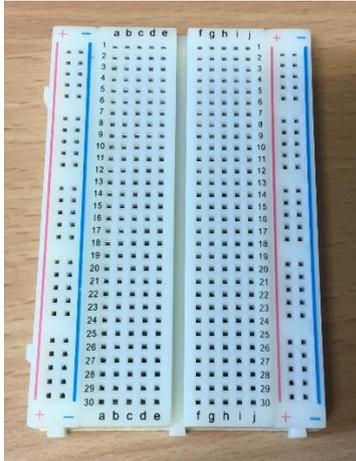


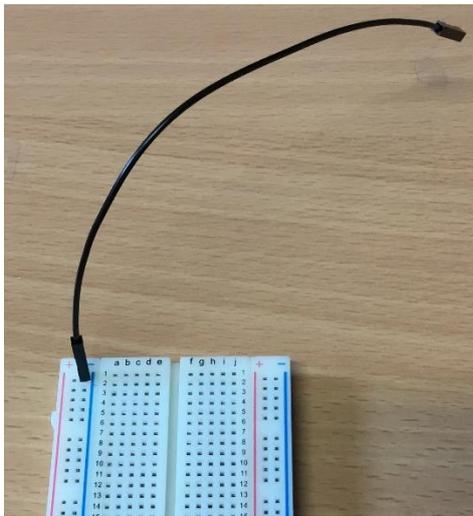
## Raspberry Pi Workshop

In this workshop, you'll learn how to set up a circuit with lights, then use a Python script on a Raspberry Pi to make the lights flash.

**Firstly, make sure your Raspberry Pi is powered off and disconnected from the power supply.**



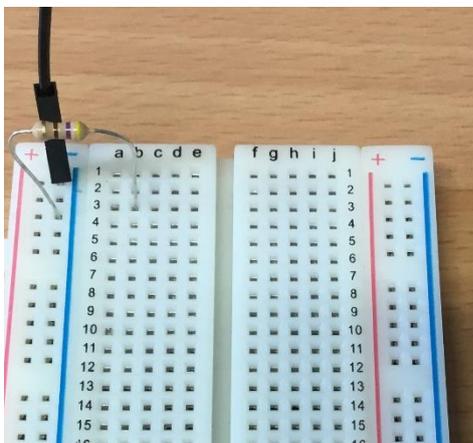
Before you begin building the circuit, take a look at the breadboard in your electronic starter kit. We'll connect components to this to create the circuit.



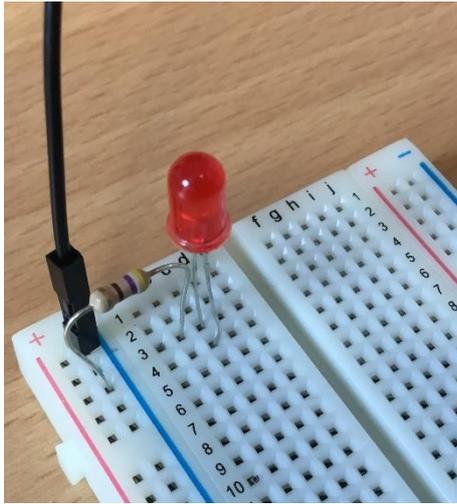
You'll now need to find a jumper wire, and connect it to a negative slot on the breadboard.

*Note:* In this example, I've used a **black** wire; you can use any colour you wish, but you may find it easier to follow the instructions if you use the same colours I've used in my examples, as I will be referring to the wires by their colour.

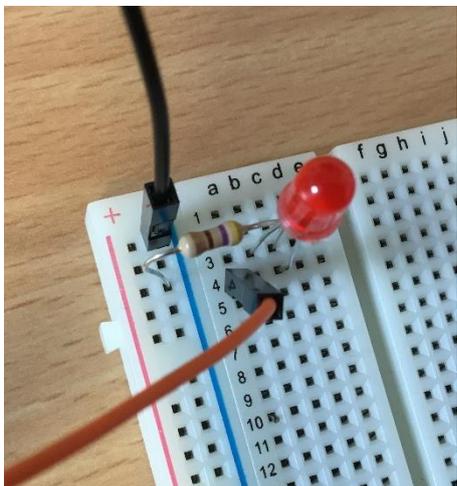
You don't need to connect the other end yet.



Next, take a 470Ω resistor and connect one end to a negative slot on the left of the breadboard. Connect the other end to slot **b3** on the breadboard.

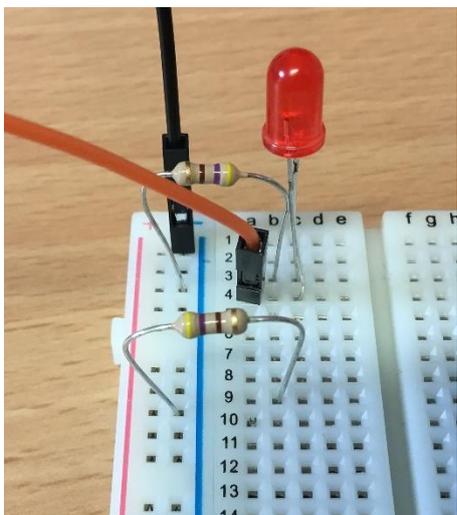


Now take a red LED from the kit and insert the short connector into slot **c3** and the long connector into slot **c4**.

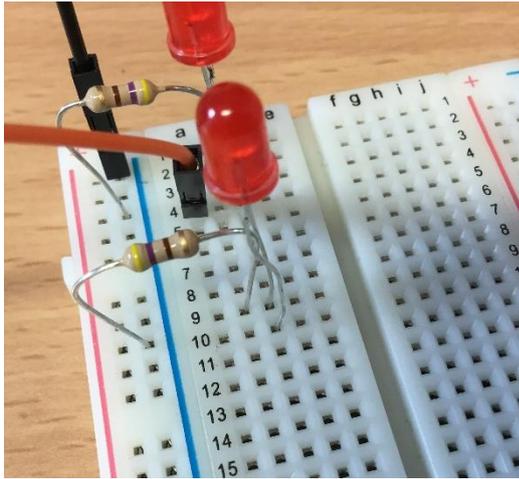


Take another jumper wire and connect it to slot **a4** on the breadboard. I've used an **orange** wire in this example.

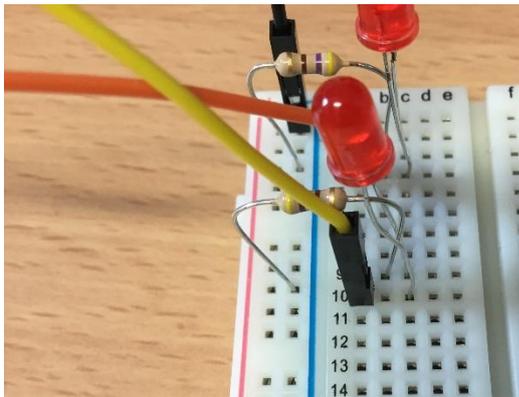
You don't need to connect the other end yet.



The next step is to take another  $470\Omega$  resistor and connect one end to a negative slot on the left of the breadboard, and the other end to slot **b9** on the breadboard.



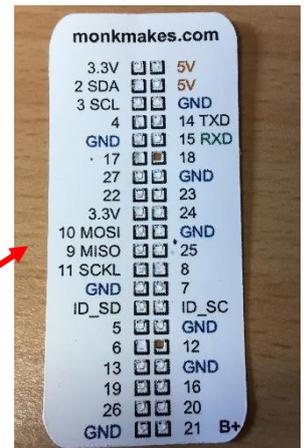
Now take another red LED and connect the short connector to slot **c9** and the long connector to slot **c10**.



Take another jumper wire (I've used **yellow** here) and connect it to slot **a10**.

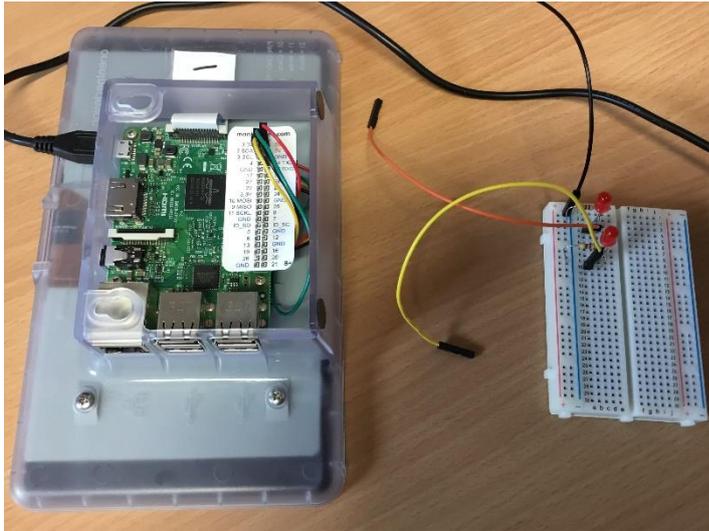
Now it's time to connect your jumper wires to the Raspberry Pi itself. **Don't turn it on yet.**

You can use the sheet shown in the picture to the right (which should be among the items in your kit) and place it over the pins in the Raspberry Pi (shown in the next picture) to see what each pin is called.



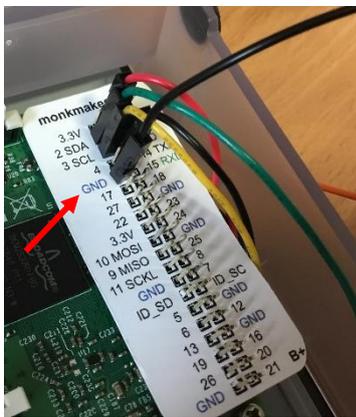
If you haven't already done so, remove the cover from the back of the Raspberry Pi. You will then be able to see the pins that you'll need to connect the wires to. You can place the sheet shown above over the pins so you know what each pin is called (for example, we'll need to connect a wire to pin **27** later in these instructions).

*Note:* You may notice some wires are already connected – these are for the screen, so if you have to remove these to attach the sheet, please put them back where they were. If you can't remember, you can ask for help.

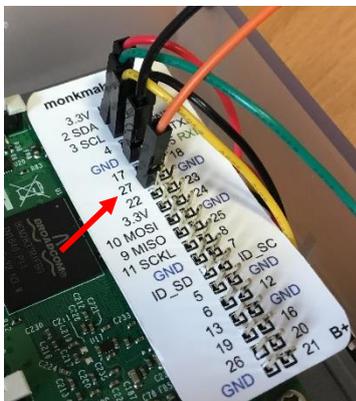


Place your breadboard next to the Raspberry Pi. You'll need to connect the black, orange and yellow wires next.

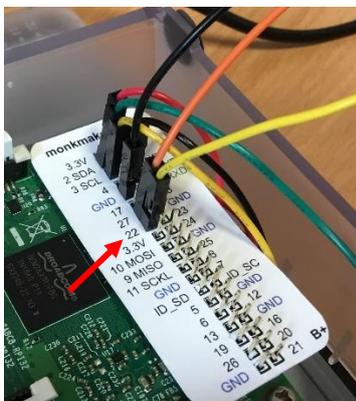
*Note:* If you've chosen to use different colours, please use the wire that is in the same place as the ones I refer to in the next steps.



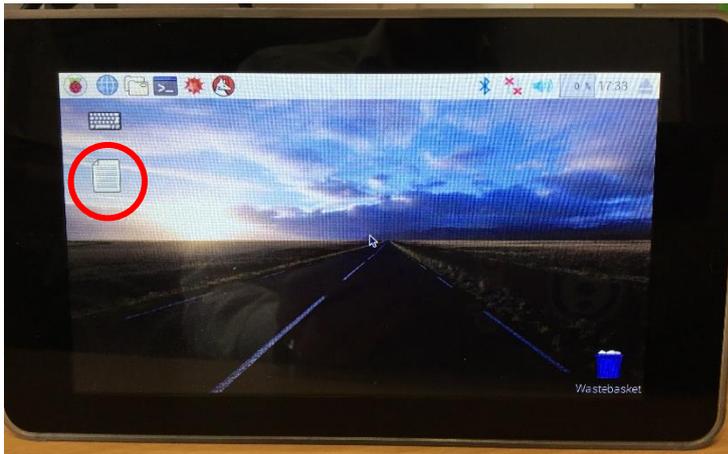
Connect the **black** wire to the **GND** pin shown in the picture.



Connect the **orange** wire to pin **27**.

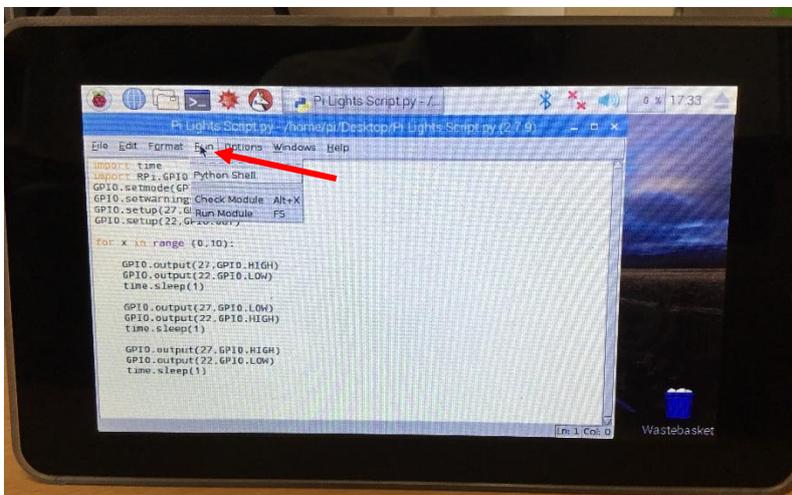


Connect the **yellow** wire to pin **22**.

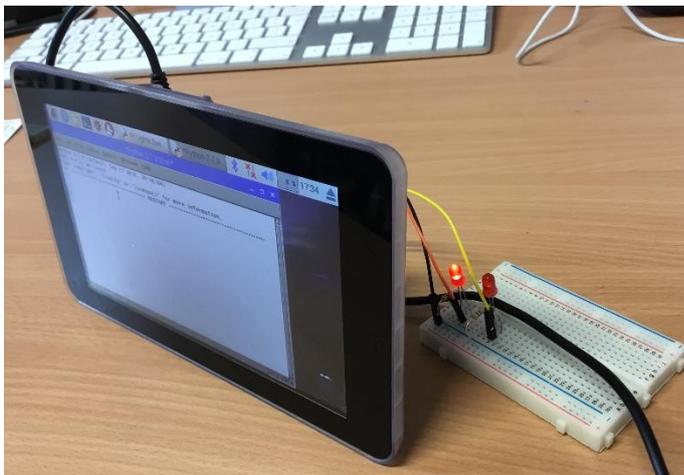


Power on the Raspberry Pi and wait for it to load.

Once it's loaded, open the **Pi Lights Script** file on the desktop by double-tapping it (the file is circled in the picture).



Once the script opens, click **Run** in the menu at the top, then click **Run Module**.



Once the module starts running, the LEDs on the breadboard should start flashing to show your circuit and the script has worked!

Now you can try experimenting with different ways of setting up the circuit; for example, you can create the same outcome by moving the components to different slots on the breadboard, as long as they still form a circuit; or, you can modify the Python script in several ways, such as making the lights flash faster; or you can try adding more components to the circuit.