

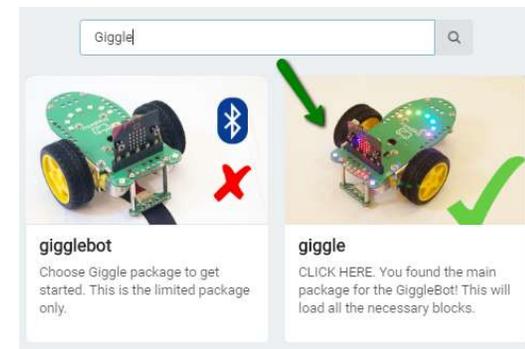
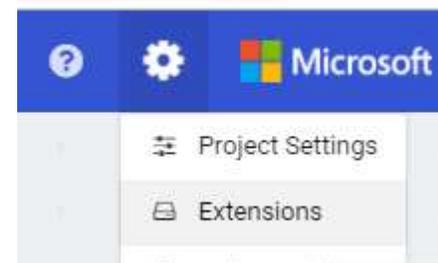


0

Load Giggle Extension

1. Go to <http://makecode.microbit.org/>
2. Click *New Project*
3. Click on the gear, top right.
4. Click *Extensions*.
5. Search for *giggle*.
6. Load the one with the green checkmark.

Load Giggle Extension



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2. Glue the backs together



3. Cut along the blue line



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1

Remote Control

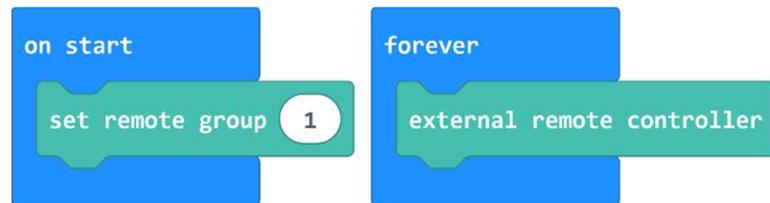
You need two micro:bits, a handheld one and the GiggleBot

On the hand-held one, keep sending signals. Look in the Remote category.

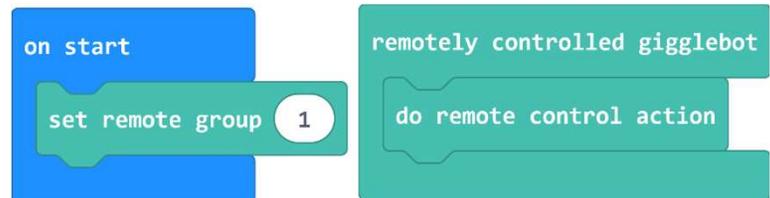
On the GiggleBot, receive signals and do the actions.

Remote Control

Hand-Held micro:bit



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Draw a circle

Steering allows you to share the power between the two motors as you want.

Steer 25% to the right for 8 seconds

Try different values for bigger or smaller circles

Draw a circle

on button **A** pressed

steer **25** towards the **right** for **8000** ms

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Correct Direction

Under GiggleBot/More, use the 'correct direction' block. 1 is a small correction and 5 is huge.

Drive forward for 4 or 5 seconds. Evaluate how straight the robot is going.

Try different numbers until you get acceptable results.

Correct Direction

GiggleBot not driving straight?

Correct its direction as needed.

```
on start
  correct towards right by 5
  drive forward for 5000 ms
```

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Draw a square

Create a loop.
Loop 4 times.

Drive forward. You can make a
small or large square.

Turn right. You will need to find
which number will make a right
angle for your GiggleBot.

Draw a square

```
on start
  repeat 4 times
    do
      drive forward for 1000 ms
      turn right for 350 ms
```

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Direct Motor Control

Under GiggleBot / More you can control motors directly

Setting power directly to each motor lets you create new movements

Direction and speed can be controlled .

Direct Motor Control

```
on button A pressed
  set left power to -90 and right to -70
  pause (ms) 2000
  set power on both motors to 0
```

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Rainbow Cycle

Display a dazzling rainbow.

Control how often the rainbow will cycle.

Hint: put this block in a Forever loop for endless dazzles.

RainBow Cycle

on start

cycle rainbow 3 times

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Rainbow Cycle Control

Control how fast the rainbow cycles its colors

Change how fast or how slow the colors will change.

Control how long it will last in milliseconds.

RainBow Cycle Control

on start

cycle rainbow every 1000 ms for 10000 ms

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Bi-Color Smile

Under Neopixels/More, find the “set pixel color at 0 to color”.

Swap the “strip” variable for the “smile” variable under Lights.

Change the number between 0 and 6 and the color.

Bi-Color Smile

on start

smile set pixel color at 0 to green

smile set pixel color at 1 to red

smile set pixel color at 2 to green

smile set pixel color at 3 to red

smile set pixel color at 4 to green

smile set pixel color at 5 to red

smile set pixel color at 6 to green

smile show

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Stop Before Obstacle

Drive forward.

In a Forever loop, keep checking the readings from the distance sensor.

If the distance sensor reports an obstacle, then stop.

Stop Before Obstacle

****Requires Distance Sensor****
Stop within 10cm of an obstacle

```
on start
  drive forward

forever
  if obstacle is closer than 100 mm then
    stop
```

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Display Graph from Sensor

The smile LEDs can display how close an object is, from 0 to a max value.

Use “display graph” block, found in Lights category.

Add sensor value, and adjust max value as wanted.

Display Graph from Sensor

****Requires Distance Sensor****

Display how close an object is, up to 200 mm away.

forever

display graph of distance to obstacle (mm) with a max of 200

Any object found between 0mm and 200mm will trigger some of the smile LEDs to turn off, until the last one shows up as yellow.

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Distance and Smile

Use the while loop to display a color as long as an object is far.

Change the smile color when the object gets closer.

Try it out by bringing your hand closer to the distance sensor.

Distance and Smile

****Requires Distance Sensor****

```
on start
while obstacle is farther than 100 mm
do
display a green smile
display a red smile
```

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Follow a Line

Follow a Black Line on pressing A.
Stop following line on pressing B.

The GiggleBot will stop if it loses track of the black line.

Use **following line** for more actions.

Follow a Line

```
on button A pressed
  follow a thick black line

on button B pressed
  stop

forever
  if following line then
    show icon [grid icon]
  else
    show icon [grid icon]
```

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Detect a Black Line

Test to see if your line is properly detected.

Place both sensors over the surface you want to test.

Change “black” to “white” to detect a white surface.

Detect a Black Line

```
on button A pressed
  if black line is detected then
    show icon [grid icon]
  else
    show icon [grid icon]
```

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Get Line Sensor Values

The line sensors read values between 0 and 1023.

To see how black is “seen”, press button A or B.

These values can be used to create your own line follower.

Get Line Sensor Values

on button **A** pressed

show number **right** line sensor

on button **B** pressed

show number **left** line sensor

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Your Own Line Follower

Stop when both sensors read “white”. Go forward if they read “black”

If a sensor reads more than the value for black, turn the opposite way.

Do this in a loop, over and over.

Your Own Line Follower

forever

if white line is detected then

stop

else if black line is detected then

drive forward

else if left line sensor > 200 then

turn right

else if right line sensor > 200 then

turn left

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Follow a White Line

Reverse when to stop and when to go straight.

Reverse the comparison and change the numbers to fit a white line

Do this in a loop, over and over.

Follow a White Line

forever

if black line is detected then

stop

else if white line is detected then

drive forward

else if left line sensor < 250 then

turn right

else if right line sensor < 250 then

turn left

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GiggleBot Set Servos

17

Set servo motors to a value between 0 and 180

Ensure the servo has a delay to achieve its new position

Try out mirror mode, and synchro mode!

Set Servos

Requires Servo Motors

on button **A** pressed

set both in mirror servo to 30

pause (ms) 1000

on button **B** pressed

set both in mirror servo to 150

pause (ms) 1000

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GiggleBot Follow Light

18

Like “follow line”, “follow light” does not need to be in a loop.

Throw a blanket or capture the GiggleBot in a box to stop following a light.

Stop will also stop it of course.

Follow Light

on button **A** pressed

follow light

on button **B** pressed

stop

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Turn Toward Light

Use “turn towards light” in any loop to control when to start and when to stop.

Use any conditions you want!

Create a light avoider by changing “towards” to “away from”.

Turn Toward Light

Example Requires Distance Sensor.

```
on button A pressed
while obstacle is farther than 200 mm
do turn towards light
```

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20

Read Light Levels

Access each light sensor to get a feel of the ambient light

Find the light sensor block under Gigglebot / More

In theory, values are between 0 and 1023, but rarely over 900.

Read Light Levels

on button **A** pressed

show number **right** light sensor

on button **B** pressed

show number **left** light sensor

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Detect Darkness

Both sensors need to detect darkness or brightness!

Brightness is defined as readings higher than 890.

Darkness is defined as readings less than 10.

Detect Darkness

```
forever
  if darkness is detected then
    show icon [darkness icon]
  else if brightness is detected then
    show icon [brightness icon]
  else
    show icon [darkness icon]
```

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Change Darkness Threshold

**Follow card #21 first.
Change the definition of darkness /
brightness to fit your environment.**

Switch to Javascript Mode!

Find:

`'gigglebot.lightest(gigglebotLightLevel.Darkness)'`

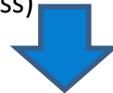
**Add comma and new value.
You can go back to Block mode.**

Change Darkness Threshold

Do card 19 first! Then JavaScript!



```
gigglebot.lightTest(gigglebotLightLevel.Darkness)
```



```
gigglebot.lightTest(gigglebotLightLevel.Darkness, 50)
```

```
gigglebot.lightTest(gigglebotLightLevel.Brightness)
```



```
gigglebot.lightTest(gigglebotLightLevel.Brightness, 200)
```

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