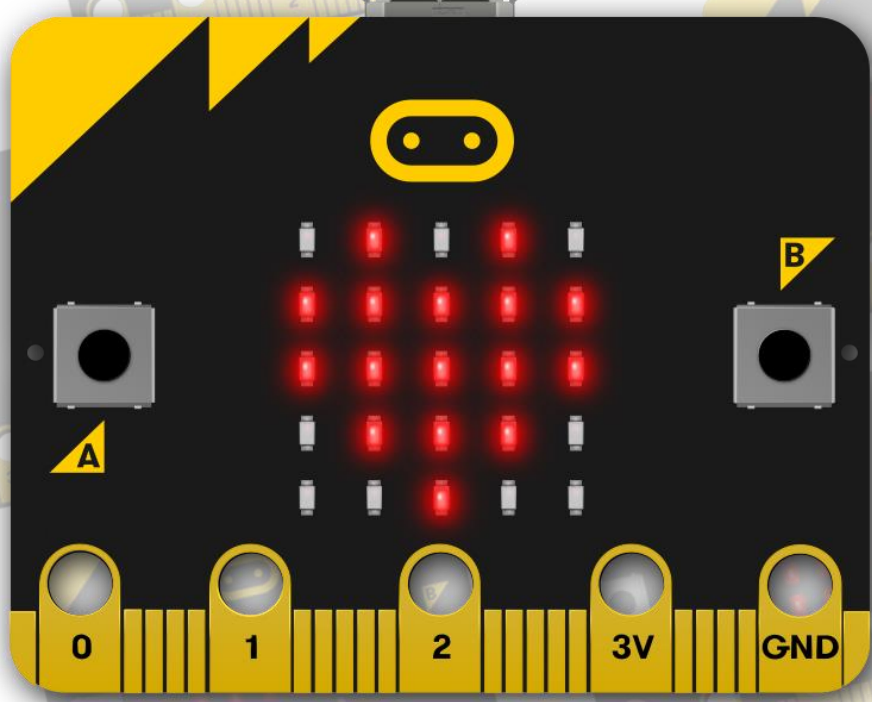


INTERNET CONNECTION
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Controlling Neopixels

MICRO:BIT EDUBLOCKS EDITOR



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EduBlocks.org
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micro:bit: Controlling Neopixels

Written
By: Joshua Lowe

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Objective

We are going to control a set of neopixels (WS2812b LEDs) with the micro:bit to make them flash 3 different colours. You will also learn how to use the micro:bit Edge Connector.

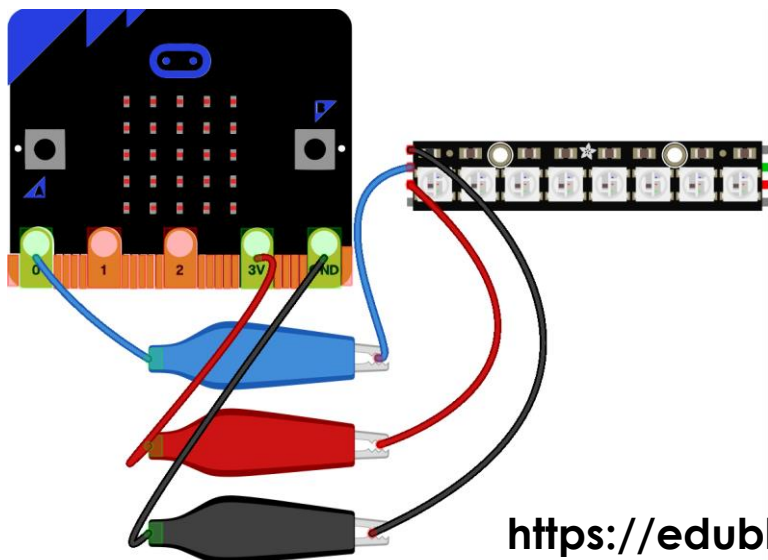
Get Started

Start by going to a web browser of your choice and heading to this website:

<https://microbit.edublocks.org>

Circuit Build

To start off, we need to wire up our neopixels. You can easily pick neopixels up online, we reccommed to only use a maximum of 8 with the micro:bit. Follow the wiring below:



You will need:

Strip of 8 neopixels
3 Crocodile Clips
3 M/F Jumper wires

<https://edublocks.org>

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Let's Code

Now its time to build our code. We can drag our code blocks from the EduBlocks toolbar which is on the left hand side of the screen. Our first 3 blocks of code can be found in the Basic and neopixel tabs. They are colour co-ordinated. Pink blocks in Basic, and green in Neopixel. Drag the blocks into the workspace as shown in the diagram below.

```
from microbit import *  
import neopixel  
np = neopixel.NeoPixel( pin0, 8 )
```

In this section of code we are importing the micro:bit and neopixel libraries and then telling the micro:bit there are 8 neopixels on Pin 0.

Our next set of blocks can be found inside 2 sections. The pink ones in Basic and the green ones in Neopixel. This first section will turn all 8 pixels to **Red**.

```
while True:  
    for r in range( 8 ):  
        np [ r ] = ( 255, 0, 0 )  
        np .show()  
    sleep( 500 )
```

In this section of code, we are creating a loop to run the code forever. Then we are creating a loop that will turn all neopixels to **red** for half a second. The np.show() block will display the set colour on the LEDs.

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Let's Code

So, you have completed the code to turn the pixels **red**. Now to turn them **green**, as before pink blocks in Basic and green in Neopixel, this section goes underneath the last section inside the While True loop.

```
for g in range( 8 ):
    np [ g ] = ( 0, 255, 0 )
    np .show()
sleep( 500 )
```

In this section of code we are turning the neopixels green. The FOR G IN RANGE(8) statement will make sure all neopixels are turned to green.

Now onto our final section of code, where we will turn the neopixels the blue. This section will complete our program. Again, this section is connecting under the last section we did inside the While True loop.

```
for b in range( 8 ):
    np [ b ] = ( 0, 0, 255 )
    np .show()
sleep( 500 )
```

In this section of code, we shall turn all the neopixels to blue, the final colour in the sequence.

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Save your code

Your program should look like the one below

```
from microbit import *
import neopixel
np = neopixel.NeoPixel( pin0, 8 )
while True:
    for r in range( 8 ):
        np [ r ] = ( 255, 0, 0 )
        np .show()
    sleep( 500 )
    for g in range( 8 ):
        np [ g ] = ( 0, 255, 0 )
        np .show()
    sleep( 500 )
    for b in range( 8 ):
        np [ b ] = ( 0, 0, 255 )
        np .show()
    sleep( 500 )
```

Plug in your micro:bit to a USB port. To download our code onto the microbit. Click the **DOWNLOAD HEX** button in the navigation bar at the top.



Download Hex

The file will now download to your PC. On Google Chrome, it will show at the bottom. Click on the up arrow on the grey file at the bottom and select Show in folder. Drag the highlighted file onto the micro:bit on the left hand side. For a guide on how to do this check:

uploadmymicrobit.edublocks.org

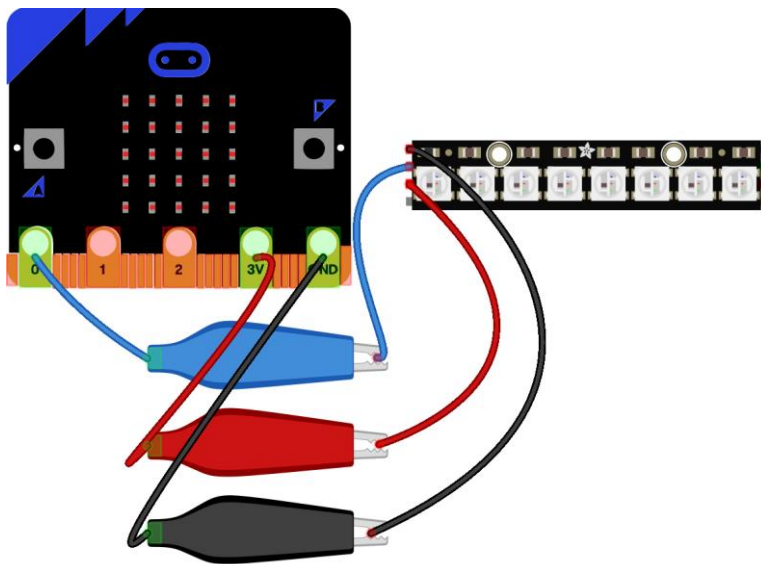
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Run your code

Now it's time to run our code. Once the file has been dragged onto the micro:bit and the orange light on the back has finished blinking, you should now be able to interact with your micro:bit. You should see the neopixels turn Red, then Green and then blue. If your neopixels don't work, check your wiring.



Outcomes

In this tutorial we have learnt how to control neopixel LEDs with the micro:bit.

Challenge: Can you make the neopixels flash different colours. Numbers like “255, 0, 0” can be changed to make different colours. Experiment by changing these 3 numbers in the different sections and see what happens.