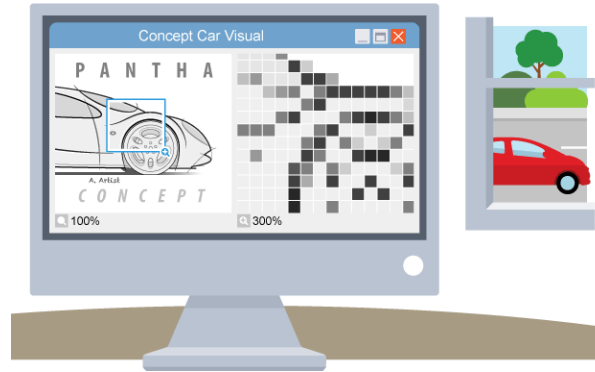


Digital images

Graphics on a screen are made up of tiny blocks called **pixels**. The more pixels on the screen, the higher the **resolution** and the better the quality of the picture will be. The higher the image resolution, the more **memory** is needed to store the graphic. Image files can be either **bitmaps** or **vectors**.

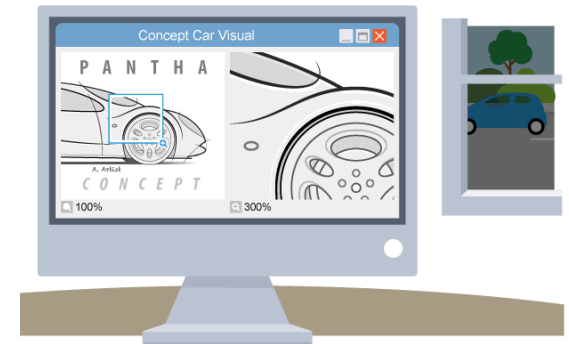


Bitmaps

Bitmap images are widely used on digital cameras, **smartphones** and online. Common bitmap image file types include **JPEG, GIF** and **PNG**. Bitmaps are also known as pixelmaps or raster graphics. Bitmap images are organised as a grid of coloured squares called pixels (short for 'picture elements'). When zooming in or enlarging a bitmap image, the pixels are stretched and made into larger blocks. This is why bitmap images appear as poor quality when enlarged too much.

Vectors

A **vector image** uses scalable shapes such as straight lines and curves, using coordinates and geometry to precisely define the parts of the image. It is more efficient than bitmaps at storing large areas of the same colour because it does not need to store every pixel as a bitmap does. Vector graphics can be scaled without losing resolution. They can be enlarged or reduced in size - but the file size will stay almost exactly the same.

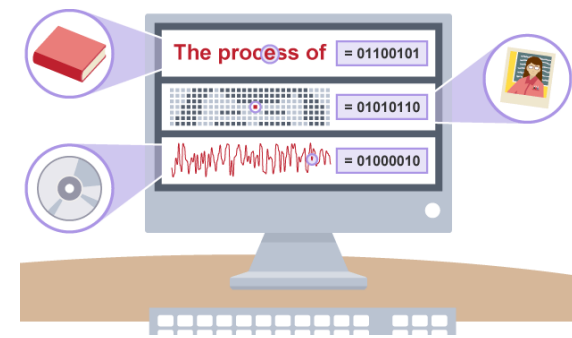


How computers see the world

There are a number of very common needs for a computer, including the need to store and view **data**.

Computers use electrical signals that are on or off, so they have to see everything as a series of **binary** numbers. This data is represented as a sequence of 1s and 0s (on and off). **All data that we want a computer to process needs to be converted into this binary format.**

Encryption



What is binary?

Binary is a number system that only uses two digits: 1 and 0. All information that is processed by a computer is in the form of a sequence of 1s and 0s. Therefore, all data that we want a computer to process needs to be converted into binary.

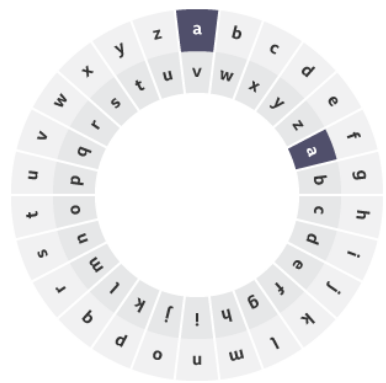
The binary system is known as a 'base 2' system. This is because:

- there are only two digits to select from (1 and 0)
- when using the binary system, data is converted using the power of two.

Encryption

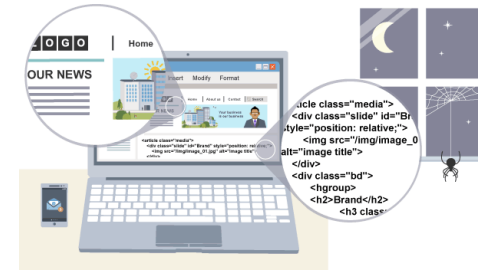
Encryption is the process of encoding data or a message so that it cannot be understood by anyone other than its intended recipient. In computer processing, encryption means that data can be stored and transmitted securely by the sending computer to the receiving computer. The data or message is encrypted using an encryption algorithm. The opposite of encryption is **decryption**.

Caesar
Cypher



Web pages

A web page is a document that can be viewed on a web browser. It can contain text, images, sounds, animations, videos and hyperlinks to other web pages. Most web pages are written using HTML, HTML5, XML and CSS.



Type	Description
Navigational features	These are clearly displayed on a web page and are essential in guiding the user through the content contained on a site. When web designers are building a website, the navigational features are among the most important to get right.
Web banner	This is the title or header image of a web page and it works in the same way as a newspaper masthead or magazine title. It aims to attract an audience and indicates the type of content available. It does this through choice of image and selection of font.
Flash elements	These design options allow web designers to incorporate animations and interactive content into a website. A flash plug-in is required to view these features on a web browser. Many websites are moving away from Flash and using platform neutral technologies such as HTML5 instead. Some web browsers, such as Chrome, have announced they are withdrawing from supporting Flash.
Advertisements	Though not all websites carry advertisements, many do as it helps generate revenue from site visits.
Multimedia features	This is the use of images, video, text and audio on a website to present information in an engaging and effective way. These features can help make the content more entertaining and informative.
Web links	When links direct a user to another page on the same website they are 'internal links' and when they direct a user to the pages of another website they are 'external links'.
Interactive elements	These allow the user to contribute to the website by taking part in forums, surveys, games, quizzes, or by commenting on an article. In turn, the audience may be inspired to produce blogs and vlogs using platforms like YouTube, Tumblr or WordPress, which encourage interactivity from site visitors.





Key Terms used within this unit	
2D/3D	In game terms, this refers to whether the gameplay screen is 2 dimensional or 3 dimensional. For example, an overhead view of a maze would be a 2D game whereas a walkthrough first person shooter game would be 3D.
Characters	These are the characters that are found within the game. Examples would include the player character(s) and any non-player characters, which are controlled by the game programming.
Game Characteristics	This covers elements such as main theme, number and type of players, player characters, style of game play, type of environment, genre etc. In combination, they define the characteristics of the game. Contrasting examples would be a first person shooter game versus a quiz or simulation game.
Game Components	The game components include clearly defined goals, rules, challenges and interactions. These would need to be developed as part of the game creation process, which is different to the descriptive nature of the game characteristics.
Game Console	A dedicated piece of hardware used for playing digital games. Examples include Nintendo 64, Sega Dreamcast, Microsoft Xbox, Sony PlayStation, Nintendo Wii.
Game Environment	This is the setting for the gameplay and may be the 2D background or the 3D room. This is sometimes referred to as the game world. The players' character is positioned in the environment or room. This term should not be confused with the game development environment, which would be the same as game engine.
Game Platform	The platforms are the hardware that the game is played on, which might be different to the hardware that is used for the development. Examples of games platforms would include a PC, Xbox, PS4, Wii and Smartphone.
Genre	The style of game. Examples would be arcade, FPS (first person shooter), role playing, adventure, MMORPG (massively multiplayer online role playing game).

Key Terms used within this unit	
Generations 1-8	Game consoles have been categorised using this system since the early 1970s. The generations 1 through to 8 represent periods of time when consoles have evolved. For example, Atari Pong arcade game is generation 1, the original Xbox is generation 6 along with PlayStation 2, whereas the Xbox One and PS4 are generation 8.
Legislation	In game design terms, this applies to the use of any intellectual property and copyrighted material that is planned within the content of the game. For example, the use of established and well known characters such as Mario, Harry Potter or any Marvel superheroes in a new game would not be allowed. In terms of copyrighted material, this may restrict the use of some assets eg images, graphics, sounds and background music.
Narrative	This refers to the storyline that the game is based upon. Not all games have a narrative such as a basic racing game. However, as soon as there are multiple levels or strategies as part of the game then this becomes part of the storyline.
PEGI	PEGI is the Pan European Gaming Information who provide age ratings for games based on their content. The age ratings are 3, 7, 12, 16 and 18.
Scoring System	These are a way of measuring progress and achievement in a game. They can be based on points that are accumulated through gameplay or alternatively, based on timing systems (where a faster time to achieve an objective equates to a higher performance by the player).
Visual Style	This is related to the genre and refers to what is shown on the game screen. Stylisation can also refer to colours, brightness and the overall visual content, which may be dark and moody to give a sinister feel for example.
Visualisation Diagram	A visualisation diagram is a drawing or sketch that illustrates what is to be produced and/or what the final product will look like. This would be a rough version and used either for approval purposes by the client or potentially by a designer when creating the actual product. The diagram could be created either digitally or drawn by hand for example.

Word processing

Most people are familiar with word processing packages such as Microsoft Word

Standard features

All word processing applications allow you to:

- enter and edit text
- save
- print
- cut/copy/paste
- check your spelling
- Cut, copy, and paste

Demonstration of the cut copy and paste function

Cut and copy work in a similar way. Highlighting a piece of text, right-clicking and selecting copy/cut will store the text in memory. The difference is that copy leaves the highlighted text behind whereas cut removes it. To insert the copied/cut text into a different area of the document, a different document, or an entirely different application altogether, right-click and select paste.

The use of cut, copy, and paste is not necessarily limited to text.

Business Documents

Text formatting

Formatting text makes a document easier to read. You can:

- change font type and size
- change the alignment of text (left, centre, right or justified)
- bold text
- underline text
- italicise text
- create bulleted or numbered lists

Other features

Other features that may be expected include find and replace, which replaces one word with another, and the ability to import graphics, eg from a clip art library. Headers and footers and page numbering are also very useful.

Mail Merge

Advantages

One standard letter can be written and sent to all customers without having to manually add each name and address.

The letter can be personalised - it looks as though the letter has been written to the individual person.

It's a very fast way to produce hundreds of personalised letters.



What is programming?

Programming is writing computer code to create a program, to solve a problem. **Programs** are created to implement **algorithms**. Algorithms can be represented as **pseudocode** or a **flowchart**, and programming is the translation of these into a computer program.

To tell a computer to do something, a program must be written to tell it exactly what to do and how to do it. If an algorithm has been designed, the computer program will follow this algorithm, step-by-step, which will tell the computer exactly what it should do.

What is a programming language?

A **programming language** is an artificial language that a computer understands. The language is made up of series of **statements** that fit together to form **instructions**. These instructions tell a computer what to do.

We need to learn two programming commands:

print – this command sends whatever is in the brackets after to the screen. You can put several bits there separated by commas. You must put a string (a bunch of characters) in speech marks and you must have a bracket at the beginning and end of the stuff to print.

`print("Hello", "George")` will write Hello George on the screen.

`print("Python is fun")` will write Python is fun on the screen.

input – this is used to ask the user to enter something. Whatever they type in will be treated as a piece of text which means we might have to change it if we want to ask for numbers. But more of that later.

`name = input("Please enter your name: ")` will write Please enter your name: on the screen and wait for the user to enter something. As the user presses [Enter] the word(s) they've typed are put into the variable name.

This last bit is very important. Putting something into a variable is called assignment. A variable can be changed at any time in a program by assigning a new value to it. It acts like a label for a piece of information, and whenever we refer to the variable '**name**', the computer will know that we mean the thing that the user input.