3.3 Fundamentals of data representation

3.3.6 Representing images

Content	Additional information	Chk
Understand what a **pixel** is and be able to describe how pixels relate to an image and the way images are displayed.	Students should know that the term pixel is short for Picture Element. A pixel is a single point in a graphical image. VDUs display pictures by dividing the display screen into thousands (or millions) of pixels, arranged into rows and columns.	
Describe the following for bitmaps: • **image size** in pixels • **colour depth**. Know that the size of a bitmap image in pixels (width x height)	The size of an image is expressed directly as width of image in pixels by height of image in pixels using the notation width x height. Colour depth is the number of bits used to represent each pixel.	
Describe how a **bitmap** represents an image using pixels and colour depth.	Students should be able to explain how bitmaps are made from pixels.	
Describe using examples how the number of pixels and colour depth can affect the file size of a bitmap image.	Students should be able to describe how higher numbers of pixels and higher colour depths can affect file size and should also be able to use examples.	
Calculate bitmap image file sizes based on the number of pixels and colour depth.	Students only need to use colour depth and number of pixels within their calculations. Size (bits) = W x H x D Size (bytes) = (W x H x D)/8 W = image width H = image height D = colour depth in bits.	
Convert binary data into a bitmap image.	Given a binary pattern that represents a simple bitmap, students should be able to draw the resulting image as a series of pixels.	
Convert a bitmap image into binary data.	Given a simple bitmap, students should be able to write down a bit pattern that represents the image.	