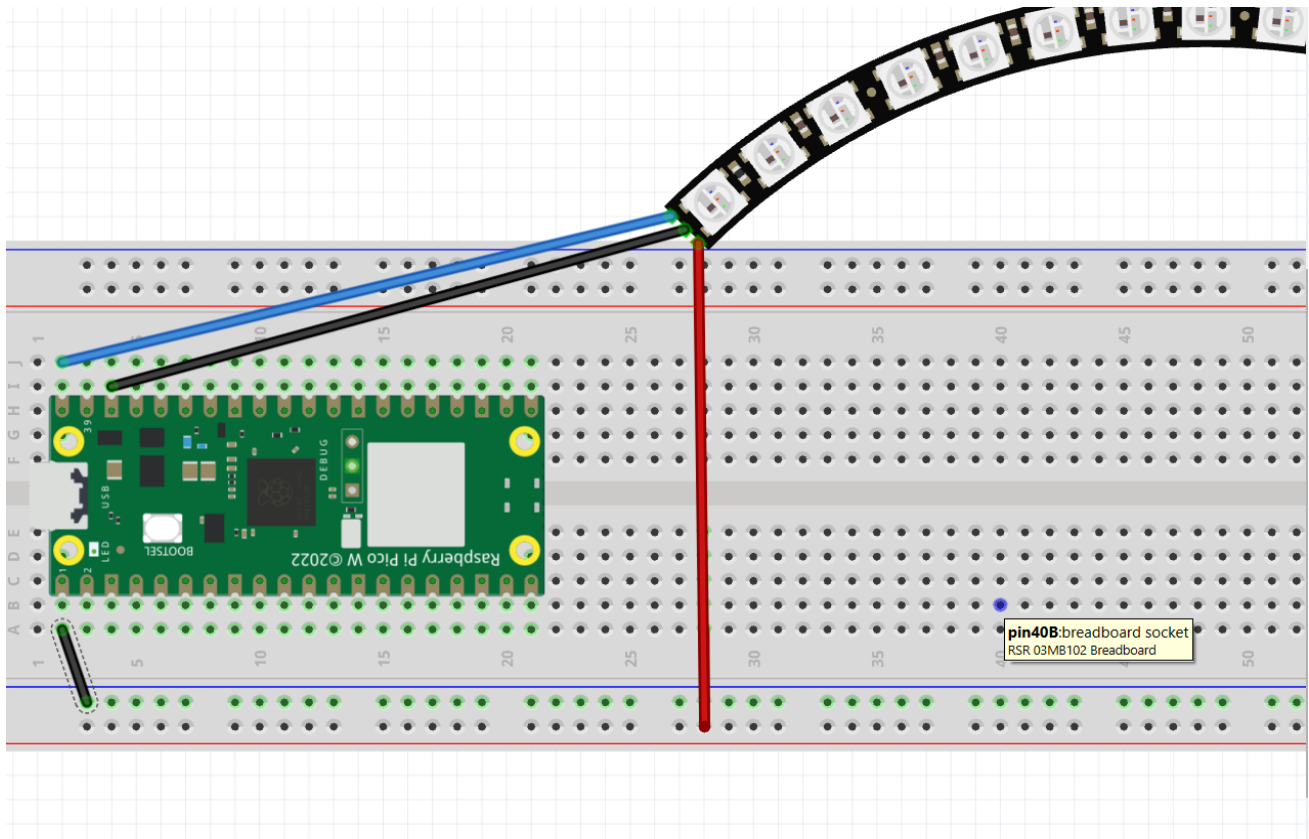


LESSON 8

Change All NeoPixel LEDs to Different Colours

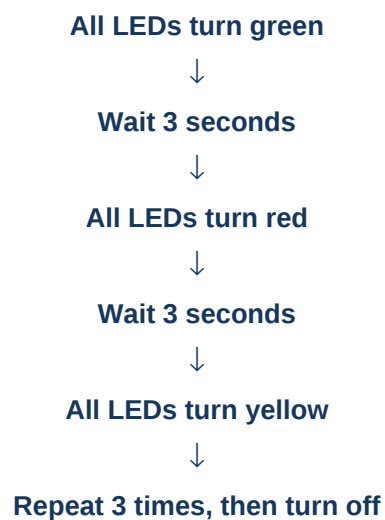
Raspberry Pi Pico W - Student Guide



Lesson Objective

Learn how to change all 8 NeoPixel LEDs to green, red and yellow, and repeat the colour sequence three times.

How the program works



Pin Numbers and Connections

Use the following connections for the NeoPixel strip.

NeoPixel Wire	Pico Connection	Physical Pin	Purpose
Data In (DIN)	GP0	Pin 1	Sends colour data to the strip
Power	VBUS	Pin 40	Provides 5 V power while Pico W is powered by USB
Ground	GND	Pin 3, 8, 13, 18, 23, 28, 33, or 38	Completes the circuit

Connection Steps

1. Connect NeoPixel DIN to GP0 (Pin 1).
2. Connect the power wire to VBUS (Pin 40).
3. Connect the ground wire to any GND pin.
4. Make sure the data wire is connected to the DIN end of the strip.

Python Code

File name: lesson8.py

```
import neopixel
from machine import Pin
from time import sleep

number_leds = 8
GPIO_0 = 0

np = neopixel.NeoPixel(Pin(0), number_leds)

cycles = 1

while cycles < 3:
    np.fill((0, 10, 0))
    np.write()
    sleep(3)

    np.fill((10, 0, 0))
    np.write()
    sleep(3)

    np.fill((10, 10, 0))
    np.write()
    sleep(3)
    cycles += 1

np.fill((0, 0, 0))
np.write()
```

Understanding the Code

Code	Meaning
number_leds = 8	The strip has 8 NeoPixel LEDs.
np = neopixel.NeoPixel(Pin(0), number_leds)	Creates the NeoPixel strip using GP0.
while cycles < 3:	Repeats the colour sequence three times.
np.fill(...)	Sets every LED on the strip to the same colour.
np.write()	Sends the colour to the NeoPixel strip.
sleep(3)	Keeps the colour on for 3 seconds.
cycles += 1	Adds 1 to the cycle counter.
np.fill((0, 0, 0))	Turns all LEDs off after the sequence finishes.

Colour Sequence

Green for 3 seconds -> Red for 3 seconds -> Yellow for 3 seconds -> repeat three times -> all LEDs off

Key Learning Point

The **fill()** command changes every LED on the NeoPixel strip to the same colour. The **cycles** variable controls how many times the sequence repeats.