



Silly Maqueen



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Game Map

There are 2 playing modes for Crazy Maqueen, and each mode includes missions in different levels.
The further you advance, the harder it will be, challenge now!

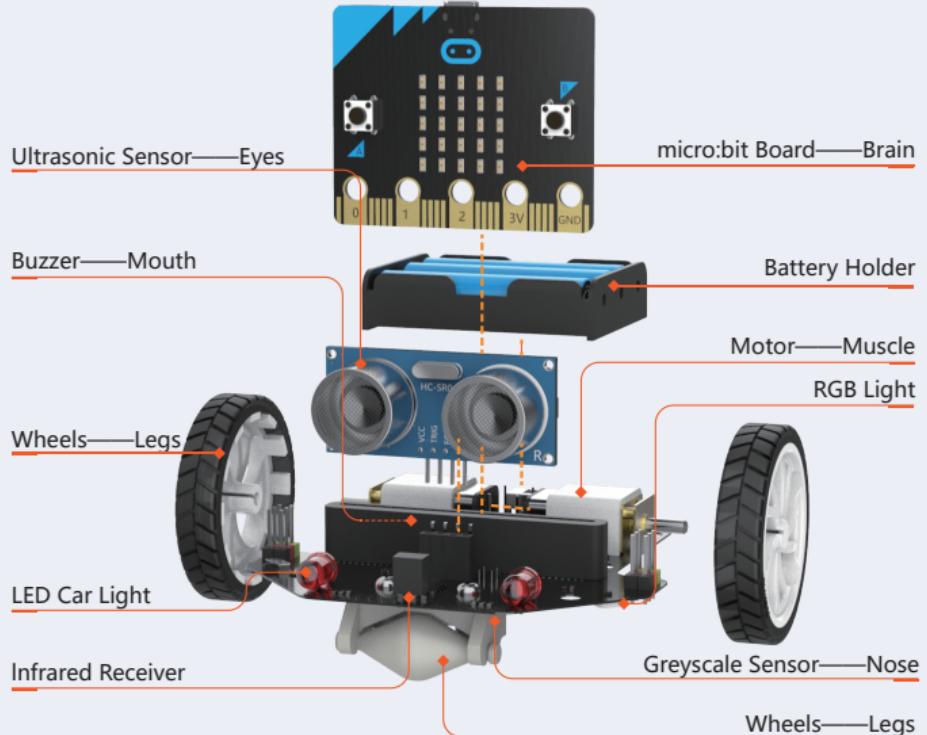
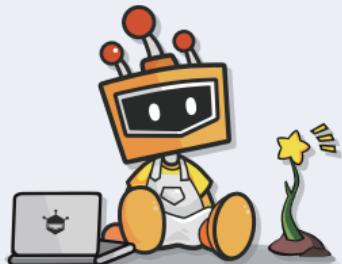




Preparation



Let's get to know maqueen
and check its equipment
before we get started.

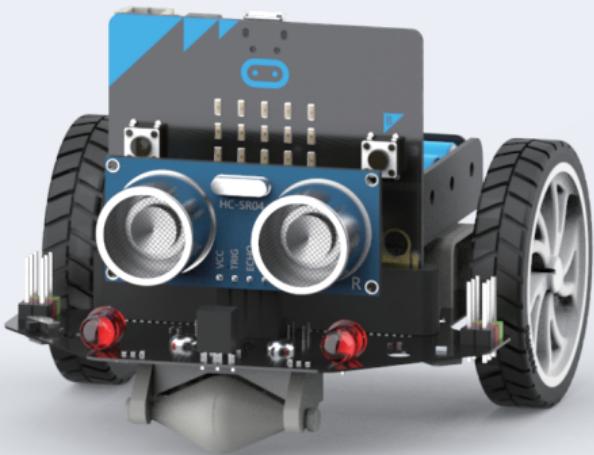




Preparation



WOW! Now Maqueen
is armed to teeth .
Let' s begin!





Preparation

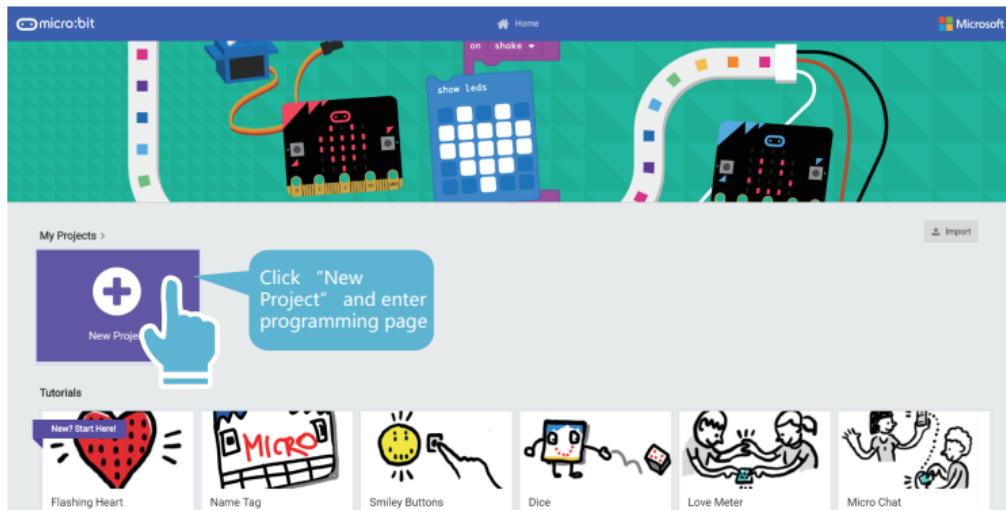


After prepared all equipment in Maqueen, then we can build the programming environment, which is the important command base to set order commands.

Input <https://makecode.microbit.org/> and you can enter Makecode editor.

Note: please login with Internet. If it cannot be loaded, please try install Google explorer.

The initial interface for login

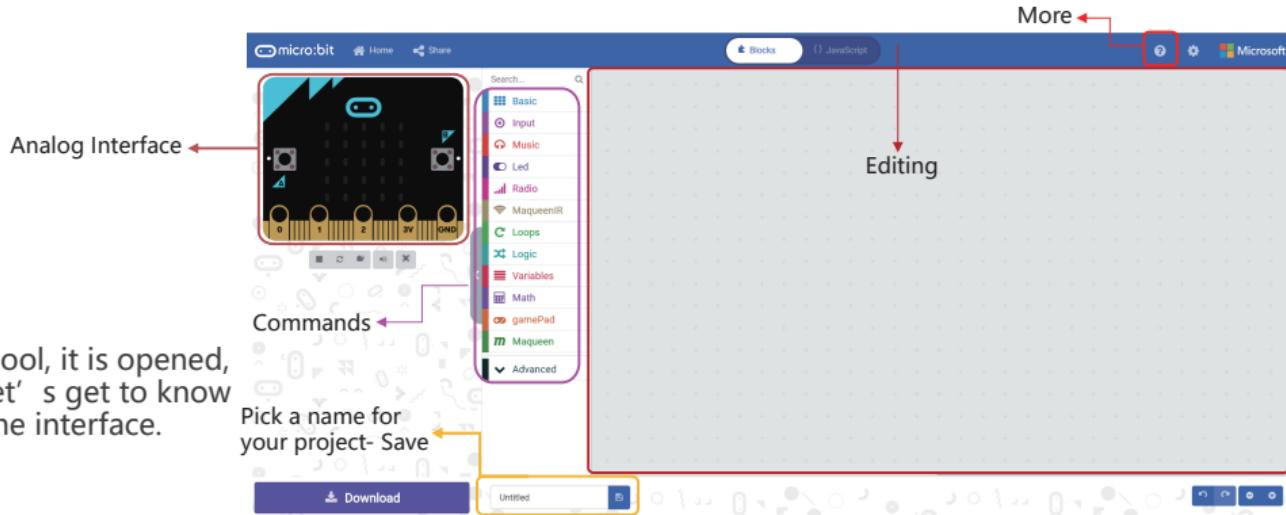




Preparation



Open Makecode editor and create a new project, the interface will show as below.

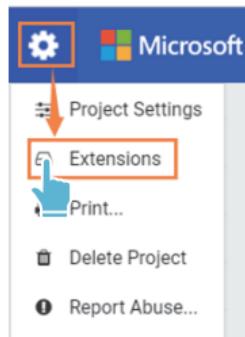




Preparation

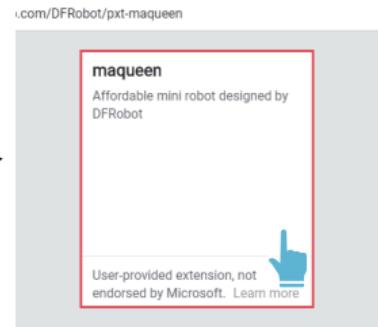


Learned basic operation interface of the base, hereafter, we need to find out commands that match Maqueen in extensions.



2. Input [\[https://github.com/DFRobot/pxt-maqueen\]](https://github.com/DFRobot/pxt-maqueen) in Search and click to add Maqueen library

1. Open "More", click "Extensions"

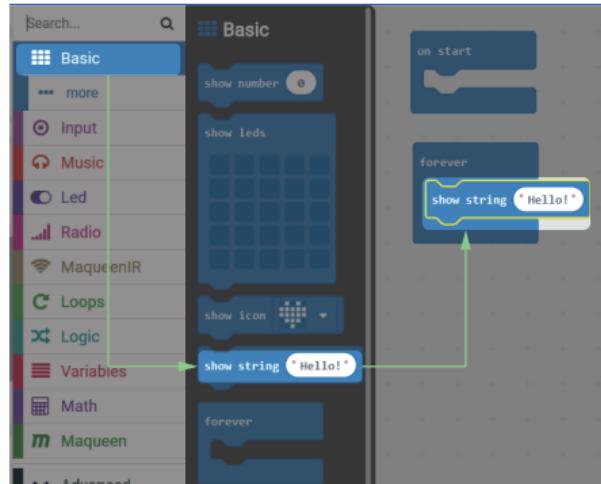


3. Click the result —maqueen

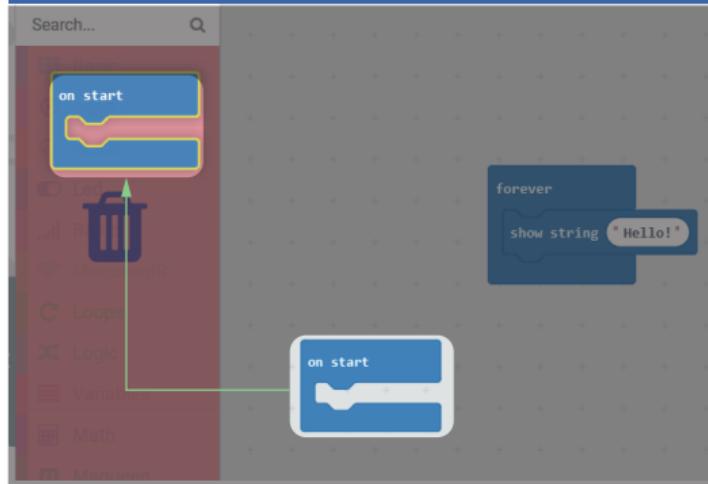


Preparation

Then, come to learn basic method of the base Makecode, which is the key to make Maqueen alive!



1. Drag necessary block to the editing



2. Drag blocks in editing to Commands or click the right button to delete.

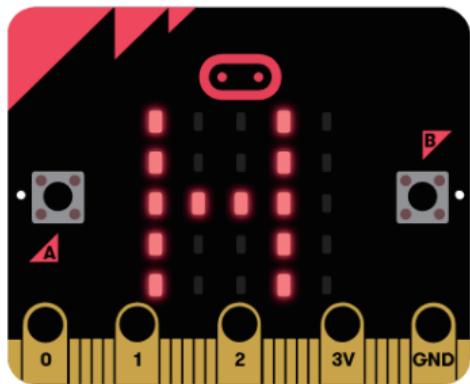


Preparation

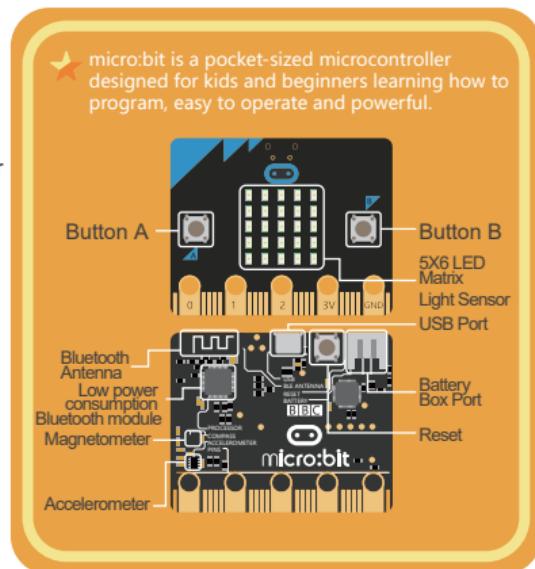


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3. Check the program result in the simulator.



- Start/Stop the simulator
- Restart the simulator
- Slow-Mo
- Mute audio
- Launch in fullscreen

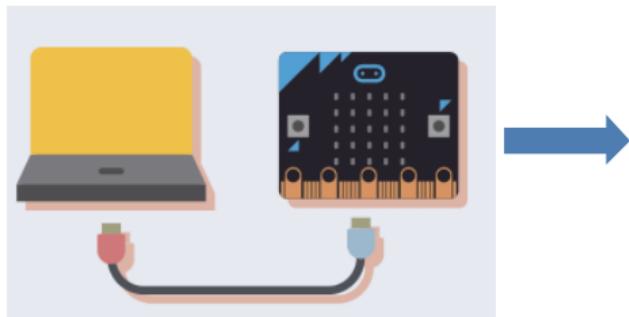




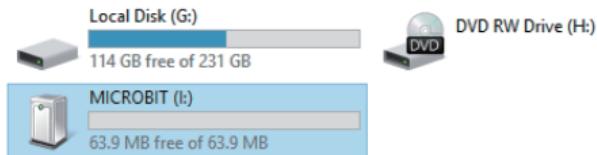
Preparation



4. Upload commands



1. Connect the Maqueen' s brain(micro: bit) to the computer via USB wire



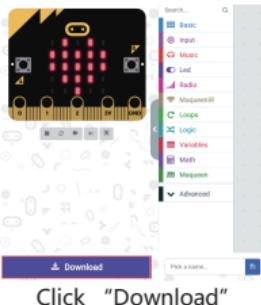
2. If a new hard disk drive shows in "My computer" - "micro:bit" , which suggests a successful connection between Maqueen and computer.



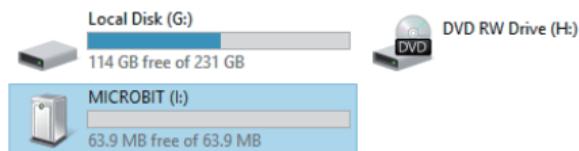
Preparation

4. Upload commands

3. Upload command to the brain of Maqueen

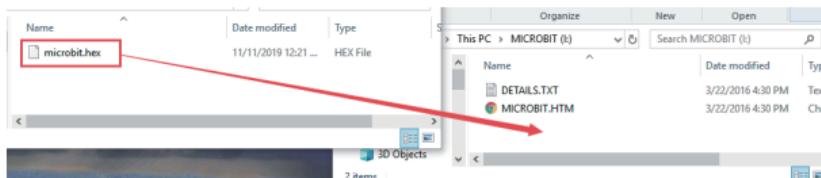


Click "Download"



Select and save file in the dialog box pops up to micro:bit, as shown below: H:\

Here is the other way to upload command. You can copy the .hex file and paste to MICROBIT disk.



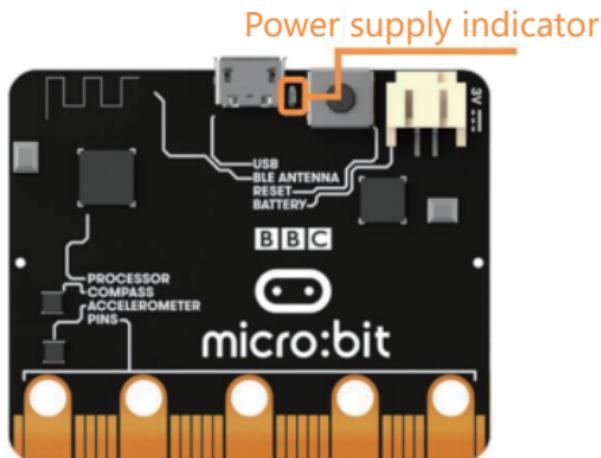
NOTE: the indicator in the back of micro: bit will keep flashing in burning, please do not disconnect the power supply.



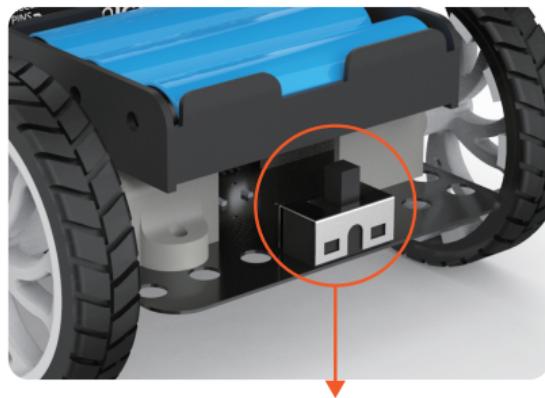
Preparation

5. Upload commands

3. Start Maqueen



The indicator stops flashing when the command transportation ends.



Turn ON the switch in Maqueen

Switch ON to wake up Maqueen when the command transportation ends.



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Game Map

- Unlock all basic equipment in Maqueen.
- Take advantages of equipment to finish task in different levels.
- Be familiar with Makecode editor and its commands.





Single Player Mode Rules



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Walking Maqueen

Maqueen do the special

Singer Maqueen

Play Twinkle, twinkle, little star is so easy

Rhythm Master

Show Maqueen' s talent in dancing and music

Light Chasera

Make Maqueen a light chaser

Little Tagalong

Maqueen, the most faithful friend

Streetcar

Maqueen can follow black wire to find the direction to proceed.



Walking Maqueen



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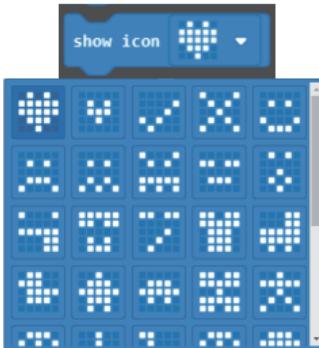
★)) Task:

Let Maqueen walk along a square.



★)) Command Skills:

Display built-in pattern block: select different built-in patterns to turn Maqueen into a living emoji.



Movement control block: control Maqueen's movement in different directions.





Walking Maqueen



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```
forever
  .how icon [grid icon v]
  motor left move Forward at speed [150]
  motor right move Forward at speed [150]
  pause (ms) [1000 v]
  show icon [grid icon v]
  motor left move Forward at speed [255]
  motor right move Forward at speed [0]
  pause (ms) [200 v]
```

The Scratch script consists of a **forever** loop. Inside the loop, there is a **.how icon** block set to a grid icon. Following this are two **motor** blocks: one for the left motor moving forward at speed 150 and one for the right motor moving forward at speed 150. A **pause (ms)** block with a value of 1000 follows. Then, a **show icon** block is used to change the robot's appearance to a grid icon. Another set of **motor** blocks follows, with the left motor moving forward at speed 255 and the right motor moving forward at speed 0. A final **pause (ms)** block with a value of 200 concludes the loop.

Let Maqueen move forward and then change direction. Once you can adjust the speed and time patiently, you will make it drive along a perfect square.



Hidden Level:

Challenge the hidden level!
Switch to different emojis and revise routine to make Maqueen walk like a catwalk model.





Singer Maqueen



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★)) Task:

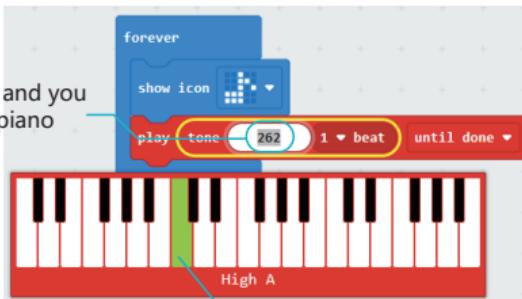
Make Maqueen sing the song Twinkle, twinkle, little star.



★)) Command Skills:

Music Play Command: select different beats and notes and turn Maqueen into a singer.

Click here and you will see a piano keyboard.



Click the keyboard to choose notes.

The Music Score Twinkle, twinkle, little star





Singer Maqueen



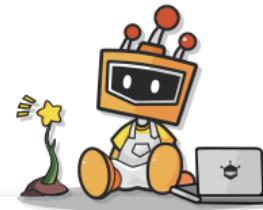
DFROBOT[®]
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Compose the part Twinkle, twinkle, little star
according to the music.

The Scratch script consists of the following blocks:

- An "on start" hat block with a "pause (ms) 500" control block attached.
- A "forever" control block containing:
 - A "show icon" control block.
 - Seven "play tone [Middle C] for [1 beat]" sound blocks, each followed by a "until done" control block.

Hint: the quarter note is for 1 beat and the half note is for 2 beats.



Hidden Level:

Challenge the hidden level!
Try different notes and beats,Maqueen
can sing all kinds of songs for you!





Rhythm Master



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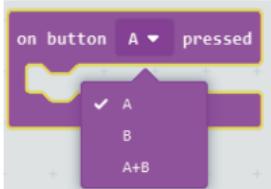
★)) Task:

Switch Maqueen among lighting engineer, singer and dancer smoothly.

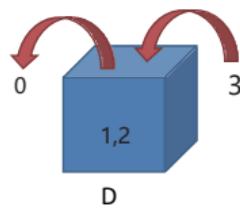


★)) Command Skills:

Select different keys to start the programs of Maqueen.



Variable Command: a box to store data of all kinds (usually, changing data). Here, the variable represents 4 RGBs(0, 1, 2, 3) in Maqueen.



Sound Command: select different sounds to play in Maqueen.



Rhythm Master



★)) Command Skills:

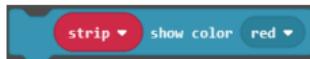
Command to set RGB pins: select related pins and number to light ON.



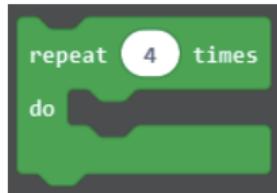
Select pin No. 15

Set RGB No. 4

RGB Color Command: choose RGB color to make Maqueen display various shining effects.



Repeat until: set times to execute a set of program. E.g. Flash RGB for 4 times and turns off.



Project Settings

Extensions

Print

Delete object

Report Abuse...

Language

Hint: RGB belt command should be added in extensions.

Click "More..." and select "Extensions"



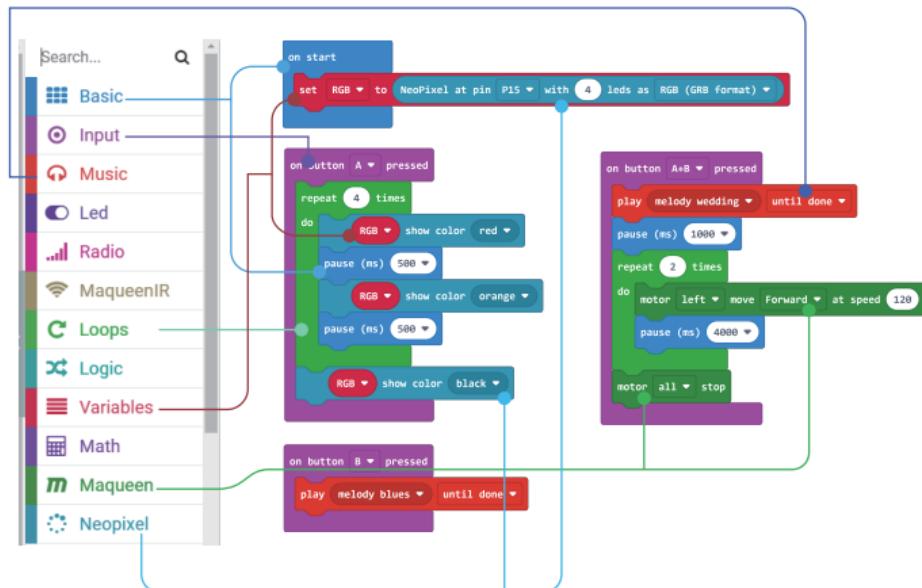
Click "neopixel" and add RGB belt



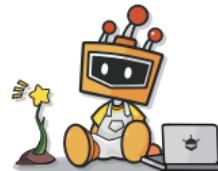
Rhythm Master



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Press Button A to light up RGBs;
Press Button B to make Maqueen play sound;
Press Button A and B to move Maqueen



Hidden Level:

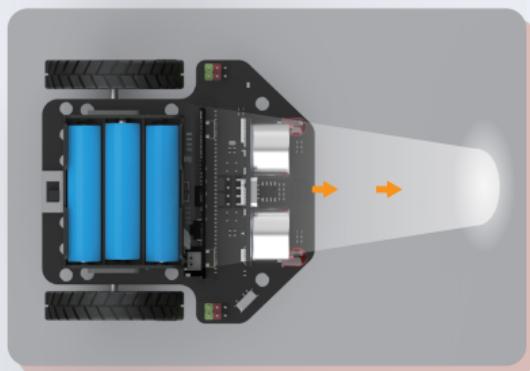
Challenge the hidden level!
When light up RGB, Maauqueen looks so cool. It must be fantastic to use RGB belt command make a flowing water lamp effect!



Light Chaser

★)) Task:

Maqueen likes light very much, let's make it a light chaser.



★)) Command Skills:

Condition judgement command(if...then...else...): execute the 1st section if it satisfies the condition, otherwise execute the 2nd section. In this program, this is used to judge the environment light strength. If it satisfies the condition(fixed environmental light value), Maqueen can be moved, otherwise it keeps static.

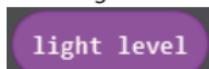


- Section 1
- Section 2

Comparison: to compare 2 values as a condition to judge.



Brightness: store ambient light value.





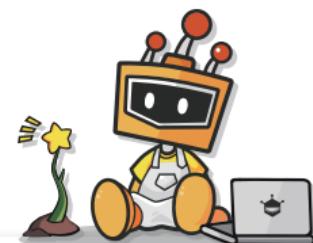
Light Chaser



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Move if the light intensity is over 100, otherwise keep static. The light intensity is adjustable according to the environment.

```
Search...  
Basic  
Input  
Music  
Led  
Radio  
MaqueenIR  
Loops  
Logic  
Variables  
Math  
Maqueen  
Neopixel  
Q  
Set the ambient light intensity >100  
forever  
  if [light level] > [100] then  
    [motor left v move Forward v at speed 150]  
    [motor right v move Forward v at speed 150]  
  else  
    [motor all v stop]  
end
```



Hidden Level

Challenge the hidden level!
THE light chaser will follow light, but what if we turn Maqueen into a light avoiding robot, how to realize that?



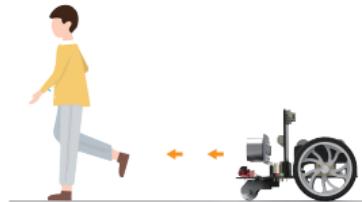
Little Tagalong



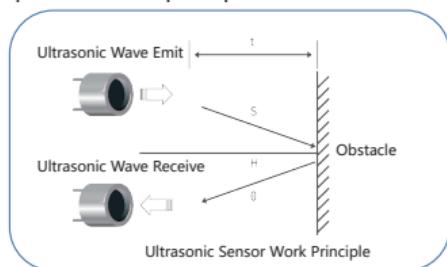
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★)) Task:

let Maqueen follow your steps.

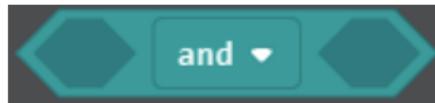


To begin with, let's get to know the eyes of Maqueen—the principle of ultrasonic wave

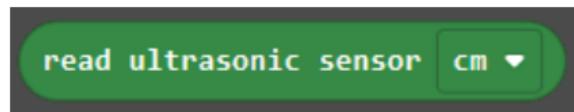


★)) Command Skills:

AND: only two conditions are satisfied at the same time can drive Maqueen.



Read Ultrasonic Value Command: here store the distance value the sensor detected.





Little Tagalong

Search...

- Basic
- Input
- Music
- Led
- Radio
- MaqueenIR
- Loops
- Logic
- Variables
- Math
- Maqueen
- Neopixel

Q

forever

set D ▾ to read ultrasonic sensor c ▾

if D ▾ < 50 and ▾ D ▾ > 5 then

motor left ▾ move Forward ▾ at speed 200

motor right ▾ move Forward ▾ at speed 200

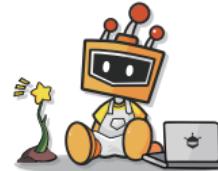
else

motor all ▾ stop

+

If the distance between Maqueen and the obstacle is within 5~50,Maqueen will move on, otherwise keeps static.

Upload command to Maqueen.
Unplug the USB serial wire, let's play outside.



Hidden Level:

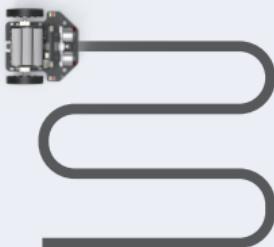
Challenge the hidden level!
Maqueen is a naughty robot, sometime he wants to avoid people, try making a Maqueen robot like that.



Streetcar

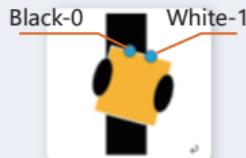
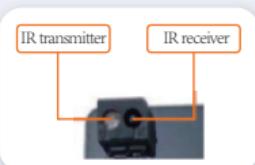
★)) Task:

Let Maqueen drive along the black line, like a streetcar.



Hint: the black line should be wide enough so that the left and right greyscale sensors can be both on the line.

To begin with, let's get to know the output value when the ultrasonic sensor detects white and black: Black-0,White-1.

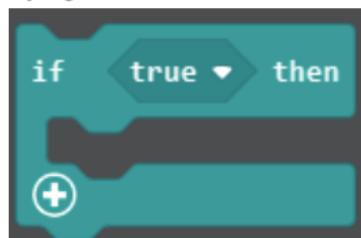


★)) Command Skills:

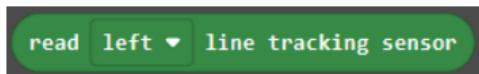
"= " Equation: store the right value of the equation to the left variable.



Condition Judge(If...then...): execute block contained in the section if the condition is satisfied. In the program, it is always used to judge whether black wire is detected.

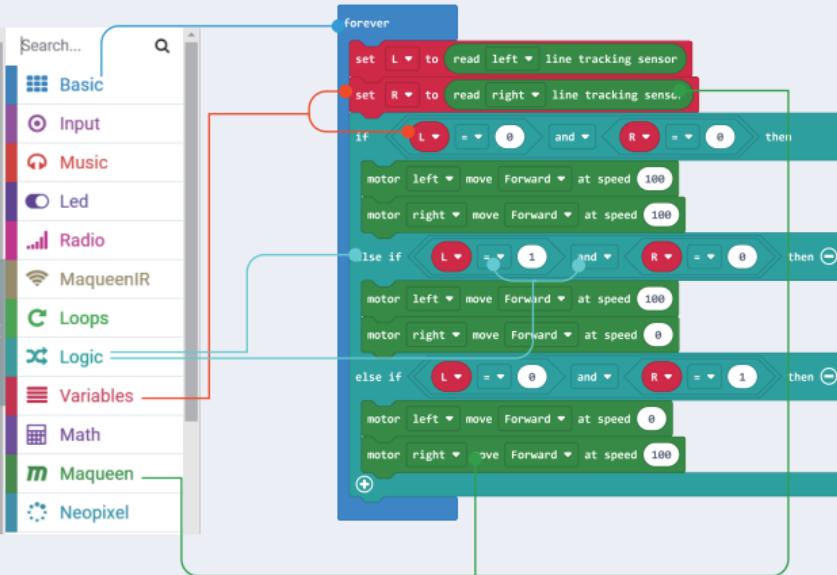


Grayscale Sensor: set the output value of the line-tracking sensors





Streetcar

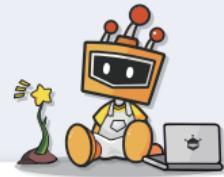


The Scratch script consists of a 'Forever' loop. Inside, it reads left and right line tracking sensors. If both are black (0), it moves forward at speed 100. If the left sensor is black (0) and the right is white (1), it turns left at speed 100. If the right sensor is black (0) and the left is white (1), it turns right at speed 100. It also includes a 'else' block which moves forward at speed 0.

```
forever
  set [L v] to [read left line tracking sensor]
  set [R v] to [read right line tracking sensor]
  if [L v] = [0] and [R v] = [0] then
    motor [left v] move [Forward v] at speed [100 v]
    motor [right v] move [Forward v] at speed [100 v]
  else if [L v] = [0] and [R v] = [1] then
    motor [left v] move [Forward v] at speed [100 v]
    motor [right v] move [Forward v] at speed [0 v]
  else if [R v] = [0] and [L v] = [1] then
    motor [left v] move [Forward v] at speed [0 v]
    motor [right v] move [Forward v] at speed [100 v]
  end
end
```

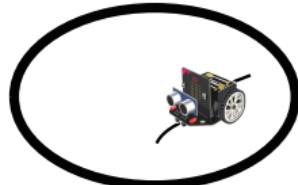
The left and right sensor detected the black line, go straight.
If the left sensor detected the black line, turn left. If the right sensor detected the black line, turn right.
Take care of high speed and avoid rushing out of the street.

Upload command to Maqueen.
Unplug the USB serial wire, let's play outside.



Hidden Level:

Challenge the hidden level!
Maqueen is a naughty robot, sometime he wants to avoid people, try making a Maqueen robot like that.





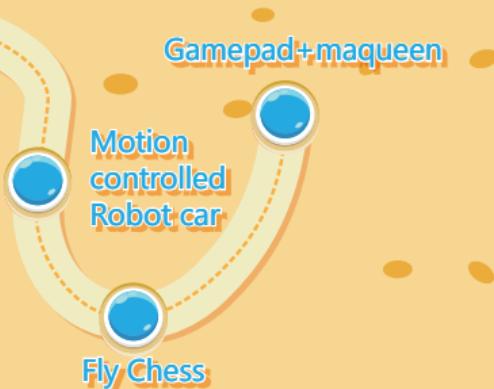
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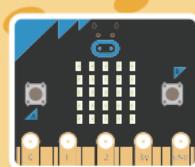
Multiplayer Mode

- Unlock the external equipment
- Accomplish the task with the help of the external equipment

Maqueen's Commander



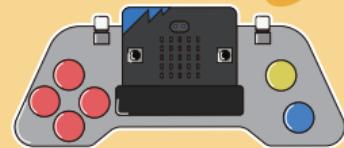
External equipment in need



micro:bit



IR Remote Controller



Micro: Gamepad



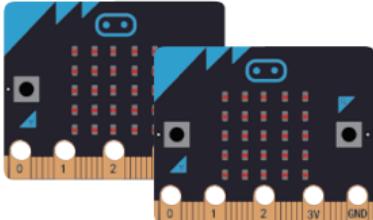
Multiplayer Mode

🎮 Maqueen' s Commander



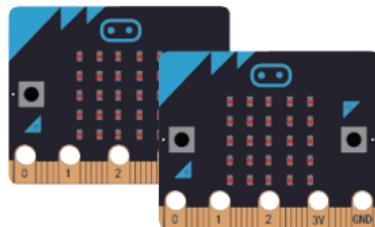
IR Remote Controller

🎮 Motion-controlled Robot Car



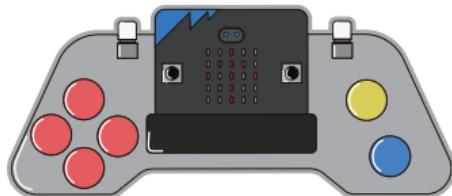
Double Micro:bit Boards

🎮 Flying Chess



Double Micro:bit Boards

🎮 Remote control car with Micro: Gamepad



Micro:Gamepad



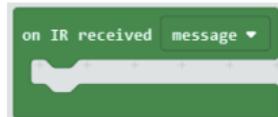
Maqueen's Commander

★ Task:

control Maqueen move forward and move back with IR controller

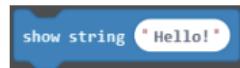
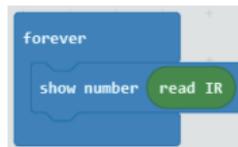


IR Command:



Receive and read the value of IR signal, set push-button to control Maqueen.

Show string:



Note: we need to know the button value before using Maqueen control Maqueen.

Use show number module to read button value of the IR controller

Key2=17, Key 8=25,

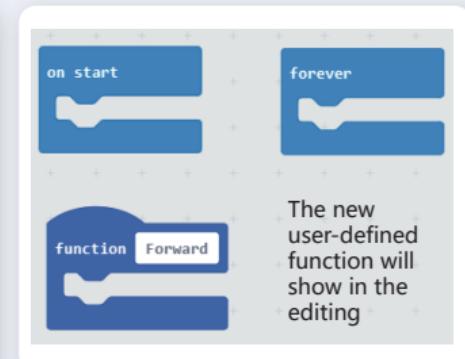
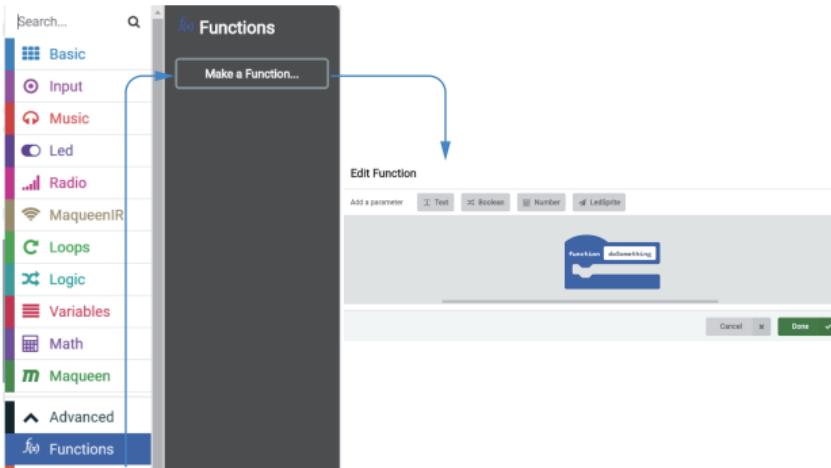
Key 4=20, Key 6=22

Key5=21



Maqueen' s Commander

Command Skills: make a new function doSomething to distinguish functions and makes the code more clearly.





Maqueen' s Commander

Press button " 2" to move forward.

Press button " 8" to move back.

Press button " 4" to turn left.

Press button " 6" to turn right.

Press button " 5" to stop.

```
on start
  show icon
  on IR received [message]
    if [message v] = [17 v] then
      call Forward
    end
    if [message v] = [25 v] then
      call Backward
    end
    if [message v] = [28 v] then
      call Turn Left
    end
    if [message v] = [22 v] then
      call Turn Right
    end
    if [message v] = [21 v] then
      call Stop
    end
  end
end
```

Self-define the function "Move forward"

```
function [Forward v]
  show string [F v]
  motor left v move Forward v at speed [120 v]
  motor right v move Forward v at speed [120 v]
  LEDLight left v turn ON v
  LEDLight right v turn ON v
end
```

Self-define the function "to"

```
function [Backward v]
  show string [D v]
  motor left v move Backward v at speed [120 v]
  motor right v move Backward v at speed [120 v]
  LEDLight left v turn OFF v
  LEDLight right v turn OFF v
end
```

Self-define the function "move back"

```
function [Turn Left v]
  show string [L v]
  motor left v move Forward v at speed [8 v]
  motor right v move Forward v at speed [120 v]
  LEDLight left v turn ON v
  LEDLight right v turn OFF v
end
```

Self-define the function "stop"

```
function [Turn Right v]
  show string [R v]
  motor left v move Forward v at speed [120 v]
  motor right v move Forward v at speed [8 v]
  LEDLight left v turn OFF v
  LEDLight right v turn ON v
end
```

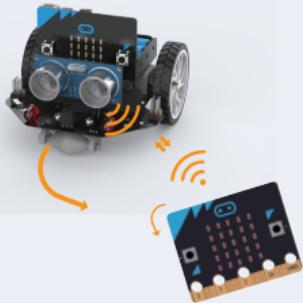
```
function [Stop v]
  show string [S v]
  motor all v stop
  LEDLight left v turn OFF v
  LEDLight right v turn OFF v
end
```



Motion-controlled Robot Car

★)) Task:

Maqueen turns left and right as the micro:bit tilts to left/right.



Note: please prepare the other micro:bit to challenge this level.

★)) Command Skills:

String Command: you can store string form in the space as below, Such as F,B,L,R...



Wireless Setting Command: only micro:bit and Maqueen in a same channel, can they communicate.



Wireless Data Sending(string): micro:bit send strings to Maqueen with wireless communication. Such as F, B, L, R...



Wireless Data Receiving(string): Maqueen receive data from micro:bit with wireless communication.



Micro:bit Gesture Command: 11 types at all, you can control Maqueen to move by these gesture commands.



Click the pull-down arrow to select different gestures.



Motion-controlled Robot Car

Examples:

Change micro:bit gestures to send different data to Maqueen.

Micro: bit Send

The Scratch script consists of six sequences of blocks:

- Sequence 1 (Top Left):** Triggered by "on start". It sets the wireless group channel to 1 and sends the string "F" to Maqueen when the micro:bit icon is downward.
- Sequence 2 (Top Right):** Triggered by "on screen up". It sends the string "F" to Maqueen when the micro:bit icon is upward.
- Sequence 3 (Middle Left):** Triggered by "on logo down". It sends the string "B" to Maqueen when the micro:bit icon is downward.
- Sequence 4 (Middle Right):** Triggered by "on tilt left". It sends the string "L" to Maqueen when the micro:bit icon is tilted left.
- Sequence 5 (Bottom Left):** Triggered by "on tilt right". It sends the string "R" to Maqueen when the micro:bit icon is tilted right.
- Sequence 6 (Bottom Right):** Triggered by "on logo up". It sends the string "S" to Maqueen when the micro:bit icon is upward.

Annotations explain the logic for each sequence:

- "Set the wireless group channel as 1" (top left)
- "When micro:bit display is upward, send the string "F" to Maqueen" (top right)
- "When micro:bit icon is downward, send the string "B" to Maqueen" (middle left)
- "When micro:bit tilts left, send the string "L" to Maqueen" (middle right)
- "When micro:bit tilts right, send the string "R" to Maqueen" (bottom left)
- "When micro:bit icon is upward, send the string "S" to Maqueen" (bottom right)



Motion-controlled Robot Car

Maqueen Receive

When Maqueen receives data from micro: bit, it moves forward and back according to the states of micro: bit .

Set the wireless channel as "1" in accordance with the channel to send data.

```
on start
  radio set group 1
```

NOTE

The "receivedString" here is the same as the variable "receivedString" as below.a

```
on radio received receivedString
  if receivedString = "F" then
    motor left move Forward at speed 120
    motor right move Forward at speed 120
  +
  if receivedString = "B" then
    motor left move Backward at speed 120
    motor right move Backward at speed 120
  +
  if receivedString = "L" then
    motor left move Backward at speed 0
    motor right move Backward at speed 120
  +
  if receivedString = "R" then
    motor left move Backward at speed 120
    motor right move Backward at speed 0
  +
  if receivedString = "S" then
    motor all stop
```

When Maqueen feels micro: bit is upward and receives the wireless data "F", it starts moving forward.

When Maqueen feels micro: bit is downward and receives the wireless data "B", it starts moving back.

When Maqueen feels micro: bit tilts left and receives the wireless data "L", it starts turning left.

When Maqueen feels micro: bit tilts right and receives the wireless data "R", it starts turning right.

When Maqueen feels micro: bit is upward and receives the wireless data "S", it stops moving.



Flying Chess

★)) Task:

Shake micro: bit and get one number. The number suggests the steps that Maqueen move forward.



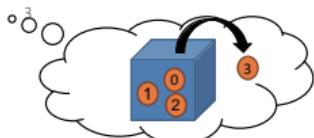
Move forward
for 1 steps

Shake the number to 1



★)) Command Skills:

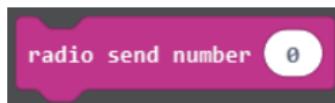
Random Command: return one number between 0~N.
E.g. There are 4 numbers(0~4) in the box, then we take one from them, and the number that we took out is a random number within 0~3.



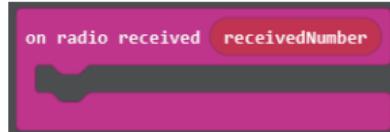
Arithmetic Operator: multiplication, to get the product of numbers or variables.



Wireless Number Sending: send numbers to Maqueen via wireless communication, such as 1,2,3,4...



Wireless Data Receiving(number): Maqueen receives data from micro: bit wirelessly.





Flying Chess

Flying Chess
micro:bit send

```
on start
    radio set group 2
```

```
on shake
repeat (2) times
    do
        show icon [diamond]
        pause (ms) 50
        show icon [cross]
    end
call Send a wireless signal
```

```
function Send a wireless signal
    set number to pick random 1 to 6
    show number [number]
    radio send number [number]
```



Flying Chess

Flying Chess
Maqueen receive

The Scratch script consists of two main sections:

- on start:** A blue hat block containing:
 - show icon [grid icon]
 - radio set group [2]
- on radio received [receivedNumber]:** A green control hat block containing:
 - if `receivedNumber ≥ 1` and `receivedNumber ≤ 6` then
 - show number `receivedNumber`
 - motor [left v] move [Forward v] at speed [120]
 - motor [right v] move [Forward v] at speed [120]
 - pause (ms) `receivedNumber × 1000`
 - motor [all v] stop

NOTE: The "receivedString" here is the same as the variable "receivedString" as below.

The number of the steps that Maqueen moves forward is the same as the number received from the micro:bit.



Flying Chess

Upload command to micro: bit and Maqueen

Download

Download to device

Upload the commands to receive and send separately to micro: bit and Maqueen. And put groups of Maqueen to race at the runway, who will be the winner?

Let's run!

1	
2	
3	
4	

End



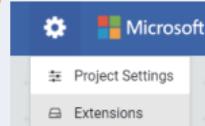
Gamepad + Maqueen

★)) Task:

control Maqueen with micro: gamepad, just the same as we did before to add Maqueen.



Note: please add extensions of micro:gamepad



1. Click Extensions

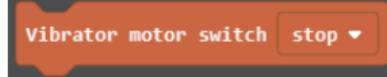
→ <https://github.com/DFRobot/pxt-gamePad>

2. Input the link: <https://github.com/DFRobot/pxt-gamePad> and click to search, and add gamepad library.

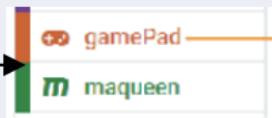


★)) Command Skills:

Button Command: Once a button is pressed, Maqueen will execute the corresponding function.



Motor vibrate command: to enable motor start or stop vibration.



3. The Command will show gamePad when add it successfully.



Gamepad + Maqueen

Remote-control car Gamepad send

Open wireless communication, gamepad send data to Maqueen and receive feedback from Maqueen. If the distance between Maqueen and obstacle is within 12cm, gamepad will vibrate to inform until the distance > 12cm.

```
on start
  show icon [Maqueen v]
  radio set group 3
```

```
on button [D-PAD down v] is pressed v
  radio send string "DOWN"
  show string "D"
```

```
on button [D-PAD right v] is pressed v
  radio send string "RIGHT"
  show string "R"
```

```
on button [X button v] is pressed v
  radio send string "STOP"
  show string "S"
```

```
on button [D-PAD up v] is pressed v
  radio send string "UP"
  show string "U"
```

```
on button [D-PAD left v] is pressed v
  radio send string "LEFT"
  show string "L"
```

```
on radio received receivedString v
  if receivedString = "Vib" then
    Vibrator motor switch Vibration v
  else if receivedString = "Stop" then
    Vibrator motor switch stop v
```



Gamepad + Maqueen

Remote-control car Maqueen receive

Once Maqueen receives data from micro:
gamepad, it starts execute functions such as **move forward, move back, turn left, turn right and stop**. If it encounters obstacles ahead, it will send feedback data to micro:
gamepad.

```
on start
  show icon [Maqueen v1 icon]
  radio set group [3]
end

forever
  if [read ultrasonic sensor (cm) < v] [12] then
    radio send string [Vib]
  else
    radio send string [Stop]
  end
end

on radio received [receivedString]
  if [receivedString = "UP"] [then
    motor [left v move Forward v at speed 120]
    motor [right v move Forward v at speed 120]
  ]
  if [receivedString = "DOWN"] [then
    motor [left v move Backward v at speed 120]
    motor [right v move Backward v at speed 120]
  ]
  if [receivedString = "LEFT"] [then
    motor [left v move Forward v at speed 8]
    motor [right v move Forward v at speed 120]
  ]
  if [receivedString = "RIGHT"] [then
    motor [left v move Forward v at speed 120]
    motor [right v move Forward v at speed 8]
  ]
  if [receivedString = "STOP"] [then
    motor [all v stop]
  ]
end
```



Gamepad + Maqueen

Upload command to micro: gamepad and Maqueen

Upload command to micro: gamepad and Maqueen, switch ON, try finishing challenges as below.

Download to device



Children can DIY a racetrack and make groups to challenge the game "Blindfolded Control Maqueen" , and check which group will reach the terminal firstly.

Challenge Rule: the challenger should be blindfolded, and control Maqueen with micro: gamepad according to the command from the partner, the first one reaches to the terminal is the winner.