

Storing Images

- 1 A computer screen displays images using pixels.

a) Describe how the number of bits used per pixel affects the colours in an image.

The number of bits per pixel determines the number of colours

And so increases the amount of unique colours an image has available to use.

[2]

b) How many bits per pixel would be needed for a pattern that uses 256 unique colours?

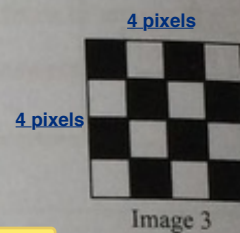
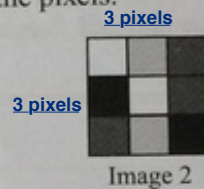
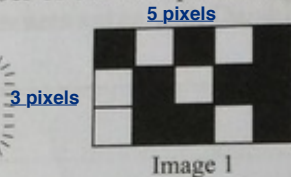
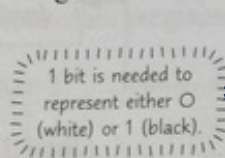
Remember Bit-Depth Here

As $2 \text{ to the power } 8 = 256$

8

[1]

c) Explain which of the following images would need the greatest number of bits to represent all of the pixels.



In Image 1, there are 2 colours, black and white, so 1 bit is required to represent each pixel.

In an image 1, 15 bits are needed as there are 15 pixels.

In Image 2, we can see there are 4 different colours (white, light grey, dark grey, black) so 2 bits are required for each pixel.

There are 9 pixels. So 9×2 bits are required = 18 bits.

In Image 3, there are 2 colours, black and white, so 1 bit is required to represent each pixel.

We can see in Image 3, there are 16 pixels, and with 1 bit representing each pixel $16 \times 1 = 16$ bits are required.

[4]

[Total 7 marks]

- 2 Duncan prints a 10×10 inch photograph with a resolution of 60 DPI.

a) i) Define the term 'resolution'.

DPI means Dots Per Inch or Pixels Per Inch

Resolution is the number of pixels which represent an image.

[1]

ii) Calculate the total number of pixels in Duncan's photograph.

$$10 \times 60 \times 10 \times 60 = 360,000 \text{ pixels}$$

[2]

b) Explain how decreasing the DPI would affect the image quality.

A lower DPI (Dots/Pixels Per Inch) means that a lower resolution.

A lower resolution decreases the quality of the image.

As it means the number of pixels in a given area decreases.

[2]

c) Explain the purpose of metadata in an image file.

The purpose of it is to allow the image to be displayed on the screen properly.

Meta-data is data about data.

So, it includes data about heighth, width, resolution, etc.

[2]

[Total 7 marks]