Hello World 1

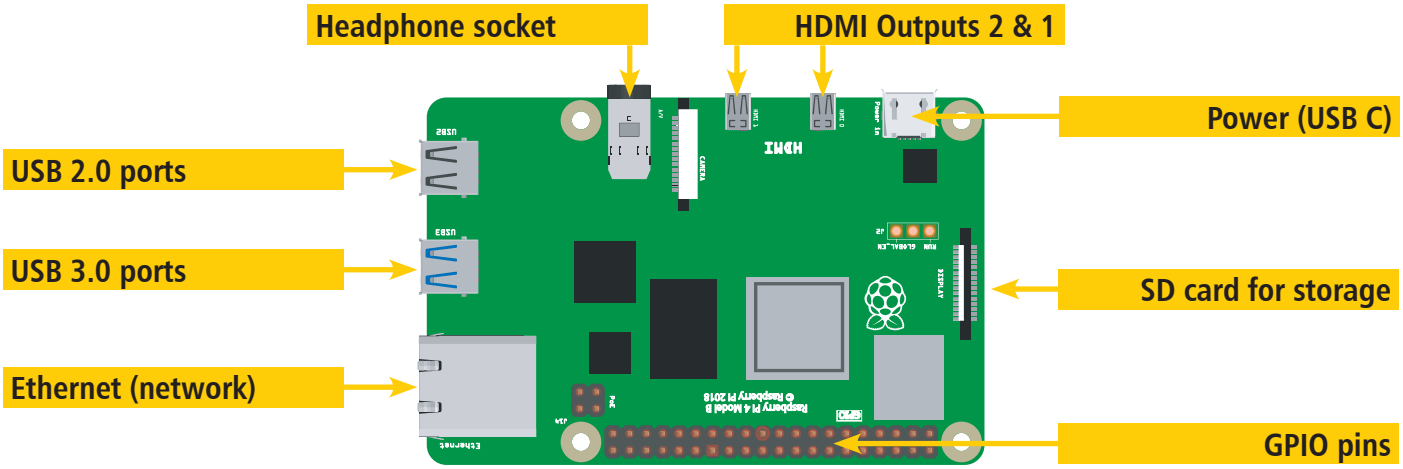
Our introduction to using Python and electronics to interact with Minecraft on the Raspberry Pi. Like all new programmers, we will start with "Hello world".

60 mins

1. Introduction to components

The Raspberry Pi layout

This layout is the Raspberry Pi 4B. The GPIO pins are the same for all 40-pin Raspberry Pi devices. **Note:** the diagram has been rotated 180° to make it easier for you to access the GPIO pins and keep cables out of your way.



GPIO pins

We will be connecting electronic components to the Pi's GPIO (general purpose input output) pins, and controlling them using Python 3. We will refer to the BCM pin connection numbers as shown.

5v +5 volt pin. Use with caution

3v +3.3 volt pins

G Ground pins

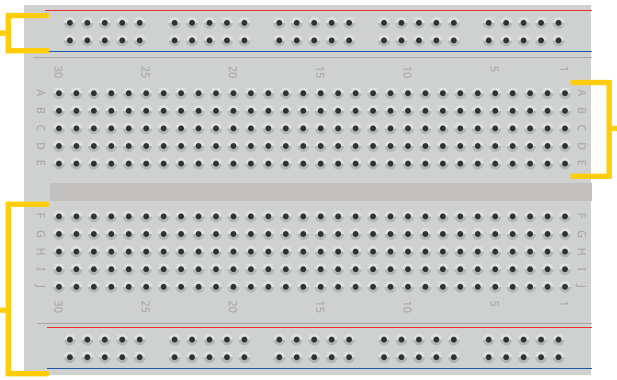
40 GPIO pins

Breadboard

The pins of electronic components are inserted into holes in the breadboard. This allows you to quickly and easily build and change electronic circuits without the need for soldering.

Each horizonal rail runs the full width of the breadboard. They are typically used for negative and positive connections

The lower half of the breadboard is a mirror of the top half



Vertical rails run to the centre of the board, with 5 connected holes in each column

2. Before we build

Let's enter and run a simple "Hello World" program without the extra hardware. This will enble us to understand how Python communicates with Minecraft.

On your Raspberry Pi:

- open Thonny and make a new document
- type-in the program to the right
- remember to use capital letters exactly as shown
- when you have typed it in, launch Minecraft and start playing
- return to your Python editor and run your program
- you should see your "Hello world" message appear in the game!

```
1.  # Import the Minecraft library
2.  import mcpi.minecraft as minecraft
3.
4.  # Create an object and link it to Minecraft
5.  mc = minecraft.Minecraft.create()
6.
7.  # Post a message to the chat window
8.  mc.postToChat("Hello World")
```

3. Components list

In addition to your Raspberry Pi and breadboard, you will need:

2 x male to female jumpers

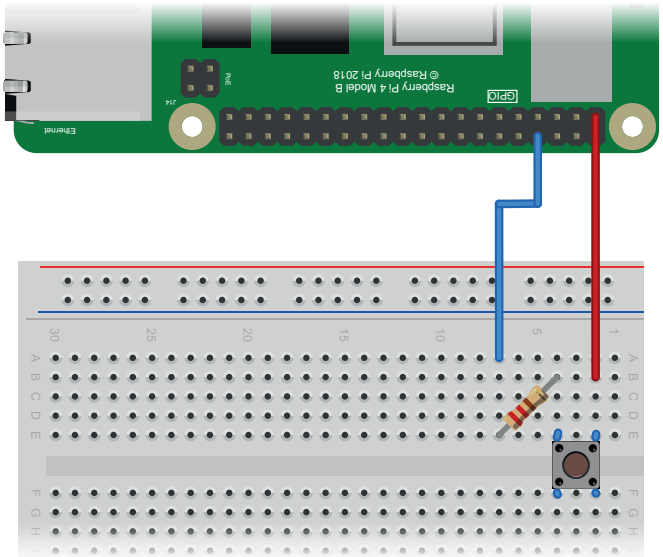
1 x male to male jumper

1 x momentary push button

1 x 220 ohm resistor

4. Enter the code and build the circuit

```
1.  # Import Minecraft Library
2.  import mcpi.minecraft as minecraft
3.
4.  # Import the GPIO Libraries
5.  import RPi.GPIO as GPIO
6.
7.  # Import the time Library
8.  import time
9.
10. # Create an object and link it to Minecraft
11. mc = minecraft.Minecraft.create()
12.
13. # Set which pin numbering to use
14. GPIO.setmode(GPIO.BOARD)
15.
16. # Set which pin our button will use
17. buttonPin = 8
18.
19. # Set the action of the button press
20. GPIO.setup(buttonPin, GPIO.IN, pull_up_down = GPIO.PUD_DOWN)
21.
22. # Loop forever
23. while True:
24.     # Check if the button has been pressed
25.     if (GPIO.input(buttonPin)):
26.         # If it has, post the message
27.         mc.postToChat("Hello World")
28.         # Wait half a second to avoid duplcate keypresses
29.         time.sleep(0.5)
```



5. Challenge

Add more buttons and more messages to display on the in-game chat.