Product Details

This Micro:bit expansion board is compatible with all Micro:bit boards. The IO ports are extended by RJ11 interfaces, which is convenient for connecting external sensors. Inside is a 3.3V-5V levels conversion circuit. That applies 3.3V and 5V   sensors.
When the working voltage is 3.3V, you need to turn the

DIP switch at V to 3.3V end   ; if the working voltage is 5V, you need to turn the DIP switch at V to 5V end, and turn the DIP switch at the power socket to ON end
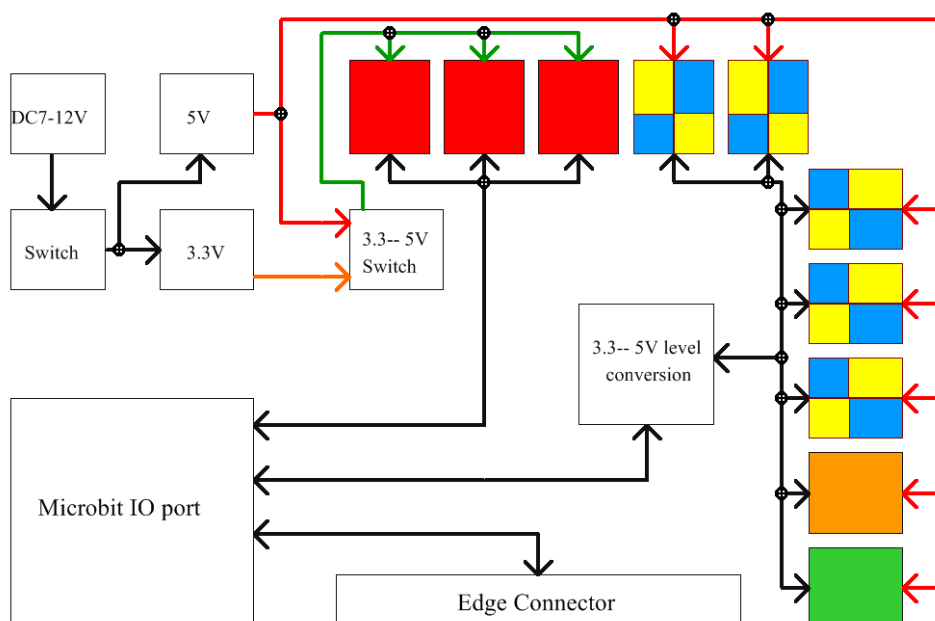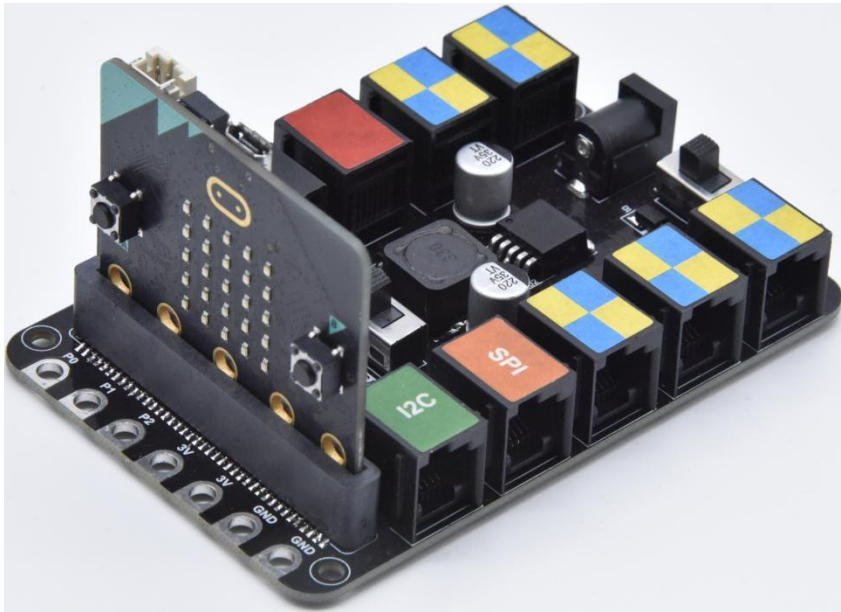
.
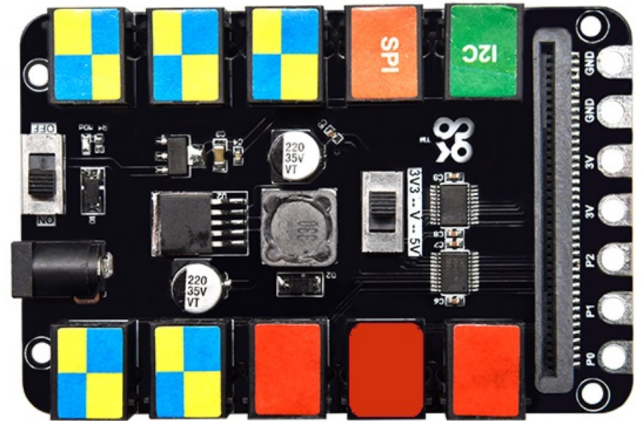
Features and Benefits

- DC seat input voltage: 7-12V recommended
- 3.3V maximum output Current: 800mA
- 5V maximum output Current: 3A
- Interface: RJ116P6C
- Compatible with all Micro:bit boards

Technical Drawings

The Micro:bit shield works with the Micro:bit board.
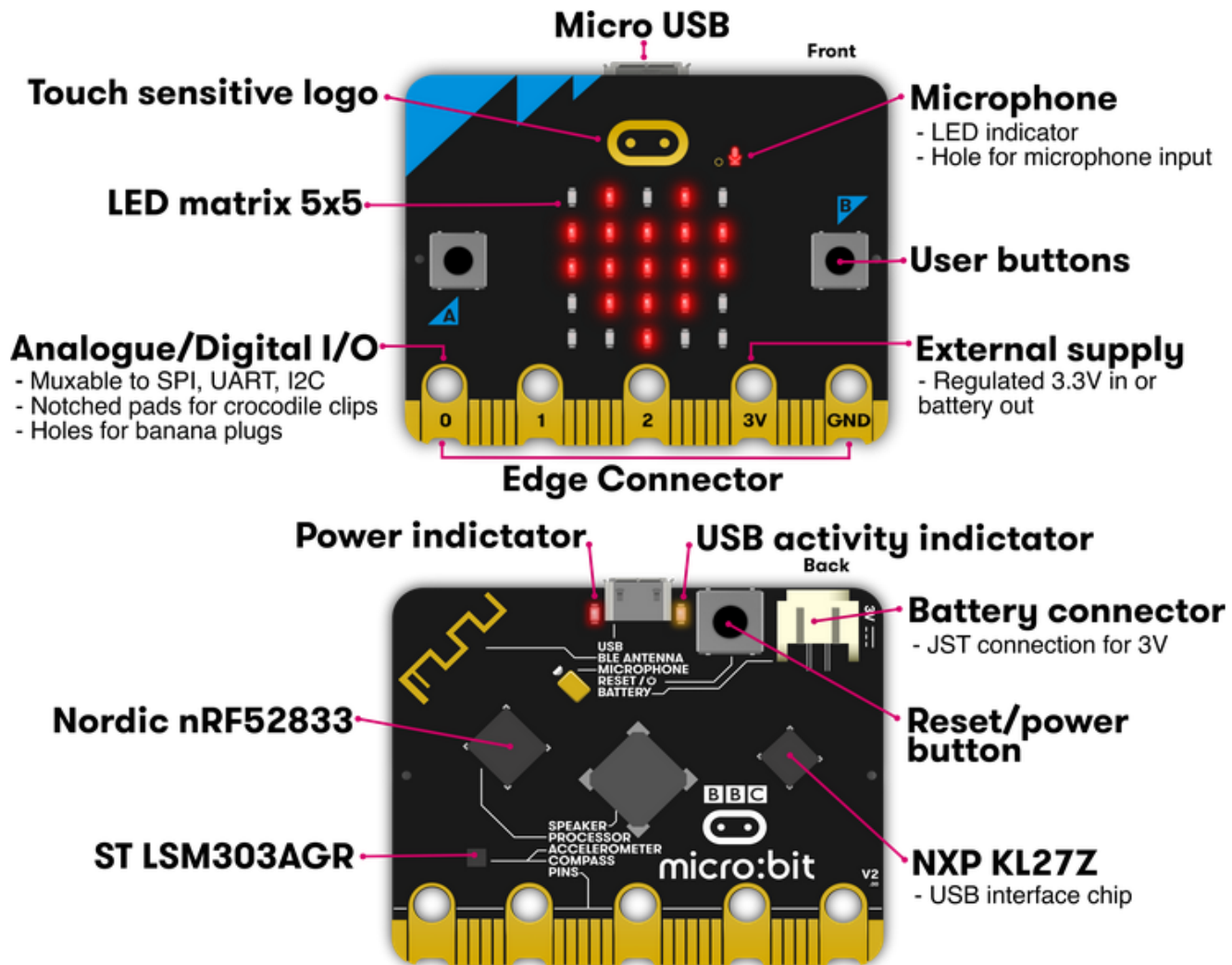

3.   What is Micro:bit?

Designed by BBC, Micro:bit main board aims to help children aged above 10 years old to have a better learning of programming.

It is equipped with loads of components,including a 5*5 LED dot matrix, 2 programmable buttons, a compass, a Micro USB interface and a Bluetooth module and others. Though it is just the size of a credit card, it boasts multiple functions. To name just a few, it can be applied in programming video games, making interactions between light and sound, controlling a robot, conducting scientific experiments, developing wearable devices and make some cool inventions like robots and musical instruments, basically everything imaginable.

The latest version, that's version 2.0, of Micro:bit main board has a touch-sensitive logo and a MEMS microphone. And there is a buzzer built in the other side of the board which makes playing all kinds of sound possible without any external equipment. The golden fingers and gears added provide a better fixing of crocodile clips. Moreover, this board has a sleeping mode to lower the power consumption of battery and it can be entered if users long press the Reset & Power button on the back of it. More importantly, the CPU capacity of this version is much better than that of the V1.5 and the V2 has more RMA.

In final analysis, the Micro:bit main board V2 can allow customers to explore more functions so as to make more innovative products.
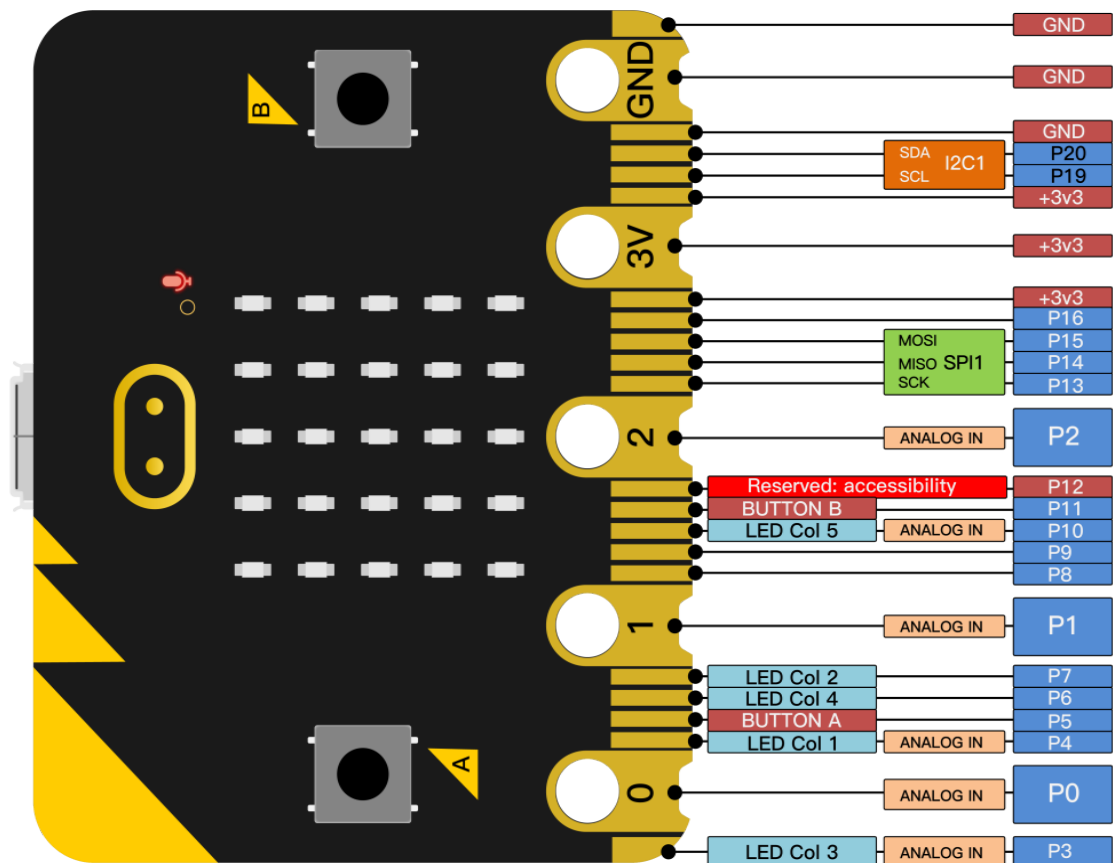
（2）**Micro:bit Board**：

Press the reset& power button to reset the Micro:bit

For more details: https://tech.microbit.org/hardware/
https://microbit.org/new-microbit/
https://www.microbit.org/get-started/user-guide/overview/
https://microbit.org/get-started/user-guide/features-in-depth/

Pinout

Pinout functions of the Micro:bit board

GPIO	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、P10、P11、P12、P13、P14、P15、P16、P19、P20
ADC/DAC	P0、P1、P2、P3、P4、P10
i2c	P19(SCL)、P20(SDA)
SPI	P13(SCK)、P14(MISO)、P15(MOSI)
PWM（commonly used）	P0、P1、P2、P3、P4、P10
PWM（uncommonly used）	P5、P6、P7、P8、P9、P11、P12、P13、P14、P15、P16、P19、P20
Occupied	P3(LED Col3)、P4(LED Col1)、P5(Button A)、P6(LED Col4)、P7(LED Col2)、P10(LED Col5)、P11(Button B)

For more details, please refer to the official website：
https://tech.microbit.org/hardware/edgeconnector/
https://microbit.org/guide/hardware/pins/

**Note:**

a.   It is recommended to cover it with a silicone protector to prevent short circuit for it has a lot of sophisticated electronic components.

b.   Its IO port is very weak in driving since it can merely handle current less than 300mA. Therefore, do not connect it with devices operating in large current,such as servo MG995 and DC motor or it will get burnt. Furthermore, you must figure out the current requirements of the devices before you use them and it is generally recommended to use the board together with a Micro:bit shield.

c.   It is recommended to power the main board via the USB interface or via the battery of 3V. The IO port of this board is 3V, so it does not support sensors of 5V. If you need to connect sensors of 5 V, a Micro:bit expansion board is required.

d.When using pins(P3, P4, P6, P7, P10)shared with the LED dot matrix, blocking them from the matrix or the LEDs may display randomly and the

data about sensors maybe wrong.

e.The battery port of 3V cannot be connected with battery more than 3.3V or the main board will be damaged.

f. Forbid to use it on metal products to avoid short circuit.

g. Port P19, P20, P19 and P20 cannot be used as IO ports. Only I2C communication can be used.

To put it simple, Micro:bit main board is like a micro computer which has made programming at our fingertips and enhanced digital innovation. And about programming environment, BBC provides a website: https://microbit.org/code/, which has a graphical MakeCode program easy for use.

In fact you don't need to install the driver of the Micro:bit

But if your PC can't recognize the Micro:bit board, you still need to install its driver. You can refer to the file related to how to install the driver of Micro:bit.

| | 📄 Install the driver of Microbit |
| 📁 2.Micro：bit Driver → | 🗔 mbed_usb_2020_x64_1212.exe |
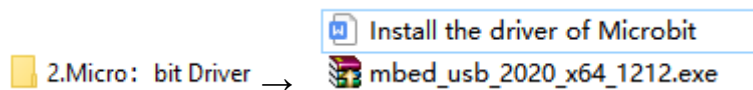
4.Install Micro:bit Driver

Code and Programming：

The following instructions are applied on Windows system but can also serve as a reference if you are using a different system.

You are recommended to browse the official website of Micro:bit for more details, and the link is attached below:

https://microbit.org/guide/quick/

Step 1: Connect the Micro:bit main board

Firstly, link the Micro:bit board with your computer via a USB cable. Macs, PCs, Chromebooks and Linux（including Raspberry Pi）systems are all compatible with the Micro:bit main board.

Note that if you are about to pair the board with your phone or tablet, please refer to this link:

https://microbit.org/get-started/user-guide/mobile/
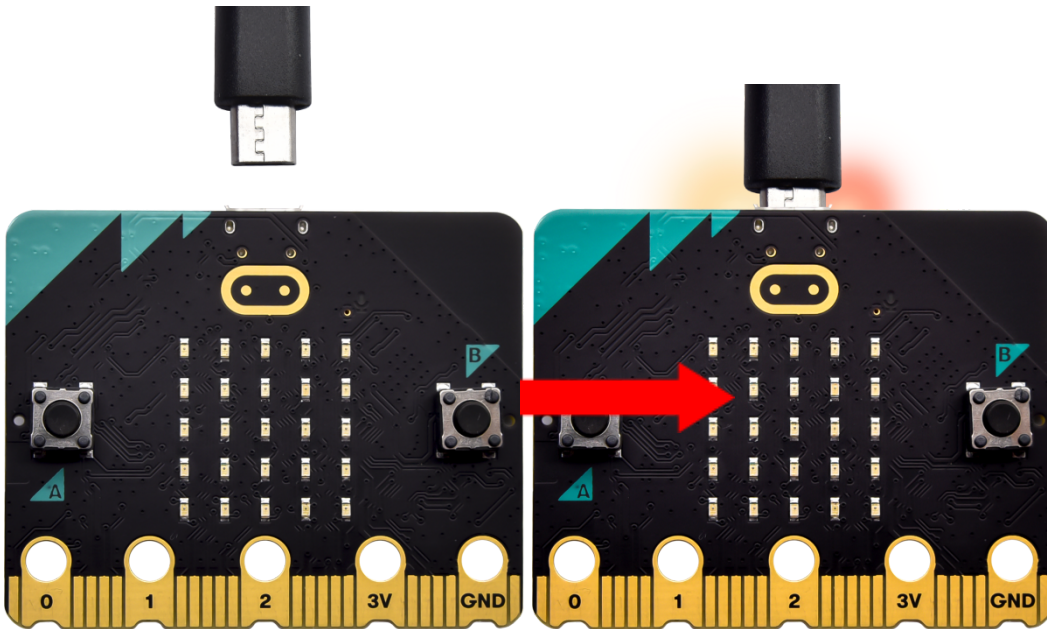
Secondly, if the red LED at the back of the board is on, that means the board is powered. When the Micro:bit communicates with your PC, the LED indicator will flash.

For example, if you are programming a"hex", the Micro:bit board will appear on your computer as a driver named 'MICROBIT'.

Please notethat it is not an ordinary USB disk as shown below.
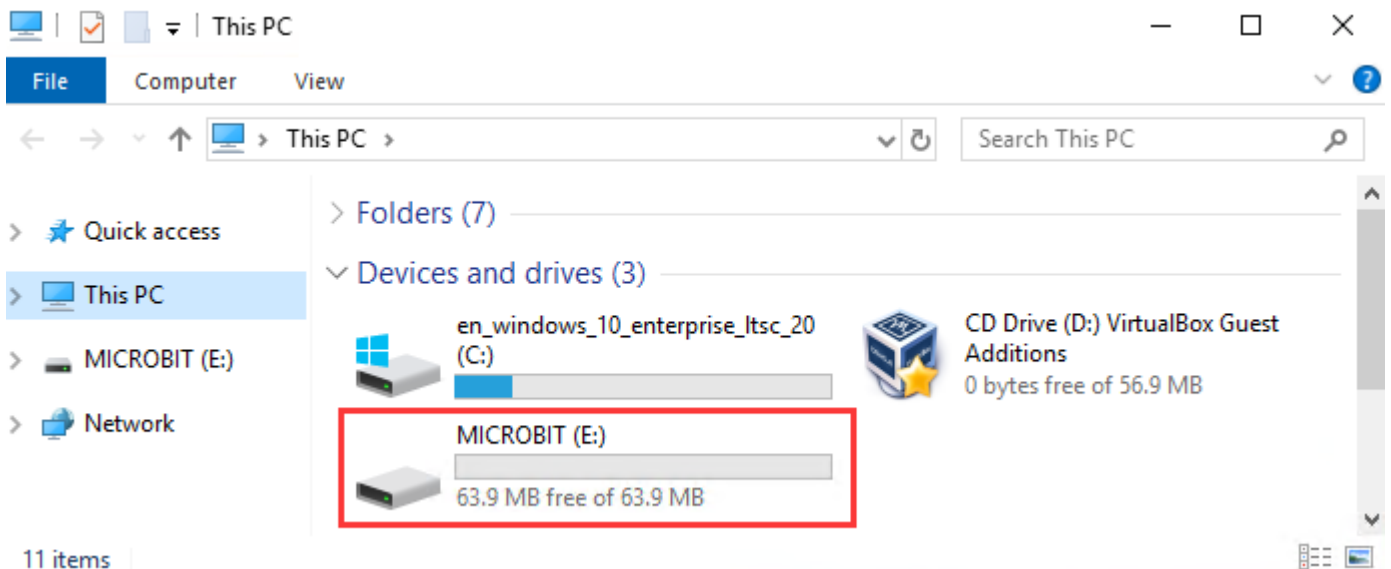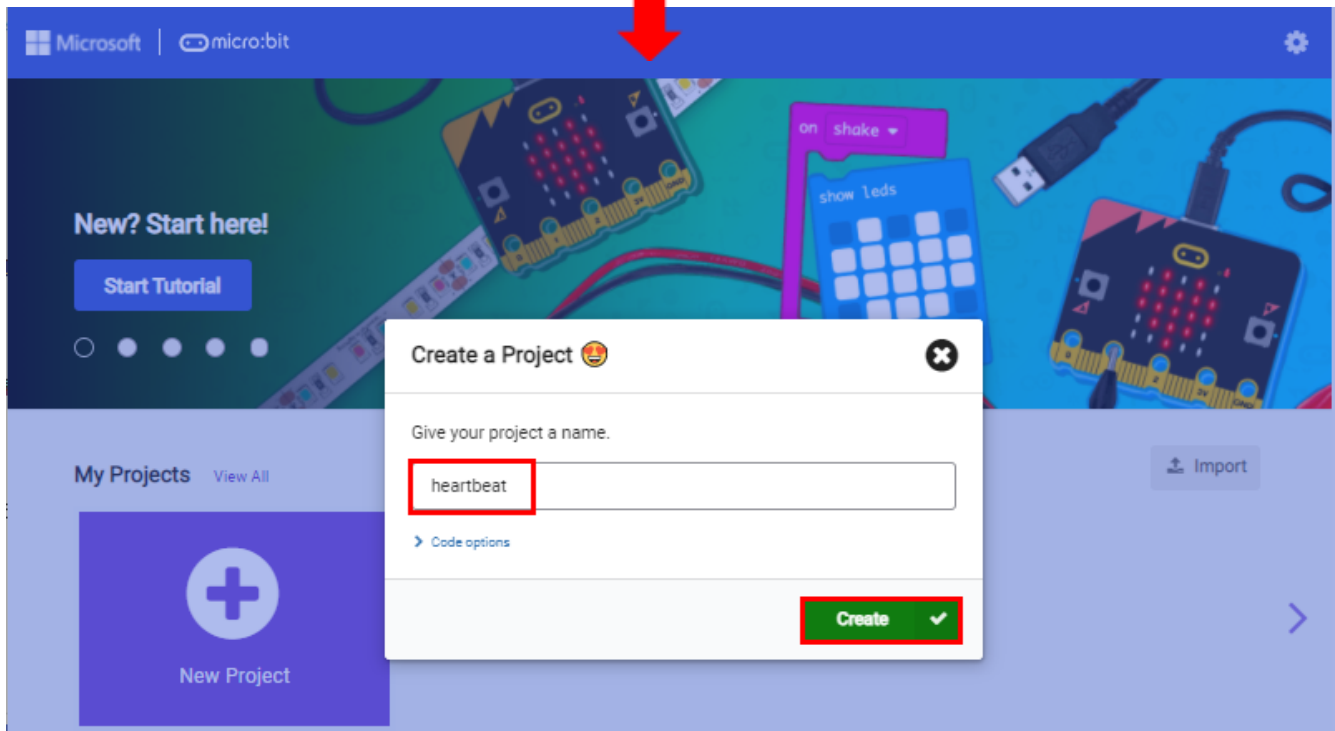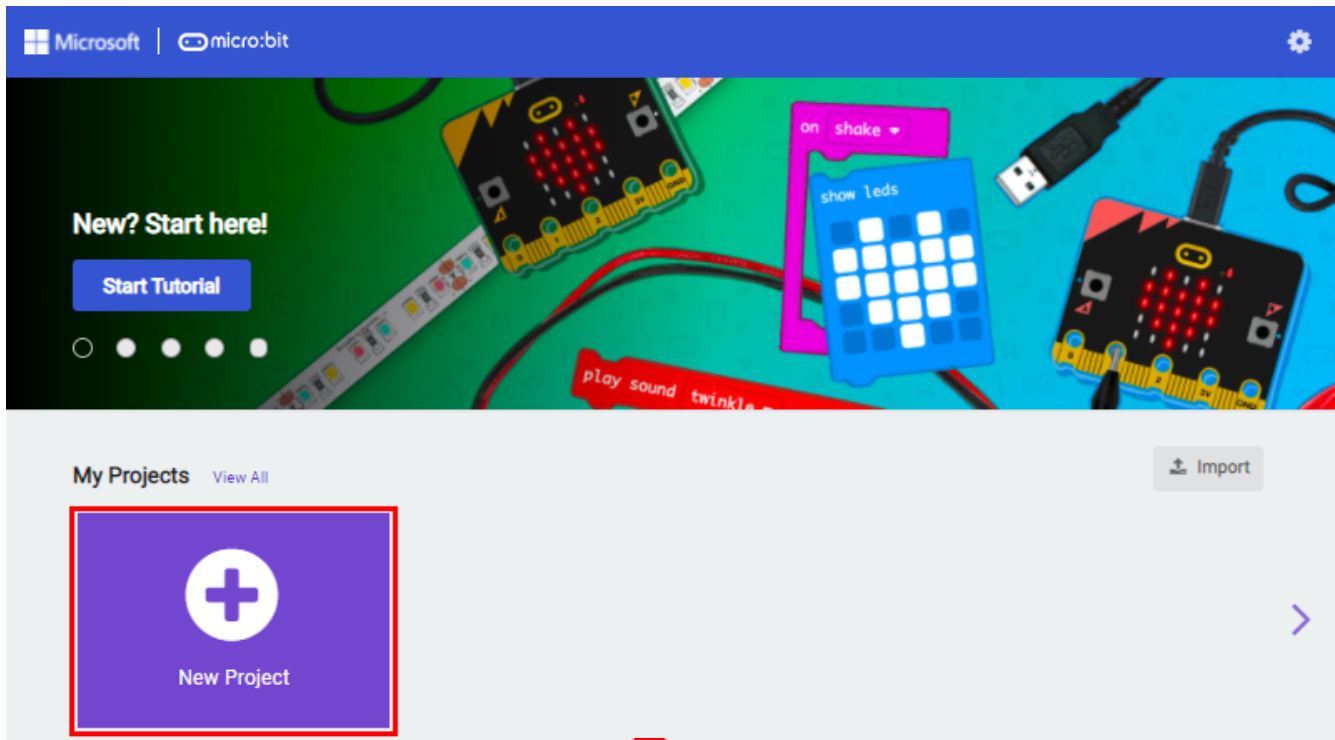

Step 2: Programming

View the link https://makecode.microbit.org/ in your browser;

Click"New Project";

The dialog box'Create a Project' appears, fill it with'heartbeat' and click 'Create √'to edit.

(If you are running Windows 10 system, it is also viable to edit on the Windows 10 APP , which is exactly like editing in the website.

And the link to the Windows 10 APP is https://www.microsoft.com/zh-cn/p/makecode-for-micro-bit/9pjc7sv48lcx?ocid=badgep&rtc=1&activetab =pivot:overviewtab)

Write a set of Micro:bit code. You can drag some modules in the blocks list to the editing area and then run your program in Simulator of MakeCode editor as shown below
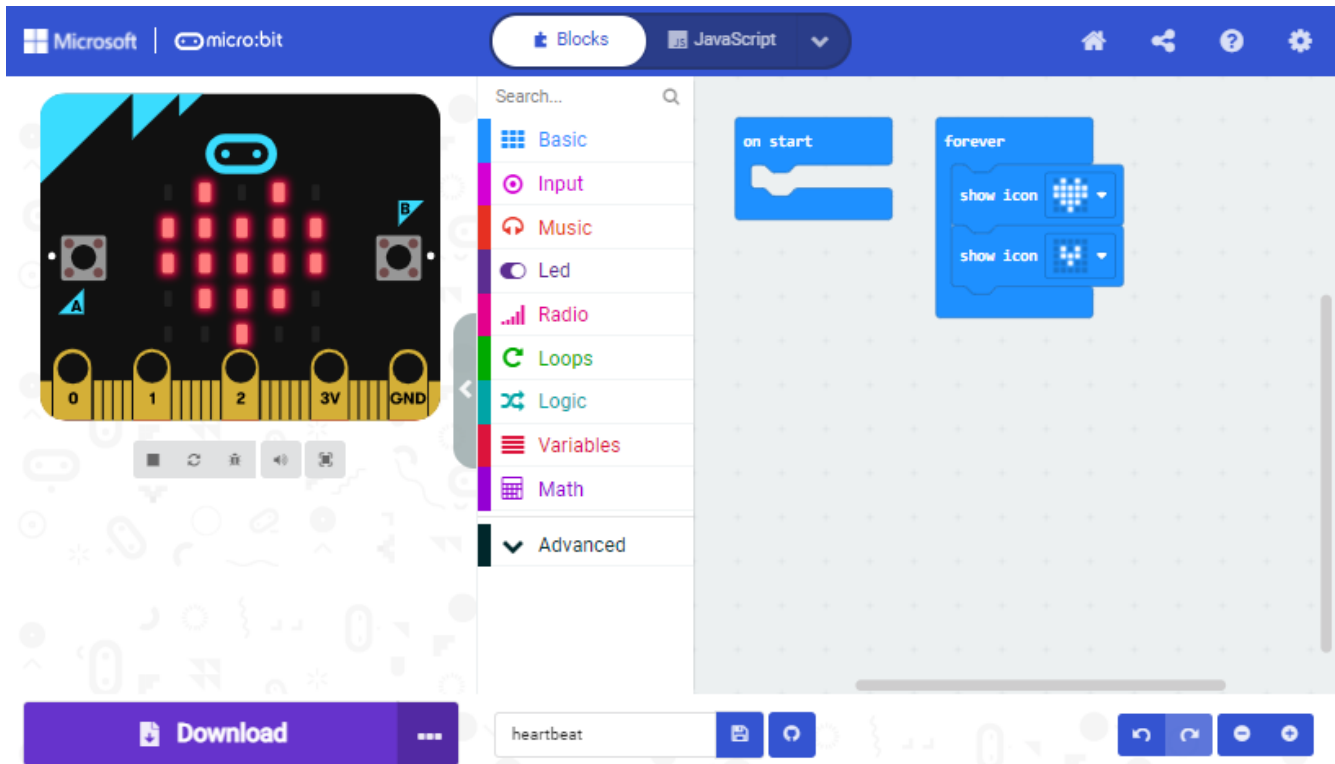
Click"JS JavaScript", you can view JavaScript language code, as shown below;


```javascript
1  basic.forever(function () {
2      basic.showIcon(IconNames.Heart)
3      basic.showIcon(IconNames.SmallHeart)
4  })
5
```
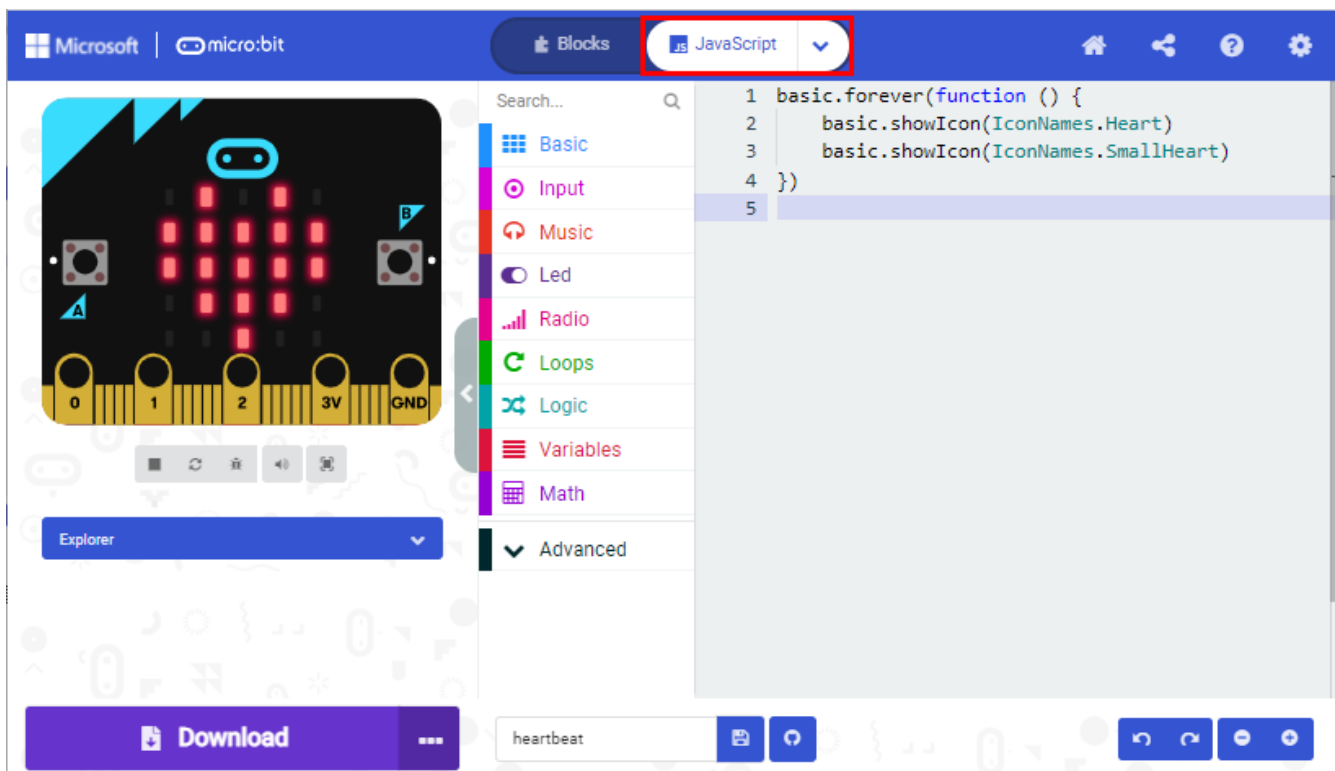
Click"Python"to switch to Python code, as shown below;
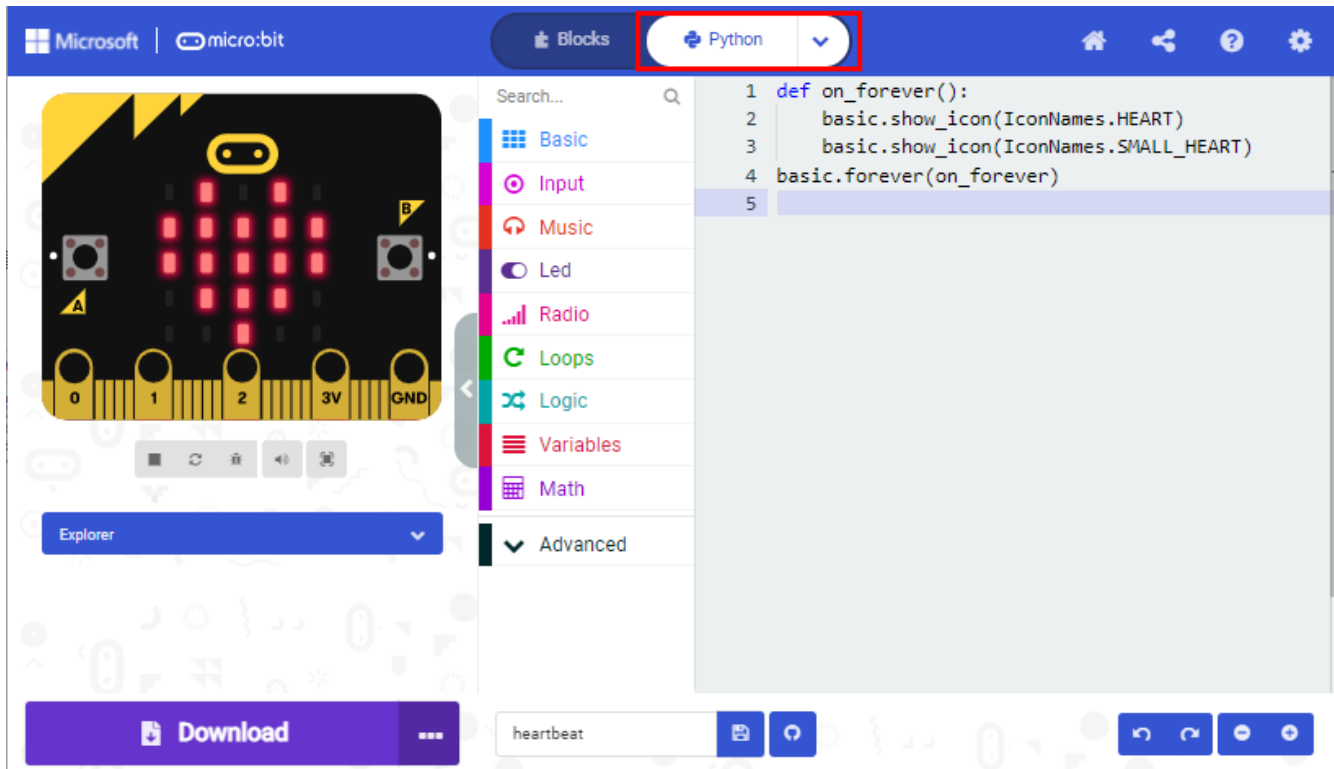
Step 3: Download test code

If you use Windows 10 App to write a code, you only need to click the "Download" button, then the code will be downloaded directly to the Micro:bit board without any other operations.

If you program through the website, following these steps:
Click the"Download"in the editor to download a "hex" file, which is a hexadecimal compact program format that the Micro:bit board can read.Once the hexadecimal file is downloaded, copy it to your Micro:bit board just like the process that you copy the file to the USB driver. For Windows system, you can also right-click and select'Send to → Microbit (E)'to copy the hex file to the Micro:bit main board
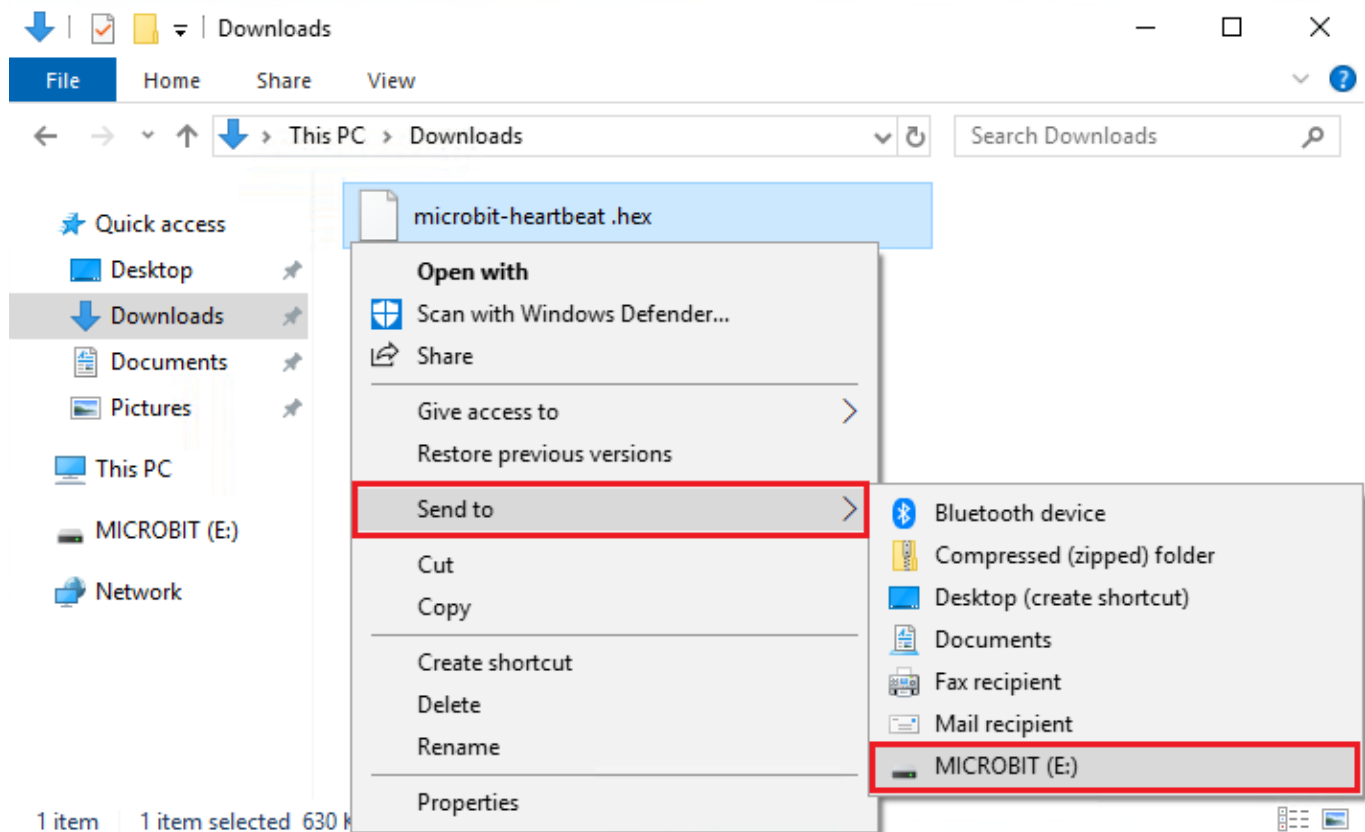
You can also directlydrag the "hex" file onto the MICROBIT (E) disk.
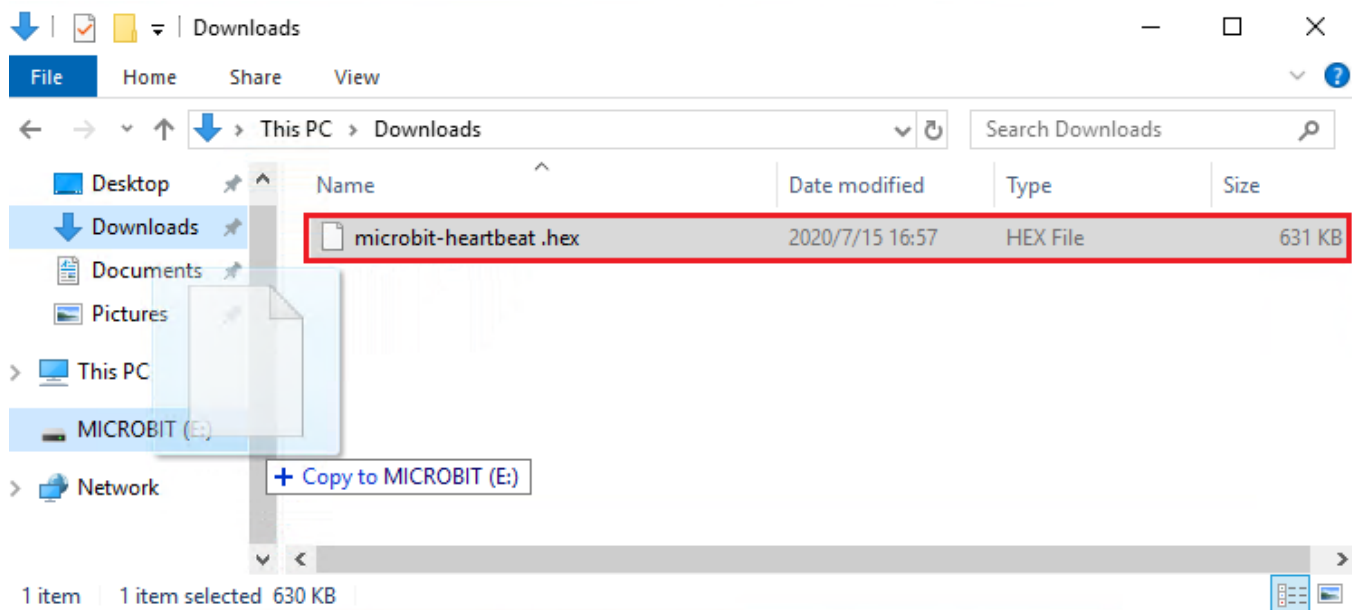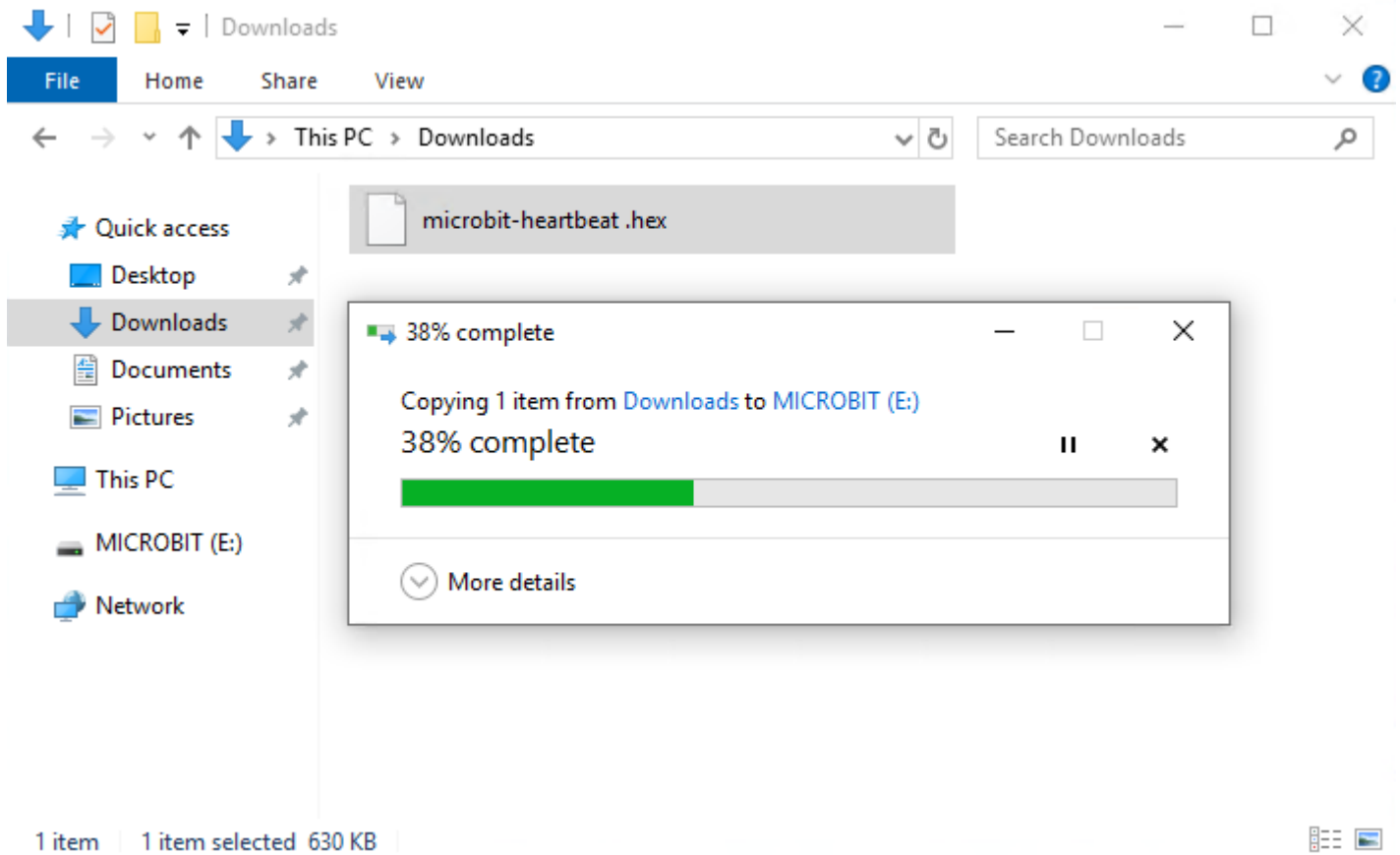
During the process of copying the downloaded hex file to the Micro:bit, the yellow signal light on the back side of the board flashes. When the copy is completed, the yellow signal light will stop flashing and remain on.

Step 4: Run the program
After the program is uploaded to the Micro:bit board, you could still power it via a USB cable or change to via an external power. The 5 x 5 LED dot matrix on the board displays the heartbeat pattern.
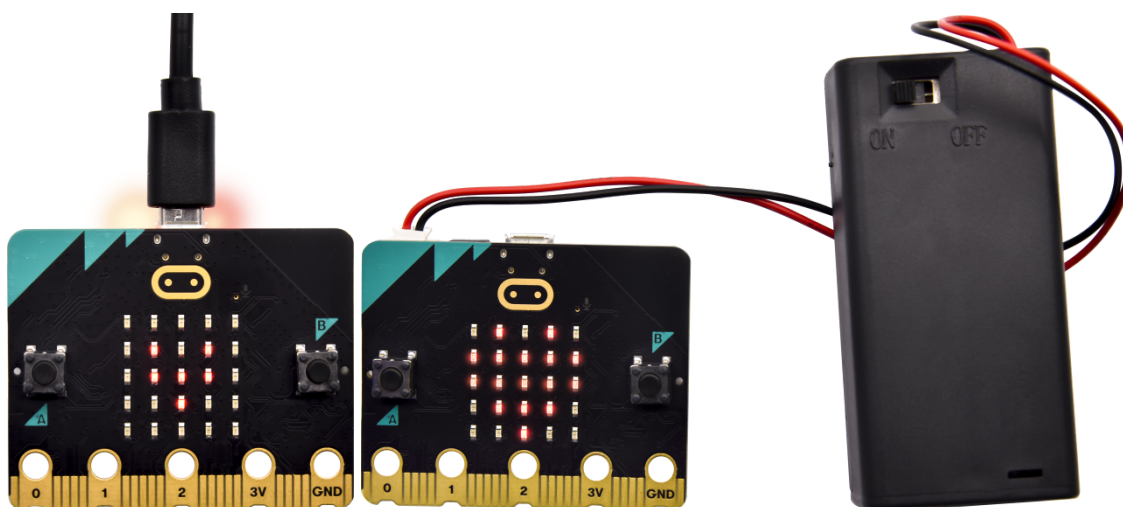
micro USB cable external power（3V）

For each programming, the Micro:bit drive will eject and your"hex"file will disappear in that the Micro:bit only receive files instead of saving anything.

Step 5：other programming languages

This chapter has described how to use the Micro:bit

But except for the Makecode graphical programming introduced you can also write Micro:bit programs by Python and JavaScript. Go to the link: https://microbit.org/code/ to know about other programming languages , or view the link: https://microbit.org/projects/, to find something you want to have a go.

Makecode

Browse https://makecode.microbit.org/ and enter Makecode online editor
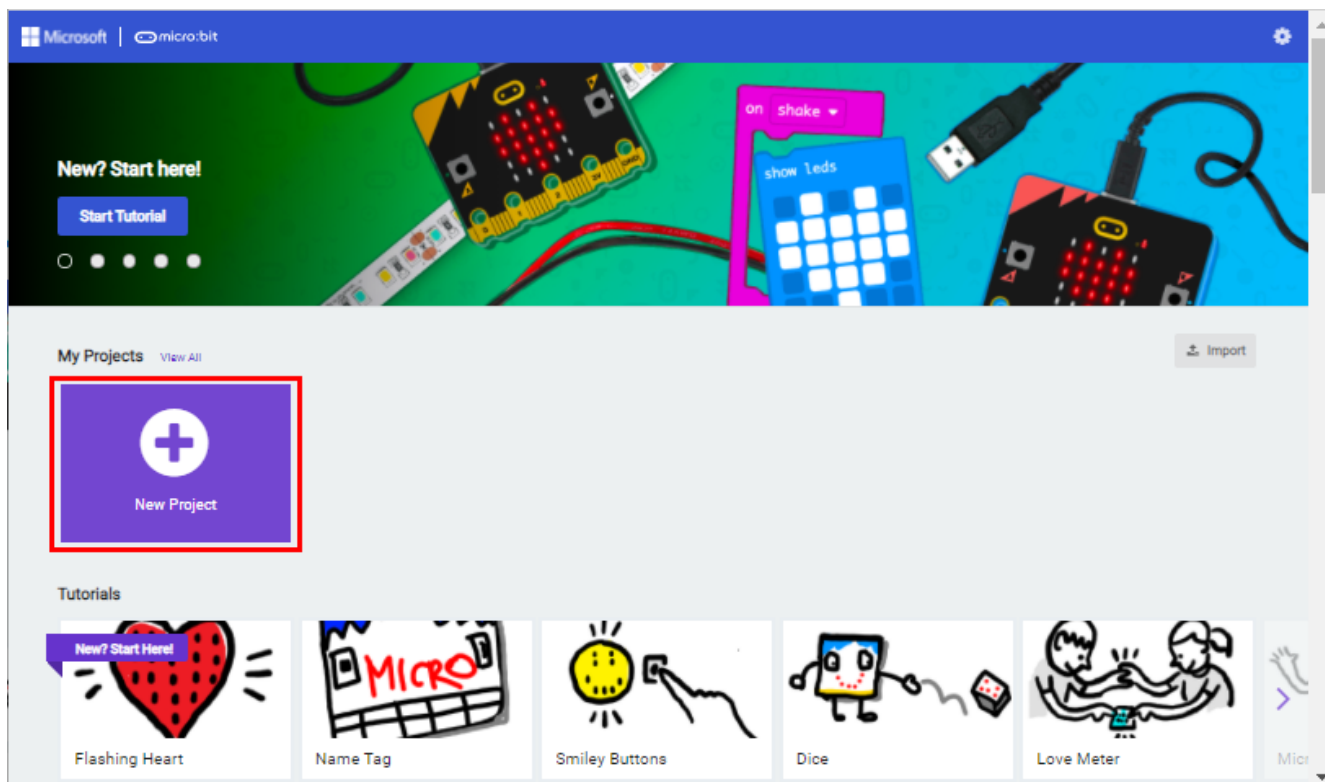
Click"New Project", and input"heartbeat"，then enter Makecode editor, as shown below:
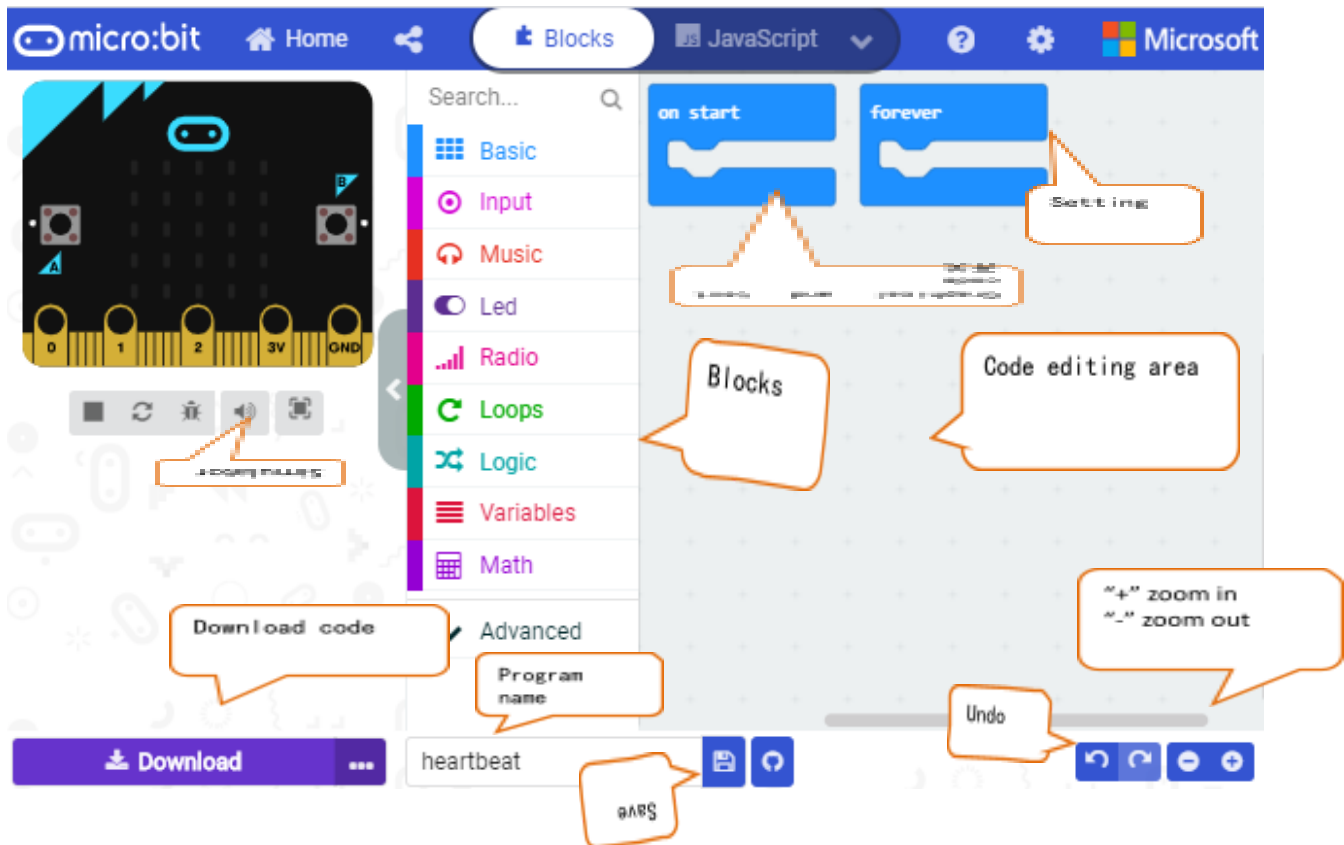
There are block"on start"and"forever"in the code editing area.
When the power is plugged or reset,"on start"means that blocks in the code are only executed once, and"forever"implies that code will run cyclically.

Quick Download

As mentioned before, if you use Windows 10 App, then you can quickly download the code directly to the Micro:bit board by clicking the "Download" button.

While it is a little more trickier if you are using a browser to enter makecode. However, if you use Google Chrome, suitable for Linux, macOS and Windows 10, the process can be quicker too.

We use the webUSB function of Chrome to allow the internet page to access the hardware device connected USB.
You could refer to the following steps to connect and pair devices.

Pairing device

Connect Micro:bit to your computer by USB cable. Click"..."beside"Download"and click"Pair device".
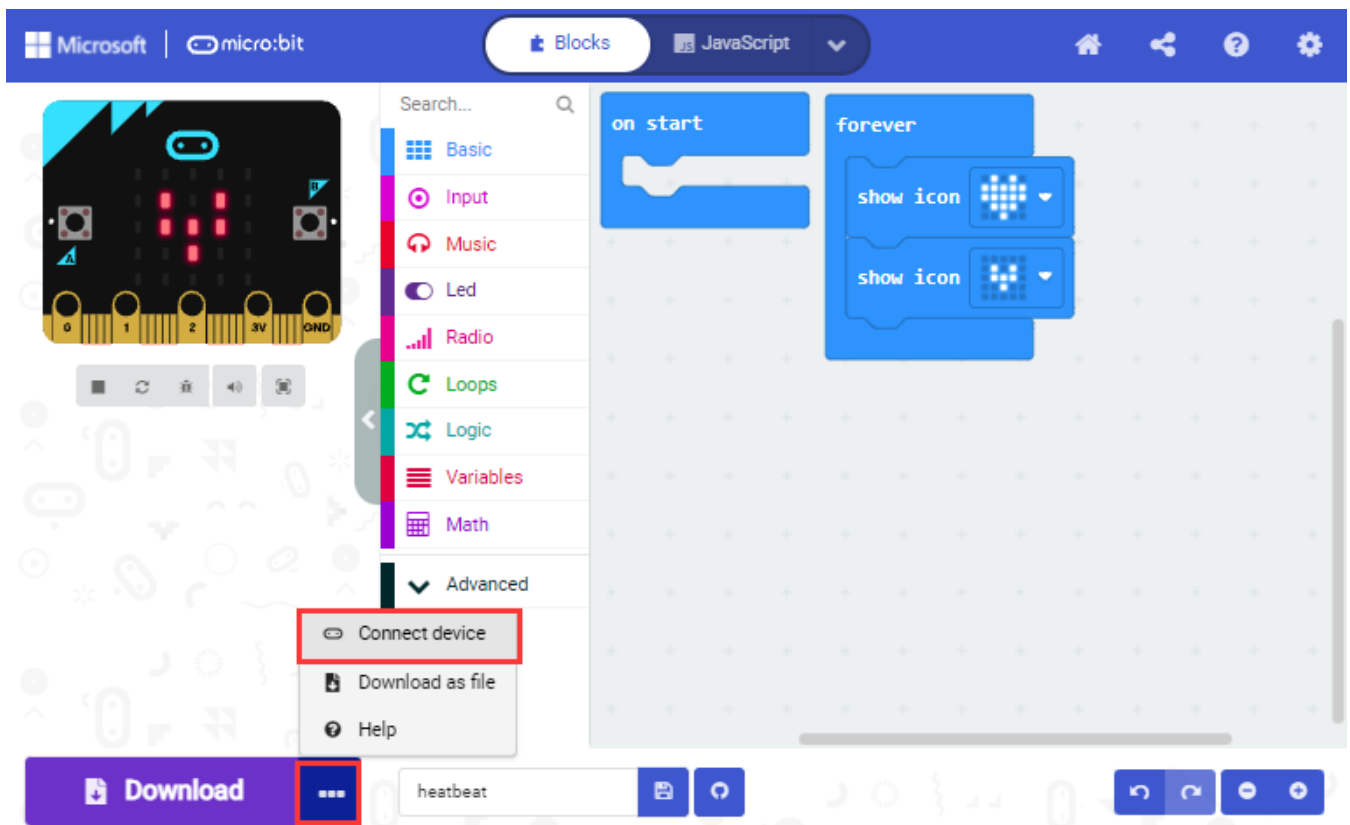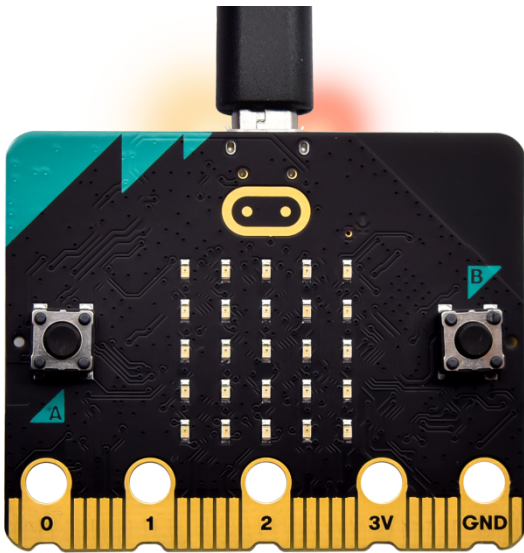
Click "Next"
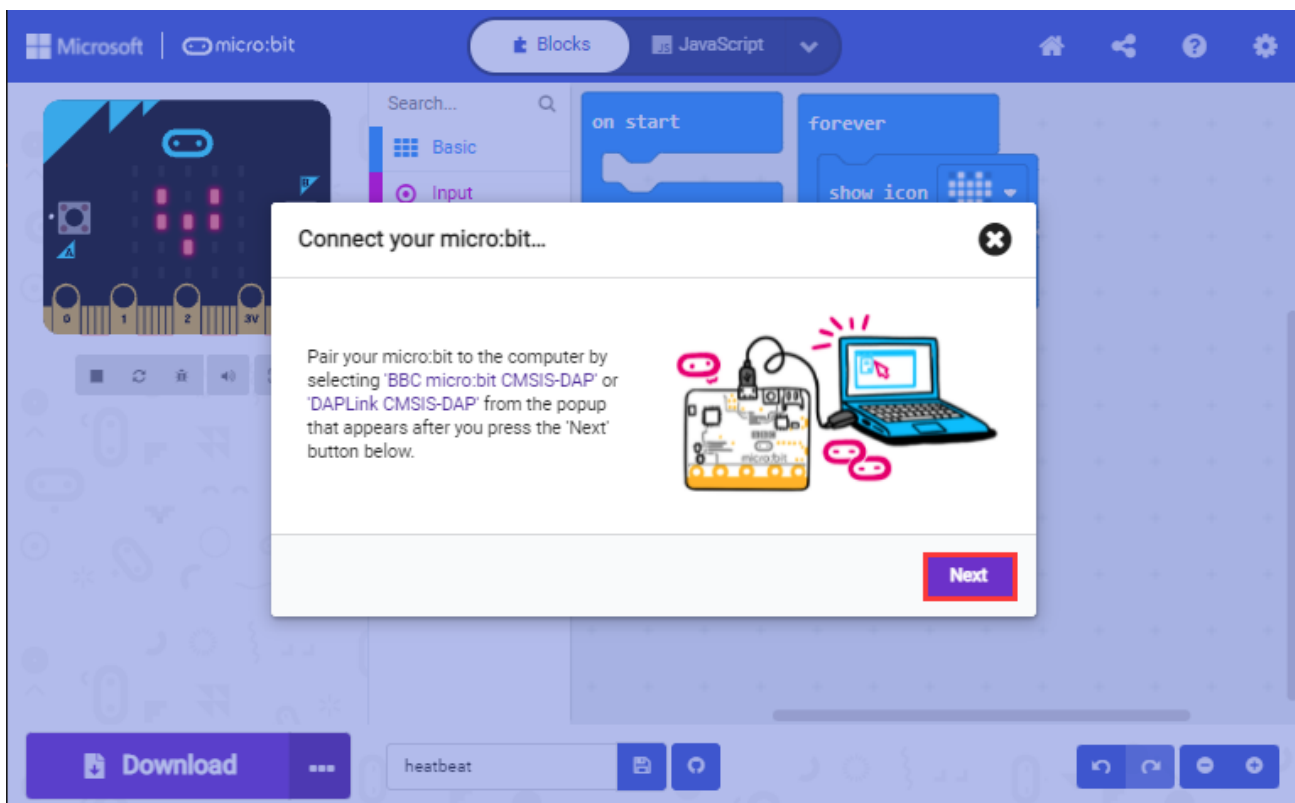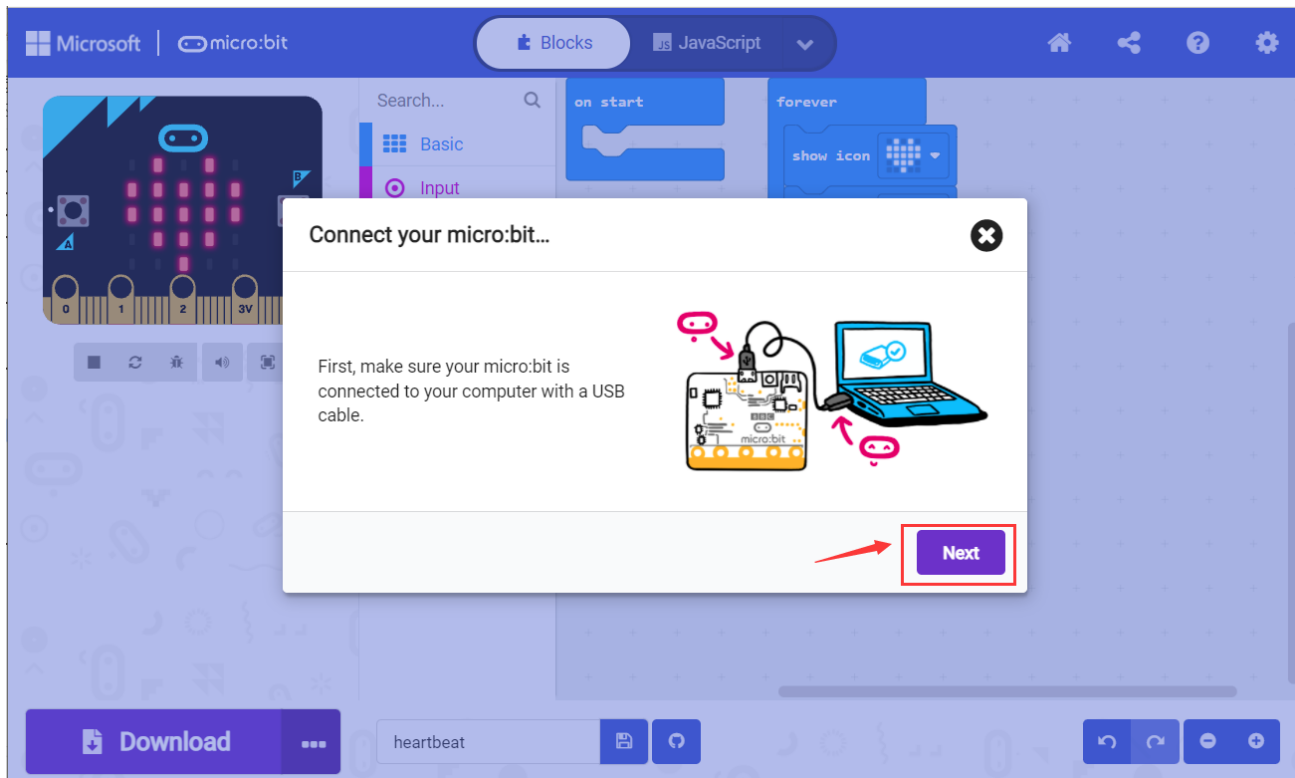
Then select "BBC Micro:bit CMSIS-DPA" and click "Connect". If "BBC Micro:bit CMSIS-DPA" does not show up for selection, please refer to https://makecode.microbit.org/device/usb/webusb/troubleshoot

We also provide Troubleshooting Downloads with WebUSB in the folder.

What's more, if you don't know how to update the firmware of Micro:bit, refer to the link: https://microbit.org/guide/firmware/ or browse file Update the Firmware we provide.
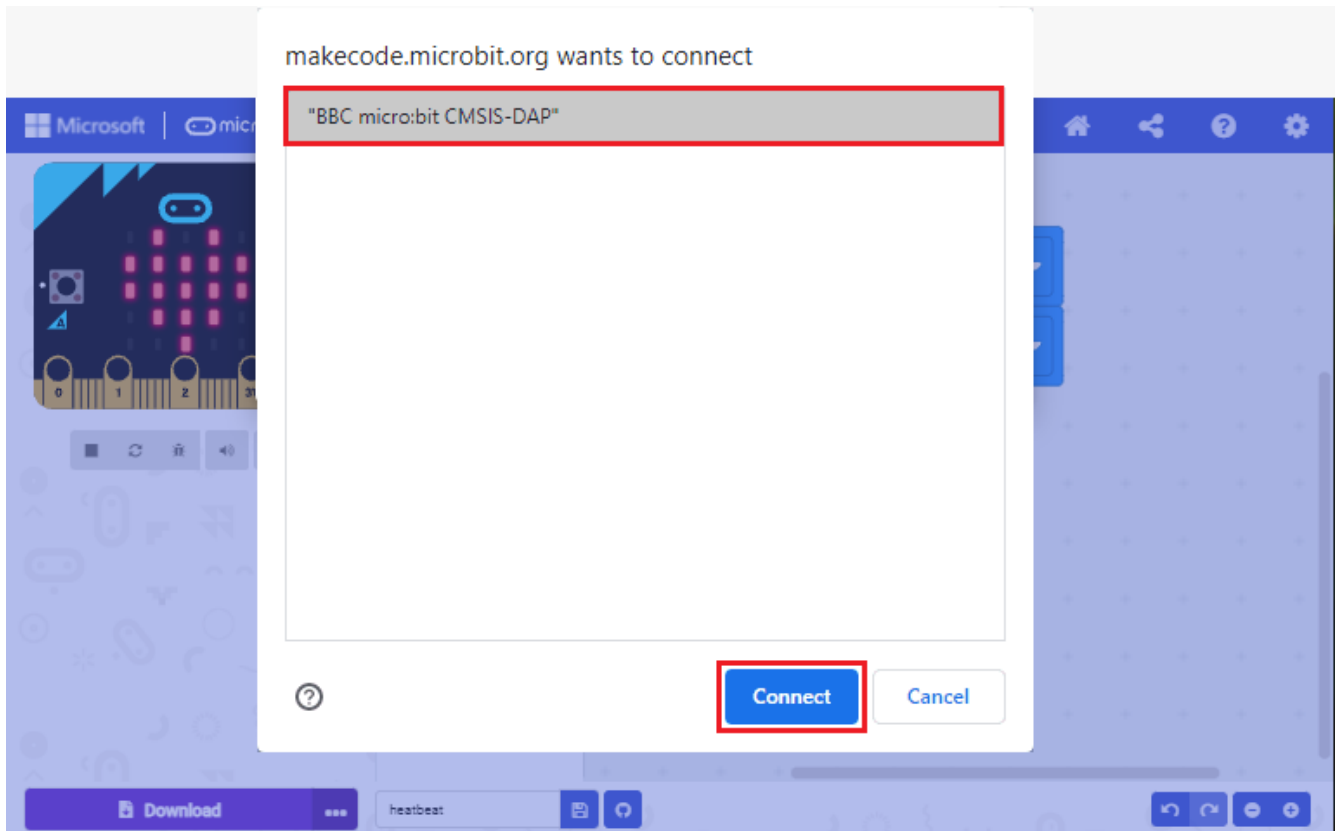
Then click "Done", then the Micro:bit board is connected successfully.
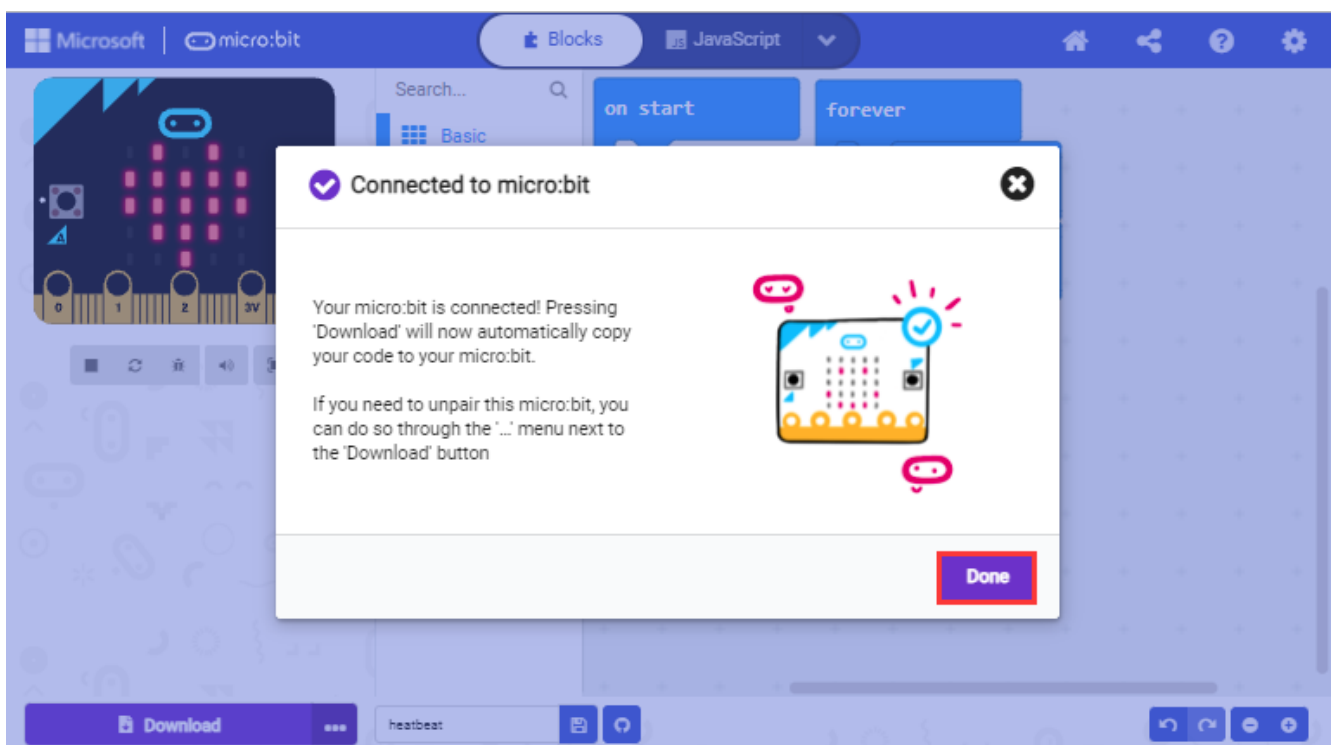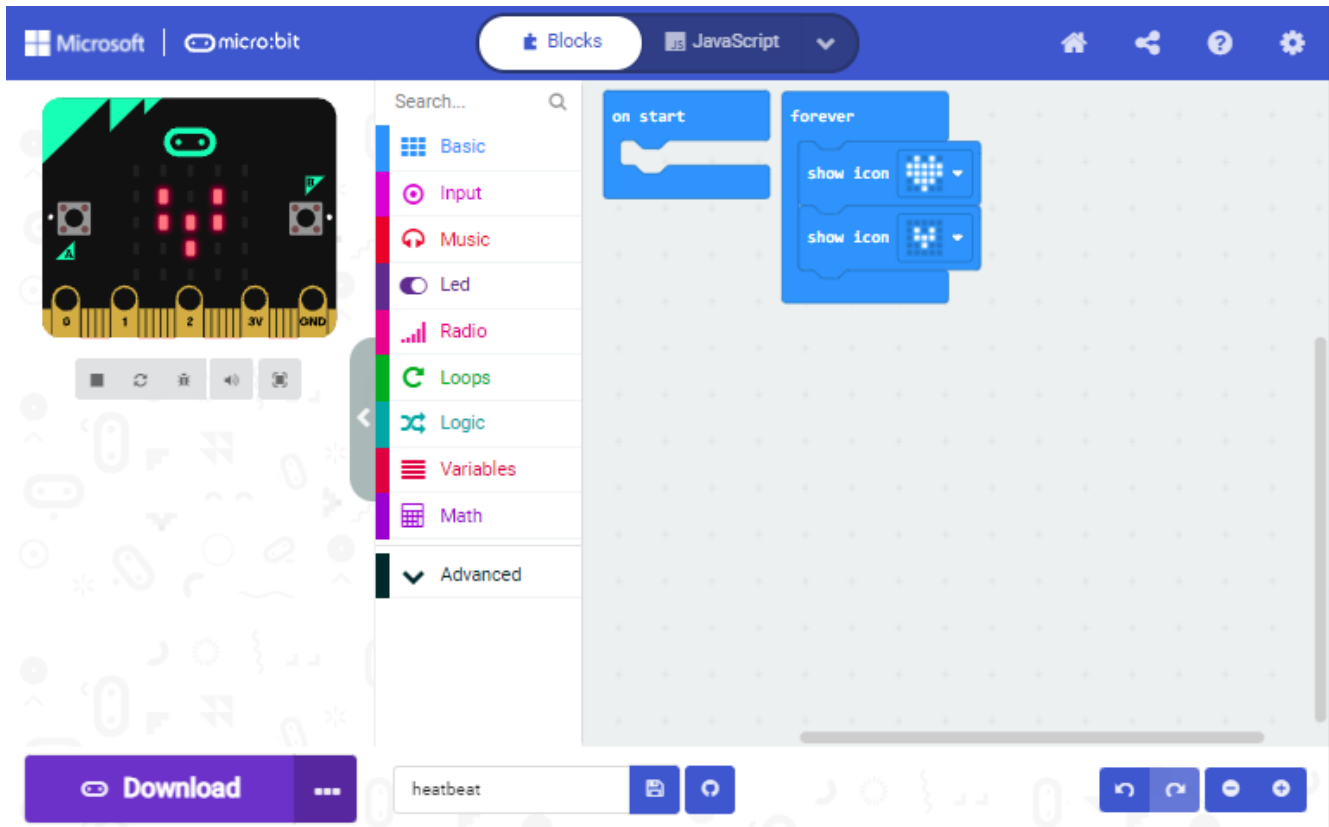
Click to download code to the Micro:bit, then will change

into , which means the code is downloaded well.
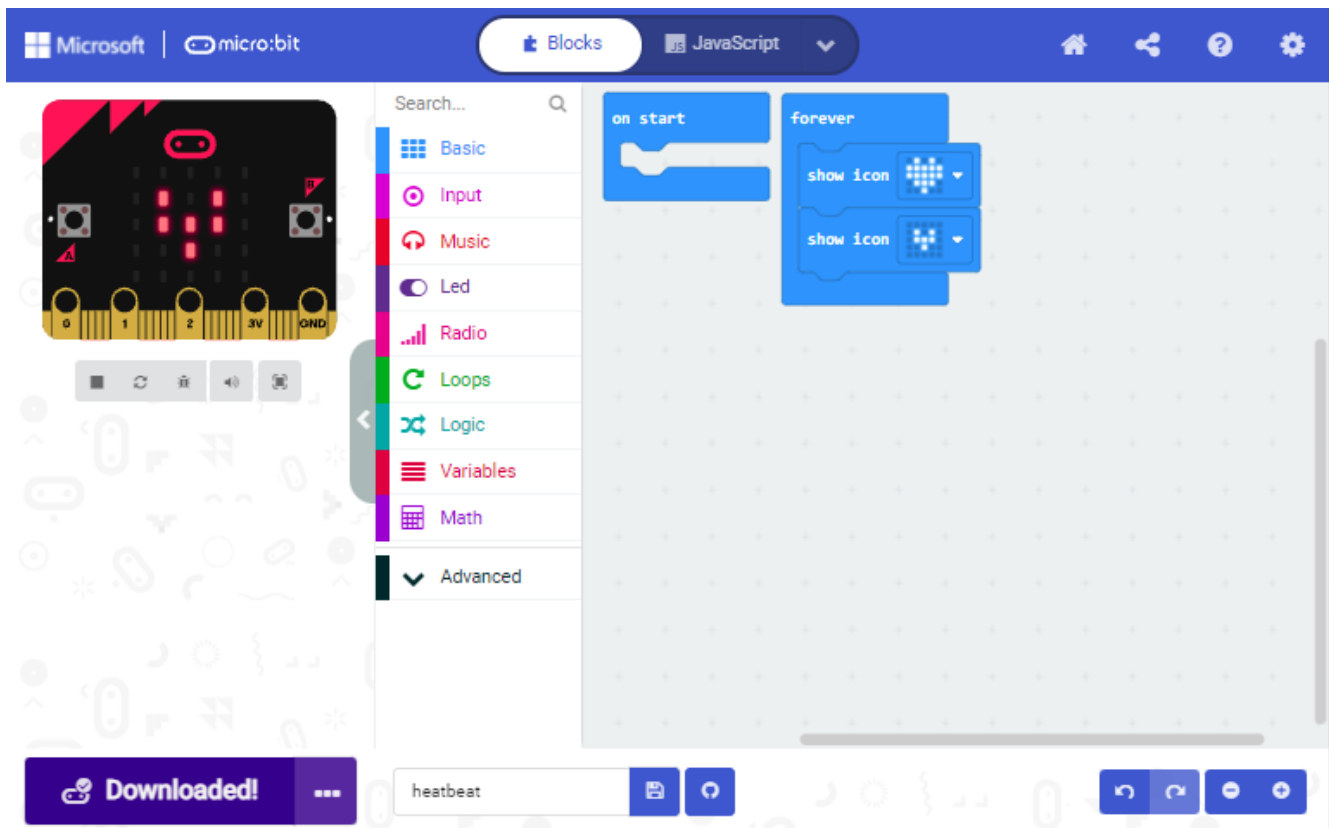
Import Test Code

We provide hexadecimal code files (project files) for each project.The file can be imported directly, or you can manually drag the code blocks to complete the program for each project.
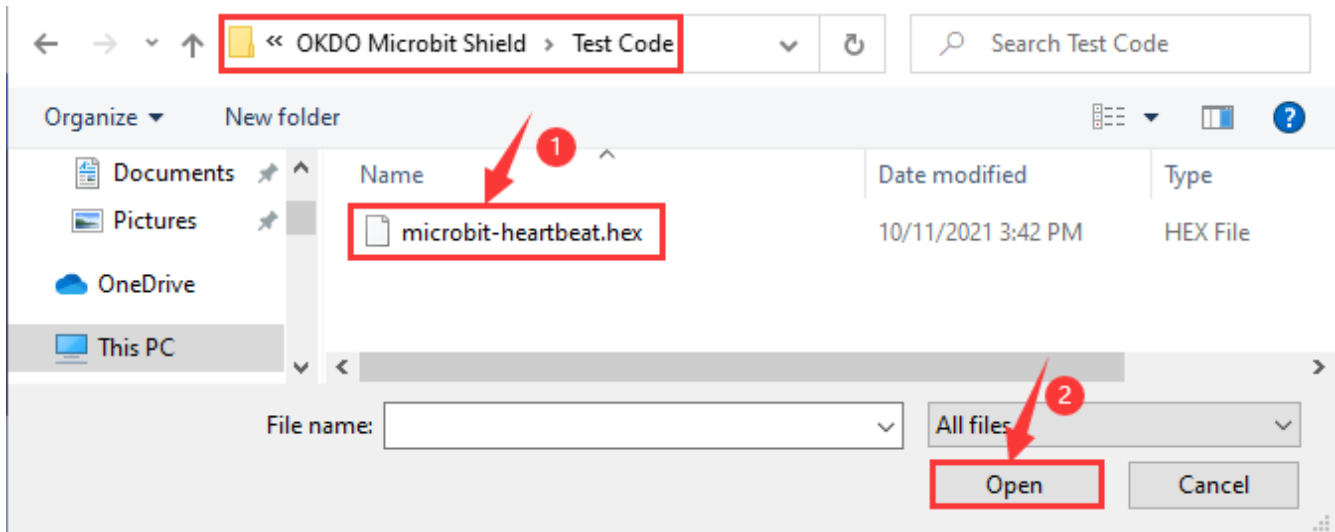
Let's take the "Heatbeat" project as an example to show how to load the code.
Open the Web version of Makecode.
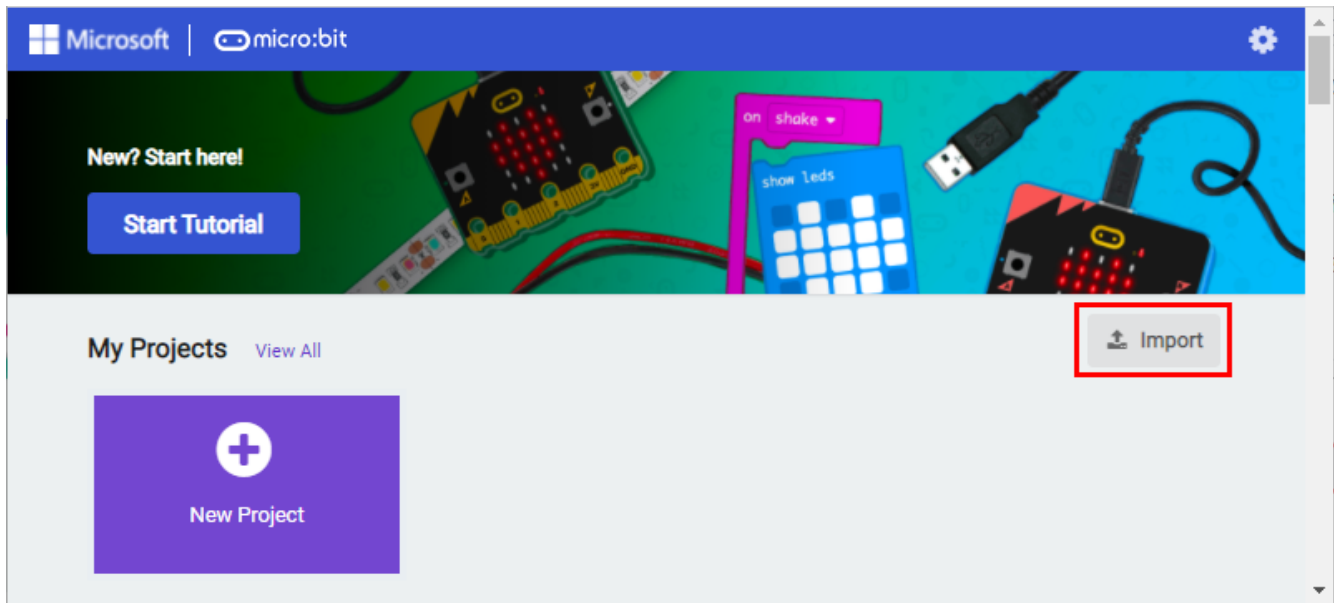
Click"Import File";
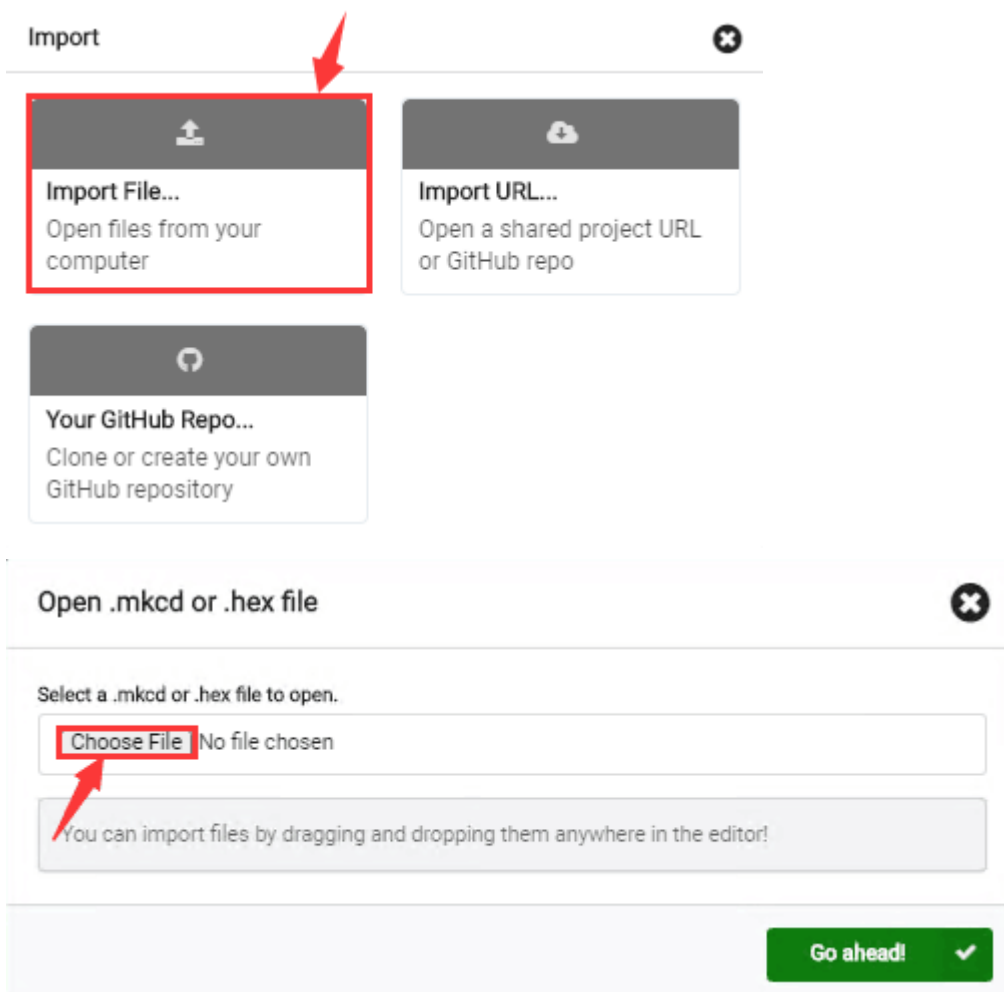
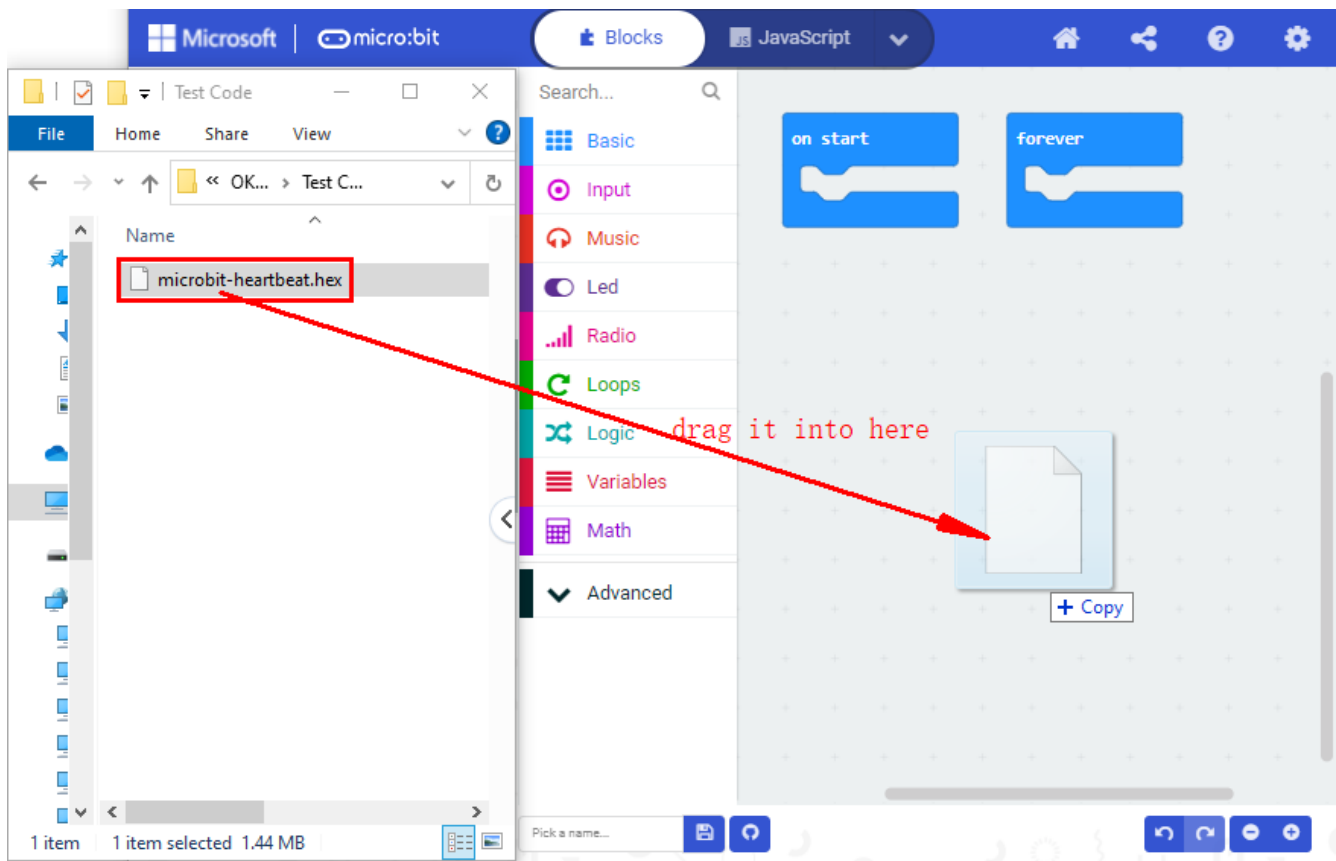Select"microbit-heartbeat.hex"then click"Open"and click"Go ahead".

In addition to importing the test code file provided into the Makecode compiler above, you can also drag the the test code file provided into the code editing area of the Makecode compiler, as shown in the figure below:
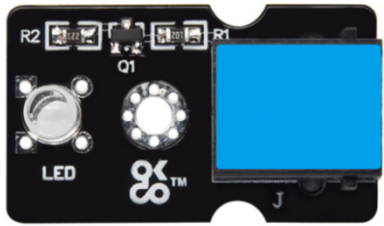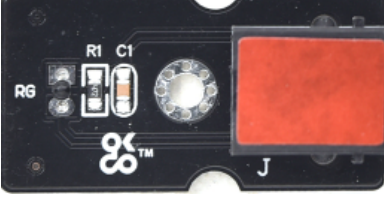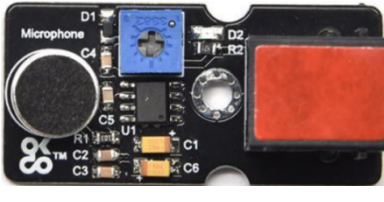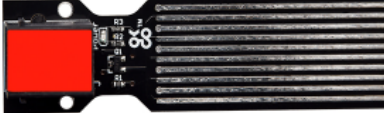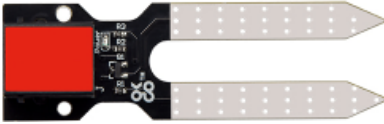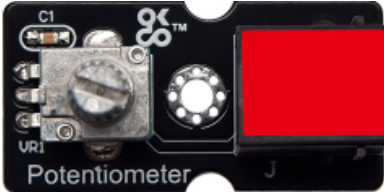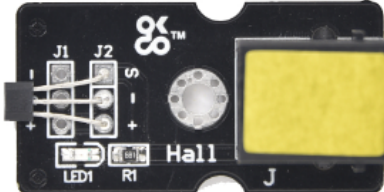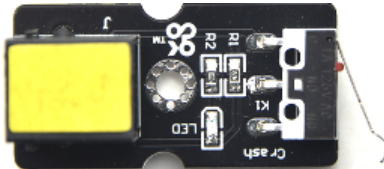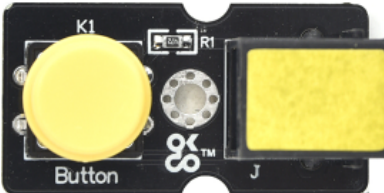
After a few seconds, it is done.
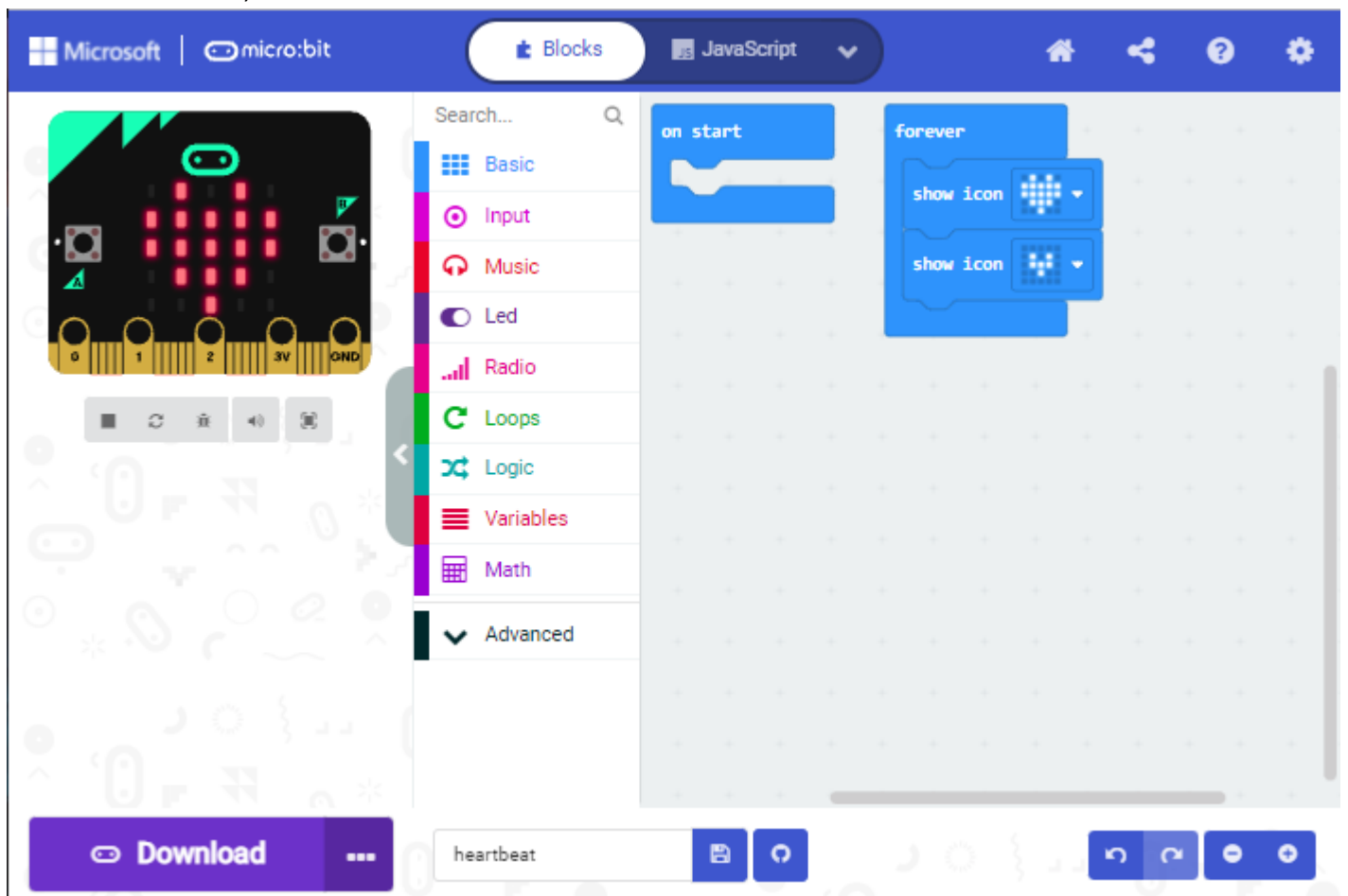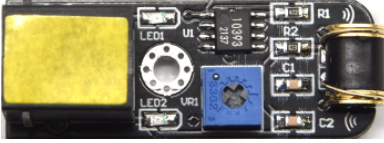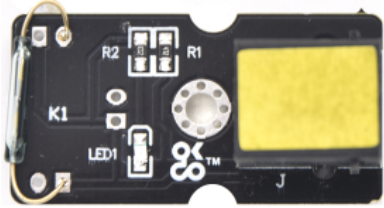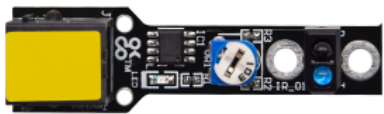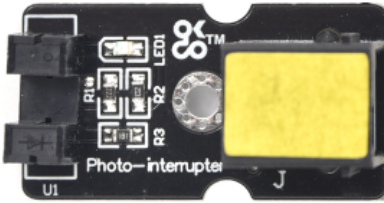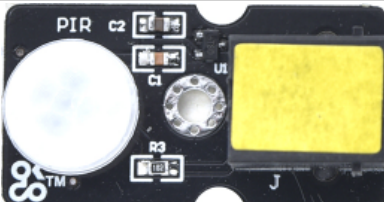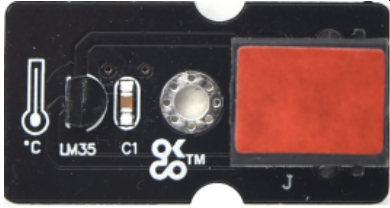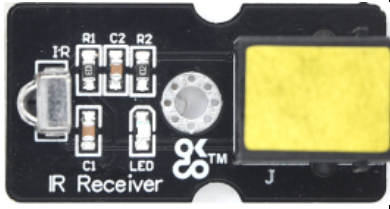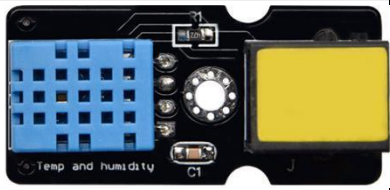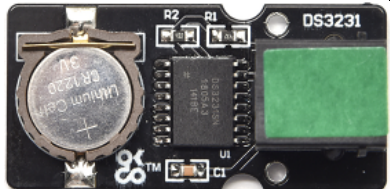
END

This shield is compatible with the following modules

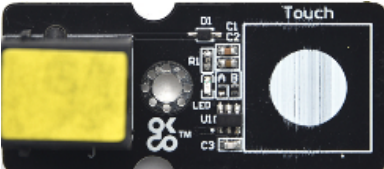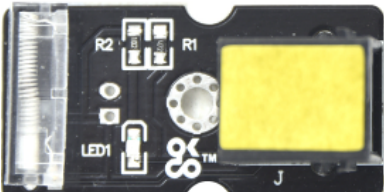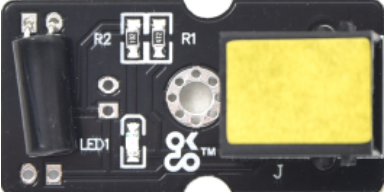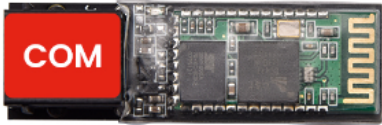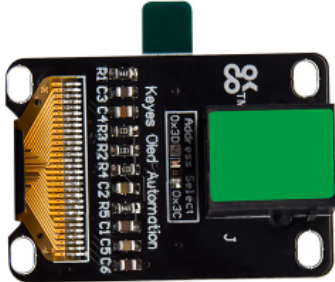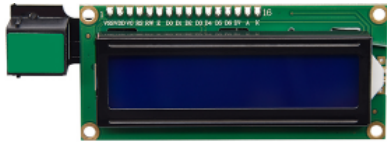| Name	Picture	Specifications	MPN	RS Code
White LED Module		Sensor type: Digital output Working voltage:3.3V-5V LED color: white Dimensions: 34mm*20mm*18mm Weight: 3.8g	TS2129	
Active Buzzer		Sensor type: Digital output Working voltage:3.3V-5V Dimensions: 39mm*20mm*18mm Weight: 6g	TS2130	
Passive Buzzer		Sensor type: Digital output Working voltage:3.3V-5V Dimensions: 39mm*20mm*18mm Weight: 6g	TS2131	
Thermistor		Sensor type: Analog input Working voltage: 3.3V-5V Temperature range: -55°C～315°C Dimensions: 38mm*20mm*18mm Weight: 4.2g	TS2132	
Analog Sound Sensor		Sensor type: Analog intput Working voltage:3.3V-5V Operating current：<10mA Dimensions: 42mm*20mm*18mm Weight: 6.0g	TS2133	
Photoresistor		Sensor type: Analog intput Working voltage:3.3V-5V Dimensions: 38mm*20mm*18mm Weight: 4.3g	TS2134	
Water Level Sensor		Sensor type: Analog intput Operating voltage: 3.3V-5V Operating current: <20mA Detection area: 40mm x16mm Operating temperature: 10%~90% without condensation Dimensions: 68mm*20mm*18mm Weight: 5.7g	TS2135	
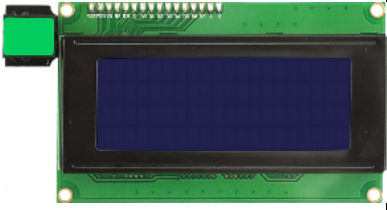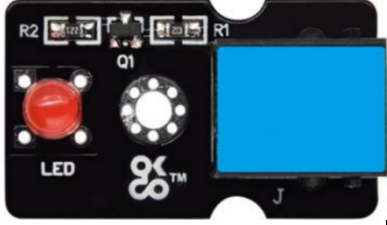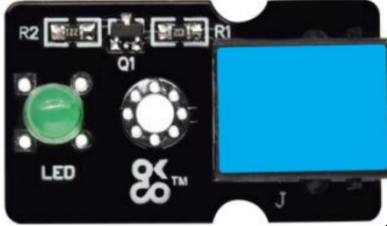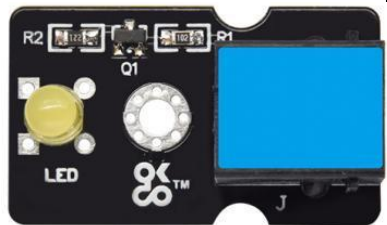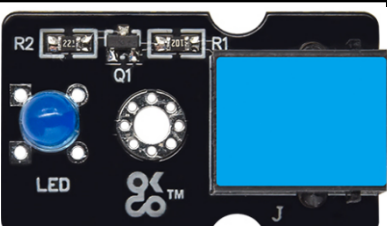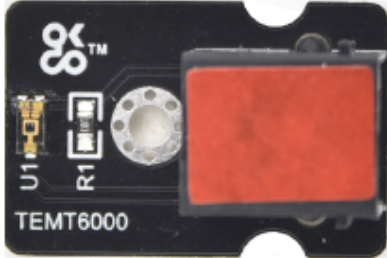
Soil Moisture Sensor		Sensor type: Analog intput Working voltage:3.3V-5V Working Current: ≤ 20mA Output Voltage: 0-2.3V Dimensions: 66mm*20mm*18mm Weight: 4.8g	TS2136	
Potentiometer		Sensor type: Analog intput Working voltage:3.3V-5V Dimensions: 38mm*20mm*18mm Weight: 9.1g	TS2137	
Hall Magnetic Sensor		Sensor type: Digital input Working voltage:3.3V-5V Detection range: up to 75px Dimensions: 38mm*20mm*18mm Weight: 9.1g	TS2138	
Collision Sensor		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 44mm*20mm*18mm Weight: 5.5g	TS2139	
Digital Push Button Sensor		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 44mm*20mm*18mm Weight: 5.5g	TS2140	
Capacitive Touch Sensor		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 44mm*20mm*18mm Weight: 5.5g	TS2141	
Knock Sensor		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 44mm*20mm*18mm Weight: 5.5g	TS2142	
Tilt Sensor		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 44mm*20mm*18mm Weight: 5.5g	TS2143	
Flame Sensor		Sensor type: Digital input Working voltage:3.3V-5V Detection range: 500px (4.8V) ~ 2500px (1V) Spectral Bandwidth Range: 760nm ~ 1100nm	TS2144	
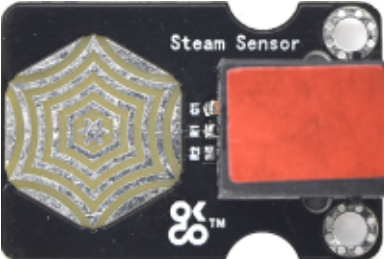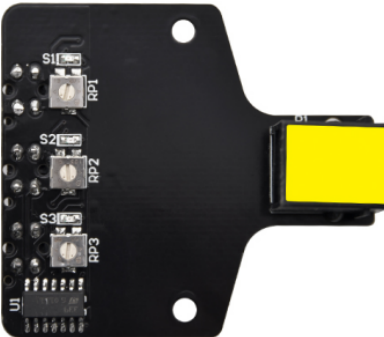
		Operating temperature: -25℃ to 85℃ Dimensions: 48mm*17mm*18mm Weight: 4.6g		
Vibration Sensor		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 46mm*16.7mm*17.6mm Weight: 6.2g	TS2145	
Reed Switch Module		Sensor type: Digital input Working voltage:3.3V-5V Working current: ≥20mA Working temperature: －10℃ to＋50℃ Detection distance: ≤10mm Dimensions: 39mm*20mm*18mm Weight: 4.6g	TS2146	
Line Tracking Sensor		Sensor type: Digital input Working voltage:5V Operating current: <10mA Operating temperature: 0℃~50℃ Dimensions: 57mm*16mm*18mm Weight: 4.8g	TS2147	
IR Obstacle Avoidance Sensor		Sensor type: Digital input Working voltage:3.3V-5V Working current: ≥20mA Working temperature: －10℃ to＋50℃ Detection distance: 2~40cm Effective Angle: 35° Dimensions: 52mm*17mm*18mm Weight: 6.2g	TS2148	
Photointerrupter		Sensor type: Digital input Working voltage:3.3V-5V Dimensions: 38mm*20mm*18mm Weight: 4.8g	TS2149	
PIR Motion Sensor		Sensor type: Digital input Working voltage:3.3V-5V Working Current: 15uA Working Temperature: -20 ~ 85℃ Output Voltage: High 3V, Low 0V Output Delay Time (High Level): About 2.3 to 3 Seconds Detection angle: 100°	TS2150	
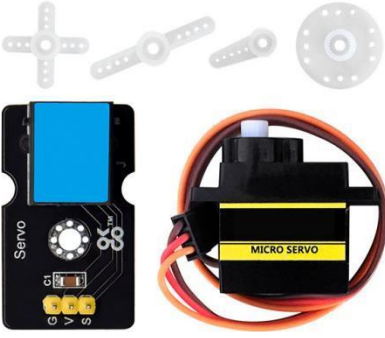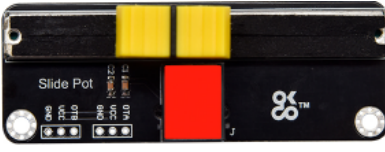
		Detection distance: 7 meters Output Indicator LED (When output HIGH, it will be ON) Pin limit current: 100mA Dimensions: 38mm*20mm*18mm Weight: 5.6g		
LM35 Temperature Sensor		Sensor type: Analog input Working voltage:3.3V-5V Sensitivity: 10mV per degree Celsius Function range: 0℃ to 100℃ Dimensions: 38mm*20mm*18mm Weight: 4.6g	TS2151	
IR Receiver Module		Sensor type: Digital input Working voltage:3.3V-5V Modulate Frequency: 38Khz Dimensions: 38mm*20mm*18mm Weight: 5g	TS2152	
Relay Module		Sensor type: Digital output Working voltage:3.3V-5V Rated current: 10A (NO) 5A (NC) Maximum switching voltage: 150VAC 24VDC Control signal: TTL level Contact action time: 10ms Dimensions: 47mm*28mm*19mm Weight: 17.4g	TS2182	
DHT11 Temperature and Humidity Sensor		Sensor type: Digital input Working voltage:5V Relative Humidity and temperature measurement： Good for 20-90% humidity readings with 5% accuracy； Good for 0-50°C temperature readings ±2°C accuracy Dimensions: 42mm*20mm*18mm Weight: 5.6g	TS2153	
DS3231 Clock Module		Sensor type: I2C Working voltage:3.3V-5V Temperature range: -40℃ to +85℃ Timing accuracy: about ± 5ppm Output: 1Hz and 32.768kHz High speed (400kHz), I2C serial bus	TS2154	
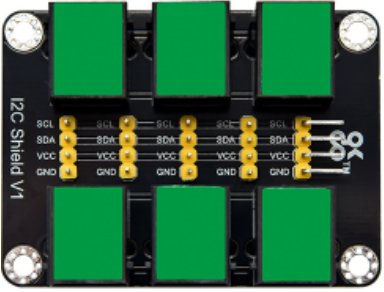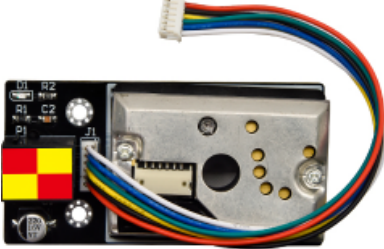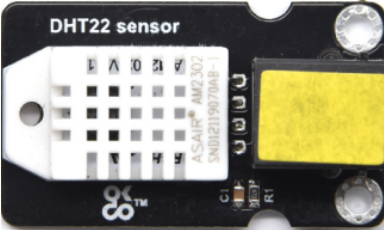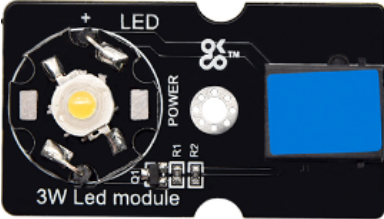
		Output Level: TTL level Dimensions: 38mm*20mm*18mm Weight: 5.4g		
Analog MQ-2 Gas Sensor		Sensor type: Digital and Analog Working voltage:5V Can be used to Measure or detect LPG, Alcohol, Propane, Hydrogen, CO and even methane Analog output voltage: 0V to 5V Digital Output Voltage: 0V or 5V (TTL Logic) Preheat duration 20 seconds Dimensions: 56mm*20mm*18mm Weight: 9g	TS2155	
Analog MQ-3 Alcohol Sensor		Sensor type: Digital and Analog Working voltage:5V Current Consumption: 150mA DO output: TTL digital 0 and 1 (0.1 and 5V) AO output: 0.1- 0.3 V (relative to pollution), the maximum concentration of a voltage of about 4V Detecting Concentration: 0.05-10mg/L Alcohol Heater consumption: less than 750mW Operating temperature: 14 to 122 °F (-10 to 50°C) Load resistance: 200kΩ Sensitivity S: Rs(in air)/Rs(0.4mg/L Alcohol)≥5 Sensing Resistance Rs: 2KΩ-20KΩ(in 0.4mg/l alcohol) Dimensions: 56mm*20mm*18mm Weight: 7.5g	TS2156	
MQ-135 Air Quality Sensor		Sensor type: Digital and Analog Working voltage:5V Detect/Measure NH3, NOx, alcohol, Benzene, smoke, CO2, etc. Analog output voltage: 0V to 5V	TS2157	

		Digital output voltage: 0V or 5V (TTL Logic) Preheat duration 20 seconds Dimensions: 56mm*20mm*18mm Weight: 9.2g		
Bluetooth 2.0 Module		Working voltage:5V Bluetooth protocol: Bluetooth 2.1+ EDR standard USB protocol: USB v1.1/2.0 Operating frequency: 2.4GHz ISM frequency band Modulation mode: GFSK (Gauss Frequency Shift Keying) Transmit power: ≤ 4dBm, class 2 Sensitivity: ≤-84dBm at 0.1% Bit Error Rate Transfer rate: Asynchronous: 2.1Mbps(Max)/160kbps ; Synchronous: 1Mbps/1Mbps Supported configuration: Bluetooth serial port Operating temperature: -20℃ to +55℃ Dimensions: 52mm*16mm*18mm Weight: 5.3g	TS2183	
OLED Module		Sensor type: I2C Working voltage:5V 0.96" diagonal OLED Pixels: 128 × 64 Color Depth: Monochrome (White) Brightness (cd/m2): 100 (Typ) Dimensions: 39mm*27mm*18mm Weight: 7g	TS2158	
i2c 1602 LCD Module		Sensor type: I2C Working voltage:5V 16 characters wide, 2 rows I2C Address: 0x27 Back Light: Blue Text Color: White Dimensions: 99mm*37mm*21mm Weight: 37.4g	TS2159	

i2c I2C 2004 LCD Module		Sensor type: I2C Working voltage:5V I2C address: 0x27 Back Light: Blue Text Color: White 20 characters wide, 4 rows Dimensions: 114mm*60mm*22mm Weight: 77.7g	TS2160
Red LED Module		Sensor type: Digital output Working voltage:3.3V-5V LED color: Red Dimensions: 34mm*20mm*18mm Weight: 3.8g	TS2161
Green LED Module		Sensor type: Digital output Working voltage:3.3V-5V LED color:Green Dimensions: 34mm*20mm*18mm Weight: 3.8g	TS2162
Yellow LED Module		Sensor type: Digital output Working voltage:3.3V-5V LED color: Yellow Dimensions: 34mm*20mm*18mm Weight: 3.8g	TS2163
Blue LED Module		Sensor type: Digital output Working voltage:3.3V-5V LED color: Blue Dimensions: 34mm*20mm*18mm Weight: 3.8g	TS2164
L9110 Fan Module		Sensor type: Digital output Working voltage:3.3V-5V Fan diameter: 75mm Interface: double digital Dimensions: 50mm*75mm*18mm Weight: 14.2g	TS2165
TEMT6000 Ambient Light Sensor		Sensor type: Analog intput Working voltage:3.3V-5V Operating Temperature: -40~85°C Illumination Range: 1 – 1000 Lux Output: analog voltage, 0 – 5V @VCC=5V Dimensions: 30mm*20mm*18mm Weight: 3.5g	TS2166

Joystick Module		Sensor type: Digital and Analog Working voltage:5V Internal Potentiometer value: 10k Operating temperature: 0 to 70 °C Dimensions: 45mm*28mm*33mm Weight: 12.5g	TS2184	
Steam Sensor		Sensor type: Analog intput Working voltage:3.3V-5V Working Current: <20mA Working Temperature: -10°C $\sim +70^\circ$C Dimensions: 35mm*24mm*18mm Weight: 4.6g	TS2167	
Three-channel Line Tracking Sensor		Sensor type: Digital input Working voltage:3.3V-5V Sensor: TCRT5000, high sensitivity Sensitivity: digital potentiometer to adjust Sensing distance: 0 to 3 cm Digital switch output: (0 and 1) Comparator: LM393 chips, work stability Detection reflection distance: 1mm to 25mm	TS2168	
4-Digit LED Display		Sensor type: I2C Working voltage:3.3V-5V Control chip:TM1637 Module current: 30--80MA Tube colour: 0.36 inches LED, red highlights Dimensions: 50mm*23mm*18mm Weight: 9g	TS2169	
2812 2x2 RGB Module		Sensor type: Digital output Working voltage:5V Power: 0.1W Light Source: SMD 5050 RGB IC model: 4 / WS2812 Gray level: 256 levels Illumination angle: 180° Luminous color: Full colour Dimensions: 38mm*20mm*18mm Weight: 4.5g	TS2170	

Thin-film Pressure Sensor		Sensor type: Analog input Working Voltage: DC 3.3V—5V Range: 0-0.5KG Thickness: ＜0.25mm Response Point: ＜20g Repeatability: ＜±5.8%（50% load） Accuracy: ±2.5%（85% range interval） Durability: ＞100 thousand times Initial Resistance: ＞100MΩ (no load) Response Time: ＜1ms Recovery Time: ＜15ms Working Temperature: -20℃ to 60℃ Dimensions: 80mm*20mm*18mm Weight: 4.4g	TS2171	
Servo Module and Servo		Sensor type: Digital output Working Voltage: DC 5V Angle range: about 180°(in 500→2500μsec) Pulsewidth range: 500→2500μsec No-load speed: 0.12±0.01 sec/60（DC 4.8V）; 0.1±0.01 sec/60（DC 6V） No-load current: 200±20mA（DC 4.8V）; 220±20mA（DC 6V） Stop torque: 1.3±0.01kg/cm（DC 4.8V）; 1.5±0.1kg/cm（DC 6V） Stop current: ≦850mA（DC 4.8V）; ≦1000mA（DC 6V） Standby current: 3±1mA（DC 4.8V）; 4±1mA（DC 6V） Operation temperature: -10℃～50℃ Save temperature: -20℃～60℃	TS2172	
Slide Potentiometer		Sensor type: Analog intput Working voltage:3.3V-5V Resistance: 5K Dimensions: 28mm*76.7mm*31.3mm Weight: 17g	TS2173	

i2c Interface Conversion Shield		Sensor type: Adapter Working voltage: DC 5V Interface : I2C Pin pitch: 2.54mm Dimensions: 60mm*44.4mm*17.5mm Weight: 20.2g	TS2174	
WIFI and Bluetooth Shield		Sensor type: Adapter Working voltage:3.3V-5V Interface:WIFI .Bluetooth Pin pitch: 2.54mm Dimensions: 44mm*24mm*18mm Weight: 6.4g	TS2185	
GP2Y1014AU PM2 Dust Sensor		Sensor type: Digital input Working Voltage: DC 5V Working temperature: -10 to +65 degrees Celsius Current consumption: 20mA maximum Minimum particle detection: 0.8 microns Sensitivity: 0.5V/(0.1mg/m3) Voltage in clean air: 0.9V (typical) Working temperature: -10°C to 65°C Storage temperature: -20°C to 80°C Dimensions: 35.6mm *69.7mm * 28mm Weight: 27g	TS2175	
DHT22 Temperature and Humidity Sensor		Sensor type: Digital input Working voltage:3.3V-5V Humidity measurement range: 0----100%RH Humidity measurement accuracy: ±2%RH Temperature measurement range: - 40°C to 80°C Temperature measuring accuracy: ±0.5°C Dimensions: 43mm * 26mm * 18mm Weight: 9.3g	TS2176	
3W LED Module		Sensor type: Digital output Working voltage:3.3V-5V Emitting color: Yellow Recommended use current: 600－700ma Luminance: 200－220LM	TS2186	

		Input signal: digital signal Dimensions: 49mm*27mm*18mm Weight: 7.7g		
Breakout Board		Sensor type: Adapter Working voltage: 5V Interface: 2.54mm pin headers Fixing hole diameter：3.2mm Dimensions： 49mm*18mm*16mm Weight：8.9g	TS2128	
Ultrasonic Sensor		Sensor type: Digital output and input Sensor type: I2C Operating Voltage: DC 5V Operating Current: 15mA Operating Frequency: 40KHz Max Range: 3--5m Min Range: 2cm Measuring Angle: 15 degree Trigger Input Signal: 10μS TTL pulse Dimensions: 49mm*26mm*28mm Weight: 11.3g	TS2181	