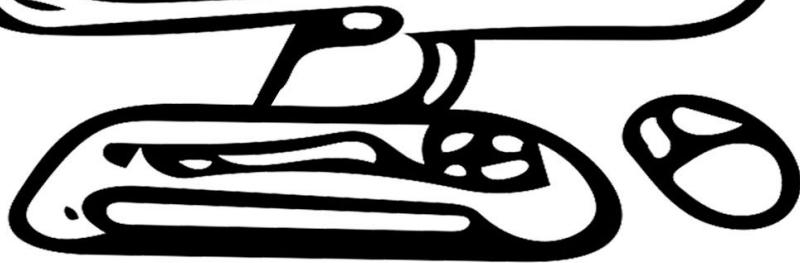
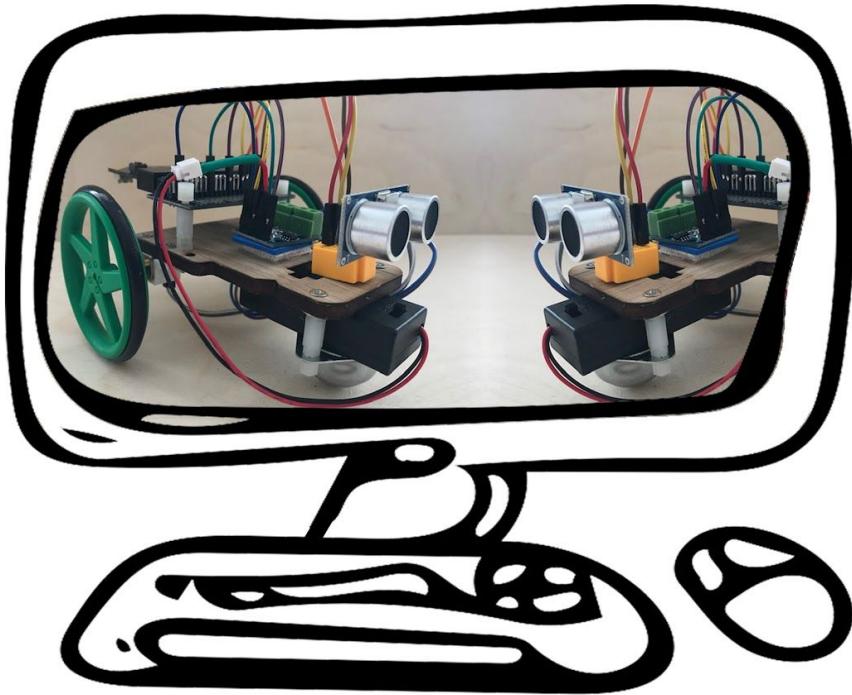
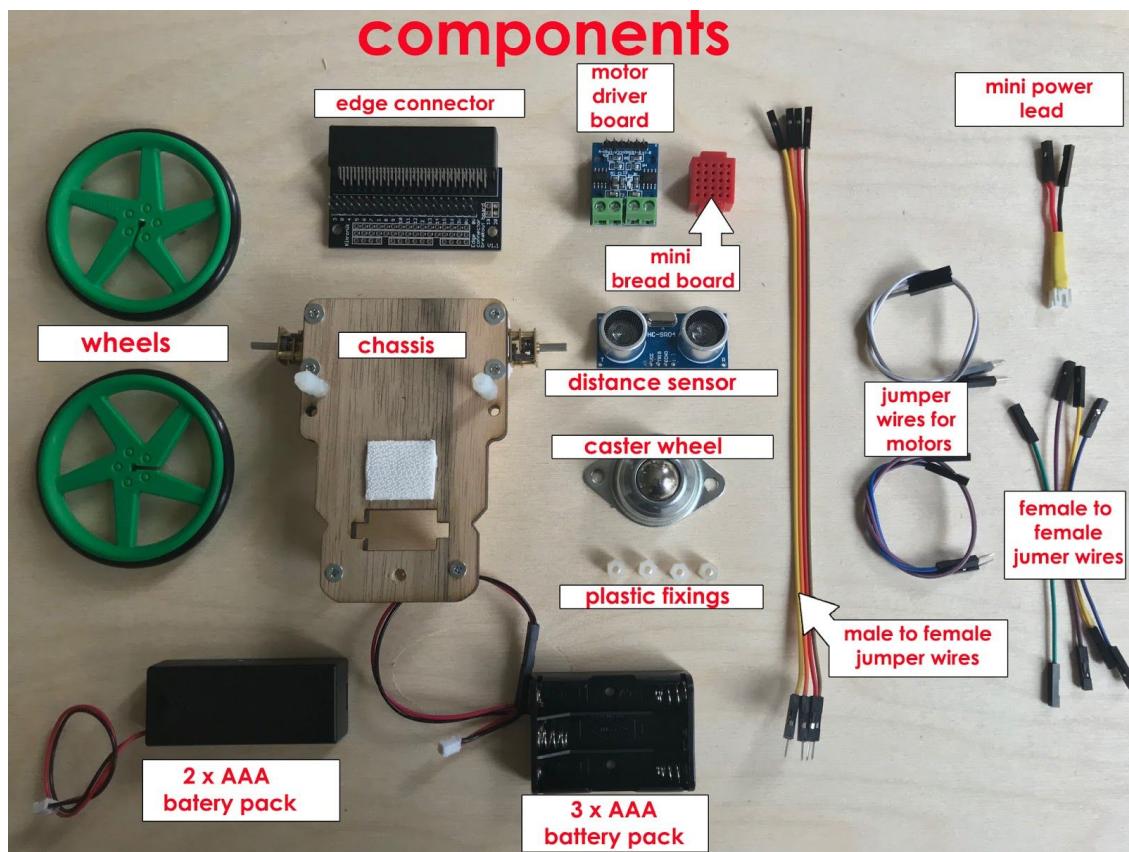


# Micro:bit Robot

## Assembly Instructions



**GIRLS INTO CODING**



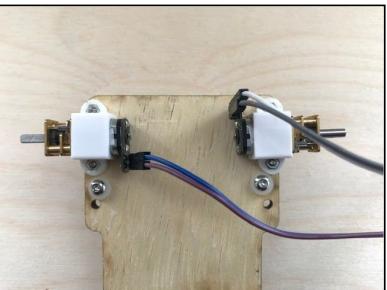
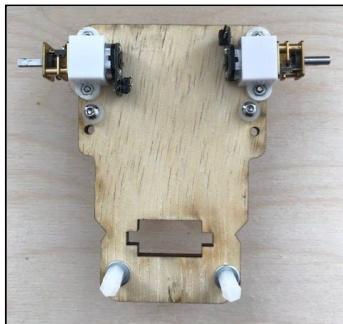
# Micro:bit Robot

You can find an online version of the project instructions on Github

[https://github.com/Avmaker/Microbit\\_Robot](https://github.com/Avmaker/Microbit_Robot)

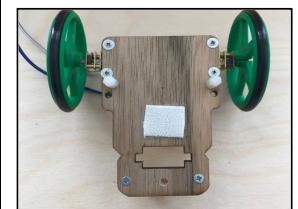
Check out this Youtube video for additional help with the assembly <https://youtu.be/YVciGal-lao>

1. Turn the chassis over as shown in the photo. We'll start by attaching the jumper wires - by doing this first, you'll be protected from the sharp pins on the motors!

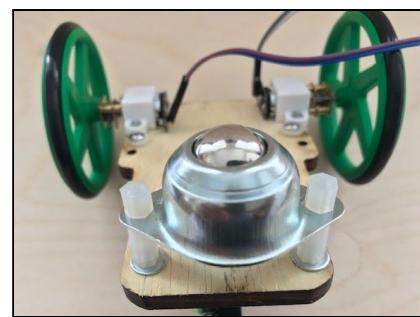
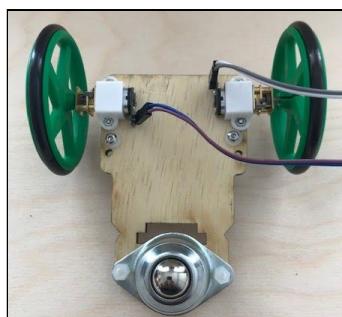


Use this photo to double check your wiring!

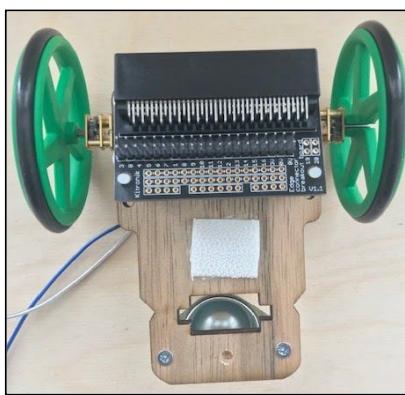
2. Attach the wheels to the motor shaft. Align the D - shape in the centre of the wheel with the D-shaped motor axel & push on firmly.



3. Place the castor wheel onto the plastic mounts at the front of the chassis. Then secure using two of the plastic fixings.



4. Place the edge connector on the standoffs at the rear of the chassis and secure using two of the plastic fixings (As shown in the diagram).

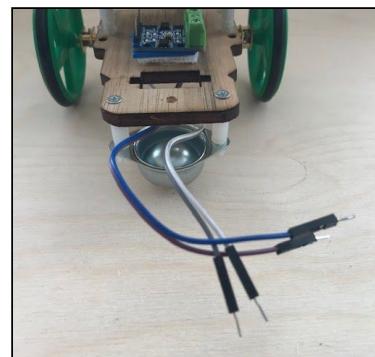
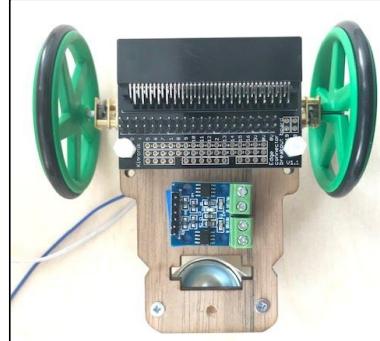


# Micro:bit Robot

- Position the motor driver board



and press down firmly to secure with Velcro and then thread the jumper wires through the gap in the front



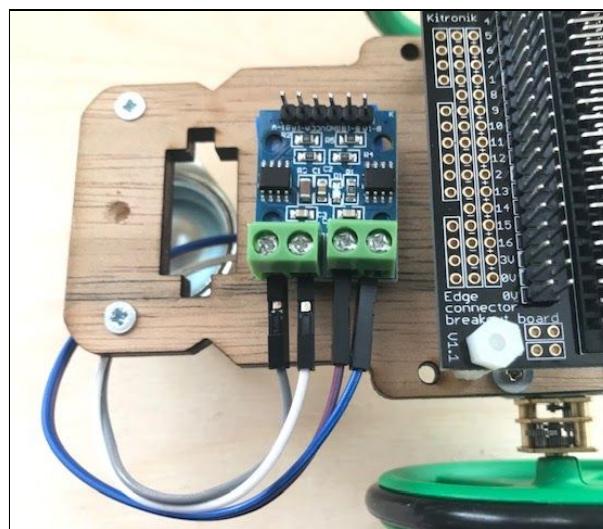
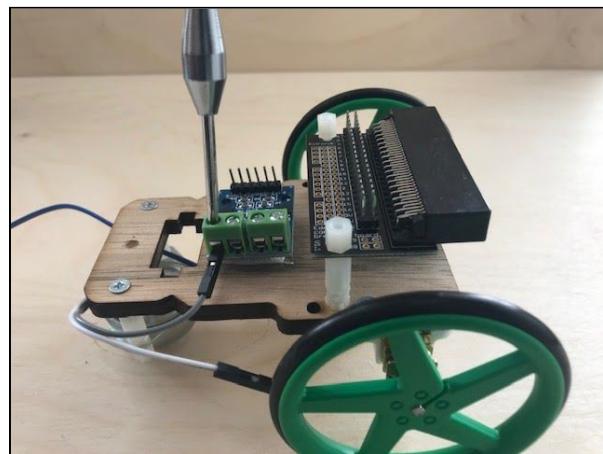
- Using a screwdriver connect the male end of the motor jumper wires to the terminals on the motor driver board (As shown in the diagram).

**Always double check your wiring before moving onto the next stage!**



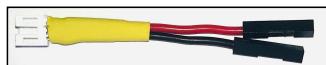
Male jumper wire

screwdriver

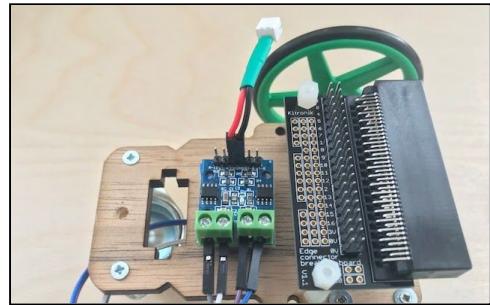


# Micro:bit Robot

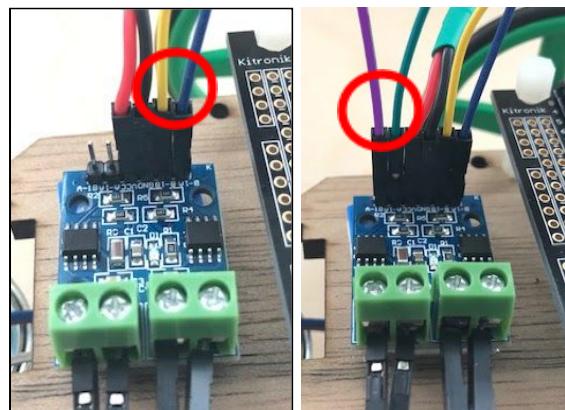
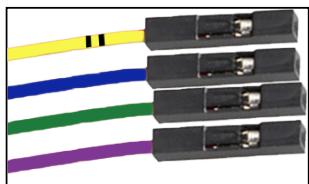
7. Add the **small power cable** to the motor driver board as shown in the photo. **Double check your wiring before moving to the next stage.**



Yours will be yellow (as above) or green (shown on the right).



8. Connect the small yellow, blue, green and purple **female** jumper wires to the motor driver board as shown in the photograph. **Double check your wiring before moving on to the next stage!**



9. Now attach the other end of the jumper wires to the edge connector as follows: **yellow** goes to pin 16; **blue** goes to pin 0; **green** goes to pin 8; **purple** goes to pin 12.

| Jumper wire: | Pin number: |
|--------------|-------------|
| yellow       | 16          |
| blue         | 0           |
| green        | 8           |
| purple       | 12          |

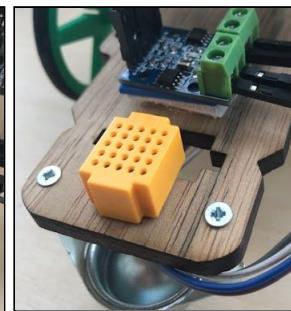
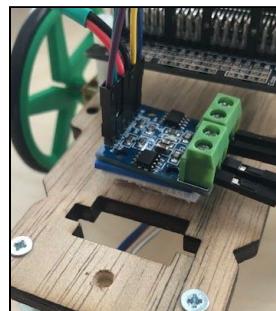


**Double check your wiring**

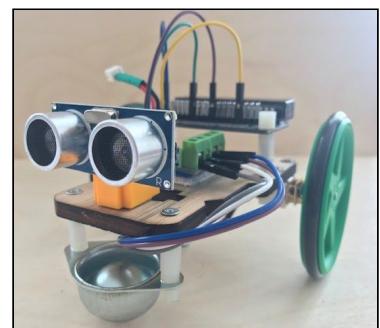
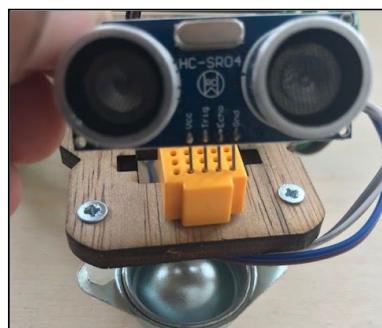
**Gentle warning:**  
**it is very easy to mistake pin 3 for pin 0**

# Micro:bit Robot

10. Attach the **mini breadboard** to the hole in the front of the chassis, press down firmly making sure that velcro keeps it firmly in place.



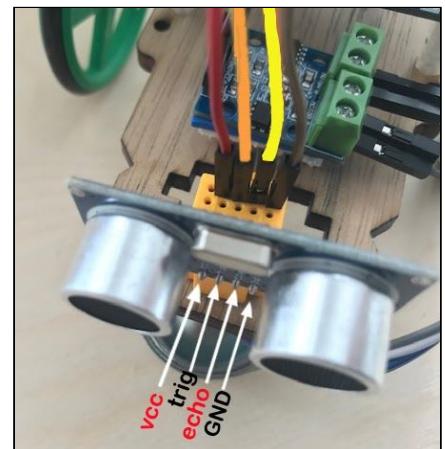
11. Insert the **sonar sensor** into the mini breadboard. **Make sure that the GND pin is on the far right of the breadboard.**



12. We will now wire the sonar sensor to the edge connector. For this we will use the long jumper wires and plug the **male** ends into the relevant holes in the mini breadboard.

| Jumper wire: | Sonar sensor pin: |
|--------------|-------------------|
| Brown        | GND               |
| yellow       | Echo              |
| orange       | Trig              |
| red          | Vcc               |

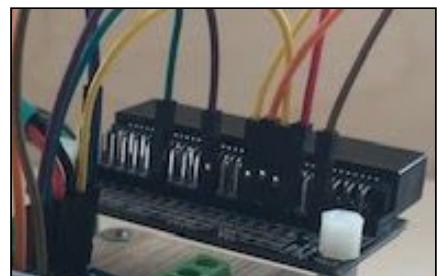
**Double check your wiring**



male end of jumper wire

13. Now we need to connect the other end of the jumper wires (the female end) to the edge connector.

| Jumper wire: | Edge connector pin: |
|--------------|---------------------|
| Brown        | 0V                  |
| yellow       | 14                  |
| orange       | 13                  |
| red          | 3v                  |



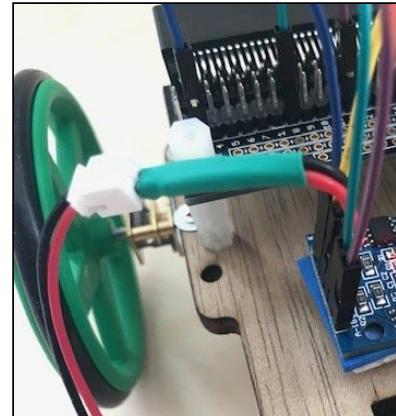
Female end of jumper wire

# Micro:bit Robot

14. Connecting the **2 x AAA** battery pack to the motor driver board:

You'll need to put the batteries into the battery holder (double check that you have put them in the right way). **Make sure that the switch on the battery holder is in the OFF position for now.**

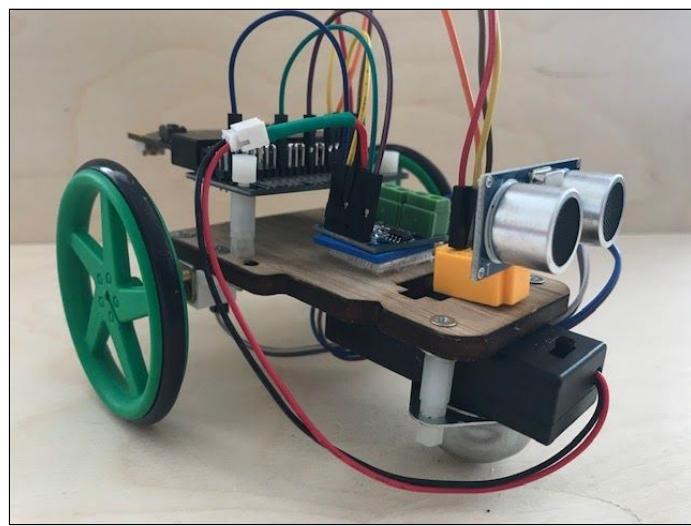
Now connect the battery pack cable to the mini power lead on the motor driver board.



15. Store the battery pack in the space at the front of the robot, between the caster wheel and the chassis.

Gently ease it into position.

We'll connect the other battery pack (3 x AAA) to the Micro:bit later on, once we've completed the coding.



16. **Now go to the coding instruction sheets.**

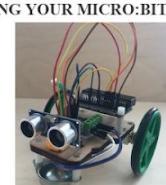
**RETURN TO STEP 17 ONCE YOU'VE  
DOWNLOADED YOUR CODE**

You'll find an overview of how to code the motors, followed by two projects.

**The first project uses two Micro:bits**, one will allow you to control the robot by tilting it forwards, backwards, left & right - it will communicate with the other Micro:bit which will be onboard the robot.

**The second project** uses the sonar sensor to help the robot avoid obstacles.

## CODING YOUR MICRO:BIT ROBOT



### Assembling The Robot

See separate Assembling Instructions

### Understanding How Motors Work

To control the motors, we need to access the pins of the microbit. We do this through the Edge connector and the motor driver L9110s.

Each motor has two pins connected to it. Right motor: Pin 8, Pin 12 Left motor:

Pin 0, Pin 16

L9110S & Edge connector connection:

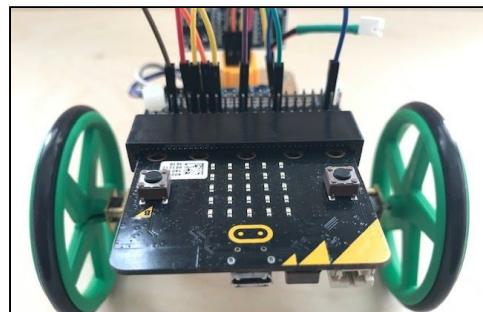
Right Motor: A-1A --- pin8 of the edge connector

Right Motor: A-1B --- pin12 of the edge connector

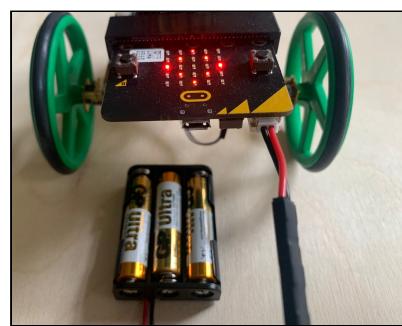


# Micro:bit Robot

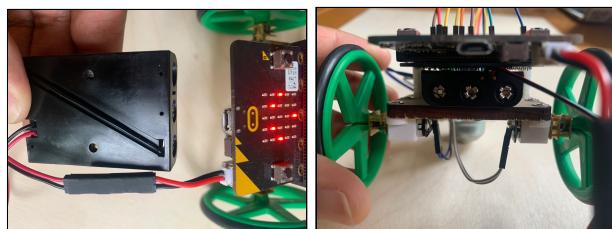
17. Once you have downloaded your code onto the Micro:bit, carefully slot it into the edge connector.



18. To power the micro:bit, we will now attach the 3 x AAA battery pack.



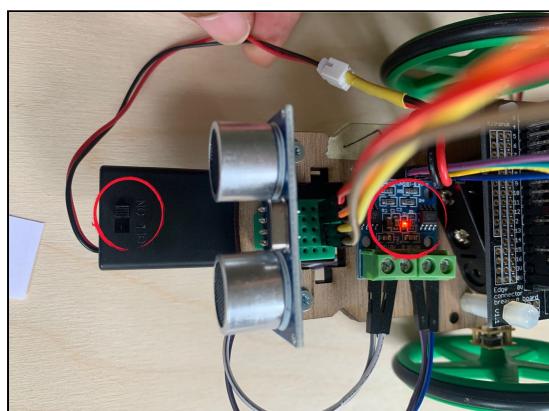
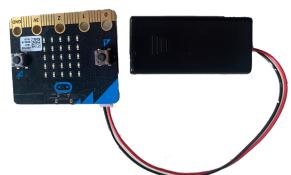
19. Turn the battery pack over and place it upside down in the space under the micro:bit.



20. To provide power to the motors you will also need to **switch ON** the other battery pack at the front of the robot.

A small red LED will light up on the motor driver board.

The first project uses 2 Micro:bits, so ensure that both are connected to a battery pack.



**After getting project 1 up & running, attempt the sonar sensor project!**