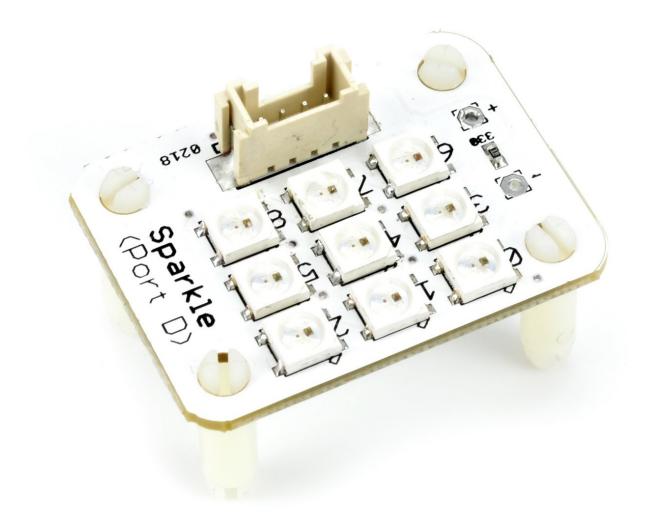


C - Sparkle Feedback

You may have found that when testing your robot, it was sometimes difficult to know what was going wrong as there was no feedback about the sensors!



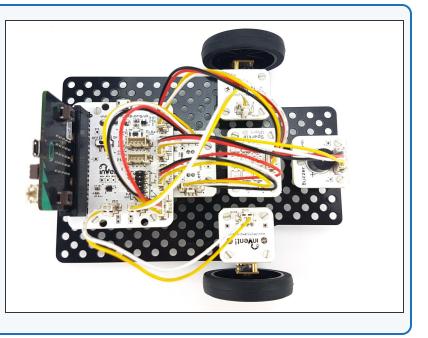
INTRODUCTION

You may have found that when testing your robot, it was sometimes difficult to know what was going wrong as there was no feedback about the sensors! Let's use the sparkles to add some feedback and make it easier to see what is going on.

Step 1

Assemble Your Robot

- Let's add some more modules to allow our robot to give **feedback** about the line it is following.
- Add the Line sensor underneath as before then add Sparkle and buzzer modules to your robot like in the picture.
- It can be quite hard to see the wiring with so many things plugged in! The motors and line sensor should be the same as before (M1, M2 and P0, P1)
- Plug the **buzzer** into P2, and the Sparkles into **P8**.



Step 2

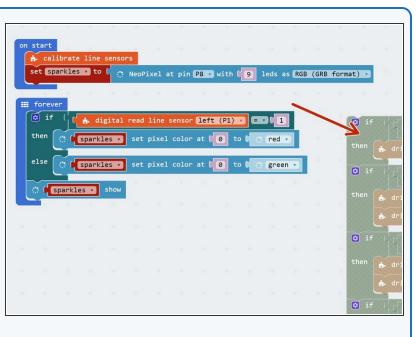
Two Sensor Program

- Load up your **two sensor line follower program** from the last lesson.
- It should look something like our example in the picture.

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Left Sensor

- Let's use the **outer front** two Sparkles (**0** and **2**) to show the state of the two **infrared sensors**.
- If the **left** sensor is on the line (**0**), turn the **left** Sparkle **green**.
- If the **left** sensor is off the line (1), turn the **left** sparkle **red**.
- Drag your main program to the side for now don't delete it!
- Write the simple code in the picture test it on the track by moving the robot side to side across the line.
- You will need to install the Neopixel package and setup the Sparkles - if you can't remember how, have a look at the <u>Sparkles Guide</u> (<u>https://courses.techcamp.org.uk/Guide/A+-+Starting+Lights/187)</u>.

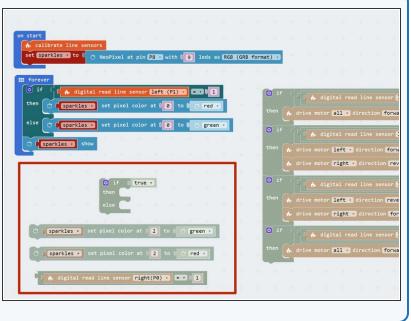


Step 4

Step 3

Right Sensor

- Let's use the right Sparkle (Sparkle 2) to do the same thing for the right hand sensor.
- Add some blocks to set the right Sparkle in the same way as the left one, but using the right sensor.
- There are some hint blocks if you need them!
- Don't forget to test it properly.



Centre

Step 5

- Let's add some more blocks so the middle Sparkle (Sparkle 1) is green when both sensors are on the line.
- This is when both the left sensor and right sensor are
 0!
- Add a third IF/ELSE block that checks if both the left and right sensors are 0, and sets the middle Sparkle green if they are.
- There are some hint blocks if you need them!
- Don't forget, the **AND** block is in the **logic menu**.

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Step 6

Make it Better

- You may have thought the last program didn't look quite right - as the robot moved over the line, two Sparkles changed at once!
- It would be more sensible for the program to set just the middle Sparkle green when both sensors are on the line, instead of all three.
- We need to change the code to do this, to set the colours of **all three Sparkles** for each **combination** of sensor states.
- In the picture is the structure you will need 3 IF
 blocks for checking if the robot is to the left, right or on the centre of the line.
- Add blocks to the bottom two IF blocks to set the Sparkles properly, like in the top IF block we have done already.

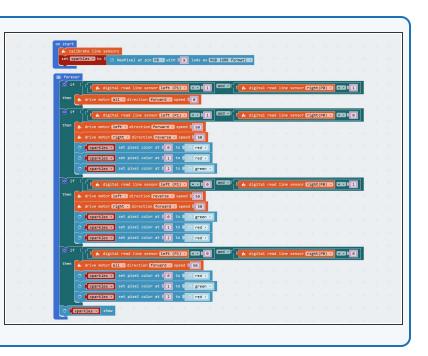
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Combine the Code

Step 7

Step 8

- You may have noticed that our Sparkle code and line following code have some very similar IF blocks.
- Move the Sparkle blocks into the matching IF blocks in the main program, to merge your line follower and Sparkle programs together.
- You should end up with something like the picture a combination of the Sparkle and Line following code.
- Test it properly on the track!



Red Lights for Stop



• What about when the robot comes off the line completely?

• Add some more Sparkle blocks to the first **IF block** to turn all the Sparkles **red** if the robot is **off the line**.

SOS - I'm Lost!

Step 9

- Our robot should probably make more of a fuss if it **gets lost completely** and doesn't know where the line is.
- Add some blocks to make the buzzer beep SOS if the robot goes off the line.
- You can look back at the <u>Morse Code lesson</u> (<u>https://courses.techcamp.org.uk/Guide/B+-+Save+our+Robot!/180</u>) if you can't remember how to do this!

Extension Challenge