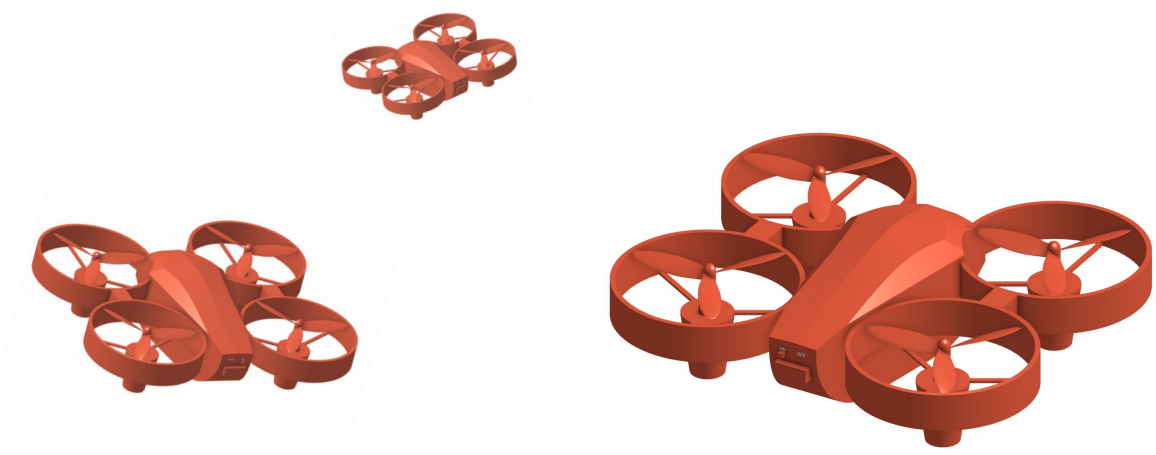
STAGE ONE EDUCATION

Hands-on Engineering Workshops

ROBOTICS WORKSHOP

ELECTRONICS & CODING

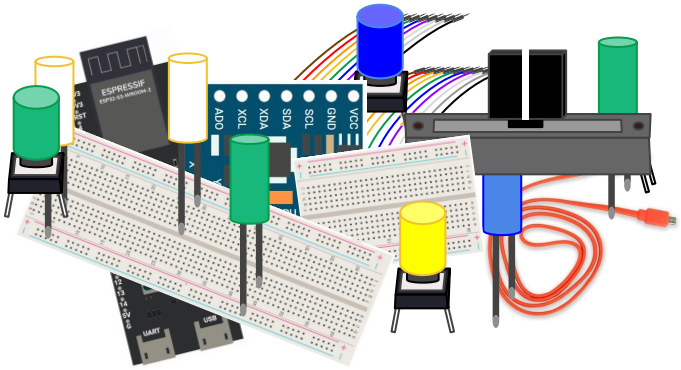


with
ARDUINO
&
ESP32

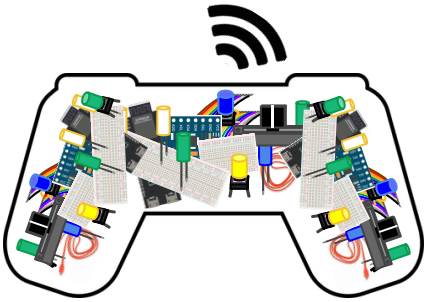
V 1.9

Background

Get ready to build a controller using simple electrical components!



You'll use this controller to send signals to your drone, allowing you to control its flight both manually and autonomously.



Along the way we will build, program, and optimize our circuit and drones flight.

Parts that we'll use today

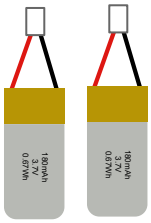
On your desk

Laptop

Open your laptop and connect to power

Instructions

Safety Glasses

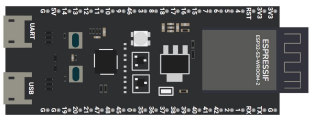


Drone Batteries

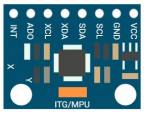
Electronics Box

Check that you have all the parts we will use today

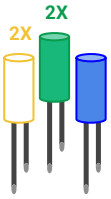
Drone



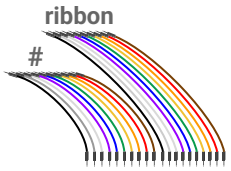
ESP32 Development Board



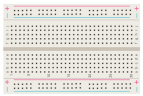
GY-521 Accelerometer



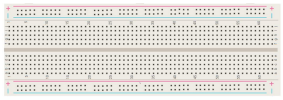
LED's



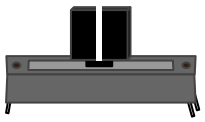
Wires



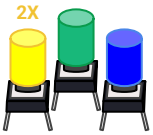
Small Breadboard



Large Breadboard



Slider Variable Resistors



Buttons

Drone Battery Charging Cable

USB to Micro USB

Start-Up

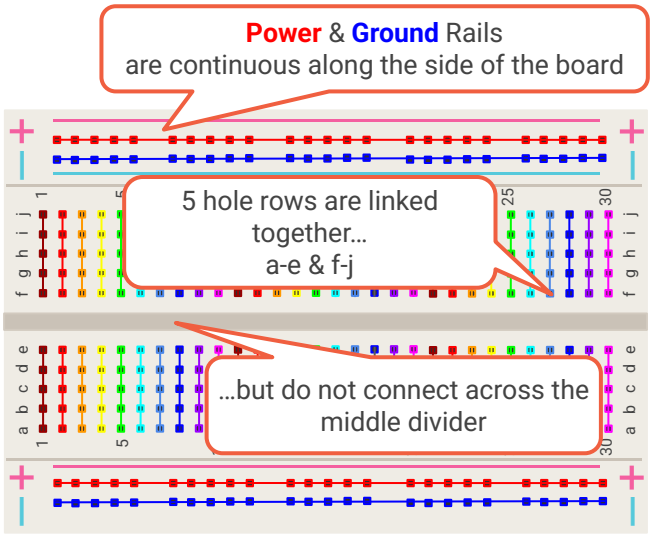
SAFETY GLASSES REQUIRED

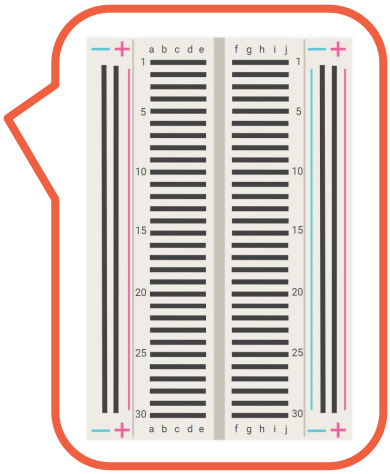
Put on your safety glasses

BREADBOARDS

NEVER twist wires

ALWAYS connect wires using the breadboard!





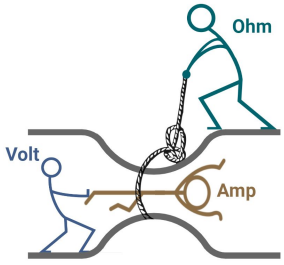
GOOD TO KNOW

Ohm's Law

Voltage = Current ✖ Resistance

Current (Amperage)
measure the flow of electrical current in a circuit. It indicates how many electrons are passing a point in the circuit per second.

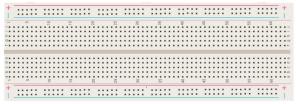
Voltage
the electrical potential difference between two points in a circuit. It is measured in volts (V)



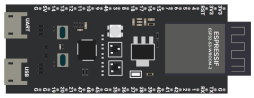
Resistance (Ω)
measures how much a component resists the flow of current. It's measured in ohms (Ω)

Drone Control Board Assembly

Parts we need



Large Breadboard

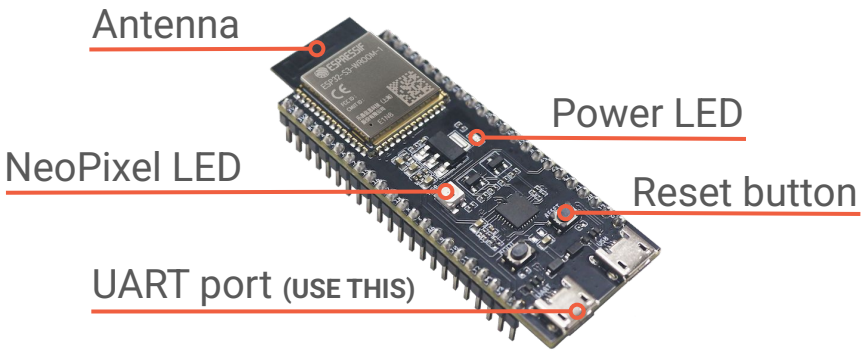


ESP32

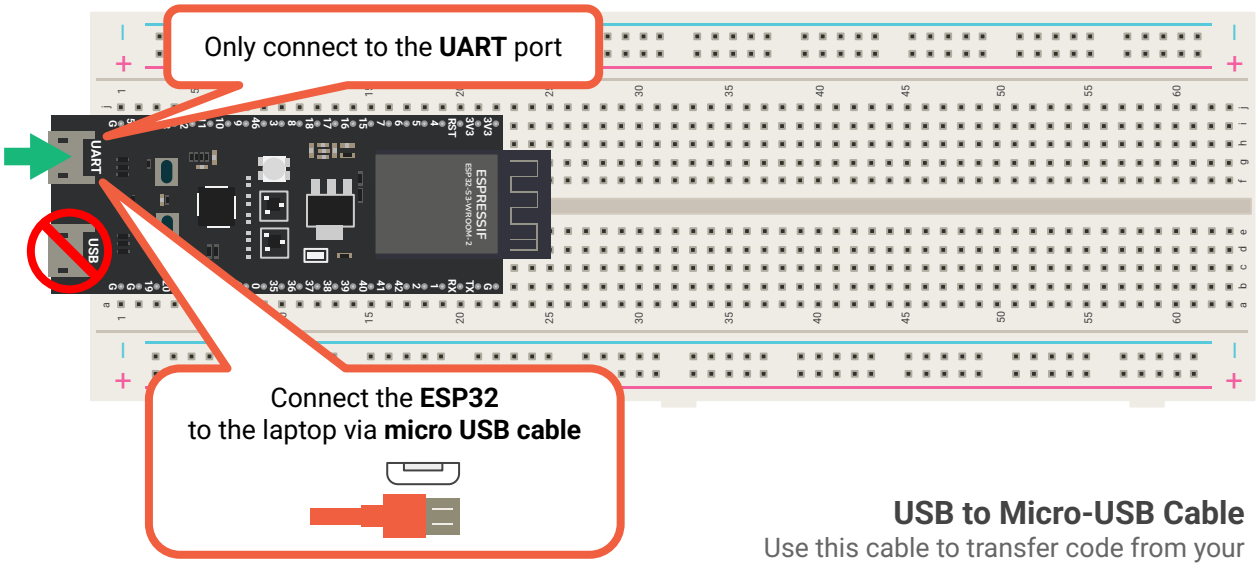
USB to Micro-USB

ESP32-S3-WROOM Development Module

This component is like a small computer that lets devices communicate.
We'll use it to link to our drone's WiFi and create a controller to pilot the drone!



The **ESP32** will be installed on the **breadboard**



USB to Micro-USB Cable

Use this cable to transfer code from your laptop to the ESP32. Only connect it when you're ready to upload to protect your circuit.