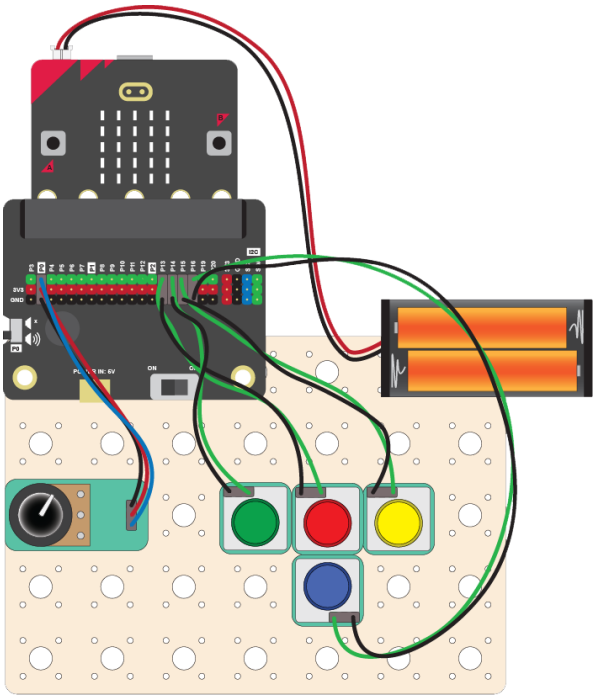
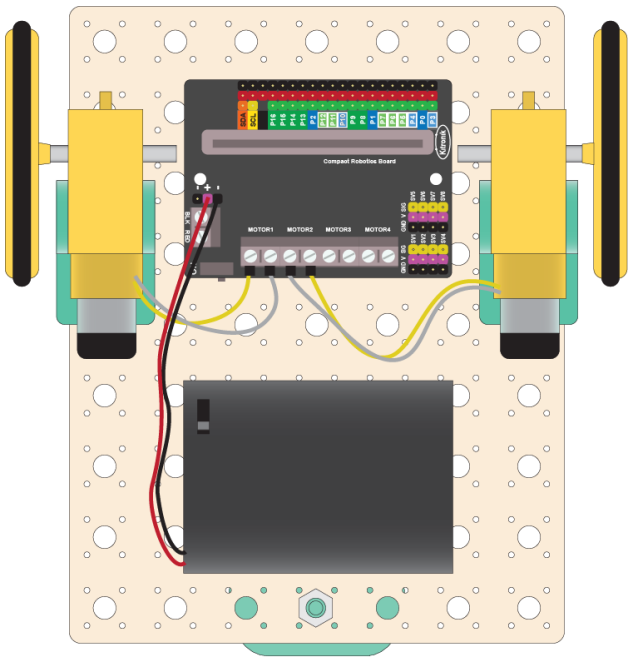
Add a Speed Control to your Remote

Project 1.05

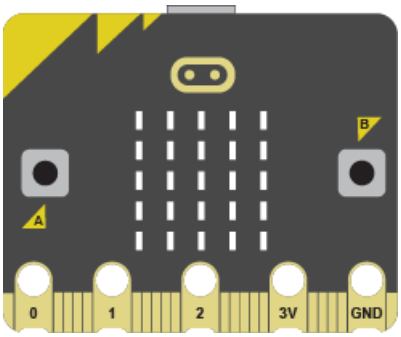
In this workshop you will add a speed control to your remote controller.





For the speed control you will add a **potentiometer** to the remote control. This is an **analogue input device**. By turning the knob, you can get different values from 0 to 100 which can be used to set the speed. When we read the value from the potentiometer on the controller, we need to send the value across to the robot, so it can adjust its speed:

Controller Microbit



Messages:

F for Forwards

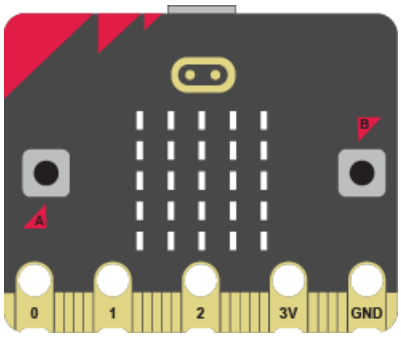
L for Left

R for Right

B for Backwards

speed=value

Robot Microbit

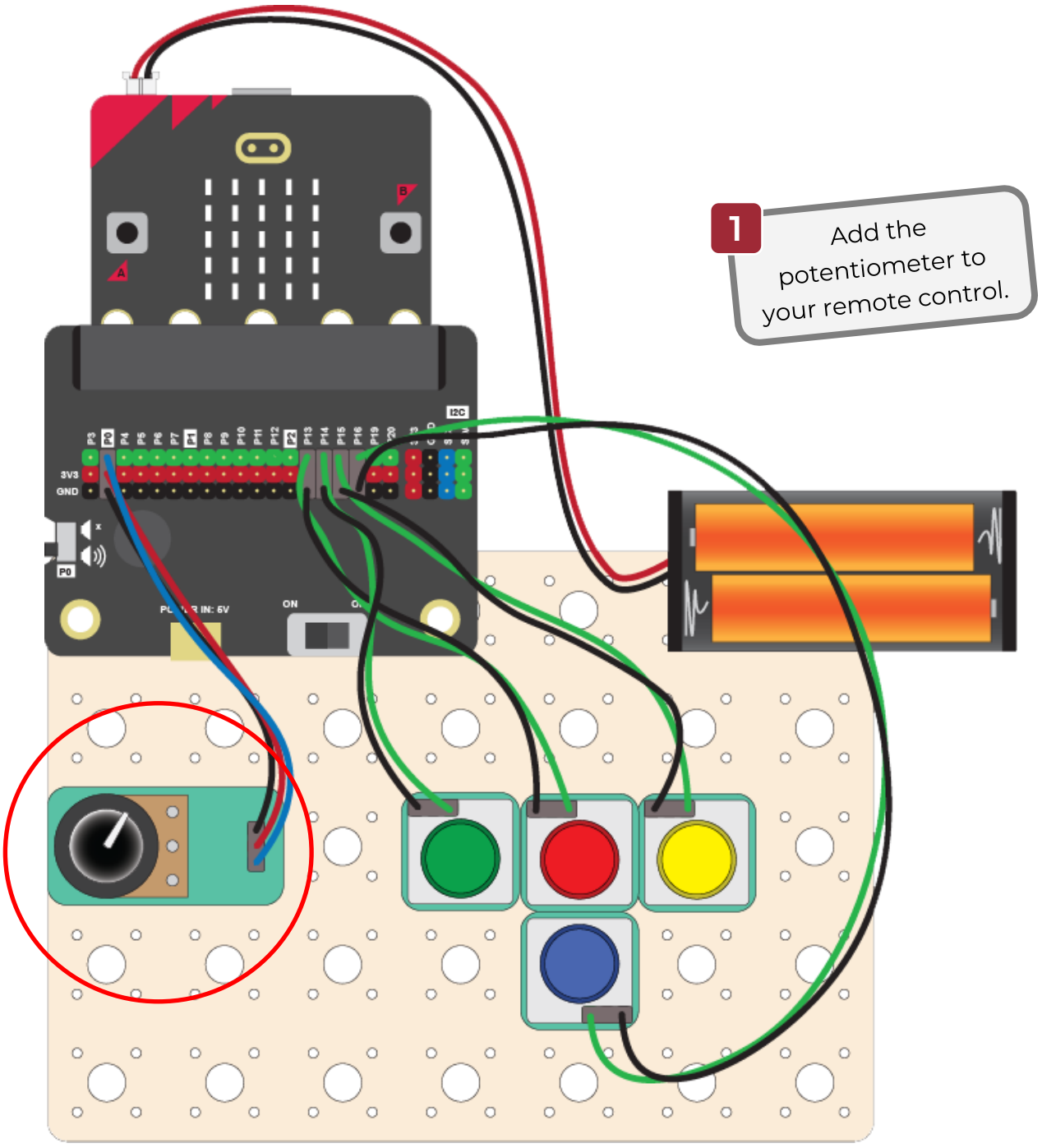


What to do

- If you haven't already done so, build the robot and remote control by referring to the previous worksheets.
- Then follow this worksheet to use the potentiometer to control the speed of your robot's forward movement.
- Finally, attempt the coding challenge to adjust the speed of the turning and reversing

Assemble the Speed Control

Add the Potentiometer



2 Wire up the potentiometer as follows using a GVS wire

Component	Microbit Connections	Purpose
Potentiometer	P0	Speed control

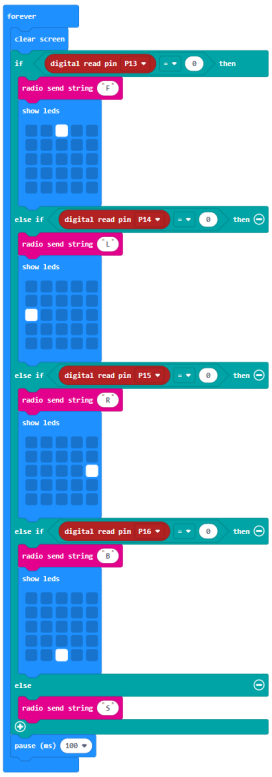
Code the Controller

Find your Controller Code

Refer back to the worksheet **Add a Remote Control for your Robot.**

This should have given you code that looks like this —>

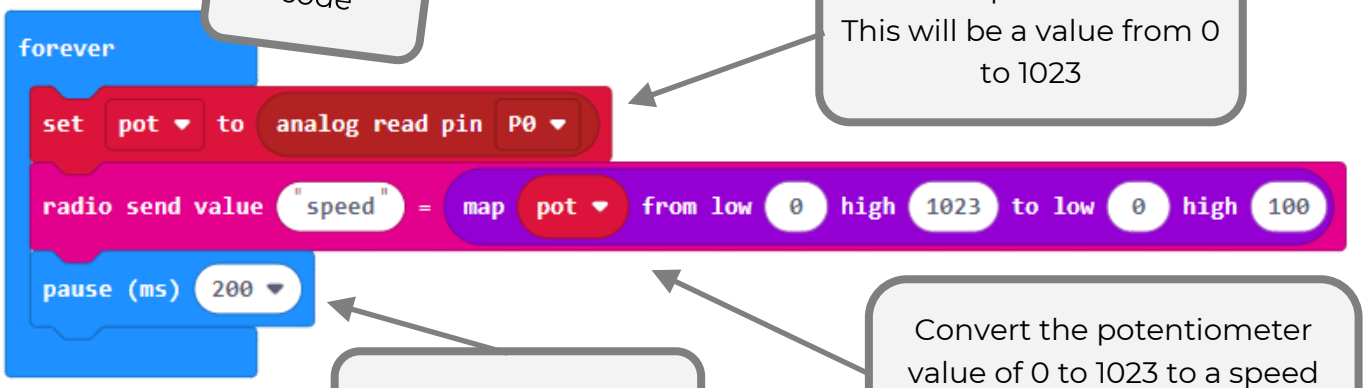
In the **on start** block it sets up the radio channel and the 4 buttons. Then in the **forever** block it sends messages to the robot when each button is pressed.



Send the Speed to the Robot

Now get your controller to send the speed according to the setting of the potentiometer.

1 Add this code

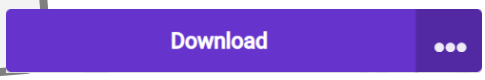


Read the potentiometer. This will be a value from 0 to 1023

Convert the potentiometer value of 0 to 1023 to a speed value of 0 to 100. Then send the speed to the robot

Wait a bit so we don't send too many values

2 Download the code to the controller Microbit



Code the Robot 1

Find your Robot Code

Refer back to the worksheet **Add a Remote Control for your Robot.**

This should have given you code that looks like this —>

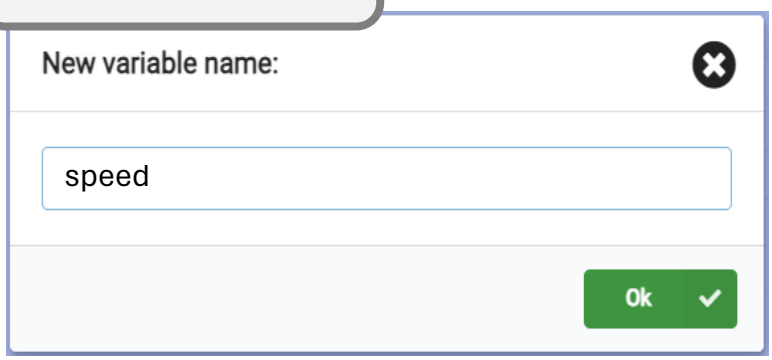
In the **on start** block it sets up the radio channel. Then in the **forever** block it responds to messages from the controller to control the robot's movements.

Set up a Speed Variable

The speed of the robot will vary according to the speed value sent from the controller. When we receive the speed message, we need to store the speed value so that we can use it to drive the robot speed.

1 Locate the variables block and click on Make a Variable

2 Create a variable called **speed**

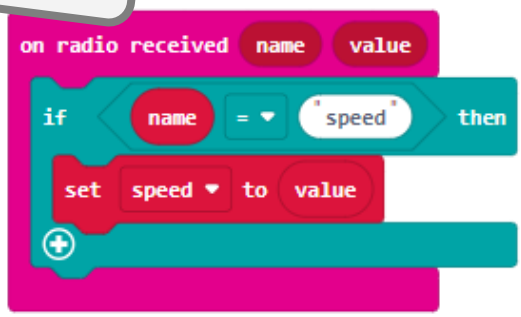


Code the Robot 2

Receive and Respond to the Speed Message

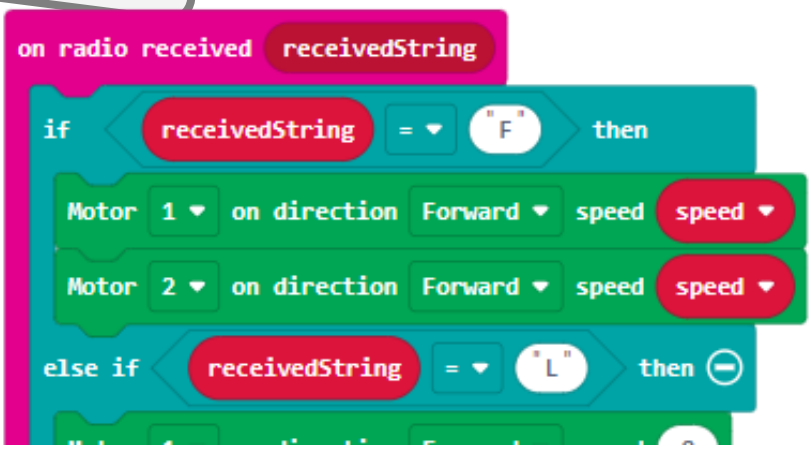
At the moment the robot's movements are a fixed speed. We need to receive the speed message from the controller and store it in speed variable. We can then use this variable to instead of the fixed speeds.

1 Add this code



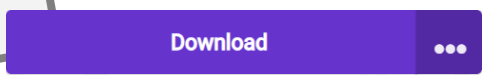
When we get a speed message, save the value in the speed variable

2 Change this code



Change the fixed speeds to the speed variable

3 Download the code to the robot Microbit



Challenges

Your challenge!

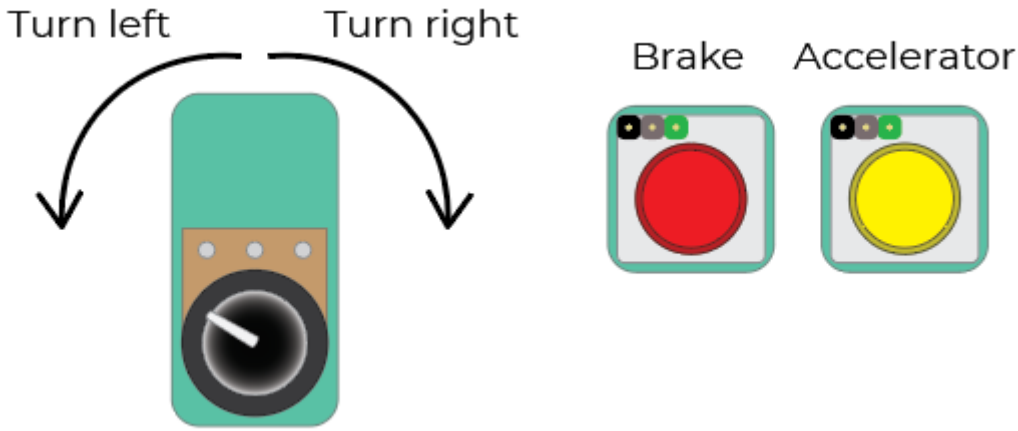
You should be able to control the speed of the forward movement of the robot.

Can you now control the speed of the left, right and backwards movements of the robot?

Super challenge!

Your remote control now uses the potentiometer to control the speed and the buttons to control the direction. But a real car uses a steering wheel to control direction and pedals to control speed.

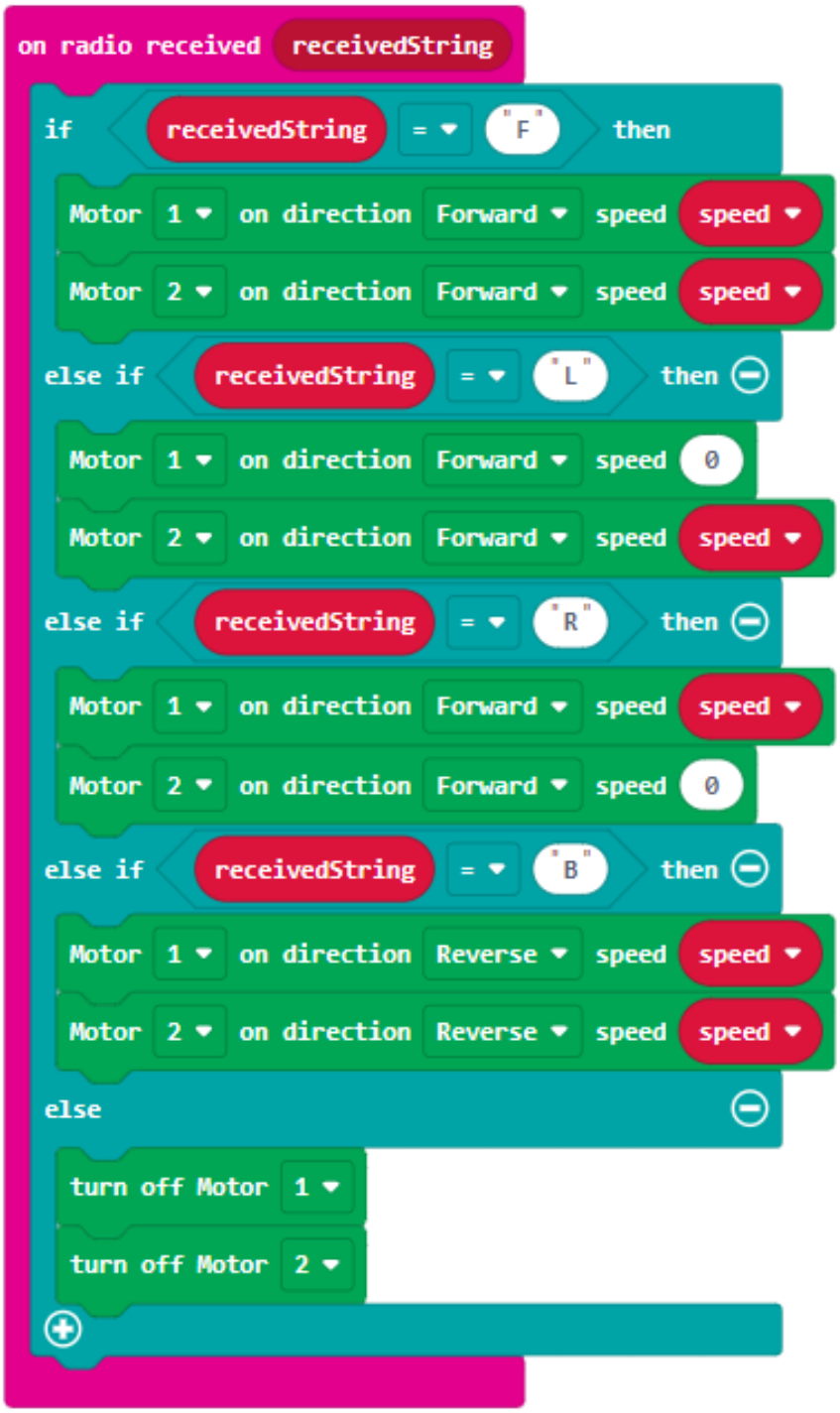
Can you make a new project that uses the potentiometer as a steering wheel and two buttons, one for accereration and one for braking?



Solution 1

Robot

All the changes can be done on the robot code. You can use the same speed variable to adjust the motor speeds for the different movement directions.



Solution 2

Super challenge solution

Coming soon!