

Singing

1.Learning goal

In this course, we mainly learn to combine LED:bit programming blocks, micro:bit programming blocks for playing tones, and programming blocks for controlling RGB lights.

Use the buzzer on the Basic:bit to play music, while the LED:bit display shows the dynamic expression with a big mouth, just like singing.

2.Programming method

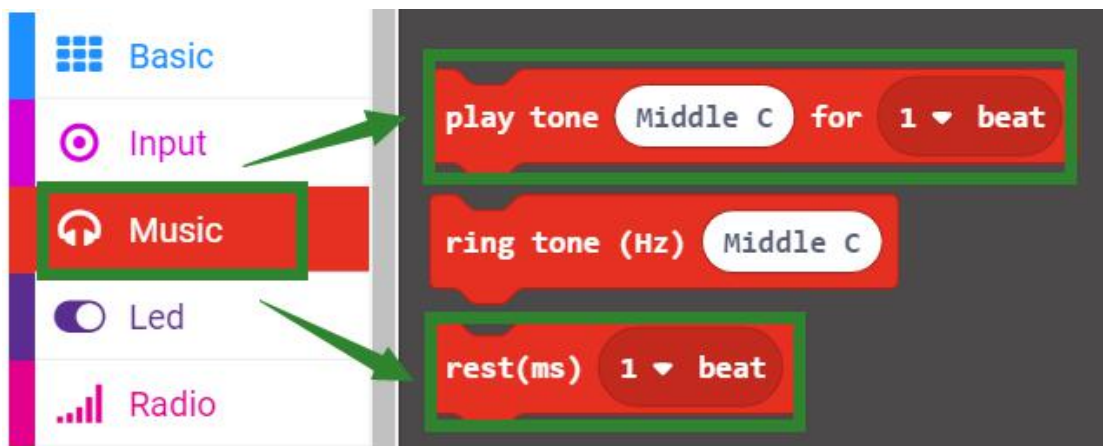
Mode 1 online programming: First, we need to connect the micro:bit to the computer by USB cable. The computer will pop up a USB flash drive and click on the URL in the USB flash drive: <http://microbit.org/> to enter the programming interface. Add the Yahboom package <https://github.com/lzty634158/LED-Bit> to program.

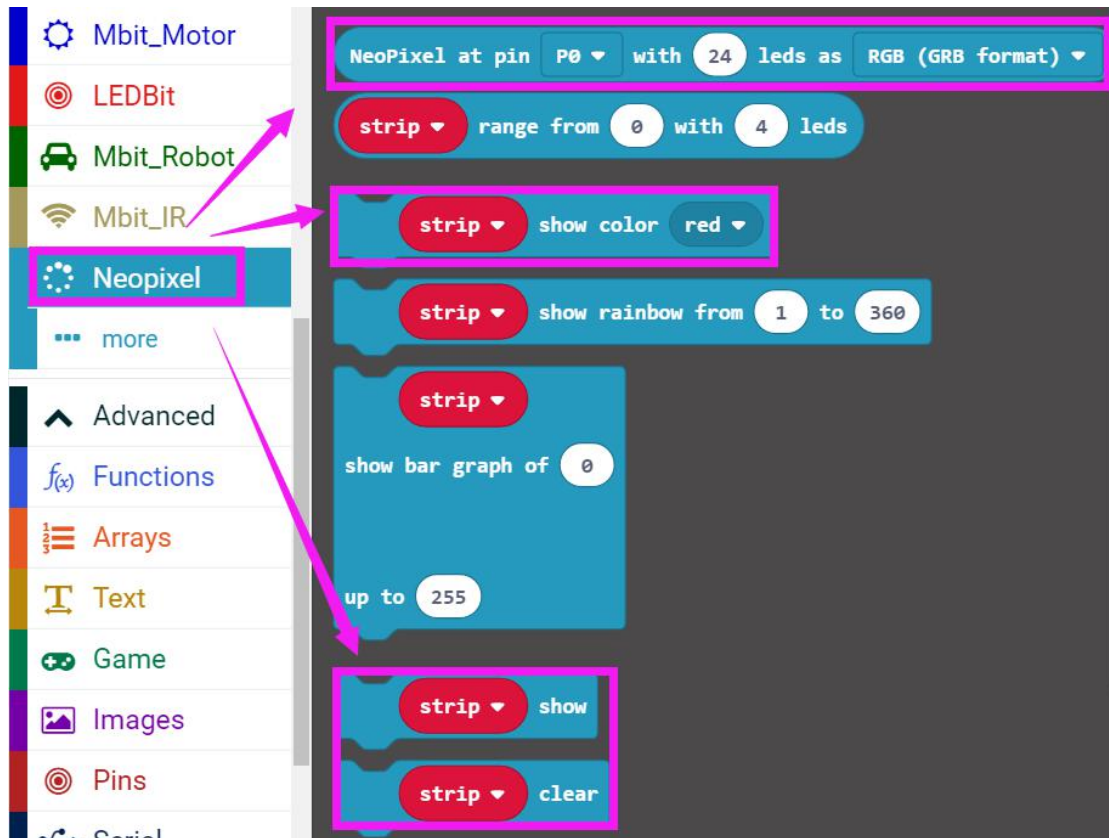
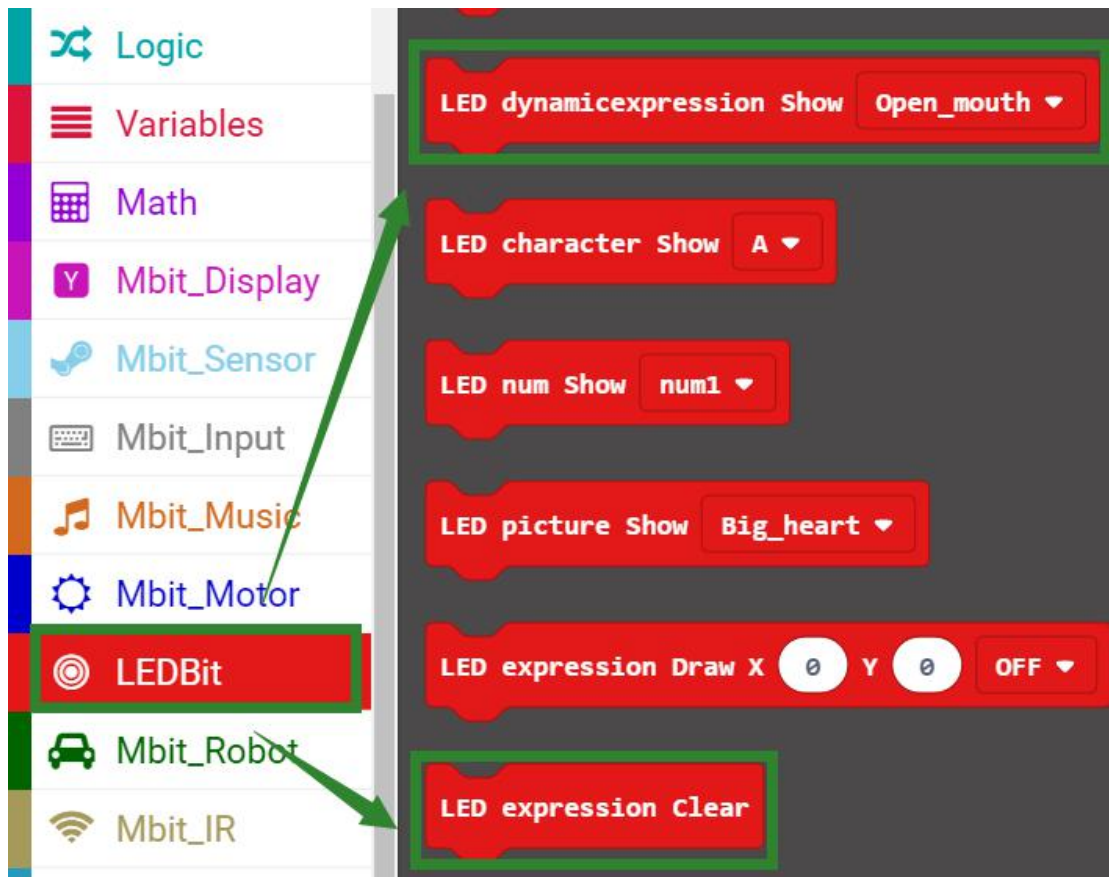
Mode 2 offline programming: We need to open the offline programming software. After the installation is complete, enter the programming interface, click **【New Project】**, add Yahboom package:

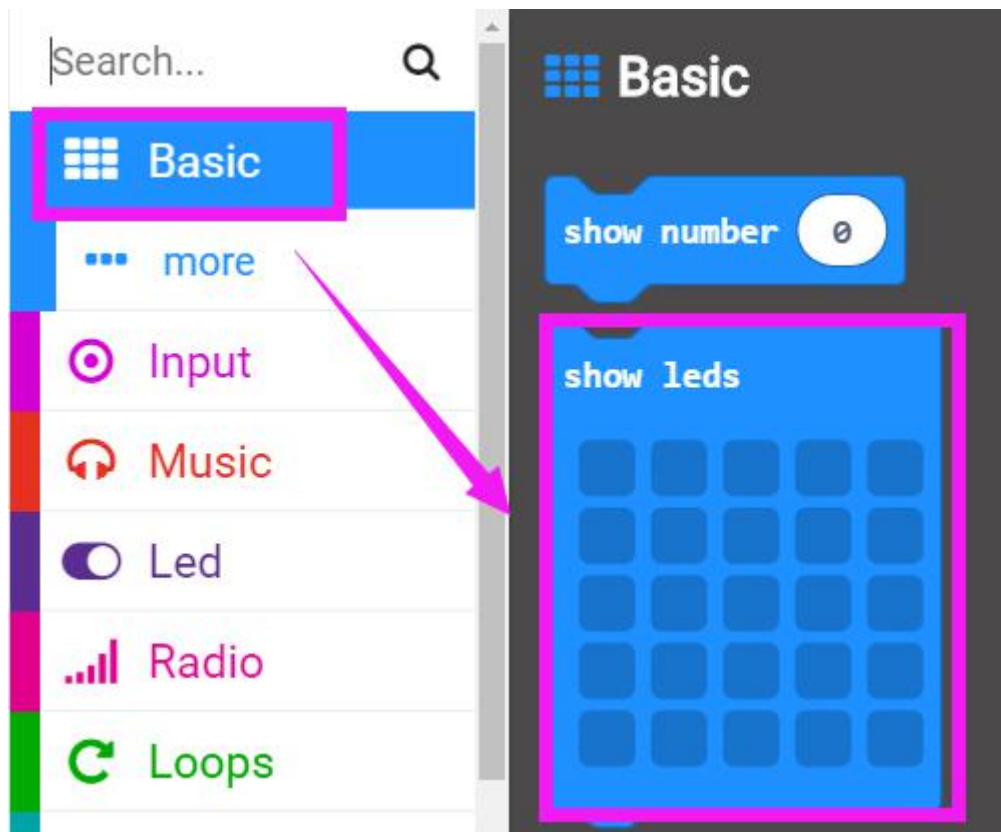
<https://github.com/lzty634158/LED-Bit>, you can program.

3.Looking for blocks

The following is the location of the building blocks required for this programming.

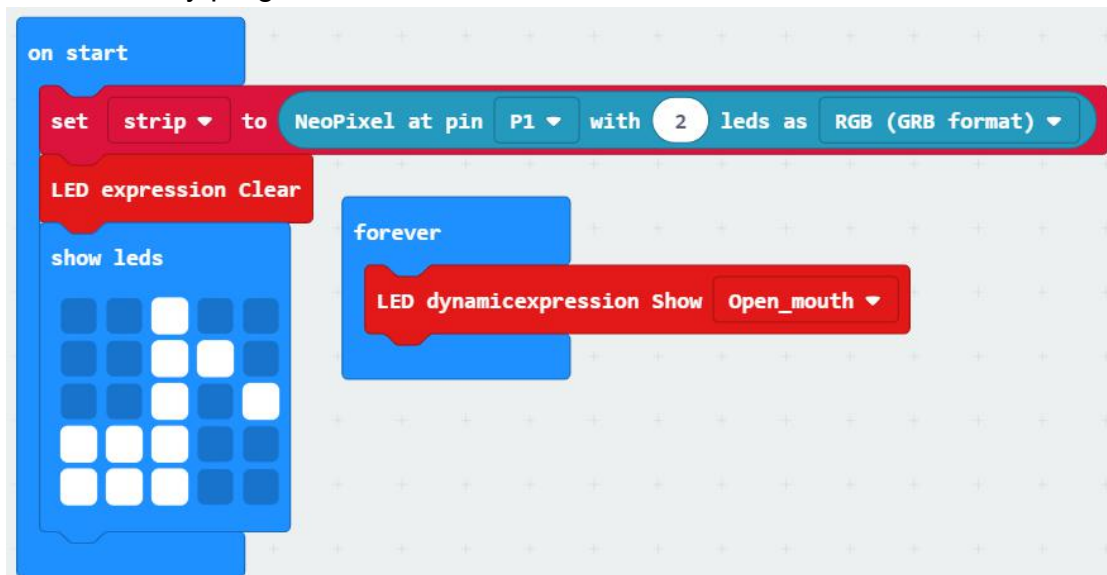






4.Combine building block

The summary program is shown below:



The image displays two columns of Scratch code blocks. The left column is enclosed in a 'forever' loop. Each iteration of the loop contains a sequence of blocks: a 'strip' block with a 'show color' sub-block set to 'red', followed by a 'strip' block with a 'show' sub-block, then a 'play tone' block set to 'Middle C' for '1/2' beat, another 'strip' block with 'show color' set to 'purple', a 'strip' block with 'show', a 'play tone' block set to 'Middle D' for '1/2' beat, a 'strip' block with 'show color' set to 'red', a 'strip' block with 'show', a 'play tone' block set to 'Middle E' for '1/2' beat, a 'strip' block with 'show color' set to 'purple', a 'strip' block with 'show', a 'play tone' block set to 'Middle C' for '1/2' beat, and finally a 'strip' block with 'show color' set to 'red'. The right column contains a single sequence of blocks: a 'strip' block with 'show', a 'play tone' block set to 'Middle G' for '2' beat, a 'strip' block with 'show color' set to 'purple', a 'strip' block with 'show', a 'play tone' block set to 'Middle A' for '1/2' beat, a 'strip' block with 'show color' set to 'blue', a 'strip' block with 'show', a 'play tone' block set to 'Middle A' for '1/2' beat, a 'strip' block with 'show color' set to 'orange', a 'strip' block with 'show', a 'play tone' block set to 'High C' for '1/2' beat, a 'strip' block with 'show color' set to 'green', a 'strip' block with 'show', and a final 'play tone' block set to 'Middle A' for '1/2' beat.

```
forever
  strip ▾ show color red ▾
  strip ▾ show
  play tone Middle C for 1/2 ▾ beat
  strip ▾ show color purple ▾
  strip ▾ show
  play tone Middle D for 1/2 ▾ beat
  strip ▾ show color red ▾
  strip ▾ show
  play tone Middle E for 1/2 ▾ beat
  strip ▾ show color purple ▾
  strip ▾ show
  play tone Middle C for 1/2 ▾ beat
  strip ▾ show color red ▾

strip ▾ show
play tone Middle G for 2 ▾ beat
strip ▾ show color purple ▾
strip ▾ show
play tone Middle A for 1/2 ▾ beat
strip ▾ show color blue ▾
strip ▾ show
play tone Middle A for 1/2 ▾ beat
strip ▾ show color orange ▾
strip ▾ show
play tone High C for 1/2 ▾ beat
strip ▾ show color green ▾
strip ▾ show
play tone Middle A for 1/2 ▾ beat
```

The image displays two side-by-side Scratch code editors, each containing a sequence of blocks for a music project. The blocks are organized into two columns.

Left Column:

- strip ▾ show color purple ▾
- strip ▾ show
- play tone Middle G for 2 ▾ beat
- strip ▾ show color orange ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color red ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color white ▾
- strip ▾ show
- play tone High C for 1 ▾ beat
- strip ▾ show color red ▾
- strip ▾ show

Right Column:

- play tone Middle G for 1/2 ▾ beat
- strip ▾ show color purple ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color red ▾
- strip ▾ show
- play tone Middle G for 1 ▾ beat
- strip ▾ show color purple ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color red ▾
- strip ▾ show
- play tone Middle G for 1/2 ▾ beat
- strip ▾ show color purple ▾

The image displays four panels of Scratch code blocks, each representing a sequence of musical notes and corresponding color changes for a strip light. The code is organized into four distinct sections, each with a unique color scheme for the notes and colors.

Top Left Panel (Blue/Red/Orange/Green/Purple):

- strip ▾ show
- play tone Middle E for 1/2 ▾ beat
- strip ▾ show color blue ▾
- strip ▾ show
- play tone Middle G for 1/2 ▾ beat
- strip ▾ show color orange ▾
- strip ▾ show
- play tone Middle E for 1/2 ▾ beat
- strip ▾ show color green ▾
- strip ▾ show
- play tone Middle C for 1/2 ▾ beat
- strip ▾ show color purple ▾
- strip ▾ show
- play tone Middle D for 1/2 ▾ beat

Top Right Panel (Blue/Red/Orange/Green):

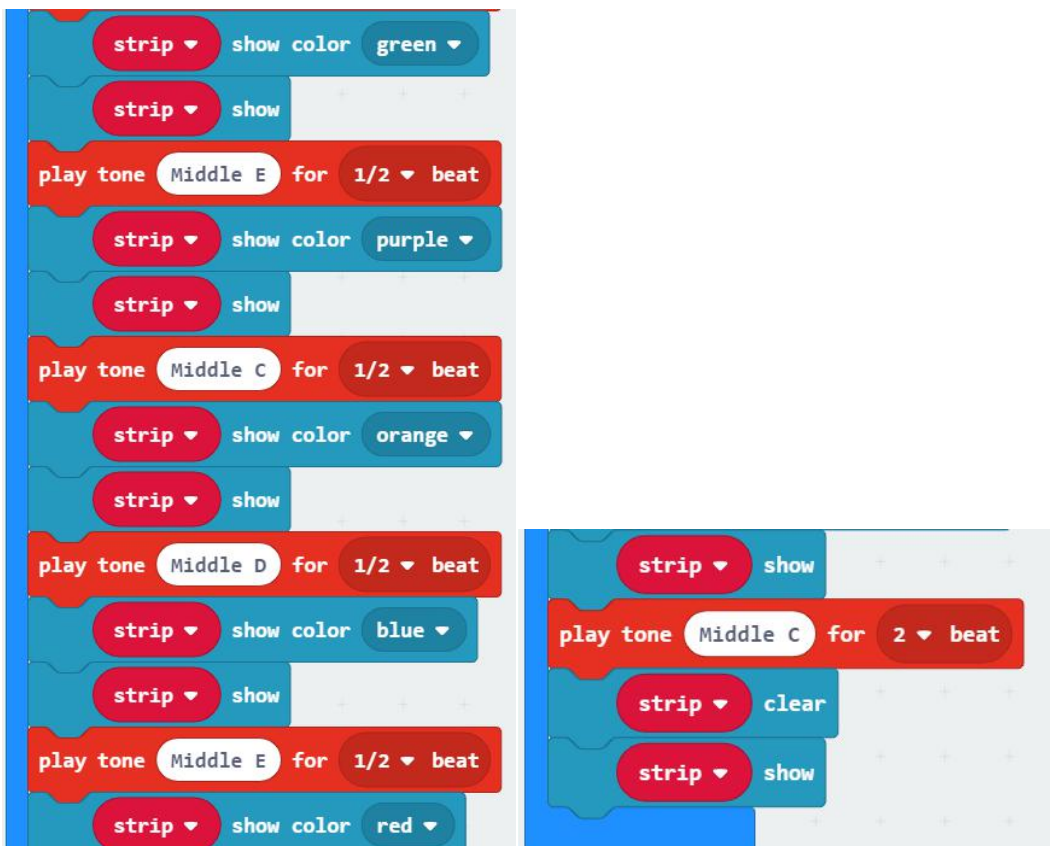
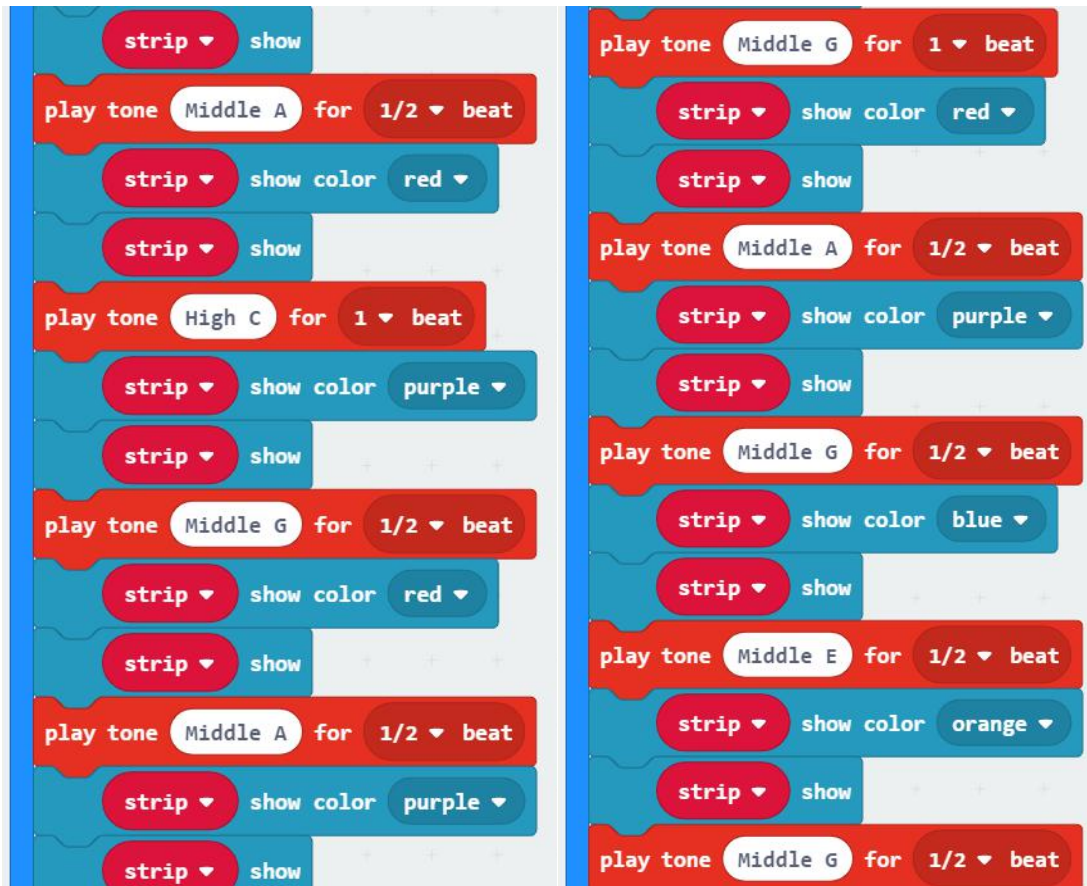
- strip ▾ show color orange ▾
- strip ▾ show
- play tone Middle E for 1/2 ▾ beat
- strip ▾ show color blue ▾
- strip ▾ show
- play tone Middle C for 2 ▾ beat
- strip ▾ show color orange ▾
- strip ▾ show
- rest(ms) 1 ▾ beat
- play tone Middle C for 1/2 ▾ beat
- strip ▾ show color orange ▾
- strip ▾ show
- play tone Middle D for 1/2 ▾ beat
- strip ▾ show color green ▾

Bottom Left Panel (Blue/Red/Orange/Green/Purple):

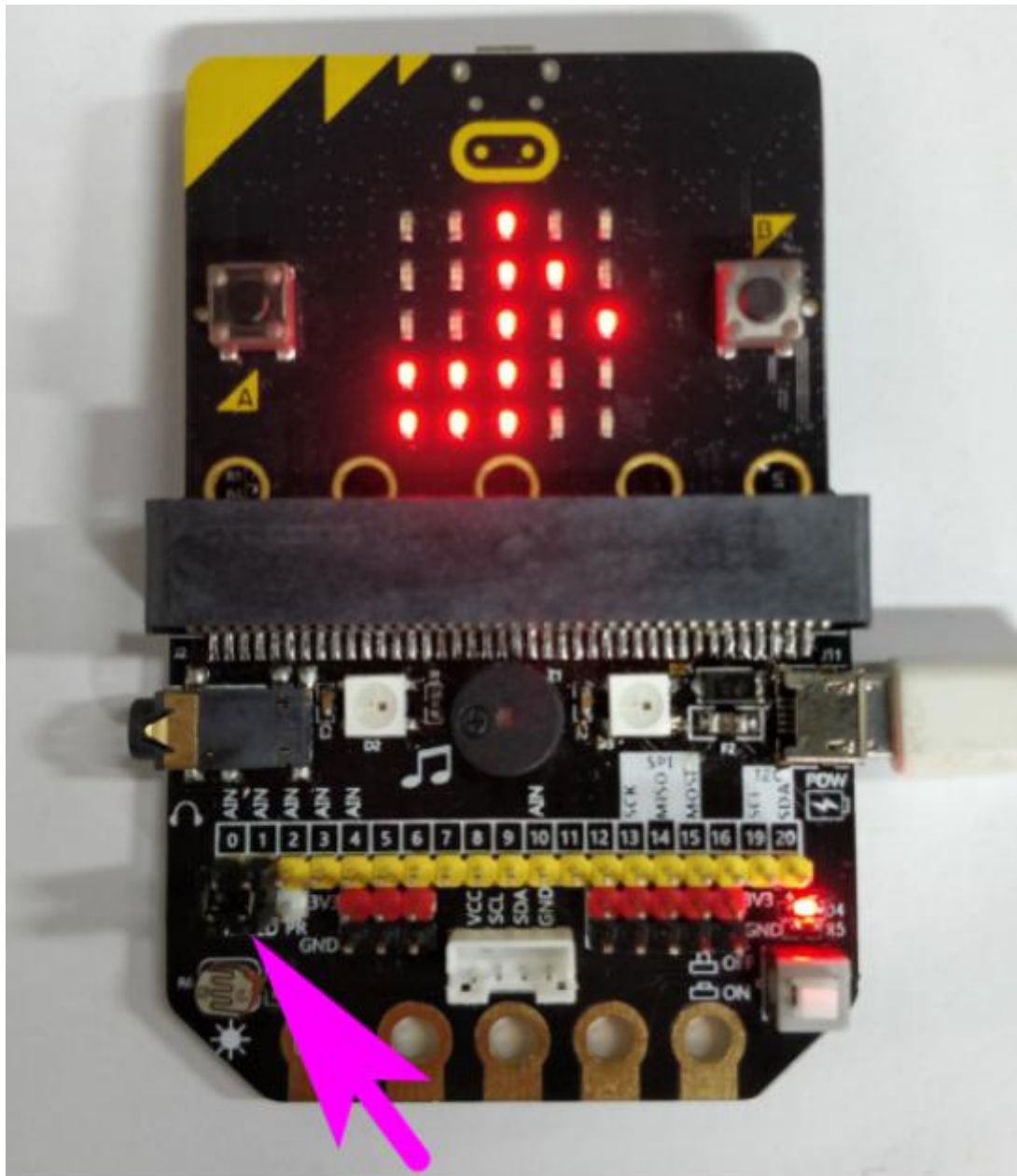
- strip ▾ show
- play tone Middle E for 1/2 ▾ beat
- strip ▾ show color purple ▾
- strip ▾ show
- play tone Middle C for 1/2 ▾ beat
- strip ▾ show color blue ▾
- strip ▾ show
- play tone Middle G for 2 ▾ beat
- strip ▾ show color red ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color orange ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat

Bottom Right Panel (Blue/Red/Orange/Green):

- strip ▾ show color green ▾
- strip ▾ show
- play tone High C for 1/2 ▾ beat
- strip ▾ show color purple ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color orange ▾
- strip ▾ show
- play tone Middle G for 2 ▾ beat
- strip ▾ show color red ▾
- strip ▾ show
- play tone Middle A for 1/2 ▾ beat
- strip ▾ show color white ▾



Note: The jumper cap needs to be connected to the P1 and LED pins, P2 and PR pins on the Basic:bit expansion board. As shown below.



5. Experimental phenomena

After the program is successfully downloaded, the micro:bit dot matrix displays a music pattern, then the buzzer on the Basic:bit expansion board starts to play the music "Song of School", and the RGB lights will change different colors. At the same time, we can see a dynamic expression open_mouth on the LED: bit.