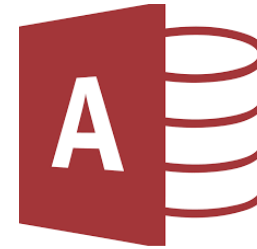
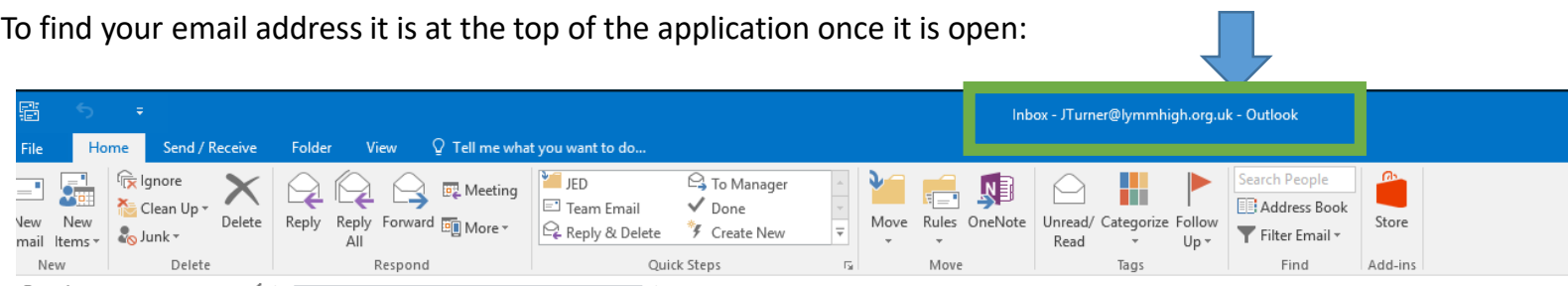


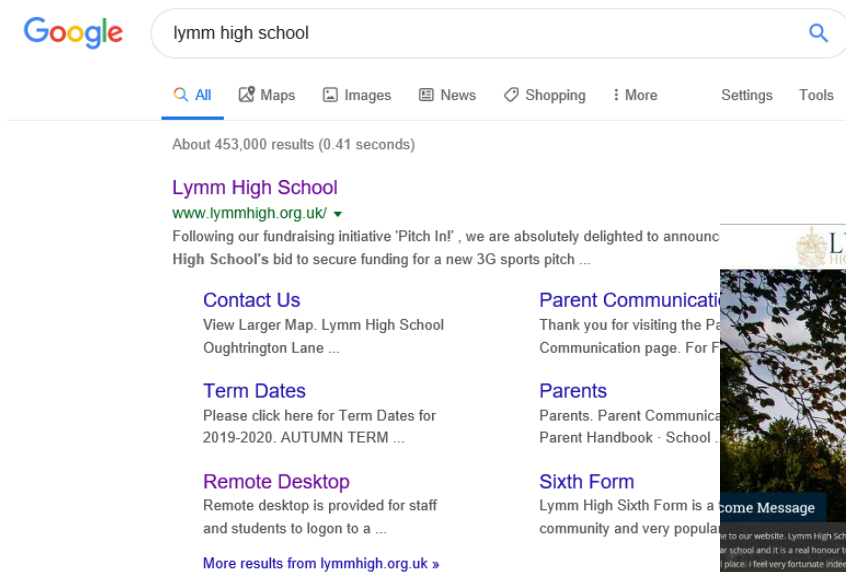
Year 8 IT/Computer Science Knowledge Organiser



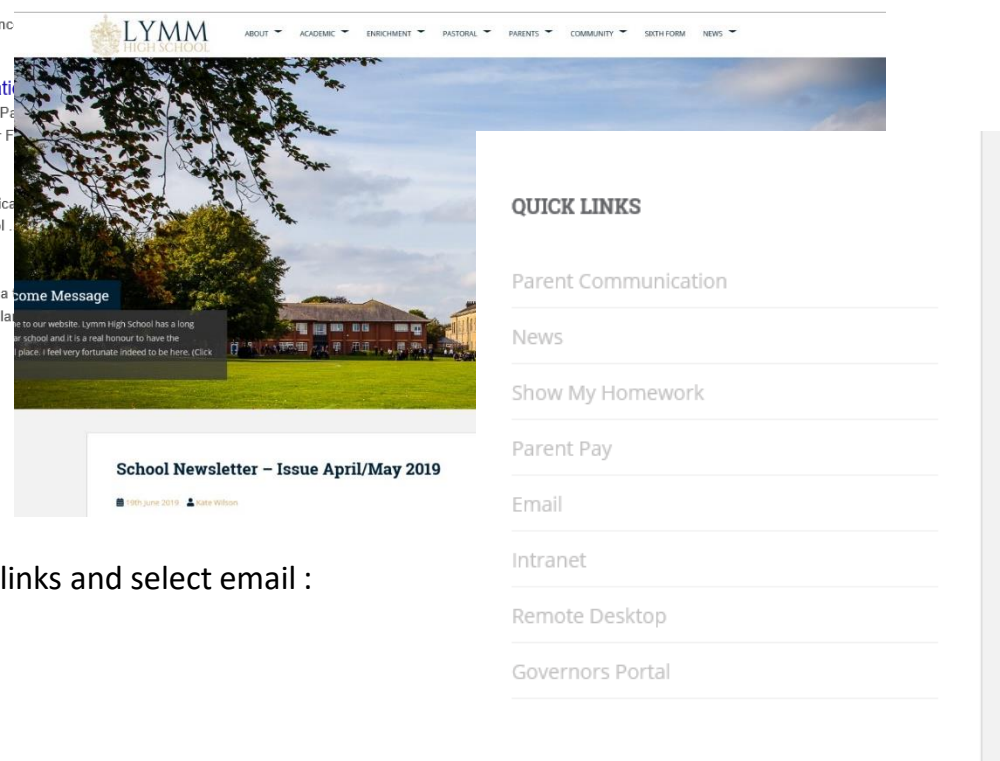
To find your email address it is at the top of the application once it is open:



To access your email from home:



To access remote desktop from Lymm high home page go to the quick links and select remote desktop:



On the right find the quick links and select email :

Accessing Microsoft Office for free

If you don't have access to Microsoft Office on your computer, laptop, tablet, phone, or any digital device then don't worry! You have a **free account** which is connected to your **school email address** and this guide tells you how to do it. Select the device that you have and follow those instructions:



Go to www.office.com and if you're not already signed in, select **Sign in**. Sign in with your school email and password. After signing in, follow the steps that match the type of account you signed in with. Install it onto your computer. Once done it will ask you to activate it, select activate and there you have it – Office installed.

You can use Office 365 online without actually installing it onto your computer or laptop, all you need is your school email address and password, go to: <https://www.office.com/apps>. Click sign in, located top right. Then you should see all you have access to. This actually saves it to the OneDrive rather than on your computer. Therefore, you could access the document in school as well as home.



iPhone



ANDROID



You will need access to the **app store** for this - You can install the new Office app that combines Word, Excel, and PowerPoint into a single app, and introduces new mobile-centric features to view, edit and share files without the need to switch between multiple apps. Note that Office mobile app is currently available for **Android** and **iPhone only**.

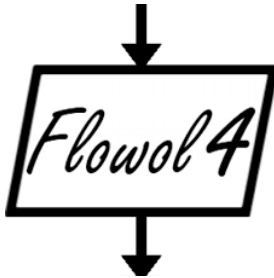
Or you can install the Office apps individually on your **iPhone** or **iPad**:

	Key term	Definition
1	Application	A device or program enabling a user to communicate with a computer.
2	Mimic	Controllable pictures which respond visually and realistically to commands the user has inputted.
3	Control	Computer control means that a computer is part of the control system. The computer is normally used to run the control program.
4	Monitoring	The process of being aware of what is happening around you, in this case the computer system monitors the control system to check it is working correctly.
5	Sensor	A sensor is a device which is designed to measure some physical quantity in its environment, an example is a heat sensor that measures the room temperature.
6	Subroutine	In computer programming, a subroutine is a sequence of program instructions that perform a specific task, packaged as a unit.
7	Actuator	A hardware device that moves or controls a mechanism. A motor is an actuator.
8	Sequence	Sequencing is the specific order in which instructions are performed in an algorithm.
9	Selection	A decision within a computer program when the program decides to move on based on the results of an event.
10	Iteration	In computer programming, this is a single pass through a set of instructions.
11	Flowchart	A diagram that shows a process, made up of boxes representing steps, decision, inputs and outputs.
12	Algorithm	A sequence of logical instructions for carrying out a task. In computing, algorithms are needed to design computer programs.

What is a system flowchart?

System flowcharts are a way of displaying how data flows in a system and how decisions are made to control events.

To illustrate this, symbols are used. They are connected together to show what happens to data and where it goes.



Year 8
Flowcharts and sequencing

Symbols linked together form a flowchart. Flowchart programming consists of:

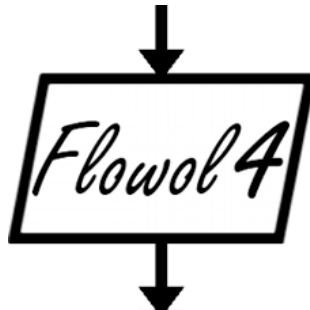
- sequences of instructions that lead to a real-life simulation
- decisions that result in two different actions
- loops that repeat an action until a certain condition is met
- variables that store data for use in decision making

Basic flowchart symbols

Name	Symbol	Usage
Terminator		Starts or stops a process.
Input or output		An input is data received by a computer. An output is a signal or data sent from a computer.
Process		An instruction or a command.
Decision		A decision, either yes or no. For example, a decision based on temperature that turns a central heating system on or off.
Line tool		Connects the symbols. The arrow indicates direction.

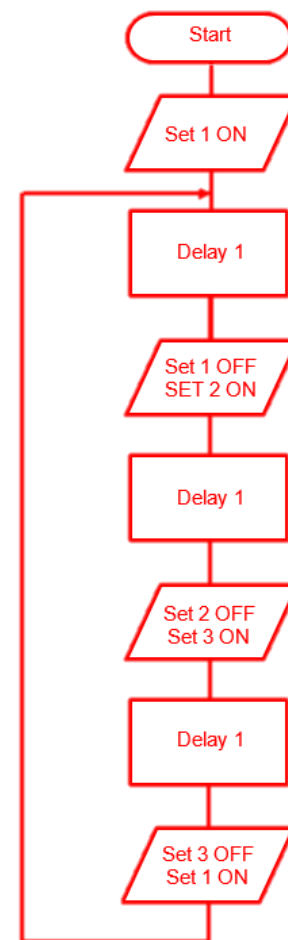
Sensors

Sensor	Measures	Where Used
Heat	Temperature	Living room for central heating system
Humidity	Water vapour in the air	Swimming pool, greenhouse
Infra-red	Infra-red radiation e.g. body heat	Security alarm systems
Light	Light levels	External security lights
PH	Acid/alkali levels e.g. pH of soil	Environmental experiments, river pollution
Pressure	Pressure	Burglar alarm systems, automatic doors
Smoke	Smoke in the atmosphere	Offices
Sound	Levels of sound	Security alarm systems
Tilt	Angle of tilt	Windows in security alarm system
Touch	Detects if one object bumps into another	Computer controlled robots



Year 8 Flowcharts and sequencing – page 2

Christmas lights flowchart



Computer control

Control technology is used to:

- operate systems, e.g. traffic lights
- control actions, e.g. a robot's movement
- create video games
- control manufacturing devices, e.g. laser cutters.

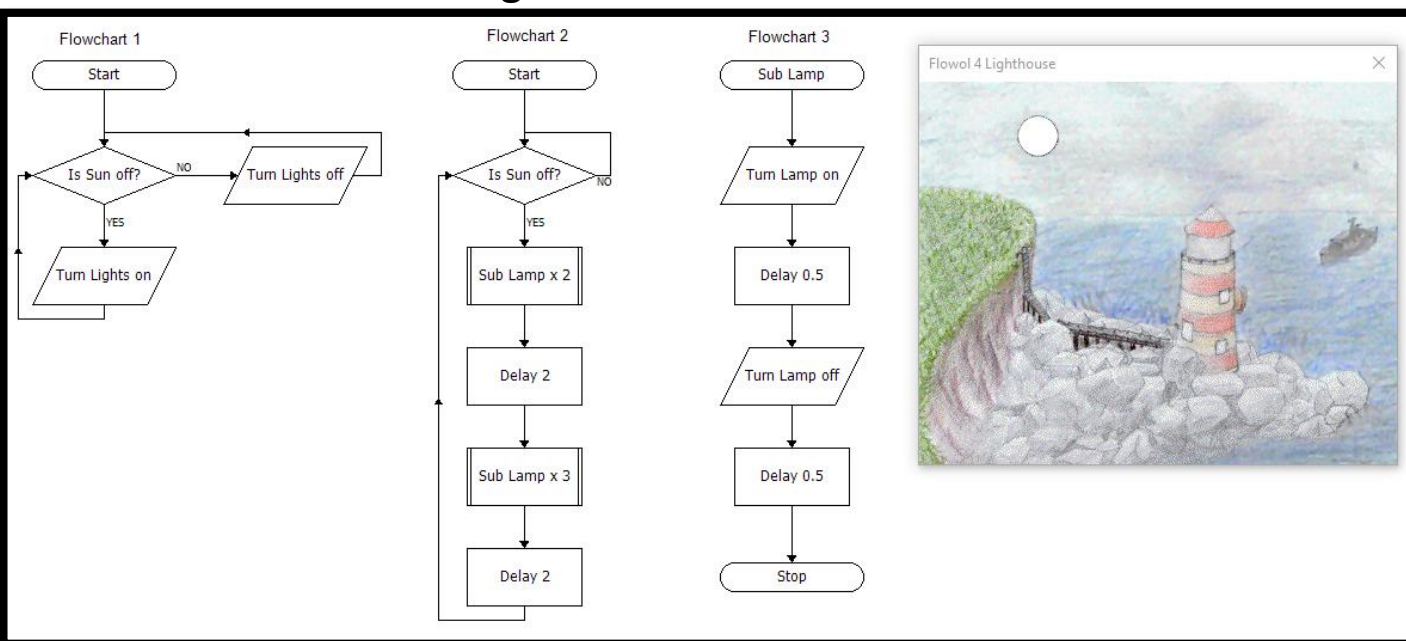
Computers follow instructions or sequences programmed into them. A flowchart can be used to help design a sequence.

Sensors are used to measure physical quantities such as temperature, light, pressure, sound, and humidity. They send signals to the processor. There are many items within our homes that use control systems. These include:

- electric kettles
- washing machines
- TV remotes
- TV recording devices

We **monitor** the system with the above sensors to make sure it is working properly.

Lighthouse solution



Advantages

- ✓ Can operate 24 hours a day without taking a break.
- ✓ Can work without holidays or sick days.
- ✓ Will work without any wages.
- ✓ Will accurately repeat actions over and over again,
- ✓ Can process data from sensors very quickly.

Disadvantages

- ✗ If the computer malfunctions then the system won't work.
- ✗ If the power is cut then the system won't work.
- ✗ The computer can't react to unexpected events like a person could.

A search engine is an online tool that helps people find information on websites

Year 8 Using Technology Safely

Cyberbullying

"Bullying others through the use of technology, for example a mobile phone or the Internet."

Includes: threats, rumours, identity theft etc...

Don't reply, however tempting

Block the sender

Keep any evidence

Tell somebody

Use a 'Report' button

A **phishing** email is one from a criminal trying to find out personal information about you such as password and account information. It tries to get you to click on a link in the email

Social networking Definition: The use of websites to interact with friends, family and classmates, or to find people with similar interests

Cookies are small text files

They can store details such as:

- what you have bought, looked at or searched for
- settings for a particular website, such as favourite genres of music or films

They can make online shopping smoother – and they help advertisers know what you like

Email

- Electronic messages sent across the internet to another email provider.

Pros

- Spam
- Viruses
- Phishing
- Need an Internet connection
- Your message can only be read when the recipient next logs in and checks their mail

Cons

- Can send to multiple recipients at once
- Can send attachments
- Sent instantly at any time
- Can request a receipt that the email has been read
- Can send and receive email from any web enabled device

Webservers – Website information is stored on web servers, all over the world. When you type in a website address, your browser requests the right website file from the web server

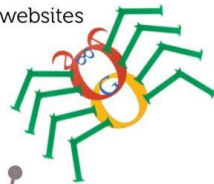
Password Dos

- Use at least 8 characters
- Use a mixture of UPPERCASE and lowercase letters, numbers and symbols

Password Don'ts

- Write it down
- Tell anyone
- Use something easy to guess such as your name or date of birth, or a word in the dictionary
- Use the same password for all your online accounts

Spider visits all websites



Remembers everything it sees and copies to database

Displays results on screen



Matches "eggs"



Google fetches matching pages from database



eggs

You do a search

Year 8 Moose Productions

Key vocabulary	Definition
Logo	A symbol or other small design adopted by a business to identify its products
Animated banner	Creating frames with timings attached to them so it appears like they are moving
Visualisation diagram	Plan of the final product.
Annotations	Labelling the diagram explain what you have done and why.
Formula	Mathematical expression, such as adding or averaging, that performs calculations on data in a spreadsheet
Functions	Predefined formula in a spreadsheet
Formatting	Making the spreadsheet look appealing to the user by adding colour, merging cells, etc.
Spreadsheet modelling	Computer models of mathematical data, such as budgets, are usually done using a spreadsheet application that processes and performs calculations on the data entered by the user.
House style	Consistent layout created when designing something so it doesn't draw the attention away from the message being put across.
Colour scheme	Looking at colours that match each other rather than just applying colours we like.

Operator	What does it do?
+	Addition
-	Subtraction
*	Multiply
/	Division
All formula must start with =	

Function	Description
=SUM(A1:A7)	This would add up the cells from A1 to A7
=AVERAGE(A1:A7)	This would work out the average of cells A1 to A7
=MIN(A1:A7)	This would find the lowest value from cells A1 to A7
=MAX(A1:A7)	This would find the highest value from cells A1 to A7

Target audience

Who is the final product intended for?

Categories:

- Age – need to be clear about the age group. (E.G. 6-12, 12-18, 18-40, 40+)
- Gender
- Location – local, national, international
- Ethnicity – background, culture, race, religion, language

Research

- Primary sources: the information is obtained first hand from an original source
- Secondary sources: the information is obtained second hand where somebody else has created the data

File formats

Video File Formats	<ul style="list-style-type: none"> • MPG - Compressed file formats • MOV – small file size • MP4 – fast loading online
Audio File Formats	<ul style="list-style-type: none"> • MP3 (compressed / small file sizes / good for devices) • AIFF (uncompressed / high quality / Mac only) • WAV (uncompressed / high quality / Windows only)
Image File Formats	<ul style="list-style-type: none"> • JPG (lossless compression; photography) • PNG (lossless compression; photography) • TIF (large file sizes / Posters / high quality printing) • PDF (un-editable/ Documents) • GIF (small file sizes/ Online / web buttons)

Client requirements

Whether you are creating something for yourself or for a client, your project will have a set of client requirements.

Purpose of client requirements:

- Provide the media developer with outline information and any constraints (timescale)
- Clear statement of what is to be produced

Content of client requirements:

- Statement of what media product is needed
- Purpose of the media product
- Target audience
- Content
- Timescale
- Restrictions
- House style

Visualisation diagrams

Purpose of a visualisation diagram:

- Plan the layout of a still image in a visual manner
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Content of a visualisation diagram:

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An IF statement checks to see if a statement is **true or false** and then does one of two things depending on the result. It looks like this in Excel: **=IF(Condition check, Do this if true, Do this if false)**

For example consider this formula written in spreadsheet cell B1:

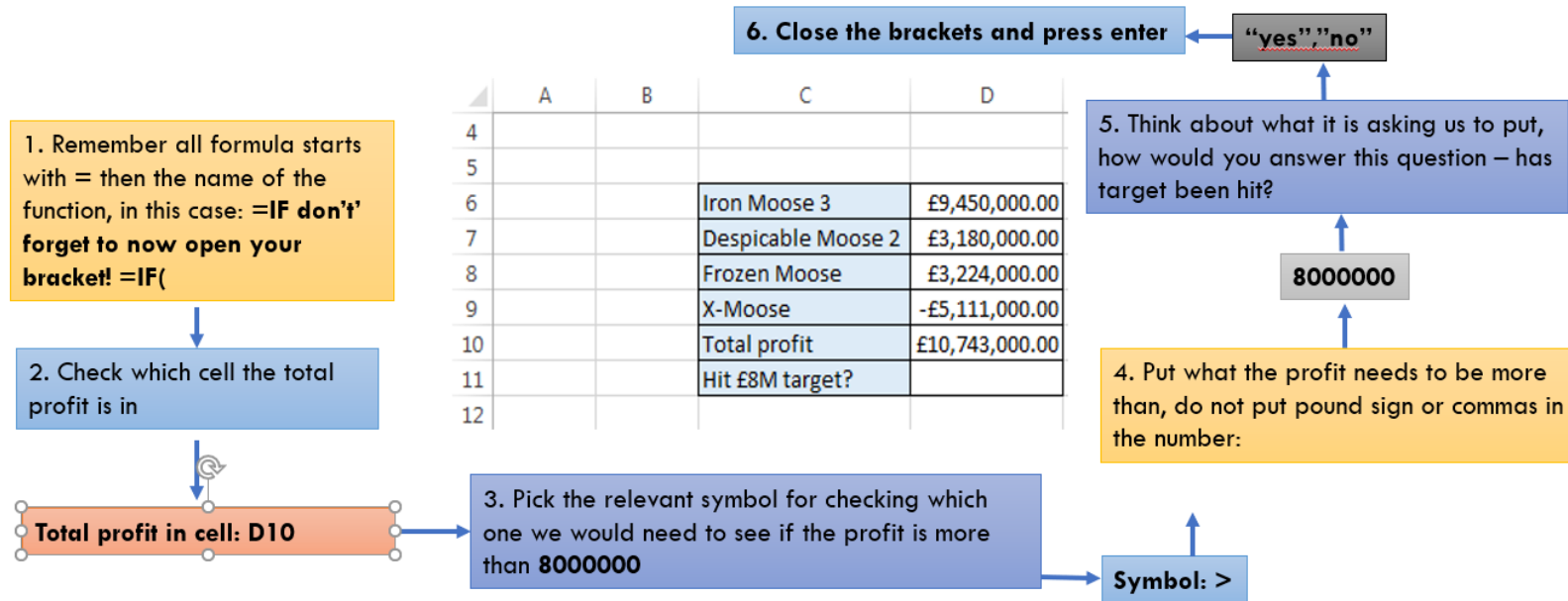
=IF(A1 > 0, "Profit", "Loss")

This checks to see if the value of cell A1 is more than zero. If it is, then the word "Profit" appears in cell B1 otherwise the word "Loss" appears.

Year 8 Moose Productions

Moose Production IF statement

- Do an IF statement to see if the £8,000,000 target has been hit.
- Lets break this down:



Answer

=IF(D10>8000000,"Yes","No")

Year 8 Networks and Technology

Key term	Definition
Network	Two or more computers connected together to share data and devices
LAN	A network over a small (local) area (building or site)
Network Interface Card	A piece of hardware which converts computer signals into a form that can be sent over a network (and convert them back when network data is received)
Switch	A device which passes networked data to the correct nodes
Peripheral	Something that is on the edge of or attached to the computer, e.g. printer, mouse, keyboard, etc.
Local area network (LAN)	This is a network within a single building.
Wide area network (WAN)	This is a network over a wider geographical area such as in different buildings, cities or even countries.
Internet	The Internet is a huge world wide network which allows computers to communicate and share information.
Modem	This stands for Modulator Demodulator. It converts a digital signal (that the computer uses) into an analogue signal which can be transferred down traditional telephone lines and then converted back into a digital format at the other end so that the computer can read it again.
Network Card	This is a card which is built into the computer and slots into the motherboard. It provides a socket at the back of the computer for the network cable or to receive the wireless signals.
Internet Service Provider (ISP)	The company that provides you with access to the internet – depending on the service it might be free or involve making regular payments to subscribe.
Internet protocol (IP)	IP stands for Internet Protocol, which means the rules that networks have agreed to so that they can communicate easily with each other.
Data Packets	These are created from the splitting up of a file when data is sent across the internet. It is reassembled at the receivers' end to reform the file.
Computer virus	A computer virus enters your system without your knowledge and can then copy itself to other computers. They are usually transferred to other computers and can be caught by transferring files through a USB drive or more commonly through attachments sent with emails. Most computer viruses will alter, delete or damage the files in the computer system.
Virus Checker	Antivirus software should be installed on your system to scan for threats and quarantine potential viruses.
Worms	Worms can do as much damage as viruses but the important difference is how they are spread around a system. They creep around the network automatically, copying themselves and slowing it down.
Trojan horse	A Trojan horse is software that pretends to be something useful, so the user downloads it, but actually it does something else.
Spyware	Spyware collects information about users so that it can be used for fraudulent purposes.
Keylogger	Keylogger software is used to record the user's keystrokes and can find out people's passwords, bank details, etc.
Adware	Adware is software that is automatically downloaded and installed on your computer so you are directed to advertising material.
Input device	Input Devices: these are used to control the computer and are used to put data into the system.
Output device	These get something out of the computer for instance data or sound.
Storage device	These are used to save data onto and can be inside the computer or portable so the data can be taken with the user.
Operation Software	Used to control the workings of a computer, e.g. Windows 10
Application software	Installed onto the computer to perform a specific task such as creating documents or spreadsheets.
Utilities software	These carry out specific tasks which help the computer system run efficiently such as virus checking and Winzip.
Cloud computing	The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.
Workstation	This is a desktop computer, where you complete your work. It is connected to the network.

Year 8 Networks and Technology

Data Packets

Hardware needed to connect to the internet

A computer network is: Two or more computers connected together to share information and resources.

Hub

A device that connects nodes together.

Not intelligent – data is sent to all nodes across the **whole of the network**.

Cheap devices – **USB hubs** useful in home computer installations.

Switch

• A device that connects nodes together.

• An **intelligent device** that can send data to the nodes that the data is intended for.

• This **reduces network traffic** because making the **network run faster**.

If the LAN is to connect to the Internet, a Router is needed.

Routers work by sending data between networks (e.g. over the internet)

WAN

- **Wide Area Network**
- Covers a large geographical area – may be worldwide
- Devices may be provided by telecoms companies like phone lines and satellites

A LAN is a **Local Area Network**.

It is a connected set of computers and other devices. Each device is called a node (e.g. computer, printer, etc.)

A LAN is installed on one site.

Relatively small

It is owned by the organisation

Advantages

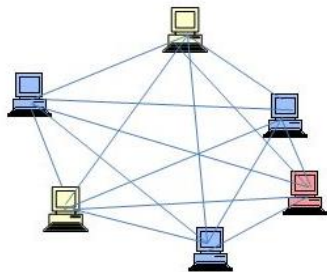
It allows communication between workers or students
It allows data to be shared
It allows peripherals (e.g. printers) to be shared
It allows computers to be upgraded more easily
It allows distributed processing – the ability for a single program to be run simultaneously at various computers.

Disadvantages

Expertise required to set up and maintain a large network (costly)
Security issues from unauthorised access to data

Measures to secure a network include:

Passwords – strong passwords use a range of character types
Changing passwords frequently
Not allowing users to install software
With wireless access, use encryption



Mesh topology

Each node relays the data it receives to other nodes within reach. There is **no** central node in a mesh network.

Using cables means the network would become too expensive, however, using wireless a mesh offers a lot more advantages over a star network, such as:

Very robust – if one node fails the other nodes within range allow data transmission around the network to continue.
Excellent wireless range.

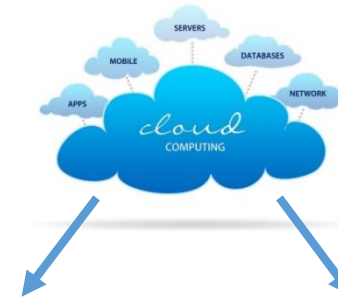
Files are split into millions of **data packets** when sent across a network or the internet.

Packets get sent by different routes according to availability.

When you send a file online, the parts of the file might travel one way around the world and the other parts may go in the opposite direction!

Packets are reassembled at receiving end.

Typical packet structure:



Advantages:

Lower Cost – no need to purchase hardware or software licences and you only pay for what you need.

Better Performance – Processing time on demand.

Less maintenance – somebody else manages the servers and core software.

Unlimited storage capacity – Use it when you need it.

Disadvantages

Requires a constant connection – if the connection is lost then the system will not work.

Loss of control – The problem of somebody else controlling the hardware and software may result in security concerns.

Unpredictable cost – the cost may fluctuate each month which may cause problems with budgeting in the future.

Work plans

Purpose of a work plan:

- Provide a timescale for the overall project to be completed
- To map out against time for all the different aspects of the project

Content of a work plan:

- Tasks
- Activities
- Durations – amount of time a task is expected to take
- Timescales – how long the project will take
- Milestones – key dates when a section is completed
- Deadlines – date when something has to be done by
- Resources – what is needed
- Contingencies – back up plan, extra time if needed

Visualisation diagrams

Purpose of a visualisation diagram:

- Plan the layout of a still image in a visual manner
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Content of a visualisation diagram:

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- House style

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- Gender
- Location – local, national, international
- Ethnicity – background, culture, race, religion, language

Lossy and Lossless

Compression can be **lossy** or **lossless**. Lossless compression means that as the file size is compressed, the picture quality remains the same - it does not get worse. Also, the file can be decompressed to its original quality. Lossy compression permanently removes data.

KS3 - Graphics

Bitmap graphics

Bitmap graphics made with painting packages consist of many tiny dots called pixels. It is possible to edit each individual pixel. Since the computer has to store information about every single pixel (the colour for example) in the image, the file size of a bitmap graphic is often quite large. Bitmap graphics lose quality when they're resized.

Research

- Primary sources: the information is obtained first hand from an original source
- Secondary sources: the information is obtained second hand where somebody else has created the data

Primary Sources	Secondary sources
<ul style="list-style-type: none">• Autobiography• First-hand account• Diary• Interview• Video footage• Photo• Official records	<ul style="list-style-type: none">• Biography• Second-hand account• History textbook• Magazine article• Report• Other people's products• News broadcast

File formats




Video File Formats 	<ul style="list-style-type: none">• MPG - Compressed file formats• MOV – small file size• MP4 – fast loading online
Audio File Formats 	<ul style="list-style-type: none">• MP3 (compressed / small file sizes / good for devices)• AIFF (uncompressed / high quality / Mac only)• WAV (uncompressed / high quality / Windows only)
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Image copyright ©

Before capturing and collecting images to use in your project, make sure you understand the law surrounding image copyright.

You can read about image copyright in the Copyright section of Managing Projects. Don't forget to acknowledge the copyright of the images you use in your project.

Vector graphics

Vector graphics are based on mathematical relationships with control points that make up the image. Information is not stored about each pixel. These points are connected by lines and curves called vector paths or vectors.

Advantages

Smaller file size
Scalable - when you resize a vector graphic the mathematical relationships mean that the image does not lose quality.

A vector object is a shape made up of vector paths. It is possible to edit each object separately, for example, change the shape, stroke, fill, size and position. A stroke follows the outline of the vector path and a fill adds a colour to the area inside the path.

Disadvantage

Vector graphics are never going to be as lifelike as bitmaps or photos. They will always appear computer generated.



FILE FORMATS

JPG

Joint Photo Expert Group

Raster file format used for images, pictures. Is destructive, more compression of the image, smaller file size, more degradation of image quality.
Not good for type, logos, graphics. Cannot be made transparent.

Graphic Interchange Format

Pronounced with a G, not a J. Developed by Compuserve to save raster type, logos, graphics to very small file sizes. Uses limited (index) colors so not ideal for images. Can be transparent. Can be animated. For web only.

GIF

PNG

Portable Network Graphic

Developed to replace a GIF which required royalties be paid for its use. Uses limited (index) colors so not ideal for images. Can be made transparent. Options are PNG-8 or PNG-24 for true transparent effects. Not for print.

Bitmap File

Developed by Microsoft, BMP files are like PNG and GIF files. Made specifically to render simple yet crisp logos, type, icons. Used mainly for print for simple graphics.

BMP

PSD

Photoshop Document

Native file format for photoshop files. Supports transparency, channels, masks and vector type and objects, paths and layers. For print/photos only. PSD file type not supported for web.

Scalable Vector Graphic

Used to render 2D vector formatted files as well as for animation. SVG is ideal for type, logos, graphics and vector shapes. Based on XML, it is used on the web. Can be compressed with out any loss of quality.

SVG

TIFF

Tagged Image File Format

Older file format for images and photoshop files. Can be saved with layers, channels, masks and path but does not support transparency in the saved file. For print files only.

Encapsulated Postscript

Older file type that allows saving of vector artwork such as an Illustrator file or a Photoshop file that contains vector shapes or type. Not commonly used but still supported. Used only for print.

EPS

Year 8 Website Knowledge organisers

Key term	Definition
Accessibility	Basically, this is the ability of a website to be used by people with disabilities, including visually impaired visitors using screen readers, hearing impaired visitors using no sound, colour blind people, or those with other disabilities. A website with low accessibility is basically going to be impossible for those with disabilities to use.
Anchor Text	The words that appear clickable in a text link. Usually used to take the user to top of the page or bottom of page when clicked.
Browser	Browser refers to the program a website visitor is using to view the web site. Examples include Safari, Firefox, Google Chrome, Opera, and Internet Explorer.
Navigation	Navigation refers to the system that allows visitors to a website to move around that site. Navigation is most often thought of in terms of menus, but links within pages, breadcrumbs, related links, pagination, and any other links that allow a visitor to move from one page to another are included in navigation.
Site plan	A site map is a model of a website's content designed to help both users and search engines navigate the site.
House style	How the website uses image, colour, etc. to portray their organisation.
Navigation bar	A series of common menus or buttons should be added to each page for consistency
Hyperlink	Hyperlinks enable you to move from one page to another page. These can be graphical (whole-image links), hotspots (where different parts of an image take you to different pages), rollover buttons (buttons which change colour when you move your cursor over them), or polygon links (links using different shapes). We can also use anchors to take us to different parts of one, very long web page.
Banners	These are usually animated advertisements. Leader board banners appear at the top of each page and skyscraper banners appear down the side.
Hotspots/image maps	Where different parts of an image take you to different pages
Rollover images	Buttons which change colour when you move your cursor over them
Radio buttons	A radio button is an element of the graphical user interface (GUI) which allows a user to select a single item from a predefined list of options.
Drop-down menus	A drop-down menu, drop menu, pull-down list, picklist) is a graphical control element, similar to a list box, that allows the user to choose one value from a list
Templates	Master pages enable you to create a basic outline of how each page on your site will look. All new pages can then use this template to create a consistent structure.
Homepage	This is the first page visitors will see and should link to the other pages.

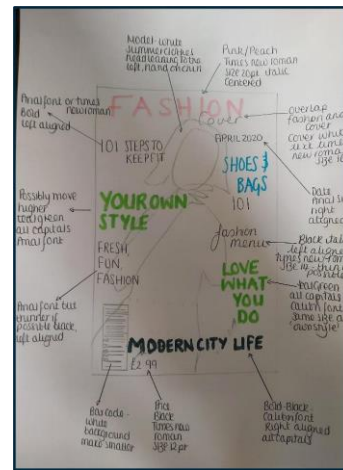
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Mood boards

Mood boards collect together a range of items such as images or colours

The purpose of a mood board is to:

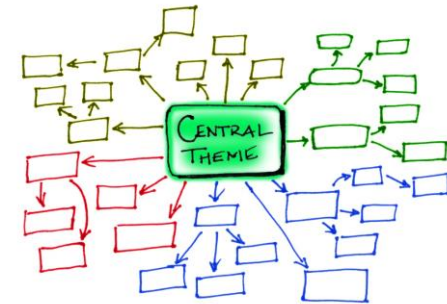
- Generate ideas and concepts for a media product
- Create a feeling for a media product
- To be a reference for others in the creative team to understand the look and feel to be created

Mind maps

- Mind maps help to generate ideas around a theme
- The main theme is placed at the centre
- Components from the theme are then placed in nodes which are connected by branches
- Further information is then placed in sub-nodes

The purpose of mind maps is to:

- Help with thinking up ideas
- To record ideas for a whole project
- To show links between different parts and processes of a project
- To explore further, break down and develop each of the initial ideas



When you analyse two or more existing websites you have browsed, you can normally comment on:

- House style – How the website uses image, colour, etc. to portray their organisation.
- Audience – Who the website is aimed at.
- Size – How many pages there are on the website (try to find something called a 'site map').
- Techniques – What design skills were used in producing the web pages.
- Search – You can look at search engine rankings when you search for a website and you can look at the accuracy of a search box on the website itself.