

CCEA GCSE

Unit 1: DIGITAL TECHNOLOGY

STUDENT WORKBOOK

Student Name: _____

Content	Learning Outcomes	Tick
Digital Data	Students should be able to:	
Representing Data	Describe the difference between information and data	
	Describe how data is stored in the following units: bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte	
	Identify the following data types: numeric (integer and real), date/time, character and string	
Representing Images	Demonstrate understanding of how pixels are used in image representation	
	Demonstrate understanding of how image resolution affects file size	
	Describe how vector-based graphics and bitmap graphics are stored	
	Describe the difference between vector-based and bitmap graphics	
	Demonstrate understanding of how buffering and streaming are used to support the transfer of moving image files	
Representing Sound	Describe factors that affect sound quality, including sample rate, bit depth and bit rate when recording sound	
	Explain the need for analogue to digital conversion in sound recording	
Portability	Demonstrate understanding of data portability and the following file formats that support it: jpeg, tiff, png, pict, gif, txt, csv, rtf, mp3, mp4, midi, mpeg, avi, pdf, wav and wmv	
	Demonstrate understanding of the need for data compression	
Software	Students should be able to:	
System Software	Describe the functions of system software, referring to allocating memory, storage and processing time	
	Describe the following modes of processing: real-time, batch processing and multi-user	
	Describe the following tasks carried out by the utility applications: disk defragmentation, task scheduling, backup and restoring data	
	Describe the role of anti-virus software and the importance of regular updates	
Computer Hardware	Students should be able to:	
Central Processing Units	Explain the purpose of the central processing unit (CPU)	
	Describe the role of the following components of the CPU: the arithmetic logic unit (ALU), control unit and immediate-access store	
	Describe the role played by the following in the fetch-execute cycle: program counter, memory address register (MAR), memory data register (MDR), memory data register (MDR), instruction address register (IAR) and ALU	
	Describe the impact of clock speed, cache size and number of cores on CPU performance	
Input, Output and Storage Devices	Describe the characteristics, typical uses, advantages and disadvantages of the following devices: Microphone, Mouse, Graphics digitiser, touch screens,	

	speakers, printers (laser and 3D), hard disc drive (HDD), high definition (HD) storage media, solid state storage device	
	Explain the purpose of random access memory (RAM) , read only memory (ROM) and cache	

Content	Learning Outcomes	Tick/Date as topics are completed
Network Technologies	<u>Students should be able to:</u>	
Network Technologies	Describe the main features of a Local Area Network (LAN) and a Wide Area Network (WAN)	
	Describe the difference between the World Wide Web, The Internet of Things and Intranets	
	Describe and evaluate the effectiveness of the following network communications technologies: WIFI, Bluetooth, Optical fibre, Mobile Communication Technology (4G and 5G)	
	Describe the function of the following network resources: Network Interface Card, Network Cables, Switch and Router	
	Describe the following network topologies: Bus, Star, Ring	
	Describe the advantages and disadvantages of using a network in an organisation	
Cyberspace, Network Security and Data Transfer	<u>Students should be able to:</u>	
Cyberspace, Network Security and Data Transfer	Define the term cybercrime and give examples of threats to cyber security including: hacking, pornography, cyber stalking, data theft, denial of service, digital forgery, cyber defamation, spamming and phishing	
	Define the term malware and describe the following forms of malware: virus, Trojan horse, worm, key logger and spyware	
	Explain how networks and data can be protected using encryption, passwords, levels of access, backup and firewalls	
	Describe the role of a protocol in data transfer	
	Describe the purpose of the following protocols: File Transfer Protocol (FTP), Hypertext Transfer Protocol (HTTP) and Hyper Text Transfer Secure (HTTPS)	
Cloud Technology	<u>Students should be able to:</u>	
Implementation and application, security and impact on local systems	Define the term cloud computing	
	Describe the advantages and disadvantages of cloud computing to an organisation	
	Describe the impact of cloud computing on gaming, file storage and sharing (including collaborative tools)	

Content	Learning Outcomes	Tick/Date as topics are completed
Ethical, Legal and Environmental Impact of Digital Technology on Wider Society	<u>Students should be able to:</u>	
Legislation	Demonstrate knowledge and understanding of: the Consumer Contracts Regulations, the Copyright Design and Patents Act, the Data Protection Act, the Computer Misuse Act	
	Identify typical breaches of the Copyright Designs and Patents Act, including software piracy and software licensing infringements	
	Demonstrate and apply knowledge and understanding of: the eight principles of the Data Protection Act, the rights of the data subject and the responsibilities of the data controller and Information Commissioner in ensuring the Data Protection act is enforced	
	Describe the terms hacker, virus and spyware and how these relate to the Computer Misuse Act	
Moral and ethical considerations	Describe the ethical impact of technology on society, referring to the following: internet misuse, access to personal information, social media misuse, the implications of general packet radio services (GPRS) and tracking, concerns about the security of personal data	
Changes in employment opportunities, skills requirements and work practices	Describe the impact of digital technology on employment including: increased job opportunities in the digital technology and computing sector, job displacement, changes in work patterns and the need for up-skilling	
Health and safety	Demonstrate an understanding of digital technology-related health and safety issues, including repetitive strain injury (RSI), back strain and eye strain	
	Identify the measures that both the employee and employer should take to promote good health and safety practice in the workplace	
Digital Applications	<u>Students should be able to:</u>	
Digital applications	Describe the main features of gaming applications, simulations and mobile phone applications and how they can be used to support the following: education and training, social interactions, work practices	
	Evaluate the impact of the following digital applications on our everyday lives: online banking, online training and e-commerce	

REPRESENTING DATA: Data and Information

KEY FACTS

Raw data is a string of meaningless information that has not been given a context.

For example: 1643 or Blue car or 75%

Information is data that has been given a context and is meaningful.

For example: There are 800 pupils in a school. The blue car is parked illegally. John attained 85% in his Digital Technology Examination.

STUDENT ACTIVITY

For each of the following descriptions in No 1 to 6, identify whether it is DATA OR INFORMATION. For No 7 & 8, ADD YOUR OWN EXAMPLES



1. Mr Smith	
2. Club Membership Number 068	
3. The sky is blue today	
4. JC4685731	
5. Yellow, Red and Blue	
6. 13:10, Monday 12th September	
7.	
8.	

REPRESENTING DATA: Data and Information

A BUSINESS USES INFORMATION TO:

- Identify what resources they currently have available, so they can plan for the future
- Research and analyse market trends in the industry, so they can be competitive
- Record and monitor financial plans
- Monitor their performance against expected plans
- Make decisions on how they should best use their resources

STUDENT ACTIVITY

Joe owns a bakery. He has recorded the following statistical data. As his manager, you have been asked to transform the data into meaningful information. You should consider: What does the data tells you? How can this information be used to make decisions about resources e.g. staff, raw material orders, production?

Day of the week	Bread Units Sold	Sausage Rolls Units Sold	Cake Units Sold
Monday	30	100	50
Tuesday	20	50	50
Wednesday	20	30	30
Thursday	30	50	30
Friday	60	100	80
Saturday	50	150	60
Sunday	CLOSED	CLOSED	CLOSED

Transform the data into meaningful information here:	Explain how Joe can use the information to make decisions
<p>The bakery is open 6 days a week. the bakery is closed on sundays.</p>	

KEY FACTS

Units of data are a measurement used to describe digital storage size. The smallest unit is a bit. A single bit may contain a binary value of 0 or 1, On or Off, True or False. There are 8 bits in a byte. A byte can store 256 values. Most files contain thousands of bytes and are measured in kilobytes, megabytes, gigabytes and terabytes.

Units of Measurements in order of size

Unit	Value	Equivalent to
bit	0 or 1	1/8 byte
nibble	4 bits	½ byte
byte	8 bits	1 byte
kilobyte (KB)	1024 bytes	1 kilobyte
megabyte (MB)	1024 megabytes	1 gigabyte
gigabyte (GB)	1024 gigabytes	1 terabyte

REPRESENTING DATA: Units of Data

STUDENT ACTIVITY

For each of the following electronic files described in No 1 to 6, identify the unit they are most likely to be measured in.
For No 7 & 8, ADD YOUR OWN EXAMPLES.



1. A short letter	
2. A movie	
3. On or Off	
4. A 5 second animated gif	
5. A complex and extensive website	
6. Network backup for a small office	
7. Smartphone Storage capacity	
8. Games console	

REPRESENTING DATA: Storage Facilities, Devices and Units of Data

KEY FACTS

Storage facilities today are wide ranging and include: Primary Storage e.g. RAM, Secondary Storage Devices e.g. external hard drive and Cloud Computing. Storage devices are used to save data, back-up and transfer many different types of files. Storage device capacity continues to grow as technology develops.

STUDENT ACTIVITY

Research the following types of Storage Facilities and identify for each their (a) Storage Capacity (b) Examples of what type of data they may be used for. The first one is done for you.



Storage Facility	Storage Capacity Range	Example of Use
CD (Optical Device)	Approximately 700MB	A selection of school photographs
USB Memory Pen		
Cloud Storage		
External Hard Drive (Solid State Drive)		
Magnetic Tape		
DVD (Optical Device)		

Draw OR use printed images to illustrate each storage facility and place below in order of size from the smallest to largest

REPRESENTING DATA: Data Types

KEY FACTS

A data type classifies the data so that the computer program recognises the type of data each variable will hold and alerts the user to which type of data they can enter. Common types of data include: Numeric (Integer and Real), Date/Time, Character and String.

Integer numbers include positive and negative whole numbers e.g. 10, -5

Real numbers contain decimal values, although can also store whole numbers e.g. 12.2

Date/Time can be set up to record date or time data in a specific way.

For example: Short Date 15/01/15, Medium Date 15-May-15, Short Time 15:30

*Although we view them on the screen this way, they are stored as numbers by the computer

Character may store a single letter, number or symbol e.g. Y or N

String can contain combinations of letters, numbers and symbols e.g. telephone number, Postcode, Passwords.

Boolean can represent 1 or 0, On or Off, True or False

STUDENT ACTIVITY

The following data will be used to create a table to be stored in a database. For each of the following data described in No 1 to 6, identify the most appropriate data type it should be stored

1. Customer Surname	
2. Email	
3. Date of Birth	
4. 1 st Line of Address	
5. Postcode	
6. Number of years at current address	
7. Newsletter Delivery (Y or N)?	
8. I wish to receive email updates about special offers	

REPRESENTING DATA: Data Types

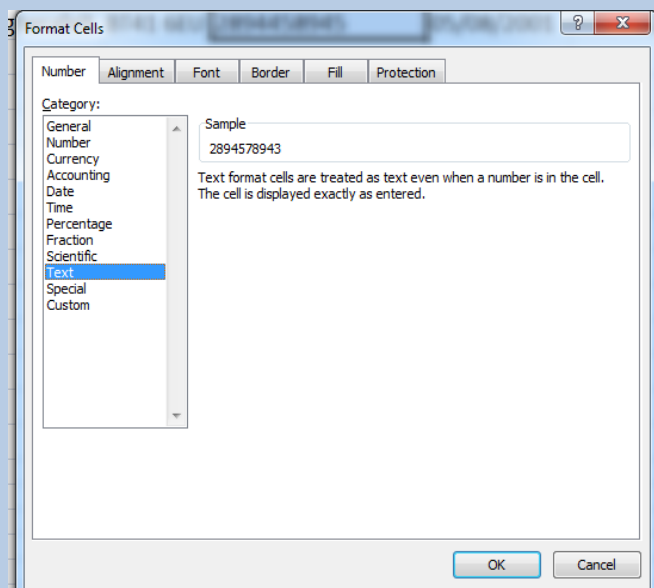
Spreadsheets and Databases are usually set up to record information in a specific way. This means that data is formatted to suit the type of data entry. For example: Text, Number, Currency, Date/Time.

STUDENT ACTIVITY

Open a new MS Excel Spreadsheet. Enter the following data as shown below:

	A	B	C	D	E	F	G	H	I
1	YOUTH CLUB MEMBERS								
2									
3	Surname	First Name	1st Line of Address	Town	Postcode	Telephone Number	Date of Birth	Group Number	Voluntary Contributions
4	Boyd	Bill	26 Lyons Way	Antrim	BT41 6HI	2894578943	24/06/2000	2	15
5	Hanson	Johanne	14 Peoples Lane	Ballymena	BT41 7TU	2894476342	12/10/1999	2	25
6	Walker	David	23 River Park	Crumlin	BT41 2DI	2894475843	14/01/2005	1	10
7	Miller	Jane	36 Tims Avenue	Antrim	BT41 6IY	2894458493	10/03/2008	1	30
8	Young	Fiona	23 Styles Way	Magherafelt	BT41 6EU	2894458945	05/08/2001	2	20
9									

You may notice that MS Excel automatically assigns a general data type and items such as the telephone number, date of birth and voluntary contributions may not be appropriately displayed. This is because you will need to format the data. To do this, highlight the specific column of data and select the formatting option. Formatting in MS Excel includes some of the following options:



What format should telephone number be and why do you think this is necessary?

What formatting options are available for date of birth?

What type of format should be applied to voluntary contributions?

STUDENT ACTIVITY

Apply appropriate formatting to your Spreadsheet and Save As: DataTypes

REPRESENTING IMAGES: Pixels

KEY FACTS

Images are converted into binary in order for a computer to understand and process them. Digital images are made up of pixels (short for Picture Element) and when they are displayed onto our screen it is divided into thousands of pixels arranged in rows and columns. The number of pixels used to create a digital image is referred to as the 'resolution' and the higher the pixel count, the better the quality of the image.

In the example below 0 is white (OFF) and 1 is black (ON) to produce a black and white image. Using this information, shade in the picture on the table on the RHS

0	0	0	0	0	0
0	1	1	0	1	0
0	1	1	1	0	0
1	1	1	0	0	1
1	1	0	0	1	1
1	1	1	0	0	1
1	1	1	1	0	0
1	0	0	0	1	0
0	0	0	0	0	0
0	0	0	0	0	0

Of course, in reality most images today are in colour. The number of bits represents how many colours are available for each pixel. A 2-bit will give us 2 squared i.e. 4 more colours to use. For example we could say:

00 – Green

01 – Red

10 – Black

11 – Grey

In Summary the number of colours available depends on the number of bits per pixel.

Number of bits per pixel	Colours Available
1 bit	$2^1 = 2$ colours
2 bit	$2^2 = 4$ colours
3 bit	$2^3 = 8$ colours
4 bit	$2^4 = 16$ colours

The number of bits per pixel is known as the Colour Depth. Therefore, the more colours required, the more pixels needed to store the available colours. When you take a photograph using a digital camera or scan an image, you are creating a bitmap graphic. As information must be stored about every single pixel in the image, the file size can often be large.

***Pupil Activity – why not find a bitmap graphic and zoom in. Record your findings on what you observe!**



REPRESENTING IMAGES: PIXELS

STUDENT ACTIVITY

Design your own Minecraft pixel image in MS Excel or MS Word using the table facility (10 x 10) to design a 2-bit colour image. You can create your own colour code. In the space below, show how the image can be encoded as a grid of numbers.

Decisions on your colour code:

00 = red

01 = green

10 = blue

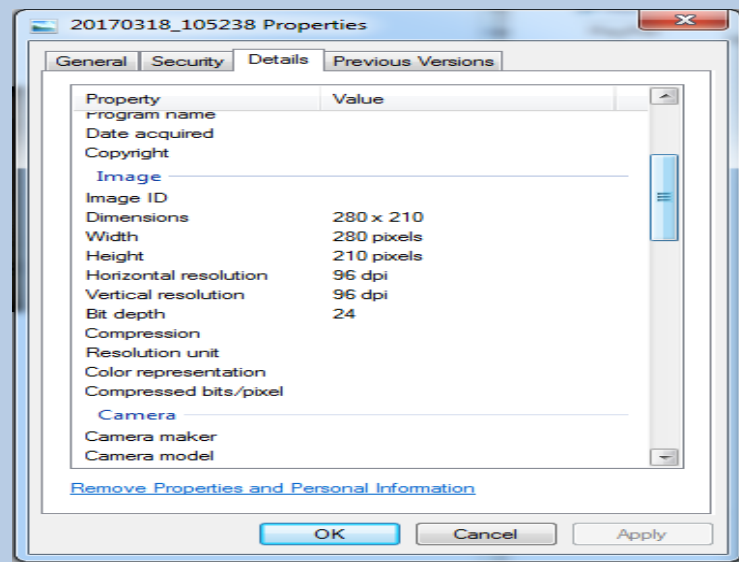
11 = orange

ENCODED IMAGE

IMAGE RESOLUTION

KEY FACTS

Image resolution refers to the number of pixels in an image. To identify the resolution we can right hand click on an image and choose the property option (see screen shot below). Resolution is sometimes identified by the width and height of the image. In the example below, the image property shows this particular image as 280 pixels x 210 pixels = 58,800 pixels. The input resolution can also be measured in Pixels per Inch (PPI), Pixels per Centimetre (PPCM) and Dots per Inch (DPI). This determines the amount of detail the image has and therefore the quality of the image.



Pupil Research: Follow the following questions

the link and answer

http://www.bbc.co.uk/schools/gcsebitesize/dida/using_ict/presenting_informationrev4.shtml

When is an image at its best DPI?

What is the best way to enlarge an image without destroying its quality?

Conversion Calculator Activity:

Choose three images you have previously saved in 'My Documents'. Check out the properties and then use the online converter link to complete the table below.

Brief Description of Image	Value e.g. DPI	Conversion to PPI	Conversion to PPCM

<http://www.webconversiononline.com/image-conversion.aspx?from=dpi&to=dpcm>

VECTOR BASED versus BITMAP GRAPHICS

KEY FACTS

VECTOR GRAPHICS

- Vector graphics are created in graphic packages
- Vector graphics consist of shapes, referred to as objects
- Each object can be edited separately and elements can be grouped
- Images are usually more precise than bitmaps
- The file size is usually small
- When a vector graphic is re-sized it does not lose quality
- Common file formats include: .svg, .xml

BITMAP GRAPHICS

- Bitmap graphics are created when using a digital camera or an image is scanned
- A bitmap graphic is made up of pixels
- A bitmap graphic is made up of many different colours
- Individual pixels can be edited
- The file size is usually large
- When a bitmap is re-sized it loses quality
- Common file formats include .bmp, .jpeg, .png, .gif, .tiff

STUDENT ACTIVITY

Look at the following scenarios. For each, decide whether the image should be a vector or bitmap graphic and give reasons for your answer.

SCENARIO 1: An illustrator is drawing up a cartoon advertisement for the local paper.

Graphic Type:

Reasons for your answer:

SCENARIO 2: A personal photograph for a personal profile on facebook

Graphic Type:

Reasons for your answer:

SCENARIO 3: An image of some cattle for a local farmer's website

Graphic Type:

Reasons for your answer:

SCENARIO 4: A scale drawing for the design of a greenhouse

Graphic Type:

Reasons for your answer:

BUFFERING AND STREAMING

KEY FACTS

Streaming is essentially multimedia constantly being received by a provider using the internet, for example: SKYE, NOW TV, AMAZON. Streaming is an alternative to downloading the whole file before watching.

When you are streaming a video on your portable device, there is nothing more annoying than it constantly pausing! In order to prevent a video from stopping to load your screen pauses and this is where buffering comes in. Buffering allows the video stream to catch up and then the video plays again. It uses cache which stores the data, so that the video can be played without further interruptions.

STUDENT ACTIVITY

There are a number of factors that affect the smooth streaming of multimedia. Using the key point provided, research the internet to source further information on why this happens and suggestions on how the situation can be improved. Can you find one more?



Key Point	Explanation of Possible Problems	Potential Improvements
Wireless Connections		
Bandwidth		
Device / PC		

Class Debate Scenario: Jim is having his friends around to watch a movie tonight. He can't decide whether to download the movie in advance **OR** to just stream it when they arrive.

FOR DOWNLOADING TEAM *research examples:*

Advantages of Downloading, Disadvantages of Streaming

FOR STREAMING TEAM *research examples:* Advantages of Streaming, Disadvantages of Downloading

DOWNLOADING VERSUS STREAMING



STUDENT ACTIVITY
Following the class debate, summarise both teams findings in the table below.



ADVANTAGES OF DOWNLOADING	ADVANTAGES OF STREAMING

DISADVANTAGES OF DOWNLOADING	DISADVANTAGES OF STREAMING



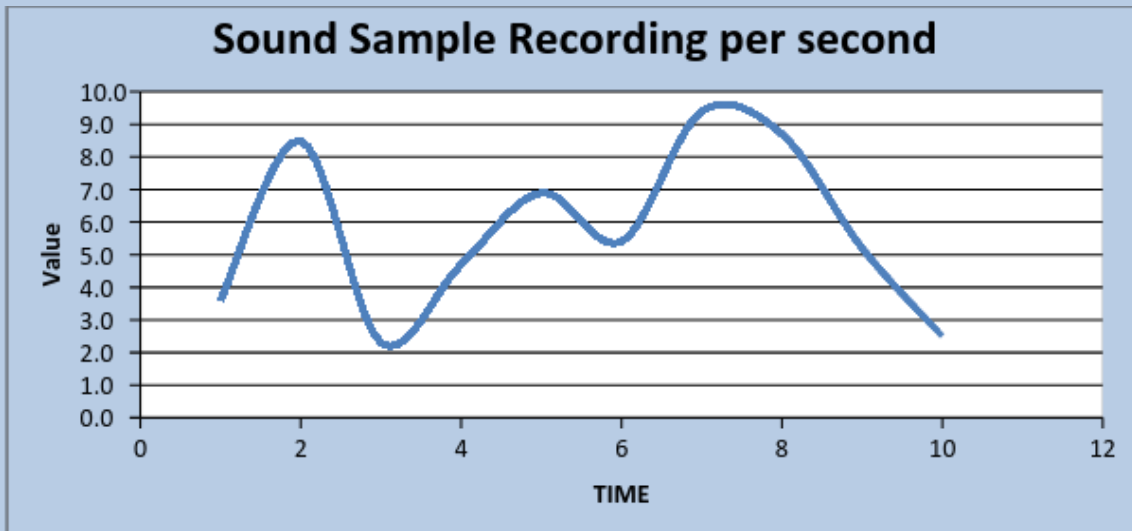
KEY FACTS

Sound is a type of wave that is made up of continuous vibrations i.e. small waves of pressure in the air, detected by the human ear and processed by our brain. However, our love for music and film means that we require a way of record sound to be able to play it over and over again.

Sound is usually recorded through a microphone diaphragm, for example, available on an audio recorder or a mobile phone. The microphone diaphragm detects changes in atmospheric pressure caused by acoustic sound waves.

We used to record sound as analogue on a digital cassette tape, however, there were often imperfections of crackling and background noise when it was played back. As we use digital devices today sound must be converted from an analogue to a digital sound using binary for computers to be able to process it. An analogue to digital converter is required for this job. This works by sampling the sound waves at regular time intervals. The more frequently the samples are taken, the more accurate and better quality the sound.

The following graph visually represents a sound wave shown at regular time intervals per second



Samples are recorded to the nearest whole number and then converted to binary. To complete the next task you will need to know some of the basic denary (decimal) to binary conversions. See the table below:

1	2	3	4	5	6	7	8	9	10
0001	0010	0011	0100	0101	0110	0111	1000	1001	1010

Can you see the pattern?

STUDENT ACTIVITY 1

Plot the information on the graph on page 19 to the nearest whole number in denary (decimal) and then convert the data into binary.

Time Sample	1	2	3	4	5	6	7	8	9	10
Denary	4	8	2	5	7	5				
Binary	0100	1000	0010							

Now compare your new graph to the one of page 19 and comment on the following:

How does it compare?

What are the key reasons for this?

REPRESENTING SOUND

KEY FACTS

The key factors that affect sound quality include: Sample Rate, Bit Depth and Bit Rate.

The **bit depth** is the number of bits of information in each sample and is related to the amplitude measurements. If we were to merge more than one sound there would be lots of calculations, which involve the use of decimal places taking place (producing a more complicated illustration than on page 18). If each sound is only an approximation of the original analogue it may not appear to sound like the original. Bit depth commonly ranges from 8 bit to 32 bit and the higher the bit rate the more precise the sound calculation and the better quality the sound.

The **bit rate** is the bit depth x sample rate, meaning that when either the bit depth or sample rate rise, so does the bit rate.

Class Activity and Discussion Points (YouTube clip – 12 minutes)

Watch the following YouTube clip and record the key points you learn in the text box below:

<https://www.youtube.com/watch?v=1RIA9U5oXro>

DIGITAL DATA: PORTABILITY

KEY FACTS

Data Portability is to do with how easily data can be transferred from one system to another without having to re-enter the data. It is quite likely that you frequently transfer many different types of files such as word-processed, images, audio and video files from one place to another. Examples may include: images from your mobile phone to Facebook, a homework report from your personal PC to the school network. The format in which your document is saved will indicate whether it is portable between different systems of application programmes.

Examples of file formats that support data portability include: jpeg, tiff, png, pict, gif, txt, csv, rft, mp3, mp4, midi, mpeg, avi, pdf, wav and wmv.

STUDENT ACTIVITY 1

Expand the following acronyms using the Internet to help you and draw, insert or print and glue any recognisable icons.

Acronym	Expansion of Acronym and ICON (where appropriate)	Key Points for Learning
.jpeg	joint photographic experts group	Compressed graphic image file Small file size Ideal for digital photographs Commonly found on the web Can be used on different operating systems Known for lossy compression Quality decreases as the file size decreases
.tiff	tagged image file format	Large raster file referred to as a bitmap image Made up of tiny pixels Formatting maintained across devices Can be compressed to reduce file size Does not lose its quality Secure document format, difficult to alter High quality and used in publishing profession
.png	portable network graphic	Useful for interactive documents such as web pages Suitable for projects that require high resolution Referred to as lossless Do not lose quality during editing
.pict	programmable integrated communications terminal	Used in Macintosh graphics applications Most common use is to create file icons Supports screen captures Web browser may not support .pict files Mostly replaced by .pdf file format
.gif	graphic interchange format	Most common as an animation Small file size Commonly found on the web, used for advertising Colour quality may be poor

SCENARIO 1: A selection of images alternating required for a Website Banner	
Graphic Type:	Reasons for your answer:
SCENARIO 2: Creating a logo for a new business	
Graphic Type:	Reasons for your answer:
SCENARIO 3: Creating a step by step guide illustrating how to set up a spreadsheet	
Graphic Type:	Reasons for your answer:
SCENARIO 4: A high quality image for a magazine	
Graphic Type:	Reasons for your answer:

STUDENT ACTIVITY 3

Expand the following acronyms using the Internet to help you and draw, insert or print and glue in any recognisable icons.

Acronym	Expansion of Acronym and ICON	Key Points on File Type
.mp3		File format used for compressing audio Relatively small file size, but retains quality Most popular for downloading music
.mp4		File format used for compressing files which contain video, audio, text and images Used for sharing video files on the web Relatively small file size, but retains quality MP4 is the file type, MPEG is a compression method
.midi		Standardised way music sequences are stored Compact size Commonly used in mobile phone ringtones, e-cards
.avi		Universally accepted for storing video and audio Supported by most web browsers Offers less compression Replaced for the most part by .wmv
.wmv		Originally designed for streaming Smallest video files over the web Small file size also decreases the quality
.wav		Standard audio file used in Windows PC Commonly used for storing uncompressed quality sound files

STUDENT ACTIVITY 4

Look at the following scenarios. For each, decide which type of audio or video file type would be most suitable and give reasons for your answer.

SCENARIO 1: Saving a short video to be played in a school assembly

Audio or Video file:

Reasons for your answer:

SCENARIO 2: Downloading your favourite tracks onto your mobile phone

Audio or Video file:

Reasons for your answer:

STUDENT ACTIVITY 5

Expand the following acronyms using the Internet to help you and draw, insert or print and glue in any recognisable icons.

Acronym	Expansion of Acronym and ICON	Key Points on File Type
.pdf		Developed by Adobe, viewable using Acrobat Reader Can be created from a range of files e.g. Word PDF smaller than original file Transferrable onto most systems
.txt		Simple text file that hold letters and numbers Can be imported into a word processor May not retain its original format
.csv		CSV files store tabular data Usually contain text and numbers Each line of the file is a record and a number of fields separated by commas Common used for data transfer between a number of applications e.g. GCSE examination results
.rtf		A text file format used by Microsoft applications Can be read by most word processors

STUDENT ACTIVITY 6

Look at the following scenarios. For each, decide which type of file type listed above would be most suitable and give reasons for your answer.

SCENARIO 1: Sending examination entries to CCEA

File Type:

Reasons for your answer:

SCENARIO 2: Emailing a text file that will run on most applications

File Type:

Reasons for your answer:

DIGITAL DATA: FILE TRANSFER AND COMPRESSION

KEY FACTS

Sometimes files need to be converted to another format. Reasons may include:

- to allow viewing on a different software application
- to compress the file into a smaller size
- to convert an old file into a more modern format
- to transfer a file onto a different storage medium
- so that it is more suitable for the web or to send via. email

Special software may be required to perform this operation e.g. 7-Zip, IZArc, WinRar

Data compression

Data compression involves storing a file in a format that takes up less space

Data compression can be done by either using compression tools or by saving the file in a different format, where the option is available. Key attributes of images will be changed.

Visit GCSE ICT/Computer Science related websites to find out more facts about Data Compression.

Use your research to help you answer the following questions.

(1) What are the key attributes of an image file?	The type of file, image size and resolution.
(2) Compression can be lossy or lossless. What is the difference between them?	
(3) Give one example of a data compression tool. Explain how it works and how the file is de-compressed.	
(4) Provide 3 examples of compressed files	

(5) Provide an example of an image file conversion that that is required to reduce its size for the web to reduce download time. What file extension would you recommend?	
(6) Provide an example of a document file conversion that is required to ensure that editing of the original document cannot take place once	

SELF EVALUATION CHECKPOINT

FLIPPED CLASSROOM: HOMEWORK REVISION ACTIVITY
Summarise your notes to date either using a set of index cards **or** by using a mind map diagram with headings, definitions and key points.

PEER ASSESSMENT

Ask a peer to test and question and assess you on the following topics:

	Question	Marks
1	Difference between data and information with an example	/2
2	2 questions on conversion of units of data	/2
3	2 questions on storage devices capacity and use	/2
4	Question on data types requiring 2 key points	/2
5	2 questions on image resolution e.g. pixels, key terms	/2
6	Question on graphics e.g. vector, bitmap graphs – responses require 2 key points	/2
7	Question on buffering and streaming – responses require 2 key points	/2
8	2 questions on sound and sampling	/2
9	2 questions on data portability	/2
10	2 questions on file transfer and compression	/2
TOTAL MARKS		/20

SELF ASSESSMENT – Tick the relevant box

Marks Attained	Statement	Tick the relevant box
18-20	I am confident in almost all topics assessed	
15-17	I am confident in many of the topics assessed	
10-14	I am confident in a number of the topics assessed	
Below 10	I am confident in some or a few of the topics assessed	



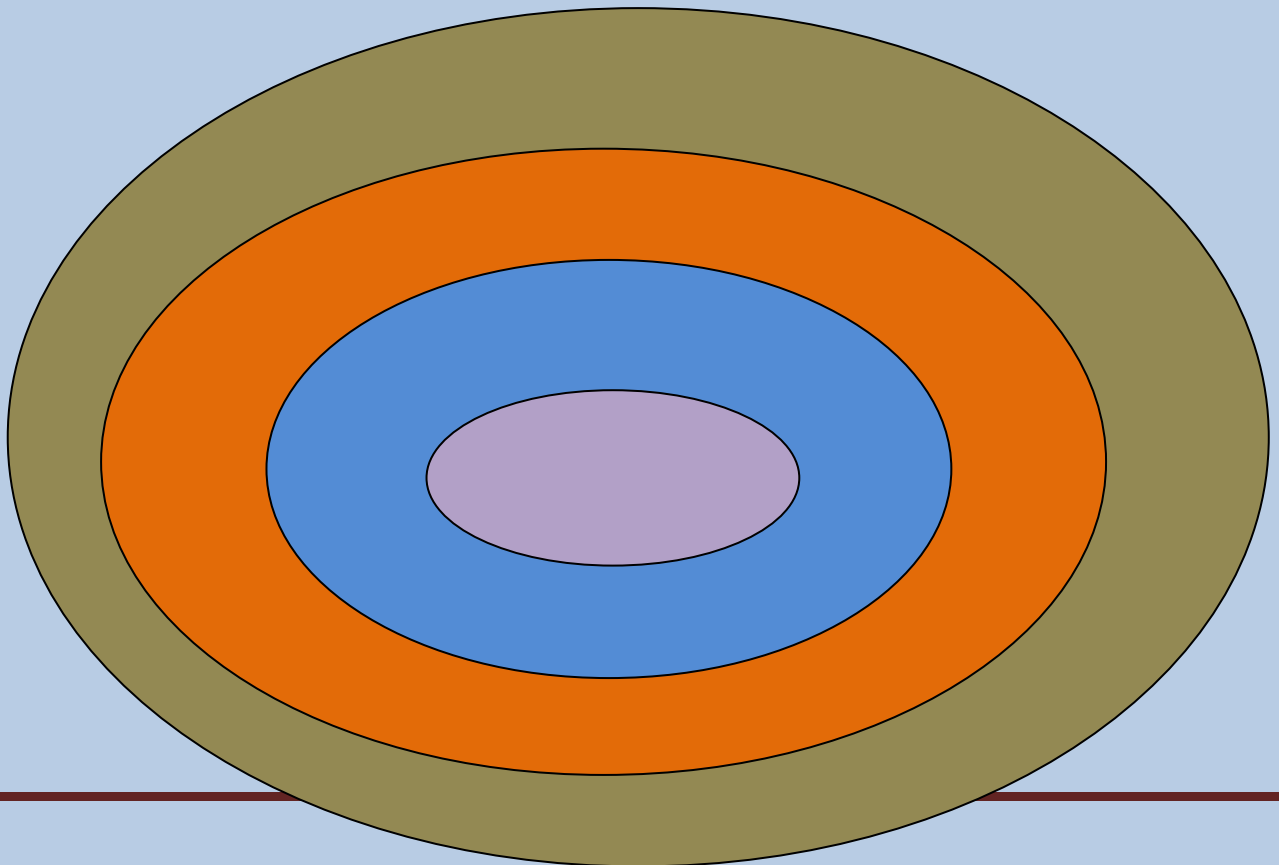
TOPICS I NEED TO RE-VISIT – Tick the relevant box

Data and Information	
Units of Data	
Storage Devices Capacity and Use	
Data Types	
Image Resolution	
Graphics	
Buffering and Streaming	
Data Portability	
File Transfer and Compression	

SYSTEM SOFTWARE

STUDENT ACTIVITY

Slot in the following labels: USER, HARDWARE, APPLICATION SOFTWARE, SYSTEM SOFTWARE in terms of where it sits in relation to the user. Add examples where appropriate.



THE OPERATING SYSTEM: Storage, Processing & Memory

Role Play Activity

Characters: The Boss, The Secretary

The Boss

You work for a postal service, in the factory office where the mail is sorted. You work closely with and allocate tasks on a daily basis to your secretary. It is always busy.

The Secretary

You work for a postal service in the factory office and directly report to The Boss. You must follow his/her instructions carefully. It is always busy.

Your teacher

The boss will be given guidance on the type of instructions to be issued to the Secretary. The secretary should act out the instructions. The role play gets busier as the role play goes along and the secretary must make some important decisions on how to respond.

Reflection of your experience and observations

(1) What was the easiest part of the task?	
(2) When did the task become more difficult?	
(3) What key decisions did the Secretary have to make as the role play progressed?	

In many ways, the Operating System runs in exactly the same way. The OS finds the program files in the storage files, loads the files into the memory and instructs the Central Processing Unit to start executing the program. The OS follows a number of steps to complete the process.

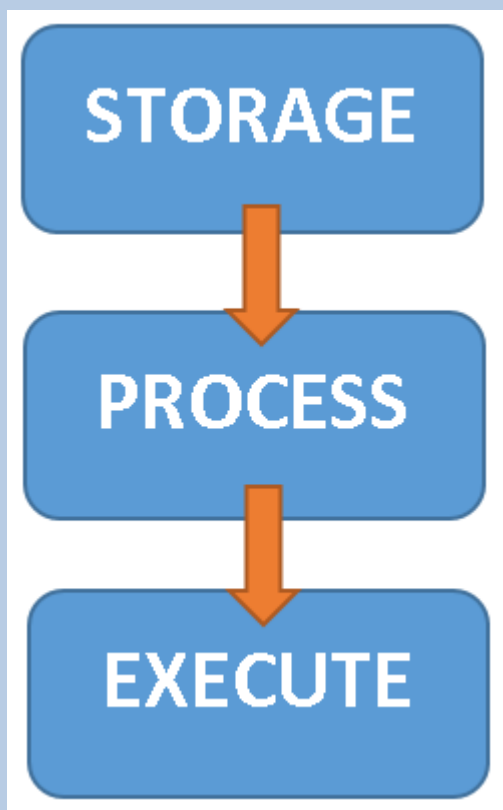


On many occasions, the Operating System has to multi-task meaning that it has to run several programs at the same time. This doesn't mean that more than one task is completed at once, but rather that some tasks are stored in RAM and set aside for later. Programs can either be running, waiting or runnable. Unlike humans however, the OS can swap between tasks so fast that to the human eye it appears that all processes are running at the same time!

THE OPERATING SYSTEM: Storage, Processing & Memory

Visit GCSE ICT/Computer Science related websites to find out more facts about Storage, Processing & Memory. Use your research to assist you in completing the following tasks.

Activity 1: To execute a program the Operating System follows steps. Draw or insert a flow chart in the space below to illustrate this.



Activity 2: Answer the following questions in your own words

(1) How does the operating system manage Multi-tasking?	
(2) What does the term scheduling mean?	

(3) How does the operating system manage how main memory is used?	
(4) What would happen if a file got too big for the RAM or hard disk to hold?	
(5) What factors can contribute to slow processing time of a computer?	

MODES OF PROCESSING: Real time, Batch & Multi-User

KEY FACTS

A **real time processing** system receives data, processes them and returns the results very quickly. It is used to deal with input requests so that it can control the output. A common example of a real time processing are online booking systems e.g. to book a flight, accommodation or to purchase a ticket for a concert. In these instances, the system must operate in real time so that as booking or orders take place, the availability reduces for future buyers. Real time processing systems are also necessary where the stakes are high. For example, air traffic control.

A **batch processing** system operates applies set times to deal with inputs. Whilst the actual data may be collected on a daily basis, the information may not be calculated or processed until later. Batch processing may be used for producing monthly telephone bills, payroll and stock control systems.

A **multi-user system** allows multiple users to access the same system at once. They are usually highly sophisticated and complex. For example, numerous teachers can access the School Information Management System at once.

STUDENT ACTIVITY 1

Using the suggested links provided by your teacher, summarise the key advantages and disadvantages of the different modes of processing. Can you also add some further examples?

BATCH PROCESSING	ADVANTAGES	DISADVANTAGES
Examples:		

REAL TIME PROCESSING	ADVANTAGES	DISADVANTAGES
Examples:		
MULTI-TASK PROCESSING	ADVANTAGES	DISADVANTAGES
Examples:		

MODES OF PROCESSING: Real time, Batch & Multi-User

STUDENT ACTIVITY 2

Look at the following scenarios. For each, decide which mode of processing would be most suitable and give reasons for your answer.

SCENARIO 1: Playing an online computer game	
Mode of Processing:	Reasons for your answer:
SCENARIO 2: Calculating a gas bill	
Mode of Processing:	Reasons for your answer:

BATCH PROCESSING KEY TERMS

A **transaction file** is a collection of records which contains information about daily transactions. For example: employee's hours of work, customer purchases or usage of facility.

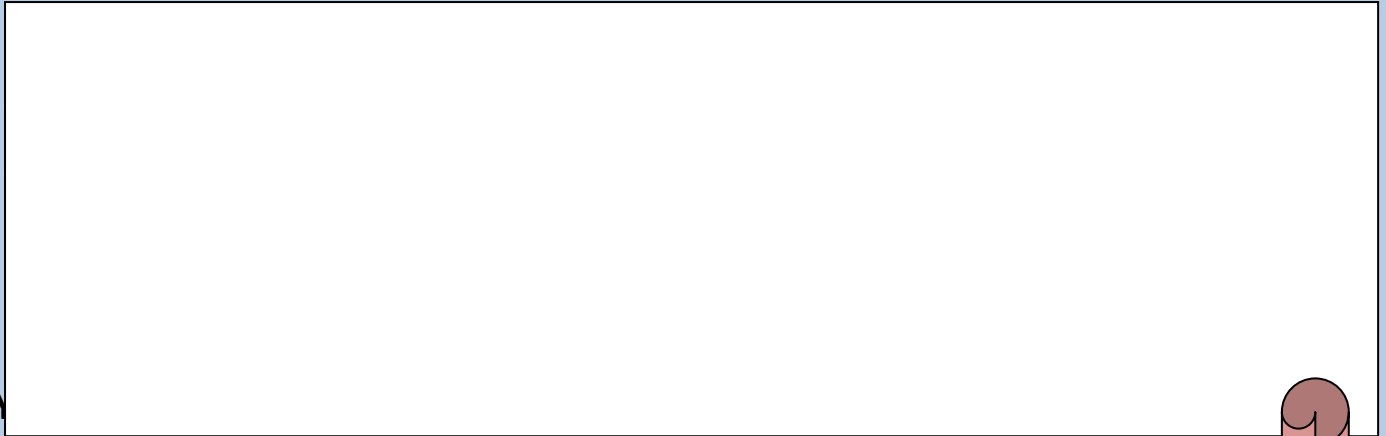
A **master file** usually contains standard data that does not change as frequently. For example: employees address, Staff ID number. It may also include a standard layout to insert data from the transaction file at the end of a particular period of time.

BATCH PROCESSING EXAMPLE – A payroll system for a petrol garage

- 1) Staff Record cards are updated on a daily basis about the number of hours each employee works
- 2) Data is entered onto the Payroll Transaction File (records each employees hours of work individually)
- 2) Transactions are double checked at the end of every week against the record card to report any errors
- 3) Errors are rectified on the Payroll Transaction File

- 4) The total hours of work for each employee is calculated at the end of the week and merged with the Master File
- 5) A payroll slip is produced and issued to each employee

PUPIL ACTIVITY : DRAW A FLOW CHART TO ILLUSTRATE USING THE FOLLOWING SHAPES TO LABEL:



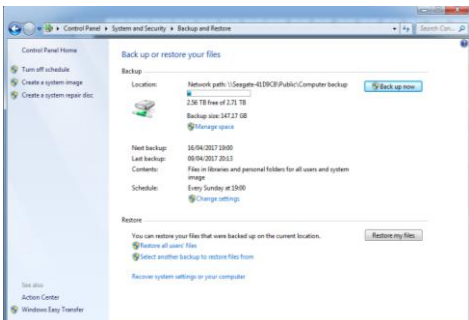
KEY FACTS

Utilities Applications allow the user to manage the computer. The 2 key utilities are **Maintenance Utilities** and **Security Utilities**. **Maintenance Utilities** may include features such as: File Management, Diagnostic tools, Backup, Disk Cleaner, Disk Fragmentation and Task Scheduling. **Security Utilities** may include features such as: Anti-Virus Software, Firewalls and Management of User Accounts.

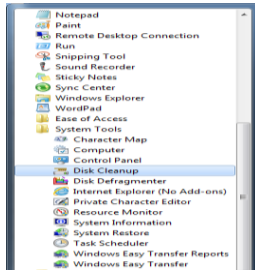
Different computer systems may have different system software facilities. These are usually accessible through the control panel or accessories folder.

STUDENT ACTIVITY 1

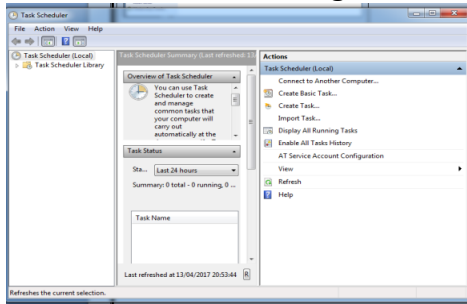
Use the suggested links provided by your teacher to help you summarise the key tasks associated with each and why they are performed

UTILITY EXAMPLES	Tasks performed
<p style="text-align: center;">Backup and Restore</p> 	

Disk Cleaner and Disk Fragmentation



Task Scheduling



SOFTWARE: ANTI-VIRUS SOFTWARE

KEY FACTS

A virus is a malicious piece of code which is designed to attach itself to a program. Once infected, just like a biological virus it can replicate itself and spread from host to host. It can have devastating and disruptive effects on work productivity by altering computer settings or even cause it to stop working altogether. Viruses are usually obtained through downloading, opening untrustworthy email attachments or links.

Many PCs and digital devices have anti-virus programmes installed as part of the System Software. In addition, businesses and individuals may download or purchase additional anti-software to protect their PCs and networks. Examples include: AGV, Avira, Symantic, Norton.

STUDENT ACTIVITY 1

See what you can find out about the chaos caused by the following well known viruses.



VIRUS	How it works and the chaos it caused
CIH (Chernobyl Virus 1998)	

Melissa Virus (1999)	
ILOVEYOU Virus (2000)	

STUDENT ACTIVITY 2
 Choose one of the examples above and create a comic strip using an appropriate software programme or on an A3 Poster as instructed by your teacher, illustrating how it works, its impact and the damage it caused.

SOFTWARE: ANTI-VIRUS SOFTWARE

KEY FACTS
 The main function of anti-virus software is to detect and remove viruses by scanning the PC or electronic device and comparing it to a database of known viruses. The database and virus protection software must be up-to-date to be effective. When a virus is detected, it is quarantined and the computer notifies the user so that the file can be deleted.

In addition to protection against viruses, anti-virus software can include other anti-malware features, such as anti-Trojan, anti-spyware, key logger and anti-worm.

STUDENT ACTIVITY 3
 Research the internet and identify the threats and harmful effects the following forms of malware cause. Can you find out any others not provided in the table below?

Malware	Description of the threat and harmful effects
Trojan Horse	

Worm	
Key Logger	
Spyware	

SELF EVALUATION CHECKPOINT

FLIPPED CLASSROOM: HOMEWORK REVISION ACTIVITY

Summarise your notes to date either using a set of index cards **or** by using a thought shower diagram with headings, definitions and key points.

PEER ASSESSMENT

Ask a peer to test and question and assess you on the following topics:

	Question	Marks
1	2 definitions on System Software	/2
2	2 questions on Operating Systems	/2
3	2 questions on Modes of Processing with examples	/2
4	2 questions on Utility Applications	/2
5	2 questions on Ant-Virus Software	/2
TOTAL MARKS		/10

SELF ASSESSMENT – Tick the relevant box

Marks Attained	Statement	Tick the relevant box
8-10	I am confident in almost all topics assessed	
5-7	I am confident in some of the topics assessed	
Below 5	I am confident in a few of the topics assessed	

TOPICS I NEED TO RE-VISIT – Tick the relevant box

System Software	
Operating Systems	
Modes of Processing	
Utility Applications	
Ant-Virus Software	



COMPUTER HARDWARE: The Central Processing Unit

KEY FACTS

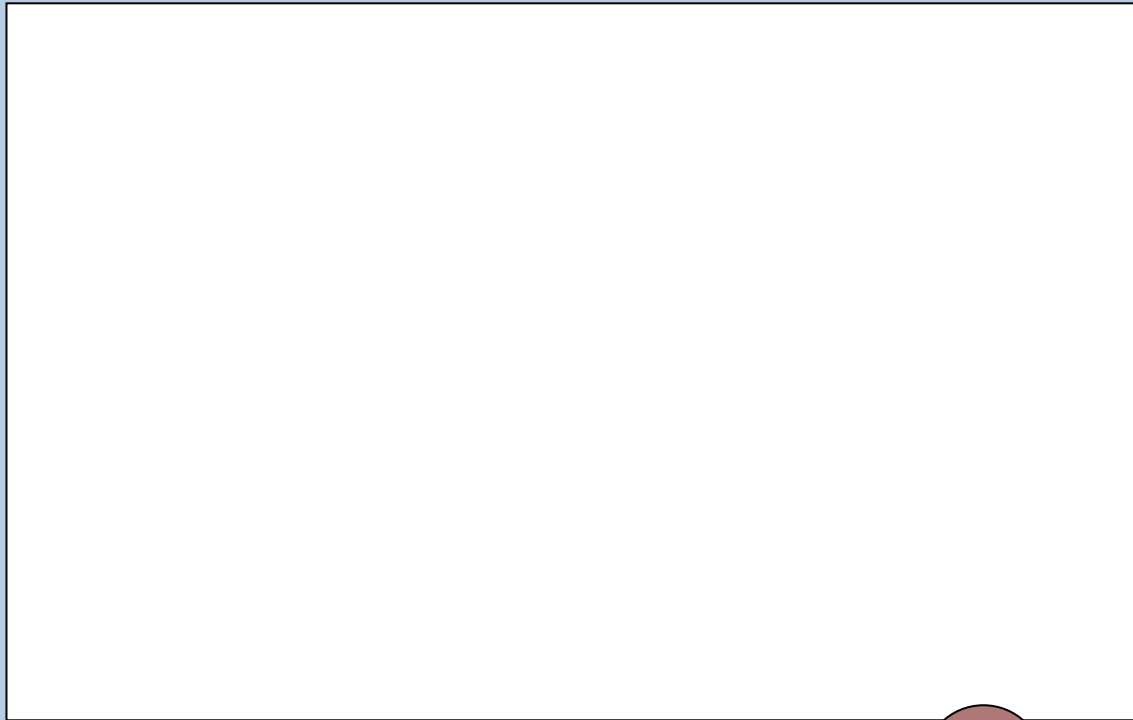
The **Central Processing Unit (CPU)** is often referred to as the *brain of the computer*. Its key purpose is to handle and execute instructions it receives from the hardware and software. Instructions are held in programs.

The CPU can be identified as **the chip inside the motherboard** of a PC or laptop which is held inside a CPU socket. It is usually square or rectangular in shape and has hundreds of pins that fit into the socket. Nowadays, numerous electronic devices such as mobile phones and washing machines rely on CPUs to operate. There are numerous processor specifications available for PCs and devices.

There are 3 key components to the CPU: Control Unit, Immediate Access Store and Arithmetic Logic Unit. The **Control Unit** informs the computer's memory, Arithmetic Logic Unit, Input & Output devices how to respond to a program's instructions, essentially decoding the instructions into commands. The **Immediate Access Store** is where the data and programs that are currently running are stored e.g. a word document that is being edited. The **Arithmetic Logic Unit** performs arithmetic calculations and logic operations e.g. $4 + 5$, $5 > 2$.

STUDENT ACTIVITY 1

Search the Internet to help you create a suitable diagram in the textbox below which illustrates the flow and operation of the CPU and its 3 key components. Label and colour code each appropriately.



COMPUTER HARDWARE: The Central Processing Unit

KEY TERMS

The Central Processing Unit's speed is influenced by 3 key factors: Clock Speed, Number of Cores and Cache Memory.

The **Clock Speed** is the speed at which the CPU can carry out instructions. Clock speed is measured in cycles per second. One cycle per second is one hertz. The higher the clock speed, the more instructions the CPU can execute per second. Clock speed is usually measured in Megahertz or Gigahertz.

A CPU can contain one or more processing units, each unit is known as a **Core**. Modern CPUs can have two (dual), four (quad) or more cores. A dual core can fetch and execute two instructions in the same time it takes a single processor.

Cache is a tiny block of memory which is used to hold temporary or most commonly used instructions. The control unit automatically checks the cache before it tries to retrieve data in RAM because it is positioned closer to the Control Unit. The larger the cache size, the more quickly instructions can be fetched and processed.

Scenario

Megan has requested a new laptop for her birthday. She is 15 and has just embarked on her GCSEs. Megan will require MS Office, Photoshop and access to the Internet to support her studies. For personal use, Megan enjoys using the computer to listen to music and SKYPE friends abroad. Megan frequently works between different programs.

STUDENT ACTIVITY 2

Working in pairs, research laptop suppliers and find a suitable laptop which you believe provides the best value for money, based solely on the Clock Speed, Core and Cache facilities. Her budget is £500. Using suitable software, create a short 2 Slide Presentation to present to your peers which explains and justifies your decisions. The class will vote on the best one!

Content to consider

Laptop Supplier

Name of Product, Image of Product

Specification: Operating System, Processor Details

Cost of Laptop



COMPUTER HARDWARE: The Central Processing Unit

KEY TERMS

The **fetch-decode-execute cycle** is a standard process which describe the steps required for processing to take place.

Fetch

Each instruction has a unique address held in the **Memory Address Register (MAR)**. The CPU fetches data and instructions from main memory and stores them in the temporary storage place called the **Memory Data Register (MRD)**. The **Program Counter** gives an address value of the location of where to find the next instruction. As each instruction is fetched, the program counter increases its stored value by one.

Decode

The CPU has to make sense of the instruction it has fetched. The instruction must be de-coded to prepare the chip for execution of the command. This might involve calculations or logical operations carried out by the Arithmetic Logic Unit (ALU).

Execute

In this part of the cycle data processing takes place i.e. the instruction is carried out.

STUDENT ACTIVITY 3

Search the Internet to help you create a suitable diagram in the textbox below which illustrates the flow and operation of the Fetch, Decode, Execute process. Label and colour code appropriately.

COMPUTER HARDWARE: Input, Output and Storage Devices



KEY TERMS

An **Input Device** is any hardware device that can send data to a PC or electronic device. Examples include: microphone, mouse and graphics digitiser.

An **Output Device** is any hardware device that outputs the data. Examples include: speakers, printers, monitor.

Some hardware devices are both an input and output device. Examples include: touch screen digital camera.

A **Storage Device** is a device for storing data. Storage devices include Primary Storage Devices such as RAM (Random Access Memory) and Secondary Storage Devices such as a





STUDENT ACTIVITY 1

Working in a team of 4, allocate responsibility for researching and summarising in bullet points key information on the following Input, Output, Storage Devices & Memory. Each student should complete one table each and e-mail other team members their findings so they can copy/paste or write in their findings into individual Student Booklets. Each student should also print a copy of the table they were responsible for.


STUDENT ACTIVITY 2 (each team will require a number)

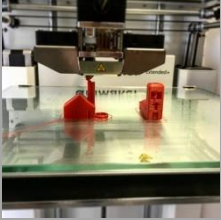
Cut out your completed tables and place in piles in the following categories: Name of Device, Technical Features & How it Works, Uses, Benefits and Drawbacks. On the back of each cut out, write in big letters the number of your team. Now shuffle each pack of cards. Swop yours with another team. On an A3 sheet of paper attempt to put the relevant information back together, using glue to stick it to the paper. Can you add anything new to your own tables?

COMPUTER HARDWARE: Input, Output and Storage Devices

Name of device	Input or Output?	Technical Features / How it works	Benefits	Drawbacks
Microphone 				
Mouse 				
Graphics Digitiser 				
Touch Screens 				

COMPUTER HARDWARE: Input, Output and Storage Devices



Name of device	Input or Output?	Technical Features / How it works	Benefits	Drawbacks
Speakers 				
3D Printer				

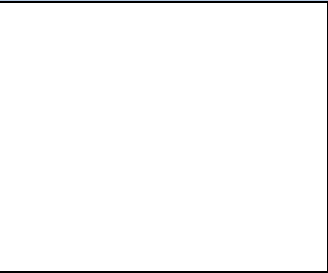


Laser Printer

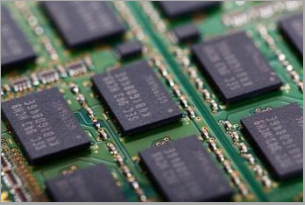




COMPUTER HARDWARE: Input, Output and Storage D

Name of device	Storage	Technical Features / How it works	Benefits	Drawbacks
<p>Hard-disk drive (HDD)</p> 				
<p>HD Storage Media (HD)</p> 				
<p>Solid State Drive (SSD)</p>				



COMPUTER HARDWARE: Memory

Memory Type	Technical Features / How it works/ When it is used
<p>Random Access Memory (RAM)</p> 	
<p>Read Only Memory (ROM)</p> 	
<p>Cache</p> 	

SELF EVALUATION CHECKPOINT

FLIPPED CLASSROOM: HOMEWORK REVISION ACTIVITY

Summarise your notes to date either using a set of index cards **or** by using a thought shower diagram with headings, definitions and key points.

PEER ASSESSMENT

Ask a peer to test and question and assess you on the following topics:

	Question	Marks
1	4 questions on The Central Processing Unit	/4
2	2 questions on Input Devices (Tech Features/How it works, benefits, drawbacks, use)	/8
3	2 questions on Output Devices (Tech Features/How it works, benefits, drawbacks, use)	/8
4	2 questions on Memory (Tech Features/How it works, Use)	/4
5	2 questions on Storage Devices (Tech Features/How it works, benefits, drawbacks, use)	/8
TOTAL MARKS		/32

SELF ASSESSMENT – Tick the relevant box

Marks Attained	Statement	Tick the relevant box
26-32	I am confident in almost all topics assessed	
21-25	I am confident in most of the topics assessed	
16-20	I am confident in a number of the topics assessed	
Below 16	I am confident in some or a few of the topics assessed	

TOPICS I NEED TO RE-VISIT – Tick the relevant box

Central Processing Unit	
Input Devices	
Output Devices	
Memory	
Storage Devices	



NETWORK TECHNOLOGIES: STARTER



What year were the following online communication networks launched? Draw an arrow to indicate the correct year.

Twitter

1995

E-Mail

2003

Facebook

2010

YouTube

1972

E-Bay

2006

Instagram

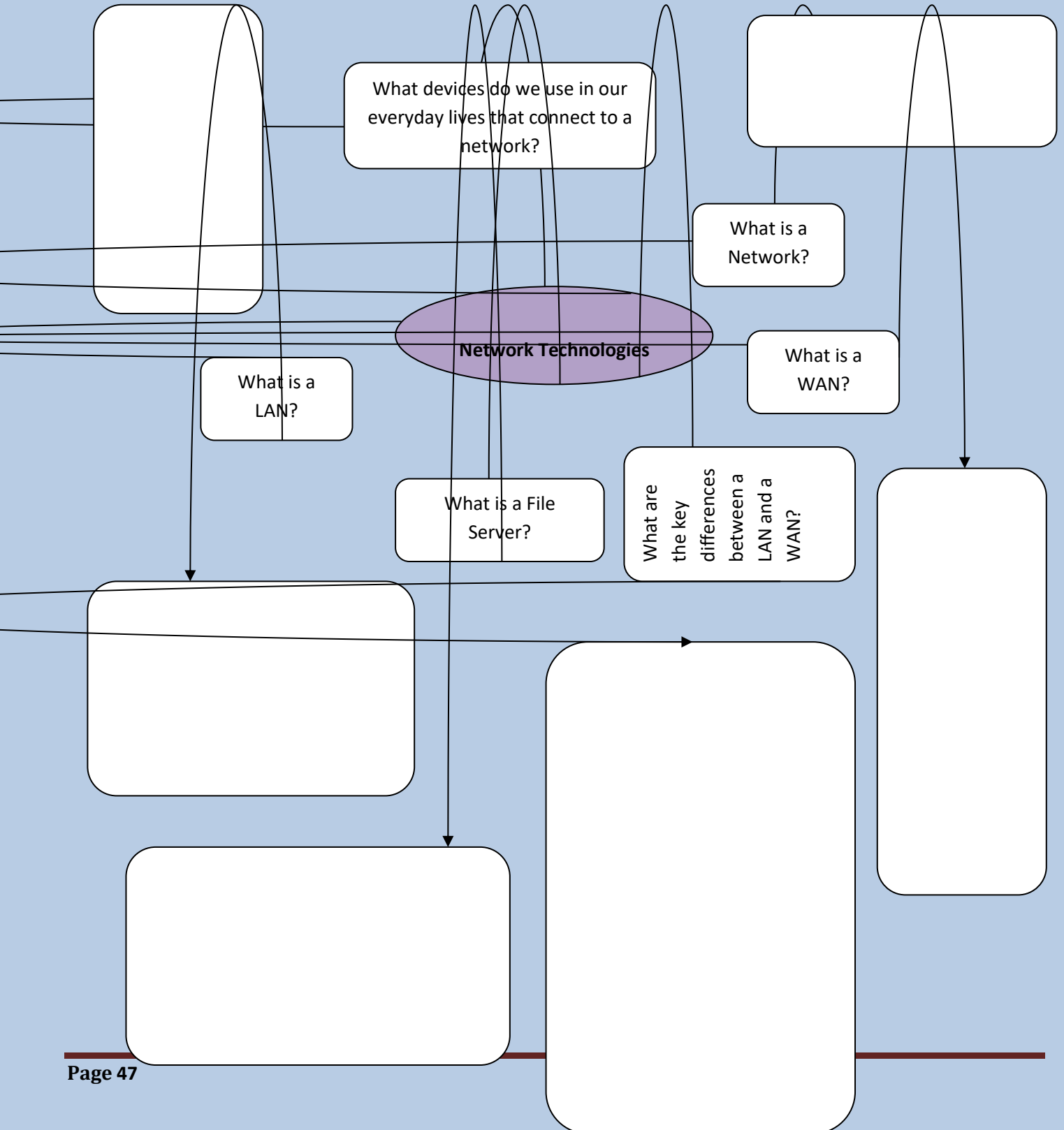
2004

LinkedIn

2005

NETWORK TECHNOLOGIES: LAN AND WAN

Complete the following diagram, writing down all the key facts you remember from the PowerPoint and Class Discussion



Network Solutions

You are a Network Advisory team. Your task today is to prepare a solution for a small graphic design business. You are competing against other network companies to win the bid. Each team will place a vote at the end to decide which network company provided the best and most convincing solution. You will not be allowed to vote for your own team!

Scenario

In the first year a new graphic design business has grown from the sole owner taking care of the business to an employer with ten employees. There are currently ten stand alone computers. They are considering creating a network so that computers can communicate but are nervous about the implications of the change. In teams, your job is to evaluate stand-alone versus networked computers AND advise on potential network solutions.

You should use the internet to help you research and make decisions on the proposal for the business. Each team will present their proposal to the rest of the class. You should create a poster display to illustrate and support arguments. *You can use the images already available to the team. *Every member of the team should contribute to the presentation.

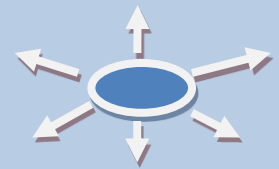
What your team should consider

- A clear comparison between stand-alone computers and a networked solution (advantages/disadvantages of each)
- Potential network solutions to investigate LAN and WAN
- Reduce fears of change e.g. training provided, cost savings in the long run and other benefits

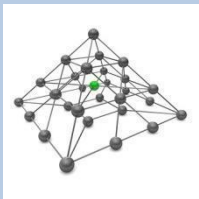
Suggested websites to help you get started

<http://www.webopedia.com/TERM/N/network.html>

https://en.wikipedia.org/wiki/Computer_network



NETWORK TECHNOLOGIES: NETWORK TOPOLOGIES



STUDENT ACTIVITY 1

From memory, summarise the key advantages and disadvantages of networks in bullet points in the table below. Students should feed back to the teacher and add any they missed out!

Advantages of Networks	Disadvantages of Networks

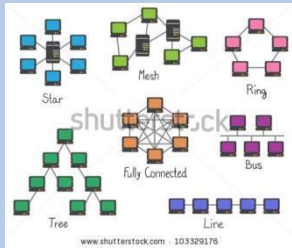
STUDENT ACTIVITY 2

In pupil groups allocated by your teacher, find the four photographs dotted around the room. Can you guess the correct computer term for the object in the picture? Write down all 4 and take your answers to the teacher.

Challenge: Who is the first group to find all 4 images and get the terms correct?

STUDENT ACTIVITY 3

In the same groups as before, using your knowledge obtained from the teacher PowerPoint, mix and match the correct definitions, advantages and disadvantages of Star, Bus and Ring topologies. How many groups got them all right? Make the necessary corrections as your teacher goes over the answers.



STUDENT ACTIVITY 4

Copy up the correct answers into the table below.

Network Type	Definition	Advantages	Disadvantages
Star Network			
Bus Network			
Ring Network			

--	--	--	--

NETWORK TECHNOLOGIES: NETWORK RESOURCES

KEY TERMS

A network interface card enables each computer to connect with the network, so that it can communicate with the file server and other computers on the network.

Network cables are plugged into the back of each computer into the network card from the network point. Further cables are usually kept behind a protective shield and connected from there to a switch. Data travels along the network cables.

The switch is connected to a file server and enables computers and other devices to communicate with the file server and other computers on the network. One ICT lab or computer room may be connected to the same switch.

A Router connects networks. It enables the LAN and computers on the network to access the Internet or other WANs.

STUDENT ACTIVITY 5

Research the internet to find an image of each network resource.
Either draw or insert the image into the table below.

Network Interface Card	
Network Cables	

A Switch	
A Router	

NETWORK TECHNOLOGIES: WWW, INTERNET OF THINGS, INTRANETS

KEY TERMS

Sir Tim Berners-Lee is a Computer Scientist who invented the **World Wide Web (www)** in 1989. <http://webfoundation.org/> WWW is webspace containing a collection of web pages that have a **Uniform Resource Locator (URL)** (web address). These are interconnected through **hyperlinks** to pages formatted in a language called **Hypertext Markup Language (HTML)** which are displayed in an understandable form to the user.

The Internet is a global system where computer networks can connect to each other. The WWW and the Internet are not the same thing, but they are inter-dependent on each other.

The Internet of Things is a concept where all sorts of physical devices, software, electronic and mechanical objects can inter-connect and exchange data.

An **Intranet** is an internal, private network that is only accessible to individuals within the organisation. For example, Your School Network: FRONTER, Shared Resources, C2K E-Mail. Intranets are only accessible through a User Name and Password.

STUDENT ACTIVITY 1

Complete the following practical and research activities below to familiarise yourself with some of the key features and terminologies relating to the World Wide Web.

Address bar

This allows the user to enter the web address or URL of the website they wish to visit. A URL is a **Uniform Resource Locator**. This is another name for the website address. For example the URL for the BBC website is <http://www.bbc.co.uk>

URLs are made up of a number of components. We can find out a lot about websites by simply looking at them. Explain what you know about the BBC website by completing the table below:

Component	Title in full	Explanation of its function
http://		
www.bbc.co.uk		

Web Browser

A Web Browser is a type of software application required for viewing, downloading and uploading material to the Internet or offline web pages. One example is Internet Explorer. Using your own knowledge and research, add 3 further examples of web browsers and write down 2 key facts about each in the table below.

Name of Web Browser	2 Key Facts
Internet Explorer	Internet Explorer was developed by Microsoft It used to be the most widely used web browser

Search Engine

A search engine facility is used to search the Internet to find relevant websites and web pages that are matched to the criteria the user has entered. One example is Google. Using your own knowledge and research, add 3 further examples of search engines and write down 2 key facts about each in the table below.

Name of Search Engine	2 Key Facts
Google	Google uses a special algorithm (programming technique) to trawl the Internet using an index of key words Google ranks the search results in relevancy

Internet Service Provider

An Internet Service Provider (ISP) is required to access the Internet. Individuals and Businesses usually pay the ISP on a monthly basis to have access to the Internet and a range of other services. Examples of ISPs include: BT, Sky. Research and list in the textbox below typical services provided by an Internet Service Provider.

STUDENT ACTIVITY 2
 In pairs, discuss and then explain the purpose of the following Intranet features and explain (where relevant) how they are used by teachers and pupils in school to support learning.

INTRANET RESOURCE	Used by teachers and pupils for ...
E-Mail	
Shared Resources	
FRONTER	
APPS	

Network Communication Technology	Definition	Advantages 3 Key Points	Disadvantages 3 Key Points

Wi-Fi			
Bluetooth			
Optical Fibre			
4G			
5G			

NETWORK TECHNOLOGIES: STARTER

STUDENT ACTIVITY 1

Look at the following scenarios. For each, decide which network communication would be most suitable and give reasons for your answer.

SCENARIO 1: A student wants to access the Internet from an iPad at home – WIFI, BLUETOOTH OR 3G	
Network Communication Technology:	Reasons for your answer:
SCENARIO 2: A driver requires hands free access to answer a call on his mobile phone – WIFI OR BLUETOOTH	
Network Communication Technology:	Reasons for your answer:
SCENARIO 3: A person wants to check their work email while travelling by train on the way to work – WIFI OR 4G	
Network Communication Technology:	Reasons for your answer:
SCENARIO 4: An owner of a Samson GalaxyS3 wants to check out cinema times online – 4G or 5G	
Network Communication Technology:	Reasons for your answer:

STUDENT ACTIVITY 2

Create a newsletter introducing Year 8 pupils to the School Network.

Create a Newsletter in MS Word OR MS Publisher which provides an Introduction to Year 8 students about the school network. You should include the following sub headings:

- (1) An introduction to the School Network – what it does, how it works and the key features
- (2) Accessing the School Network from school and at home
- (3) Accessing E-mail and information to expect in your inbox and how you might use it to support your studies
- (4) A description of the key APPS and a brief description of their purpose and use – this may include software such as MS Word, Excel & PowerPoint AND others such as FRONTER
- (5) Accessing The Internet, key features and terms

SELF EVALUATION CHECKPOINT

FLIPPED CLASSROOM: HOMEWORK REVISION ACTIVITY

Summarise your notes to date either using a set of index cards or by using a thought shower diagram with headings, definitions and key points.

PEER ASSESSMENT ACTIVITY

Ask a peer to test and question and assess you on the following topics:

	Question	Marks
1	2 questions LAN and WAN	/2
2	2 key advantages and disadvantages of networks	/4
3	2 questions on Network Topologies (Definition, Advantage, Disadvantage)	/6
4	4 questions on Internet/Intranet key terms	/4
TOTAL MARKS		/16

SELF ASSESSMENT – Tick the relevant box

Marks Attained	Statement	Tick the relevant box
12-16	I am confident in almost all topics assessed	
8-11	I am confident in a number of the topics assessed	
Below 8	I am confident in some or a few of the topics assessed	


TOPICS I NEED TO RE-VISIT – Tick the relevant box

LAN and WAN	
Advantages & Disadvantages of Networks	
Network Topologies	
Internet and Intranets	



CYBERCRIME STARTER

KEY TERM
 Cybercrime is a criminal activity carried out by using digital technologies.



STUDENT ACTIVITY 1
 Drawing cybercrime threats to the correct definition.

Hacking	Disrupting services by making it unavailable to users
Pornography	Sending emails or texts to large numbers of people for marketing purposes
Cyber Stalking	Unauthorised access to a computer or network
Data Theft	A fraud that involves altering digital documents or images

STUDENT ACTIVITY 2

Working in pairs create an A3 Poster for an Anti-Cybercrime campaign.

Create an A3 Poster which provides information for vulnerable people on how they can avoid being a victim of cybercrime. You should include the following:

- (1) A Slogan for your A3 Poster campaign
- (2) Recent newspaper cut-outs or online stories about cybercrime and its impact on society
- (3) Summarised key points of advice on what to look out for, what to do and what not to do
- (4) Relevant images to support your message

STUDENT ACTIVITY 3

Present your Poster campaign to the class

List the key points of advice you established below for your study records

CYBERSPACE, NETWORK SECURITY AND DATA TRANSFER



STUDENT ACTIVITY 1
In a previous lesson you investigated different types of malware that can damage computerised systems. Can you remember the definitions?

Virus

Trojan Horse

Worm

KEY TERMS

There are many threats to **Network Security**. Networks must be protected from:

- Unauthorised access to confidential files, software and data
- Physical abuse
- Viruses and other malware
- System failure and disruption of services
- Other forms of Cybercrime

CYBERSPACE, NETWORK SECURITY AND DATA TRANSFER

METHODS USED TO PROTECT NETWORKS

Users may be provided with a unique **User ID and Password** to access the network. The User ID identifies the person as an authorised network user and the password clarifies it is the user.

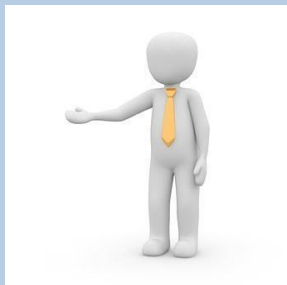
Larger networks are likely to provide different **levels of access** to the network. For example, The C2K Manager will have read/write access on all areas of the network; Teachers will have read/write access to some areas of the network e.g. Staff and Shared Resources, whereas pupils will have read only access to Shared Resources. Businesses and other organisations use a similar approach.

Network data is often protected through **encryption**, usually to protect sensitive data such as bank account numbers and personal information. Encryption scrambles the data so that if information is accessed by an unauthorised user they will only see a meaningless string of data. The data can be unscrambled by the intended recipient by entering an encryption key to decode it.

Networks can crash from time to time and to ensure data is not lost there will be **backup** procedures in place. Networks are often backed up on a daily, weekly and monthly basis. Some organisations may still use magnetic tape for this purpose or the more modern method of backing up on the cloud.

STUDENT ACTIVITY 2
Using internet research, describe the purpose of the following protocols.

Protocol	Purpose
File Transfer Protocol (FTP)	
Hypertext Transfer Protocol (HTTP)	
Hypertext Transfer Protocol Secure (HTTPS)	



STUDENT ACTIVITY 3 (in pairs)
Create a 5 Slide Presentation on Network Security

Scenario: You are the Network Manager for GoTelecom who provide a mobile telephone service. A new network has recently been installed and you have been asked to present a 3 minute presentation informing staff about Network Security and advising them on preventative measures. You should research and include the following:

- (1) 5 Slides – Slide 1 should include an Introduction to the purpose of the Presentation
- (2) Key points only that you will use as a guide to support your speech and relevant images

STUDENT ACTIVITY 4

Present your PowerPoint to the class

TIPS FOR YOUR PRESENTATION

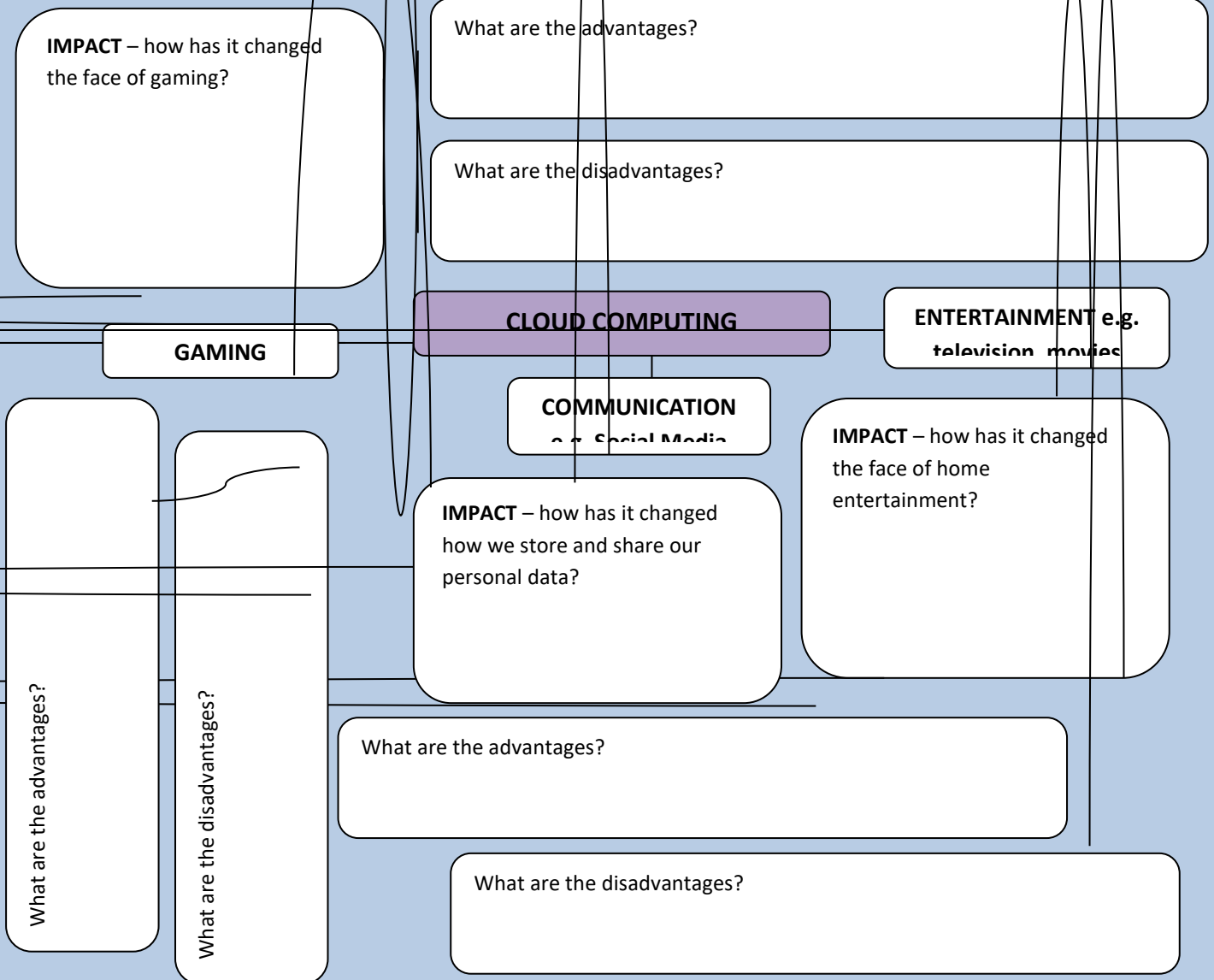
- Don't overuse text in the PowerPoint.
- Keep it simple and focus on the key points
- Apply features such as transitions to pause between each slide and special effects to bring in or enhance key points, but don't overdo it
- Keep eye contact with your audience
- Speak clearly
- Practice your timing (3 minutes)

CLOUD TECHNOLOGY

KEY TERMS

Cloud computing is an alternative and modern way to store, manage and process data. Instead of storing data on a local network, stand alone computer or external storage device it is accessed, processed and stored on the Internet. The data itself is stored in data centres all over the world.

Discuss in pairs and complete the mind map below about how we use cloud computing AT HOME e.g. gaming, entertainment and communication. Feedback your ideas to the class.



CLOUD TECHNOLOGY

Cloud computing is not only used at home, but has also become a popular method of data storage for businesses and other organisations. They also use cloud computing for collaboration and file sharing e.g. Drop box.

STUDENT ACTIVITY 2

Your teacher will play a short video clip. Summarise below the key reasons why businesses and organisations have moved to Cloud Computing.

--

STUDENT ACTIVITY 3

Visit the website/s suggested by your teacher and summarise the key advantages and disadvantages of cloud computing

Advantages	Disadvantages

STUDENT ACTIVITY 4

Design a logo you think might sell worldwide that identifies the term 'cloud computing'. You can do this task in a word processing or graphics package.

ETHICAL AND LEGAL IMPACT OF DIGITAL TECHNOLOGY

KEY LAWS

The purpose of the **Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013** is to protect the consumer and outlines details about contracts between the trader and the buyer.

The purpose of the **Copyright, Design & Patents Act 1988** is to protect and recognise the time and effort that has gone into creating original works of authors, musicians, video producers and software programmers. The Act also provides the creator with the authority to control how their work is used.

Legislation: Consumer Contracts Regulations 2013

STUDENT ACTIVITY 1

Answer the following questions about Consumer Contracts Regulations 2013.
Use the following web link to help you.

Questions	Answers
When did the regulation come into force?	
Name 3 key pieces of information online traders must provide about their product	(1) (2) (3)
Describe 3 key rights of the buyer	(1) (2) (3)

<http://www.which.co.uk/consumer-rights/regulation/consumer-contracts-regulations>

Legislation: Copyright, Design & Patents Act 1988



STUDENT ACTIVITY 2

There are many famous infringements of copyright laws. Complete online research to find one example. Complete the table below and feedback to the class.

Who was involved in the case?	
What were the key issues raised as why there was a breach of copyright law?	
How was the issue settled?	

CLASS DISCUSSION ACTIVITY 3

Illegal copying and downloading of films and music is a challenge for the industry. Consider your opinion on the issue. Do you (a) think it is fair to be able to copy film and music for free? (b) think it is unfair. Justify reasons for your view. In Conclusion what does the law say about it?



Legislation: Data Protection Act (1998)

STUDENT ACTIVITY 1

Using your knowledge attained from the Introductory PowerPoint Slides explained by your teacher and the web links provided, summarise the key points covered within the legislation in the table below.

<https://ico.org.uk/for-organisations/guide-to-data-protection/>

<http://www.bbc.co.uk/schools/gcsebitesize/ict/legal/0dataprotectionactrev1.shtml>

Purpose of the Data Protection Act	
The 8 Key Principles of the Data Protection Act	
Principle 1	
Principle 2	
Principle 3	
Principle 4	
Principle 5	
Principle 6	
Principle 7	
Principle 8	
Key Roles of people involved to ensure Data Protection Laws are followed	
Information Commissioner	
Data Controller	
Data Subject	
Examples of the Rights of Data Subjects	

Legislation: The Computer Misuse Act (1990)

STUDENT ACTIVITY 2

Use the link below to help you summarise and describe the 3 key offences covered within the legislation.

<http://www.legislation.gov.uk/ukpga/1990/18/contents>

(1)

(2)

(3)

STUDENT ACTIVITY 3

Complete the table below indicating the associated law from the following list:
Consumer Contract Regulations, Copyright, Design and Patents Act, Data Protection Act, Computer Misuse Act

Situation	Associated Law
Gaining unauthorised access to and editing content to a business report	
Using a Google image for a business website	
A business fails to keep customer payment records up to date	
Uploading a video of a live concert to You tube	

Installing a virus onto the school network	
Stating the wrong price of a product on a business website	
Hacking, Deliberate attempt to spread a virus or use of spyware	

MORAL AND ETHICAL CONSIDERATIONS

Our Digital Footprint

STUDENT ACTIVITY 1

In allocated groups on an A3 sheet OR electronically (as instructed by your teacher), list all the ways you can think of that we produce our own digital footprint. Consider potential threats and concerns. Update your own list below after class feedback.

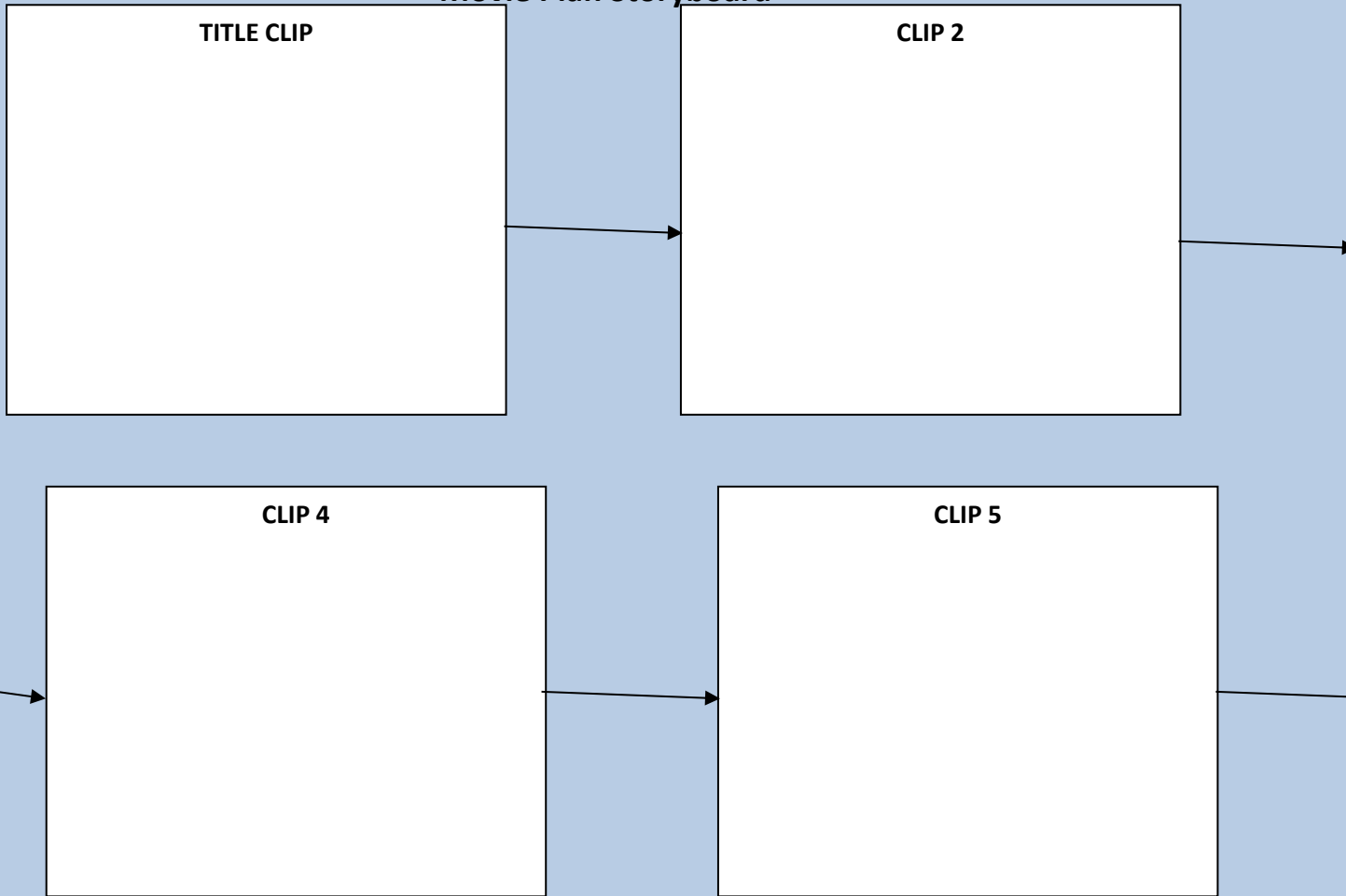
CATEGORY	POTENTIAL THREATS AND CONCERNS
HOME Example: Uploading personal images on Facebook	
SCHOOL/WORK	

E-Mailing a personal message to a peer or colleague	
OUT AND ABOUT Making purchases at a shop with a credit/debit card	

STUDENT ACTIVITY 2

Choose one category and create a Storyboard (using the outline below) illustrating 2 different ways technology can be misused and the potential impact of each. The advertisement should last no more than 40 seconds in 6 clips and will be created in Movie Maker.

Movie Plan Storyboard



WHAT TO INCLUDE ON EACH CLIP:

Insert a Title Clip, Insert/draw images and add intended text overlay, credits, special effects, the number of seconds each clip will last.

WHAT TO INCLUDE BETWEEN EACH CLIP: name and description of each transition **AUDIO:**

_____ (Name of Clip)

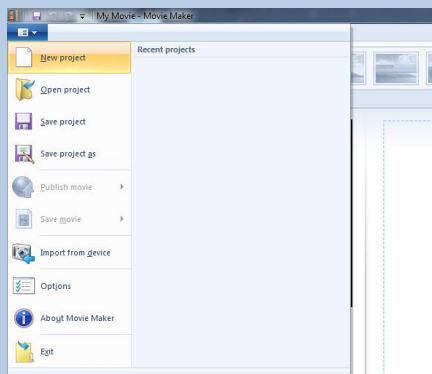
✓ WELL DONE ON CREATING YOUR FIRST STORYBOARD

MOVIE MAKER BASICS

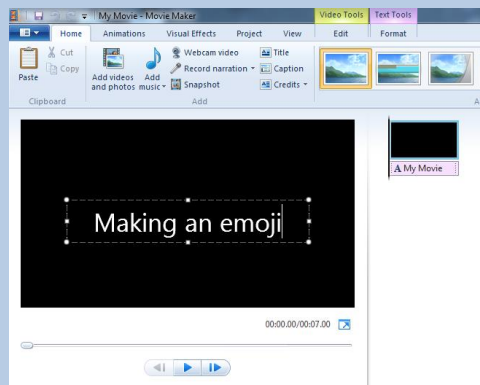
KEY FACTS

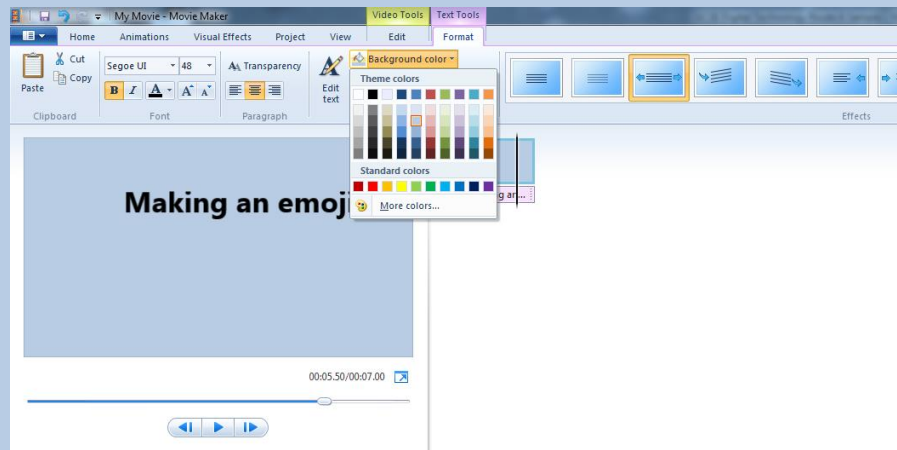
Movie Maker is freeware video making software by Microsoft. It offers the ability to create, edit and publish movies. Still images, video clips and sound can be imported for use into your movie. Video and Music/Audios can be "cut" to any number of short segments, which will play together seamlessly. Movie Maker also supports a large variety of *titles, visual effects, transitions and animations*. Effects alter how the video clip looks and can be applied to text or images. Transitions affect how one clip flows into another.

OPENING MOVIE MAKER: Open MY APPS, Choose Movie Maker and New Project

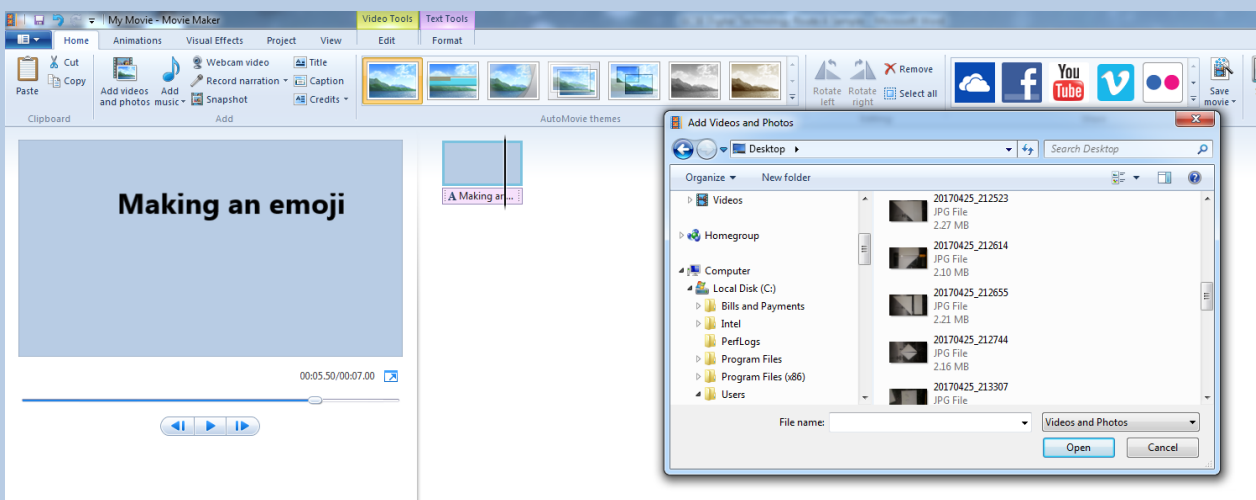


CREATING A TITLE SLIDE: Choose Title and enter the title. There are facilities available which allow you to edit the background colour, text style, text size and colour. You can also choose a transition for the slide.

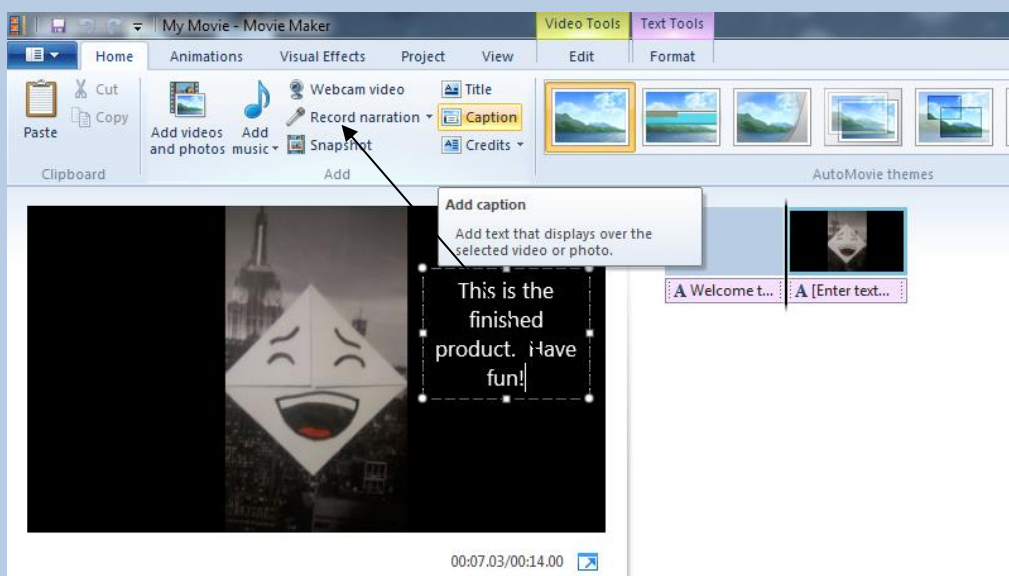




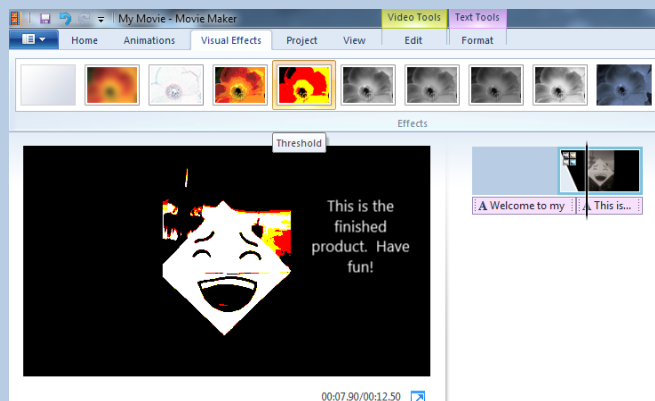
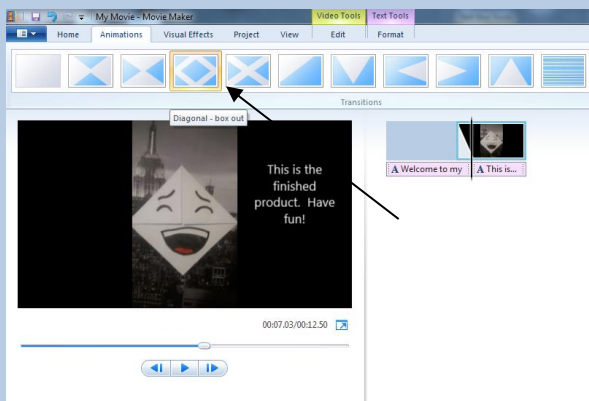
ADDING IMAGES OR VIDEO CLIPS: Click on the Home option, then choose Add Videos and Photos. Then go to your My Documents, find and double-click on the pre-saved image or video clip you wish to insert.



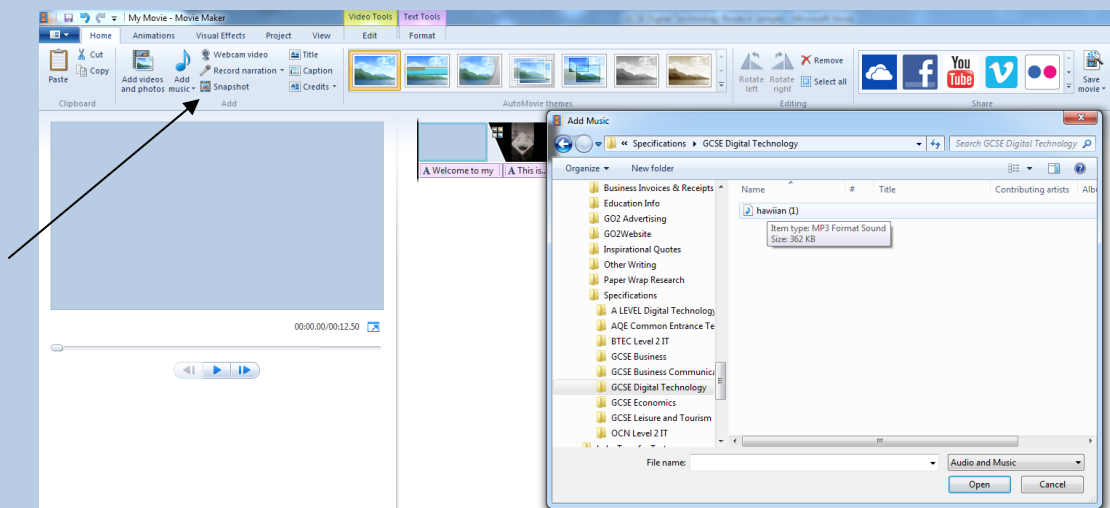
ADDING TEXT ONTO A CLIP WITH AN IMAGE: Click on the clip and choose Add Caption. You can move the position of text by moving the text box. You can now enter the text.



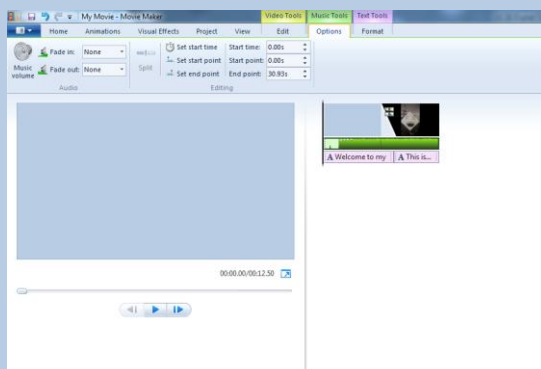
ADDING ANIMATIONS AND VISUAL EFFECTS: Click on the clip you wish to apply the effects. Choose animations and click on your preferred animation. You can also alter the timing of animations. To add a visual effect, choose Visual Effects and apply one to test.



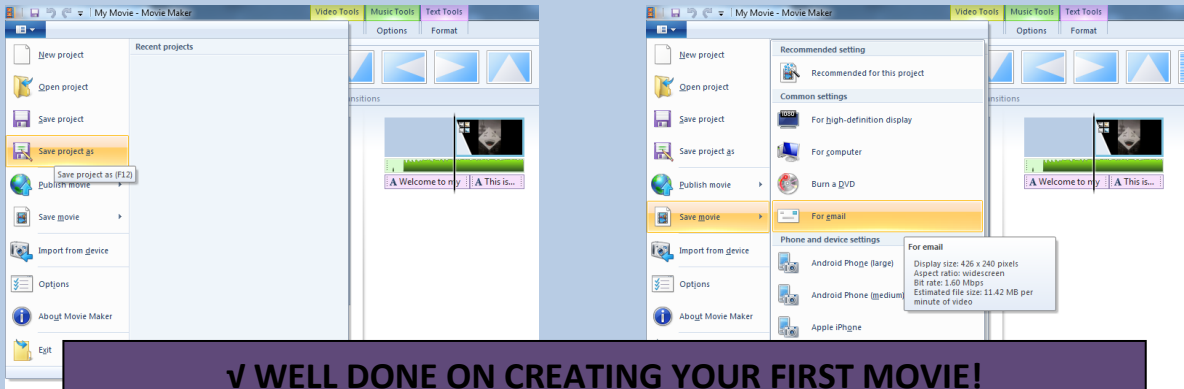
ADDING SOUND: Choose Add Music. Then go to your My Documents, find and double-click on the pre-saved audio clip you wish to insert.



EDITING SOUND: Click on the audio area. Then choose Music Tools. There are facilities to adjust the sound, fade in/fade out and set a start/end time for the audio. There are similar facilities that can be used with a video. In addition you can split a video in two or more parts or trim a section you want to delete.



SAVING YOUR PROJECT: To save your project for future editing, Save Project As and then choose the location you wish to save it to. To publish your movie as a final version choose Save Movie.



SELF EVALUATION CHECKPOINT

FLIPPED CLASSROOM: HOMEWORK REVISION ACTIVITY

Summarise your notes to date either using a set of index cards **or** by using a thought shower diagram with headings, definitions and key points.

PEER ASSESSMENT

Ask a peer to test and question and assess you on the following topics:

	Question	Marks
1	4 questions on The Cybercrime key terms	/4
2	2 questions on Malware key terms	/2
3	2 questions on Methods used to protect networks	/2
4	2 questions on specific areas of Cloud Computing (Impact, Advantage, Disadvantage)	/6
5	2 questions on Consumer Contracts Regulations 2013	/2
6	2 questions on Copyright Design & Patents Act 1988	/2
7	2 questions on Data Protection Act 1998	/2
8	2 questions on The Computer Misuse Act 1990	/2
9	2 questions on Moral and Ethical Considerations (Digital Footprint)	/2
TOTAL MARKS		/24

SELF ASSESSMENT – Tick the relevant box

Marks Attained	Statement	Tick the relevant box
20-24	I am confident in almost all topics assessed	
15-19	I am confident in most of the topics assessed	
11-14	I am confident in some of the topics assessed	
Below 11	I am confident in a few of the topics assessed	

TOPICS I NEED TO RE-VISIT – Tick the relevant box

Cybercrime	
Malware	
Network Protection	
Cloud Computing	
Consumer Contracts Regulations	
Copyright	
Data Protection	
Computer Misuse	
Moral & Ethical Considerations	



CHANGES IN EMPLOYMENT OPPORTUNITIES, SKILLS AND WORK PRACTICES

Increased job opportunities in the Digital Technology and Computing sector

STUDENT ACTIVITY 1

Check out the web links below and complete the research tasks set

Research Link	Research Task
http://uk.businessinsider.com/skills-that-can-get-you-hired-2016-10	According to the article and LinkedIn research, what are the highest demanded skills and job opportunities around the Globe?
https://www.nidirect.gov.uk/articles/skills-demand	According to NI Direct Government Services, what are likely to be the highest demanded skills and occupations in the future in Northern Ireland?
https://www.nijobfinder.co.uk/search/338139972	The list of I.T. jobs advertised on the NIJobfinder website continues to grow. List 3 examples of jobs listed and the salary for each.
https://digitaldna.org.uk/technology-2017-belfast-half-billion-pound-industry/	What are the key points the article states about the Digital Technology economy in N.I. and the UK?

Company 1:	
Location (base)	
Description of what the company does	
Company 2:	
Location (base)	
Description of what the company does	

EXAMPLES OF DIGITAL TECHNOLOGY AND COMPUTING COURSE OPTIONS

Queens University Belfast Undergraduate Degrees	University of Ulster Undergraduate Degrees	Northern Regional College Foundation Degrees	Apprenticeships Belfast Met
<ul style="list-style-type: none"> - Computer Science - Computing and I.T. - Business I.T. - Mathematics and Computer Science <p>http://www.qub.ac.uk/Study/Course-Finder/</p>	<ul style="list-style-type: none"> - Information Technologies - Creative Technologies - Interactive Media - Computing Science - Animation - Business Information Systems <p>http://www.ulster.ac.uk/courses</p>	<ul style="list-style-type: none"> - Business Digital Technology - Computing - Interactive Design <p>http://www.nrc.ac.uk</p>	<p>http://www.belfastmet.ac.uk/apprenticeships/ICT-Apprentice-Event/</p>

STUDENT ACTIVITY 3

Carry out a search for two ICT/Computer Science related courses from your preferred options and the links provided.

F.E./University:	
Foundation Course / Apprenticeship	
Qualification Access Requirements	
F.E./University:	
Undergraduate Course	
Qualification Access Requirements	

SALARIES IN THE ICT INDUSTRY. Visit the following site.

<http://www.brightwatneri.com/candidates/salary-survey>. Choose the Information Technology as the profession.

Choose a job you would like to aspire to and complete the information below:

Job Title	Salary Range in N.I.

Would a career in the Digital Technology and Computing Sector be an option you might consider at this stage?

Please circle: **YES / NO**. Give reasons for your answer in the text area below.

CHANGES IN EMPLOYMENT OPPORTUNITIES, SKILLS AND WORK PRACTICE

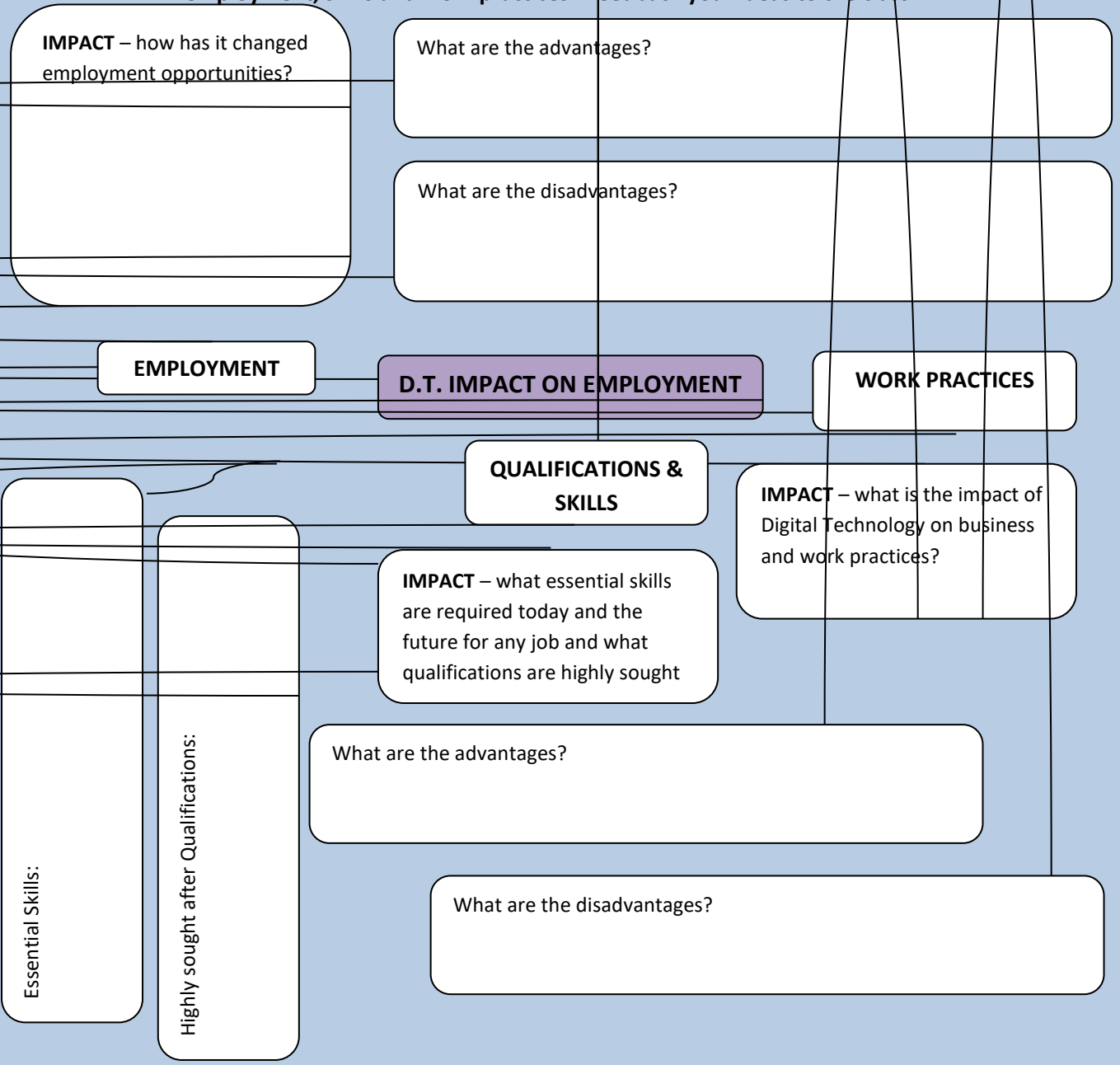
KEY TERMS

Job Displacement is where jobs are lost or no longer required. This is often the case when a position or specific job role is replaced by Digital Technologies, for example, Robots, Machinery, Artificial Intelligence

Working patterns have changed in many industries over the years. In some cases they are implemented because of legal obligations, for example, part-time, flexi hours, job-sharing. In other cases they have become possible through changes in Digital Technologies, for example, teleworking.

Up skilling of employees is often required as digital technologies continue to develop and working practices change.

Discuss in pairs and complete the thought shower below about the impact Digital Technology has had on employment, skills and work practices. Feedback your ideas to the class.



Teleworking Scenario

You are a web developer and employee at Web Creations. Your task today is to prepare for an organised company debate on the introduction of teleworking to the business.

Debating Teams

You will be allocated to one of the following teams:

- Team 1 – Managers (for the introduction of teleworking)
- Team 2 – Managers (against the introduction of teleworking)
- Team 3 – Employees (for the introduction of teleworking)
- Team 4 – Employees (against the introduction of teleworking)



Background Information

What does a web developer do?

Web developers must also analyse user needs to enable the proper content, graphics and capacity to meet the goals of the website.

Daily responsibilities include:

- Meetings with Clients
- Working with or directing other project team members
- Writing, designing and editing web page content
- Identifying and correcting problems uncovered by testing or user feedback
- Converting written, graphic, audio and video components to compatible web formats

Manager

A person responsible for managing physical resources and/or other employees

Employee

An individual who has a contract of employment with the business

Factors to consider

- You should consider your role carefully (managers may think differently than employees)
- Each person in your team must put forward at least one statement, explanation, impact and useful evidence where possible e.g. statement made by employee/employer on the web, statistical information about teleworking
- Each team should write a list of questions to challenge the opposition

USEFUL WEBLINKS

<http://www.bbc.co.uk/schools/gcsebiteize/ict/implications/2workpatternsrev5.shtml>

<http://www.bbc.co.uk/news/magazine-21588760>

HEALTH AND SAFETY in relation to Digital Technology

Pa KEY TERMS

The **Health & Safety (Display Screen Equipment) Regulations 1992** was introduced to protect employees who regularly use display screen equipment, including computers, laptops and other digital devices as part of their normal working routine. There is a number of health risks associated with the use of DSE and employers have legal obligations to put practice to reduce risks to their employees.

Health Risks associated with prolonged use of DSE include fatigue, eye strain, headaches, back strain

STUDENT ACTIVITY 1

Here are some health and safety products that can be used to help reduce certain health problems when employees use DSEs. Can you work out what each of them is for? Write a short sentence to explain.

HEALTH AND SAFETY in relation to Digital Technology

OTHER MEASURES EMPLOYERS CAN TAKE TO REDUCE RISKS OF USING DISPLAY SCREEN EQUIPMENT

Staff Training to ensure that employees are aware of company policy on the issue and how they can reduce personal risks. **Examples include:** reporting equipment concerns, adopting a proper posture, keeping wrists off the table when typing, adjusting their chair to the correct height, adjusting the blinds for correct lighting, taking regular breaks or changing activities, annual eye tests.

CASE STUDY

GO2 Bank Online has increasing concerns about the increasing number of recorded staff sick days which report fatigue, headaches and aching limbs in the Customer Service team. Employees spend all day long answering and recording telephone enquiries and recording information on the computer. GO2 Bank Online has reviewed its Computer Use policy and believe that it is necessary to take action in order to reduce the increasing number of staff sick days, which seem to be related to prolonged use of Display Screen Equipment. They have made progress in updating all of its computer equipment to help minimise the risk, but want to raise staff awareness on taking personal care to reduce health risks.

STUDENT ACTIVITY 2

Produce a poster than can be copied and displayed around the workplace which promotes good health and safety practice in the workplace. Use the following web links and Internet Research of your own to help you.

<http://www.healthyworkinglives.com/advice/work-equipment/display-screen-equipment-dse>

<http://www.hse.gov.uk/msd/dse/>

<http://www.qcs.co.uk/control-employees-health-dse/>

<http://www.legislation.gov.uk/uksi/1992/2792/contents/made>

<http://www.compactlaw.co.uk/free-legal-articles/display-screen-equipment-regs-1992.html>

DIGITAL APPLICATIONS: Gaming, Simulations & Mobile Phone/Devices

FLIPPED CLASSROOM - In preparation for next lesson, complete the following activities.

STUDENT ACTIVITY 1

Using your own ideas and Internet Research, come up with a list of games, simulations or mobile phone applications you are aware of that support educational studies. Use the following web links to help you.

<https://www.digitaltrends.com/mobile/best-apps-for-teachers-education/>

<http://www.bbcactive.com/BBCActiveIdeasandResources/WhataretheBestEducationalApps.aspx>

Game, Simulation or Social Media App	Description

STUDENT ACTIVITY 2

Investigate further 2 of the gaming, simulation or mobile phone apps you have a particular interest in. If they are free, why not try them out if you own a mobile phone or device? *Remember to ask permission if the mobile device, laptop or computer belongs to someone else. Add the key features, as shown in the example below:

Mobile App	Key features	Educational Purpose
What's App	<ul style="list-style-type: none"> - ability to create groups, adding students with a common interest e.g. GCSE Digital Tech - instant messaging facility - free video calls (wifi) - can share images, videos, audio and documents free over the Internet (wifi) 	<ul style="list-style-type: none"> - collaborate, share ideas and support each other with difficult topics, exam paper post mortems, revision, collaborative projects

STUDENT ACTIVITY 2 Continued...

Mobile App	Key features	Educational Purpose

STUDENT ACTIVITY 3

Mobile Apps and simulations are also used in the workplace for Staff Training, Team Collaboration and to share Work Practices. Research the following APPS to identify the key features and purpose.

Mobile App	Key features	Purpose
Udemy		
Yammer		

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DIGITAL APPLICATIONS: Gaming Applications and Simulations

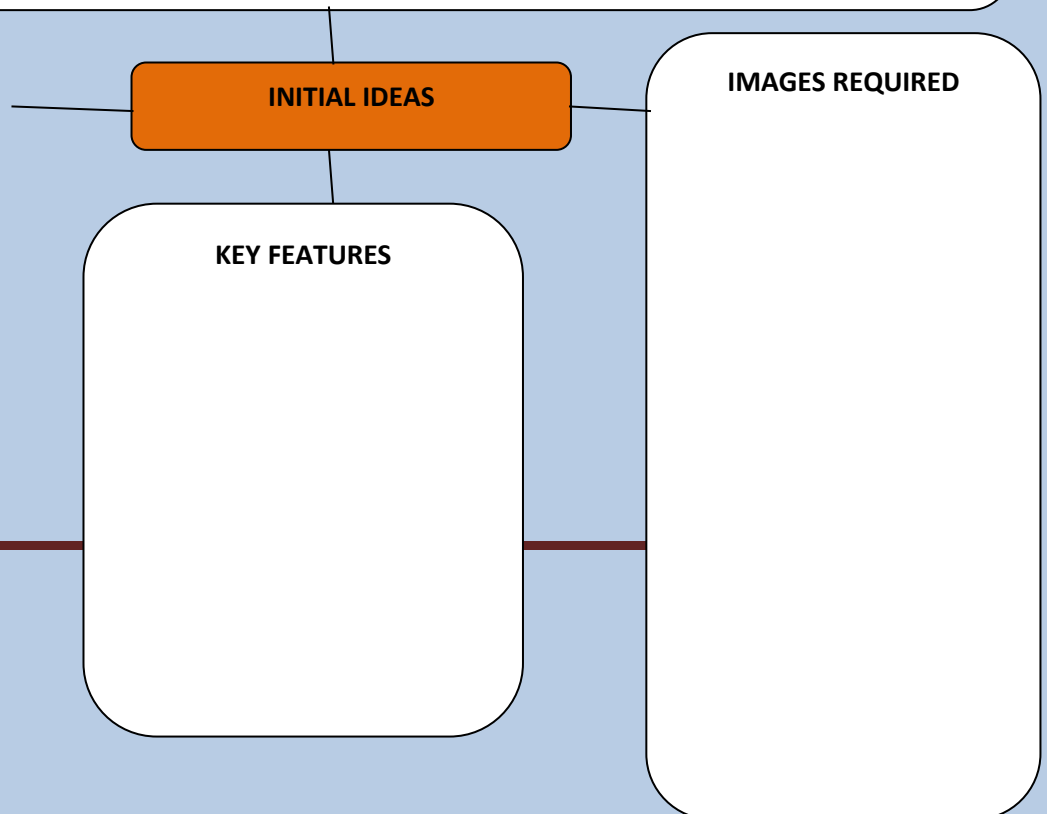
STUDENT ACTIVITY

In teams, create a plan to implement a simple mobile app of your own designed to perform a specific task, topic revision/test e.g. homework reminder. This can be a game, simulation or social media type app for educational OR work purposes. Each team should present your ideas to the class using an A3 Poster to illustrate.

DRAFT PLAN

Name of Mobile App	
Target Age Group	
Type of Mobile App i.e. Game, Simulation, Social Media	

HOME SCREEN - Text, Images, Buttons





DIGITAL APPLICATIONS: E-Commerce

STUDENT ACTIVITY 1

In pairs, research a given business or organisation who uses the Internet to interact and sell goods to customers online. Write a summary below detailing a brief overview of the business, products/service and the key features of the website.

Name of Business:	
Key Products or Services Provided	
Key features of the website e.g. logon facility, online booking facility etc.	

STUDENT ACTIVITY 2

Attempt the following questions. Fill in the gaps as the class discusses answers at the end of the activity.

E-commerce is the buying and selling of goods on the World Wide Web. Describe 3 advantages to the customer of this method of shopping.

(1)
(2)
(3)

Describe 3 advantages to the business of selling goods in this way.

(1)
(2)
(3)

Describe 2 disadvantages or concerns the customer might have in purchasing goods online.

(1)
(2)

Describe 2 disadvantages the business might have of selling goods online.

(1)
(2)

How has e-commerce changed life for consumers?



STUDENT ACTIVITY 3

Use your own research about online banking with real online banks and the suggested web links to help you answer the following questions about Online Banking. Update your answers post class feedback.

https://en.wikipedia.org/wiki/Online_banking

<http://www.finweb.com/banking-credit/online-banking-advantages-and-disadvantages.html#axzz4kBqUBZp1>

Customers can access their bank account using the bank's secure website. This is known as online banking. The customer registers for online banking to be able to use this facility. It involves the customer logging on by entering a username and password. The customer may be asked for certain verification data to access their account. List 6 facilities available:

(1)
(2)
(3)
(4)
(5)
(6)

Describe 2 advantages to the customer of banking online.

(1)
(2)

Describe 2 advantages to the bank of allowing customers to bank online.

(1)
(2)

(1)
(2)
(3)

What concerns may the customer have regarding online banking?

(1)
(2)
(3)

What concerns may the bank have regarding online banking?

How has online banking changed the industry?

SELF EVALUATION CHECKPOINT

FLIPPED CLASSROOM: HOMEWORK REVISION ACTIVITY

Summarise your notes to date either using a set of index cards **or** by using a thought shower diagram with headings, definitions and key points.

PEER ASSESSMENT

Ask a peer to test and question and assess you on the following topics:

	Question	Marks
1	2 questions on the increase of job opportunities in the ICT/Computing Sector	/2
2	2 questions on the Impact of Digital Technology on Employment	/4
3	2 questions on Health Risks associated with the use of Display Screen Equipment	/2
4	2 questions on Reducing Health Risks associated with the use of DSE	/6
5	Question on Game, Simulation and App development for educational purposes (key feature, educational purpose)	/2
6	Question on Game, Simulation and App development for work purposes (key feature, work purpose)	/2
7	2 questions on E-Commerce (in relation to consumer/customer)	/2
8	2 questions on E-Commerce (in relation to seller/business)	/2
9	2 questions on E-Banking	/2
TOTAL MARKS		/24

SELF ASSESSMENT – Tick the relevant box

Marks Attained	Statement	Tick the relevant box
20-24	I am confident in almost all topics assessed	
15-19	I am confident in most of the topics assessed	
11-14	I am confident in some of the topics assessed	
Below 11	I am confident in a few of the topics assessed	

TOPICS I NEED TO RE-VISIT – Tick the relevant box

Job Opportunities in ICT/Computing Sector	
Impact of Digital Technology on Employment	
DSE Health Risks	
DSE Reducing Health Risks	
Game, Simulation & Apps for Educational Purpose	
Game, Simulation & Apps for Work Purpose	
E-Commerce	
Banking	

