

1 What you need

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Micro:bit V2
the brain: it runs your program and feels movement

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Addressable LED strip
10 LEDs, each with its own chip. Strips plug together: +10 LEDs each

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Breakout board (pin:bit)
the Micro:bit slides in; its pins go into the breadboard

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Breadboard
holds the breakout board and the wires

×3

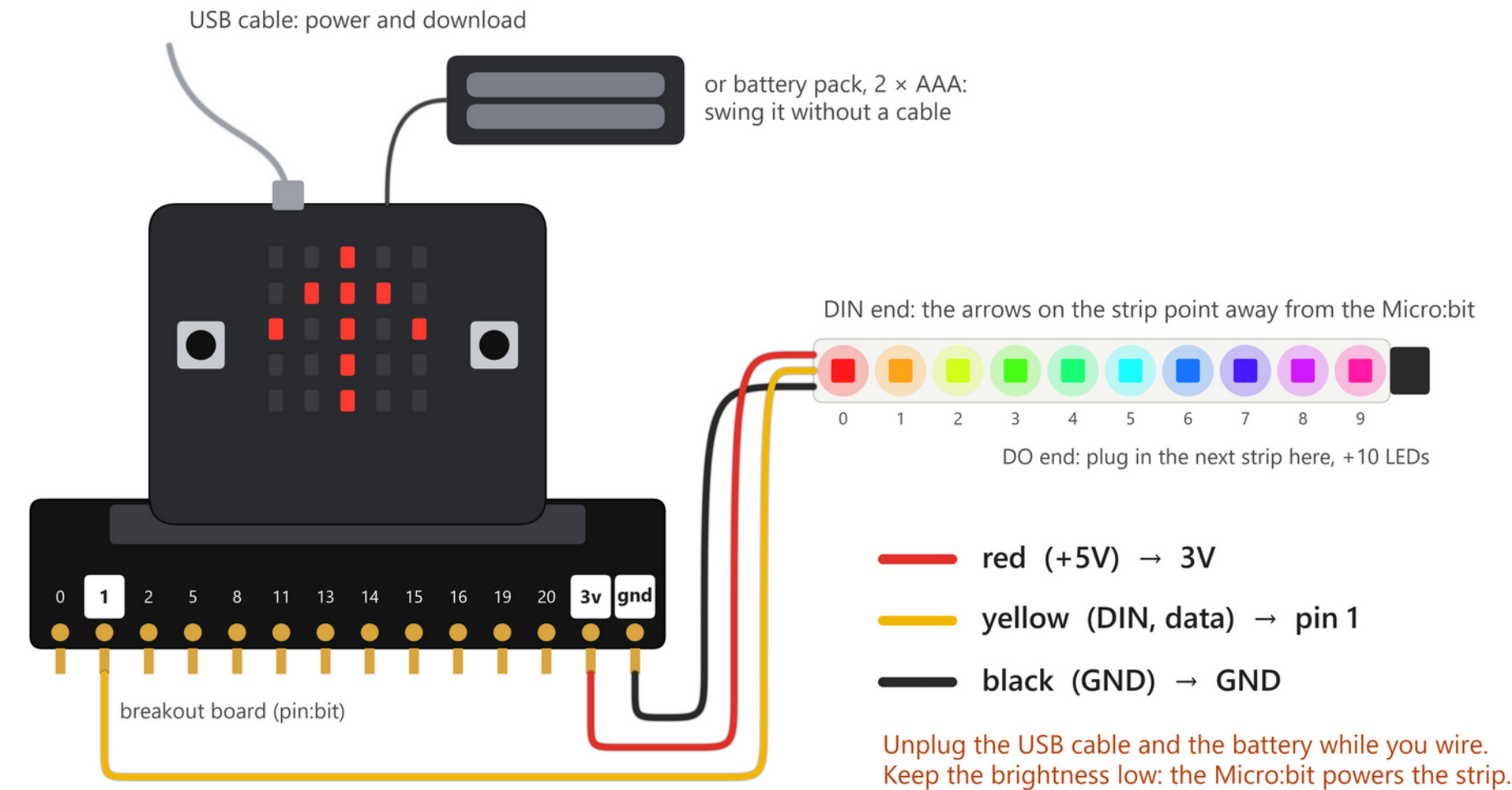
Jumper wires
or crocodile clips: red, yellow, black

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USB cable
power and download from the laptop

Battery pack 2 × AAA
only for level 4: swing it without a cable

2 Wire it



4 How addressable LEDs work

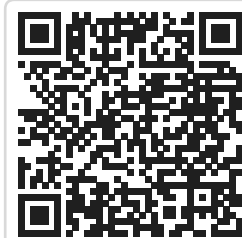
Every LED has a tiny chip and a number: its address. The Micro:bit sends 24 bits per LED on one wire: 8 for green, 8 for red, 8 for blue.



LED 0 keeps the first 24 bits and passes the rest on. LED 1 keeps the next 24 bits, and so on: one data wire for the whole strip.

Power
One LED on white: 60 mA. One strip on white: 600 mA. The Micro:bit gives about 200 mA: keep the brightness at 40 of 255.

Scan: guide
+ LED strip lab



3 Program it, level by level

Level 1: Rainbow

```
on start
  set strip to NeoPixel at P1 with 10 leds
  strip set brightness 40
  strip show rainbow from 1 to 360
  forever
    strip rotate pixels by 1
    strip show
    pause (ms) 50
```

rotate moves every colour one LED along.

Level 2: Running light

```
forever
  for index from 0 to 9
    strip clear
    strip set pixel color at index to red
    strip show
    pause (ms) 30
```

10 LEDs: numbers 0 to 9.

Level 3: Lightsaber

```
on button A pressed
  for index from 0 to 9
    set pixel color at index to blue
  strip show
  pause (ms) 20
on button B pressed
  for index from 0 to 9
    set pixel color at index to black
  strip show
  pause (ms) 20
```

B: the same loop, LED 9 – index to black.

Level 4: Swing it

```
on shake
  strip show color white
  pause (ms) 80
  forever
    if lit then
      set hue to map acceleration x
      strip show color hue
```

lit: true after A, false at B.