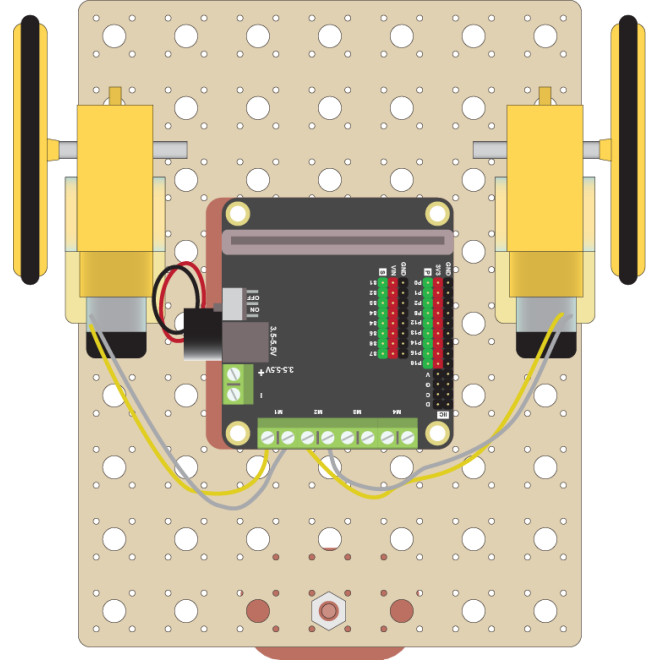
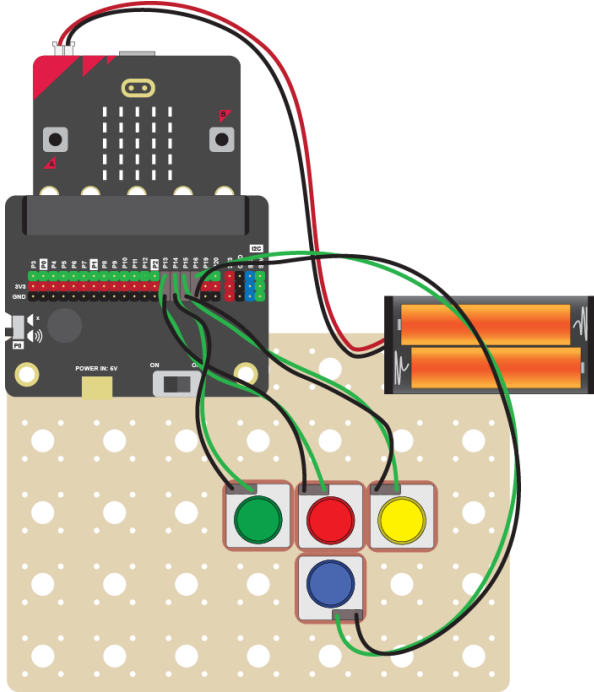


Build a Remote Control Robot

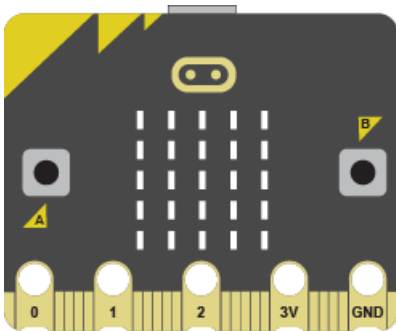
Project 1.04

In this workshop you will make a remote controller which can be used to control the robot you built in a previous workshop.



For the remote control you will need another Microbit. So you will have two microbits, one in the controller and one in the robot. We will use the radio feature of the Microbit to send messages from the controller to the robot:

Controller Microbit



Messages:

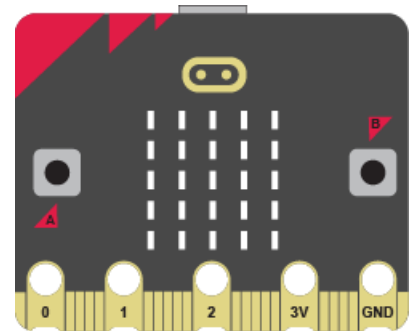
F for Forwards

L for Left

R for Right

B for Backwards

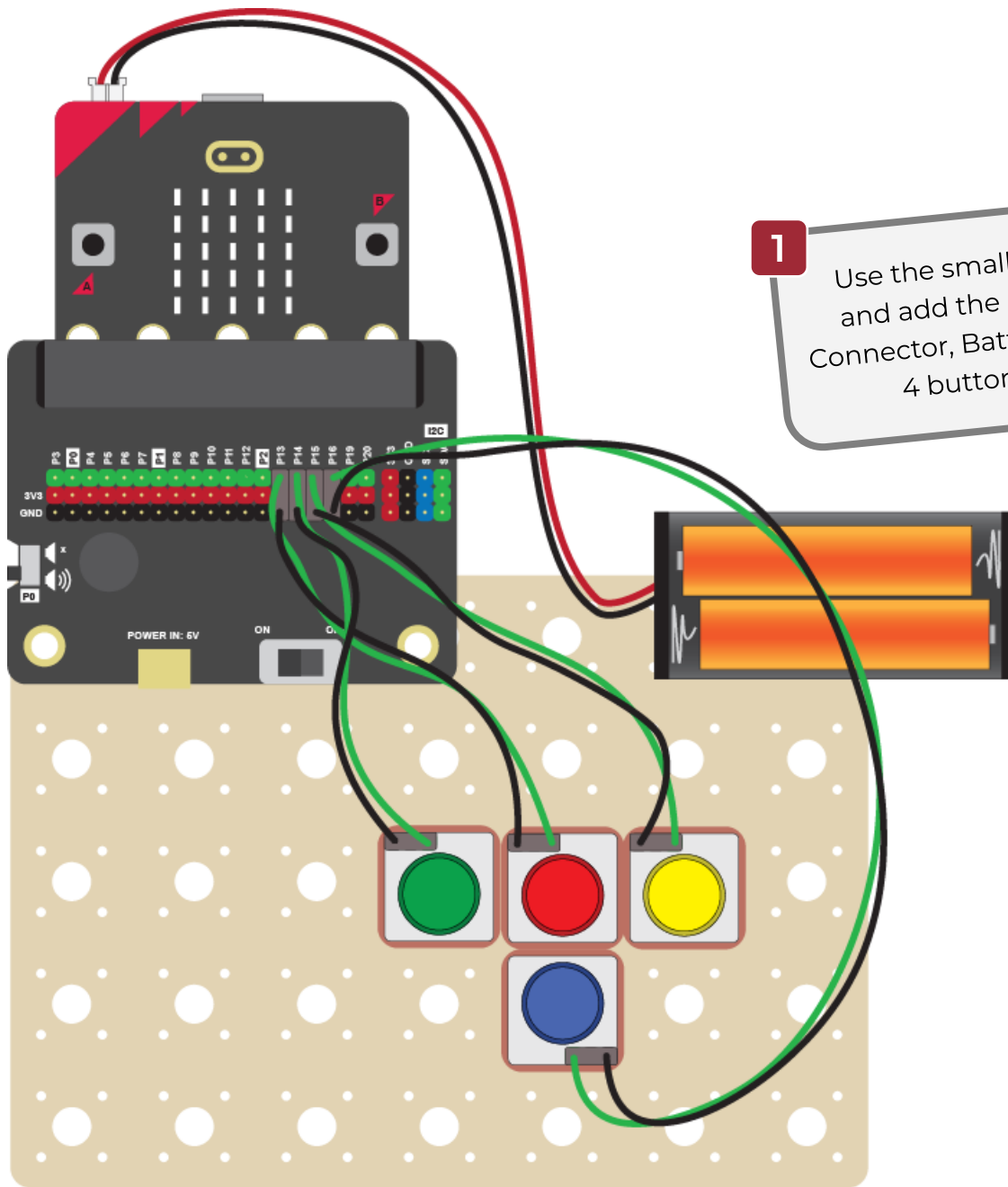
Robot Microbit



What to do

- If you haven't already done so, build the robot by referring to the previous worksheet (just build it, don't code it).
- Then follow this worksheet to remotely control the forward movement of your robot.
- Finally, attempt the coding challenge to get the left, right and backwards movements of your robot working.

Assemble the Controller



1 Use the small board and add the Edge Connector, Battery and 4 buttons

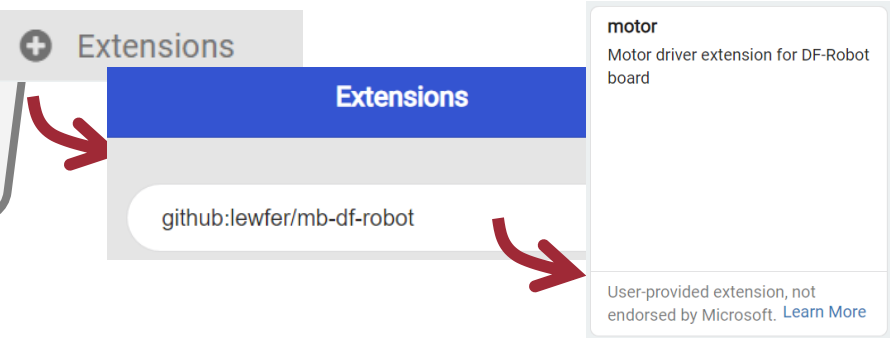
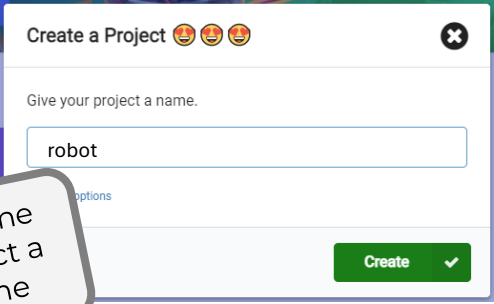
2 Wire up the buttons as follows using GS wires

Component	Microbit Connections	Purpose
Red button	P13	Forwards
Green button	P14	Left
Yellow button	P15	Right
Blue button	P16	Backwards

Build a Remote Control Robot: Code the Robot

Create a Project for the Robot

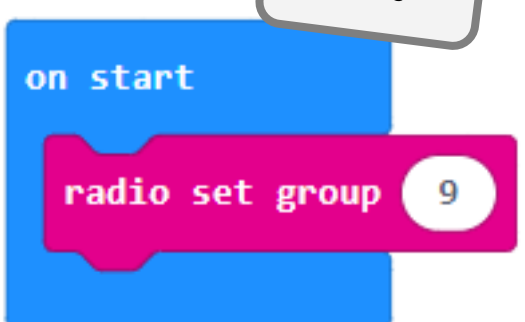
- 1 Go to the Makecode website <https://makecode.microbit.org/>
- 2 Click on New Project
- 3 Give the project a name
- 3 Add the motor driver extension



Set up the Radio Channel

Set up the radio channel (so your robot can receive messages to your controller).

- 1 Add this code



Change your radio channel number to the one used for your controller, so that the messages from your controller are received by your robot

Respond to the F Message

Now get your controller to receive the “F” message from the controller and move forwards.

1 Add this

```
on radio received receivedString
  if receivedString = "F" then
    Motor M1 direction Forward speed 50
    Motor M2 direction Forward speed 50
  else
    Motor Stop All
```

This block is only run when your robot receives a message from the controller

This block checks if the message received was an “F”

Move the robot forwards

If any other message is received, stop the robot

2 Download the code to the robot Microbit

Download

Your challenge!

The code you have on your robot allows you to only control the forward movement of the robot. That’s not very useful!

Can you get other movements working: left, right and backwards?

Hint: The controller will send different messages, such as “L”, “R” and “B” for left, right and backwards. The robot must then respond with the correct movement.

Build a Remote Control Robot: Solution

Robot

Make sure the robot channel number matches the controller channel number

You need to respond to each message and move the robot accordingly

The controller sent an F so move Forwards

The controller sent an L so move Left

The controller sent an R so move Right

The controller sent a B so move Backwards

The controller sent some other command such as S, so stop

```
on start
  radio set group 9

on radio received receivedString
  if receivedString = "F" then
    Motor M1 direction Forward speed 50
    Motor M2 direction Forward speed 50
  else if receivedString = "L" then
    Motor M1 direction Forward speed 0
    Motor M2 direction Forward speed 50
  else if receivedString = "R" then
    Motor M1 direction Forward speed 50
    Motor M2 direction Forward speed 0
  else if receivedString = "B" then
    Motor M1 direction Reverse speed 50
    Motor M2 direction Reverse speed 50
  else
    Motor Stop All
```