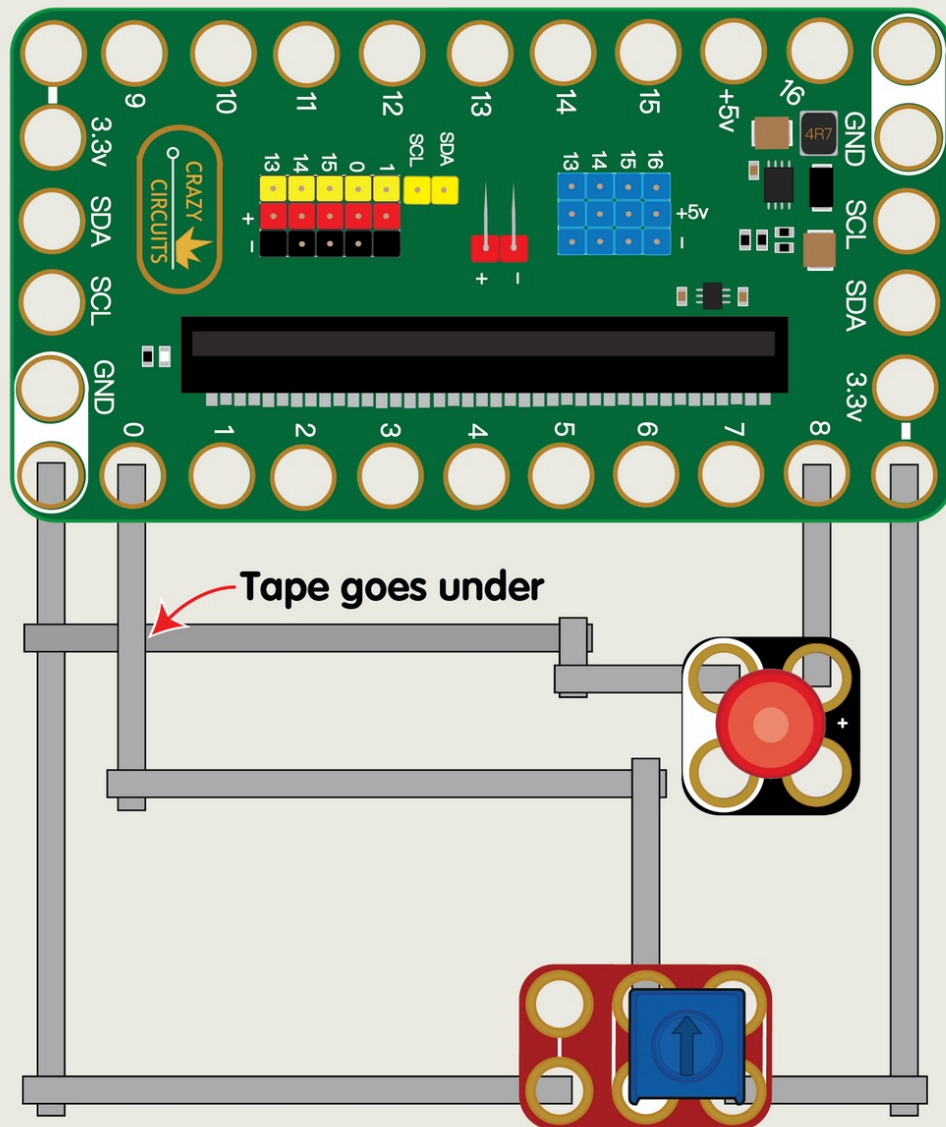




CH12-A - Potentiometer LED Bright

Connect a potentiometer to a Bit Board and control an LED.

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INTRODUCTION

Connect a potentiometer to a Bit Board and control an LED.

We'll explore how we can use a potentiometer as an input for the micro:bit and control the output of an LED.



TOOLS:

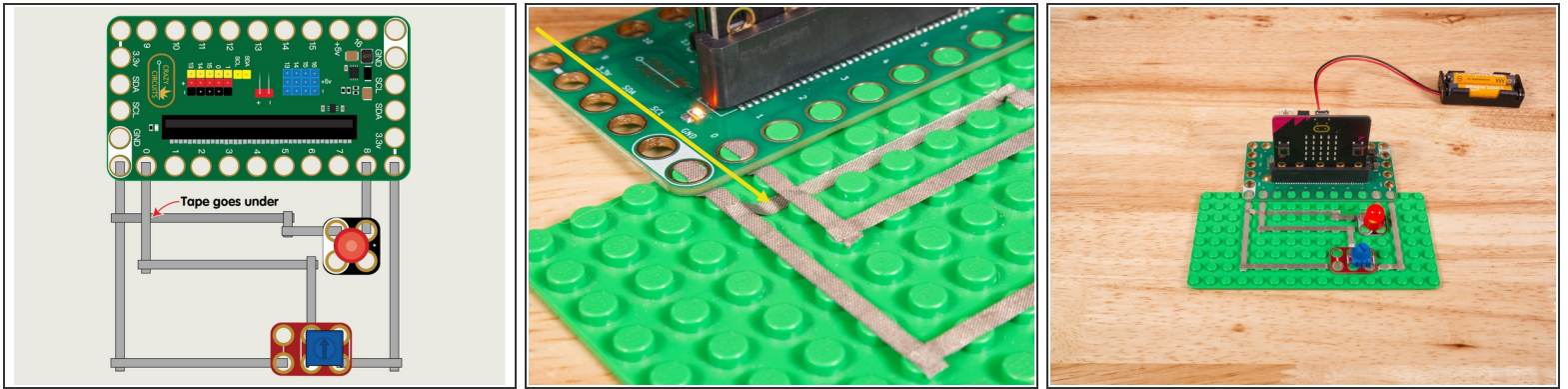
- [Computer](#) (1)
- [Scissors](#) (1)



PARTS:

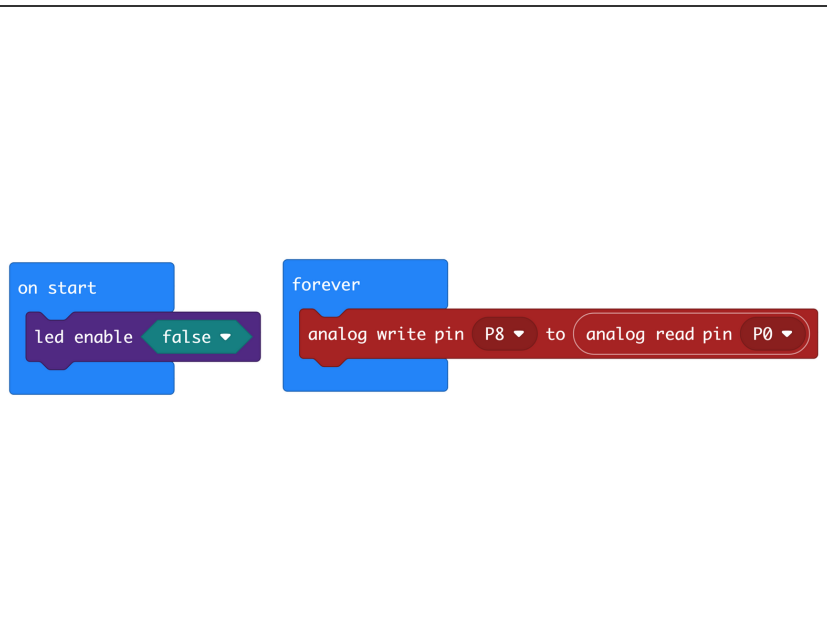
- [Crazy Circuits Bit Board](#) (1)
- [micro:bit](#) (1)
- [Maker Tape](#) (1)
1/8" Wide
- [Crazy Circuits Potentiometer Chip](#) (1)
- [Crazy Circuits LED Chip](#) (1)

Step 1 — Connect the Potentiometer



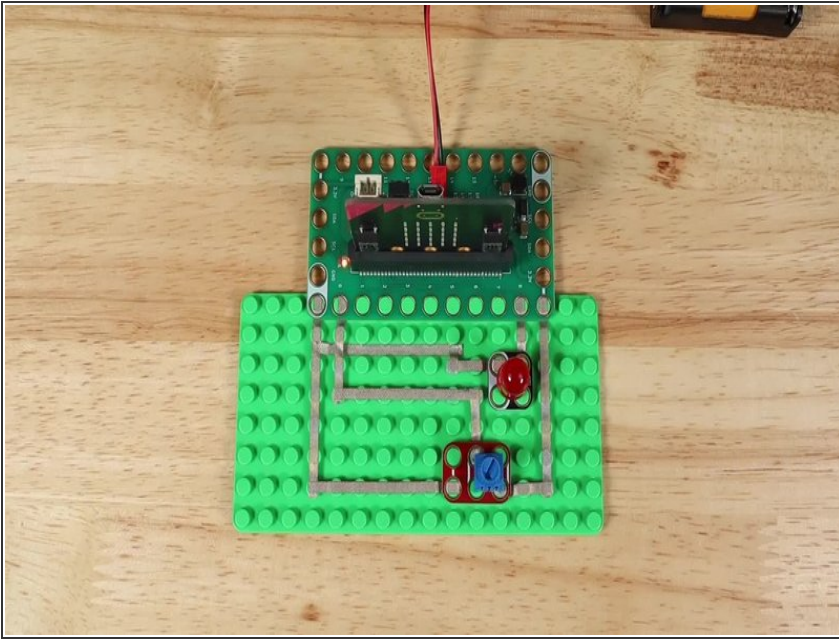
- We'll use **Maker Tape** to connect the Potentiometer and LED to the Bit Board on a LEGO baseplate.
- The LED will connect to **Pin 8** and to **Ground** (GND) **BUT!** We're going to use the "gutter" between the LEGO baseplate studs so we can have **two layers of tape** that do not touch.
 - See the photos to show how this works. It's a technique we'll use for certain projects. It can also be used when you're tight on space for tape paths.
- Once the LED is connected we'll need to connect the Potentiometer. One side goes to **Ground** (GND) and the other side to **3.3v**
- We will then connect the center of the Potentiometer to **Pin 0**. (Note that **Pin 0** is an **analog** pin.)
- ☑ You'll notice the **Ground** on the Bit Board is color coded **White**.
- ☑ The **3.3v** hole on the Bit Board is labeled and is actually two holes right next to each other on the Bit Board. (There is a small line showing the connection between them.)

Step 2 — Load the Code



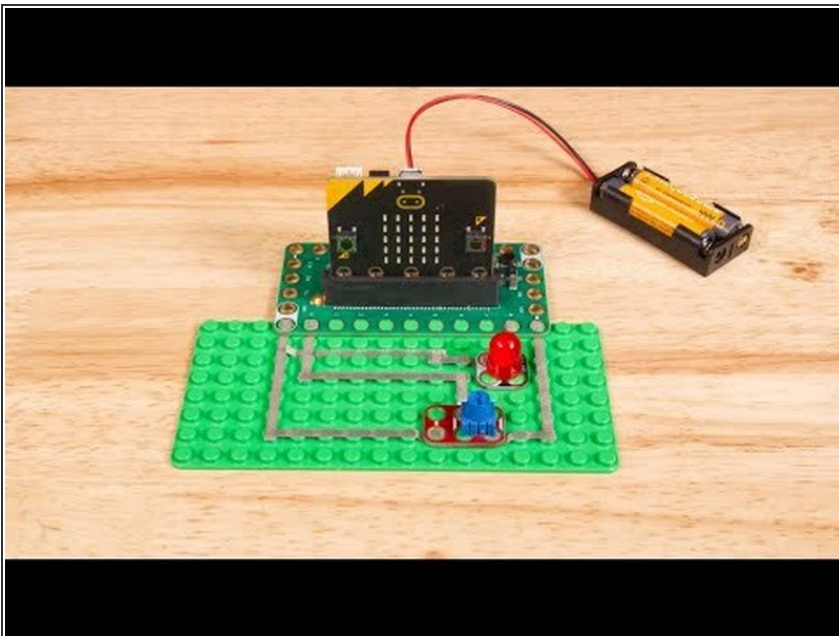
- If you've never used a micro:bit before you'll want to check out this guide: [Bit Board V2 Setup and Use](#)
- We're going to load the following code for our **Potentiometer LED Bright** program: https://makecode.microbit.org/_Fg09D1Vqh...
- Our code is pretty simple! We'll first turn off the built-in led because we don't need it, then we'll forever loop an analog write to **Pin 8** (which is where we connected the LED) and set the value we get from the Potentiometer connected to **Pin 0**.
- ☑ The Potentiometer provides a value between 0 and 1023, and the LED can accept a value between 0 (off) and 1023 (full brightness) so we don't even need to constraint or map the values.
- ☑ Some microcontrollers are limited to a range of 0-255 for **PWM** (Pulse Width Modulation) output, or what we call analog write, but the micro:bit can use 0-1023.

Step 3 — 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.
- Turn the small blue knob on the Potentiometer and you'll see the brightness of the LED change.
- Turning fully anti-clockwise should make the LED so dim it appear to be "off" and turning the knob fully clockwise should set it to the brightest it can go.

Step 4 — 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://youtube.com/live/1FlnatERZ94>

