

# EQUALOCES

## Minecraft Collection



**Hide a diamond, Find a diamond**

# Hide a diamond, Find a diamond (Dan Aldred)

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## Objective

We are going to create a game where we hide a diamond in the Minecraft world, then it is the players quest to go seek out the treasure.

## Getting Started

1. Start by going into the Raspberry Pi menu and clicking on games, then Minecraft Pi. Select Start Game then Create New. Press ESC on your keyboard and minimise the window.
2. Double click on the EduBlocks desktop icon to open up the program. You are now ready to start coding.

## Let's Code

Now its time to build our code. We can drag our code blocks from the EduBlocks toolbar which is on the left hand side of the screen. Our first 3 blocks of code can be found in the BasicTab and the Minecraft General Tab, take a look, they are colour co-ordinated. Drag the blocks onto the workspace as shown in the diagram.

```
from mcpi.minecraft import Minecraft
import time
mc = Minecraft.create()
```

In this section of code we are importing the Minecraft Module from the Minecraft Pi Library. We are importing time. The 3<sup>rd</sup> block creates a connection to the Minecraft server.



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Let's Code

Our next 4 blocks can all be found in the Minecraft commands section of the toolbar. Drag them over to the workspace and connect to the previous blocks . When entering text into blocks click inside - you can tab across.

```
mc.postToChat(" Here is the diamond block i have hidden ")
mc.setBlock( 50 , 25 , 11 , 57 )
mc.camera.set Fixed ()
mc.camera.setPos( 50 , 30 , 11 )
```



In this section of code we are firstly sending a message to the Minecraft server using `postToChat` to display the message. – Here is the block I have hidden. Then we are setting the position of where to hide the block and the camera position just above it using the x, y and z co-ordinates.

Let's Code

For this next block we need to go to the Basic Edublock section of the toolbar and select the time block. Drag this block onto the workspace and connect to the previous blocks. Click inside the time block and enter the number 10 (this means 10 seconds)

```
time.sleep( 10 )
```

This block allows us to set a sleep within our code. It will allow the above code for our message and camera to be displayed for 10 seconds before the rest of the code runs.

For our final 2 blocks we need to go back to the Minecraft General blocks. Drag them onto the workspace and attach to the previous blocks.

```
mc.postToChat(" Go find it ")
mc.camera.set Normal ()
```

Now for the final 2 blocks, the first sends a message to the Minecraft server using postToChat to display the message – “Go find it”  
The second tells our camera to go back to normal setting.

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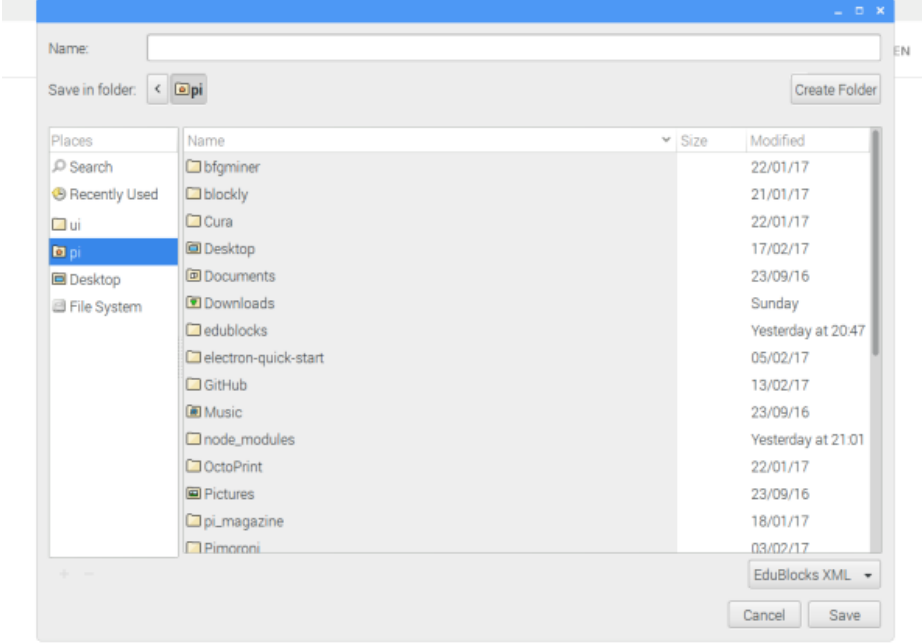
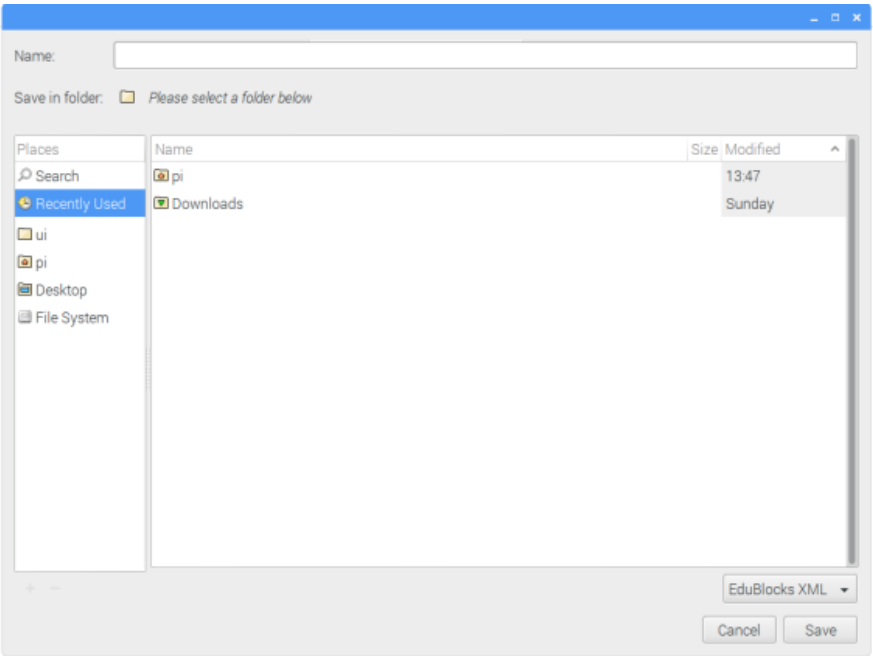
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Save your code

```
from mcpi.minecraft import Minecraft
import time
mc = Minecraft.create()
mc.postToChat(" Here is the dimond block i have hidden ")
mc.setBlock( 50 , 25 , 11 , 57 )
mc.camera.set Fixed ()
mc.camera.setPos( 50 , 30 , 11 )
time.sleep( 10 )
mc.postToChat(" Go find it ")
mc.camera.set Normal ()
```

Before we run our code, lets save it. Click on the save button in the top right hand corner of the EduBlocks window. Select the folder called Pi.

Type in the file name box lets call it **Findablock** then click save.





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Run your code

Now it's time to run our code. Click on the run button in the top right hand corner of the EduBlocks window. Then click on the Minecraft tab to return to our Minecraft world. Now go and seek the hidden treasure.



Outcome

In this tutorial we have learnt how to import libraries, talk to the Minecraft server - in order to display a message, and use variables. We have used a set camera code and knowledge of the x, y and z co-ordinates to firstly hide a block and then find it.

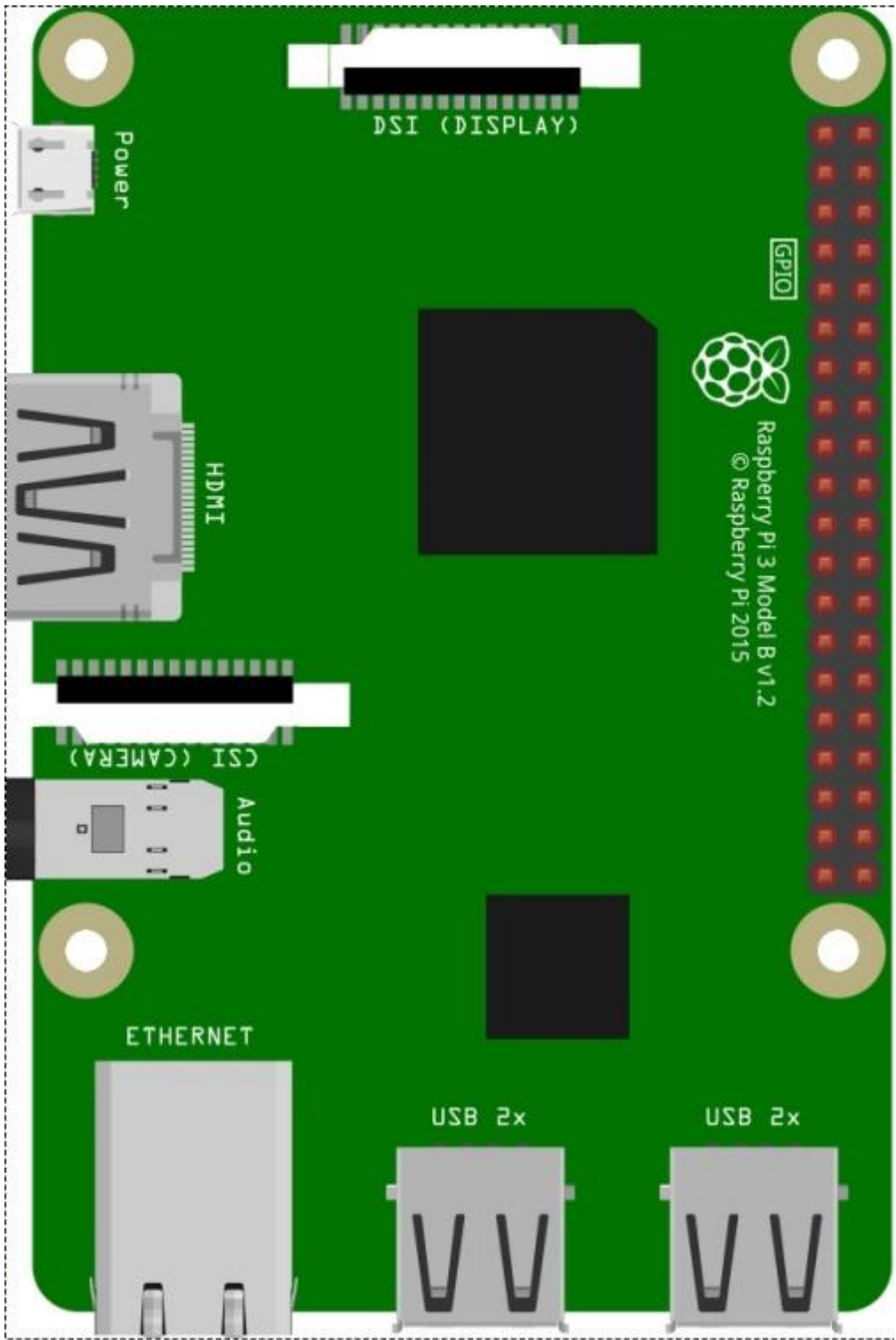
**Challenge: Continue to page 6 for some Physical Computing.**

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## Physical Computing

We can make the game more exciting by adding a physical element like lights. Lets add some code so that when we get closer to finding the block we make lights flash and a congratulations message appear. Firstly lets connect our lights to the GPIO pins of our Raspberry Pi.



GPIO stands for General Purpose Input Output. Inputs are things like buttons, keyboards and sensors. Outputs are things like lights, buzzers and signals.

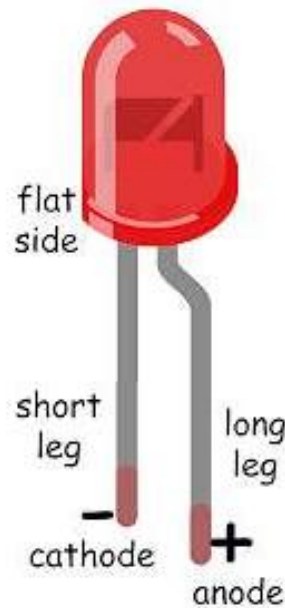
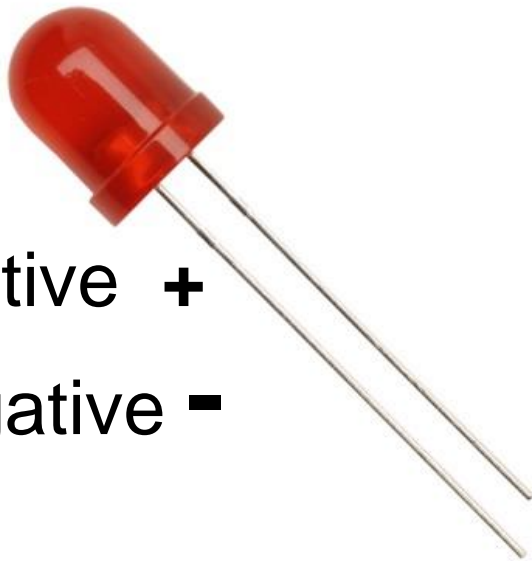


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Physical Computing

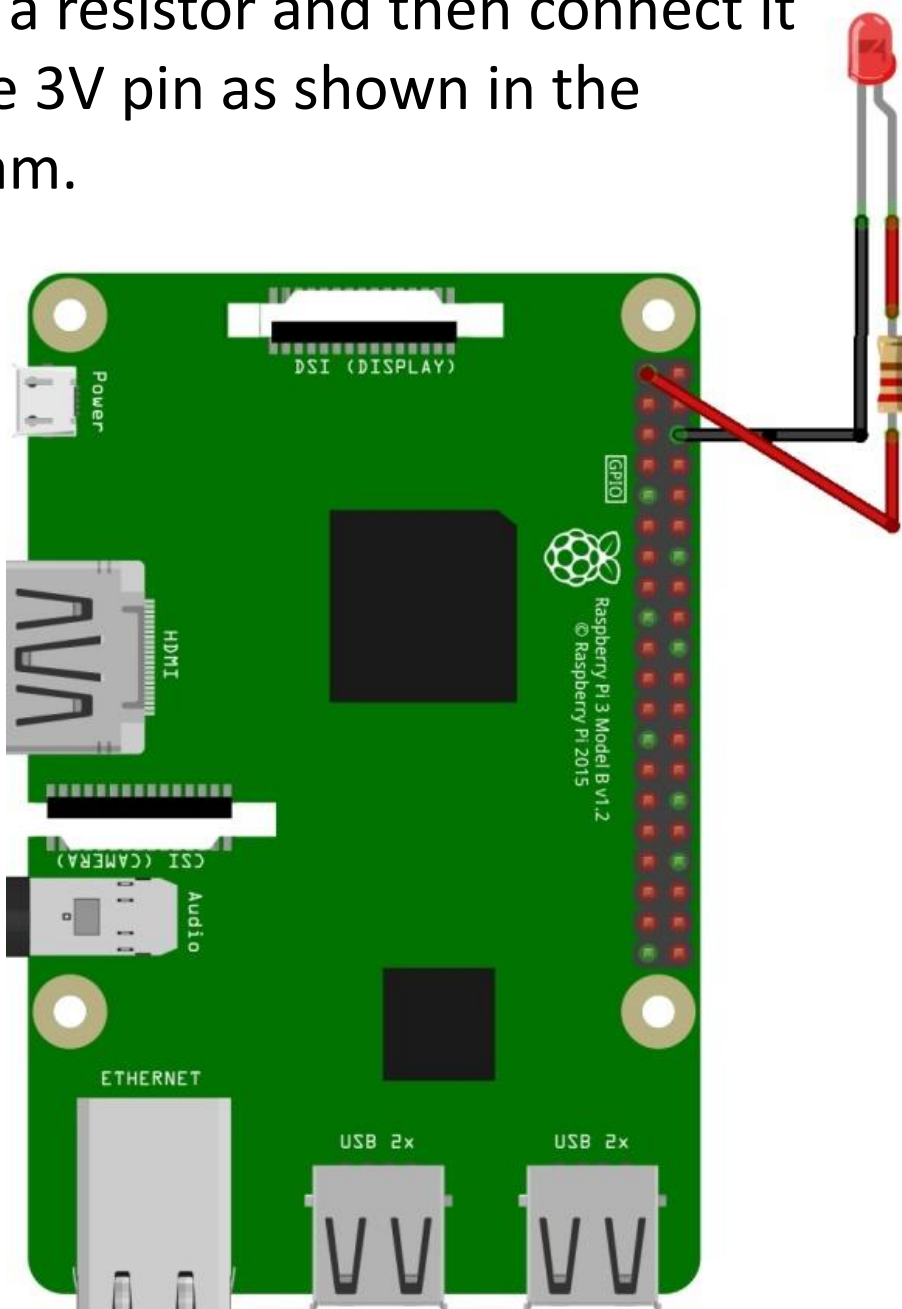
**LED:** Real  
Long Leg Positive +  
Short Leg Negative -



**LED:** Diagram  
Bent Leg Positive +  
Straight Leg Negative -

## Step 1

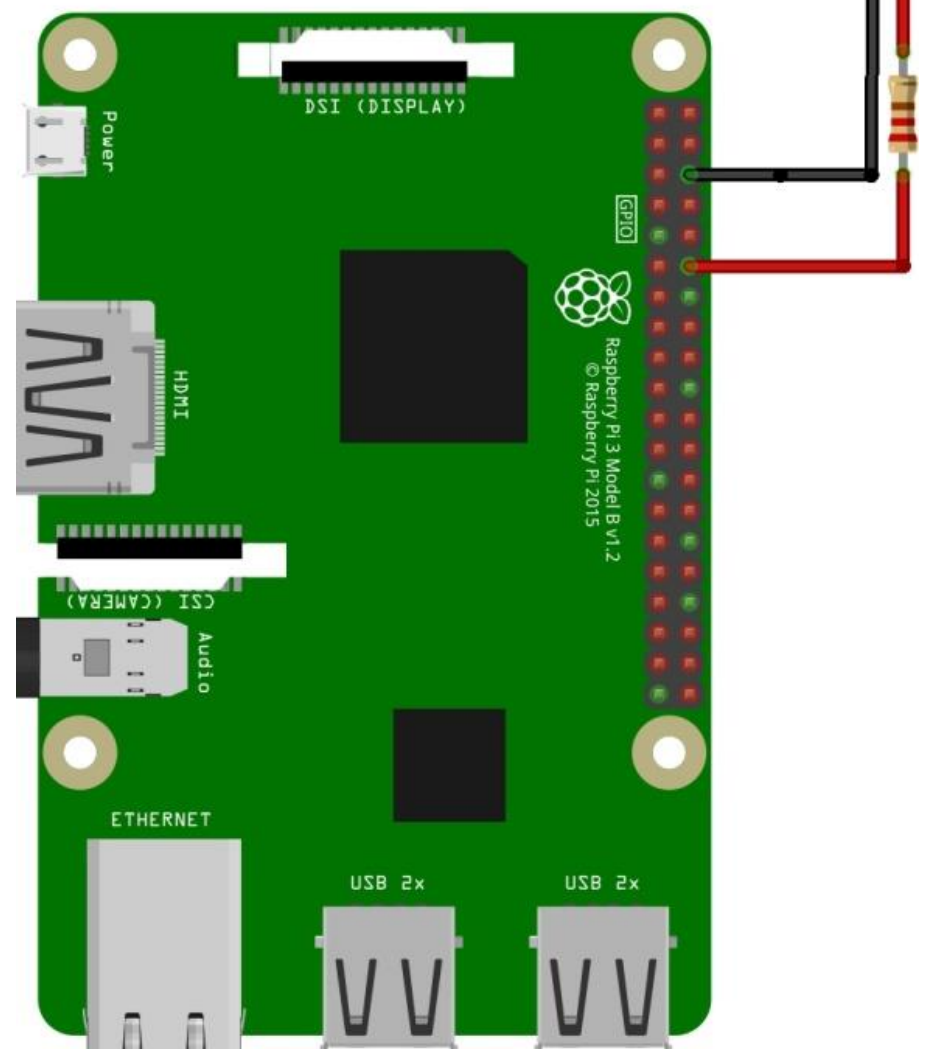
We need to connect our LED to the GPIO pins. First let's connect the negative leg to ground. Then to test our LED works connect the positive leg to a resistor and then connect it to the 3V pin as shown in the diagram.



We need to use a resistor to reduce the amount of power going to the LED so it doesn't blow.

## Step 2

Now we know our LED works move the positive wire to GP18 pin. Notice the LED is no longer lit, this is because we need to tell the pin to give the LED power.





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Let's Code

We need to add two blocks from Basic to our existing code click them underneath the very first block of your existing code.

```
import math
from gpiozero import *
led = LED( 18 )
```

The first block imports the math library, this can be found in Basic. The second block imports GPIOZero, this can be found in GPIOZero >> General. The third blocks sets up our LED on pin 18, this can be found in GPIOZero >> Outputs >> LED.

We now need 3 more blocks they can all be found in Basic. The first is the While true block, click this onto the very last block of our existing code. The second block is a variable that you need to add text into. Click this block inside the While true loop. The third block is an If statement block ,click this onto the block you have just inserted.

```
while True:
    distance = distance_to_player(50, 25, 11)
    if distance<5 :
```

The first block is a while loop, this is a way of looping through commands until the condition is met in this case it will always be true and will run forever. The second block creates a variable so when we want to mention distance in the loop we can shorten the code to just distance. The third block is an if statement, in this case if the distance is less than 5 then do the following.

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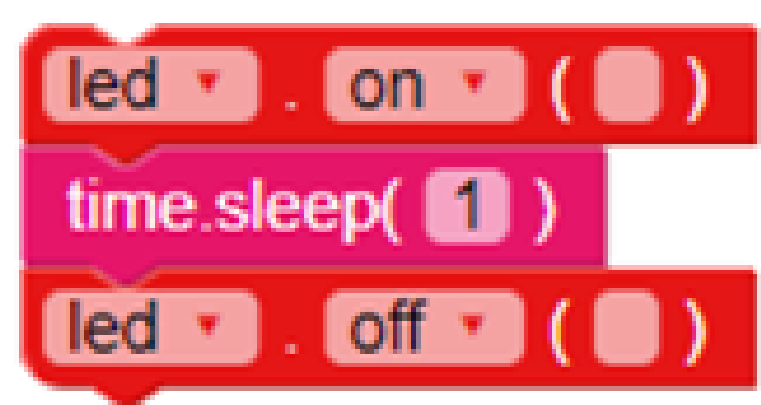
Let's Code

Our next block can be found in Minecraft commands, click it inside the If statement and type in the message.

```
mc.postToChat(" Congratulations you have found it! ")
```

This block sends a message to the Minecraft server using postToChat to display the message "Congratulations you have found it!"

We need to add 3 more blocks before our code is finished they can be found in GPIOZero >> Outputs >> LED. The sleep block can be found in Basic. Add the blocks to the post to chat block inside the If statement block.



The first block sends power to the GPIO pin number 18 to turn our LED on. The second block creates a pause before the next bit of code runs. The third block stops the power going to GPIO Pin number 18.

Save your code

Now its time to save our code just like we did on page 4. This time save it as **Findablocklight**



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```
from mcpi.minecraft import Minecraft
from edupy import *
import math
import time
mc = Minecraft.create()
mc.postToChat(" Here is the diamond block i have hidden ")
mc.setBlock( 50 , 25 , 11 , 57 )
mc.camera.set Fixed ()
mc.camera.setPos( 50 , 30 , 11 )
time.sleep( 10 )
mc.postToChat(" Go find it ")
mc.camera.set Normal ()
while True:
    distance = distance_to_player(50, 25, 11)
    if distance<5 :
        mc.postToChat(" Congratulations you have found it! ")
        red _led_on()
        time.sleep( 1 )
        red _led_off()
```

The forever loop we have added means that as the player gets closer to the block, in this case less than 5, our LED will flash on for one second then off, at the same time as displaying the message on screen, this will continue over and over until we move further away.

Run your code

Now run your code just like you did on page 5.

## Challenge:

1. Change the location of the block  
(remember to change your coordinates in all the relevant places).
2. Make the lights flash faster or slower.
3. Change the type of block that is hidden.