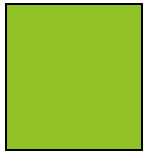
Exercises

Imagine you have taken a picture with a **4 megapixel** digital camera. For ease of calculation, assume that the picture is **square**, not rectangular.



4 million pixels

Assume that you are printing this picture out on a printer that has approximately **4000 dots per inch.**

A) How many inches across would the picture be when it was printed?

- 4,000,000 = 2000 * 2000

  Therefore the picture would take up 0.5 by 0.5 inches.

B) If you viewed this image on a screen that had 1000 dots across, what portion of the image would be visible?

- You would see ½ the width and ½ the height.
- Therefore you would see: ½ * ½ = ¼ of the image

Exercises

- How many colours can be represented by 3 bits?
- $2^3 = 8$ colours
- How many bits are required to represent 128 different colours?
- $128 = 2^7$. Therefore 7 bits are required.
- How much memory would be required to store a black and white image that is 10 pixels high and 5 pixels wide? Show your working.
- Number of colours = 2^1. Therefore 1 bit is required per pixel.

  Number of pixels = h * w = 10 * 5 = 50

  Memory needed = 50 * 1 = 50 bits

Exercises

- How much memory (in bytes) would be required to store an image that has 256 different colours and is 3 pixels high and 5 pixels wide? Show your working.
- Number of colours = 256 = 2^8. Therefore 8 bits or 1 byte are required per pixel.

  Number of pixels = h * w = 3 * 5 = 15

  Memory needed = 15 * 1 = 15 bytes