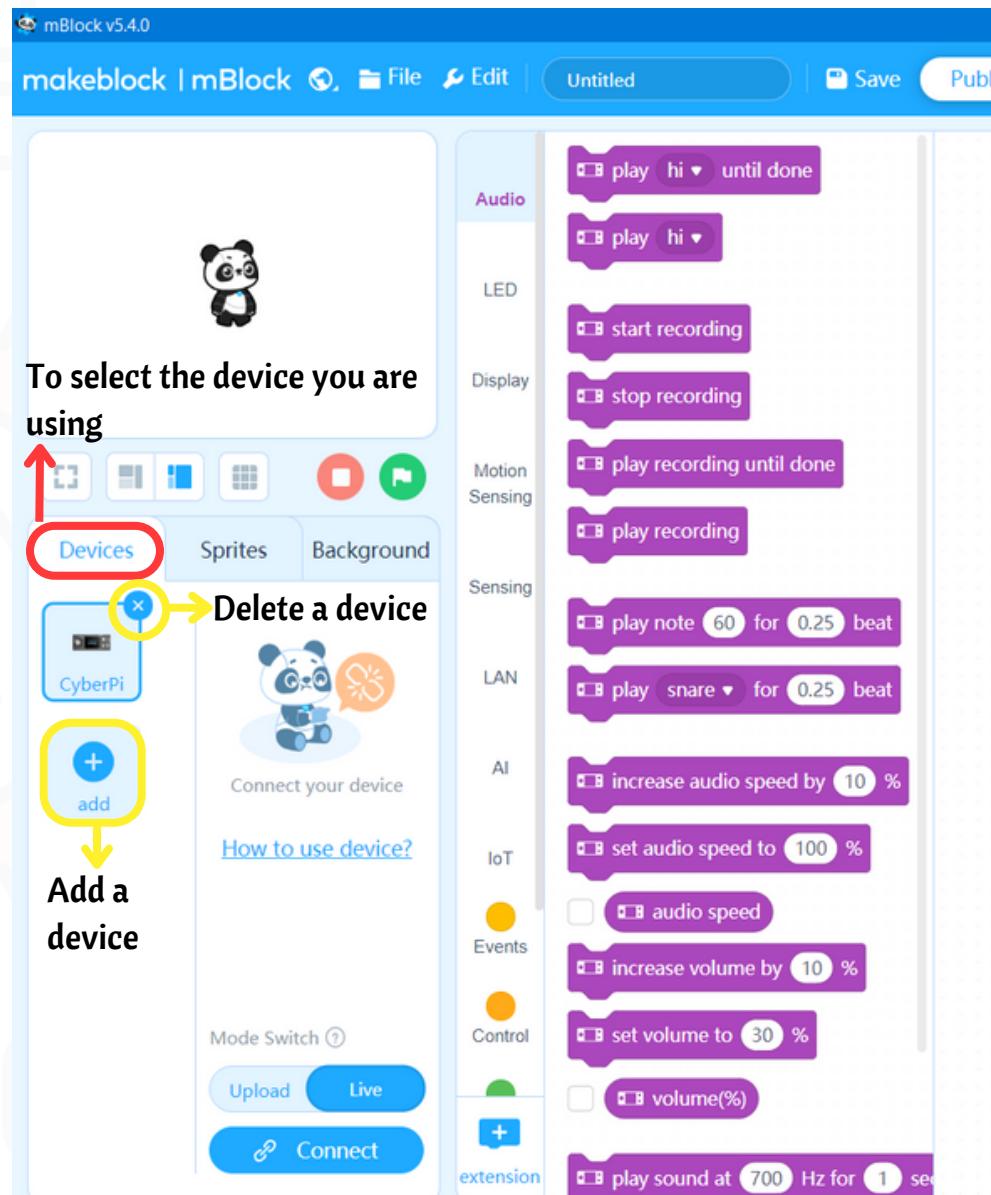
Getting started with mblock

Step 2: Install mblock.



Getting started with mblock

Step 3: Set up.

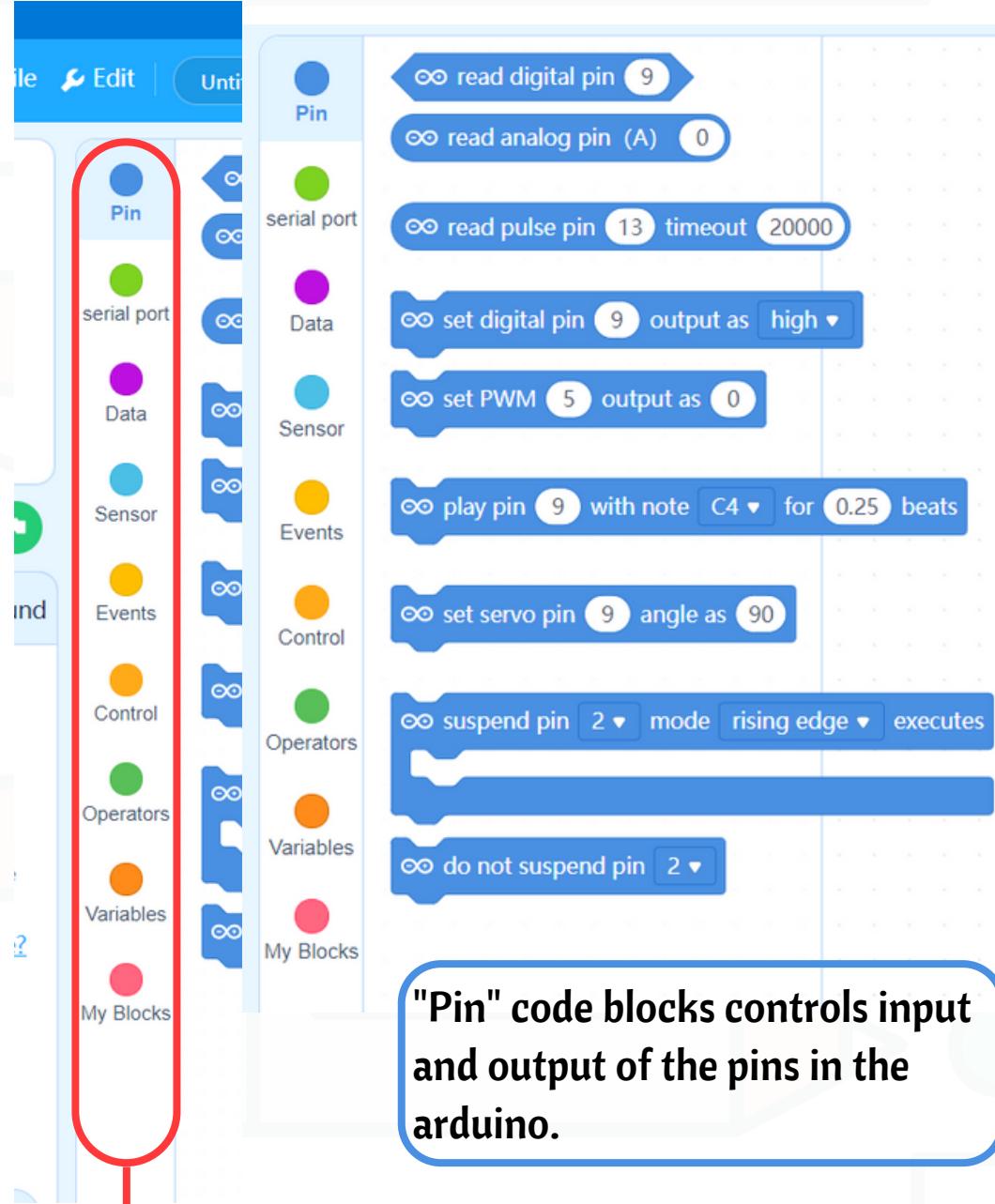


Download device if not
already downloaded

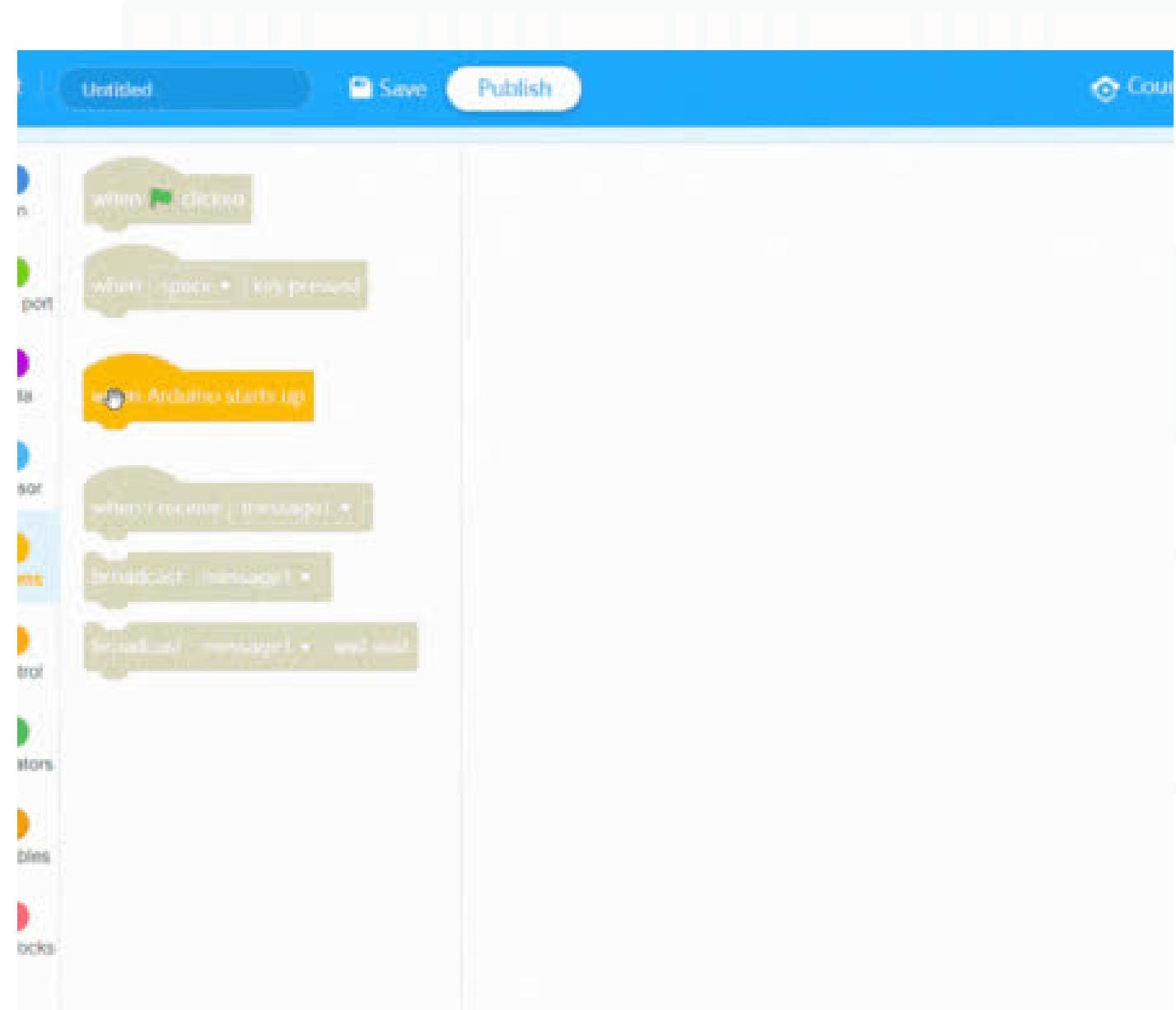
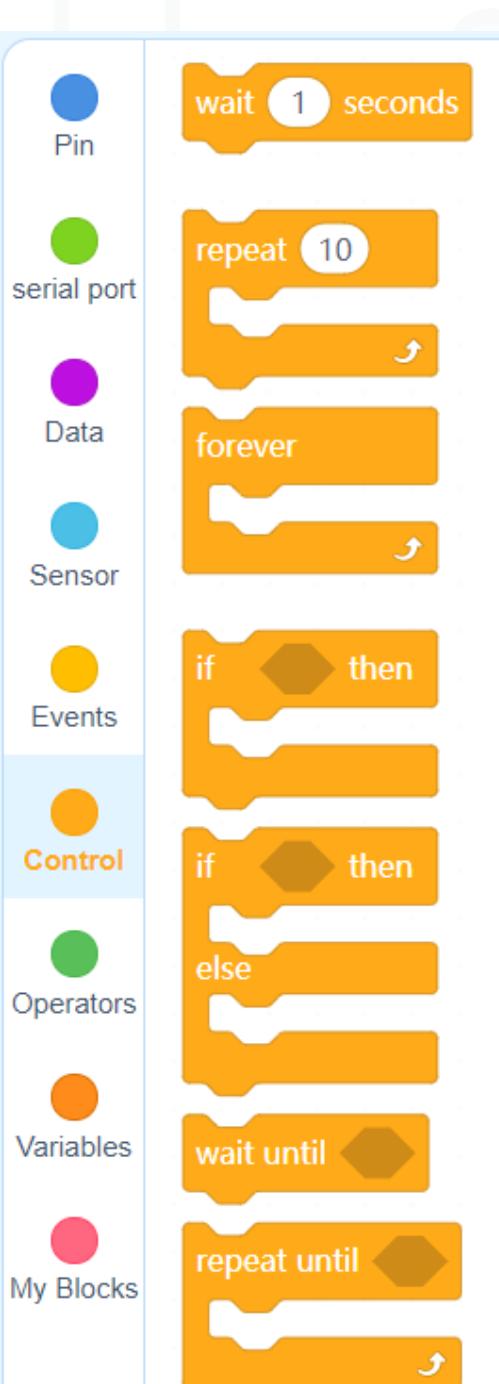
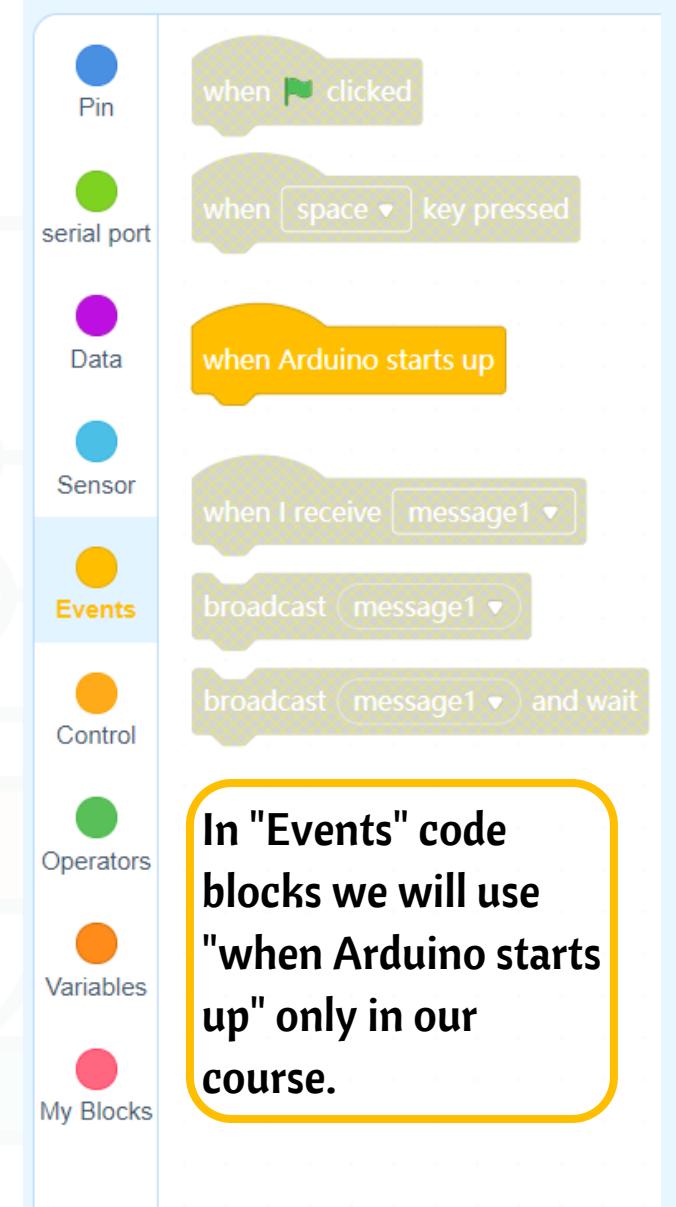
Select device and click "ok"

Getting started with mblock

Step 4: Let's code.



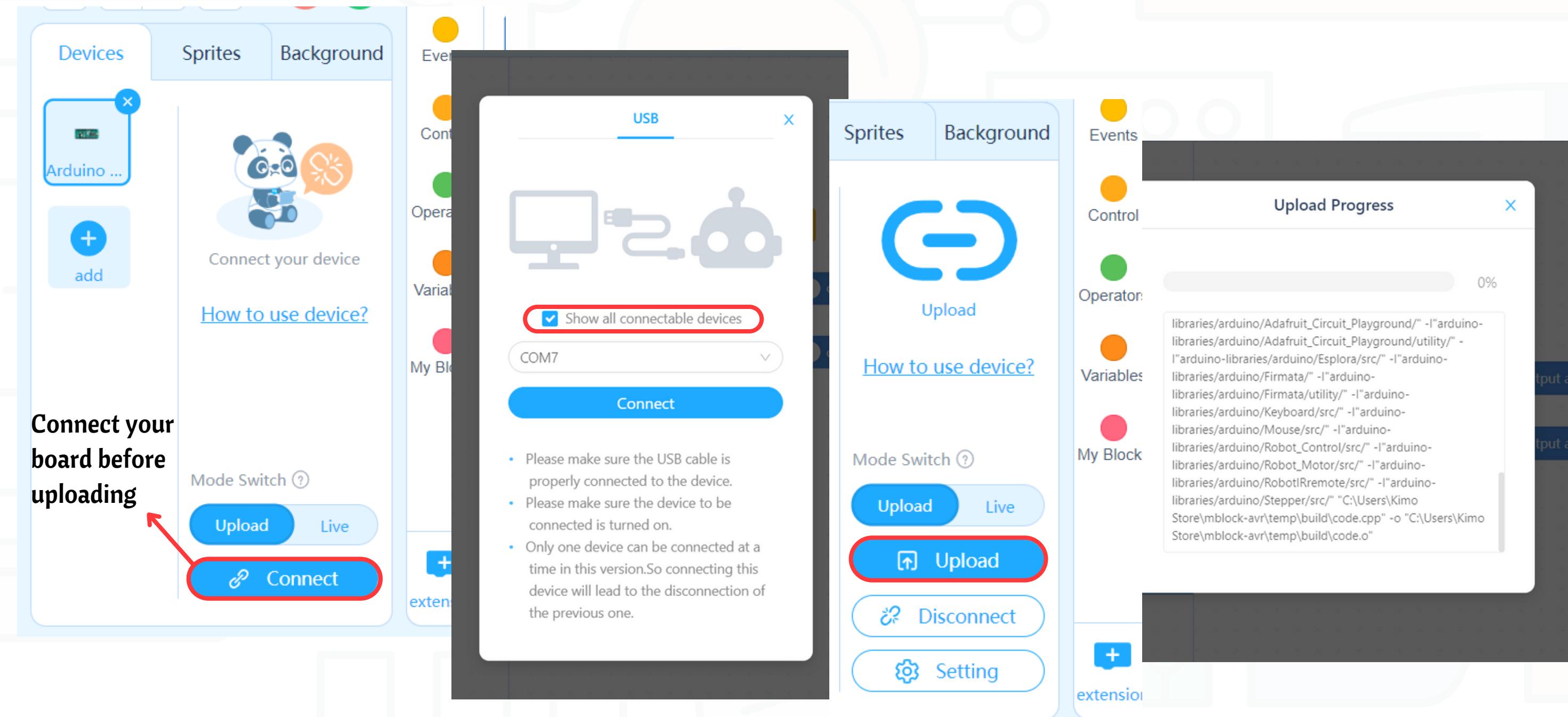
Categorized code blocks



Building code

Getting started with mblock

Step 5: Upload code.



Let's try it on mBlock

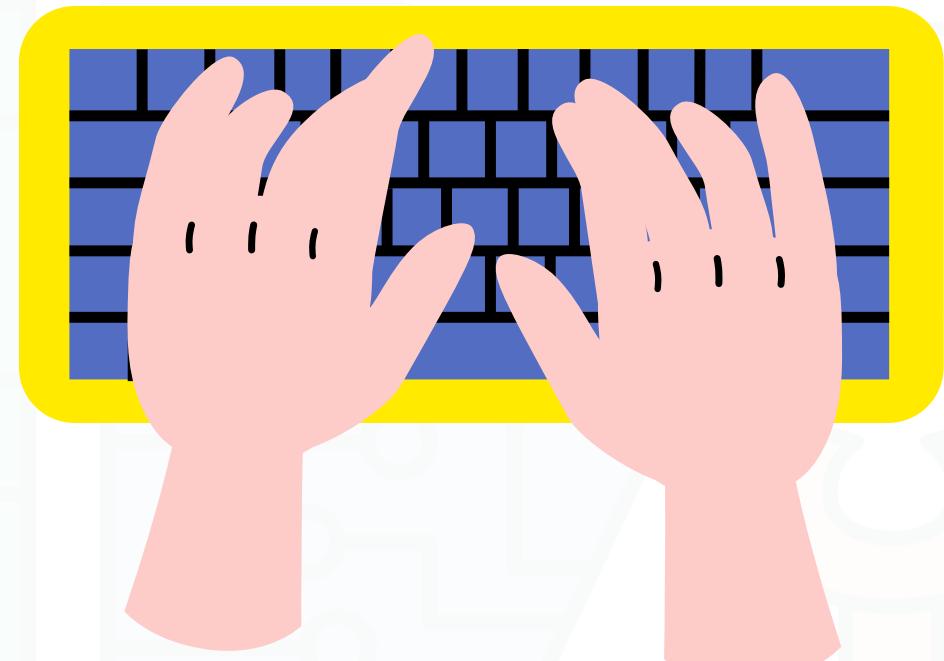


Write a code to make the built in led in the arduino blink.

Try it by yourself



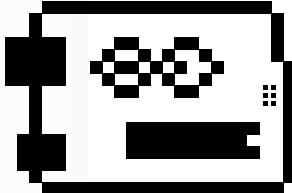
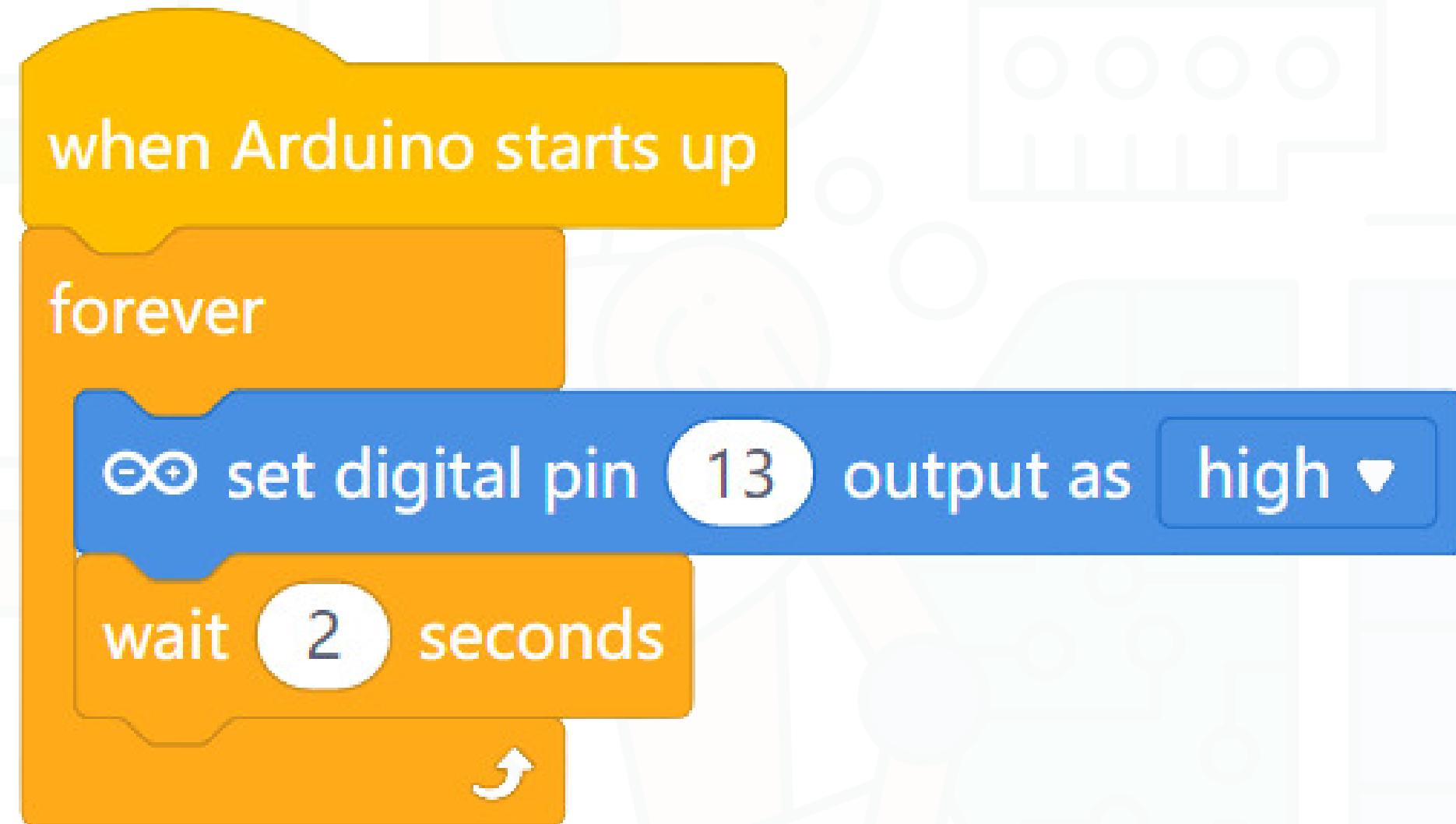
Hint: Built-in led connected to pin 13



Let's try it on mBlock



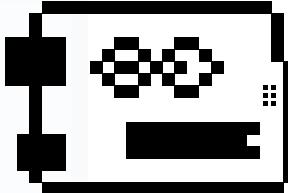
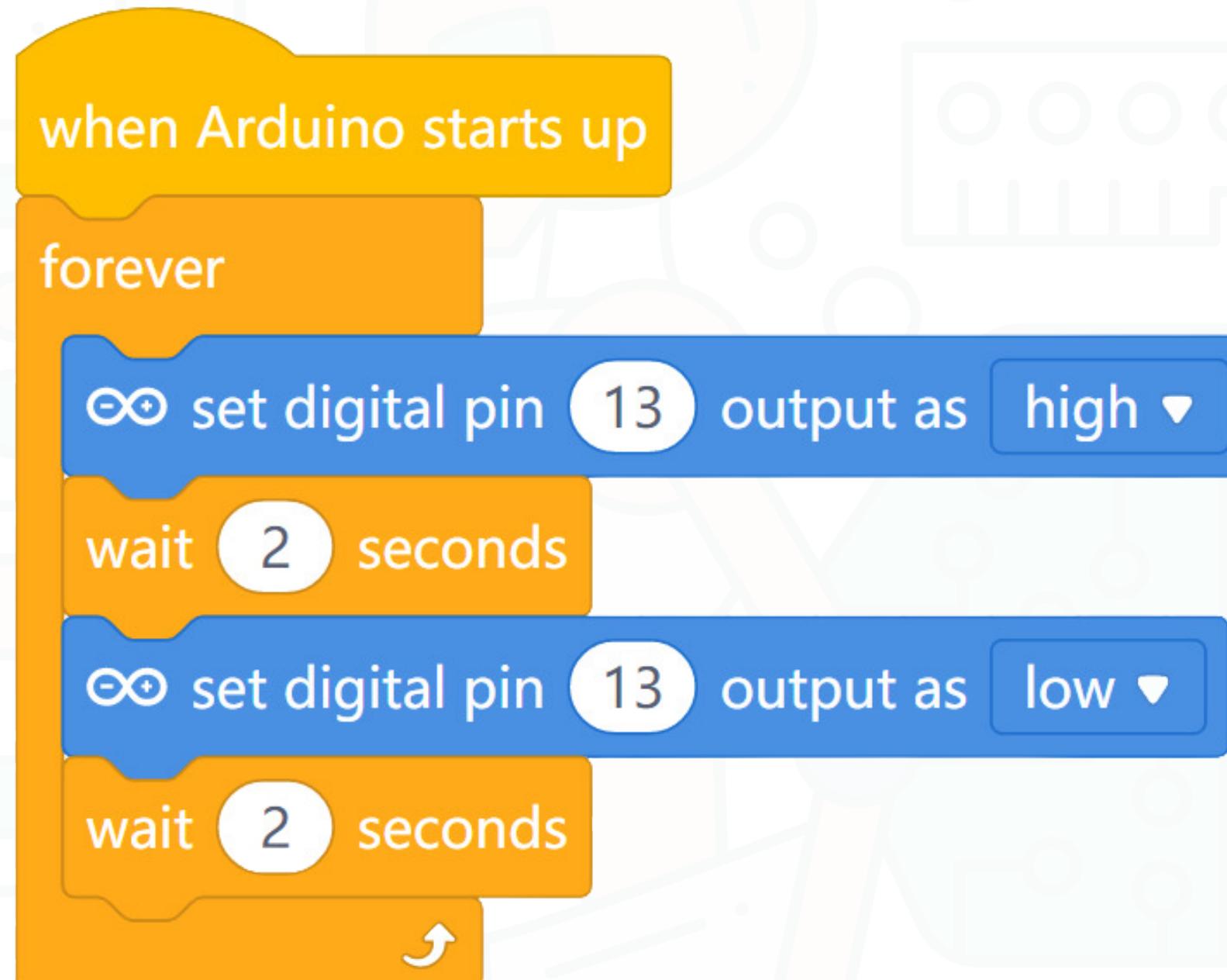
Step 1: Set pin 13 "HIGH" for 2sec



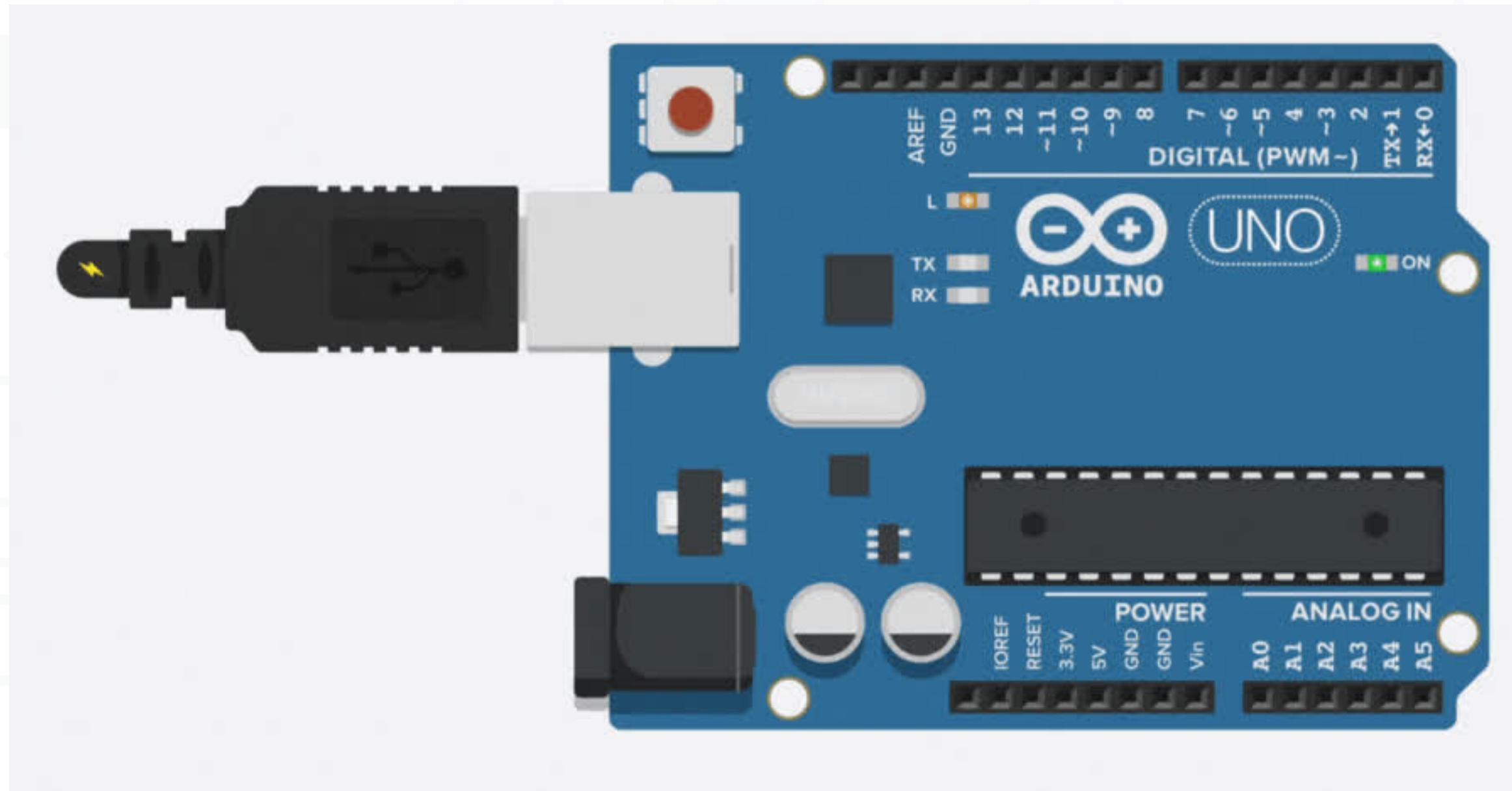
Let's try it on mBlock



Step 1: Set pin 13 "LOW" for 2sec" for 2sec



Let's try it on mBlock



Let's try it on mBlock



untitled

Edit Save Publish

Pin

when green flag clicked

when I speak or tiny pressed

Date

on Arduino start up

Sensor

when crocodile connection is

when crocodile connection is

Events

Control

Operators

Variables

My Blocks

The screenshot shows the mBlock visual programming interface. At the top, there are tabs for 'Edit' (highlighted), 'Untitled', 'Save', 'Publish', and 'Cloud'. On the left, a sidebar lists categories: Pin, Date, Sensor, Events, Control, Operators, Variables, and My Blocks. The main workspace contains a vertical stack of blocks. From top to bottom, they are: 'when green flag clicked', 'when I speak or tiny pressed', a yellow 'Control' block labeled 'on Arduino start up', another 'when green flag clicked' block, a 'Control' block labeled 'when crocodile connection is', and a 'Control' block labeled 'when crocodile connection is'. The blocks are color-coded by category: green for Pin, Date, Sensor, and Events; yellow for Control; and orange for Operators and Variables.

