

ASTRO PI¹ MISSION ZERO

Part 3: Colour Sensor

Send a personalised image to the astronauts on the International Space Station!

Last week you created 8x8 pixel-art (8 pixels high by 8 pixels wide)

Pixels are **picture elements**.

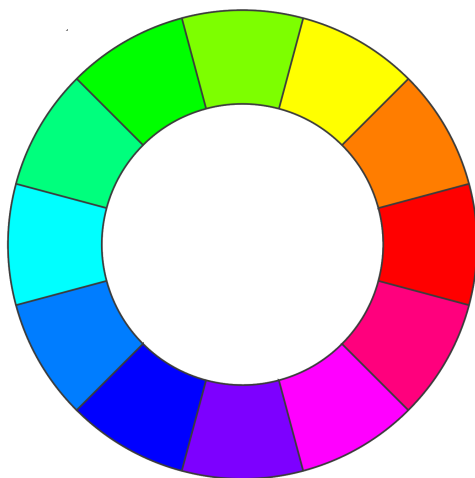
- Open **pixilart.com** (we can all use the same login **CodeClub67**)

1. Click on the profile *avatar* at the top-right of the window
2. Select **My Gallery**
3. Click on your first image (if you want to change it click **edit**)
4. In the panel on the right scroll down to **Details**
5. Click **Download Original** to download a .png (ping) image.
6. Save this in your downloads folder.



- **MISSION ZERO grid**

1. Open <https://codeclub67.github.io/astro-pi>
2. Choose the .png file in downloads
3. Complete the first mission grid on the sheet.
4. Write your name on the back.



Your first mission is to change your image using a sensor reading. We can simulate this in Scratch.

Use a sensor to change image colours.

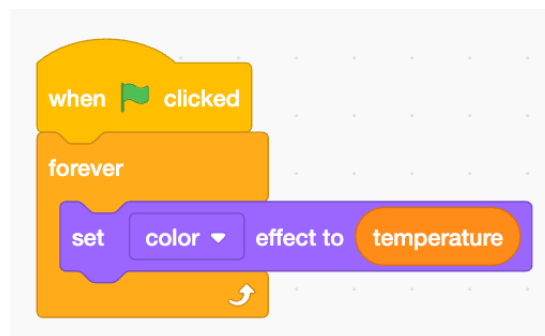
*Colours can be placed on a colour wheel. Any colour can be shifted clockwise around the wheel using the Scratch **colour effect** with the shift value.*

The wheel is 200 units around, so a value of 100 will shift any colour to the opposite side.

¹ astro-pi.org

MISSION ZERO – Scratch Simulation

1. Login to **scratch.mit.edu**
2. Create a new Scratch project
3. **Upload** a new sprite using the .png image in downloads.
4. It's very small – only 8x8. Adjust the size to 2000%
5. Simulate a sensor by **making** a new variable, called **temperature**.
6. Make sure the variable is **ticked** so it's shown on-screen.
7. Right-click on the on-screen variable to make it a **slider**.
8. Right-click on the on-screen variable to **change slider range**
Set the **maximum value** to 200 (the *circumference* of the colour wheel), **OK**
9. Add this code to set the colour effect according to the temperature.
10. Run the code and change the temperature.



Try a temperature of 100, does it shift the colour to the opposite side of the colour wheel?

A sensor value of 200 should take the colour all the way round the colour wheel back to where it started. What happens?

Astro-pi

Your tutor will show you how to do the same thing on the Astro-pi.

- Open Astro-pi Mission Zero:
https://missions.astro-pi.org/mz/code_submissions/new
- Paste in and demo the example sensor code from:
https://codeclub67.github.io/astro-pi/temperature_sensor.py
- Download a Pixilart gallery image and use the Mission Zero image encoder tool to generate the image and paste this into the Python code, and indent as necessary:
<https://codeclub67.github.io/astro-pi/encoder.html>
- Run the code and vary the temperature
- The code also uses the colour sensor to clear the screen at the end.
- Enter **classroom code** and **team name** and save the work (no need to submit yet)