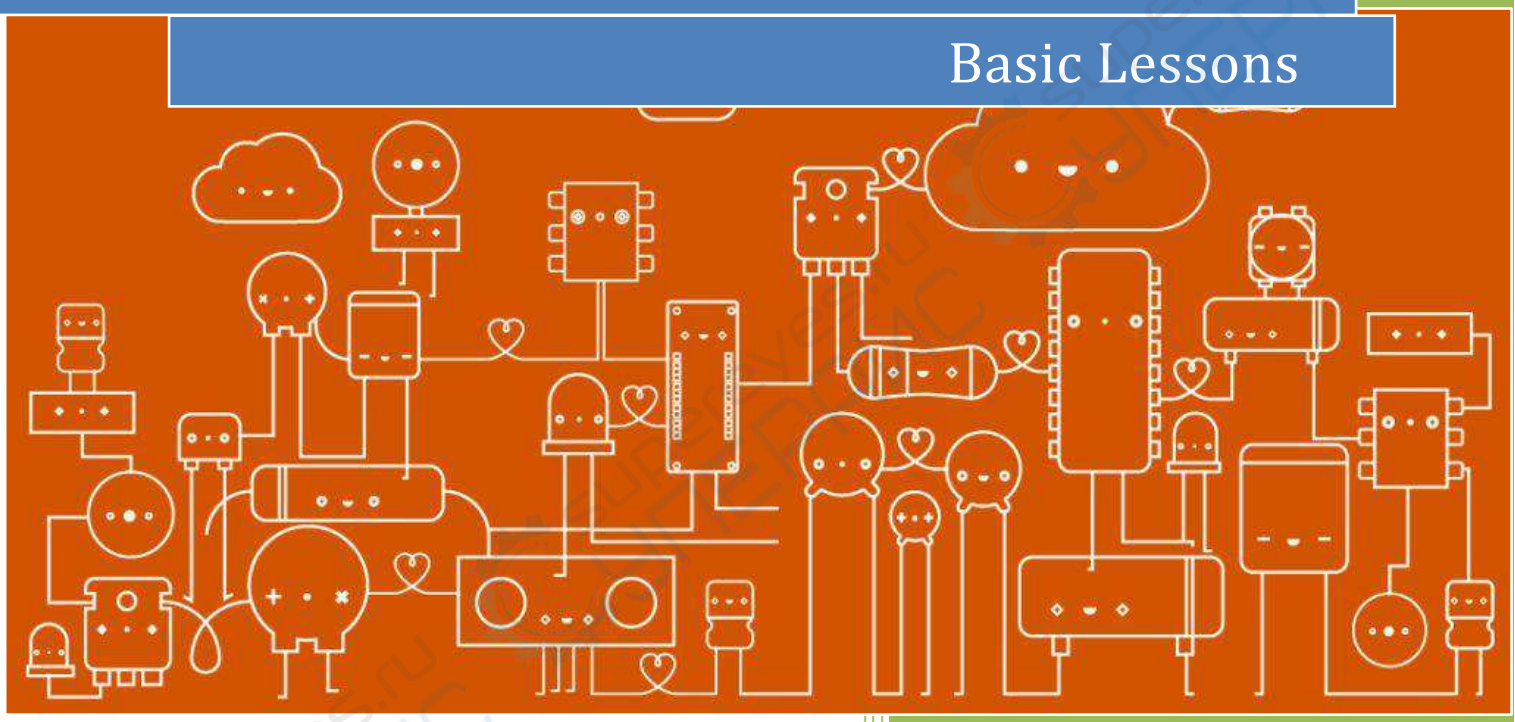
2019

Micro:bit Smart Robot Car

Basic Lessons

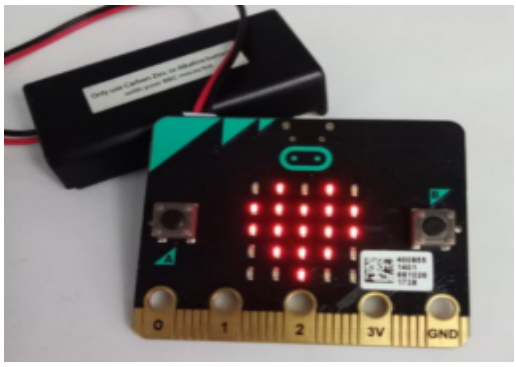


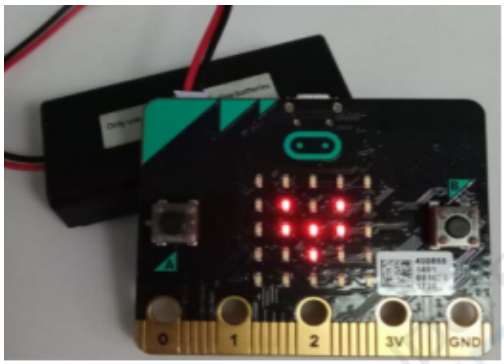
Basic Lessons

Lesson 1 “Heartbeat

1. Learning goals:

Showing a big heart sharp on LED matrix firstly, and showing small heart later, this cycle like heart beat.





2. Preparation

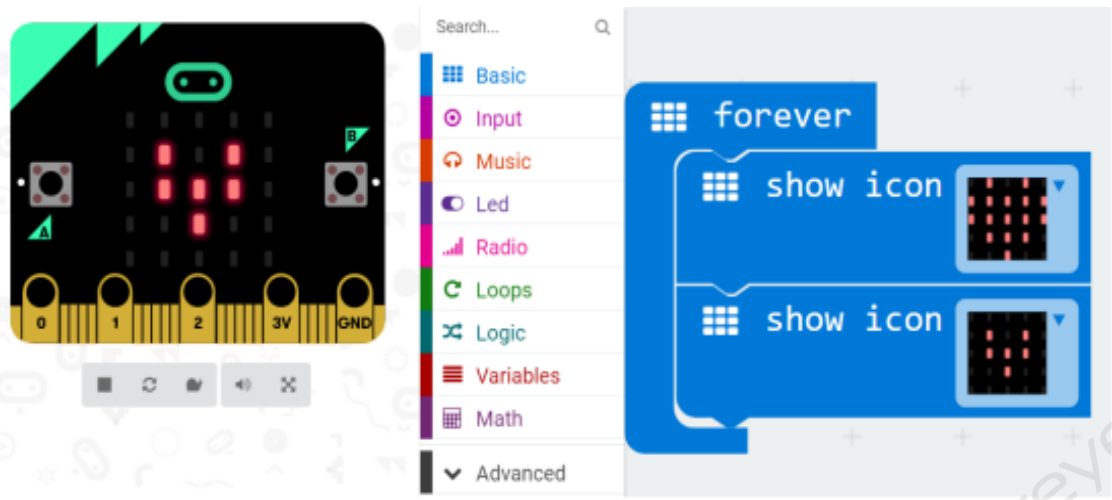
Hardware:

1 X Micro: bit Board
1 X Micro USB Cable
2 X AAA batteries

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

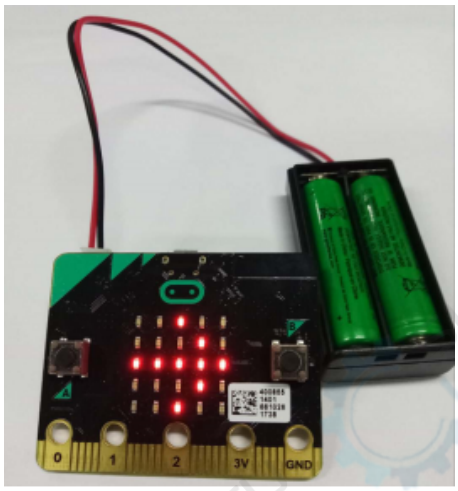
3.Search for blocks:

4.Combine blocks



Lesson 2 “See who is pressing fast”

1. Learning goals:



When you download a good program, call your little partner to play. One is standing on the A key, and the other is standing on the B button. And then you count down 3,2,1 and press the button together. If the A button is pressed first, there will be an arrow pointing to the A button on the dot matrix. If the B button is pressed first, there will be an arrow pointing to the B button on the dot matrix. If it is pressed at the same time, it will show a love on the dot matrix.

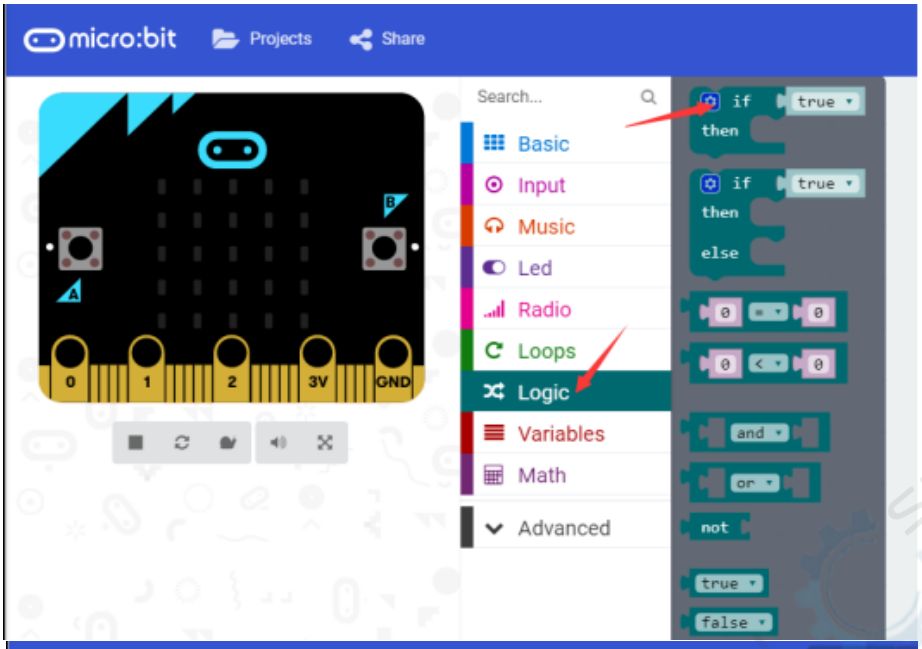
2. Preparation

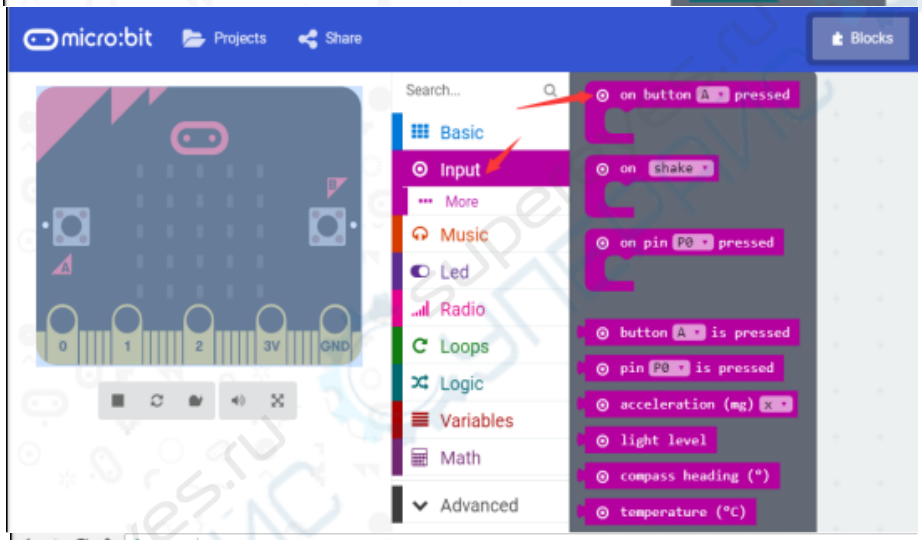
Hardware:

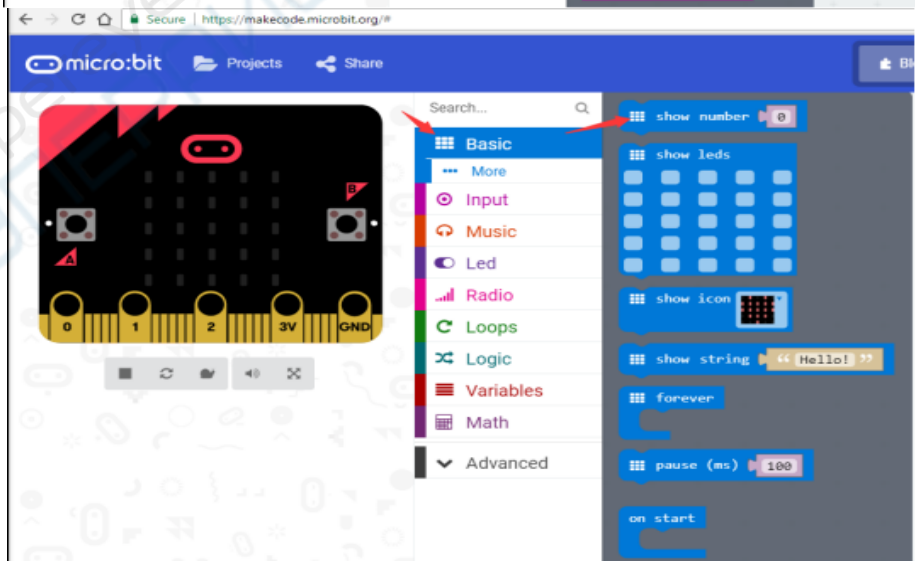
1 X Micro: bit Board
1 X Micro USB Cable
2 X AAA batteries

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

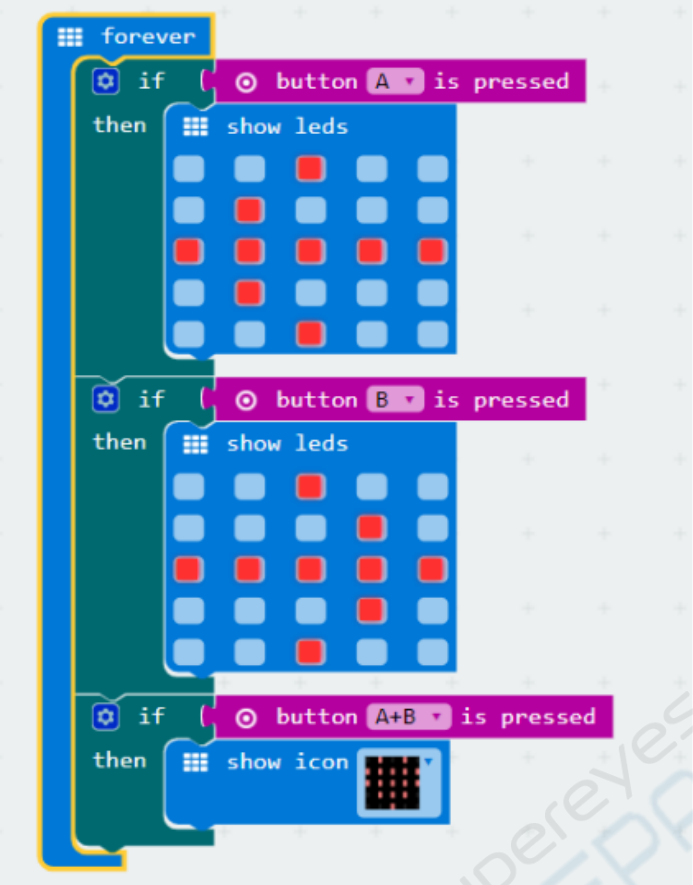
3. Search for blocks





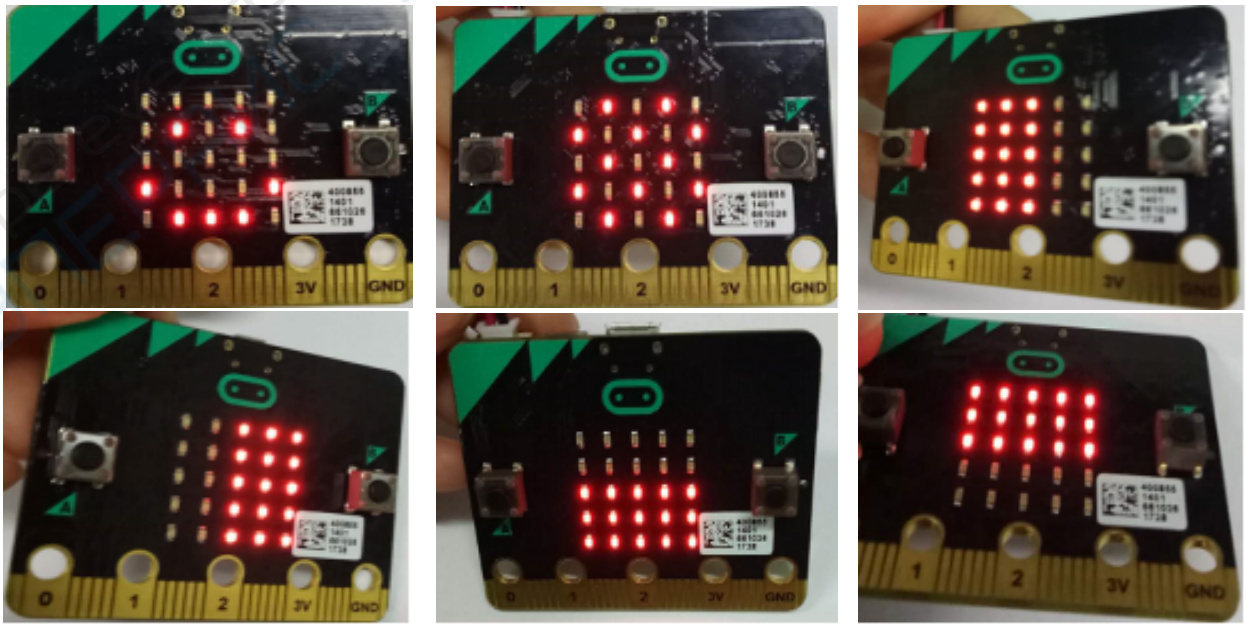


4. Combine blocks



Lesson 3 “Flowing sand”

1. Learning goals:



When you download the program, the micro:bit board will show a smile first when it is put up (the dot matrix is facing up). Shake can show a plate of sand. Tilt to the left and the sand sink to the left, tilt right and to right, tilt down and to the bottom, tilt to up and to above. Look at it, it's not like a flow of sand?

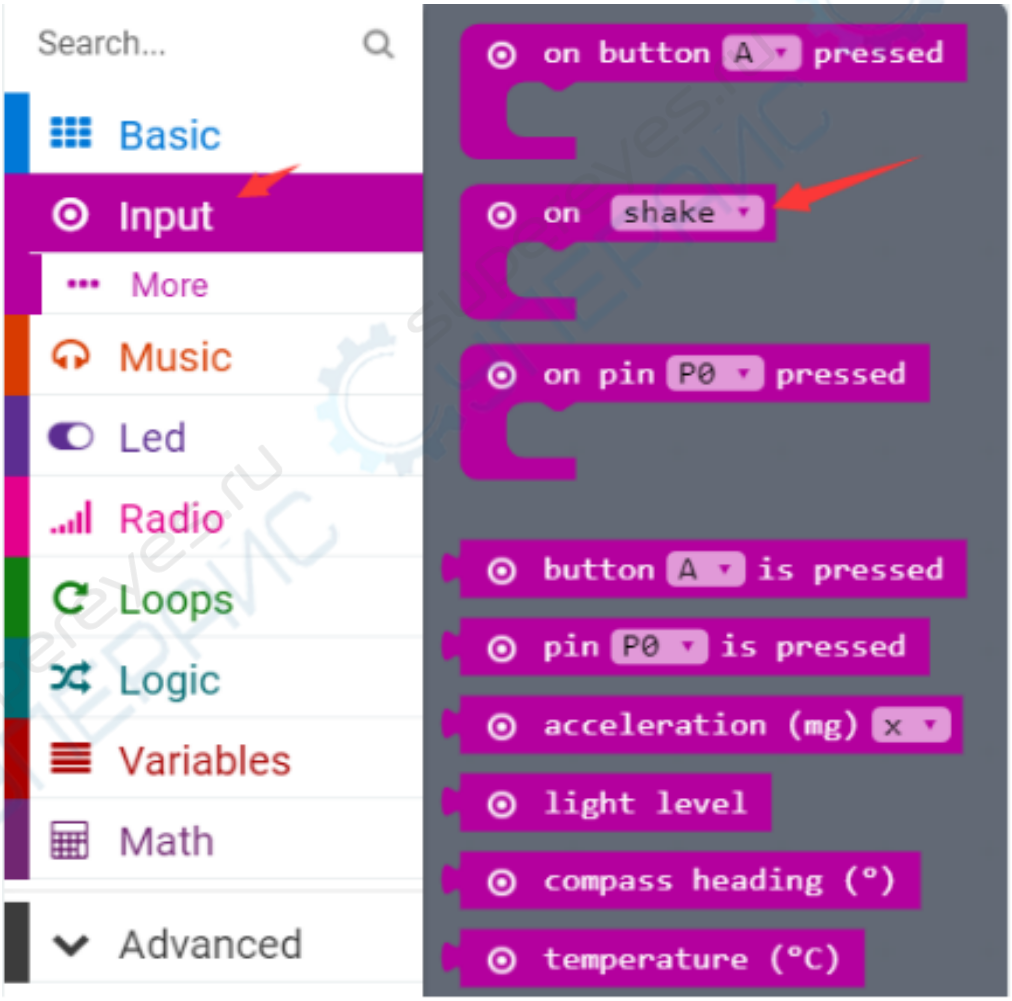
2.Preparation

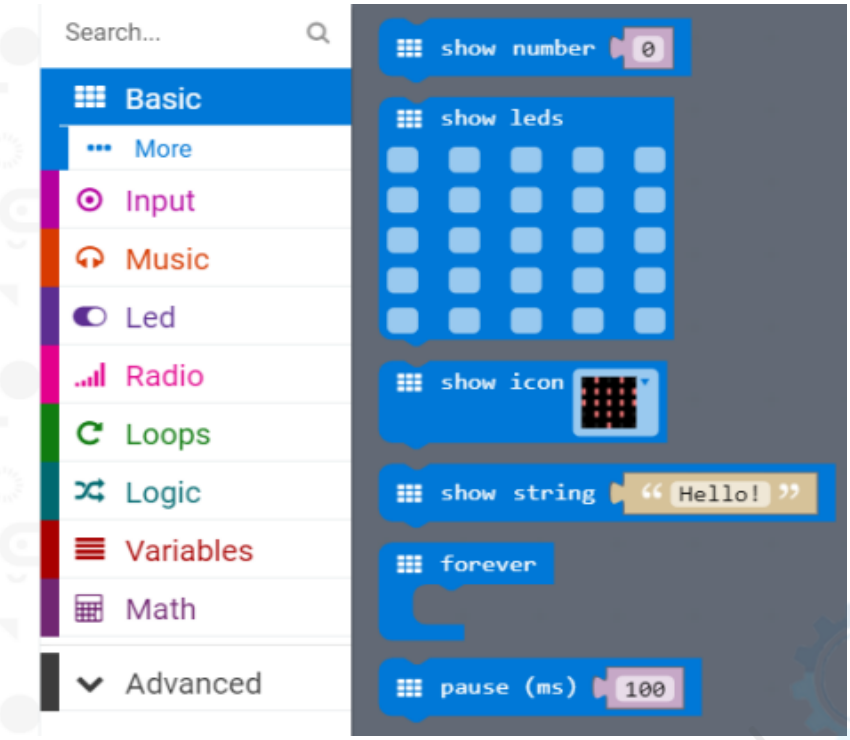
Hardware:

1 X Micro: bit Board
1 X Micro USB Cable
2 X AAA batteries

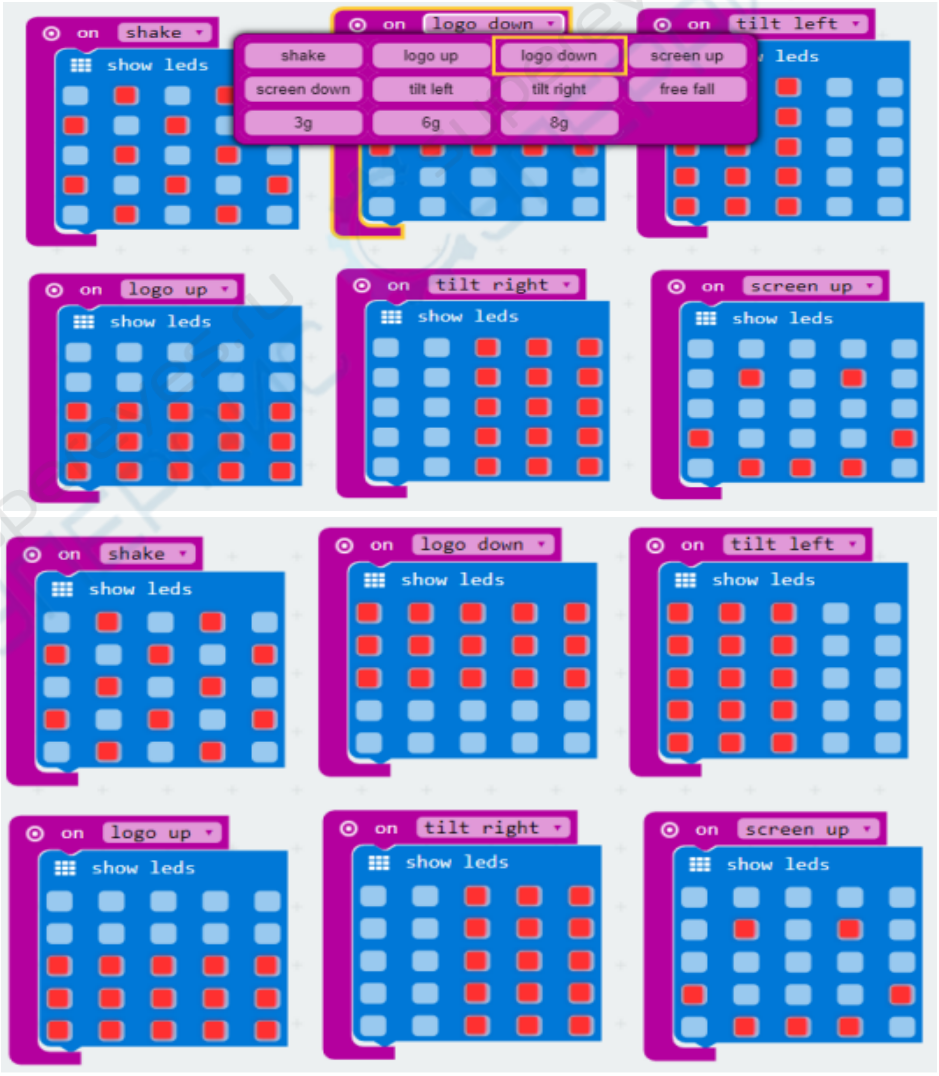
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

3.Search for blocks





4.Search for blocks

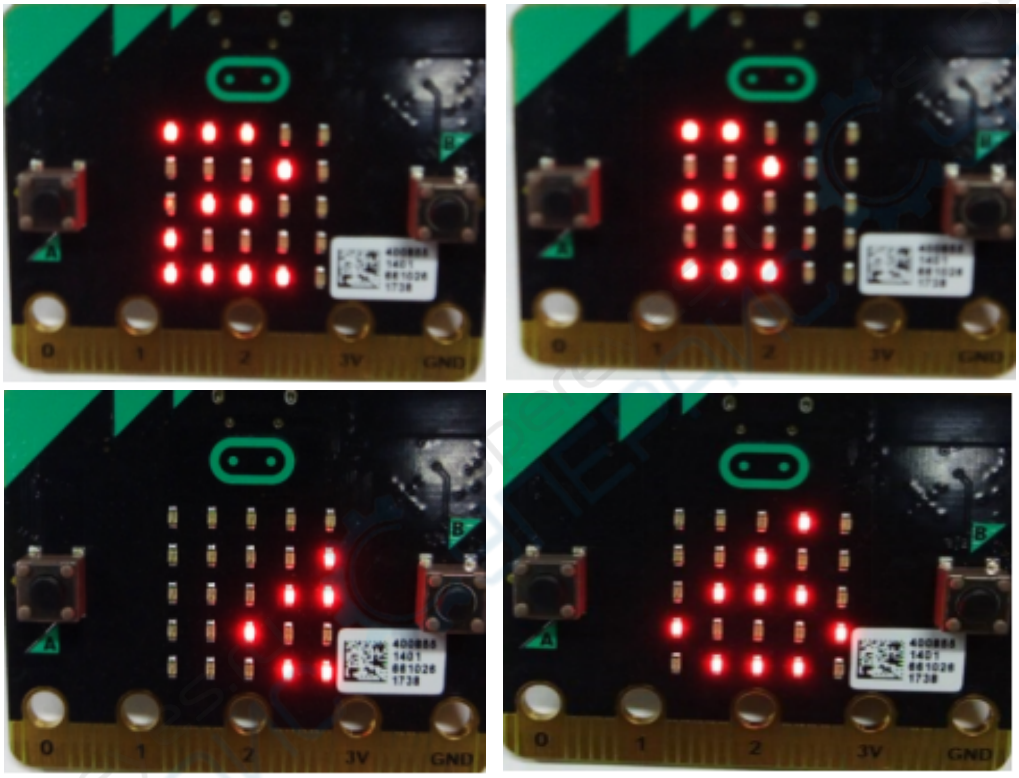


Tips:

Accelerometer is used to measure the deflection of physical quantities, such as tilt inversion and other azimuth deflection. It can accurately determine the actual actions of users, and send some instructions to micro:bit through these actions he collected. There are many places involved in accelerometer. For example, we can make some small games with accelerometer.For example, dice game, snake game is achieved through micro:bit accelerometer.

Lesson 4 “DIY thermometer”

1. Learning goals:



After you have downloaded the program, you can see the value of the temperature on the micro:bit’s dot matrix to the left. At present, the teacher has measured the temperature of 26 degrees Celsius. The students can try to see how much the temperature is around you.

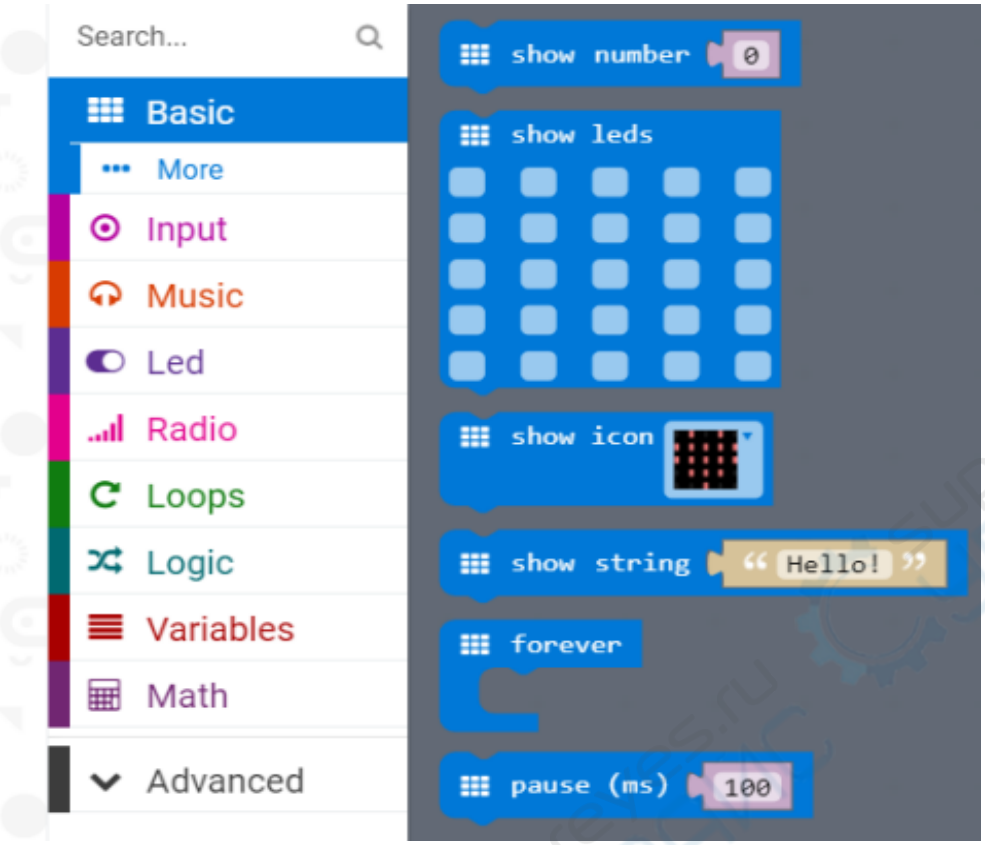
2.Preparation

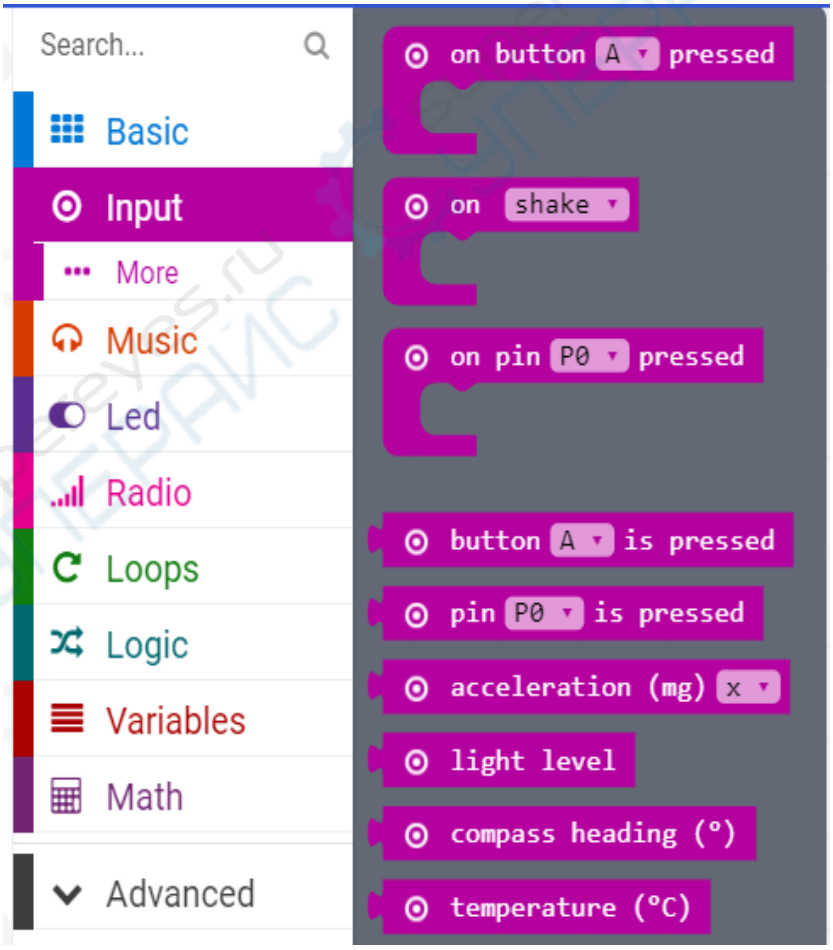
Hardware:

- 1 X Micro: bit Board
- 1 X Micro USB Cable
- 2 X AAA batteries

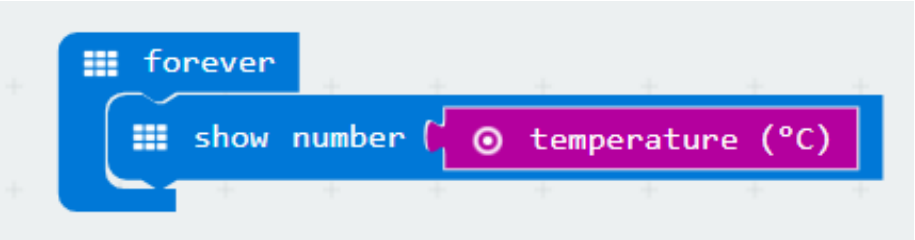
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

3. Search for blocks



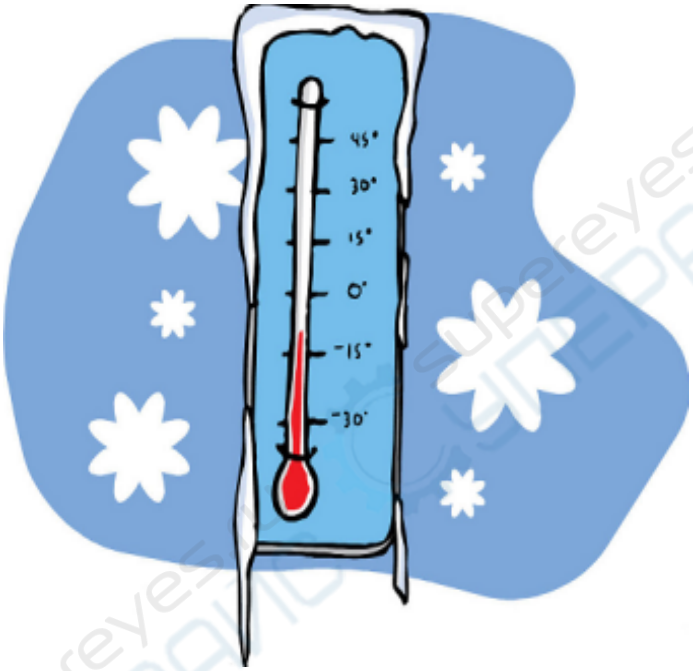


4. Combine blocks



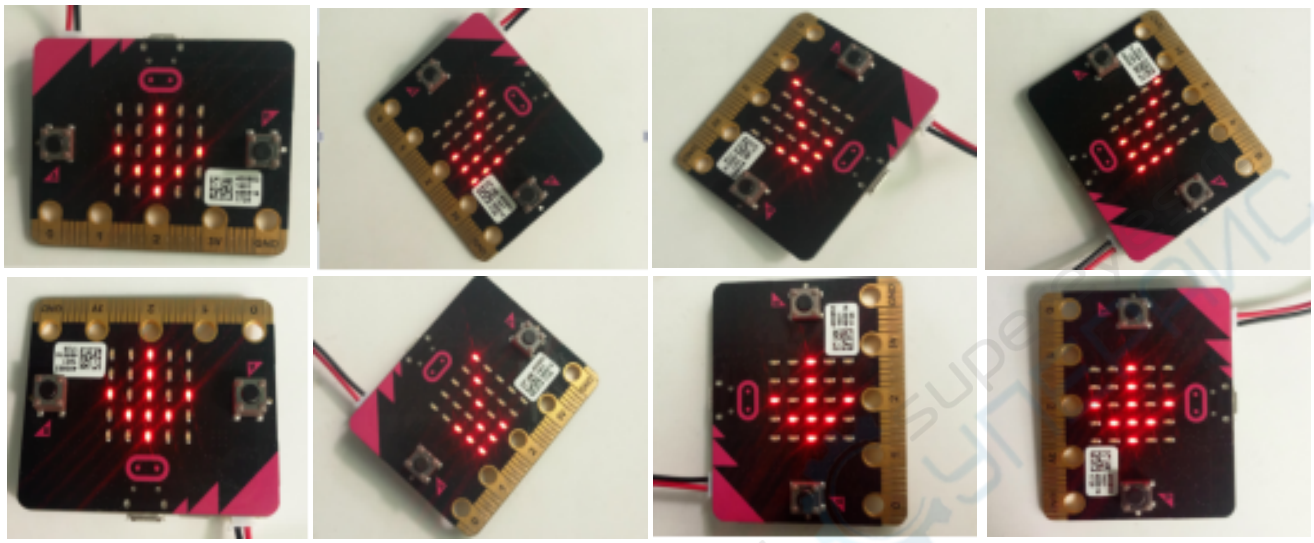
Tips:

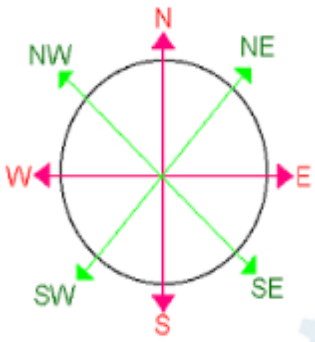
Temperature is the physical quantity that represents the degree of cold and heat of a body. Microscopically speaking, it is the intensity of the thermal movement of an object molecule. In this experiment, we measured the Celsius temperature. The inventor was Anders Celsius, the freezing point was 0 degrees, and the boiling point was 99.974 degrees. So what are your temperature now, children?



Lesson 5 “Direction follower”

1. Learning goals:





After downloading the program, the bit development board can be swung to the east, west, south, north, northeast, northwest, southeast, southwest eight different directions. You can see that no matter which direction the micro:bit swings, the pointer on the dot will point to this direction.

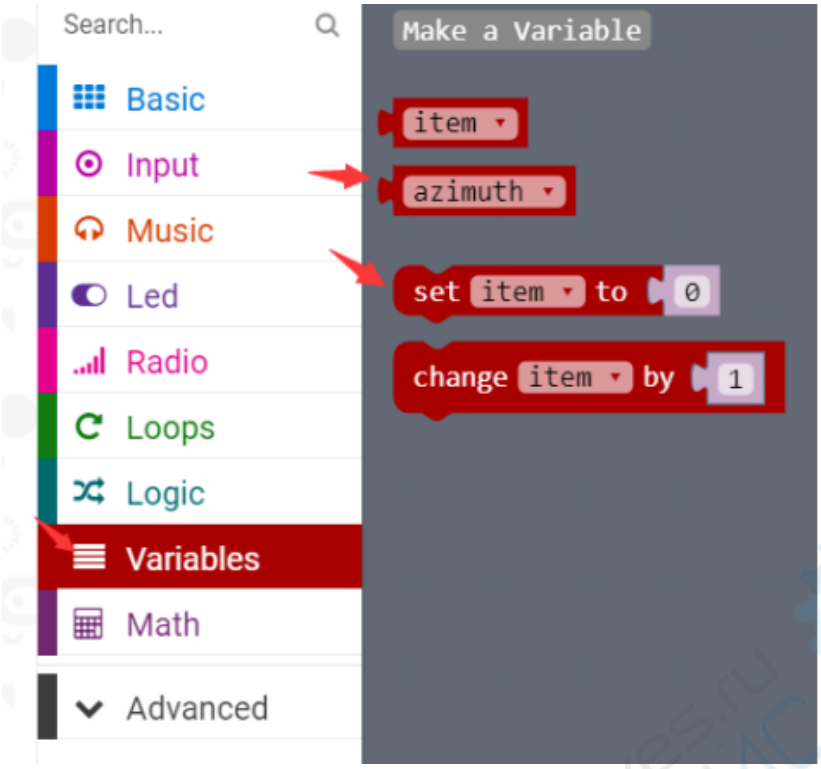
2.Preparation

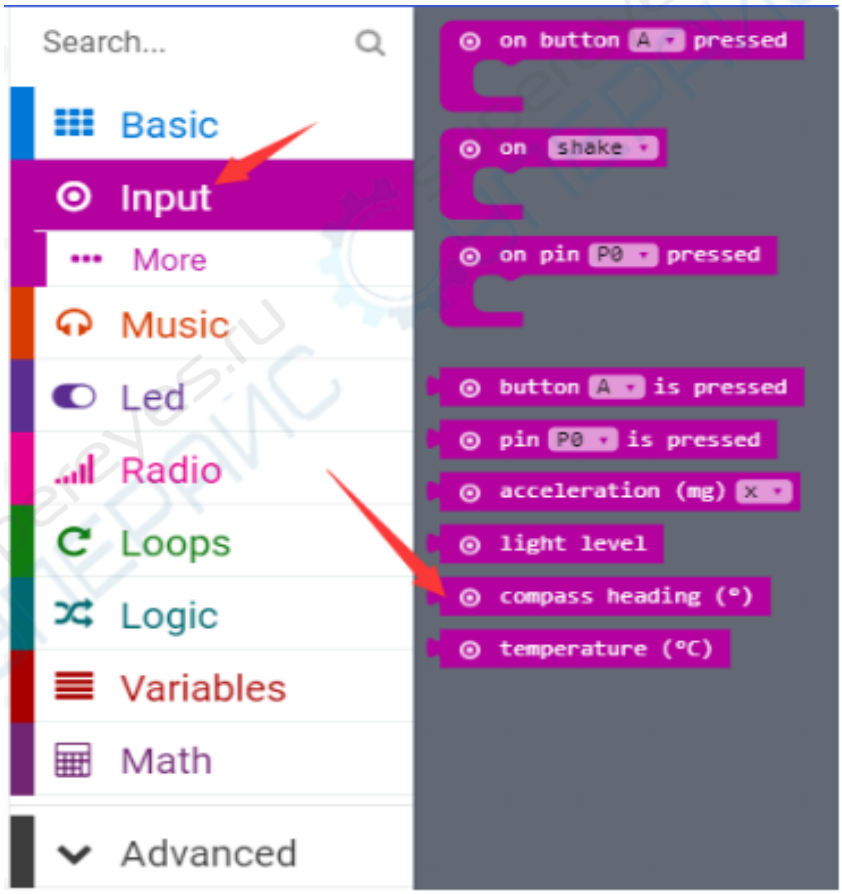
Hardware:

1 X Micro: bit Board
1 X Micro USB Cable
2 X AAA batteries

Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

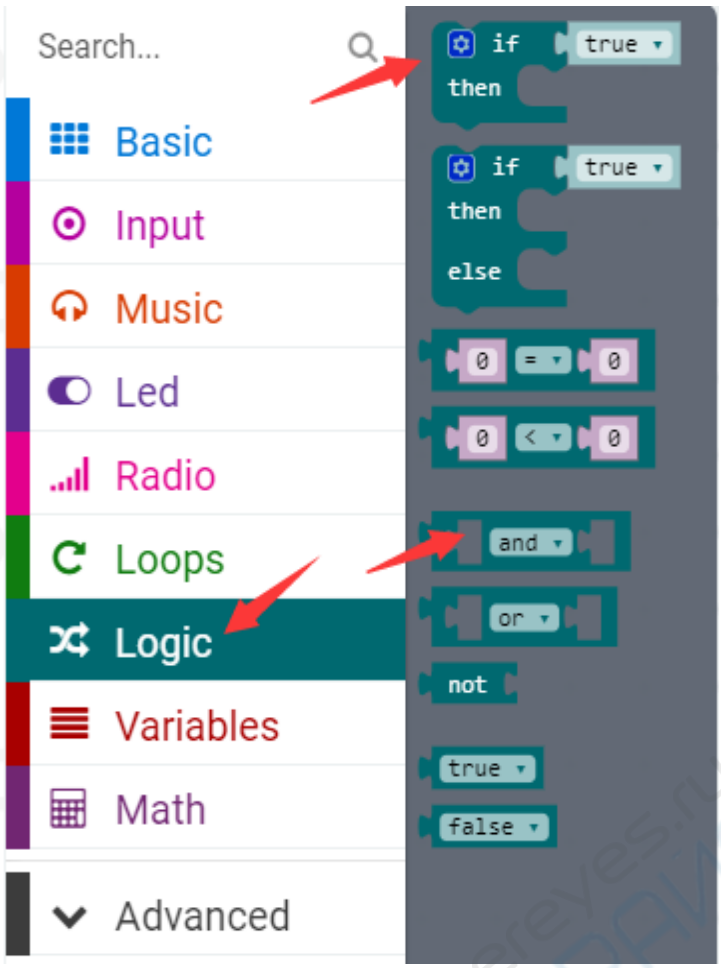
3. Search for blocks

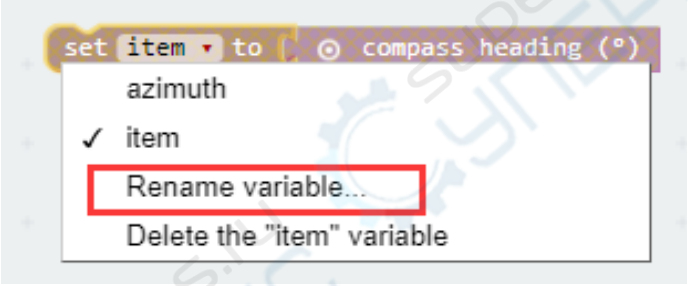


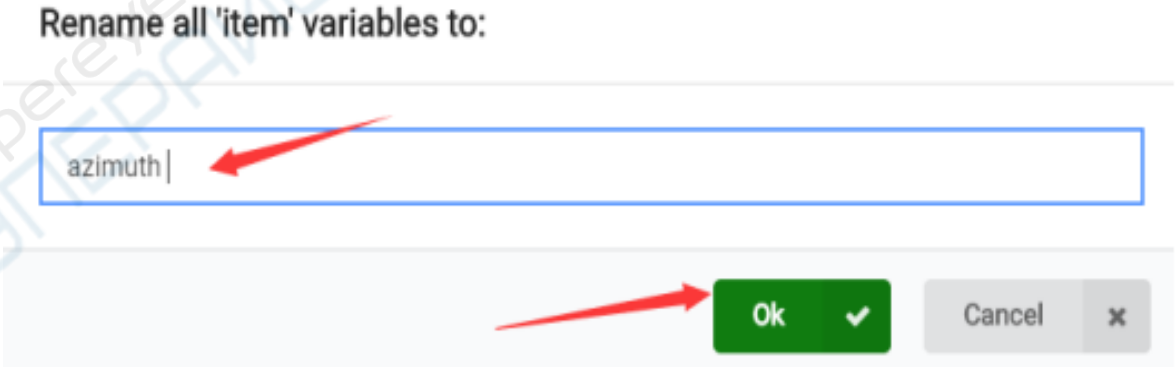


compass heading: “the direction of the compass”,

In micro:bit, we use the degree to indicate its direction by default.

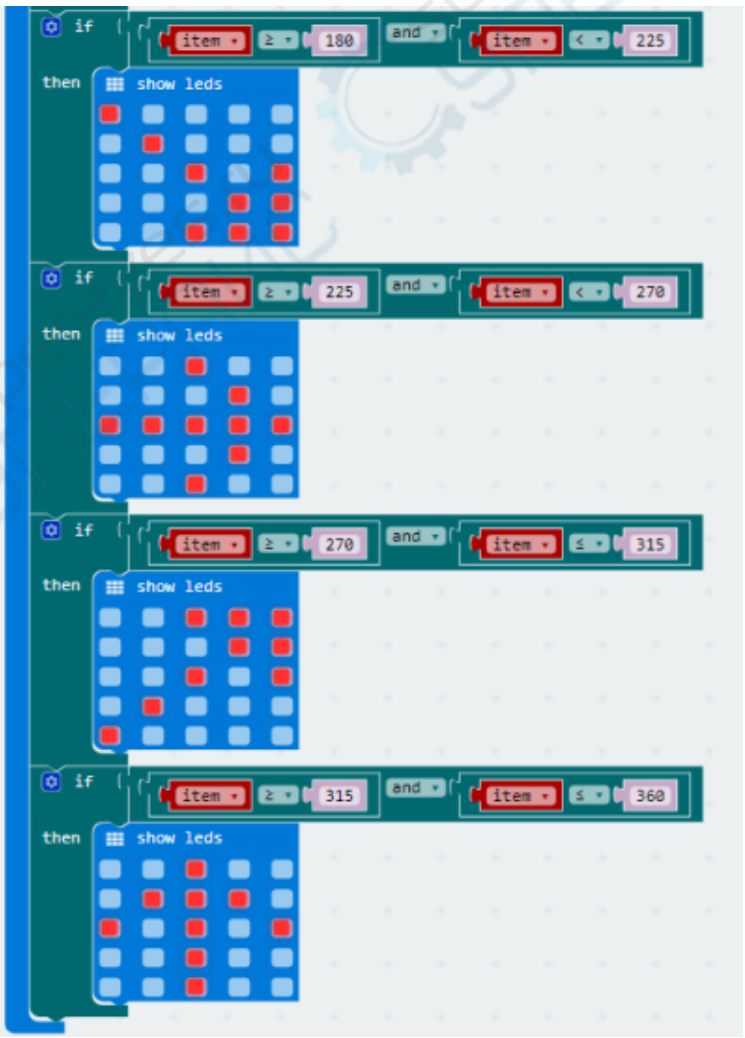

Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
if true then
if true then else
0 = 0
0 < 0
and
or
not
true
false


set item to compass heading (°)
azimuth
item
Rename variable...
Delete the "item" variable


Rename all 'item' variables to:
azimuth
Ok
Cancel

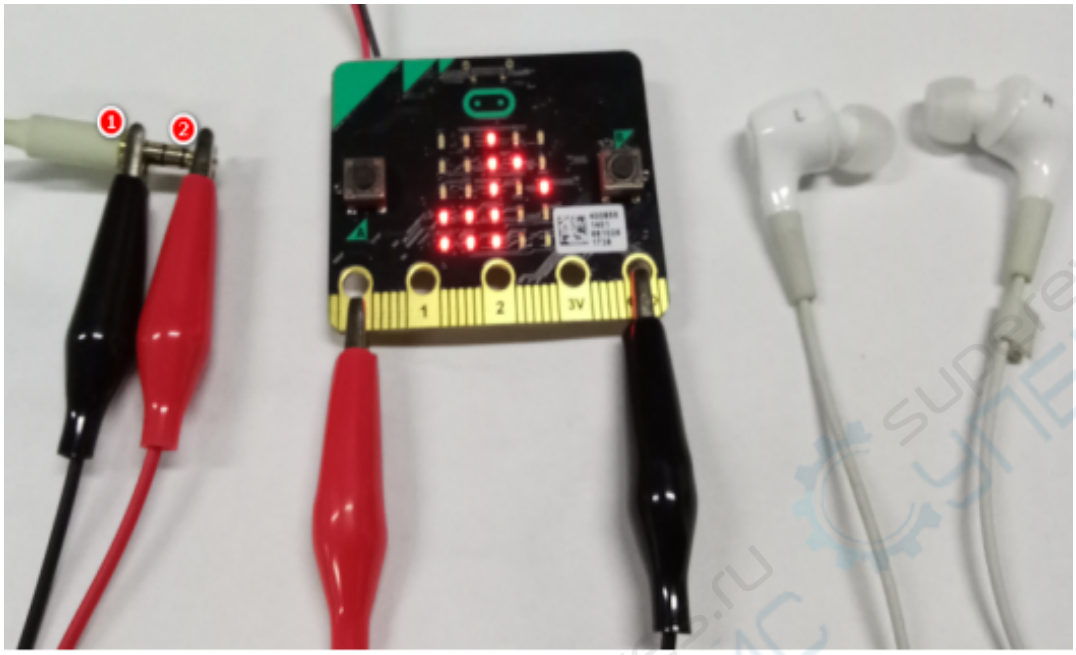

Rename to azimuth
set azimuth to compass heading (°)

4. Combine blocks

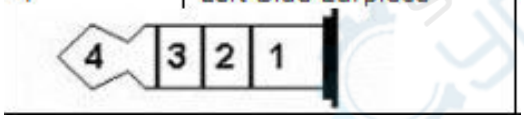


Lesson 6 “Listen to music”

1. Learning goals:



PIN	Description
1	Ground
2	Microphone
3	Right Side Earpiece
4	Left Side Earpiece



You need two crocodile clips and a pair of headphones for this experiment. First, the black crocodile clip is used to clamp the GND of micro:bit, and the black crocodile clip on the other side clamps the interface of the earphone.

Then use the red crocodile clip to clamp P0, and the other end clamps the interface of the earphone 2.After downloading the program, you can play music from the earphone.

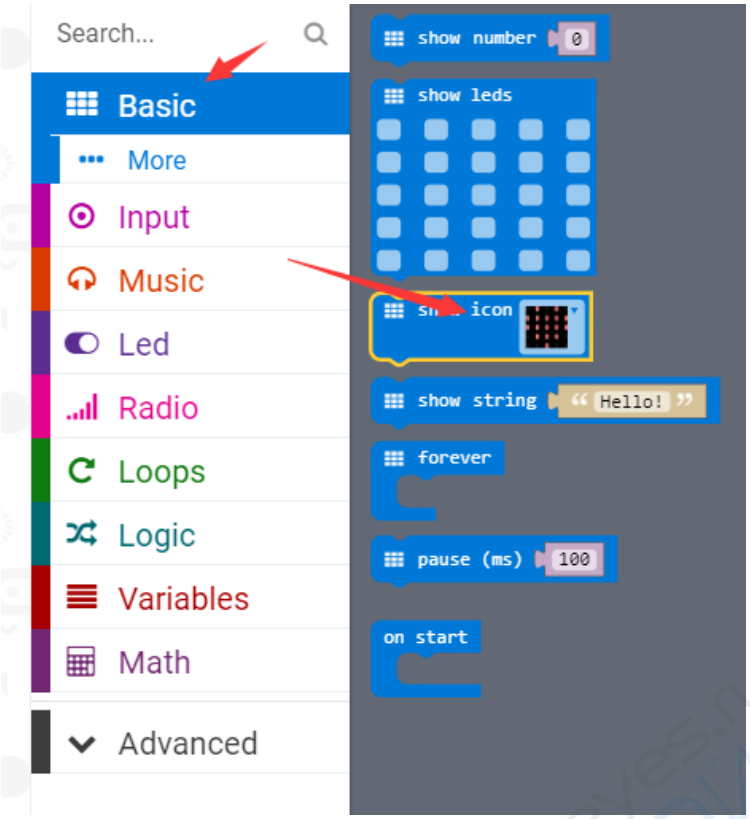
2.Preparation

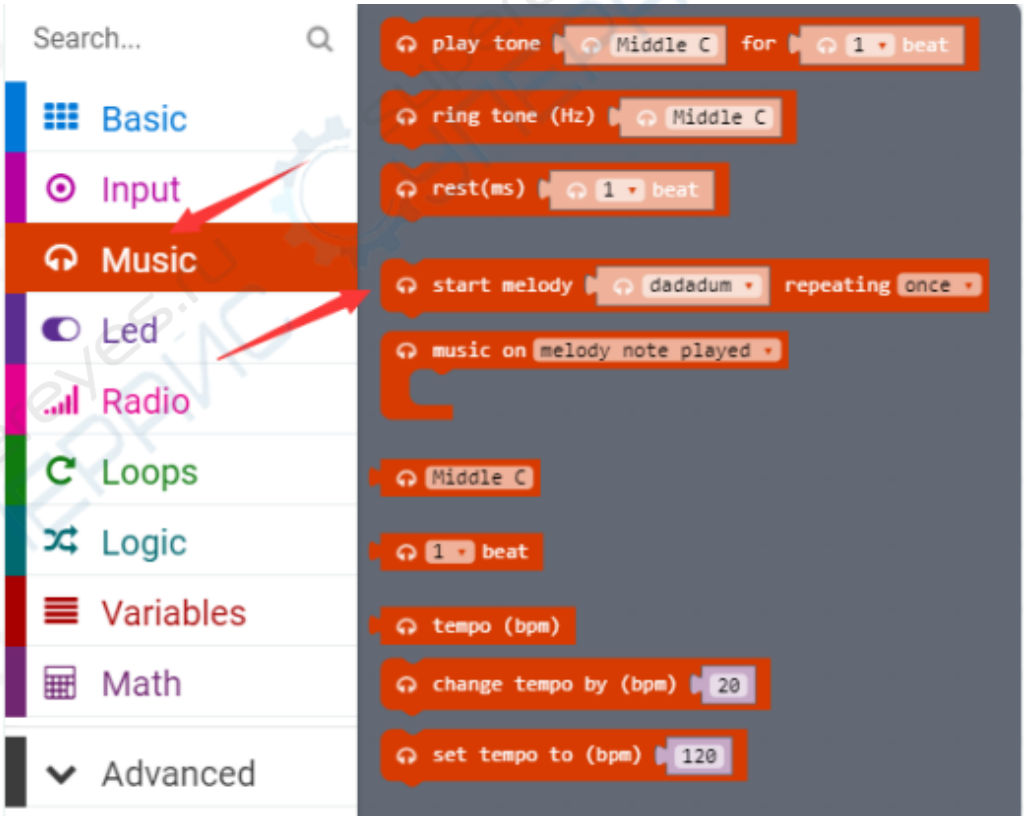
Hardware:

1 X Micro: bit Board
1 X Micro USB Cable
2 X Crocodile clip cable
1 X Headphones
2 X AAA batteries

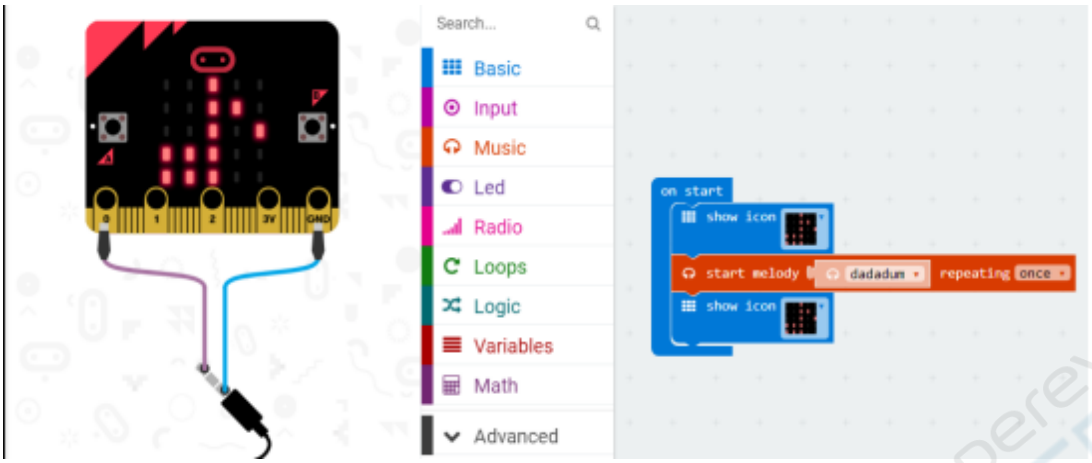
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

3. Search for blocks



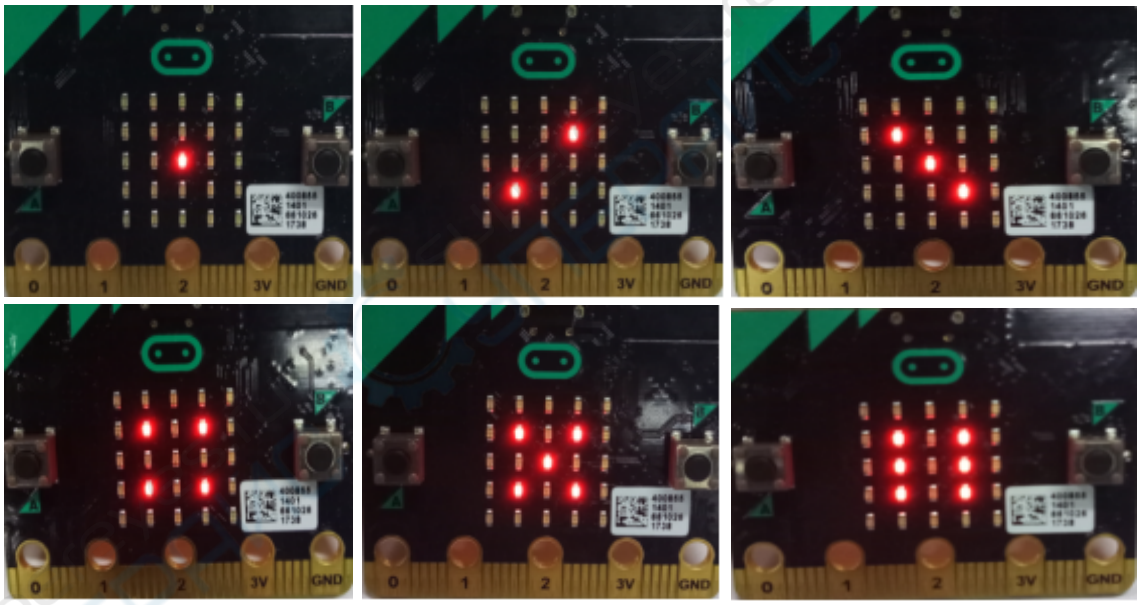


4. Combine blocks



Lesson 7 “Dice game”

1. Learning goals:



After downloading the program, shake a roll of micro:bit. There are 1-6 points randomly appearing on the dot matrix, which is exactly the same as playing the dice. You can call your buddy to play this game, see who points out relatively large

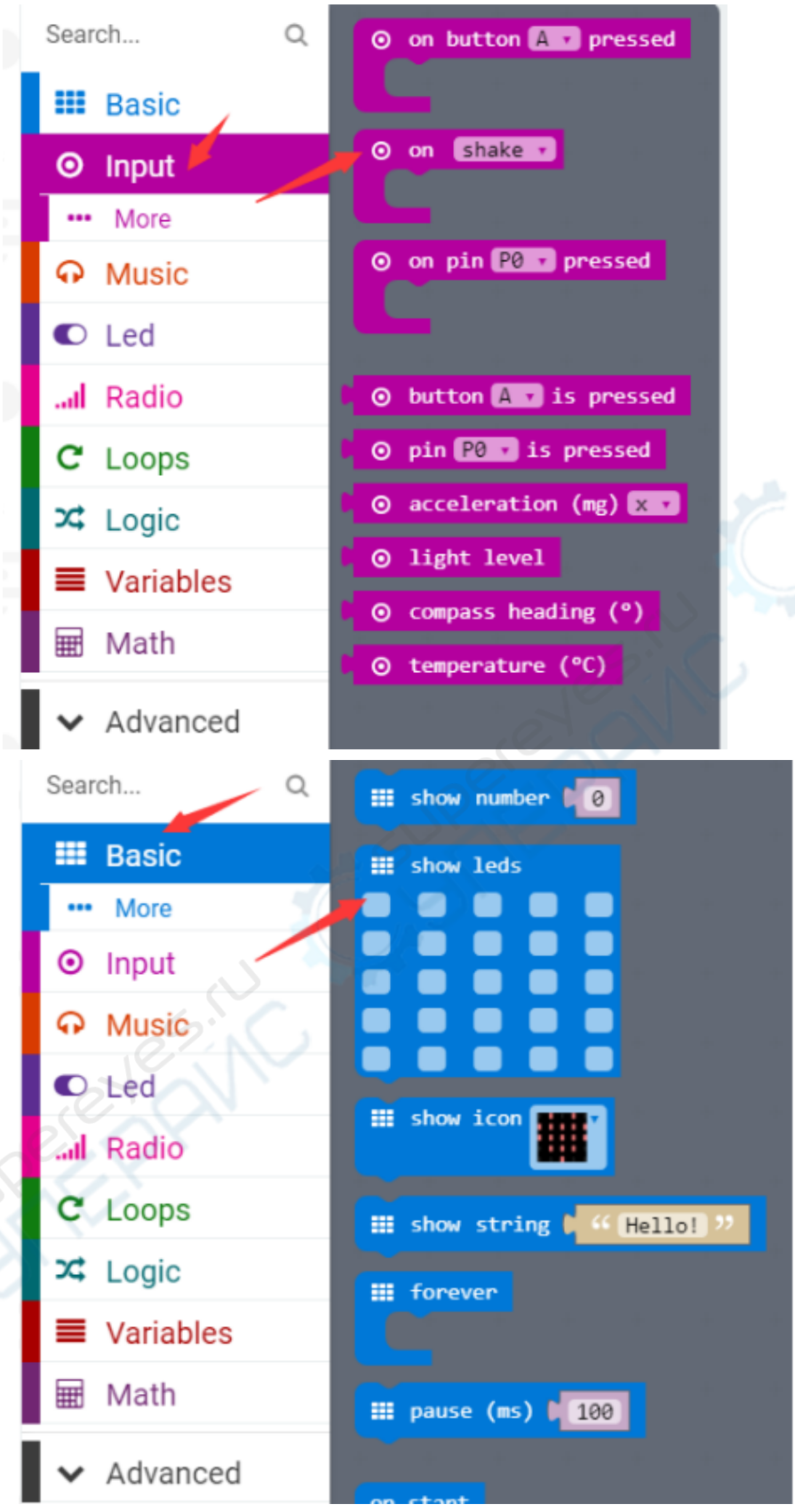
2.Preparation

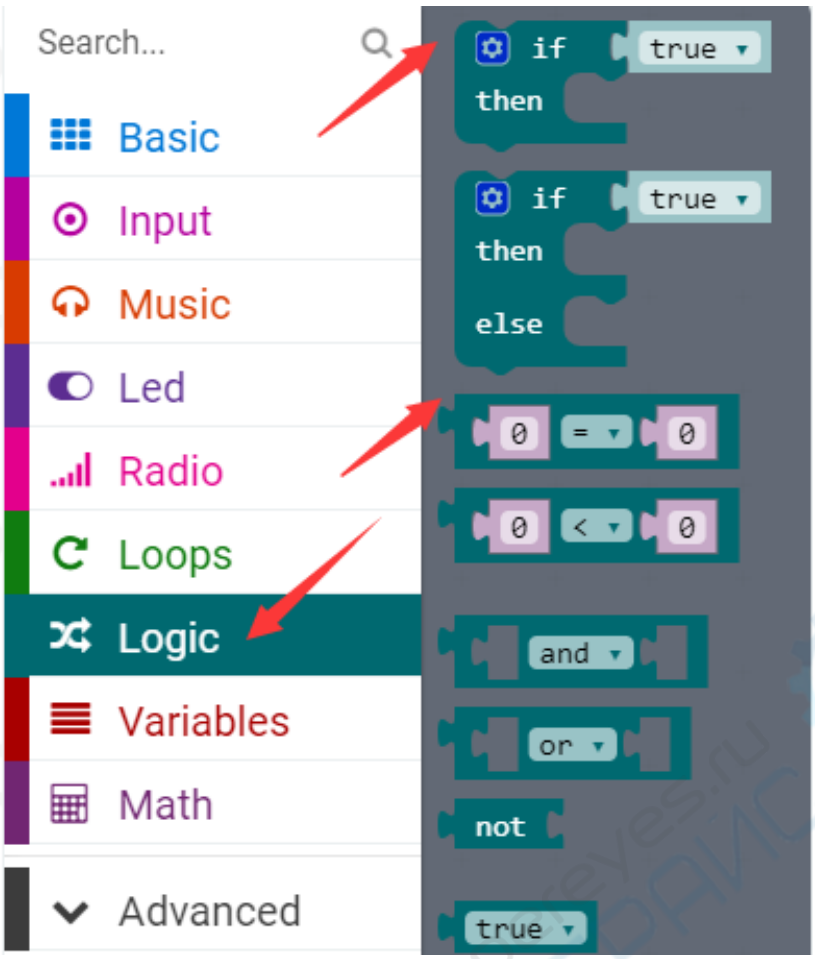
Hardware:

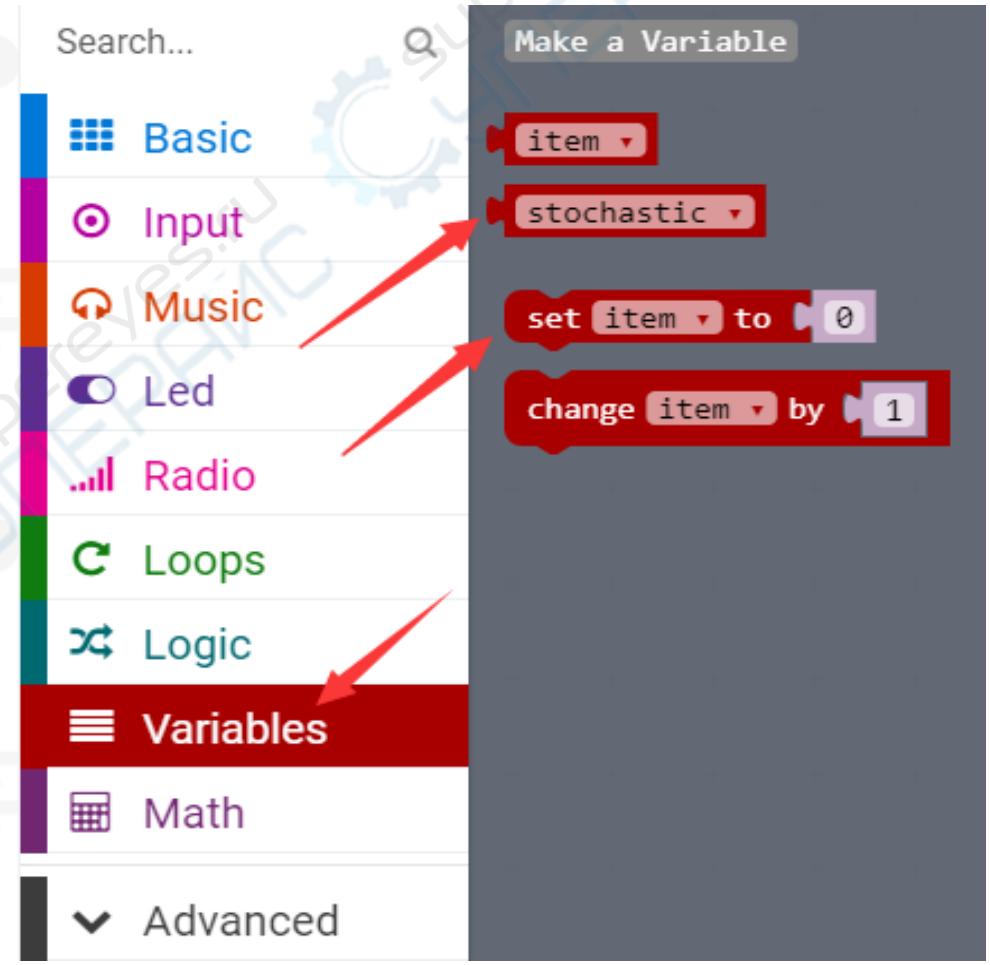
1 X Micro: bit Board
1 X Micro USB Cable
2 X AAA batteries

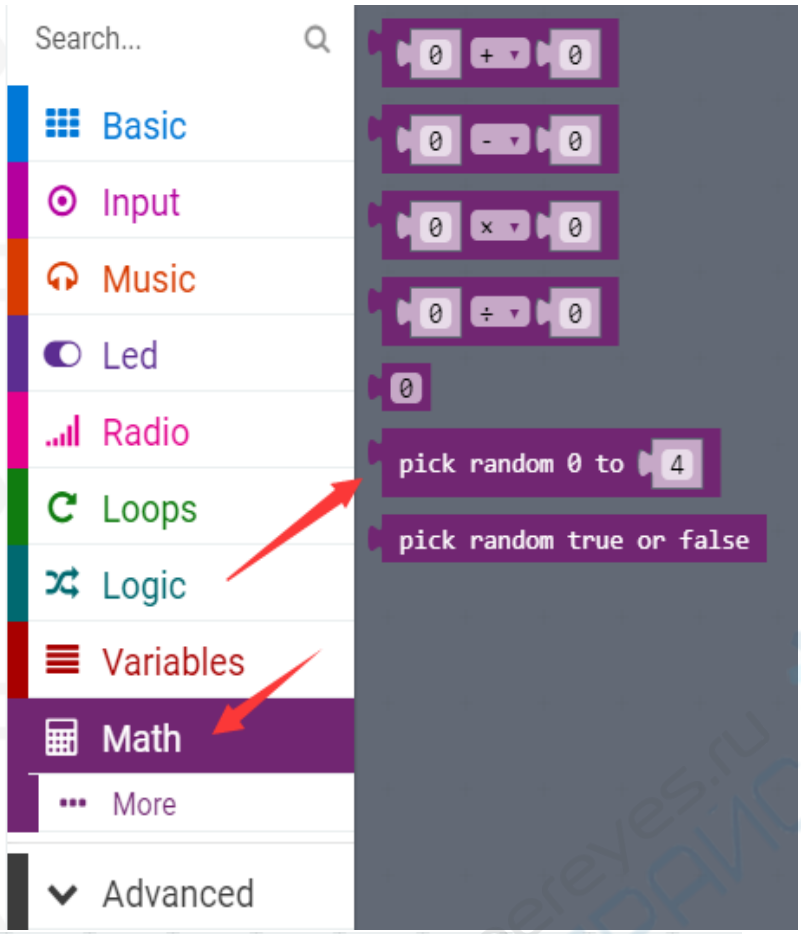
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

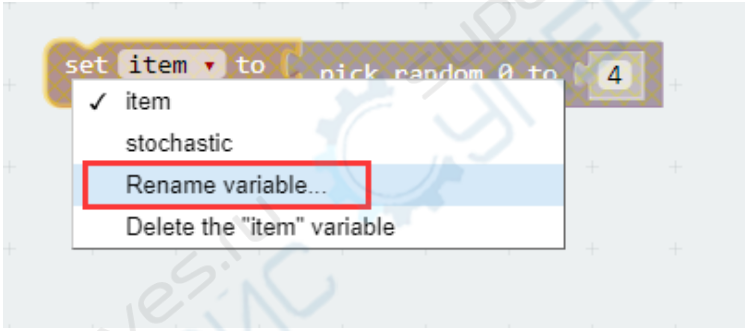
3. Search for blocks

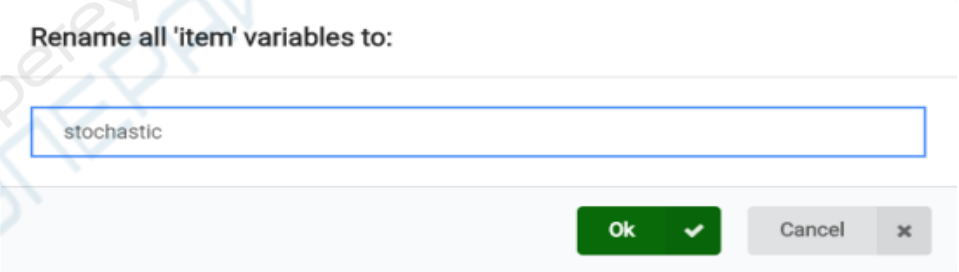



Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
if true then
if true then else
0 = 0
0 < 0
and
or
not
true


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
Make a Variable
item
stochastic
set item to 0
change item by 1

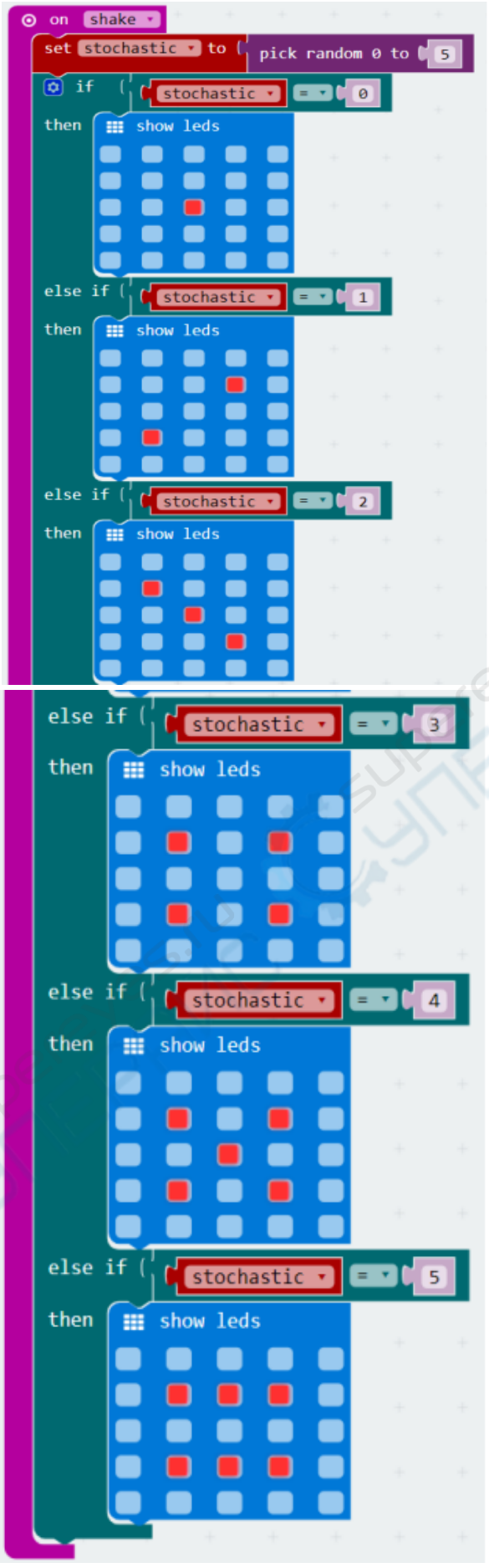

Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
More
Advanced
0 + 0
0 - 0
0 × 0
0 ÷ 0
0
pick random 0 to 4
pick random true or false


set item to pick random 0 to 4
item
stochastic
Rename variable...
Delete the "item" variable


Rename all 'item' variables to:
stochastic
Ok
Cancel

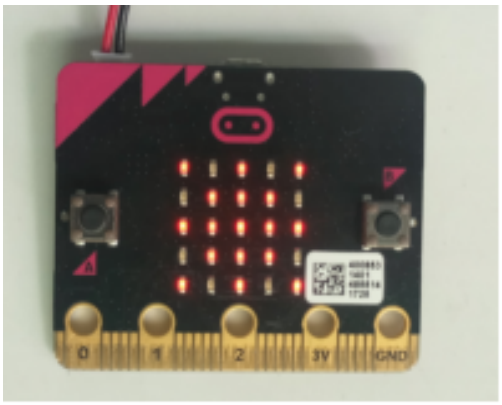

New variable name
set stochastic to pick random 0 to 4

4. Combine blocks

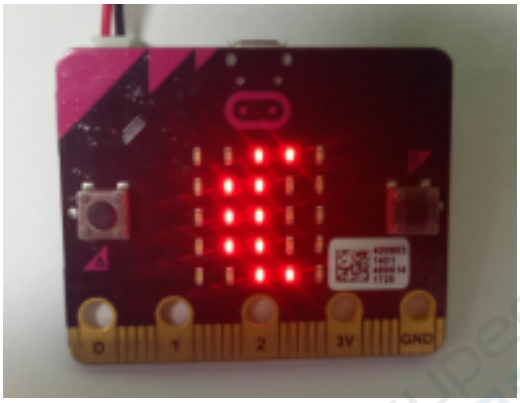


Lesson 8 “Good morning, good night”

1. Learning goals:



Sunlight(Good morning)



Moon (Good evening)

After downloading the program,When the micro:bit development board is in the brighter environment, a pattern of the sun will be displayed on the dot matrix, which means to say “good morning” to everyone. similarly, when in a dark environment, the moon pattern will be displayed on the dot matrix, which means to say “good night” to everyone.

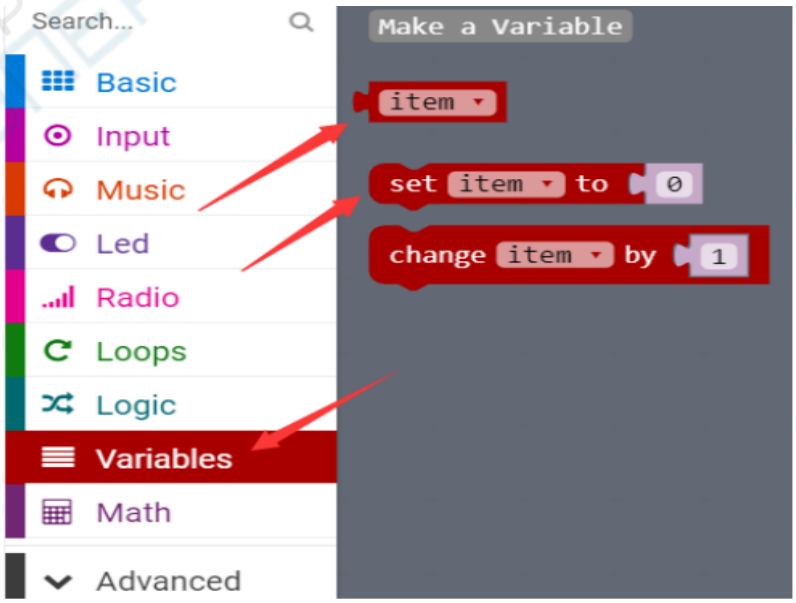
2.Preparation

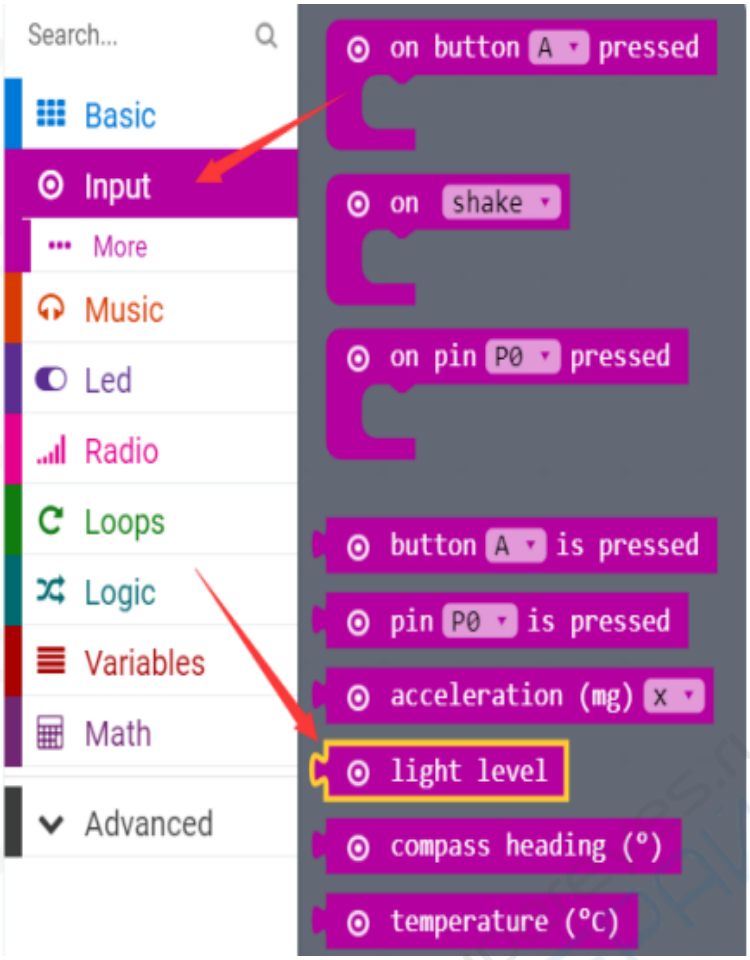
Hardware:

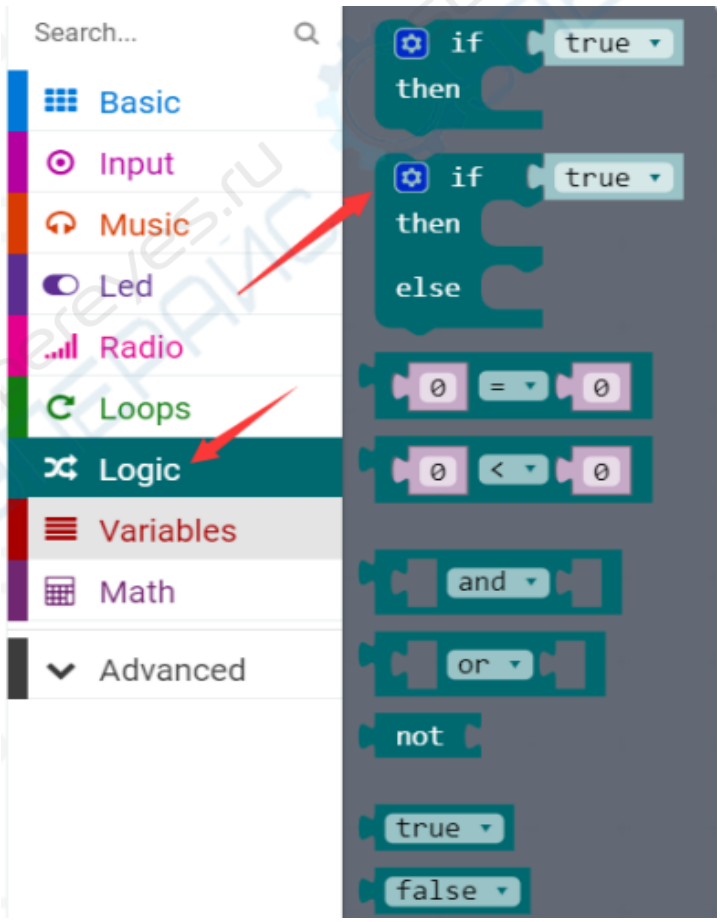
1 X Micro: bit Board
1 X Micro USB Cable
2 X AAA batteries

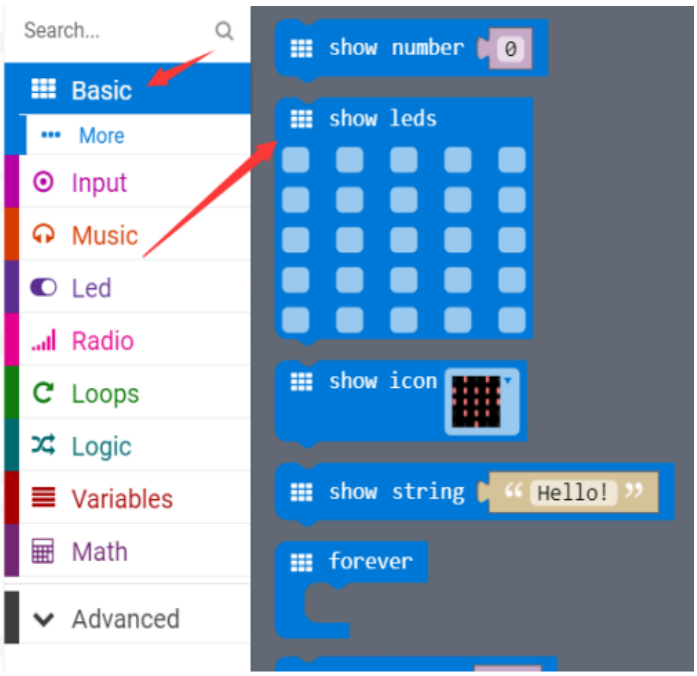
Then the micro:bit is connected to the computer through USB, and the computer will pop up a U disk and click the URL in the U disk to enter the programming interface.

3.Search for blocks

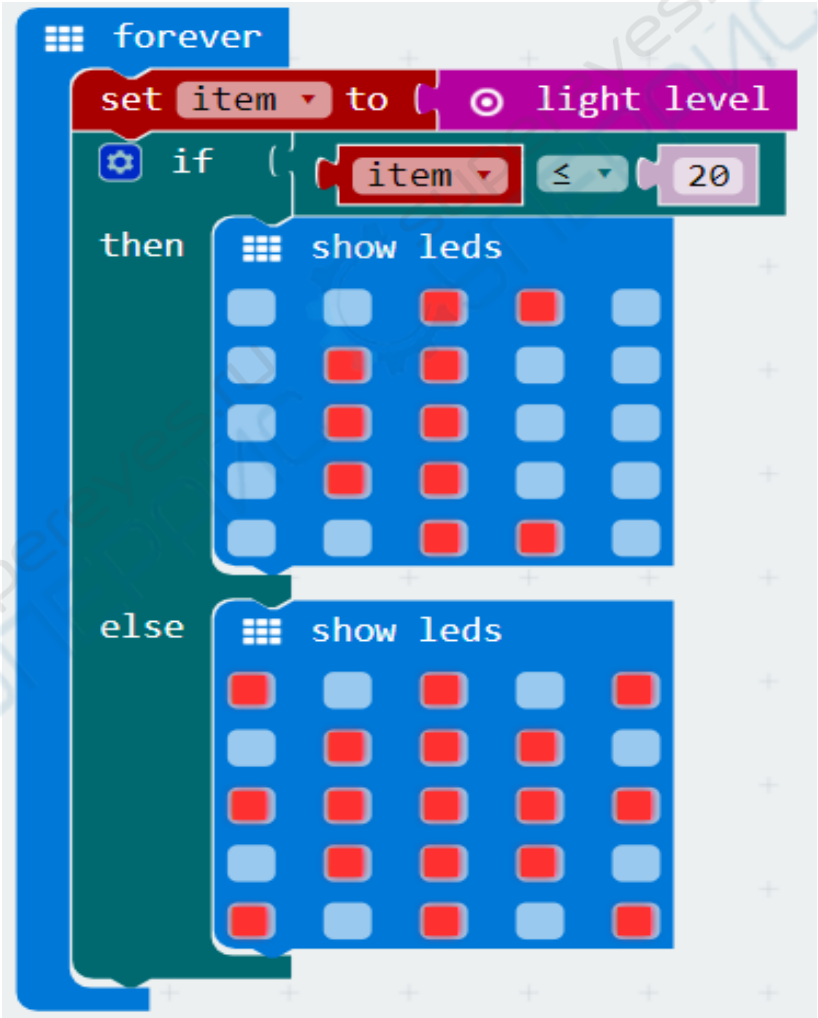



Search...
Basic
Input
More
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
on button A pressed
on shake
on pin P0 pressed
button A is pressed
pin P0 is pressed
acceleration (mg) X
light level
compass heading (°)
temperature (°C)


Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
if true then
if true then
else
0 = 0
0 < 0
and
or
not
true
false



4. Combine blocks



20 here is an intermediate value set freely,The meaning of building blocks is that:If the current light intensity is less than 20, the moon will appear on the dot matrix. If greater than 20, the sun will appear.

Median value: Put all the numbers in numerical order. If there is an odd number of results, the median is the middle number. If there is an even number of results, the median will be the mean of the two central numbers.(in this course, you can set the middle value on your own).