



F8.7 Images

Data representation · GCSE · OCR J277 1.2.4, AQA 8525 3.3.6, Edexcel
1CP2 2.2.2 · about 15 min

Name _____

Class _____

Date _____

What this lesson is about

Pixels, resolution, colour depth, metadata and file size, from the robot's camera.

- A picture is a grid of numbers
- Seeing it in the console
- Resolution and colour depth
- File size
- Metadata

Questions

5 marks in all

1. An image is 32×24 pixels with a colour depth of 8 bits. How many bits is it? [1 mark]

2. How many colours can a pixel with a colour depth of 4 bits have? [1 mark]

3. Doubling both the width and height of an image does what to its file size? [1 mark]
☐ A Multiplies it by 4
☐ B Doubles it
☐ C Leaves it the same
☐ D Halves it
4. What is metadata in an image file? [1 mark]
☐ A Data about the image, such as its width, height and colour depth
☐ B The brightest pixels
☐ C The compressed pixels
☐ D A copy of the image
5. What is the effect of increasing colour depth? [1 mark]
☐ A More colours and a larger file
☐ B Fewer pixels
☐ C A smaller file
☐ D Lower resolution

The task: camera pixels

Capture `camera_image(32, 24)`. Print it as 24 lines of 32 characters, `#` for a pixel whose average of red, green and blue is below 128, `.` otherwise. Then print `1-bit size: <bits>` and `24-bit size: <bits>` for a 32×24 image, worked out with a calculation.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

img = camera_image(32, 24)
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/f8-7-images/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Count how many pixels in the picture are mostly red, meaning red is more than green and blue added together.
2. Print a greyscale picture using the characters `. : - = + * # % @` from light to dark.
3. How many bytes would 10 seconds of camera frames at 320×240 , 24-bit and 30 frames a second take?