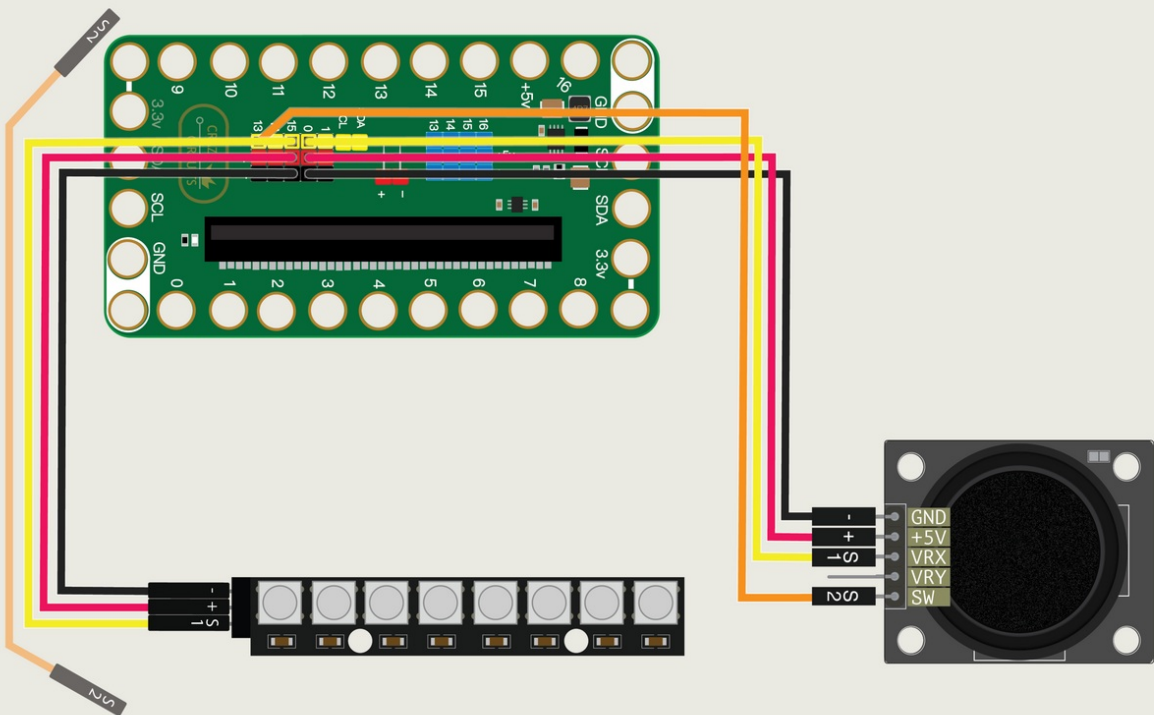




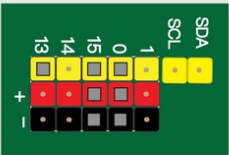
CH42-E - Thumbstick NeoPixel Random

Connect a Thumbstick to a Bit Board and control a NeoPixel Strip.

Written By: Pete Prodoehl



TSTK	Bit Board
GND	-> - (Negative) Pin
+5V	-> + (Positive) Pin
VRX	-> PIN 0 (S1)
VRY	-> (not used)
SW	-> PIN 13 (S2)



NEOP	Bit Board
GND	-> - (Negative) Pin
VCC	-> + (Positive) Pin
IN	-> PIN 15 (S1)

INTRODUCTION

Connect a Thumbstick to a Bit Board and control a NeoPixel Strip.

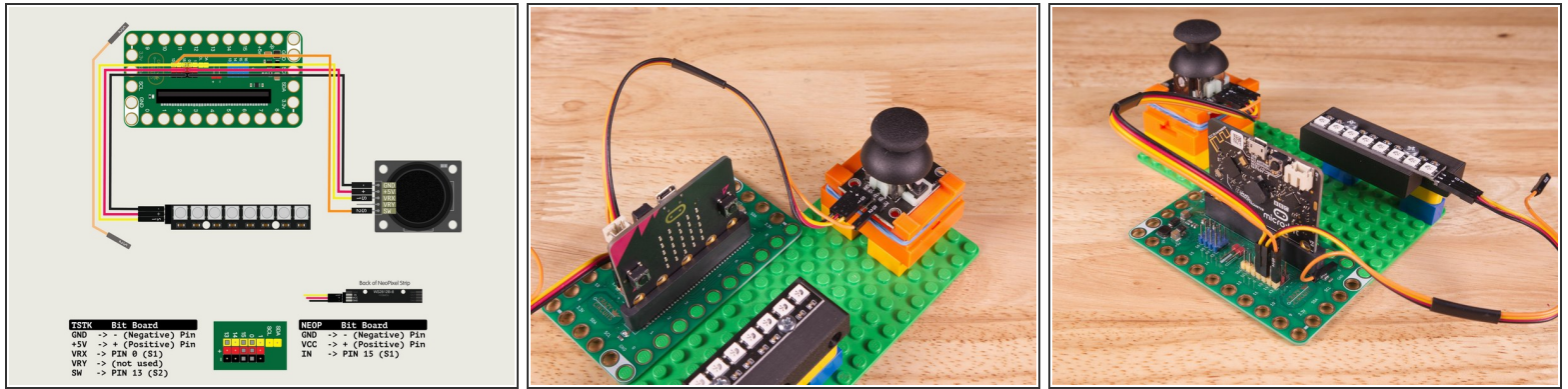
 TOOLS:

- [Computer](#) (1)

 PARTS:

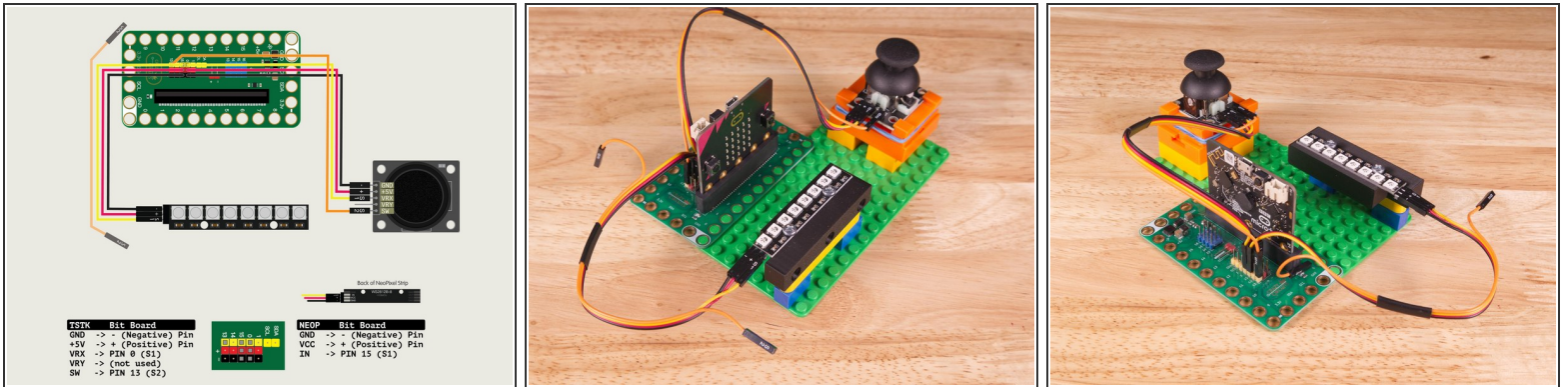
- [Crazy Circuits Bit Board](#) (1)
- [micro:bit](#) (1)
- [Crazy Circuits Ribbon Cable](#) (2)
- [Thumbstick](#) (1)
- [Addressable RGB LED Strip](#) (1)

Step 1 — Connect the Thumbstick



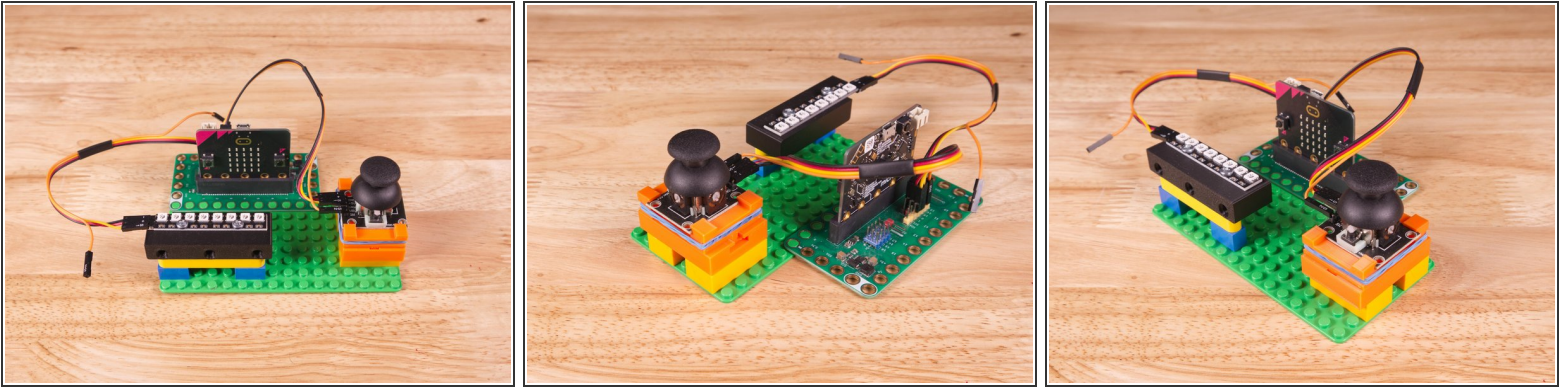
- We'll connect the **Thumbstick** with a **Crazy Circuits Ribbon Cable** using all four wires.
 - Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 0** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow pin.
 - Next, plug **S2** (orange) into **Pin 13**. (*S2 is separated from the three-wire connector to allow you to plug it into another row.*)
 - To the Thumbstick plug - (black) into **GND**, + (red) into **+5V**; **S1** (yellow) into **VRx**; **S2** (orange) into **SW**.
- ☑ We won't plug anything into **VRy** pin for this example.

Step 2 — Connect the NeoPixel Strip



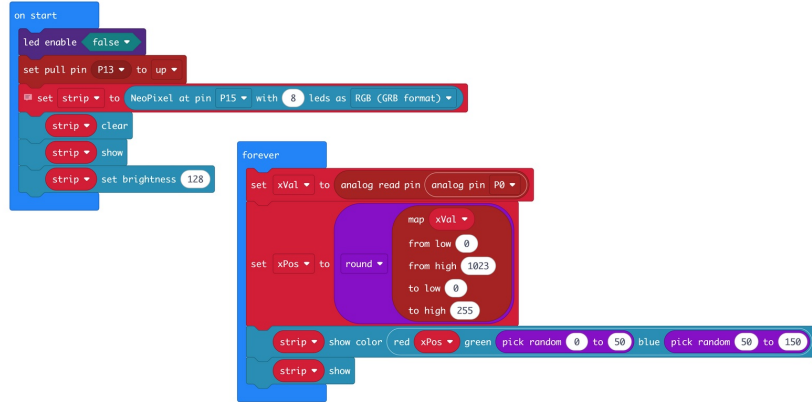
- The magical thing about these “Individually Addressable” LEDs is that you don’t have to connect each LED to an individual pin on your micro:bit, you just need **one signal wire** along with power (**Positive** and **Negative**) to light things up.
- So let's get connected! If you turn the **NeoPixel Strip** over you'll see labels for the three pins. You should see **IN**, **VCC**, and **GND**.
- Use the [Crazy Circuits Ribbon Cable](#) to connect the **NeoPixel Strip** to the **Bit Board**.
- The end with **S1**, **+**, and **-** can plug directly into the **Pin 15** row (make sure S1 goes into 15) and the other end should plug into the **NeoPixel Strip** as shown.
- We only need three wires for the **NeoPixel Strip** so you can leave **S2** (the Orange wire) unconnected.

Step 3 — Mounting the Thumbstick and NeoPixel Strip



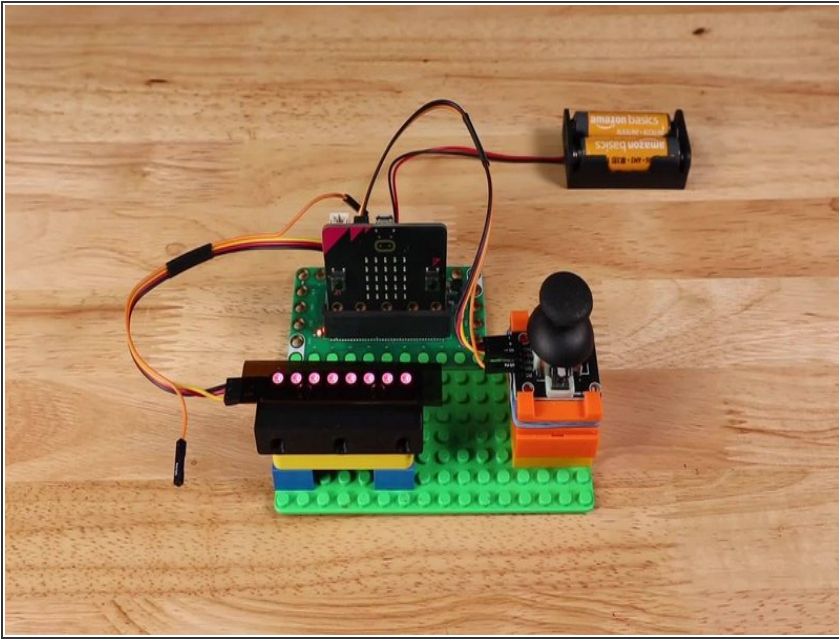
- We used a 3D printed part we designed to hold the Thumbstick in place on a LEGO baseplate.
- We attached two 2x4 LEGO Bricks to the bottom of the 3D printed holder to allow it to snap onto the LEGO Baseplate a bit easier.
- Alternately you can try to use some LEGO bricks and some rubber bands to hold the sensor in place, or just hold it in your hand.
- You can always 3D print your own [Thumbstick Sensor Holder](#) if you need one.
- Our NeoPixel Strips come pre-attached to our [Rover NeoPixel Beam Holder](#), so a few Technic pins, a Technic beam, and some LEGO bricks are all that is needed.

Step 4 — Load the Code



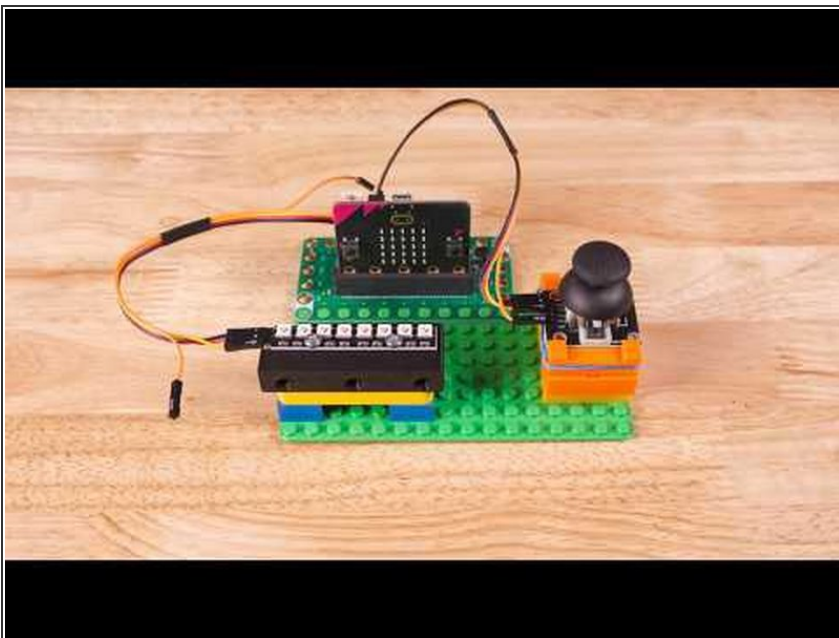
- If you've never used a micro:bit before you'll want to check out this guide: [Bit Board V2 Setup and Use](#)
- We're going to load the following code for our **Thumbstick NeoPixel Random** program: https://makecode.microbit.org/_UDL2PhK72...
- In the on start block we'll disable the LED matrix and set **Pin 13** to **pull up**. (In previous chapters we've used **Pin 13** to read the button on the Thumbstick but for this example we're going to ignore it.)
- We'll also set up our NeoPixel Strip connected to **Pin 15** with **8** LEDs. (Remember that even though we have 8 LEDs they are addressed as **0 through 7**.) We also call strip clear, strip show, and then set brightness when we get started.
- In the forever loop we'll read the thumbstick and store the value in **xVal**, then map that value on a scale from **0 to 255** and assign it to **xPos**.
- We then use show color and assign **xPos** to **red**, while we use pick random to continually change the values for **green** and **blue**.

Step 5 — Test it Out!



- Once the code is loaded it should start running immediately.
- ① You can power the micro:bit via the USB cable you used to load the code or you can use a battery pack plugged into the Bit Board.
- The NeoPixels will be flickering right away. Move the Thumbstick left and right you'll see the color change as the amount of red (compared to green and blue) varies.

Step 6 — Follow Along



- Follow along with our recorded Live Stream!
- ① You can watch the full video of us walking through this project, along with explaining and exploring the code:
<https://www.youtube.com/live/-m3Rf60AoIA>