Metadata | Part A

When we work with digital images we need to be aware of the trade-off: higher quality images require more space to store in memory. A digital image is like a description of an object. We can describe an object with a brief sentence – let's say "a little house on a hill" that will take very little space on a page. Or we can describe it more detail - "a 1,000 square feet Victorian house on a North side of the hill with a pretty fence outside and red roof shingles" - this is starting to take up more space. An architect could fill a book with a detailed description of this house - this will require even more space to store.

When an image is more detailed we say it has "higher resolution" – it is made up of finer dots and each dot takes up space of course.

Similarly, all the dots and shades in an image will have their own colours of different brightness and tint. On small-sized images this information is thrown away. But a diligent high resolution image will describe the colours so well that your computer can show you exactly what was in the original picture your friend sent you.

Colour depth is the number of bits used to describe the colour of a single pixel. Using more bits gives us more combinations of colour, so that we can find a combination that is the closest to the one we need. Common colour depths are 8 bit, 16 bit, 24 bit and 32 bit.

Even black-and-white images are not just black and white. Pure black and white is known as monochrome, while the regular images without colour are known as grayscale because they have many shades of grey, scaled from black to white.

For example, let's imagine a girl named Ada need to buy a mobile phone case to go with her light brown bag. When she comes to the first store, a small stall in the shopping centre, they only have 2 mobile phone cases - black and gold. These two combinations could be described with 1 bit: 0 for black and 1 for gold. Not a very good match for her bag.

The next store, on high street, she goes and she finds 4 cases: black, gold, pink and brown. She is happier and almost buys the brown one. However, she is not quite happy that her bag is really light brown, while the case is really dark. It kind of works, but doesn't match particularly well. So she tries her chance with a third store.

The third store is located out of town's centre and is much bigger, once she gets there, she sees 8 cases: black, gold, yellow, pink, red, dark red, light brown, dark brown. We can describe them with 3 bits:
000 is black
001 is gold
010 is yellow
011 is pink
100 is red
101 is dark red
110 is light brown
111 is dark brown
She is happy, she found the exact match. The first two stores carried just the basic colours but the third store had different shades, deeper colours - but the downside is that it needs bigger shelves and has to be out of town's centre to save on rent.

So, to summarise, higher quality pictures require more memory using more bits to describe more pixels and more realistic colours. This can slow down your computer, but your eyes will