

Chapter 5

Light Sensing Robot

Without light, there would be no sight. We are able to see because light from an object can move through space and reach our eyes. But human eyes are very sensitive to light, both too strong and weak lights are harmful to our eyes. How do we know the changes in light brightness? Maqueen Plus can help us achieve that.

Goal



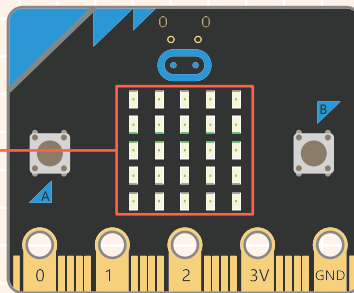
1. Learn the light sensor
2. Learn to use "show number" block

Electronic Component



Light sensor Brief

Light sensor



The micro:bit LEDs can be used to estimate the amount of ambient light, and output the light level as electric signal.

Command Learning



Block Brief

Light Level

Light level

Reads the light level applied to the LED screen in a range from 0 to 255.

Show number

show number 0

Scroll a number the micro:bit LED matrix.

Hands-on Practice



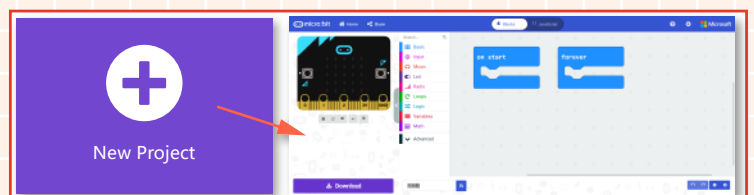
Step 1 Create a New Project

1. Input <https://makecode.microbit.org/> into your browser to enter MakeCode editor.
2. Click "new project" to enter MakeCode programming interface.
3. Add the Maqueen Plus library: <https://github.com/DFRobot/pxt-DFRobot-Maqueenplus>

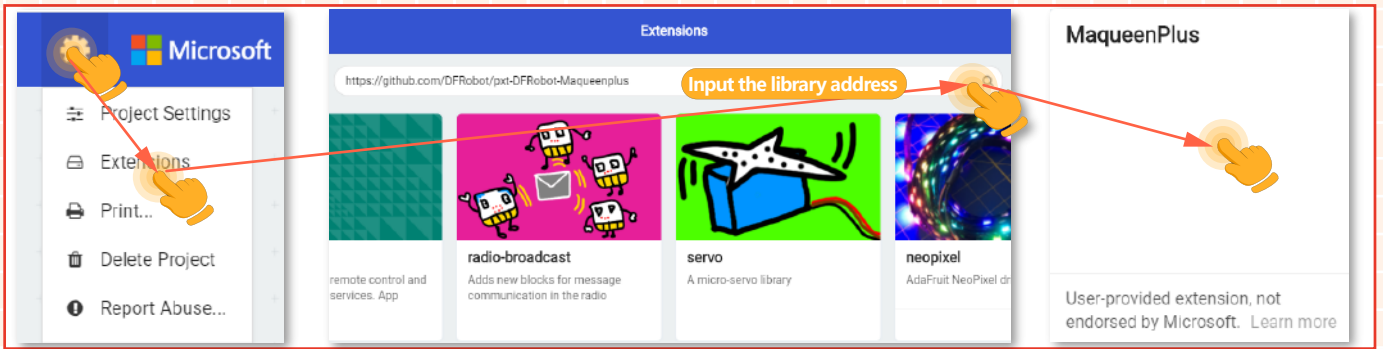
<https://makecode.microbit.org/>



1. Enter MakeCode editor



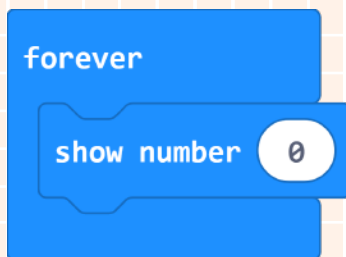
2. Enter programming interface



3.Add the extension library

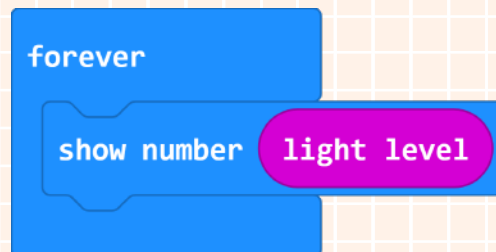
Step 2 Programming

1.Embed the "show number" block into the "forever" block, then the robot will read the light level constantly.

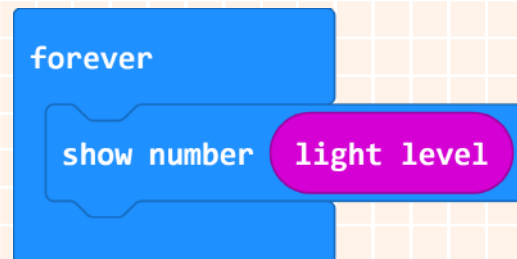


Note: the "show number" block displays 0 by default.

2.To display the ambient light level on the micro:bit LED screen in real time, we have to put the "light level" block into the "show number" block.



3.The complete program is shown below.



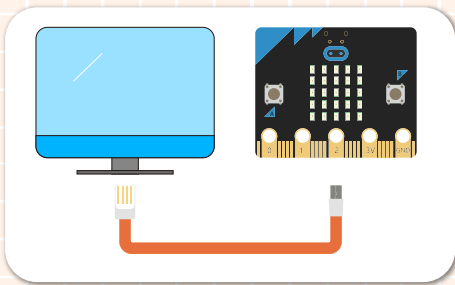
4.Name your project as "Light sensing robot" and save it.

Step 3 Download Program

1.**Connect to a computer:** connect the micro:bit to your computer with a USB cable before downloading. There will be a hard-disk named micro:bit appearing in the computer when the connection is successful.

2.**Download the program:** download your project into the micro:bit hard-disk.

3.**Plug in the micro:bit board:** after downloading the program, plug the micro:bit board into Maqueen Plus.



1. Connect to computer

Download

MICROBIT (P)
File name: xxxxxx.hex

2. Download program



3. Plug in micro:bit

Step 4 Effect Display

Turn on Maqueen Plus' s power, the LED screen will constantly display the current light level! The following are the light levels measured at the office and photo studio.

Place	Light Level
Office	125
Photo studio	255

Note: data in the experiments are for reference only.

Think & Explore



Light level varies from places, let our Maqueen Plus explore! After that, please think if the light level of each place is reasonably designed.

Place	Light Level
Kitchen	
living-room	
Bedroom	
Study	