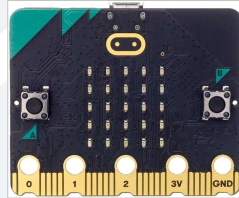


Coding Session



- In this session you will be writing the code for your Bot on a Micro:bit



1

Which skills will we use today?



Solving problems in sensible ways
Logical

Putting in lots of effort
Observant

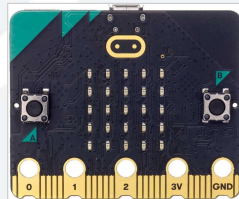
Learning about new things
Curious

2

Micro:bits



- In this session you will be connecting your micro:bit to the servo and writing the code.
- The micro:bit is a little computer that you can code to react to the world around it using its amazing sensors.

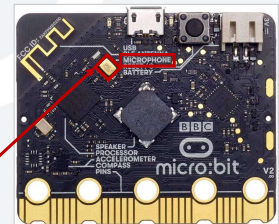


3

Micro:bits



- The micro:bit has sensors that are very small and can be hard to see!
- For the Bot we are going to use the microphone to sense any loud noises.
- Can you see it on the micro:bit?



4

Connecting the parts



Parts you need today:

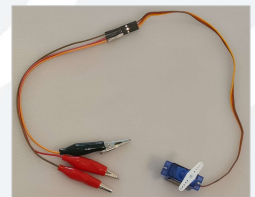


5

Connecting the parts



- Connect the 3 crocodile to jumper pin cables to the servo header



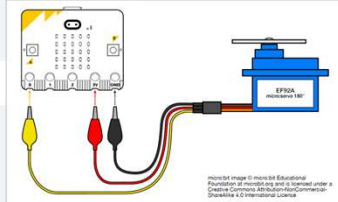
6

Connecting the parts

Connect the crocodile clips to the micro:bit as follows:

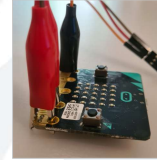
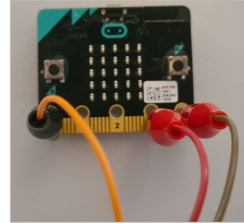
- Crocodile clip connected to the **YELLOW** servo wire → micro:bit pin 0
- Crocodile clip connected to the **RED** servo wire → micro:bit pin 3V
- Crocodile clip connected to the **BROWN** servo wire → micro:bit pin GND

NOTE: the colours of the wires attached to the crocodile clip may NOT match. It is important to just ensure the right servo colour wire goes to the right pin.



7

Connecting the parts



Note that the clips are attached perpendicularly to the micro:bit for a more secure grip.

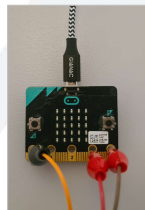
8

Connecting the parts

- Finally connect the micro USB cable to the micro:bit.

NOTE:

Be gentle with cable. It only goes in one way up!
It will stick out a little bit like in the photo

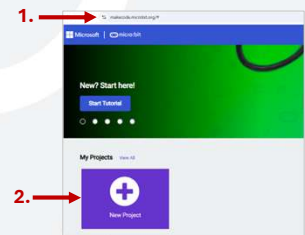


9

Write the code

You will be writing the code on the micro:bit website.

1. Go to:
<https://makecode.microbit.org>
2. Then click on "New Project".

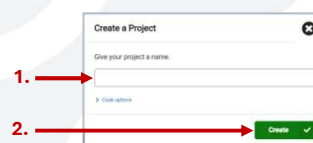


10

Write the code

- A window will pop up asking you to name the project.

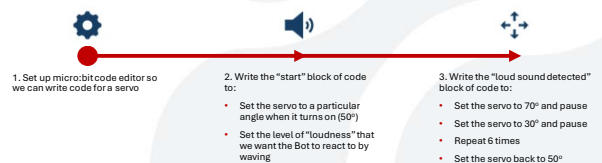
1. Type in your Bot's name!
2. Then click on "Create".



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Writing the code

- You will need to write code that will change the angle of the servo when the micro:bit senses a loud noise. Changing the angle will mean the arms attached to it will move up and down like a wave.
- We will do this in a few steps:

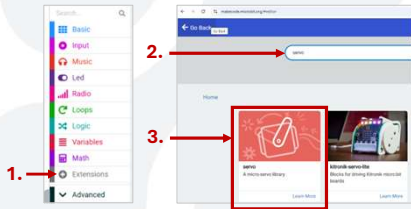


12

1. Step up the micro:bit editor

- You will need to add an extension to use the servo with the micro:bit.

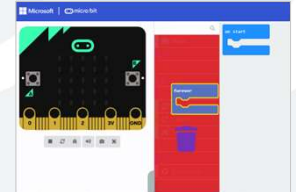
- Click on "Extensions" in the menu
- Type in "servo" in the search bar then press Enter.
- Click on the servo icon that will appear



13

1. Step up the micro:bit editor

- Remove the "forever" block by dragging it over the menu and letting go when you see a "bin" icon.



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2. Write the "start" block of code

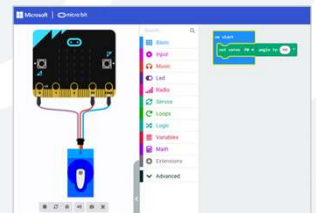
- Click on "Servos" on the menu and select "Set the servo angle".
- Drag this to the middle of the "start" block of code.



15

2. Write the "start" block of code

- You will see that in the diagram on the left, a servo appears attached to the micro:bit just like the one we have connected.

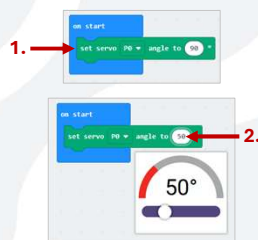


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2. Write the "start" block of code

- This block of code tells the servo to turn to a particular angle when the micro:bit is first started.
- At the moment it says 90. But you will need to change it to say 50. You can do this by clicking on the number "90" and replacing it with "50".

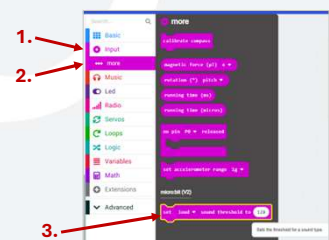
- You may find later that you want to change this if the angle is not right when your Bot is waving.



17

2. Write the "start" block of code

- Click on "Input" on the menu.
- Then click on "... more".
- Then select the last block of code that sets the loud sound threshold.



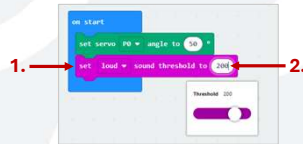
18

2. Write the "start" block of code

1. Drag the "on loud sound" block of code into the "start block" of code under the set servo block.

2. Edit the threshold to 200. You will need to return to this number later to change how sensitive you want your Bot to be.

- The start block is now written.



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3. Write the "loud sound detected" block of code

- Next we will write a new block of code which is what happens when your Bot detects a loud sound.

1. Click on "Input" on the menu.
2. Then select the block of code "on loud sound" that is under the micro:bit (V2) title.

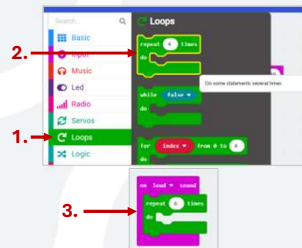


20

3. Write the "loud sound detected" block of code

- Next we will write a loop. This is a block that will repeat the code inside as many times as we tell it to.

1. Click on "Loops" on the menu.
2. Then select the block of code "repeat 4 times" and drag this into the "on loud sound" block.
3. Change the number of repeats to 6.

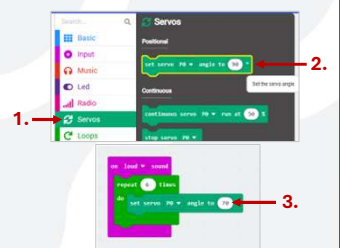


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3. Write the "loud sound detected" block of code

- Inside the repeat block we will set the servo angle and pause for two different angles.

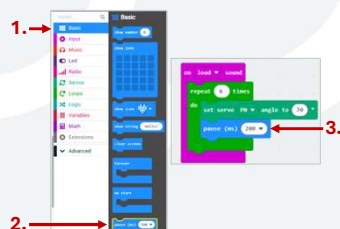
1. Click on "Servos" on the menu.
2. Select the "set the servo angle" block of code and drag it into the repeat block.
3. Change the angle to 70°.



22

3. Write the "loud sound detected" block of code

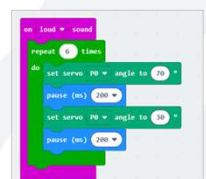
1. Click on "Basic" on the menu.
2. Select the "pause" block of code and drag it into the repeat block under the set servo block.
3. Change the time to 200 ms.



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3. Write the "loud sound detected" block of code

- Repeat the last two slides of instructions so that you have a second set servo angle, with the angle set to 30° and a second pause.

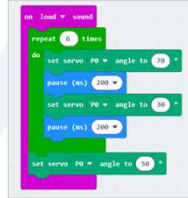


24

3. Write the “loud sound detected” block of code



- Finally add one more set servo angle block of code to the bottom of the on loud sound block of code after the repeat loop. Set this angle to 50°.



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Running the code



- Now it is time to download and run the code onto the micro:bit.
- Connect the micro:bit's micro USB cable into the computer you're writing your code on.

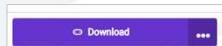


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Running the code



- Click on the Download button.
- Follow the on-screen instructions to pair your micro:bit with the computer.
- This should end with the code being downloaded onto your micro:bit.
- Any problems with connecting the micro:bit please refer to the micro:bit help: <https://microbit.org/get-started/user-guide/transfer-code-to-the-microbit/>



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Testing the Code



- Finally you get to test your code.
- Make a loud noise next to the micro:bit and the servo should move.
- The best way to make a loud noise is to clap.

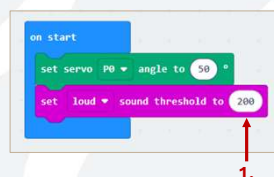


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Adjusting the Code



- You now need to decide if your code does what you want.
- Loud level
 - Does the micro:bit react to the right level of noise? If not you can change the loud threshold number.
 - Remember to download the code again every time you make a change.

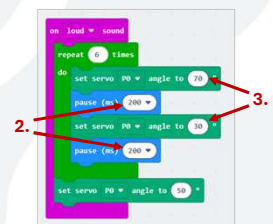


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Adjusting the Code



- You can have your robot wave slower by increasing the pause time.
 - Does the servo move enough? Remember you will be sticking larger arms onto the servo. But do you want the angle of movement to be greater? If so, change the angles for the servo. Remember to leave the final set servo at 50 though!
- Remember to download the code again every time you make a change.



30

Code is complete!

- Your code is ready for your Bot.
- Next session you will be making your Bot.



31

Which skills did we use today?



Solving problems in sensible ways Logical	Putting in lots of effort Observant	Learning about new things Curious
---	---	---

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