**WEEK 16 Image representation**

**Starter:**

**What does ASCII stand for?**

American Standard Code for Information Interchange.

**How many characters are in the ASCII character set?**

In ASCII, there are 128 different characters that can be represented in 7-bits of code.

**What is the difference between ASCII and Unicode?**

ASCII uses lowercase letters (a-z), uppercase letters (A-Z), digits (0-9) and punctuation marks to represent letters, whereas Unicode uses symbols. Unicode also uses more languages and math's symbols

**Task 1**

a) Give a description of the two main types of digital image:

1) Mathematical instructions are used to draw vectors.

2) Bitmap / Raster is an invisible grid that separates the page into pixels, each of which is assigned a color

b) Identify two advantages and two disadvantages for each type of digital image.

**Bitmap**

* The ability to produce high-quality images.
* Using an array of memory to store pixel data, bitmap files can be easily created.

**Vector**

* Size of file is smaller.
* You can scale the image without losing any quality.

**Task 2**

What is metadata and why does it need to be included in the file?

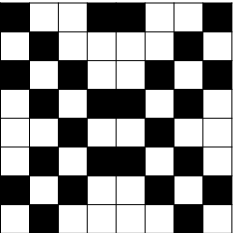
A file starts with meta data that tells the computer how it should process the data.

**Task 3**

Size of the image grid (width and height)

Color depth (number of bits per pixel)

Resolution to display the image in (pixels per inch)



10011001

01000010

10100101

01011010

00100100

01011010

10100101

01000010

The RESOLUTION is the number of PIXELS an image has on the screen.

To work out how many pixels you multiply the width by the height.

WIDTH (pixels) X HEIGHT (pixels)

**Example:**

This screen size is 1280 by 800 pixels.

1280 x 800

= 1,024,000

**Task 4**

a) In your own words, explain how a bitmap image can be represented in Binary and how the resolution of an image can change.

b) What does pixelate mean?

Pixelated is when an image is created by using 1 and 0. The outcome of this is a grid which makes an image using only black and white tiles.

**Task 5**

a) Discuss the effect of color depth and resolution on the size of an image.

1 bit allows 2 values meaning you can have two shades of color on your image. If your image is 2 bits, then you can have up to 4 shades of color.

b) Which three colors are used to make all three colors on a computer?

RGB: RED, GREEN and BLUE

**Task 6**

**Discuss direct color and explain how color is stored this way**

Direct color is made up by mixing RGB. This will create a hex color.

**Task 7**

**Firstly, why do you think that we compress images?**

Over-sized files will eat up bandwidth, leading to slower online performance.

**Task 8**

**Research some key facts about each type of compression.**

**Lossy:**

Video and audio files, as well as many types of images are often compressed by lossy methods. Lossy compression sacrifices some information to get smaller file sizes than lossless compression.

**Lossless:**

Lossless compression packs data into a smaller file size by identifying redundant data internally. If an original file is 1.5 MB, for example, according to the type of file being compressed, the size can be halved.

**Task 9**

|  |  |  |
| --- | --- | --- |
| LOSSY | LOSSLESS | Generic Compression |
| Removes unnecessary info. | Not the best at reducing file size | File storage requirement is reduced |
| Cannot get back original copy | You can get back the first copy | Uses bandwidth |
| Compatible with MP3 and JPEG | Compatible with ZIP AND GIF | Less time is needed for downloading |
| Used for multimedia files | Useful for computer program files | Helps occupy disk space and overall storage |