Harrow Way Community School
Learning for life, success for all

Year 11 Knowledge Organiser

Spring Term

How do I complete Knowledge Organiser Homework?

Link to self-quiz video: https://youtu.be/o9Vmacd3ONA

Step 1

Check on:
ShowMyHomework for what words / definitions / facts you have been asked to learn.

Step 2

Write today's date and the title from your Knowledge Organiser in your self-quizzing book.

Step 3

Read the section of the Knowledge Organiser that you are studying. Read it slowly, you can read it aloud and with a ruler if this helps.

Step 4

Cover up the section and try to write out the information exactly as it is written on the Knowledge Organiser in your self-quizzing book.

DO NOT PEEK!

Step 5

Uncover the section and compare it to what you have written. If you have made mistakes or missed parts out, add them in using a pencil or a different colour.

Step 6

Repeat steps 3-5 again until you are confident.
You will need to bring your self-quizzing book in every day and your teacher will check your work.
You will be tested in class.

Knowledge Organiser - YEAR 11 - SPRING TERM

Contents

Art - Assessment Objective 1.1

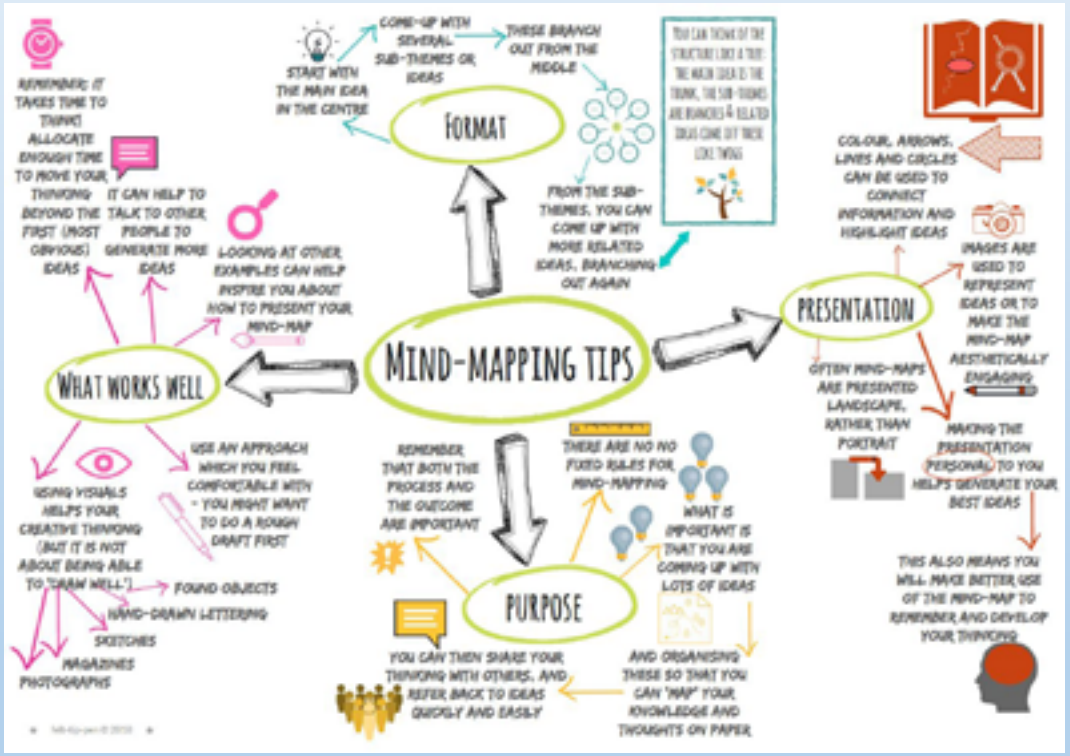
GCSE Assessment objective 1 Part 1: MIND MAPPING
DEVELOP ideas through investigations, demonstrating critical understanding of sources.

AO1

Showing your ideas

Central idea = Starting point
Must be clear and central

Key words = key idea
One word per branch which will spark a number of associations



Branches = key themes
You can explore each theme or main branch in greater depth by adding smaller branches

Colour coding = clarity
This links the visual with the logical and helps your brain to create mental shortcuts. The code allows you to categorise, highlight and analyse information. Colours also make images more appealing and engaging

What to include
IDEAS exploring the starting point: notes, phrases, drawings, images.

Images = powerful message
Visuals can convey much more info than a word or sentence. They are processed instantly by the brain and act as visual stimuli to recall info

Art - Assessment Objective 1.2

GCSE Assessment objective 1 Part 2: MOOD BOARD
DEVELOP ideas through investigations, demonstrating critical understanding of sources.

AO1

Gathering resources

Consider your theme
Do you want it quite narrow or are you happy to collect a wider range of ideas?

Use a range of sources
Internet images, photographs, magazine cuttings, drawings etc

Don't limit yourself
Even if it doesn't directly link to your starting point it may relate to the theme. Consider colours and words to help you.

Apply your ideas
Your moodboard will directly link to the development of your project. If there is empty space fill it with sketches or annotations

Pick a style
Pulling it all together with a colour theme or visual style will make your page work together as a whole

What to include
IMAGES of the work of artists, designers, craftspeople, art movements, song lyrics
Quotes from poetry, literature, film etc.

Art - Assessment Objective 1.3

GCSE Assessment objective 1 Part 3: Artist Research
DEVELOP ideas through investigations, demonstrating critical understanding of sources.

AO1

Showing your understanding of an artists work or style

Biographical information
Birth, death, style, education, important works

Social, historical and economic influences
What was happening at the time? Were they responding to anything that was happening around them?

Collected images
Select images that are relevant and that appeal to you, make comments about why you like them

Technical information
How was their work produced? What methods and materials did they use?

Artistic influences
Who influenced their work? Did their work influence anyone else?

What to include
IMAGES of the work of one artists, designer or craftsperson that inspires you
ANNOTATION (see separate knowledge organiser)
ARTIST RESPONSE (to demonstrate your understanding of the style

Art - Assessment Objective 1.4

GCSE Assessment objective 1 Part 4: Art analysis

AO1

Analysing artwork

CONTENT 1.
Looking at the subject of the work

- What is it?
- What exactly can you see?
- What is happening?
- What does the work represent?
- What does the artist call the work?
- Does the title change the way we see the work?
- What I the theme of the work?
- Landscape, portrait, journey, moment, memory, event, surreal, fantasy, abstract, message

FORM Looking at the formal elements 2.

- What colours does the artist use and why? How is the colour organised?
- What kind of shapes can you see?
- What kind of lines and marks does the artist use?
- What is the surface like?
- What textures can you see?
- What patterns can you see?
- How big is the work?
- Light, delicate, layered, strong, rough, dark, peaceful, dripped, textured, scale, vivid, bright

PROCESS 3.
How the work has been developed and made

- What materials and tools have been used?
- What is the evidence for how it has been made?
- Painted, drawn, woven, printed, cast, stitched, constructed, collaged

Technical information 4.

- How was their work produced?
- What methods and materials did they use?

Artistic influences 5.

- Who influenced their work?
- Did their work influence anyone else?

Write in note form and discuss with your teacher

Sentence starters

6.

Looking at artwork **OBJECTIVELY**.
What are the facts? Don't guess

Use these sentence starters to direct your research:

I particularly like…(title of the work you have chosen to talk about)
It is a… (painting, sculpture, textile etc)
It has been created by… (what materials and techniques did the artist use?)
The subject of this piece is… (what is in the work? If there are people in it what are they doing? If there are objects in it, what are they and where are they placed?) Describe it in detail.
The composition is inviting because…
This artwork is unique because…

7.

Look at the work **SUBJECTIVELY** (your opinions & thoughts)
Use these sentence starters to direct your research:

This artwork reminds me of…because…
This artwork makes me think of…because…
Through speculation I have come to the conclusion that…
(what do you think is happening in the artwork, how is it different or strange?
I believe the artist has created this kind of work because…
On closer inspection I notice that…
(what have you noticed since you started looking more carefully at the artwork OR by reading about it)
This piece is exciting because
(Why were you drawn to this piece of artwork? Is it the colours? How it makes you feel? How the artist has arranged the objects? Because it draws the eye in a certain direction? Look carefully and explain what is going through your mind.
I appreciate the way the artist has…
This work is similar to … (another work you have looked at) because…
This work is in contrast to … (another work you have looked at) because…
I prefer this work to… (another work you have looked at) because… (mention the differences and similarities of the two artworks)
I am interested in this type of work because at this stage I think I might… (what are you going to make or create?)
To develop my ideas I will be experimenting with… (materials/techniques)

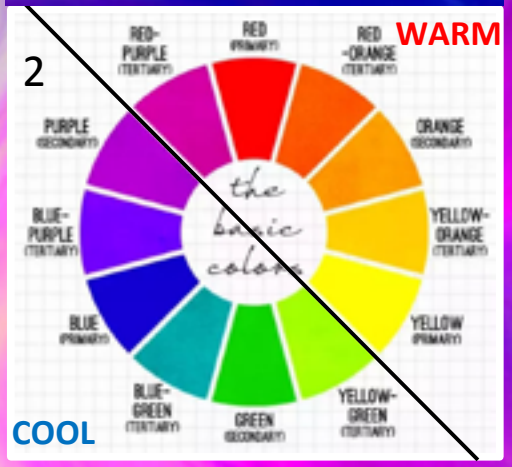
COLOUR

1

Colour plays a vitally **important** role in the world in which we live. **Colour** can sway thinking, change actions, and cause reactions. It can irritate or soothe your eyes, raise your blood pressure or suppress your appetite. As a powerful form of communication, **colour** is irreplaceable.

COLOUR WHEEL

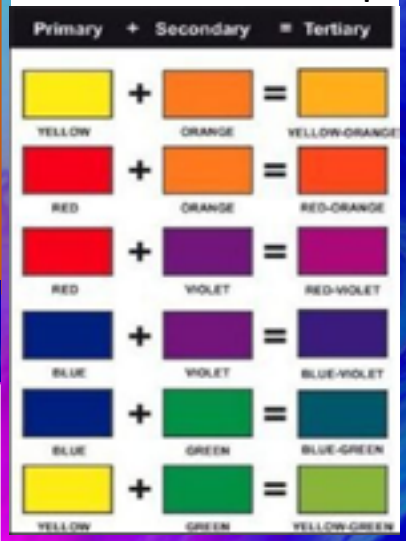
2



Cool colours painting

Warm colours painting

4



5

TINT
is adding white to a colour

TONE
is adding grey to a colour

SHADE
is adding black to a colour

ADJECTIVES TO DESCRIBE COLOURS

3

Light Bright Vivid Glowing Vibrant Brilliant Intense Dazzling Subdued Diluted Gloomy Depressing Pale Dull Murky Muted Monotonous Fluorescent Saturated Opaque Transparent

COLOUR SCHEMES

6

PRIMARY

Uses the primary colours: Red, Yellow & Blue. They can not be made by mixing other colours.

SECONDARY

Uses the secondary colours: Orange, Green & Purple. Each secondary colour is made by mixing two primary colours.

TERTIARY

Uses the tertiary colours. They are made by mixing a primary and a secondary colour next to each other on the colour wheel.

COMPLEMENTARY

Uses a pair of colours that are opposite each other on the colour wheel. The pairs are: Green/Red; Blue/Orange; Yellow/Purple.

HARMONIOUS

Uses three or four colours (primary, secondary and tertiary) that are next to each other on the colour wheel.

MONOCHROMATIC

Uses Tints, Tones & Shades of one colour. The word MONO means ONE and the word CHROMA means INTENSITY OF COLOUR.

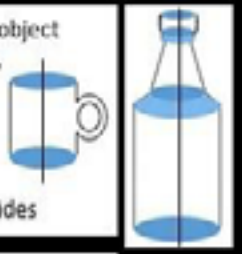
DRAWING

The **basic craft of drawing** is about two things: **1. To control your hand** and **2. Learn to see.**

Line drawing

1 ELLIPSES:
The circle found at the top and the base of a cylindrical object; i.e. bottle, cylinder, etc. Ellipse can also occur when the sides of the bottle change direction, i.e. get narrow or wide.

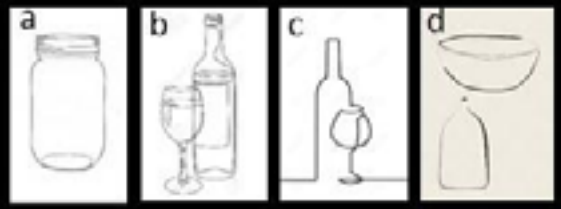
2 CENTRE LINE: Divides the object vertically in two equal parts.
LINE OF SYMMETRY: the line at which the bottle is symmetrical.
Mirror image symmetry: exactly matching opposite sides



3 POSITIVE SPACE: *(Object in white)*
The space occupied by the object/s.

NEGATIVE SPACE: *(All in black)*
The rest of the space around or in between the object/s.

4 LINEAR DRAWING
A drawing using line only to:
a) outline the shape of the object;
b) to add detail;
c) using continuous line (without lifting your pencil of the paper from start to finish.
d) Minimalist drawing



Tonal drawing

5 FLAT TONE:
A solid block of tone, see Tonal Ladder. It has no outlines. Different flat tones next to each other define shapes.

6 SHADING:
When the tone gradually changes from dark to light. It can appear a) smooth or b) rough by using lines called **Hatching** or **Cross Hatching**.

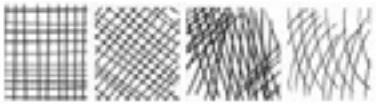
SHADING (light from the side):
On the outside of the object the tone changes gradually from one side to the other. Light and dark areas swap direction on the inside opening of the object like in this cup.

SHADING (light from the centre):
The tone is dark on both sides and smoothly gets light in the middle. It gives a 3D effect and looks very realistic.

7 TEXTURE and MARK-MAKING:
Texture is the **surface quality** of something. Artists use mark-making techniques to represent different textures.

8 Hatching

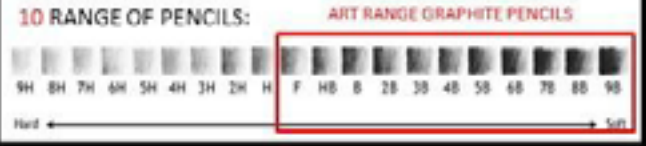
Cross- Hatching in 2,3 or more directions



Other elements of drawing

9 PERSPECTIVE:
the art of representing three-dimensional objects on a two-dimensional surface so as to give the right impression of their height, width, depth and position in relation to each other.

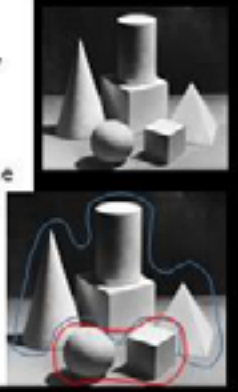
10 RANGE OF PENCILS:



11 FOREGROUND: An art term that describes the objects in the scene that are closest to the viewer. It is the part in front of everything else and has the most detail.

MIDDLE GROUND: lies between the foreground and background of a painting. The objects in this area appear smaller. They are usually placed behind the objects in the foreground.

BACKGROUND: is the part of a scene or picture that is farthest from the viewer. It usually has the least detail.

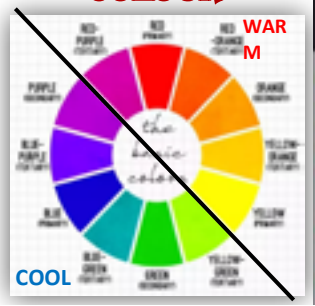


12 COMPOSITION:
Refers to the organisation, arrangement, and combination of objects within the borders of a **drawing** space.
For a great **drawing**, you want to bring the eyes of the viewer toward your centre of interest within an aesthetically pleasing **composition.**

FORMAL ELEMENTS

1
The Formal Elements are: **line, shape, form, tone, texture, pattern and colour**. They are used together to create artwork.

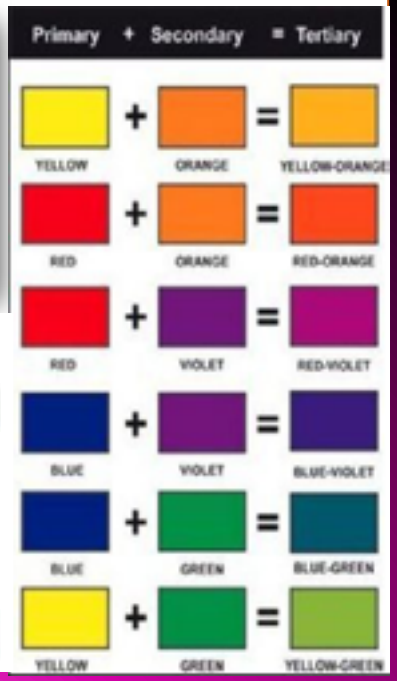
2 COLOUR



TINT
is adding white to a colour

TONE
is adding grey to a colour

SHADE
is adding black to a colour



3 PATTERN

is a symbol or shape that is repeated. A design that is created by repeating lines, shapes, tones or colours. The design used to create a pattern is often referred to as a **motif**. Motifs can be simple shapes or complex arrangements. Tessellating any image creates a Repetitive pattern.

4 LINE

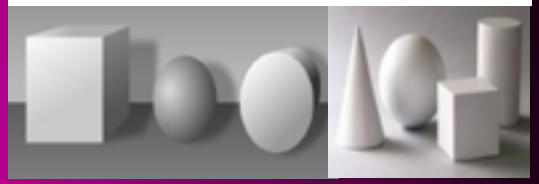
is the path left by a moving point, i.e. a pencil or a brush.
A line can take many forms. It can be horizontal, diagonal or curved. Line can be used to show: contours (the shape and form of something); movements, feelings or expressions (a short, hard line gives a different feeling to a more flowing one).

5 SHAPE

is an area enclosed by a line. It could be just an outline or it could be shaded in. When drawing shapes, you must consider the size and position as well as the shape of the area around it. The shapes created in the spaces between shapes are referred to as **negative space**.

6 FORM

is a three dimensional shape (3D), such as a cube, sphere or cylinder. Sculpture and 3D design are about creating forms. In 2D artworks, lines, tones and perspective can be used to create an illusion of form. The three dimensions of form are width, length and depth.



7 TONE

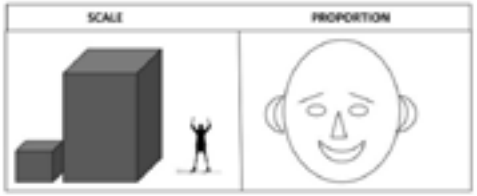
is the lightness or darkness of an object. This could be a shade or how dark or light a colour appears. Tones are created by the way light falls on a 3D object. In every 3D object there are minimum of 3 tones; light, mid-tone and dark. Tone can be flat or it can vary from dark to light.

8 TEXTURE

is the **surface quality** of something, the way something feels or looks like it feels. **Actual texture** really exists, so you can feel it or touch it. You can create actual texture in an artwork by changing the surface, such as sticking different fabrics onto a canvas.
Visual texture is created using marks to represent actual texture. It gives the illusion of a texture or surface. You can create visual texture by using different lines, shapes, colours or tones.

9 SCALE

is the size of one object in relation to the other objects in a design or **artwork**.



10 PROPORTION

refers to the relationship of the sizes of two or more subjects or elements.

PAINTING

1. The act of **painting**, using a brush, palette knife, sponge, or airbrush to apply the paint; 2. The result of the action – the **actual picture**.

1 Watercolour brushes:
Are specially made to allow the artist to control the flow of the colour from the **brush** onto the paper. A watercolour brush should hold a fine point when wet and spring back into shape after each stroke. It should carry the colour allowing the artist to:
a) lay it down on the paper evenly 2) consistency.

2 WATERCOLOUR:
a) Paints that are made of pigments suspended in a water-based solution (binder).

b) The art of painting with watercolours, especially using a technique of producing paler colours by diluting rather than by adding white.

WATERCOLOUR PAPER:
Best watercolour papers are made from **cotton fibres.** There are three types of w/c paper.

HP- Hot Press. Smooth surface for detailed work
CP (NOT) – Cold press. Slightly textured for most types of work
Rough – Heavily textured paper enhances the final piece of work.

3 WATERCOLOUR TECHNIQUES:
a) Wash: When watercolour mixture is gradually diluted with water.

b) Blending: When two colours seamlessly merge into one another.

c) Wet–on – Wet: Water is applied onto the paper and then paint is applied onto it.

d) Masking Fluid
It is a rubber type product that prevents the paint from reaching the paper and is peeled off to expose the whitepaper left untouched.

4 ROUND BRUSHES:
Good for sketching, outlining, detailed work, controlled washes, filling in small areas.

FLAT BRUSHES: Good for bold strokes, washes, filling wide spaces, impasto. Edge can be used for fine lines, straight edges and stripes.

5 ACRYLIC PAINT: Opaque and semi-opaque fast-drying paint made of pigment and acrylic polymer emulsion dilutable with water.

ACRYLIC PAINTING SURFACES:
Canvas, paper, wood, or anything which is neither greasy nor too glossy.

ACRYLIC PAINTING BRUSHES:
A good selection of round and flat stiff synthetic brushes. Palette knives.

6 ACRYLIC PAINTINGS TECHNIQUES:
UNDERPAINTING: A layer of paint applied first to a canvas or board.

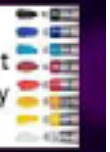
a) Tonal Grounds Under Painting
This type of painting has the entire canvas covered in a single transparent colour. This layer will create backlighting shadows that will tone the entire painting and provide contrast.

b) A Tonal Under-Painting
A layer of paint applied first that acts as a foundation for the painting with some **built in contrast** and **tonal values.**

IMPASTO: A technique used in **painting,** where paint is laid on in very thick layers that the brush or **palette**-knife strokes are visible. Paint can also be mixed right on the canvas. When dry, impasto provides texture; the paint appears to be coming out of the canvas.

7 POSTERPAINT:
A semi-opaque paint with a water-soluble binder, used mainly in schools.

8 OIL PAINTS: is a type of slow-drying **paint** that consists of pigment suspended in a drying **oil,** commonly linseed **oil.** Not used in schools.



9 MIXED MEDIA:
A Technique that uses more than one medium or material. Assemblages and collages are two common examples of art using different media that will make use of different materials including cloth, paper, wood and found objects.

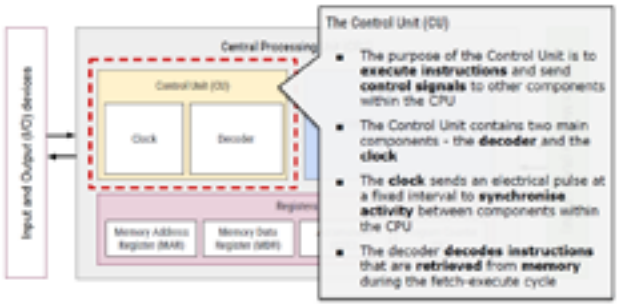
ASSEMBLAGE:
The making of 3D art, often involves using found objects.

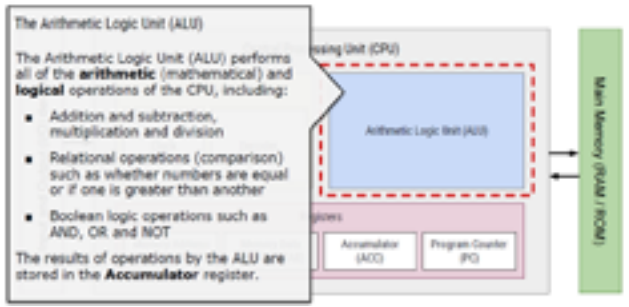
MIXED MEDIA COLLAGE:
This is an art form which involves combining different materials with paint to create a whole New artwork.

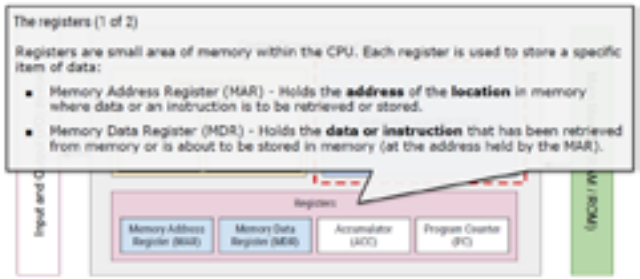
10 SGRAFFITO TECHNIQUE:
Used in **painting,** pottery, and glass. Consists of putting down a preliminary surface, covering it with another, and then scratching the top layer. The pattern or shape that emerges is of the colour below.

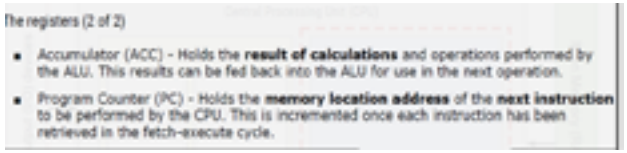
Year 11 Computer Science 1.1

The Von Neumann CPU architecture

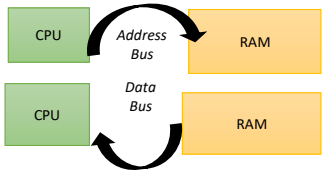








CPU and RAM interaction



Buses Electrical conductors that carry signals between the CPU and the components on the motherboard

ALU Performs all of the Arithmetic and Logical Operations

Clock Controls the rate that tasks are carried out

CU Controls the Components of the CPU and contains the decoder

Registers Perform the functions in the Fetch-Decode-Execute Cycle

Cache High Speed RAM (Random Access Memory)

An **EMBEDDED SYSTEM** is a combination of hardware and software, designed for a specific function within a larger **system**. (Washing machine, Microwave, Dishwasher.)

The Fetch-Execute Cycle (FCE)

Fetch – The address of the next instruction to be processed is copied from the PC to the MAR. The PC is incremented to the next instruction that will be needed when the cycle starts again. The instructions stored at the location helped by the MAR is copied to the MDR

Execute – The ALU performs the operation given by the CU. The value stored by the PC or MAR might be changed

Decode – The CU decodes the instructions and sends control signals to the component within or outside the CPU that needs to act.

FDE process using the registers

The Program Counter (C)	0
The Memory Address Register (MAR)	0
The Memory Data Register (MDR)	
The Instruction Register (IR)	
The Accumulator (A)	

Address	00	01	02	03	04
Instruction / Data	LDA 4	SUB 5	STA 6		5
Address	05	06	07	08	09
Instruction / Data	2				

The Program Counter (C)	0
The Memory Address Register (MAR)	0
The Memory Data Register (MDR)	LDA 4
The Instruction Register (IR)	LDA 4
The Accumulator (A)	

Address	00	01	02	03	04
Instruction / Data	LDA 4	SUB 5	STA 6		5
Address	05	06	07	08	09
Instruction / Data	2				

The Program Counter (C)	1
The Memory Address Register (MAR)	0
The Memory Data Register (MDR)	LDA 4
The Instruction Register (IR)	LDA 4
The Accumulator (A)	5

Address	00	01	02	03	04
Instruction / Data	LDA 4	SUB 5	STA 6		5
Address	05	06	07	08	09
Instruction / Data	2				

Key Words	
BIOS	Basic Input Output System. A small program stored on the ROM chip to load the OS.
CPU	Central Processing Unit. Controls and executes commands in a computer. The performance is measured in GHz,(the number of processes executed in 1 second.)
Motherboard	Used to connect all components to each other for them to communication.
RAM	Random Access Memory. Data and instructions are stored which are currently in use or recently been used by the CPU
Hardware	The physical parts / components of a computer
Peripheral	Any auxiliary device such as a computer mouse or printer that connects to and works with the computer in some way.
Input Device	A peripheral which converts data from a human to the computer system.EG Mouse.
Output Device	A peripheral used to bring data from the computer into a human form EG A monitor .
Clock Speed	Measured in Hertz. It is the frequency at which the internal clock generates pulses. The higher the pulse rate, the faster the clock speed, the quicker the computer runs.
Cache Size	Fast memory between the CPU and RAM. It is used to store recent / common programs taking advantage of the short FDE cycle. The more cache the more data can be stored without having to go back to slower RAM, speeding up processing. Having 3 levels level 1 smallest quickest and nearest to the CPU Level 3 Slowest biggest and closer to the RAM.
Cores	A multi-core processor is a single component with two or more independent CPUs, each responsibly for a FDE cycle. Allowing computers to do more than 1 thing at a time.

Year 11 Computer Science 1.2 and 1.3

Key Words	
Primary Storage	A device's internal memory, includes RAM, ROM and Cache memory. Used to store data and instructions that are required by the CPU.
RAM	Random Access Memory is volatile memory used to store data and instructions which are needed by the CPU. Also referred to as main memory.
ROM	Read-Only-Memory, internal memory that cannot be changed, stores the boot sequence for the device. This memory is non- volatile.
Secondary Storage	Long term storage, can be internal (hard-disk drive) or external (USB Drive/DVD-ROM/SD Card)
Hard Disk Drive	A device that uses magnetic storage to store data long term, normally built in to the computer.
Magnetic Storage	A storage device that saves data using strong magnetic fields to record, change or delete data
Optical Storage	A storage device that uses laser light to retrieve data from the surface of optical media such as CDs / DVDs
Solid State Storage	A storage device that uses flash memory to store data. It has no moving parts. Normally an SSD, memory stick or SD card
Volatile	Data is lost when the device is switched off
Non Volatile	Data is not lost when the device is switched off
CPU	Central Processing Unit – the brains of the computer
Bootstrap loader	A small program on the BIOS which loads the operating system.

Memory - stores program operations and data while a program is being executed. There are several types of memory, including: registers, cache, RAM , ROM and virtual memory.

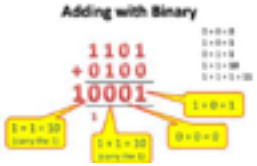
Storage - stores programs and files long term, even when they are not in use. Some examples include HDD, SDD, USB memory sticks and SD cards

Digital Sound Sampling – The more samples taken means the improved quality of the digital signal, so becomes closer to the original analogue one:
Sample Rate - Increase how often the sample is taken Increase the number of bits per sample allowing for a more precise recording to be taken – eg. have a range between 0 and 255 (8 bits) rather than 0 – 31 (5 bits)

Virtual Memory
When RAM is full, a section of the hard drive can be used to store programs and instructions.

Compression – reduces the size of a file to enable it to be stored or sent easier.
Lossy – Compressed losing some quality. Normally done by reducing the colour depth. JPEG is a Lossy file compression type.
Lossless – Compressed by sending the file reducing the memory example: red, red, red, blue, blue, red, red, red reduce to:3 x red, 2 x blue, 3 x red

Binary	Denary	Hex
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	10	A
1011	11	B
1100	12	C
1101	13	D
1110	14	E
1111	15	F



Character Sets – A set of letters numbers and symbols.
ASCII - "American Standard Code for Information Interchange". Is used to represent letters and symbols as numbers. Standard ASCII uses 7 bits to encode characters. Extended ASCII uses 8 bits
Unicode uses 16 or 32 bits and is shown in hexadecimal (FFFF). The larger character set means that it can allow character sets from other languages and emoji's.

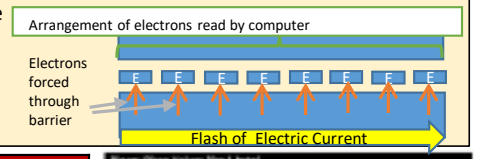
Size	Name
1 Bit = 0 or 1	Bit
8 Bits	Byte
1024 Bytes	Kilobyte
1024 Kilobytes	Megabyte
1024 Megabytes	Gigabyte
1024 Gigabytes	Terabyte

RAM	ROM
Volatile memory	Non-volatile memory
Stores open programs including the operating	Store the BIOS (bootstrap Loader)
Memory can be written to or read from.	Memory can only be read from and not written to.

Storage Media

Storage Characteristics
Capacity - how much data can it store?
Speed - how fast can it access the data?
Portability - how easy is it to move it from one place to another
Durability - how well does it last e.g. if it is dropped
Reliability - how consistently does it perform
Cost - how much does it cost per KB, MB or GB?

Flash Memory - Electrons are forced into a layer between two barriers which hold the charge by using a high electric current. Used in ROM and Solid State Storage



Cache memory is an extremely fast memory that acts as a buffer between RAM and the CPU. It holds frequently requested data and instructions so that they are immediately available to the CPU when needed. Cache memory is used to reduce the average time to access data from the Main memory.

Year 11 Computer Science 1.4 and 1.5

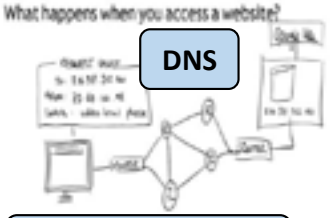
A NETWORK - 2 or more computers connected together using wired or wireless media to share resources, files, programs and to communicate.

Factors that affect network performance include:
Number of devices and users - the bandwidth is shared between all devices, so the more devices, the less everyone gets to use
Transmission media - using Wi-Fi will result in slower data transfer speeds and a greater number of lost or corrupted data packets.
Interference - wireless transmission are prone to electromagnetic interference that can corrupt data as it travels
Obstacles - physical obstacles can prevent radio waves from travelling
Bandwidth – The amount of data that can be carried at a time
Latency –is the time delay between the moment the first data packet of a communication starts and when it is received at its destination
Collisions and errors - Errors and high network traffic may result in data collisions between packets making them corrupted or lost.

A LAN - A collection of computers connected together over a small geographic area found in homes and single-site companies. The hardware is owned and maintained by the organisation that uses it.
A WAN - A collection of computers that are connected over a large geographic area. The hardware required is often owned and maintained by large telecommunication companies. They are used by companies that have office locations in countries throughout the world that need to be connected together. The Internet is the largest WAN in the world.

Hardware to connect to a network
- Network Interface Card (NIC) – Built into the motherboard it contains a MAC address that allows the computer to communicate on a network
- Router – Connects the network to an external source and transfers data to their intended destination. Routing data onto the Internet.
- Wireless Access Point – Allows wireless access to the internet
- Switch - Connects computers together on a network reducing collisions
- Transmission media – The way the data travels across the network. Fibre optic, Coaxial, Satellite, Wi-Fi, Bluetooth

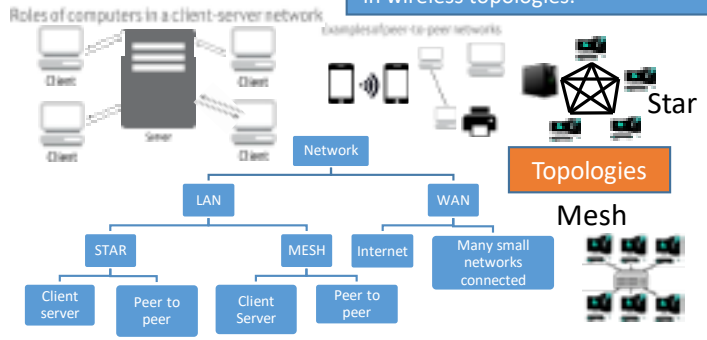
Encryption – Changing data into letters numbers and symbols. It scrambles data to secure it when sent across a network.



DNS Transfers the web address to an IP address ready to be sent across the network.

The Cloud – storage, services and applications that exist on the Internet rather than a local device such as your PC.

Topologies
Star – All computers connect to a central switch. The switch routes the traffic to the correct computer. The switch is the main cost of the network.
Mesh – All computers connect to each other via a dedicated link. Cost of cables is expensive. Used mainly in wireless topologies.



Client Server Network - Computers take the role of either a central server or a client. The server provides services to clients such as storing files and emails. There are different types of server: printer servers provide access to printers, file servers host files. The server allows the computers to have a central backup, communicate, share files and monitor and maintain everything from a central point.

Peer to Peer Network - is connected directly together - NO central server -easy to set up . Each user has the responsibility of its own hardware and software and can then share resources, files and communicate with others on the network when they are connected.

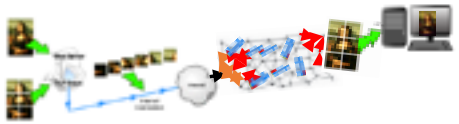
A Virtual Network is a type of network which only uses software to connect users.

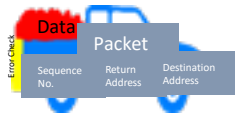
Protocols and Layers

Protocol – An agreed set of rules for network communications.
SMTP – Simple Mail Transfer Protocol defines how email messages are sent from an email client to a mail server.
POP3 – the Post Office Protocol is an email protocol that defines how emails can be retrieved from a mail server for a particular user.
IMAP - the Internet Message Access Protocol. An e-mail protocol for retrieving emails. The mailbox activity is synchronised between the client and server so that inboxes remain unified across devices.
HTTP – An application layer protocol. The Hypertext Transfer Protocol defines how data should be exchanged between web browsers (clients) and web servers as requests and responses.
HTTPS – Secure version of HTTP, the traffic is encrypted between the browser and the web server for security.
FTP File Transfer Protocol – Used to transfer files to/from a server.
IP Internet Protocol – In charge of routing packets of data around the internet or LANs and WANs.
TCP Transmission Control Protocol – This sets up and maintains a reliable connection between two computers.

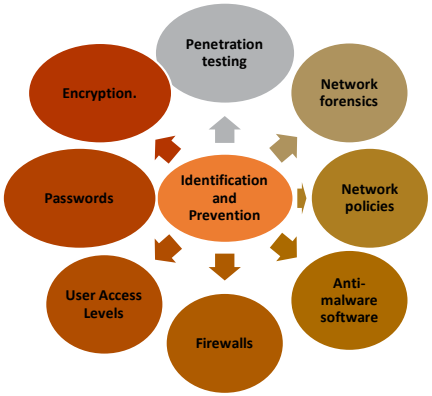
Packet Switching

1. The file is broken down into small packets of data
2. Each packet is given a header containing the IP address of the network and device that it is being sent to, the IP address of the network that it was sent from, the packet number and the total number of packets (packet 4 of 60)
3. When the packets arrive at the destination this information is used to reassemble the data.
4. Packets can be lost so sometimes the computer request the packet to be sent again, if a packet never arrives then it is deleted by the router.

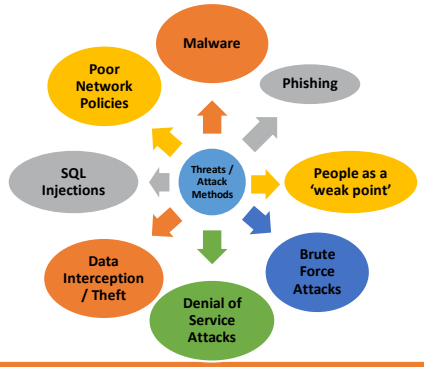




Year 11 Computer Science 1.6



The Public and Private keys – The Public keys (available to everyone) encrypts data so it can not be read by anyone other than the Private key (remains confidential)



Identification and prevention	
Penetration testing	A company invites / employs experts to simulate network attacks such as DOS and SQL injections. They try and find weaknesses in the system and tell the company so they can make improvements to their system security.
Network Forensics	Network Forensics are used to monitor and find out how an attack was carried out and by whom on a network.
Network Policies	A set of rules which explains how employees must secure their passwords and conduct business online.
Anti Virus Software	Dedicated to finding / destroying viruses on a computer. They have to be up-to-date for them to work.
Firewalls	Monitors the data which flows in and out of the network. Having ports closed protects the computer from hackers, and it monitors and detects hacker activity.
User Access Levels	Different access is given to files and data meaning employees cannot view sensitive company information and cannot sabotage vital system data.
Passwords	Strong passwords reduce networks unauthorised access.
Encryption	Data is scrambled using a set of "keys" before being sent across a network so that it is unreadable if intercepted.

Threats and Attack Methods	
Social engineering	The act of manipulating people to force them to make mistakes which can compromise a network's security.
Phishing	Using Email and phone calls criminals impersonate companies like banks and ask you to give them personal information: usernames, and bank details etc.
Brute Force	This is where criminals repeatedly try to 'login' with one password after another to hack an account
DOS	This tries to bring down websites. Using multiple computers (often with malware) they repeatedly access a website. The traffic increase overloads the server's CPU/memory to be under strain, crashing it.
Data inception and theft	Hackers use 'packet sniffers' to sniff out and intercept data packets. Then decode and steal the information.
SQK injection	SQL injections 'bolts on' some SQL to the end of your password. This will then alter the statement and allow you to access the accounts of other users.
Poor Network policy	Network policies should be in place. These are a set of rules to keep the network safe from Threats. They include passwords and user levels.

Malware	
Standard Virus	Hide in files / programs and replicate themselves in order to spread into other programs / files. Their aim is to delete or damage data.
Worms Virus	These don't damage data, they replicate themselves, taking up more of the computer's resources, slowing down your computer and making it useless.
Trojan Virus	These are programs you can use. But in the background will cause harm, like deleting files, making annoying changes to your computer setup or creating a portal for other users to use to gain access to your system.
Spyware	This is used to spy on the user and send back as much information about them as possible (passwords, usernames, websites they visit, purchases they have made). A common piece of spyware is a key logger which runs in the background recording every key you hit. It collects data to steal your identification or sell your information to third parties who will then target you with advertisements.
Adware	Its aim is to download and display unwanted adverts and collect marketing information about your online habits. It will often also try to direct you to unwanted websites by changing your default homepage
Pharming	This malware tries to change the IP address stored in the DNS to another IP address so that the user is sent to a phoney website instead of the one they intended.
Scareware	Often comes in the form of a pop up telling you that you have a virus. The pop up will them advertise purchasable software hoping that you will pass over your money.
Ransomware	This will seek to lock your computer making it useless. It will then demand that you pay a sum of money in order for you to get your computer working again.
Rootkits	These pieces of malware contain a set of tools, which once installed, allow a criminal to access your computer at an administrator level, allowing them to do what they like.

Year 11 Computer Science 1.7

Application Software	Software which is installed onto the computer to perform a specific task such as creating documents or spreadsheets
Operating System	Comes already installed on your computer and is used to control the workings of a computer.
Utilities Software:	These carry out specific tasks which help the computer system run efficiently such as virus checking and Winzip.

Application Software

The processes that are carried out by end-users (people working on a computer system) are commonly done using application software. These are run and managed by the operating software. Applications come in a very broad variety and cover features like creating documents, editing images, performing calculations and browsing websites.

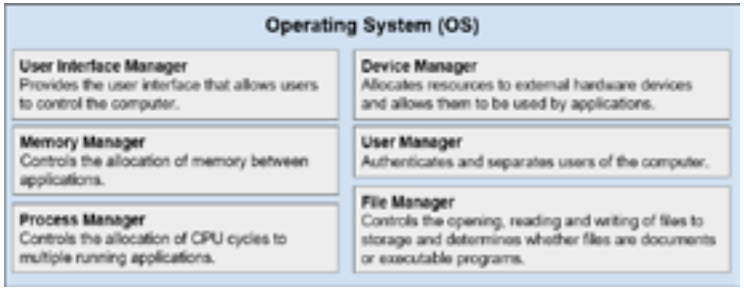
Application software

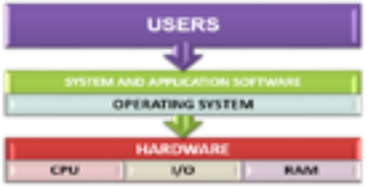
Programs that do specific tasks, such as write a letter (word processor) or edit a video.

Utility Software

Utility Software is the name given to the software tools that are designed to manage and optimise the performance of a computer system. There are a variety of functions that it performs.

Incremental Backup	Full Back up
This a process where only files that have been altered are selected for backup. It is much less time consuming than a full backup and less of a drain on the computers processing speed	This is a full back up of all of the files and data on a network. This can take some time. It is an effective way of ensuring all of the information is safe





Operating Systems Functions	
Device management	Controlling hardware components and managing peripherals
platform for software to	Allows software and applications to run
Providing a user interface	A way the user is able to interact with the software. These can be Graphical user interface (GUI), Command line Interface, Natural Language Interface and Menu Interface.
Multitasking facilities	Allows for many programs and software to operate at the same time.
Memory Management	Looking after where data is stored in the computer's memory
File Management	Naming, Allocating to folders, Moving files, Naming and Saving files
Managing users details	Allocation of an account, Access rights, Security, File management, and the key features, e.g.: § Not required û Understanding of paging or segmentation
Providing utility software	software tools that are designed to manage and optimise the performance of a computer system

Encryption	Antivirus software	Compression	Back up	Defragmentation	Disk checkers / cleaners
This protects the system by scrambling data to ensure it cannot be accessed by an unauthorised user	This prevents the system from becoming infected with malware	Applies an algorithm to reduce the space required to represent a file or its content. There are 2 types of compression Lossy and Lossless	Makes copies of the data that can be restored in the event of data loss There are 2 types of backup Full and Incremental.	Organises the data on an HDD into clusters where it is easily accessible.. This improves the speed with which the system can operate.	These scan the hard drive and find files that are not used or are unnecessary.

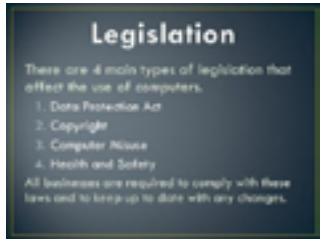
Graphical User Interface (GUI) - Uses WIMP – Windows Icons Menus/Mouse and pointers. Found on most modern operating systems.
Command Line - Line by line code like Python
Language interface - Uses natural language like SIRI
Menu Interface - Uses lists to choose from like ATM or Sky TV.

Year 11 Computer Science 1.8

Stakeholders
This term refers to all the people that have an interest in an organization, or issue. For example a the stakeholders in a school are the students, parents or guardians, teachers and local community. In terms of computing technology the global community are stakeholders and the developments in this area have an impact, to some degree, on everyone. This section will examine the impact technology has on different groups within society.

Stakeholders Rights and Responsibilities
All people have the right to access technology and are allowed to use computer systems. This includes being **allowed to use computer systems** and to **access internet services**. These must be legally acquired, which usually means through payment. With the rights of access come **responsibilities**, these include using computers **ethically** and disposing of old equipment in an **environmentally friendly** way.

The 8 principles of the Data Protection Act
1. Data must be used and processed in a fair and lawful way
2. Data must only be used for the stated purpose
3. Data should be adequate, relevant and not excessive for the use
4. Data must be accurate and kept up-to-date
5. Data should not be kept longer than necessary
6. Data should only be used according to the rights of the data subject
7. Data should be kept safe and secure
8. Data must not be transferred to organisations within other countries that do not offer a similar level of protection



Proprietary Software
This is software that you pay for, you can not access the source code and is owned by a company.

Open Source Software
This is software that is free, the source code is open and everyone can access it.

Factors Affecting the Digital Divide
Access – Not all areas in the UK have access to high speed internet as the map shows. The government has been driving forward an initiative to improve this balance, but there remains large areas where access to the internet is limited.

Economic – The cost of broadband internet access and computer systems is too expensive for some people in society and this means they are part of the divide between the **'haves and have nots'**

IT Literacy – Although IT is part of the school's curriculum there are still large numbers of people in society, especially among the older community, who are not able to use computers.

There are laws that control the use of Computer Systems. You are required to know the principles of these laws.

Data Protection Act – This law governs the information that is held on computer systems about people. According to this law the users must: **Keep information Secure, only use necessary info, Only Keep for as long as necessary , keep the information accurate and up to date, not use the information for any other purpose without permission.**

Computer Misuse Act – This law restricts how computers can be accessed and used. It is principally designed to stop hacking. It states there should be **no unauthorised access**, **unauthorised modification**, and **no accessed with intent to damaged**

Copyright Designs and Patents Act – This law is designed to **protect the work and content of individuals** from being **used or shared without permission**.

Freedom of Information Act – This law protects **people's rights to access information** that should be available to the public **including services such as Government, Health, Schools, Police and Courts**. Information from these organization can be accessed on request

Creative Commons Licensing – This law gives people the right to share and use information in certain formats: **Public Domain** (No restrictions); **Attribution Commercially** (Work used with the creator given credit) ; **Attribution Non-Commercially** (Work shared, but not sold on, with the creator given credit)

Digital Divide
This term refers to all the people that have an interest in an organization, or issue. For example a the stakeholders in a school are the students, parents or guardians, teachers and local community. In terms of computing technology the global community are stakeholders and the developments in this area have an impact, to some degree, on everyone. This section will examine the impact technology has on different groups within society.

Energy Consumption – Lots of energy is required for the production and assembly of computer equipment. Energy is also required to run computers and to maintain online storage systems. To reduce the demands on energy manufacturers have developed smarter technologies which require less energy to run systems and smaller more efficient devices.

E Waste – Old computers contain some parts that can be recycled and some metals that are valuable such as gold and aluminium. Other parts that cannot be recycled form waste which accounts for millions of tonnes that is dumped into landfills.

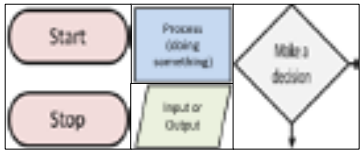
Sustainability – Computer systems have some positive impacts. The use of paperless communication (email, social media) had reduced the need for paper production, and computers are used to develop and produce sustainable technology. Although much of the material used in making computer systems relies on non renewable resources (metals) there are an increasing number of components that can be renewed for future uses.

Recycling – There are legal guidelines for the disposal of computer systems and there are companies that deconstruct the machines and extract all of the valuable materials for recycling. It is also possible to extend the life of a computer system by donating them through charities. This process can help bridge the gap in the digital divide.

Year 11 Computer Science 2 . 1

Computational thinking:
The use of computers to solve problems.
Development of algorithms to solve problems.
Uses the 4 steps below to do this.
Decomposition – breaking down a large problem into smaller sub-problems.
Abstraction – representing 'real world' problems in a computer removing unnecessary elements from the problem.
Pattern Recognition – Finds any patterns in the problem/solution.
Algorithmic Thinking - identifying the steps involved in solving a problem.

Flow Diagram



Flow diagrams visually represent the steps that make an algorithm. A standard set of shapes are used to represent different types of step, such as running a sub-process. The arrows in a flow diagram represent the flow of control through the algorithm.

Pseudocode is fake code. Between code and written English

```
x = 0
while x != 100:
   x = int(input("Please type in a number"))
print("Loop has ended")
```

```
for counter in range(3,20,2):
    print(counter)
```

```
name=input("Please type in your name")
print("Hello ",name)
Age=int(input("How old are you?"))
```

Data types
Integer e.g. 23
Real e.g. 23.7
Character e.g. A or 5
String e.g. A546TH
Boolean e.g. TRUE or FALSE.

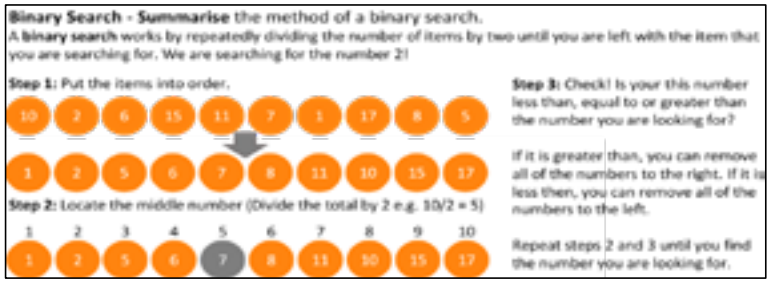
Merge Sort The list is repeatedly divided into two until the elements are separated individually. Pairs of elements are then compared, placed into order and combined. The process is then repeated until the list is whole again.

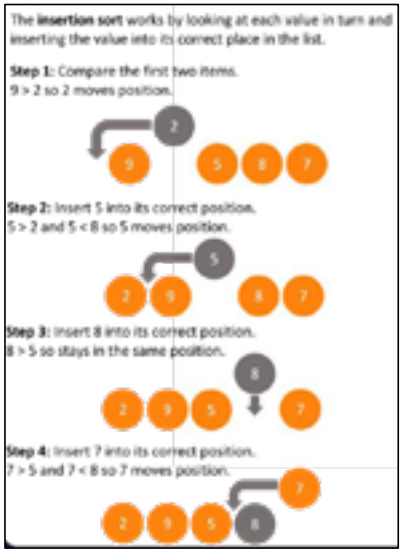
Bubble Sort: Each item is compared with the one on its right, and swapped if it is larger At the end of the first pass the largest item bubbles through to the end of the list (Mauve indicates sorted items)

9	5	4	15	3	8	11	2
5	9	4	15	3	8	11	2
5	4	9	15	3	8	11	2
5	4	9	15	3	8	11	2
5	4	9	3	15	8	11	2
5	4	9	3	8	15	11	2
5	4	9	3	8	11	15	2
5	4	9	3	8	11	2	15

Linear Search: This simply involves searching through a set of data, one item after the other, until the item we are looking for is found. Searching for the number 36.

INDEX	0	1	2	3	4	5	6
Item	23	25	26	34	36	45	47





A high level language uses human words which a CPU does not understand. A computer uses a translator to change the code so it can understand it. There are 2 ways to translate - **Complier** coverts the code into machine code before running it or **Interpreter** which coverts the code one instruction at a time running each instruction before translating the next.

Low Level Language
Machine code - Not understood by humans only by computers. Binary is used to represent the instructions to the computer. The instructions are fetched from RAM, decoded by the CPU and then executed one after the other. The code has 2 parts the **Opcode** which tells the processor what to do and the **Operand** telling the processor what to do it to.
Assembly language – It uses Binary and short acronyms, like commands JMP 1024 (jump to instruction 1024) An assembler translates the code into machine code so the processor can deal with the code

Types of Errors
Syntax errors - Variables not declare correctly Variable names spelt incorrectly
Logic errors - Conditions that can not be met Infinite loops Missing brackets
Run time errors - Division by 0 Programs that do not complete Memory is too full to continue

Year 11 Computer Science 2 . 2

Data types – How the data will be stored
Integer – Whole Number - 23
Real - Any number with a decimal – 2.223
Character - 1 single letter - A
String - A mix of letters numbers and symbols - A546TH
Boolean - Has 2 states - TRUE or FALSE. 1 or 0

Casting This is the process of **converting data** from one type to another. For example **str(age 13)** converts the integer to a string.

Variables - Are used to store values in a program. Variables can be changed. For example a variable might allows a name, age or score to be entered to a program.

Constants - Are used to store values in a program that do not change. For example a constant could be the use of Pi.

Identifiers - Are the names given to variables or constants in a program. These cannot have spaces. There are two main formats. **CamelCase -** uses a capital letter for each new word. (e.g. FirstName) or **snake_case -** uses an underscore to separate each word (e.g first_name)

Array – A data structure that can store multiple items. The items are known as **elements** . An array is created by **declaring** all the elements. The elements are stored within square brackets []. E.g scores = [1,2,3,4,5]

```
import array as arr
a = arr.array('i', [2, 4, 6, 8])

print("First:", a[0])
print("Second:", a[1])
print("Third:", a[2])
print("Fourth", a[3])
```

```
import array as arr

List = arr.array('i', [2, 4, 6])
List.append(4)
print(List)
List.extend([8, 10, 12])
print(List)
```

Managing Files - Programs use **open, read, write, close.** In pseudocode these functions are referred in the format **myFile, openRead, openWrite and close().** To manage files in python there are other functions to be aware of: f.**open** (file open), **f.write** (file write), **'a'** (Append – add to a file) **'n'** (New line)

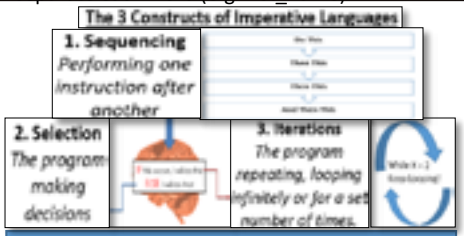
```
name = input ("Enter Your Name")
print ("Hello, " + name, "welcome to the score section")
age = input ("What is your age?")
print ("We need to know your gender")
gender = input ("Please enter male, female, or other")
print ("Now we need to know your high score")
score = input("Please enter your high score")
f = open ('scores.csv','a')
f.write(name + ',' + age + ',' + gender + ',' + score +'\n')
f.close()
f = open ('scores.csv','r')
scores = f.readlines()
print(scores[2])
```

Sub Program – This is a self contained sequence of instructions within a program. These are also known as subroutines and can be called on for a single specific function within a program.
Benefits to the use of subroutines - Reduce the amount of code - Make programs easier to read and test - Give code better structure

Types of sub Programs
A Function – Returns a value to the main program
A Procedure – Carries out a task, does not return a value to the main program
A Parameter – A value passed to the main program

Maths Operators For Pseudocode

+	Addition	3+3=6
-	Subtraction	3-3=0
*	Multiplication	3*3=9
/	Division	3/3=1
Mod	**Modulus Division** - Returns the remainder after division	17/3=6R2 Remainder No. **Mod 2**
Div	**Quotient Division** - Returns the quotient or the lowest integer	11/4=2 Complete **Div=2**
^	Exponential Powers of	3^3=27



Iteration – For and While Loops

```
x = 0
while x != 100:
    x = int(input("Please type in a number"))
print("Loop has ended")
```

```
for counter in range(3,20,2):
    print(counter)
```

Python -> English	
print('hello!')	Prints a value on screen (in this case, hello!)
input('')	Inputs a value into the computer.
x=input('')	Inputs a value and stores it into the variable x.
x=int(input(''))	Inputs a value into x, whilst also making it into an integer.
print(str(x))	Prints the variable x, but converts it into a string first.
if name == "Fred":	Decides whether the variable 'name' ha a value which is equal to 'Fred'.
else:	The other option if the conditions for an if statement are not met (eg. name = 'Bob' when it should be Fred)
elif name == "Tim"	elif (short for else if) is for when the first if condition is not met, but you want to specify another option.
#	# is used to make comments in code – any line which starts with a # will be ignored when the program runs.

SQL

```
SELECT *
FROM tblTemps
WHERE city
LIKE 'N%'
;;;
```

```
SELECT city, temperature
FROM tblTemps
WHERE temperature >= 25
ORDER BY temperature DESC
;;;
```

The **SQL Statement** uses **SELECT** * For a Wildcard **FROM** to chose the info **WHERE** this choses information **LIKE N%** Will select countries that begin with an N

The **SQL Statement** uses **SELECT** sets up the query **FROM** to chose the info **WHERE** this choses information (and excludes other fields)

Maths Operations

For multiple maths operations this is the order that needs to be followed
Brackets 3^2*12/(3*2)+6-6
Brackets (3*2)=6
Indices of Power Index 3^2 =3x3=9
Division Divide 12÷ 6 = 2
Multiplication Multiply 9*2 = 18
Addition Add 18+ 6 = 24
Subtraction Subtract 24- 6 = 18

Year 11 Computer Science 2 . 3

Defensive design: - Programs need to be designed to cope with bad entries made by users. This will :
- Minimise bugs or issues
- Program works regardless of user actions
- Errors are identified on entry

Contingencies (all possibilities) need to be considered at the planning stage for programs. This should consider possible user inputs and how to manage these.

Authentication
Identifies a user
Normally requires a combination entry (username and password)
Authentication checks against pre-set entries

- **Validation** is a method of checks an entry to ensure it is valid for the purpose that it is being used. There are some ways that code can be set up to validate inputs
- **Length Check** – Checks the number of characters in an inputs
- **Range Check** – Checks to ensure that an input falls between a set range of values
- **Presence Check** – Ensures that a field cannot be left blank

Naming conventions

CamelCase this uses a capital letter for each new word. (e.g. FirstName)
snake_case this uses an underscore to separate each word (e.g first_name)

Defensive design considerations:

Sub Program – This is a self contained sequence of instructions within a program. These are also known as subroutines and can be called on for a single specific function within a program.

Benefits to the use of subroutines
- Reduce the amount of code
- Make programs easier to read and test
- Give code better structure

Types of sub Programs
A Function – Returns a value to the main program
A Procedure – Carries out a task, does not return a value to the main program
A Parameter – A value passed to the main program

Indentation – used to highlight the blocks of code. If a block has to be more deeply nested, it is simply indented further to the right.

```
database={'name': '1234', 'name2': '5678', 'name3': '9012'}
name = input('Enter username: ')
ask = input('Enter pin: ')
if ask == database[name]:
    print ("Welcome", name)
else:
    print ("Invalid code")
```

TESTING –

ITERATIVE TESTING - Tests carried out during development.
FINAL TESTING – Test once a program has been completed.
ALPHA TESTS - final testing carried out by a programmer
BETA TESTS – Final testing carried out by users

Suitable Test Data - There are three methods to test a program.
NORMAL TESTS uses a check with a program that is expected to work.
BOUNDARY TESTS (or extreme tests) will check the program limits, with the highest and lowest numbers in a range that should work.
ERRONEOUS TESTS uses data that is not expected to work to check if the program rejects this information.

Syntax and Logical Errors –
SYNTAX errors - Grammar, spelling and character mistakes in code
LOGIC errors occur when an incorrect operand has been used, like an AND instead of an OR. These errors may allow a code to operate, but work incorrectly

Maintainability - For a program to work it should be written in a manner that is **easy to follow** with the correct use of **line breaks** and indentations. Where appropriate **comments** should be included **(//for OCR Pseudocode comments),** to show what is happening in a piece of code. **Indentations** must be used for code that is a subprogram for a previous piece of code. **Meaningful identifiers** should be used in all programs.

Commenting - Comments are the useful information that developers provide to make the reader understand the source code. It explains the logic or a part of it used in the code. They are usually helpful to someone maintaining or enhancing the code when the programmer is not around to answer questions about it. Python comments start with hashtag symbol with no white spaces (#) and lasts till the end of the line.

```
# This is a comment
# Print "GeeksforGeeks !" to console
print("GeeksforGeeks")
```

```
a, b = 1, 3 # Declaring two integers
sum = a + b # adding two integers
print(sum) # displaying the output
```

Year 11 Computer Science 2 . 4

LOGIC GATES AND TRUTH TABLES

Computational logic has only two outcomes: true or false. This is represented in binary with 1 and 0. **Boolean logic** reduces all values to the these two states. Computer processors contain 1 billion **TRANSISTORS** and these transmit current (on- true) or don't (off – false).

LOGIC GATES use transistors to carry out all calculations and run program instructions in the processor. These are represented by the symbols below.
A TRUTH TABLE is used to show how a "logic gate" works in an easy to read format.

With "AND" logic there are two inputs and one output. If both of the inputs are positive then the output will be positive.
With "OR" logic there are two inputs and one output. If either of the inputs is positive or if both of the inputs are positive then the output will be positive.
With "NOT" logic there is just one input and one output. It changes the input to the opposite value.

Truth Tables

AND			OR			NOT	
A	B	A AND B	A	B	A OR B	A	NOT A
0	0	0	0	0	0	0	1
0	1	0	0	1	1	1	0
1	0	0	1	0	1		
1	1	1	1	1	1		

Boolean Operators	Logic Gate Symbol
AND *(Conjunction)*	
OR *(Disjunction)*	
NOT *(Negation)*	

Binary Logic Gate Diagrams

NOT

A	Out
0	1
1	0

AND

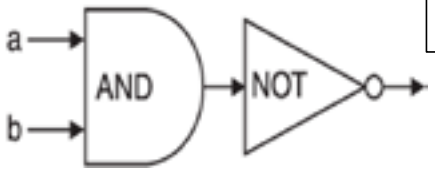
A	B	Out
0	0	0
0	1	0
1	0	0
1	1	1

OR

A	B	Out
0	0	0
0	1	1
1	0	1
1	1	1

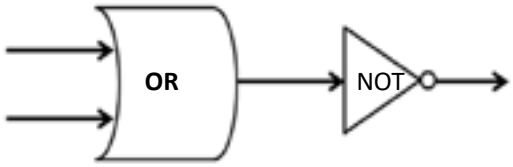
NOT (a AND b)

A	B	NOT (a AND b)
0	0	1
0	1	1
1	0	1
1	1	0



P=(A AND B) AND NOT C

Input (A)	Input (B)	Q = A OR B	Not Q
0	0	0	1
0	1	1	0
1	0	1	0
1	1	1	0



a. **Q=(NOT A) AND B**

A	B	NOT A	Q
0	0	1	0
0	1	1	1
1	0	0	0
1	1	0	0

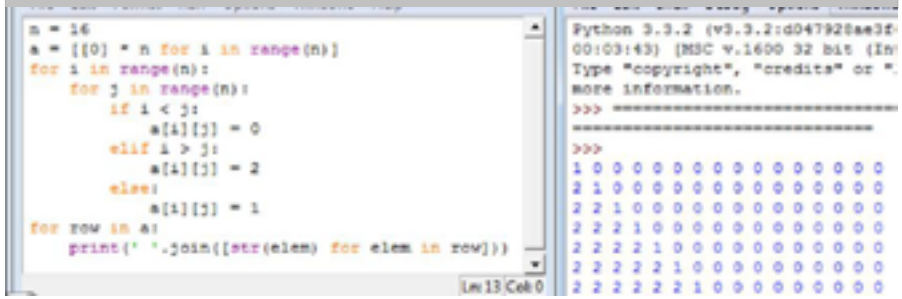
b. **Q=(NOT A) OR B**

A	B	NOT A	Q
0	0	1	1
0	1	1	1
1	0	0	0
1	1	0	1

Year 11 Computer Science 2 . 5

Translators: For assembly and high level languages to be understood systems require **TRANSLATORS** to interpret them.
Compilers: Translate the source code into machine code
Interpreters: Translates code in a line by line process
Assemblers: Translate the mnemonics of the language

An **Integrated Development Environment (IDE)** is an application software that allows programmers to develop code and test operations with a variety of facilities . An example is Python IDLE



Common IDE Tools
Editor to enable program code to be entered/edited
Error diagnostics / debugging to display information about errors (syntax / run time) / location of errors and suggest solutions
Run-time environment to enable to the program to be run and check for run time errors / test the program
Translator / compiler / interpreter to convert the high level code into machine code / low level code / binary AND to enable to code to be executed / run
Breakpoint to stop/pause program execution at a specific point
Watch window to check contents of variables
Syntax completion suggests/corrects code
Keyword highlighting / colour coding keywords / pretty printing colours command words / variables
Best to memorise three for the exam

Python IDLE contains a variety of features that support the development of code including
- **Syntax Highlighting** – coloured illustration of coded elements
- **Auto indentation** – keeping subroutines in proper locations
- **Bracket Matching** – Indicating matching sets of delimiters
- **Auto complete** – finding key words from dictionaries to aid with code entry
- **Syntax error checking** – Illustrating the lines within the code that contain errors

Computer Languages
Computer instructions can be written in a variety of different programming languages which need to be translated into machine code for computers to understand them. Languages exist at low and high levels

Assembly Language	Machine Code
LOAD 3	0011 0011
STORE 12	0100 1100
ADD 3	0110 0011
ADD # 7	0111 0111
SUB 5	1000 0101
SUB # 10	1001 1010
HALT	1110 0000

Low Level Language		High Level Language
Machine Language Processors only understand language in binary 1s and 0s	Assembly Language contains instructions that are directly equivalent to machine language. Mnemonics are used to replace the commands in the code	Java and Python are examples of High level languages and these use terms that are clear like 'print'. Most software programs are written in high level language.
Used in: embedded systems (in tv's, microwave ovens, etc.) **Used for:** Device drivers, real time systems Assembly languages are machine specific and cannot be transferred to different devices		**Used in** most software apps Portable between devices Used on different computing systems

Dance - Terminology 1

Year 11 - Knowledge Organiser - Dance

Performing skills

Term	Definition
Timing	moving to the beat of the music and/or your group.
Energy	performing actions with the full amount of effort required.
Movement memory	remembering all of the movements.
Accuracy	making the correct shapes with your body.
Facial expressions	showing the mood of the dance through your face.
Extensions	fully extending the legs, toes, arms and fingertips.
Focus	being fully committed to the performance by ignoring distractions.
Flexibility	being able to perform a wide range of movements with ease.
Projection	extending your performance to the back of the venue.
Musicality	expressing the dynamics of the music through your body.
Alignment	making the correct shapes with your body.

Choreography skills

Term	Definition
Narrative	telling a story by playing a character.
Characterisation	playing the role of a character.
Levels	the different heights the dancer reaches whilst performing.
Formations	the positions or shape that the dancers stand in.
Directions	the direction of travel or the way that the dancers are facing.
Transitions	linking one movement to another.
Dynamics	how the actions are performed.
Unison	same movements at the same time.
Canon	same movements performed one after another.

Reflecting - Structure for success

↓

WHAT is the skill?

↓

HOW do you know it is a strength/ weakness?

↓

WHY is this skill important for a dancer to have?

↓

IMPACT that the skill has on the audience?

↓

IMPROVEMENT - strategy to improve

Dance - Terminology 2

Rehearsal skills

Term	Definition
Collaboration	working with other people to produce something.
Focus	remaining on task despite distractions.
Motivation	encouraging yourself or others to succeed.
Leadership	leading or organising a group to achieve the aims.
Commitment	being dedicated to being your best.

Tier 3 vocabulary (external unit)

Term	Definition
Repertoire	the dance that you are going to perform.
Own image	how you will present yourself on stage.
Casting bracket	what type of character you can best play and why.
Rehearsal plan	a detailed plan of how you will rehearse the work (what, where, when, who and deadlines)
Lighting plan	communicates your lighting ideas to the technician.
Technical rehearsal	when you rehearse your dance with the lighting and sound cues. This will have pauses and restarts to ensure cues are correct.
Dress rehearsal	when you rehearse your dance in your costume with lighting and sound without any stops.
Theme	the subject or topic that the dance will explore.
Venue	the place where the performance takes place.

Common misspellings

Performance (not **pre**formance)

Audience

Choreography

Practise

Contemporary

Rehearsal (not reh**er**sal or reh**ur**-sal)

Extensions (not extent**i**ons)

Flexibility (not flex**a**bility)

Canon (not ca**nn**on)

Timing (not ti**mm**ing)

Character

Finale

Scene

Balance (not bal**e**nce)

Drama - Terminology

Year 11 - Drama - Term 2

Exam Unit Terminology

Term	Definition	⇦ Cover & Test Name The Term ⇩
Repertoire	The scene / play that you are going to perform.	
Rehearsal Plan	A detailed plan of how you will rehearse (what, where, when, who and deadlines).	
Lighting Plan	A drawing with notes that communicate your lighting ideas to the technician.	
Sound Script	A copy of the script with all the sound effects and music marked on it.	
Technical Rehearsal	A stop-start rehearsal in which you will practice with full lights and sound. You will also rehearse scene changes and any other technical elements of the show.	
Dress Rehearsal	A final, non-stop rehearsal of your scene using full costume with lighting, sound, props and scene changes. Treat this as a performance.	
Venue	The place (theatre, arts centre etc.) where the performance takes place.	
Venue Fact File	All the important information about the venue including seating capacity, lighting/sound equipment, health & safety rules and booking info.	
Risk Assessment	A list of all the things that could harm either you or your audience before, during and after your performance and how you will make them less likely to happen.	

Rehearsal Diary Elements

Element	Definition	⇦ Cover & Test Name The Element ⇩
Rehearsal Target	What you are going to achieve in that rehearsal. Be specific. Use pages numbers and reference acting skills. e.g. 'Today we will rehearse pages 1 to 3, focussing on adding gestures.'	
Your Contribution	The ideas you suggested & other people's ideas you developed. e.g. 'When Dave suggested he might move away from me I suggested he could push me away instead to show his anger.'	
Other Contributions	The ideas other people suggested.	
Progress	The progress you made towards your rehearsal target. e.g. 'We all added gestures to our lines on pages 1 to 3.'	
Problems	Things that stopped you making progress. e.g. 'Kelly didn't have her script with her which meant we had to write her gestures in our scripts.'	
Solutions	What you will do in your next rehearsal to fix the problems. e.g. 'At the start of next rehearsal, Kelly will update her script and we will run the first three pages using the gestures we planned.'	

Drama - Evaluation Skills

Year 11 - Drama - Term 2

Evaluation Skills

Term	Definition
Evaluation	Working out what was good about the performance and what could have been better.
Strength	What was good about the performance. Always refer to an **acting skill**.
Weakness	What could have been better about the performance. Always refer to an **acting skill.**
Example	The specific moment or line that you are writing about. If possible, always use a quote.
Target	What you will do next time to make your work better.

When you make a comment about a strength or a weakness you must always do these four things:

1	**Describe** the strength/weakness. e.g. In this scene one of my weaknesses was my tone of voice.
2	Give an **example** of the strength/weakness. Try to use a **quote**. e.g. When I said 'Look out! It's a bear!' I didn't sound very scared.
3	Explain **why** it made the performance better/worse. Try to reference **impact on the audience**. e.g. This might have made the audience think my character was not scared of the bear which would confuse them as I am supposed to be a coward.
4	Explain **how** you could improve the weakness. e.g. In the future I could pick a strong tactic for that line, such as 'to alarm', and pick a keyword to stress, such as 'bear'.

Try using theses Sentence Starters to get you going...

1 Strength / Weakness:	2 Example:	3 Why:	4 Target:
A strength of mine in this scene was… A weakness of mine in this scene was...	This was evident in the line...	This made my character seem...	I would do this again next time because….
A skill I used well was… A skill I could have been better at was…	You could see this when I...	This was a problem because it made the audience think that...	To improve my work I could...
My performance was good because of my… My performance was harmed because of my…	An example of this was...	This could have confused the audience because...	To avoid this in the future I will...
Something I did well was... Something I could have done better was...	This was obvious when I...	This suggested to the audience that my character was...	When I am getting ready for my next performance I will...

D&T Unit 1.1 - Production Systems

AQA Design & Technology 8552
Unit 1 - New and emerging technologies
1.1 Production Techniques and Systems

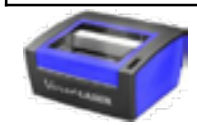
1. CAD – Computer Aided Design

Advantages of CAD	Disadvantages of CAD
Designs can be created, saved and edited easily, saving time	CAD software is complex to learn
Designs or parts of designs can be easily copied or repeated	Software can be very expensive
Designs can be worked on by remote teams simultaneously	Compatibility issues with software
Designs can be rendered to look photo-realistic to gather public opinion in a range of finishes	Security issues - Risk of data being corrupted or hacked
CAD is very accurate	
CAD software can process complex stress testing	

CAD Software

2. CAM – Computer Aided Manufacturing

Advantages of CAM	Disadvantages of CAM
Quick – Speed of production can be increased.	Training is required to operate CAM.
Consistency – All parts manufactures are all the same.	High initial outlay for machines.
Accuracy – Accuracy can be greatly improved using CAM.	Production stoppage – If the machines break down, the production would stop.
Less Mistakes – There is no human error unless pre programmed.	Social issues . Areas can decline as human jobs are taken.
Cost Savings – Workforce can be reduced.	


Laser Cutter


Robots


Barcode Scanner


AGV – Automated Guided Vehicle

3: Production Techniques

3.1 Flexible Manufacturing Systems (FMS) : involves an assembly of automated machines commonly used on short-run batch production lines where the products frequently change.

3.2 Lean Manufacturing: It aims to manufacture products just before they are required to eliminate areas of waste including:

- Overproduction
- Waiting
- Transportation
- Inappropriate processing
- Excessive inventory
- Unnecessary motion
- Defects

3.3 Just In Time (JIT) : Items are created as they are demanded. No surplus stock of raw material, component or finished parts are kept.

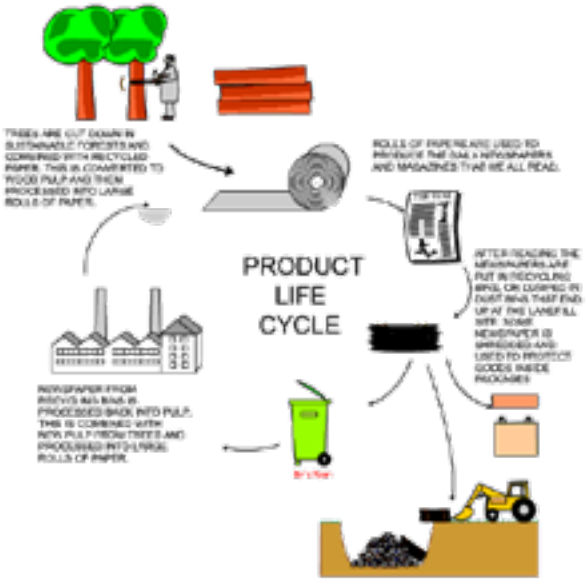
Advantages of JIT	Disadvantages of JIT
No warehousing costs	Reliant on a high quality supply chain
Ordered secured before outlay on parts is required	Stock is not available immediately off-the-shelf
Stock does not become obsolete, damaged or deteriorated	Fewer benefits from bulk purchasing

4. Scales of Production

<u>One off</u>: when you make a unique item
<u>Batch</u>: when you make a few/set amount
<u>Mass</u>: when you make thousands
<u>Continuous</u>: open ended production

5: Informing Design Decisions

5.1 Planned obsolescence - Planned obsolescence is when a product is deliberately designed to have a specific life span. This is usually a shortened life span.
5.2 Design for maintenance - Products are often designed to be thrown away when they fail... This can be achieved by designing products that can be repaired and maintained.
5.3 Disposability – Some products are designed to be disposable.
5.4 Product Lifecycle -



7: KEY WORD FOCUS

You should be able to explain the meaning of each of these words by the end of this rotation.

CNC	Computer Numerical Control
EPOS	Electronic Point Of Sale (Barcodes)

D&T Unit 1.1 - Industry

AQA Design & Technology 8552
Unit 1 New and Emerging Technologies
1.1 Industry and Enterprise

New and emerging technologies

New technologies are those that are currently being developed or will be developed in the next 5 to 10 years, and which will alter the business and social environment.
Examples:

Fuel-cell vehicles
Zero-emission cars that run on hydrogen

Additive manufacturing
The future of making things, from printable organs to intelligent clothes

Industry - Automation and the use of robotics

As industry has grown new and emerging technologies have changed the way designers, architects and engineers work.
Intelligent machines and robotics have replace machine operators and engineers.
The development of work now almost always involves the use of **Computer Aided Design (CAD)**.
This software can carry out complex tasks such as virtual stress testing this is called **Computer Aided Testing (CAT)**.
Designs can be produced to look 3D so customers ca give opinions before **prototyping** begins.

Buildings and the place of work

The development of the internet has changed how data is transferred. This has lead to people being able to work together remotely (from different buildings or countries).
Projects can be sent to machines using **computer aided manufacturing (CAD)** techniques including **computer numerical control (CNC)** machines such as laser cutters and rapid prototyping (RPT) machines such as 3D printers.
Physical layout of buildings for production should be logical to increase efficiency. This will reduce unproductive time, movement and waste materials.

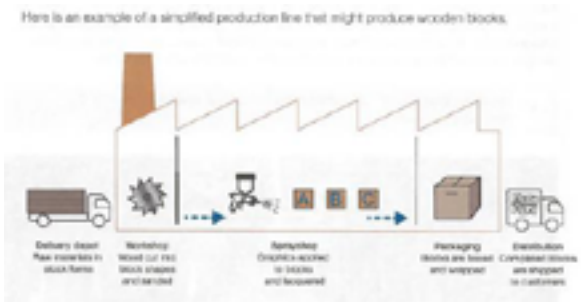


Image from AQA

Enterprise

An idea that is developed into a business proposal for a product that has commercial viability. Products developed in this way require a patent to protect the idea so that other companies cannot use it without permission this is called a registered trademark.

Crowdfunding

Funding a project or venture by raising money from a large number of people who each contribute a relatively small amount, typically via the Internet.

Virtual marketing and retail

Virtual marketing the use of search engines positioning and ranking, banner advertising, e-mail marketing and social media in order to reach a wider audience to promote a product.

Co-operatives

A farm, business, or other organization which is owned and run jointly by its members, who share the profits or benefits.

Fairtrade

Trade between companies in developed countries and producers in developing countries in which fair prices are paid to the producers.

D&T Unit 1.3 - Culture

AQA Design & Technology 8552
Unit 1 New and Emerging Technologies
1.3 People, Culture and Society

People

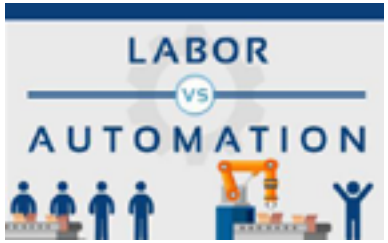
Consumer Choice
Growth of global manufacturing has lead to a wider variety of products being available, prices of products are kept low because of the wider competition.

Technology Push
Advances in technology and science lead to the development of new products. Research and Development (R&D) Departments are used within large companies to ensure they can create new and exciting products.

Advances in touchscreen technology

Market Pull
The demand for new products from the consumer market. Market Pull is the pressure put on a company to improve their products by consumers.

Changing Job Roles
The development of new technologies and automation has meant there is less reliance on manual labour. Workers need to be 'skilled up' and be more flexible.



Society

Companies putting the environment and people before profit.
Examples:

- Carbon Neutral Products
- Use of renewable materials
- Reduction of carbon emissions/greenhouse gasses
- Use of recycled materials
- Products designed to be 100% recyclable
- Promotion of Fairtrade
- Reduction of transportation
- Non profit organisations that reinvest money to support good causes
- Consideration to designing products for the elderly or disabled
- Consideration to different religious groups

4 main ways to consider the population when designing

Type of Production	Example
One size fits all	Door Frames Baths
A range of sizes to cover all	Shoes Clothes
Adjustability to allow use by all	Car Seats Shower head height
Adaptability to support location or user	Children's booster seats Car roof bars

Culture

A combination of ideas, beliefs, customs and social behaviours of a society or group of people.

Fashion and Trends
Designers developing products that are influenced by 'the latest thing'.

Faiths and Beliefs
Designers being responsible for the impact their design choices may have on a community.

D&T Unit 2.1 - Sustainability

AQA Design & Technology 8552
Unit 1 New and Emerging Technologies
2.1 Sustainability and the environment

1. Sustainability

Avoidance of the depletion of natural resources.

Finite Resources e.g. Ore and Oil
Materials which are in limited supply. Use of these should be avoided where possible or only used in small amounts.

Non Finite Resources e.g. Trees and Plants
Materials in abundant supply and are unlikely to ever run out or ones that can be grown again.

The impact of the use of resources can be measured by the following:

- CO_2 emissions
- Transportation method and distance travelled
- Impact on the environment through mining or harvesting
- Availability or scarcity
- Maintenance or repair costs
- Ethical and moral issues

2. Life Cycle

Life cycle assessment (LCA) to assess the impact of a product during the different stages of its life. The 5 main stages are:

Image from AQA

3. Waste Disposal

Consideration to waste disposal has an impact on the environment and a product life cycle.
Businesses are charged for waste disposal, reducing waste disposal will save money.
The effects of careful consideration of waste disposal within a business are:

- Less raw materials required
- Reusing waste materials/components within a company
- Sale of recyclable waste
- Energy to heat and power a business could be generated

4. Environment

Technologies that have a **positive impact**:

- Renewable materials from managed resources
- Use of renewable energy
- Using recyclable materials
- Consideration to the 6r's
- Designing products with low power consumption
- Designing products with fewer components and reduced weight
- Designing products that are upgradable extending their life
- Creating products that are sourced, produced and sold locally

Technologies that have a **negative impact**:

- Use of finite/non-recycled materials
- Use of components that are hard to repair
- Use of fossil fuels for power
- Products with high power consumption
- Products that have built in **planned obsolescence**
- Components that are shipped globally

5. Key Terms

Continuous Improvement
Kaizen, also known as continuous improvement, is a long-term approach to work that seeks to achieve small, incremental changes in processes in order to improve efficiency and quality. It is best known for being used in **lean manufacturing.**

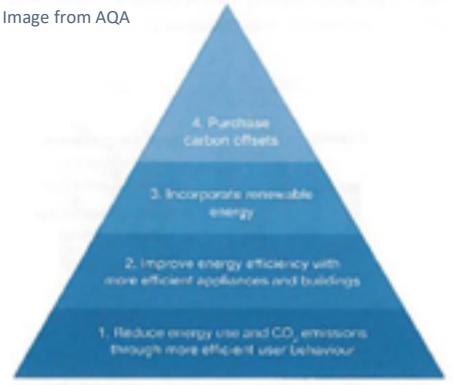
Efficient Working
Just in time (JIT) and **lean manufacturing** are examples of how businesses reduce costs. Other examples are members of staff doing 'energy walks' to turn off lights etc. to reduce costs and CO_2 emissions.

Pollution
Business's should aim to reduce pollution by conducting an LCA.

Global Warming
The release of CO2, methane (CH4) and nitrous oxide (N2O) into the environment resulting in the rise of average temperatures of the earth's atmosphere and oceans.

Carbon Offsetting

Image from AQA



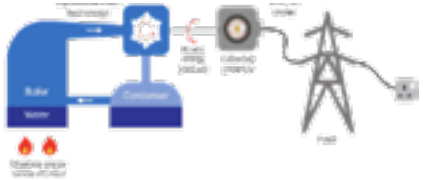
D&T Unit 2.1 - Energy

AQA Design & Technology 8552
Unit 2: Energy, Materials, Systems and Devices
2.1 Energy Generation and Storage

1. Energy Generation

Power can be generated from renewable and non-renewable sources. Non-renewable power is generated from fossil fuels.

Most electricity is created by rotating a turbine which turns a generator. Fossil fuels are burnt to create heat which superheats the water. The steam rotates the turbine which is linked to the generator to supply the electricity.



1.1 Fossil Fuels – Most electricity in the UK comes from burning Fossil Fuels such as **Coal, Gas and Oil**. Fossil fuels are **finite** resources and **cannot be replaced** as they run out. Burning fossil fuels creates carbon dioxide and is not environmentally friendly and contributes to **global warming.**

1.2 Fracking – Shale gas is trapped within the earths crust. Fracking is the process which removes it so it can then be burnt to create electricity. It involves drilling the earths crust and sending high pressure water, sand and chemical mixtures into the rock to release the gas.

3. Nuclear Power

Nuclear power is highly controversial. The process harnesses a nuclear reaction to create to create heat to power the turbines.

• Clean • Efficient	• High start up costs • Radioactive waste which is very dangerous to all living things. • Nuclear waste stays radioactive for millions of years and is stored underground.

2. Renewable Energy

Energy that comes from the planets non-finite resources is renewable. It includes



2.1 Wind Power	
• Low cost • Produce More power in winter when demand is higher.	• Do not create power when not enough wind or it is too windy. • Harmful to wildlife • Ugly
2.2 Solar Energy	
• Low maintenance costs. • Improvements in technology mean the efficiency is always improving.	• Only produce energy during daytime. • Production is less in winter.
2.3 Tidal Energy	
• Predictable and consistent.	• Machinery has to be located some distance from land making repair and maintenance difficult.
2.4 Hydro Electric Power	
• Very reliable	• High set up costs both financially and environmentally.
2.5 Bio Fuel	
• Carbon Neutral – They absorb the CO2 whilst growing and produce similar amounts when burnt for energy.	• Vast amounts of land and water needed to produce the crops which contribute to food shortages in developing countries.

4. Energy Storage

Most mechanical power is stored by using tension or compression. Coiled springs used in clocks, watches and wind up toys store physical energy from the winding process which is then released slowly through cogs, gears and other mechanisms.

4.1 Pneumatics – A form of compression is used to store gas or air under pressure. They are commonly used to controlling production lines. They are accurate, efficient and low maintenance.

4.2 Hydraulics – Very similar to Pneumatics but uses a liquid, most commonly Oil. Extremely powerful and using in manufacturing industrial applications.

Both systems will use a compressor which pump the air or liquid into a storage tank to hold it until it is needed.

4.3 Kinetic Energy – any object in motion has kinetic energy. Objects not in motion store potential energy which is converted to kinetic energy when a force is applied to the object such as gravity.

4.4 Batteries – Electrical power can be stored in batteries. Battery technology has vastly improved alongside the power consumption of modern electronic devices helping save valuable finite resources.

Alkaline batteries are more efficient than traditional acid based batteries and hold their charge well.

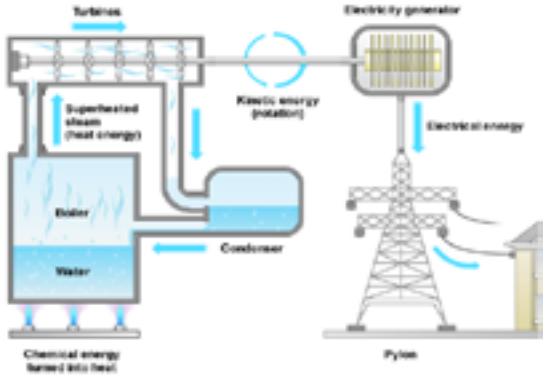
Rechargeable batteries are capable of being charge d and discharged thousands of times reducing the resources needed. The time it takes for rechargeable batteries to reach full charge has also improved in recent years making their use much more convenient.

4.5 Disposal of Batteries – Batteries must be disposed of correctly as they contain toxic electro chemicals. If placed in the normal bin and they end up in land fill sites, it will degrade over time and release harmful chemicals and metals into the soil and water.

D&T Unit 2.1 - Energy Types

AQA Design & Technology 8552
Unit 2: Energy, Materials, Systems and Devices
2.1 Energy Generation and Storage

Energy Types
1. Fossil Fuels – Non-renewable energy



In a thermal power station fuel such as coal, oil or gas is burned in a furnace to produce heat - chemical to heat energy.

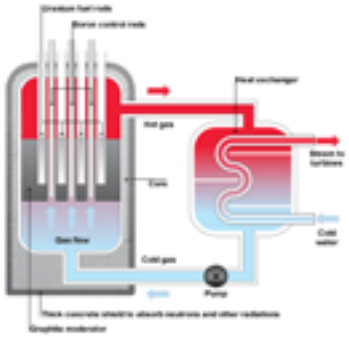
- this heat is used to change water into steam in the boiler.
- the steam drives the turbine - heat to kinetic energy
- this drives the generator to produce electricity - kinetic to electrical energy.

Some experts believe that fossil fuels will run out in our lifetime.

Energy Types 2. Biomass Energy –Renewable Energy

Biomass is an industry term for getting energy by burning wood, and other organic matter. Burning biomass releases carbon emissions, but has been classed as a renewable energy source in the EU and UN legal frameworks, because plant stocks can be replaced with new growth.

Energy Types
3. Nuclear Energy – Renewable energy



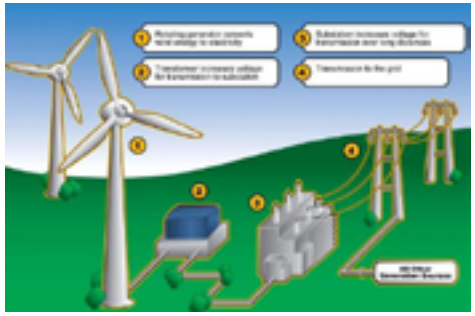
The main nuclear fuels are **uranium** and **plutonium**. In a nuclear power station nuclear fuel undergoes a controlled chain reaction in the reactor to produce heat - nuclear to heat energy.

- heat is used to change water into steam in the boiler.
- the steam drives the turbine (heat to kinetic energy)
- this drives the generator to produce electricity - kinetic to electrical energy.

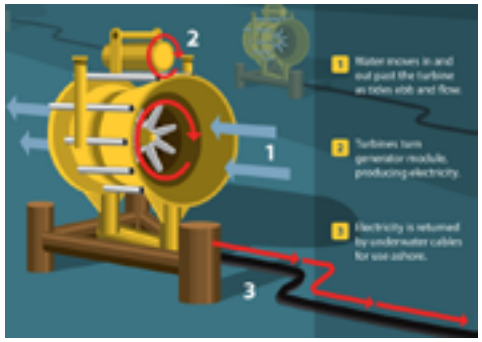
Energy Types
8.Batteries

Alkaline batteries are the most common type of domestic batteries, they are disposable but contain chemicals that are bad for the environment. Fortunately more and more battery recycling banks are appearing now where most of the battery can be reused. **Rechargeable batteries** are better for the environment and more economical in the long run (High initial purchase price). Their lifespan decreases with every charge.

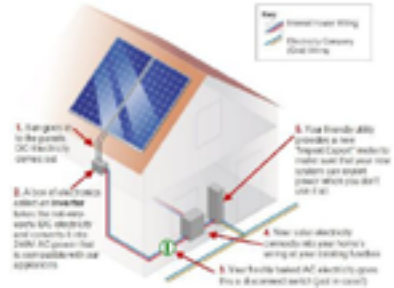
Energy Types
4. Wind Energy – Renewable Energy



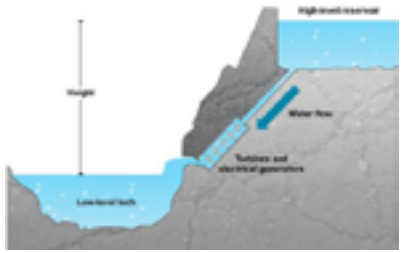
6. Tidal Energy – Renewable Energy



5. Solar Energy – Renewable Energy



7. Hydroelectricity – Renewable Energy



- In a hydroelectric power station water is stored behind a dam in a reservoir. This water has gravitational potential energy.
- The water runs down pipes (potential to kinetic energy) to turn the turbine
- The turbine is connected to a generator to produce electricity (kinetic to electrical energy).

D&T Unit 2.2 - Modern Materials

AQA Design & Technology 8552
Unit 2: Energy, Materials, Systems and Devices
2.2 Smart & Modern Materials

1. Modern materials

1.1 Corn Starch Polymers – plastics that are **biodegradable** and not toxic to the environment. They are easy to recycle.

Name	Uses	Characteristics
Polylactic acid (PLA)	• Disposable food and drink containers • 3D Printed Items	• Smooth or textured finish • Easy to Colour • Easy to mould • Fully biodegradable
Polyhydroxybutyrate (PHB) Biopol™	• Bottles • Pots • Disposable food containers	• Smooth or textured finish. • Easy to Colour • Easy to mould • Fully (but slowly) biodegradable.

1.2 Flexible MDF – Is made from wood pulp fibres in the same way as standard MDF, with the addition of grooves cut along the length of the board leaving about 2mm of the MDF intact which allows the MDF to become flexible.

1.3 Titanium – Pure titanium does not react with the human body and is used by the medical profession for artificial joints and dental implants. It has a high strength to weight ratio and has excellent corrosion resistance.

1.4 Graphene – thinnest material ever discovered, a million times thinner than a human hair, 200 times stronger than steel. It is transparent, impermeable and highly conductive.

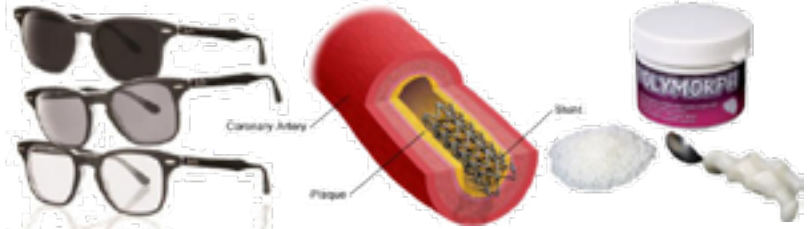
1.5 Nanomaterials - Their use in electronics has helped miniaturisation whilst improving conductivity. IN the textiles industry, they have been used as protective coatings to improve water resistance and give UV protection.

1.6 Metal Foams - Porous metal structures, often made from Titanium and Aluminium use as little as 25% of the mass. This makes them extremely lightweight but retaining most of the properties of the base material.

2. Smart Materials

A material that reacts to an external stimulus or input to alter its functional or aesthetic properties.. They can react to heat, light, pressure, moisture and electricity.

Name	Stimulus	What is does?	Uses
2.1 Thermochromic pigments	Heat	Changes colour when heat is applied.	• Flexible thermometers • Temperature indicators • Novelty goods
2.2 Photochromic pigments & particles	UV Light (Natural Light)	Changes colour in sunlight/UV Light	• Transition Lens Sunglas • Nail varnish • Clothing • Novelty goods
2.3 Shape memory alloy Nitinol	Heat or Electricity	Returns to original/pre set shape when heated to 70°C or electricity is applied.	• Glasses Frames • Fire Sprinklers • Dental Braces • Surgical Stents
2.4 Polymorph	Heat	Becomes mouldable by hand when heated to 62°C	• Personalisation of products • Repairs • Prototyping & Modelling
2.5 Quantum Tunnelling Composite	Pressure	Varies the amount of electrical current depending on pressure applied.	• Touch sensitive pads • Wearable technology • Variable speed controls
2.6 Piezoelectric Material	Movement , stress or electricity	Stress or movement produces electrical signal or ***vice versa.***	• Mobile phone speakers and microphones • Gas Lighters ignition spark
2.7 Litmus Paper	Levels of PH in substances.	Changes colour spending on chemical balance.	• Scientific experiments • Soil testing for gardener/farmers • Testing swimming pools and fish tanks

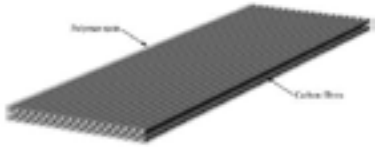


D&T Unit 2.10 - Composite Materials

AQA Design & Technology 8552
Unit 2: Energy Materials Systems and Devices
2.10: Composite Materials and Technical Textiles
From AQA

1. Composite Materials

2 or more materials combined to create a new material with improved properties.

Name	Appearance	Image	Characteristics	Uses
Glass Reinforced Plastic (GRP)	Glass fibre matting covered in a smooth resin with a glossy finish. Can be coloured, complex shapes can be formed.		Lightweight, strong, resistant to heat, chemicals and corrosion. Waterproof. Labour intensive to produce.	Car body parts, pipes, helmets, boat hulls.
Carbon Fibre Reinforced Plastic (CRP)	Carbon in the form of graphite is soft. But very thin strands of carbon are very stiff. These carbon fibres are useful for reinforcing other materials to make them tougher. They are embedded in strong plastics to make composite materials.		Lightweight, strong, good tensile strength, rigid, very expensive resistant to heat, chemicals and corrosion. Waterproof. Labour intensive to produce.	Skateboards, boat hulls and high performance sports equipment.

2. Technical Textiles

A technical textile is a textile developed with enhanced properties to withstand specific uses.

Name	Appearance	Image	Characteristics	Uses
Gore-Tex®	Thin membrane between an liner and outer material.		Has the desirable properties of nylon, but is also 'breathable'. Lets water vapour from sweat pass to the outside, but it stops rain drops from passing to the inside.	Outdoor clothing and footwear
Kevlar® by DuPont™ (Polyparaphenylene terephthalamide)	Naturally a yellowish gold material which can be dyed.		Very strong artificial fibre. It is woven to make a material that is used for light and flexible body armour. High thermal protection, non flammable, good chemical resistance.	Body Armour, safety clothing
Conductive Fabrics and Thread	A silvery fabric or thread.		Electrical current passes through the thread linking electrical components. It allows flexible and wearable control of electronic products.	Wearable inputs and processes such as switches, lights, clothing, toys etc.
Fire Resistant Fabrics	Appearance varies. Most can be dyed to change colour.		Protects the wearer from ignition from naked flame. Heat resistant.	Fire blankets, safety clothing. Race car driver protection.
Microfibers and Microencapsulation	A thin synthetic fibre woven into products. Can be dyed to change colour.		Polyester or nylon microfibres are 60 to 100 times finer than a human hair. They can be blended with synthetic or natural fibres. Thermoplastic polyester or nylon microfibres can be heat-treated to give them coils, crimps and loops, which makes these textured yarns stretchy and warm.	Clothing for outdoor pursuits, active sports, underwear, knitwear and carpets.

D&T Unit 2.11 - Systems

AQA Design & Technology 8552
Unit 2: Energy Materials Systems and Devices
2.11 Systems approach to designing

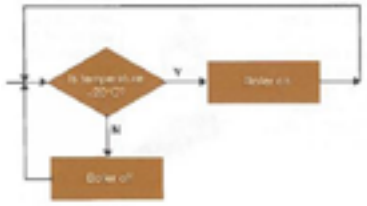
1. Systems

A system is parts or components working together to control tasks or activities.

Systems Diagram
A simple flowchart that lays out input, process, output – an automatic door

Open loop and closed loop
Has no feedback and is unable to make a decision – a room heater- has to be manually switched off

Closed loop
Able to make a decision using feedback – central heating system – automatically switch off when the desired temperature is reached



Images from AQA

2. Input Components

Name and symbol	Appearance	Image	Characteristics	Uses
Toggle switch (latching)	Available in a variety of shapes, sizes and switching positions depending on the task		Off and on positions, once switched they stay on (latched) until switched again	Lighting, power switch, control panels
Push to make (PTM) switch normally open	A wide variety of shapes, colours and sizes		The legs of the switch are only connected when the switch is pressed (momentary); it is normally open, no polarity	Door bell, intercoms, keyboards
Push to break (PTB) switch normally closed	They are identical to PTM switches so you may need to check the connectivity		The legs are only disconnected when the switch is pressed (momentary); it is normally closed, no polarity	Alarm systems, control systems
Light dependent resistor (LDR)	Small light sensitive panel often in plastic shroud, two wires for mounting to circuit		Resistance increases in the dark and decreases in the light, no polarity	Street lights, solar garden lights, security and child night lights, low-light meter for sporting events
Thermistor	Small coloured disc, two wires for mounting to circuit		Resistance changes with a change in temperature, no polarity	Thermostats on central heating systems, fridges and freezers, digital thermometers
Pressure switch	Come in all different shapes, sizes and colours.		Detects pressure from being pressed, can perform on/off tasks or detect gradual pressure being applied	Burglar alarm systems, video game floor mats, sensing fluid pressure in pipes

Image from AQA

3. Output Components

Name and symbol	Appearance	Image	Characteristics	Uses
Light emitting diode (LED)	Available in a variety of sizes, shapes and colours, most commonly 5mm round		Produces light, connected by an anode (+ve) and cathode (-ve), has polarity. Low voltage, low power consumption, long lasting, can be hard to change if broken	Low power lighting, torches, TV screens, power indicators
Lamp	Available in a variety of sizes, shapes, colours and levels of power (wattage) or brightness (lux)		Produces light, can be brighter than LEDs, less economical due to the heat produced. Not long-lasting but easy to change	Household lamps, car headlamps, street lights, floodlights and security lights
Buzzer	Small compact units in plastic casing, available in a variety of sizes and sounds		Mid- to high-pitched buzz created by fast oscillating electromagnetic parts, has polarity	Alarm systems, door entry systems, children's toys, electronics games
Speaker	Speaker cone shaped into magnetic coil at base, available in a wide variety of sizes		Full range of sound available, variety of power ratings (wattage), variety of frequency responses (treble to bass)	Headphones, music systems, intercoms, radios

D&T Unit 2.12 - Electronic Systems

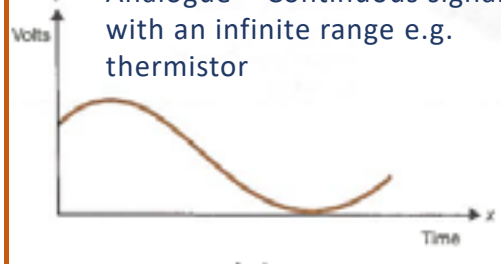
AQA Design & Technology 8552
Unit 2: Energy Materials Systems and Devices
2.12 Electronic systems processing

1. Processes

Components that process electronic signals and enable output devices to perform tasks. This is controlled by an integrated circuit (IC) e.g. A microcontroller

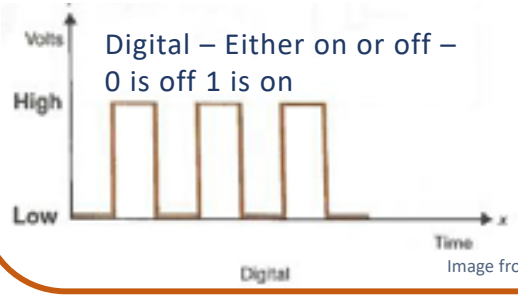
2. Digital and Analogue Signals

Analogue – Continuous signal with an infinite range e.g. thermistor



Analogue

Digital – Either on or off – 0 is off 1 is on



Digital

Image from AQA

3. Counters

Counters – Keep count of how many times something occurs, output information to a **seven segment display.**

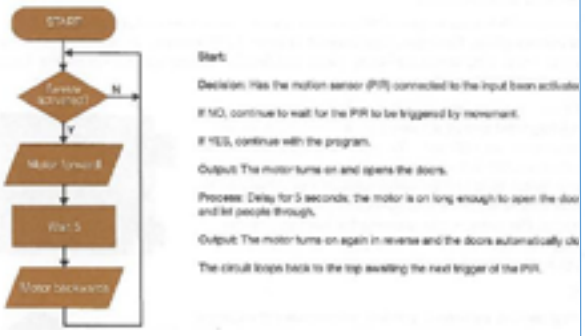
4. Programming

Micro controllers also called Peripheral interface controllers (PICs) can be programmed to perform differently by a computer.

Timers

Devices used to perform specific tasks. 2 types monostable and astable.

Monostable – output turned on for a set period of time e.g. Automatic doors



Astable – fluctuates between on and off – oscillating output e.g. Seatbelt alarm in a car

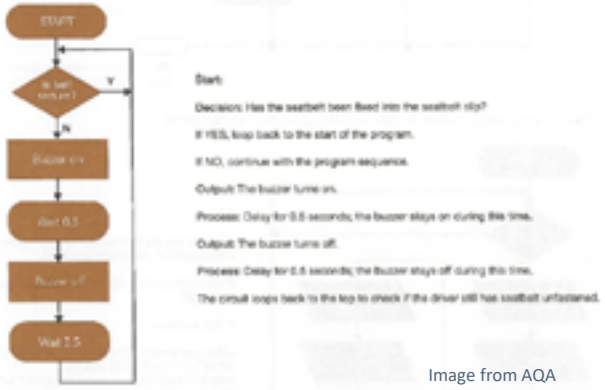
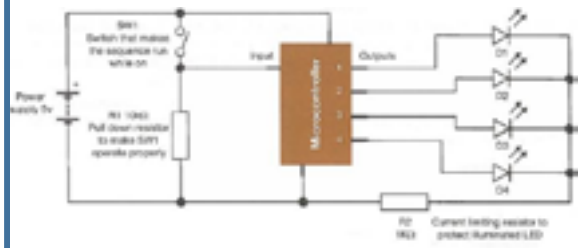


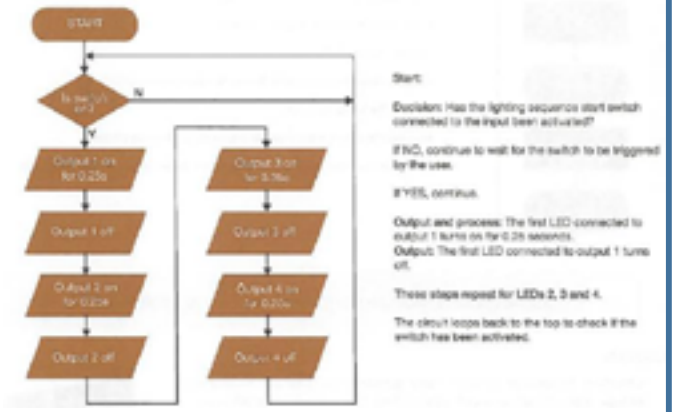
Image from AQA

5. Programming 2

Microcontrollers – How a microcontroller would control a bike light.



Program for the microcontroller to make LED's flash in sequence

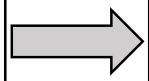
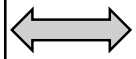


D&T Unit 2.5 - Mechanical Devices

AQA Design & Technology 8552
Unit 2: Energy, Materials, Systems and Devices
2.5 Mechanical Devices

1: Mechanical Devices - Motion

There are four types of motion:

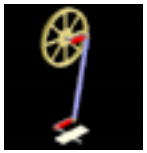
Linear Motion is movement in one direction along a straight line.		
Oscillating Motion This motion is similar to reciprocating motion, but the constant movement is from side to side along a curved path.		
Rotary Motion Examples of circular motion include a ball tied to a rope and being swung round in a circle		
Reciprocating Motion, this is repetitive up-and-down or back-and-forth linear motion		

2: Mechanical Devices – Levers

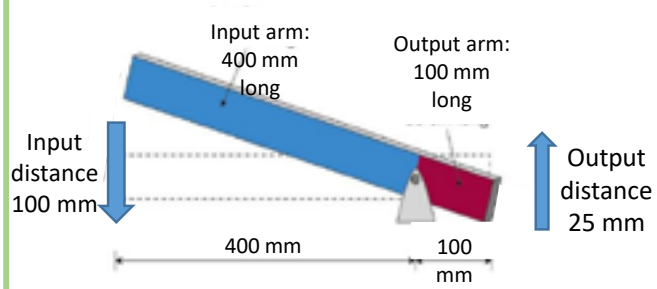
There are three classes of levers.

Class One A class one lever has its input on one side of the fulcrum and its output on the other.		
Class Two A class two lever has its input at one end of the lever, its output in the middle and fulcrum at the other end.		
Class Three A class three lever has its output at one end of the lever, its fulcrum at the other with its input in the middle.		

3: Mechanical Devices – Linkages

Reverse motion linkage	The reverse motion linkage changes the direction of the input motion so that the output travels in the opposite direction. If the input is pulled the output pushes and vice versa. It uses a central bar held in position with a fixed pivot (fulcrum) that forces the change in direction and two moving pivots which are connected to the input and output bars.	
Parallel motion or push/ pull linkage	The push/pull linkage maintains the direction of the input motion so that the output travels in the same direction. If the input is pulled the output is pulled and so on. It uses three linking bars, four moving pivots and two fixed pivots.	
Bell crank linkage	The bell crank linkage changes the direction of the input motion through 90 degrees. It can be used to change horizontal motion into vertical motion or vice versa. It uses a fixed pivot and two moving pivots.	
Crank and slider	The crank and slider linkage changes rotary motion into reciprocating motion or vice versa. It uses a crank which is held with a fixed pivot. A connecting rod uses two moving pivots to push and pull a slider along a set path.	
Treadle linkage	The treadle linkage changes rotary motion into oscillating motion or vice versa. It uses a crank which is held with a fixed pivot. A connecting rod uses two moving pivots and a further fixed pivot to create a windscreen wiper motion.	

4: How to work out a levers distance of travel



Output ÷ Input x Input distance = Output distance

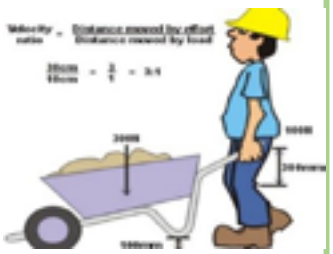
100 ÷ 400 x 100 = 25 mm

5: How to work out the Mechanical Advantage

Or use the following formula:

MA = Load = 300N = 3
Effort 100N 1

This is written as 3:1 or just MA of 3



D&T Unit 3.1 - Paper & Board

AQA Design & Technology 8552
Unit 3: Materials and Working Properties
3.1 Paper and Board

1. Paper

Type	Description and uses
Layout paper	• lightweight, thin white paper • used for initial ideas • takes colour media well • low cost
Tracing paper	• thin, translucent paper • making copies of drawings • high cost
Cartridge paper	• good quality white paper • available in different weights • general purpose work • can be used to make simple models • medium cost
Bleedproof paper	• smooth, hard paper • used with water-based and spirit-based felt-tip pens • medium cost
Grid paper	• printed square and isometric grids in different sizes • a guide for quick sketches and working drawings • low cost

2. Selection of materials or components

When selecting materials and components considering the factors listed below:

- Functionality: application of use, ease of working
- Aesthetics: surface finish, texture and colour.
- Environmental factors: recyclable or reused materials, product mileage.
- Availability: ease of sourcing and purchase.
- Cost: bulk buying.
- Social factors: social responsibility.
- Cultural factors: sensitive to cultural influences.
- Ethical factors: purchased from ethical sources such as FSC.

What is the FSC? http://www.fsc-uk.org/en-uk/about-fsc/what-is-fsc/fsc-principles

3. Boards

Type	Description and uses
Corrugated card	• strong and lightweight • used for packaging protection and point of sale stands • available in different thicknesses
Duplex board	• large foam-based board • different finishes available including metallic and hologrammatic • used for food packaging, e.g. take-away pizza boxes
Foil lined board	• quality cardboard with a aluminium foil lining • ideal for ready made meals or take away meal cartons • The foil retains the heat and helps keep the food warm
Foam core board	• very light, very stiff and very flat. • It has a white, rigid polystyrene foam centre, with smooth white paper laminated onto both faces. • It is easy to cut with a knife, a mount cutter or on a wall cutter • great for modelling
Ink jet card	• Has been treated so that it will give a high quality finish with inkjet ink • available in matt and gloss
Solid white board	• top quality cardboard made from quality bleached wood pulp. • used for hard backed books and more expensive items • excellent print finish

4. Paper and Boards- Stock sizes and weights

Paper and board is available in sizes from A0 (biggest) to A7 (smallest).
The most common size is A4.
Each size is half the one before, eg A4 is half the size of A3.
They are also sold by weight:
GSM – grams per square metre.

Card thickness or calliper is traditionally measured in **Microns**. 1000 **Microns** = 1mm, so the higher the value, the thicker the **card** or paper.

5. Properties of paper and boards.

Type	Weight or thickness	Uses	Relative cost (10= high)
Newsprint	50gsm	Newspapers	1
Layout Paper	60gsm	Sketches and tracing	3
Tracing Paper	70 gsm	Tracing	4
Sugar Paper	90gsm	Cheap mounting work	2
Inkjet/Photo paper	150-230gsm	Photos/Presentations	9
Board (Card)	230-750 microns	Model-making	5
Mount Board	230-1000 microns	Model-making, High picture quality mounting	9
Corrugated Card	3000-5000 microns	Packaging protection	5

7: KEY WORD FOCUS

You should be able to explain the meaning of each of these words by the end of this rotation.

GSM	Grams per Square Metre
Microns	Thickness of paper or card. 1000microns =1mm thickness

D&T Unit 3.2 - Boards

AQA Design & Technology 8552
Unit 3: Materials and Working Properties
3.2 Natural and Manufactured Boards

1. Woods

Man-Made Woods

Medium density fibreboard (MDF)	Description: •Has a smooth, even surface •Easily machined and painted •Available in water and fire resistant form •Often veneered or painted to improve its appearance	Uses: •Furniture and interior panelling
Chipboard	Description: •Made from chips of wood glued together with urea formaldehyde (glue) •Usually veneered with an attractive hardwood or covered in plastic laminate	Uses: •Kitchen and bedroom furniture •Shelving and general DIY work
Plywood	Description: •A very strong board, constructed of layers of veneer or plies, which are glued together with the grains at 90° to each other •Hardwood and exterior grades available	Uses: •Furniture making •Boat building and exterior work
Hardboard	Description: •A very cheap particle board •Can have a laminated plastic surface	Uses: •Kitchen unit and furniture back panels

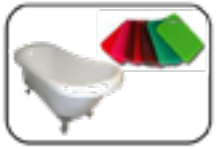
Hard Woods

Oak	Description: •A very strong, light-brown wood •Open grained •Very hard, but quite easy to work with	Uses: •High quality furniture •Beams used in building •Veneers
Mahogany	Description: •Reddish brown in colour •Easy to work with	Uses: •Indoor furniture •Shop fittings •Bars •Veneers
Beech	Description: •A straight- grained hardwood with a fine texture •Light in colour •Very hard but easy to work with •Can be steam bent	Uses: •Furniture •Toys •Tool handles
Ash	Description: •Open grained •Easy to work with •Has cream colour when stained black •Can be laminated (i.e. sliced into veneers which are glued together)	Uses: •Tool handles •Sports equipment •Furniture •Ladders •Veneers

Soft Wood

Pine	Description: •Pale yellow coloured with dark lines and a fine, even texture •Medium in weight •Stiff and stable •Inexpensive	Uses: •Readily available for DIY work •Widely used for constructional work and simple joinery •Furniture

2. Plastics

Acrylic		Properties: • Hard wearing • Will not shatter • Can be coloured • Bathtubs, School Projects, Display signs
Polypropylene		Properties: •High impact strength •Softens at 150°C •Can be flexed many times without breaking •School chairs, Crates
High Impact Polystyrene (HIPS)		Properties: •Light but strong •Widely available in sheets •Used for casings of electronic products
Polythene (LDPE)		Properties: • Weaker and softer than HPDE. • Lightweight • Carrier Bags + Squeezy Bottles
Polythene (HDPE)		Properties: •Stiff strong plastic •Used for pipes and bowls •Buckets
Urea formaldehyde		Properties: •Colourless plastic •Can be coloured •Door and cupboard handles, Electrical fittings

3. Material Properties

Strength
The ability of a material to stand up to forces being applied without it bending, breaking, shattering or deforming in any way.

Elasticity
The ability of a material to absorb force and flex in different directions, returning to its original position.

Ductility
The ability of a material to change shape (deform) usually by stretching along its length.

Malleability
The ability of a material to be reshaped in all directions without cracking.

Hardness
The ability of a material to resist scratching, wear and tear and indentation.

Toughness
A characteristic of a material that does not break or shatter when receiving a blow or under a sudden shock.

3. Metals

Aluminium	Properties: •Light Weight •Light grey in colour •Can be polished to a mirror like appearance •Rust resistant	
Mild Steel	Properties: •Heavy •Dark grey in colour •Rusts very quickly if exposed	
Stainless Steel	Properties: •Heavy •Shiny appearance •Very resistant to wear / rust.	
Cast Iron	Properties: •Re-melted pig iron with some quantities of other metals •Strong in compression •Brittle	
Copper	Properties: •Reddish brown metal •Soft •Excellent conductor of heat and electricity	
Brass	Properties: •Yellow metal •Hard •Alloy	

4. Composites

Carbon Fibre	GRP Fibreglass
Expensive in comparison to other materials. Very good strength to weight ratio. Used in the manufacture of high end sports cars and sports equipment. 	GRP is composed of **strands of glass which are woven to form a flexible fabric. The fabric is normally placed in a mould and polyester resin is added.** **Glass reinforced plastic is lightweight** and has **good thermal insulation properties.** It has a **high strength to weight ratio** 

D&T Unit 3.3 - Textiles

AQA Design & Technology 8552
Unit 3: Materials and Working Properties
3.3 Textiles

1. Fabrics

Natural Fabrics

Cotton	Soft, good absorbency, prints well, machine washable, strong breathable	Origins from the Cotton Plant.	Uses: Jeans, towels, Shirts, dresses, underwear
Wool	High UV protection, flameproof, breathable, durable insulating	Origins from Sheep.	Uses: Jumpers, Coat, blankets
Silk	Smooth, Soft, Strong	Origins from the silk worm.	Uses: Wedding dresses, lingerie.
Linen	Strong, cool in hot weather	Origins from the flax plant	Uses: Trousers, tops.
Leather/Suede	Strong, hardwearing, durable.	Origins from the skin of animals, mainly cows.	Uses: Jackets, Trousers, Shoes.

Synthetic fabrics

Polyester	Durable, wrinkle resistant, stain resistant	Uses: Shirts, jackets. Also used in safety belts, conveyor belts and tyre reinforcement.
Polyamide (Nylon)	Durable, high abrasion resistance	Uses: Sportswear, carpets.
Elastane (Lycra)	Stretchy, durable, high stain resistance	Uses: Sportswear, Swimwear, tights.
Viscose	Soft, comfortable, absorbent, easily dyed.	Uses: Dresses, linings, shorts, shirts, coats, jackets and outerwear.
Acrylic	Absorbent, retains shape after washing, easily dyed, resistance to sunlight.	Uses: Jumpers, tracksuits, linings in boots.

1. Fabrics

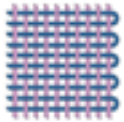
Blended and mixed Fabrics

These fabrics take on the positive characteristics of their combinations

Cotton/Polyester	Easy care and crease resistant	Uses: School shirts.

2. Fabric Construction

Woven

Plain Weave	Extremely strong and hard wearing	
Twill Weave	Extremely high strength and abrasion resistant.	

Knitted

Knitted fabrics	Stretchy, soft and comfortable.	

Non-Woven

Bonded Fabrics	These are webs of fibres held together by glue or stitches.	
Felted Fabrics	Felt is made by combining pressure, moisture and hear to interlock a mat of wool fibres.	

3. Care Labels


Washing Label- will usually have a max. temp number included


Hand Wash only


Do not wring out


Tumble Dry

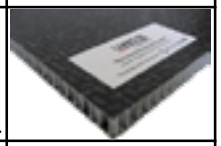
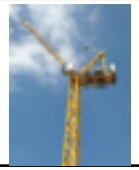

Iron on low heat. The more dots the higher the heat setting


Do not bleach

D&T Unit 4.1 - Forces & Stresses

AQA Design & Technology 8552
Unit 4: Specialist technical principles
4.1 Forces and Stresses

1: Forces and Stresses

Force	Description	A fair test for each force/stress.	How a material / object can be adapted to resist	Examples
Tension	Forces pulling in opposite directions.	Apply the same weight to each material and suspended in the same manner.	Concrete can have steel bars inserted to reinforce.	
Compression	Forces that are trying to crush or shorten.	Insert materials into a vice/clamp and apply the same amount of twists to the handle.	Composite panels can have a honeycomb structure sandwiched in the middle to resist.	
Bending	Flexing force	Apply the same weight to the material.	Steel beams have an I profile to resist bending.	
Torsion	Twisting force.	Use clamps & stands to hold the materials and turn in opposite directions at the same angle.	The diagonals on a tower crane help the structure against torsion.	
Shear	A strain produced when an object is subjected to opposing forces.	Place the material between a tool that works in opposite directions. e.g. Shears	Bolts are hardened and have unthreaded shanks to help stop shearing.	

2. Improving functionality of materials

Process	Description	Result	Example	Visual Example
Lamination	Layering of thin materials	Depending on the direction of lamination it can make boards stiffer or actually more flexible	Plywood: Laminations at 90 degrees to each other - Rigid Flexi-ply: laminations all the same direction - Bendy	
Bending / Folding	Folding a 90 degree edge on sheet metal / plastic	Makes the panel more rigid	Body panels on cars	
Webbing	Modern polymer fabrics woven together	Extremely strong and durable fabric	Seat belts	
Fabric interfacing	A strengthening material added to the unseen face of a fabric	Adds strength / shape	Shirt collars	

1: The Modification of properties for specific purposes

Process	Material	Purpose
Seasoning	Timber	Removes the moisture content so that the timber will not shrink, warp and twist
Annealing (heating)	Copper	Softens the copper to make it more malleable
Addition of Stabilisers	PVC	Stops plastic become brittle with exposure to the sun

Timber being seasoned in a kiln

Copper bowl being annealed

Metal compounds (stabilisers) are added to PVC for UV protection

D&T Unit 4.20 - Improving Functionality

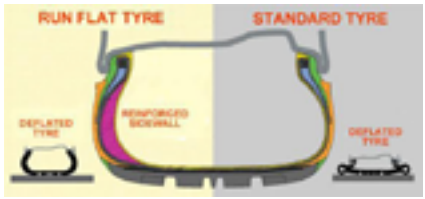
AQA Design & Technology 8552
Unit 4: Common specialist technical principals
4.20 Improving functionality

1. Key Terms

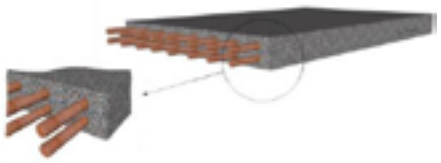
Reinforcing

Strengthening a material so it withstands force and stress

Car tyre

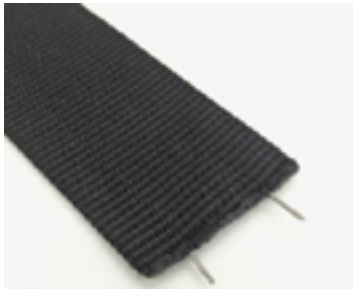


Concrete



Denim - rivets

Webbing



2. Key Terms

Laminating

Stiffening a material to improve strength, stability and flexibility.

Plywood

Paper

3. Key Terms

Fabric Interfacing

An additional layer of fabric to support certain areas of fabric.

Shirt Collar

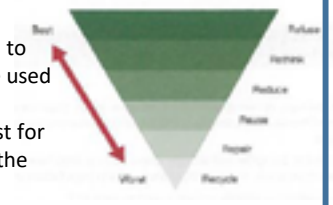
Baseball cap - peak

D&T Unit 4.4 - 6Rs

AQA Design & Technology 8552
Unit 4: Specialist technical principles
4.4 6Rs

The 6 R's

The 6 Rs are an important checklist. They are used by designers to reduce the environmental impact of products. They can also be used to evaluate the environmental impact of other products.
The hierarchy of sustainability places the strategies that are best for the planet about those that have a greater negative impact on the environment.



1. Refuse

The first stage in the process is to ask whether the proposed product, part, purchase or even journey is required at all. Asking the question 'Is it really necessary?' can play a major role in reducing the demand on materials. Simply not using something saves 100% of what you have chosen not to use. Example include:

- Using your own carrier bag rather than purchasing a new one.
- Walking or cycling to school instead of being driven.
- Not using products such as some pesticides that are known to be harmful to the environment.
- Not eating (or using) products that are over-farmed, over-fished or on the endangered list.

2. Rethink

Consumers have a growing number of choices to make about where and on what they spend their income. Greener and more sustainable options are not always the cheapest or the best, but making informed decision and rethinking ones spending power can play a huge part in conserving resources.
Deciding on the design of a product, e.g. the materials being used in its production, will directly affect its sustainability. The types of questions designers need to ask are:

- Are the materials locally sourced?
- Are they sustainably produced?
- Is it essential to use this material, of which there is a finite supply?

By rethinking how the product is likely to be made, the product can often be redesigned in a more responsible way.

3. Reduce

Reduction is often the result of having re-thought a design or action. Materials and energy are saved due to efficient manufacturing practices and the use of clever design, incorporating sustainable materials.

- Modern materials that are lighter and stronger than traditional ones have contributed to the miniaturisation of products, saving material and energy in manufacture and use.
- Reducing the complexity or number of parts a product uses and reducing the number of different materials in a product makes recycling easier.
- In factories, schools and hotels, fitting motion sensitive lighting and smart heating systems can significantly reduce energy usage.
- Many large companies employ staff to conduct 'energy walks' to turn off unused appliances and lights and to ensure windows and doors are shut to conserve heat.

4. Reuse

Reusing products multiple times for the same purpose is also known as **primary recycling.** Reusing a product in a different way from the one it was designed for is known as **secondary recycling.**
The classic glass milk bottle is reused many times before it reaches the end of its useful life, as which point it is recycled. A plastic milk bottle, however, is intended to be used only one, although it can have many different subsequent uses.
Donating to and buying from charity shops extends the life of products and in recent years there has been a resurgence of in products having second lives, thanks to websites such as eBay, Freecycle or Gum tree.

It is also becoming popular for furniture and other household items to be **upcycled** with a coat of paint and some minor repairs or adaptations, extending their useful life by many years.

5. Repair

Being able to repair a product when it is broken or worn is a way of extending its life and delaying the purchase of a new one. Repairing is a positive option over replacement as it means that only some parts of the product are replaced. This creates jobs for skilled people who conduct repairs and stimulates a spare parts market.
Unfortunately, repairing products has become harder over years. Growing number of products are not design to be repaired. There are a number of reasons why items may be designed this way, but it is usually because they are cheaper to replace than repair. Some products, especially modern electronic products, are designed to last only a few years as technology dates quickly and older products will be superseded by newer, faster, more efficient models. This is called **planned obsolescence.**

6. Recycle

Tertiary recycling, although a very important stage, is lower down the hierarchy of preferred options because most materials that are recycled this way tend to be of lower quality than the original material. It takes a lot of energy to recycle materials.
This form of recycling requires the reprocessing of the material and in many cases involves chemicals and/or heat to recover the recycled materials. In an ideal world, tertiary recycling would remove all recyclable materials from our household waste so that only biodegradable materials would be left. Only very few parts of the world are set up to cope with this level of processing.

7. Sustainability

Our planet has to provide all of our basic human needs, such as food, shelter and warmth.
Designers now have a much better understanding of which materials are sustainable and which are not.
The general principle is that resources fall into two categories:
Finite resources – are ones which are in limited supply or cannot be reproduced.
Non-finite resources – are ones which are in abundant supply and are unlikely to be exhausted.

8. Recyclable materials

Once all useful and recyclable materials are removed, the majority of the remaining waste is organic matter and can be processed in one of two ways; **'Recover'** or **'Rot'**. Food waste and garden waste can be processed at a high temperature and turned into compost. The waste can also be buried in **landfill** sites where the resulting methane gas from the rotting matter is collected and burned and used to generate heat or electricity in the same way.

D&T Unit 5 - Materials

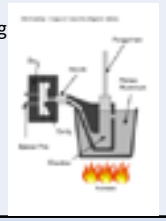
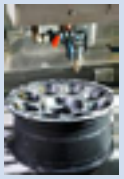
AQA Design & Technology 8552
Unit 5: Materials
Original source, commercial manufacturing and surface finish

From AQA

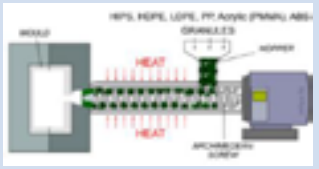
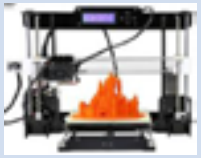
1. Wood

Material	Original Source	Commercial Manufacturing	Surface Finish
Hardwood - Oak	Deciduous Tree	CNC Routing and turning 	Oil – Soaks into the timber, must be reapplied frequently.
Softwood - Pine	Coniferous Tree		Wood preservative – Protects from fungal or insect attack and prevents rot. Reapplication may be required.
Manufactured Board - MDF	Trees		Paint – painted on with a roller or brush, can also be sprayed. Needs a primer and undercoat.

2. Metal

Material	Original Source	Commercial Manufacturing	Surface Finish
Ferrous metal – Steel	Iron ore (rocks and minerals)	Hydraulic Press 	Galvanising: involves dipping metal into a bath of molten zinc. The zinc provides a good corrosion resistant finish.
Non-ferrous metal - aluminium	Bauxite ore (rocks and minerals)	Die Casting 	Anodising: provides a hard-wearing corrosion-resistant finish. Anodising involves electrolysis and uses acids and electric currents.
Alloy - Duralumin	Metal ore (rocks and minerals) Alu 94% Copper 4% Magnesium 1% Manganese 1%	CNC Milling 	Powder coating: process used in industry. The powder is sprayed onto products which run through an oven.

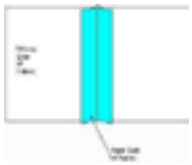
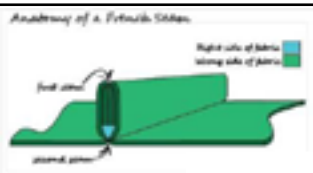
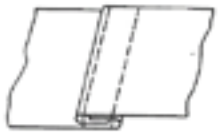
3. Polymer

Material	Original Source	Commercial Manufacturing	Uses
Thermoplastic - ABS	Crude Oil	Injection Moulding 	Toys (Lego), hard hats, electronic castings
Thermosetting plastic		Press Moulding 	Electrical fittings, handles
Biodegradable Plastic – Polylactic acid (PLA)	Vegetable starch	3D printing 	Rapid prototyping, disposable items

D&T Unit 5E.1 - Textiles

AQA Design & Technology 8552
Unit 5E: Textile based Materials
5E.1 Working with textile based Materials and Fixings

1. Construction Techniques

Open seam	This is used as the main method for constructing textile products. It is normally finished with overlocking to neaten the edges and prevent fraying.	
French Seam	This seam is used on delicate fabrics that can not be overlocked. It is generally used within lingerie.	
Machine and Fell Seam	Very strong double stitched seam for heavy fabrics. Commonly used on jeans.	
Overlocking	Used to neaten seams to prevent fraying. Generally hidden on the inside of a product.	
Binding	Used to finish a curved edge on a product, where over-locking is not suitable.	

2. Decorative Techniques


Applique


Heat Transfer


Hand Embroidery


Beads & Sequins


Buttons


Gathers


Tie Dye

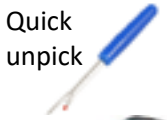

Batik


Tucks

Pin Tucks

3. Equipment

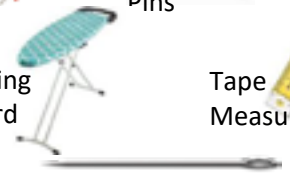

Sewing Machine


Quick unpick


Pins


Fabric Shears


Overlocker


Ironing Board


Tape Measure


Sewing threads


Iron


Needle

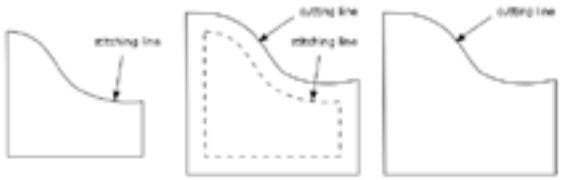

Embroidery Scissors

Pinking Shears

4. Key Terminology

Pattern
This is the term given to a paper template to aid in the cutting out of fabric for accurate construction.

Seam Allowance
This is usually a 1cm 'boarder' around your pattern to allow for construction to be the correct size.



Right Side
This is the 'correct' side of the fabric that you wish to see.

Wrong Side
This is the side of the fabric that you do not wish to see.

Pressing
This is the term given when ironing your product; e.g. press your seams open, would refer to when an open seam is sewn and they need to pressed outwards to give a flat finish.

D&T Unit 5.1 - Sources 1

AQA Design & Technology 8552

Unit 5B: Specialist Technical Principles – Timber Based Materials

5.1 – Sources, origins and properties Pg. 1

1.1 Timber Conversion

After a tree is felled (chopped down) and then cut into manageable lengths, it is then converted into planks. At this point is in known as timber. Timber is supplied in two main types of finish. **Rough Sawn** or **planed all round (PAR).** Rough sawn timber is not planed and is rough all around to touch. It is often used for exterior tasks or where the finish is not important. PAR has a much smother finish as it has been planed down on all sides. It is used for furniture and internal features such as windows or doors. Finishes such as varnish or paint can be easily applied. Planed timber is less absorbent than rough sawn timber.

Timber is available in many different shapes and sizes, standardized to enable different varieties to be used together.

1.2 Seasoning

Once timber is converted into a workable form, it is **seasoned** in order to reduce the moisture content. Typically a newly felled tree will have a moisture content of over 50% and is known as green timber. The moisture content needs to be reduced to below 20% for most exterior applications, below 15% for interior work and below 10% for interior areas that are constantly heated.

Uneven evaporation of the water content can cause some common faults such as twisting, cupping and bowing which can render the timber useless for many tasks. If the end grain dries too quickly, it can cause the plank to split.

There are two methods of seasoning; air-drying or kiln drying . Air dried timber is stacked so that air can circulate around the planks and evaporation can take place. It takes approximately one year per 25mm of plank thickness to season and in the UK the moisture content typically reduces to around 18%.

Kiln-dried timber (A kiln is basically a Giant Oven) can have a much lower moisture content and it is a much faster process, meaning the timber can be sold much sooner. It costs more then air drying, as heat and pressure is used but no additional land is required to store the timber while seasoning takes place. Kiln dried timber is less prone to faults and the heat also kills off bacteria and insects that may attack the timber.

1.3 Manufactured Board

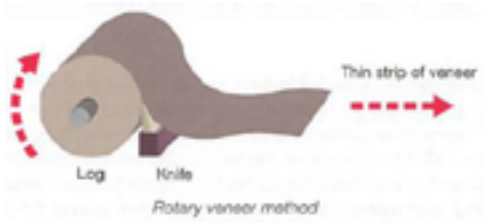
Natural timber is combined with the adhesive to make manufactured boards. They can be made from waste, low-grade and recycled timber and are usually produced in pale brown natural finish. Each manufactured board is produced in a slightly different way, the two main process used are **lamination** and **compression.**

Plywood and block board use the lamination method where layers of wood are bonded together using an adhesive. Medium Density Fibreboard (MDF), chipboard, oriented strand board (OSB) and hardboard use the compression method where wood is shredded, chipped or pulped, then heated and compressed under high pressure, in most cases using adhesives to bond the particles together.

Ply Wood | MDF | OSB | Chipboard

1.4 Veneer

Some manufactured boards are covered in a thin slice of natural timber called a **veneer.** These natural wood slices are taken from the trunk of a tree and are bonded to the surface of cheaper sheet materials. Veneers are commonly seen on medium density fiberboard (MDF) and plywood. There are two methods of veneer production; rotary and knife cut. Rotational veneer production produces the longest sheets and involves rotating a whole trunk on an industrial machine similar to a wood turning lathe. It is a bit like a huge pencil sharpener creating one long ribbon of veneer.



D&T Unit 5.1 - Sources 2

AQA Design & Technology 8552

Unit 5B: Specialist Technical Principles – Timber Based Materials

5.1 – Sources, origins and properties Pg. 2

1.5 Advantages and disadvantages of manufactured board

Manufactured Board	
• Available in large sheets, very stable which saves time and energy joining arrow planks together.	• Adhesives used to bond the boards can contain hazardous particles that can cause cancer.
• No defects such as warping. Twisting, cupping and splitting which occur in natural wood, meaning less waste.	• Machining and sanding some boards especially MDF, causes very small particles of dust to be released, easily breathed in, even through a mask.
• They do not have knots or resin pockets which can be hard to work around, avoiding waste and protecting tools from damage.	• Tools can blunt easily owing to the adhesives in the boards.
• Smooth finish which requires very little preparation.	• Many traditional wood joints cannot be used effectively with manufactured board.
• Makes use of low grade, recycled and waste wood.	• Edges can be hard to finish.
• Available in many different finishes, veneers and laminates.	• Most boards are prone to absorb moisture if not treated.

1.6 Additional common manufactured boards

Name	Characteristics	Uses
Blockboard 	Stable, tough, relatively heavy, finishes well, indoor use owing to adhesives used.	Furniture, doors, shelving, indoor construction.
Hardboard 	Flexible in large sheets, even strength, easily damaged by water unless treated. Inexpensive.	Furniture and picture frame backings. Internal panelling.
Oriented Strand Board (OSB) 	Rigid and even strength in all directions, good water resistance.	Construction hoarding, interior and exterior house building.

1.7 Additional softwoods

Name	Characteristics	Uses
Redwood 	Easy to work and machines well. Some rot resistance.	Outdoor furniture, beams, posts, decking, veneers.
Cedar 	Easy to work, can blunt tools, finishes well, naturally resistant to rot.	Outdoor furniture, fences cladding for buildings, roof shingles.

1.8 Sustainable timber production

Wood is considered to be a sustainable product, as new trees can be grown to replace those used for timber and fuel. The main issue facing timber production is that in many parts of the world, it is being used at a far greater rate than it is being replanted. The result is an unsustainable supply of timber, which is frequently illegally obtained. This is causing many problems to the land in the countries where it is happening. Some countries where it is happening. Some countries are suffering from **desertification** due to **deforestation**. This activity is also thought to be a contributing factor in **global warming.**

FSC FORESTS FOR ALL FOREVER™

PEFC Promoting Sustainable Forest Management www.pefc.org

D&T Unit 5D1 - Sources

AQA Design & Technology 8552
Unit 5D: Specialist Technical Principles – Polymers
5D1 – Sources, origins and properties Pg. 2

2.1 Plastics additives
Many different chemicals and compounds can be added to enhance the functional and aesthetic properties of plastics. **Pigments** are added to change the colour, **plasticiers** are added to increase felicity and **fragrances** can be added, as seen in some children's toys and air-freshening products.

UV light can make plastic brittle and faded.

Stabilisers can be added to make plastic resistant to heat and light. One of the main issues with plastic degradation is the effect that ultraviolet (UV) light has on it. Over time, plastic becomes brittle and can lose its colour, starting to yellow or fade. By adding UV stabilisers, this process can be slowed down, enabling a product to last longer and perform its task more efficiently.

2.2 Availability of plastics.
Plastics are abundant in our modern society and are available in many forms. They help us to solve complex design problems because they can be manufactured to have a very high strength-to-weight ratio and have many versatile properties. This means that we can use less materials to make a stronger product. Plastics last for a very long time which means they are a value for money material.

2.3 Sustainability of plastics
End of life considerations are important for all products, but as most plastics take so long to biodegrade extra care should be taken to decide how it should be managed.

Many responsible companies producing plastic products conduct a **Life Cycle Assessment** (LCA) which informs them of the environmental impact of manufacturing their products. The information gathered helps them decide how to deal with their product when it has reached the end of its working life.

Almost all plastics are recyclable or biodegradable in some form – however, the difference in the quality of the recycled products varies dramatically.

Thermosetting plastics are generally considered non-recycled although they are frequently ground down and used as a filler material or they are used for **energy recovery** through incineration.

Thermoplastics are much more easily recycled for use as a recycled plastic product. If the plastics are carefully separated into the different types, the resulting material remains high quality and commands a higher price than mixed plastics. It is important to recycle as much as possible, and poorly discarded plastics are becoming a major environmental concern, especially in our countryside, rivers and ocean.

2.4 Biodegradable plastics
Some of the newer plastics are made from vegetable starches and are fully biodegradable id composted. The natural bacteria in the soil break down the plastic very quickly, largely owing to being exposed to moister and higher temperature.

Modern biopolymer pellets are made from vegetable and corn starches.

Bioplastics are non-toxic and are already being widely used in a range of products. Since biopolymers readily decompose they cannot be recycled. Small amounts mixed in with other recyclable thermoplastics can produce low grade recycled plastic or render a batch unusable.

D&T Unit 5D1 - Sources 2

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Unit 5B: Specialist Technical Principles – Polymers
5D1 – Sources, origins and properties Pg. 3

3.1 Common biodegradable plastics
Starch based biopolymers and common thermoplastics

Name	Appearance	Image	Characteristics	Uses
Polyactic acid PLA	Smooth or textured finish, easily coloured		Widely used in 3D printers, available on reels, non-toxic, fully biodegradable, easily moulded	Bottles, pots, disposable food and drink containers, pens, phone cases and 3D printing products
Polycaprolactone PCL Polymorph 62°c Coolmorph ™ 42°c	An off-white mouldable translucent pellet which can be hand-shaped. Can be coloured with pigments		Easily mouldable and re-mouldable at low temperature in hot water, non-toxic, reusable and fully biodegradable	Repairs, hand-shaped artefacts, jewellery, modifications and personalisation of products. Excellent for prototyping and modelling
Polyhydroxy-butyrate PHB Biopol ™	Smooth or textured finish, easily coloured		Quite brittle with limited chemical resistance. Non-toxic, slow but fully biodegradable, easily processed and moulded.	Bottles, pots, household items and disposable food containers

Name	Appearance	Image	Characteristics	Uses
ABS Acrylonitrile butadiene styrene	Very Smooth finish, can be textured, easily coloured		Tough, hard, good chemical resistance, good impact resistance, can be 3D printed, easily injection moulded and extruded.	Electronic castings, 3D printed products, hard hats, Lego ™
Nylon Polyamide	Smooth, easily coloured, available in various thicknesses of sheet, bar, film or thread		Self-lubricating, very low friction, hard wearing, easily machined, can be woven into fabrics	Clothing, tights, rope, cogs, gears, bushes, pipes, tents, parachutes

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Unit 5D: Specialist Technical Principles – Polymers

5D2 – Working with polymer based materials and fixings Pg 4

4.1 Selecting appropriate plastics

Looking at the different types of plastics it is possible to work out which varieties can be used for a given task. Considerations will include:

- Aesthetics
- Size of product
- Where it will be used
- Stability
- Cost
- Size of material available
- Required finish
- Availability
- Weight
- Desired properties
- Workability
- How long it is to last

4.2 Standard material stock forms, types and sizes

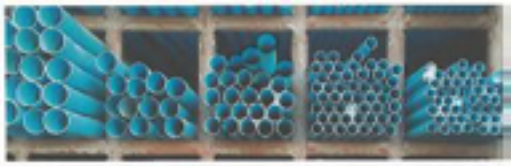
Most plastics comes in arrange of standard shapes and sizes. This enable materials to be more interchangeable, and the manufactures of tools and equipment to be aware of the material they need to cope with.

4.3 Sheet, rod and tube sizes

- Metric is the standard measurement system for plastic forms. Sheet material normally starts at around 1mm thick and increases to over 20mm thick; lengths and widths vary depending on the type of plastic and the thickness required. Rod is available from 2mm to well over 100mm diameter and tubing is available from 5mm to around 1 meter in diameter.

- Tubes are a little more complicated to measure, as you need to decide on the wall thickness you require. Too thin a wall section can mean the product lacks strength and too thick can add unnecessary weight and cost to your product.

- Wall thickness is usually measured in millimeters; however, traditionally it is known as the **gauge** and some tubular plastics may still be sold by gauge. As the gauge number increases, the wall thickness decreases.



4.4 Plastics as powder granules, foam and films

The majority of the plastics that are used in the design and technology workshop tend to be sheet, rod or tube, but they are also available in a variety of other forms.

Powders and granules are mainly used in plastic processing such as plastic dip coating, injection moulding and extrusion. The granules are heated until they become soft and can then be shaped as required. Powders tend to be bonded to the surface of hot materials such as metals. Both are available in a wide range of colours.

Rolls of plastic film are widely used for packaging, especially in the food industry. Films can easily be heat-sealed to make them airtight and tamper proof.

Expanded plastics and foams are also used by the packaging industry, and one of the most common forms in expanded polystyrene. It is incredibly lightweight and protects the contents of a packet from impact damage. Expanded plastics are also used in cars to soften areas such as dashboards and bumpers, which are prone to impact.

Plastic foams are used by the furniture industry to soften seating and beds and can even be used as floor coverings that are soft underfoot.

4.5 Standard Components

To temporarily attach plastic to itself or to other material a few different methods can be used. Machine screws have a finer thread than self-tapping screws and they have no point on the end. Plastic can be internally tapper with a screw thread, allowing machine screws to be inserted, but the internal thread can easily strip if too much **torque** is applied.

Self -tapping screws can be used without the need for a screw thread to be cut first. This special screw cuts its own thread. The correct size pilot hole must be drilled first otherwise plastics can crack or shatter as pressure is applied when it is screwed into position.

4.6 **Hinges**

Hinges are used to attach doors, windows and other openings to frames and carcasses. They can be made from many different materials but most commonly they are made from plastic and metal. Plastic hinges can be welded, glued, screwed or bolted to other plastics. Many varieties of hinge come in brass or steel finish; the steel versions can be galvanized to protect them from rusting when outside. Metal hinges will need to be bolted or screwed into position. Screws and bolts will need to be a countersunk variety in order for them to lay flat or flush, so the hinge can completely close. Metal hinges are often sold in pairs, plastic hinges are sold in pairs or by length. Both need to be carefully aligned to ensure accurate operation.

Common types of hinges for use with plastics.

Name	Characteristics	Image	Name	Characteristics	Image
Plastic butt hinge	Standard hinge for openings, can be glued, welded or bolted to the product		Piano style hinge	Long plastic butt-style hinge, cut to required length	
Plastic fold hinge	Extruded profile, holds two sheets of plastic, single centre layer allows flexing		Plastic or glass door hinge	Allows sheet materials to be held with clamping grub screw	
Butterfly hinge	Decorative version of the butt hinge, can be mounted on plastic with countersunk nuts and bolts		Flush hinge	Thin profile, mounted with small countersunk nuts and bolts	

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Unit 5D: Specialist Technical Principles – Polymers

5D2 – Working with polymer based materials and fixings Pg 5

5.1 Shaping, processing and machining polymers

A vast array of tools is available in the workshop in order to help us make the products we require. Tools enable us to mark out materials, cut to size, waste (remove material), add material, deform, reform, and apply a finish.

Before undertaking any activity in a workshop you need to be aware of the Health and Safety rules that apply to each of the machines, tools, pieces of equipment and materials that you use. Your teacher will guide you in tis area, but you must ensure that the correct personal protective equipment (PPE) is worn when operating machinery and using tools and equipment.

5.2 Drilling

Drilling a hole into plastic requires careful speed control. Large diameter drill bits require a slower speed than narrower ones to avoid overheating and the potential for the plastic to melt. The feed rate is another factor to consider – too much pressure can cause the plastic to crack.

A pillar drill is good for accuracy and is powerful enough to drill larger holes in thicker materials. A cordless drill is very adaptable and usually has variable speeds.

5.3 Common drill bits used with plastics

Name	Characteristics	Image	Name	Characteristics	Image
Twist drill bit	General purpose drill bit, also used on plastic, metal and wood		Hole saw	Used to cut large holes. They can easily overheat due to fast peripheral speed	
Countersink bit	Used to ensure countersunk screw heads are flush with the surface		PCB drill bits	Very small drill bits for drilling copper-clad plastic board, fitted to a shank for ease of mounting	

5.4 Cutting and sawing plastics

Saws are used to cut materials to size. The hacksaw and junior hacksaw are common plastic cutting handsaws that are used to cut straight lines. The coping saw and Abrafile enable curved lines to be followed in thin material. The hacksaw has a robust blade and be used for thicker material than the junior hacksaw, which is for light work.

The scroll saw and band saw are powered and can be used for curves and straight cuts through different thicknesses of material. With powered saws, you need to be aware that the plastic can easily overheat and melt. This can clog the blade and you may find the plastic bonds itself back together after being cut.

Extraction and appropriate PPE needs to be considered when using powered equipment.

5.5 Wasting by hand and abrading

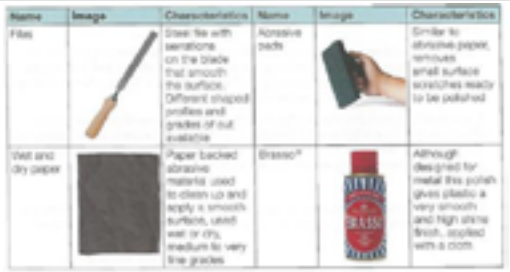
Using hand tools and power tools to accurately shape plastic takes practice in order to achieve a high quality finish.

Abrading plastic can be performed by machines but is best finished and polished by hand. Hand abrading using files and wet-and-dry paper is best for hard-to-reach areas and it also allows you to apply force where it is needed most.

Wet and dry comes in different grades; the grit density determines how rough or smooth it is. Similar to glass paper, it is measured in grit per square inch – the lower the grit number, the rougher it is. Wet and dry paper starts at 150 grit and is available up to 2000 grit, which is so fine it has a polishing effect.

A disc or belt sander is best used for easy to reach sections that can be held safely. Bobbin sanders can be used for internal curves.

5.6 Wasting and abrading tools and materials



5.7 Addition, Deforming and reforming

Laminating with plastics

Laminating Involves bonding strips or sheets of materials together in layers. It can be done with thick materials in order to create very strong structures or very thin materials to create tough and flexible products. Plastics are frequently laminated with other materials such as glass or wood to improve aesthetics or functionality.

Laminated safety glass is now used in all car windscreens. It contains a thin film of plastic, usually polyvinyl butyral (PVB) or ethylene-vinyl acetate (EVA) which holds the inner and outer glass layers together when it is cracked or shattered. Without the laminated plastic layer, the glass would fly out, potentially causing serious injury.

Plastic laminated boards are very popular for flooring products, kitchen worktops and much flat packed furniture. With these products, the plastic laminate is bonded to the surface of a manufactured board with adhesive – usually a contact adhesive that creates a strong and instant bond.

Plastic laminate comes in many colours and different effects. It can even be printed on with photographic images and is most popularly used to resemble marble or granite for kitchen worktops and wood grain effect for flooring and furniture products. The quality can be so good that it is sometimes difficult to tell if it is real or not.

The laminating process involves layering the materials with an adhesive and holding it in the chosen position using a former or jig. Pressure is applied though a press, a set of clamps or by using a vacuum. In industry melamine formaldehyde is often used for lamination, as it provides a very robust and hard-wearing surface and has a high quality finish.

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Unit 5D: Specialist Technical Principles – Polymers

5D2 – Working with polymer based materials and fixings Pg 6

6.1 Line bending

Banding most plastic involves heat unless they are very thin. Strip heaters are used for line bending which is a good way to create a permanent fold in a piece of thermoplastic such as acrylic.

Line bending process:

1. Use a marker pen or chinagraph pencil to mark out where the bend lines will be
2. Turn on the stripheater so that it comes up to a working temperature
3. Put on heat-proof gloves and have a tray of water ready to cool the workpiece
4. Place the marked line of the workpiece across the heating strip
5. Allow the plastic to heat through (the time needed will depend on the thickness of the material, thicker materials may need to be turned over to heat from both sides)
6. Test for flexibility as the workpiece approaches the right temperature (too cool can lead to it cracking, too hot can lead to scorching and blistering)

Bend the workpiece to the required angle (a jig or former may be used to ensure accuracy)

7. Once the workpiece has set it can be cooled in the water tray

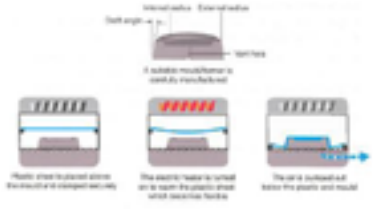
6.2 Vacuum forming

Vacuum formed products include items such as plastic egg boxes and bath tubs. A sheet of thermoplastic is heated and pressed into the former (mould) by atmospheric pressure, as the vacuum reduces the pressure below the softened thermoplastic. The plastic takes on the shape of the mould, then cools and sets in position before the mould is removed.

HIPS (High impact polystyrene) is the most commonly used plastic to vacuum form within schools. In industry PETG, ABS and acrylic are also used.

To ensure a good product is made, the mould must:

- Have a positive draft angle >3°c to ensure easy removal of the material from the mould.
- Avoid under cuts that would make the removal of the mould impossible.
- Not have too deep a profile so that the plastic is drawn too thin and could easily burst.
- Have vent holes drilled to avoid vent pockets where there are dips in the profile.
- Have corners and edges rounded with a small radius to aid removal.
- Have a smooth finish so as not to adhere to the hot plastic – a release agent can be applied to the mould to assist removal.



6.3 3D printing

3D printing enables physical objects to be formed from reels of thermoplastics. 3D printers use special CAD files, usually in STL or VRML format, and converts them into a series of coordinates that the printer will follow., building up the image in layers.

There are different types of 3D printers available, including the following:

- **Stereolithography (SL)** involves using lasers to part sure the printed shape from a bath of liquid resin. This is an expensive but very accurate method.
- **Digital light processing (DLP)** is similar to stereolithography but uses a powerful light source rather than a laser.
- **Laser sintering** uses a powdered material instead of a resin bath. The solid shape is created as the heat from the laser fuses and solidifies the powder.
- An extrusion method also known as **Fused Deposition Modelling** (FDM) is the most popular in schools and involves melting plastic filament with the heated extrusion head.

The most common in schools are single-head printers that use reels of printable plastic filament. ABS and PLA are usually used in FDM style printers and come in pre-coloured cartridges. New and interesting materials are frequently being developed which allow for printing in wood, steel and brass effect. Soft rubbery materials are also becoming available, making prototype products even more realistic.

Very complex shapes can be 3D printed and some filament printers can print in more than one colour. Dry powder printers can even print in full colour.

3D printers can print other material besides plastics, including metals, paper, ceramics and even food. 3D bio-printing is also being developed, meaning that in the future we may be able to successfully print replacement body parts.

6.4 Resin casting

Thermosetting polymers can be used to produce a variety of products by casting them into a mould where they set and permanently take on the shape of the mould. The types of thermosetting polymers used in casting are made up of two parts; the resin itself and a hardener known as a **catalyst.**

To cast thermosetting resin, you begin by preparing the mould. Then the resin is thoughly mixed with the correct about of the catalyst. The mixed liquid polymer is then poured into the mould and left to set or **cure**. Once fully cured the casting is removed from the mould and is ready for use.

6.5 Welding plastics

There are two ways to weld plastic**;** with heat or with chemicals.

A chemical weld is more often used in schools and involves using a solvent based liquid that dissolves the surface of the pieces of plastic being joined. The two styles of chemical weld are liquid solvent cement and a thicker variety called dichloromethane methyl meth acrylate , known as Tensol 12. both products are methane based and need to be treated with appropriate care and PPE. Tensol must be used in a ventilated room as it has high VOC levels.

Liquid solvent cement has a water–like consistency and is applied with either a fine tipped paint brush or a syringe. The surfaces being joined need to be flush as the cement will not fill any gaps. The cement is drawn along the joint by **capillary action.** Liquid solvent cement will join styrene, ABS, Acrylic and butyrate in any combination. The join sets very quickly but is not particularly strong in thin sections. The solvent cement can damage the surface of the plastic if not applied carefully.

Tensol 12 is best used on acrylic but will work with HIPS, PETG and polycarbonate. It is a much thicker solvent and is able to fill small gaps, but a flush accurate joint will always be much stronger. Tensol 12 is applied to the surface of the joint and can take around three hours to dry.

Heat welding plastic involves using a special hot air gun which accurately heats the areas being welded together as well as a plastic filler rod that is applied to the weld joint. Filler rods are available in HDPE, rigid PVC, LDPE, PP and ABS making it a versatile way to join many plastics.

D&T Unit 5D3 - Commercial Manufacturing 1

AQA Design & Technology 8552
Unit 5D: Specialist Technical Principles – Polymers
5D3 – Commercial manufacturing and quality control Pg 7

7.1 Plastics for commercial products

Plastics are widely used in commercial products. They have particular properties, such as electrical and thermal insulation, that are hard to find in other materials and most of them are waterproof and hygienic. Many plastics, such as polyethylene used for plastic bags, possess a good strength to weight ratio. Plastics offer value for money as a manufacturing material.

Thermoplastics are a very popular materials for seating products, as they are easy to mould and have a good level of flexibility. They are also lightweight, tough, durable, waterproof, corrosion resistant and chemical resistant making them easy to clean. Many plastics have a scratch resistant surface which helps to keep them looking good for longer. They are easily coloured and can be given a textured surface if required.

Thermosetting plastics are generally harder but more brittle than thermoplastics; they do not melt if they get hot. This is the key property that makes them so useful in electrical fittings.
Urea formaldehyde is the main thermosetting plastic used for electrical fittings and is an excellent electrical insulator with good tensile strength. It can reach a very high temperature before heat distortion occurs, making the fitting stable even if there is an electrical fault.

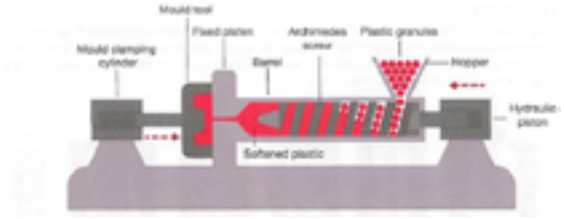
7.2 Commercial production techniques

There are many different plastic processing methods used in industry including **blow moulding** for bottles, **rotational moulding** for hollow shapes and **vacuum forming. Injection moulding** and **extrusion** are two processes that offer great repetitive accuracy and enable a high level of detail to be achieved.

7.3 Injection moulding

This process is ideal for complex shapes. Firstly a mould needs to be made; these are generally constructed from steel in two parts. They need to be very accurate as any blemishes with be transferred to every moulding produced.

1. Granules of the chosen plastic are fed into the hopper
2. The hopper feeds the Archimedes screw that drags the granules past a heater, where they are softened and become plasticised as they travel forward
3. The plastic is in a soft, pliable form as it reaches the end of the screw, where it collects until there is enough to fill the mould
4. At this point a **hydraulic piston** forces the softened plastic into the mould under pressure, filling it up
5. The plastic sets quickly, the mould is separated and **ejector pins** release the moulding
6. The process is repeated



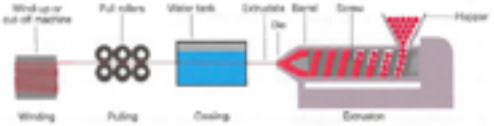
7.4 Extrusion

Extrusion is used to create a continuous flow of plastic that is pushed through a **die** to create a specific profile. Extrusion is used for cables, pipes, mouldings and even plastic film used for bags and packaging.

The extrusion process starts off in a similar way to injection moulding, using a die instead of a mould. The die sets the profile of the extruded plastic and must be made to a very precise tolerance.

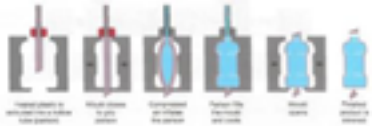
A continuous flow of the softened plastic passes through the die at just the right temperature and flow rate to hold the shape.

The extruded plastic then passes onto a cooling table or cooling through where it fully solidifies and is either wound onto a spool or drum if thin and flexible, or cut into lengths if rigid.



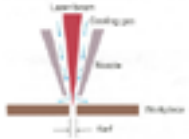
7.5 Blow moulding

Blow moulding feeds an extruded plastic tube known as a **parison** into a hollow mould such as a mould for a bottle. The parison is pinched at the bottom as the mould closes and filled with heated compressed air until the parison inflates to fill the mould.



7.6 Quality control

When products are made, checking that they are being produced correctly is an essential stage. This is known as **quality control** (QC) and is crucial to ensure dimensional accuracy is consistent and that the product is reliable and safe to use.



Laser cutters are one of the most accurate ways to cut a number of different plastics. (Note that use of some plastics, for example PVC, should be avoided as they will give off poisonous fumes when heated.) The laser itself can follow a design to a very fine tolerance, but they must be set up correctly considering the following.

- **Kerf allowance** –Every laser removes a little material and the thickness of the cut is know as the 'kerf' which can range from 0.1 mm to over 1 mm , depending on which material is used. Allowing for this variation is important to ensure the product fits correctly as it will affect the tolerance of the component being manufactured.
- **Power and speed settings** - Lasers cut using a combination of speed and power. The deepest cut would be on the slowest speed at the highest power and the lightest engraving would require the fastest speed and the least power. It is important to select the correct settings for the type of thickness of material and the type of cut or engraving required.
- **Focusing the beam** – The focual length of the laser will affect the quality of the cut or etch. Incorrect focus will mean the workpiece will not be cut through correctly and the keft usually becomes much wider. Many lasers have an autofocus fitted, but it still needs to be set. Manual focusing can be done with a simple measuring tool or pin.
- **Clean mirrors and lenses** – One of the most common issues with laser cutters is that the power seems to drop off as the cutting head moves away from the laser source. This can mean that the work furthest away may not be cut through efficiently. If this happens it often means that the laser's lenses and mirrors need to be cleaned. This is a specialist job that your teacher or workshop technician should perform.

D&T Unit 5D3 - Commercial Manufacturing 2

AQA Design & Technology 8552

Unit 5D: Specialist Technical Principles – Polymers

5D3 – Commercial manufacturing and quality control Pg 8

8.1 Plastic surface treatments and finishes

The reason for applying a finish to plastic's fall into two main categories; protective and aesthetics. Most plastics are self-finishing, but a number of more interesting finishes can be applied.

Adding aesthetic appeal may mean colouring plastic by painting or applying graphics, or electroplating with a desired metal like chrome, nickel or even gold. Plastics can be enhanced to give it a sheen r shine, or matt surface finish, by rubberising or lacquering. It can even be coated in a fur effect. Protection can make it less prone to UV corrosion and colour fade.

8.2 Common plastic based finishing techniques

Plastic finishes vary dramatically in method an application. A number of specialist techniques are on offer, depending on the desired finish. Many of the paint on and spray on products are solvent based and are not very environmentally friendly, as they contain high levels of volatile organic compounds (VOCs). This means that they give off fumes that are considered hazardous to health and should be used according to the manufacturer's instructions, normally in a well ventilation area with a mask being worn.

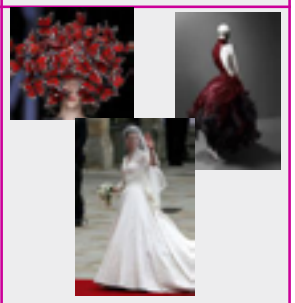
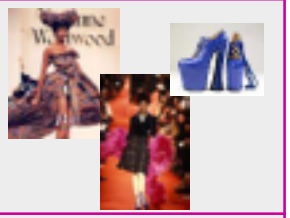
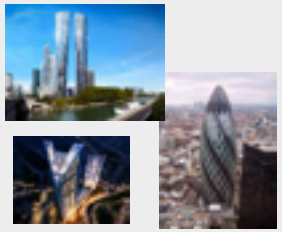
Name	Image	Characteristics	Name	Image	Characteristics
Painting - spray primer and paint		Plastics are primed and sprayed with paints for aesthetics and protection from UV degradation	Heat transfer printing		Image is printed onto special paper and transferred onto the surface with a heat press
Vinyl decals		Printed and cut self-adhesive vinyl can be attached to most surfaces	Hydro-graphic printing		Colour images are printed onto water soluble film which floats on a tank, the product is submerged and the image wraps around it
Flocking		Electrostatically charged strands of plastic stand on end and one end is bonded to the material with adhesive	Electro-plating and electroless plating		Plastics are covered in a conductive layer or etched before plating with nickel, chrome, copper, tin or gold
Engraving and frosting		Laser-engraved surface that can reflect light effectively. frosting covers larger areas to make opaque	Rubberising spray		A slightly textured coating that can be sprayed onto various materials, provides grip and has a matt aesthetic

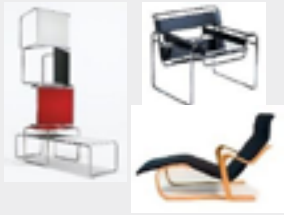
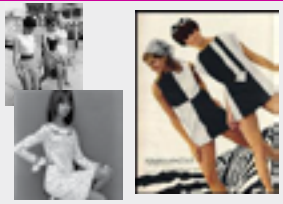
8.3 Polishing

Plastic can become rough or scratched when it is processed. It can also become weathered and faded if left outside. Polishing techniques can be used to restore a high quality finish. Brasso®
Is often used to give a lustrous shine to certain polymers such as acrylic. Many other plastic polishes are available as are a number of products that restore faded and weathered plastics.

D&T Unit 6.2 - Work of Others 1

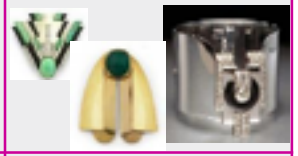
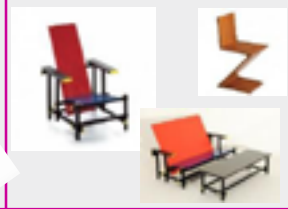
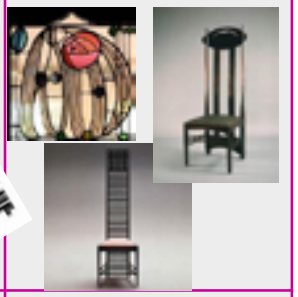
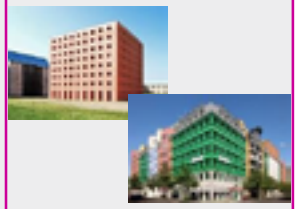
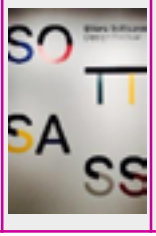
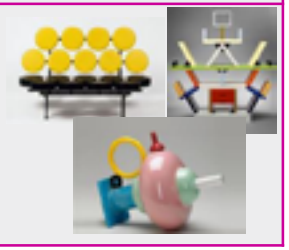
AQA Design & Technology 8552
Unit 6: Designing Principles
6.2 The work of others (Textiles)

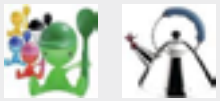
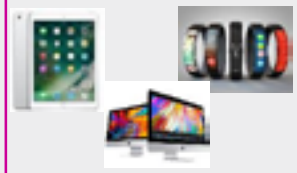
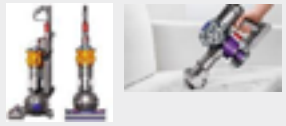
Name	Facts	Logo	Examples
Coco Chanel	**Gabrielle Bonheur "Coco" Chanel** (19 August 1883 – 10 January 1971) was a French fashion designer and businesswoman. She was the founder and namesake of the Chanel brand.	CHANEL	
Alexander McQueen	**Lee Alexander McQueen**, CBE (17 March 1969 – 11 February 2010), known professionally as **Alexander McQueen**, was a British fashion designer and couturier. He is known for having worked as chief designer at Givenchy from 1996 to 2001 and for founding his own Alexander McQueen label.		
Vivienne Westwood	**Dame Vivienne Isabel Westwood** DBE RDI (born 8 April 1941) is a British fashion designer and businesswoman, largely responsible for bringing modern punk and new wave fashions into the mainstream.	Vivienne Westwood	
Harry Beck	**Henry Charles Beck** (4 June 1902 – 18 September 1974), known as **Harry Beck**, was an English technical draughtsman best known for creating the present London Underground Tube map in 1931.	HARRY BECK	
Norman Foster	**Norman Robert Foster, Baron Foster of Thames Bank**, OM, HonFREng (born 1 June 1935) is a British architect whose company, Foster + Partners, maintains an international design practice famous for high-tech architecture.	NORMAN FOSTER	

Designer Name	Facts	Logo	Examples
Marcel Breuer	**Marcel Lajos Breuer** (22 May 1902 – 1 July 1981) was a Hungarian-born modernist, architect, and furniture designer. Breuer extended the sculptural vocabulary he had developed in the carpentry shop at the Bauhaus into a personal architecture	Marcel Breuer	
Sir Alec Issigonis	**Sir Alexander Arnold Constantine Issigonis**; 18 November 1906 – 2 October 1988) was a British-Greek designer of cars, widely noted for the ground-breaking and influential development of the Mini, launched by the British Motor Corporation (BMC) in 1959.		
William Morris	**William Morris** (24 March 1834 – 3 October 1896) was an English textile designer, poet, novelist, translator, and socialist activist. Associated with the British Arts and Crafts Movement, he was a major contributor to the revival of traditional British textile arts and methods of production.	MORRIS & Co	
Mary Quant	**Dame Barbara Mary Quant, Mrs Plunket Greene**, (born 11 February 1934) is a Welsh fashion designer and British fashion icon She became an instrumental figure in the 1960s London-based Mod and youth fashion movements.	MARY QUANT	
Louis Comfort Tiffany	**Louis Comfort Tiffany** (February 18, 1848 – January 17, 1933) was an American artist and designer who worked in the decorative arts. He is best known for his work in stained glass.		
Philippe Starck	**Philippe Starck** (born January 18,. 1949) is a French designer known since the start of his career in the 1980s for his interior, product, industrial and architectural design including furniture	S+ARCK	

D&T Unit 6.2 - Work of Others 2

AQA Design & Technology 8552
Unit 6: Designing Principles
6.2 The work of others (Product & Industrial Design)

Name	Facts	Logo	Examples
Raymond Templier	**RAYMOND TEMPLIER** (1891 - 1968) like many of his contemporaries in jewelry, was born to a family with a long tradition as jewelers.		
Gerrit Rietveld	**Gerrit Thomas Rietveld**; 24 June 1888 – 25 June 1964) was a Dutch furniture designer and architect. One of the principal members of the Dutch artistic movement called De Stijl, Rietveld is famous for his Red and Blue Chair.	Gerrit Rietveld	
Charles Rennie Macintosh	**Charles Rennie Mackintosh** (7 June 1868 – 10 December 1928) was a Scottish architect, designer, water colourist and artist. His artistic approach had much in common with European Symbolism. His work was influential on European design movements such as Art Nouveau and Secessionism.	CHARLES RENNIE MACKINTOSH	
Aldo Rossi	**Aldo Rossi** (3 May 1931 – 4 September 1997) was an Italian architect and designer who achieved international recognition in four distinct areas: theory, drawing, architecture and product design. He was the first Italian to receive the Pritzker Prize for architecture.	ALDO ROSSI	
Ettore Sottsass	**Ettore Sottsass** (14 September 1917 – 31 December 2007) was an Italian architect and designer during the 20th century. His work included furniture, jewellery, glass, lighting, home objects and office machine design, as well as many buildings and interiors.		

Company Name	Facts	Logo	Examples
Alessi	**Alessi** is a housewares and kitchen utensil company in Italy, producing everyday items from plastic and metal, created by famous designers.	ALESSI	
Apple	**Apple Inc.** is an American multinational technology company headquartered in Cupertino, California that designs, develops, and sells consumer electronics, computer software, and online services.		
Braun	**Braun GmbH** formerly **Braun AG**, is a German consumer products company based in Kronberg. From 1984 until 2007, Braun was a wholly owned subsidiary of The Gillette Company, which had purchased a controlling interest in the company in 1967.	BRAUN	
Dyson	**Dyson Ltd.** is a British technology company established by James Dyson in 1987. It designs and manufactures household appliances such as vacuum cleaners, hand dryers, bladeless fans, heaters and hair dryers.	dyson	
GAP	**The Gap, Inc.** commonly known as **Gap Inc.** or **Gap**, (stylized as **GAP**) is an American worldwide clothing and accessories retailer.	GAP	
Primark	**Primark** known as **Penneys** in the Republic of Ireland) is an Irish clothing and accessories company which is a subsidiary of AB Foods, and is headquartered in Dublin.	PRIMARK	
Under Armour	**Under Armour, Inc.** is an American company that manufactures footwear, sports and casual apparel.		
Zara	**Zara** is a Spanish clothing and accessories retailer based in Arteixo, Galicia. It is the main brand of the Inditex group, the world's largest apparel retailer.	ZARA	

D&T Project 1 - Box

AQA Design & Technology 8552
Manufacturing Project 1 - Box

1: Joining Methods

Wood joints can be either permanent of temporary depending on the type and if glue is used.

Permanent:	Temporary:
When we do not want to take the pieces apart again	When we will, or might need to take pieces apart again
Glues, welding, rivets	Screws, bolts, nails

1.1Wood joints

Lap Joint

Mortise + Tennon Joint

Dovetail Joint

2. Scales of Production

One off: when you make a unique item

Batch: when you make a few/set amount

Mass: when you make thousands

Continuous: open ended production

3. Adhesives

P.V.A. – Poly Vinyl Acetate – best for joining 2 pieces of wood together

Epoxy – a *thermosetting* resin that can be used to bond most types of material

Contact Adhesive – a glue type that creates a tacky bond on both surfaces to be joined. It can be used with most materials.

4: Materials

4.1 Woods:	
Hardwoods:	Softwoods:
Beech Oak Ash	**Scots Pine** Cedar Spruce

4.2 Engineered Boards
Engineered boards are manmade materials usually made by mixing wood chips and glues to make wooden sheets.
Examples: Medium Density Fibreboard (MDF) Chipboard, Plywood and **Hardboard**

4.3 Plastics	
Plastics are made of polymers, and are mostly refined from oil. There are 2 main categories:	
Thermoplastics	Thermosetting plastics
Acrylic	Urea Formaldehyde
Polypropylene (PP)	Melamine Formaldehyde
High Impact Polystyrene (HIPS)	Epoxy Resin

4.4 Metals	
Metals are hard and usually shiny, containing one or more elements dug and refined from the ground	
Ferrous metals are any metal that contains iron and will rust	Non-Ferrous metals do not contain iron and will not rust
Alloys are metals made from a mix of 2 metals – brass is made of copper and zinc.	

***Composite** materials* are a mix of 2 different types of material to get the best qualities from each – eg: GRP (Glass Reinforced Plastic)

5: TOOLS

Try square

Bench Hook

Vice

PVA Glue

Router Table

Mallet

Laser Cutter

Chisel

Tenon Saw

6: Surface Finishes

Finishing is usually one of the last stages of making a project. It will usually involve sanding and applying a surface coating to **protect** your material and **improve its visual appearance.**

Some examples:

Paint, Stain, Varnish, Oil, **Danish Oil**, Wax, Polish & Dip Coating.

7: KEY WORD FOCUS

You should be able to explain the meaning of each of these words by the end of this rotation.

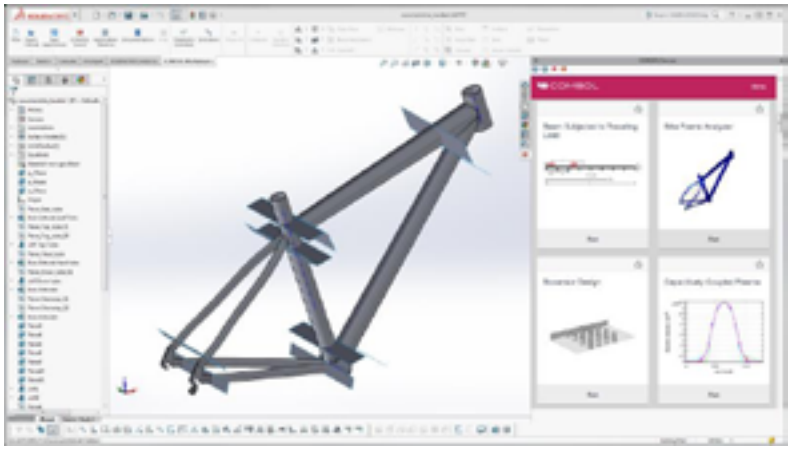
CAD	Computer Aided Design
CAM	Computer Aided Manufacture
CNC	Computer Numerical Control

D&T Unit 7.46 - Materials

AQA Design & Technology 8552
Unit 7: Making Principles
7.46 Selection of Materials and Components

1. Material Selection

The choice of material will depend upon the **functional** properties needed by the product. For example, the enclosure for an outside alarm will need to be waterproof. Advanced **CAD** packages will allow a designer to test the materials virtually to find out what material is most suitable, these tests include; stress loading and weight distribution etc. Further consideration must be made to **aesthetic** properties of the product/material. Some **CAD** software allow designers to **render** products to test the aesthetic or appearance of a product.



2. Component Selection

Component refers to a range of items used during production but is often used as a term for a **pre-fabricated** part of a product.

Some parts of a product may require specialist machinery, be time consuming or too expensive to produce which is why it is necessary to buy in components.

Examples of components include: Zips, buckles, handles, castors, hinges, battery compartments etc.

3. Functionality

The choice of material will depend upon the **function** that it needs to perform. The main areas to consider are:

Strength

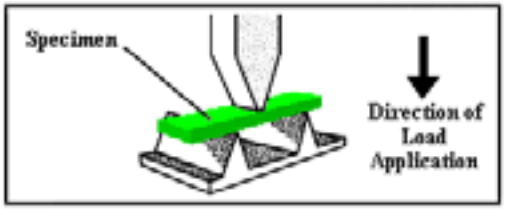
Different types of strength must be tested to ensure materials and components meet the needs of a product. This includes; resilience to wear and tear, weather proofing and chemical resistance.

Movement

Elasticity, flexibility and other forms of movement may need to be considered when working out the interactions a product may go through.

Electrical and Thermal Conductivity

This should be taken into account for products that will use electrical components.



4. Availability and Cost

Deadlines and budgets are common place in schools and workshops. Steps must be taken to ensure issues can be preempted:

Do we have the materials?

Are the materials stock forms?

Are there savings that can be made?

Are there any environmental concerns?

Compromise must be made when balancing deadlines and cost.

The '**project management triangle**' states the compromise that must be made.

D&T Unit 7.49 - Specialist Equipment

AQA Design & Technology 8552
Unit 7: Making Principles
7.49 Specialist tools, equipment, techniques and processes

1. Tool selection

Specialist material areas often require tools that perform only one function, others can be adaptable and perform multiple tasks. E.g. A Tenon saw is used to cut straight or angles in wood, a pillar drill can be used to drill into a variety of materials.

2. Safety for yourself and others

Once your equipment has been selected you must consider health and safety. Some machinery has age restrictions and/or training requirements see the equipment/machinery **data sheets** and **risk assessments** for information. Basic requirements for all projects are **PPE** (**Personal Protective Equipment**).
Other areas to think about are:
Extraction (to remove dust/fumes)
Cleaning up spillages immediately
Carrying tools correctly
Visual checks for damage/maintenance

Golden rule – if in doubt check it out

3. Data Sheets and instruction manuals

Data sheets are usually provided by a material manufacturer that are considered to be hazardous. This could be because they need to be handled in a particular way or because they give off harmful gasses. Some equipment and machinery is also considered hazardous and may have a safety data sheet or safety information in the instruction manual for example a laser cutter.

4. Outsourcing

Some companies may not have the skills for specialist tasks such as cutting and finishing toughened glass. Getting another company to do this them is called **outsourcing**.

5. Risk Assessment

Risk assessments must be produced as they are specific to individual workshops, the hazards in one workshop are not necessarily the same as another. A risk assessment is carried out to identify whether or not it is safe to carry out a particular task in that environment. A risk assessment looks for potential risks of a process, tool, material or piece of equipment.
There are 5 stages to a risk assessment:

1. Individual risk factors
2. Identify who is at risk
3. Decide the likelihood of the severity
4. Record findings and implement control measures
5. Monitor and review the risk assessment

Risk assessment: Soldering Iron / Soldering

What are the hazards?	Who might be harmed and how?	What are you already doing?	Do you need to do anything else to manage this risk?	Risk Level H—High M—Medium L– Low	Action by whom?	Action by when?	Done
Handling soldering iron while soldering	The operator of the soldering iron. If the soldering iron is not held using the handle (with fingers) it is likely. If the operator does not store the soldering iron in the stand provided burning to the contact area will result. If the operator of the soldering iron does not pay attention to who is around them and makes contact with them this will result in burning.	Soldering is undertaken in a specific area in S2 and S3. Strict guidance is given to operators on use safe behaviour will result in immediate removal of the operator from the task.	No	M	HCL/PRO	Ongoing	
Burning through electric wire	The operator because the soldering is not being stored correctly and attended to safe storage of the soldering iron is not being observed.	Clear guidance on the safe use of the soldering is given with specific instructions on storing the iron when in use. The electric supply is not protected.	A safety sheet required to remind operators of the correct way to use and make aware of possible hazards	L	HCL/PRO	Nov 2018	
Fumes	The operator could possibly inhale the fumes and also possible eye irritation could occur.	Operators are required to wear goggles. This is supported through the smaller allocation of operators soldering to minimise the generation of fumes. Observation and monitoring by the session member of staff	No	L			

- This risk assessment and proposed actions have been discussed with staff and students (where appropriate)
- The risk assessment will reviewed annually as it might no longer be valid or if there are any significant changes to the hazards in the workplace, such as new equipment or work activities. A review date has been set.
- Operator refers to all persons carrying out an activity using a process, a series of processes using equipment within the department. An operator may be a member of staff, student or visitor.

D&T Unit 7.50 - Surface Treatments

AQA Design & Technology 8552
Unit 7: Making Principles
7.50 Surface Treatments and Finishes

1. Reasons to apply a finish

Most materials will require an exterior finish to improve the look of the material and to protect it from the environment. Surface finishes can be applied by numerous methods including brushing, spraying and dipping. The main surface finishes that are available include paints, varnishes and lacquers, oils, polishes, stains, sanding sealer, plastic dip coating, powder coating, anodising, plating, galvanising, enamelling and polishing.

Finishes are usually applied for one or more of the following reasons:

1.) To protect the material from moisture, wear, abrasion, fungus, mould or insect attack.
2.) To change the materials appearance, its colour or texture.
3.) To enhance the materials durability, surface hardness or other properties.

Sometimes products have a finish that serves more than one purpose (functional and aesthetic).

2. Common issues that affect materials

Oxidisation/corrosion

Affects: Metals (rust) and plastics (weaken, become brittle)
Occurs over a period of time, oxygen atoms form an oxide layer

Rot

Affects: Wood (wood decay fungus)
Usually caused by prolonged damp conditions affecting strength and integrity

Insect, creature, biological attack

Affects: Wood, paper, board and textiles
Wood can be attacked by woodworm, death watch beetle or termites. Paper and textiles become mouldy.

UV degradation

Affects: Textiles, papers, boards, polymers
UV light breaks down colour pigments causing fading. Materials can also weaken.

3. Selecting treatments and finishes

Papers and boards	Printing Spot varnishing Laminating Plastic coating – Waterproofing Grease proofing – Baking products Wax coating – Waterproofing Foil blocking Foil coating	**Timbers**	Sealing Painting Varnishing Waxing and polishing Staining and colouring Oiling – Teak oil, linseed Preserving – Anti-rot, insect, fungal Tanalising – Anti-rot, insect, fungal
Metals	Painting Lacquering Electroplating – Anodising, nickel, chrome etc. Galvanizing – Zinc plating Polishing Brushing Plastic dip coating Sand or shot blasting Powder coating Hot blackening Rust stabiliser/converter	**Polymers**	Buffing and polishing Planing Lacquering Plating – Metal effects etc. Rubberising Flocking Decals – Self-adhesive Plastic additives including: - UV protection - Microbial protection - Heat stabilisers
Textiles	Dyeing Printing Decoration and embellishment Distressing Waterproofing Fireproofing Crease resistance Teflon® – Anti-stain coating Coolmax® – Anti-perspiration Purista® – Anti-bacterial Permethrin – Insect repellent	**Electronics**	Heat shrink shielding Protective insulator Conformal coating Types of PCB finishes: - Hot Air Solder Levelling (HASL) - Immersion Tin (Sn) - Organic Solderability Preservative (OSP) - Electroless Nickel Immersion Gold (ENIG)

Image from AQA

4. Surface preparation and application

Preparation must be done before a finish is applied. This includes; smooth surface, no grease, dust, fingermarks or pencil.

Occasionally a surface will need to be rougher in order for the finish to 'grip' to the surface this is known as providing a **key**.

Application can happen in many different ways. Data sheets and risk assessments are used to give safety guidelines such as ventilation, extraction instructions etc.

Important information when applying a finish are it's drying time, amount of coats, further surface preparation between coats, temperature for application.

Clearing away can be important as some cleaning/finishing products may have to be kept in COSHH (**Care of substances hazardous to health**) cabinets. Some solvent based cleaners may require PPE and ventilated areas.

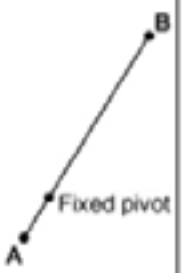
D&T Formulas & Equations

DESIGN AND TECHNOLOGY FORMULAS AND EQUATIONS

You may be asked to work out **Mechanical Advantage, Load or Effort**. Remember this triangle and you will know which equation to use.

To work out MECHANICAL ADVANTAGE MECHANICAL ADVANTAGE = LOAD / EFFORT	Example MA= 875N / 125N **MA is 7 or as a ratio 7:1**
To work out LOAD LOAD = MECHANICAL ADVANTAGE X EFFORT	Example Load = 7x125 **LOAD is 875N**
To work out EFFORT EFFORT = LOAD / MECHANICAL ADVANTAGE	Example Effort = 875N / 7 **EFFORT is 125N**

The diagram below shows the movement of a lever which is part of a toy.
The distance from point **A** to the pivot is 10mm.
The distance from point **B** to the pivot is 40mm.
If point **A** moves 10mm to the right, how far would point **B** move to the left?



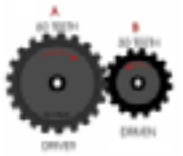
To work out distance moved:

DISTANCE B / DISTANCE A X DISTANCE A MOVED

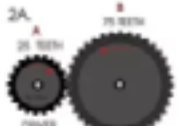
40mm / 10mm X 10 = 40mm

Gear Ratio
Velocity Ratio —also known as gear ratio
Low gear ratio = more speed with less force Driver has 60 teeth the driven has 30 teeth The gear ratio is 1:2. Driver rotates once : Driven rotates twice
High Gear ratio= less speed with more force Driver has 25 teeth the driven has 75 teeth The gear ratio is 3:1.

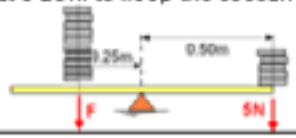
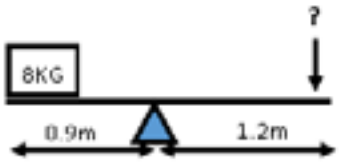
VELOCITY RATIO = DISTANCE MOVED BY EFFORT / DISTANCE MOVED BY LOAD



30 / 60 = 0.5 = 1:2

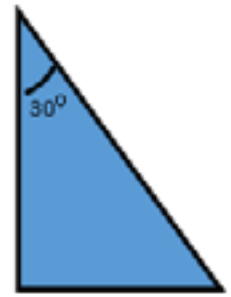


75 / 25 = 3 = 3:1

In order to balance the 5N force placed at 0.5 m from the FULCRUM, we require 10N on the opposite side at 0.25m to keep the seesaw balanced. 	**To work this out:** The force (or weight) needs to be doubled on the opposite side The distance from the Fulcrum needs to be halved on the opposite side
	**To work out FORCE:** **FORCE = (LOAD x D1)/D2** FORCE= (8x0.9)/1.2 FORCE= (7.2)/1.2 FORCE= 6KG
	**To work out DISTANCE 1:** **DISTANCE1= (LOAD2 x D2)/LOAD1** DISTANCE= (6x1.2)/8 DISTANCE= (7.2)/8 DISTANCE= 0.9m
	**To work out DISTANCE 2:** **DISTANCE2= (LOAD1 x D1)/LOAD2** DISTANCE= (8X0.9)/6 DISTANCE= (7.2)/6 DISTANCE= 1.2m

Tangent (Trigonometry)

TAN = Opposite / Adjacent



To work out the height of B

TAN 30° = 0.58

0.58 = 15 / Adjacent

Adjacent = 15 / 0.58

B= 25.9cm

HWCS English Department

Spring Term

YEAR 11

YOUR LITERATURE EXAMS

ENGLISH LITERATURE PAPER 1:

Othello extract response (20 minutes): *You will read a short extract from the play and then write a short analytical response in which you show understanding of what is happening and analyse some of the language.*

Othello essay (40 minutes): *You will be given a question on a character, theme or relationship. You need to 'tell the story' of how this is shown throughout the play. Try to refer to 4-5 key moments in the story.*

Poetry anthology – single poem response (20 minutes) *You will be given one of the poems from the anthology to write about. The question will be based on a key theme or idea in the poem. You will need to give examples of how this theme/idea is explored in the poem, making sure to analyse language and show understanding of the poem's context.*

Poetry anthology – comparison essay (40 minutes). *You will be asked to think of another poem from your anthology which explores the same theme/idea as the poem from the previous question. You now be comparing the two poems - pointing out similarities and differences and analysing language. You will need to draw on your memorized knowledge of your chosen poem to make around 4-5 comparisons between the two poems.*

ENGLISH LITERATURE PAPER 2:

Blood Brothers essay, with source (45 minutes) *You will be given a question on a character, theme or relationship. You need to 'tell the story' of how this is shown throughout the play. Try to refer to 4-5 key moments in the story. To help you with language analysis, you will be given a short extract (source) to look at – you must write about this AND the rest of the play.*

A Christmas Carol essay, with source (45 minutes) *This has the same requirements as the Blood Brothers source question; however, you must also write about the context for the story, i.e. what influenced it and why it was written.*

Unseen poetry – single poem response (20 minutes) *You will be given a poem which you have not read or studied before. You need to write about what you think the poem might mean and why it is effective, as well as pointing out some interesting language.*

Unseen poetry – comparison essay (40 minutes) *You will now have a second unseen poem to compare with the first one. You will need to point out some similarities and differences between them, as well as giving your thoughts on what they might mean and why they are effective.*

GCSE MYTHBUSTING

#1 'I have to know loads of quotations.' *No, you don't: quotations are only one form of evidence you can use to illustrate a point – it is also completely fine to simply refer to a key event or moment in the text.*

#2 'I have to point out fancy-sounding techniques otherwise I won't seem clever'. *Again, not true. In fact, merely pointing out techniques like semantic fields, metaphors, and pathetic fallacy is weak analysis. It is vastly more important to be able to explain the story, themes, characters and some of the effects that the writer creates in the text. If you come across a technique, and you think it is worth pointing out, then do this – but do not look specially for them.*

#3 'I need to write an introduction and conclusion'. *While it can be useful to write a short overview at the start of your response in order to set up your essay and address the question, it is not essential. A conclusion is not needed at all, unless you have some new insight or evaluative point to make at the end of your answer. Never end an essay by simply repeating points you have already made.*

POETRY STUDY AREAS

Your GCSE poetry responses need to include comments and analysis across all four poetry study areas.

THEMES/IDEAS/STORY – What is the poem about? What is happening in it? Where is it set? What main points does the poet make? Do you think there is a message? Does the poet keep coming back to the same big ideas?

LANGUAGE AND EFFECTS – Point out interesting words, phrases and examples of imagery. Explain why you think these are effective. Can you detect any mood and atmosphere in the text?

STRUCTURE AND FORM – How is the poem organized on the page? Has the poet done anything interesting with the way the lines/stanzas are laid out? Does the poem seem to follow some sort of order? What type of poem is it?

CONTEXT – What 'background information' do you know about the poem? Was it influenced by real-life events? Did the poet's own life influence it in some way? Is it part of a certain genre or movement?

TRANSACTIONAL WRITING TOOLKIT

GCSE transactional writing is a quick business. 30 minutes for each task! In such a short time frame, it is important that you are neat and efficient with your work. Here are some tips to help you achieve this:

REMEMBER TO BE A WRITER – It can be all-to-easy to become so absorbed in the requirements of the task that you forget what is most important: writing with skill, creativity and accuracy. All of the skills you demonstrated in your creative prose writing need to be on show here as well. The tasks may be a little unexciting, but that doesn't mean your writing should be!

START WITH DESCRIPTION – Part of your job in the transactional writing tasks is to capture the attention of an audience. Beginning with some vivid description, ideally with a visual element, is a great way to do that.

GET TO THE POINT – You are being asked to state your opinion on something in a transactional task, so get this across clearly and effectively at the beginning of the piece.

BE PERSUASIVE – Make use of tried-and-tested rhetorical devices such as hyperbole, emotive language, rhetorical questions. (But don't overdo these!)

BUILD AN ARGUMENT – Whatever your opinion is, whatever position you are arguing for in a piece of transactional writing, you must give clear *reasons* to explain why you feel this way. You must 'back up' your position with a solid argument, including examples: you cannot rely on powerful language alone.

KNOW YOUR FORM, KNOW YOUR AUDIENCE – The questions will clearly indicate what form of writing you need to produce, and who you are writing *for*. A letter needs to look like a letter, and article needs to look like an article etc. It is really important to make sure your language and ideas are appropriate to the audience you are writing for.

YOUR LANGUAGE EXAMS

ENGLISH LANGUAGE PAPER 1:

20th century fiction reading (1 hour) *You will read an extract from a story which you will not have seen before. This will be about a page-and-a-half long. You will then have five questions to answer about the text; these will test your reading and analysis skills.*

Creative prose writing (45 minutes) *You now need to write up your story, elements of which you will ideally have prepared beforehand. You will have the choice of four prompts, and you need to make sure your story fits with one of these.*

ENGLISH LANGUAGE PAPER 2:

19th and 21st century nonfiction reading (1 hour) *You will read two nonfiction texts on the same topic: the first will be from the 21st century, and is likely to be an article; the second will be from the 19th century and is likely to be from a journal or report. You will then have six questions to answer: two on each text, and then two comparison questions.*

Transactional writing task 1 (30 minutes) *You will be asked to write a letter, speech, article, report or review on a specified topic. This could be an informative or persuasive task.*

Transactional writing task 2 (30 minutes) *This task will be similar to the previous one; however, if the first task was more informative, then this one will be more persuasive, and vice versa.*

ANALYSING LANGUAGE

Language analysis *is an important part of both your English Literature and English Language exams. Here are some useful tips to ensure that you demonstrate this skill successfully:*

MAKE THE MOST OF QUOTATIONS – If you are going to use a quotation to support a point you are making, then try to look closely at the words themselves. Are some particularly vivid and powerful? If so, point this out and explain *why* you think these words are effective.

LOOK FOR EXCLAMATION MARKS (!), DASHES (–), AND ELLIPSES (…) – These are easy wins! They are all used deliberately by writers for specific effects, so point this out!

LOOK FOR REPETITION – Another deliberate effect that is easy to spot.

LOOK FOR GROUPS OF SIMILAR WORDS – Writers often create effects by using a group of words based around a single mood or topic, e.g. 'anger' or 'coldness'. *The technical term for this is a semantic field.*

DON'T FORGET STAGE DIRECTIONS – Treat these the same as you would any other part of the text, especially in Blood Brothers: they are often deliberately worded to convey key aspects of characterization.

SHORT SENTENCES – These are often used for deliberate effect, so it can be good to point them out; however, check that the sentence is *actually* a short sentence (i.e. no more than four words) and make sure you say something more than just 'the short sentence adds impact'!

VERB INFINITIVES

1-ETRE = to be
2- AVOIR = to have
3- FAIRE = to do
4- ALLER = to go
5- JOUER = to play
6- REGARDER = to watch
7- ECOUTER = to listen
8- AIMER = to like
9- MANGER = to eat
10- BOIRE = to drink
11- TRAVAILLER = to work
12- HABITER = to live
13- VISITER = to visit
14- SORTIR = to go out
15- PRENDRE = to take
16- ACHETER = to buy

PRESENT TENSE VERBS WITH "JE"

1- je suis = I am
2- j'ai = I have
3- Je fais = I do
4- je vais = I go
5- je joue = I play
6- je regarde = I watch
7- j'écoute = I listen
8- j'aime = I like
9- je mange = I eat
10- je bois = I drink
11- je travaille= I work
12- j'habite = I live
13- je visite = I visit
14- je sors = I go out
15- je prends = I take
16- j'achète = I buy

PAST TENSE VERBS WITH "JE"

1- j'étais = I was
2- j'avais = I had
3- j'ai fait = I did
4- je suis allé(e) = I went
5- j'ai joué = I played
6- j'ai regardé = I watched
7- j'ai écouté = I listened
8- j'ai aimé = I liked
9- j'ai mangé = I ate
10 – j'ai bu = I drank
11- j'ai travaillé = I worked
12- J'ai habité = I lived
13- j'ai visité = I visited
14- je suis sorti(e) = I went out
15- j'ai pris = I took
16- j'ai acheté = I bought

FUTURE TENSE VERBS WITH "JE"

1- je serai = I will be
2- j'aurai = I will have
3- je vais faire = I will do
4- je vais aller = I will go
5- je vais jouer = I will play
6- je vais regarder = I will watch
7- je vais écouter = I will listen
8- je vais aimer = I will like
9- je vais manger = I will eat
10- je vais boire = I will drink
11- je vais travailler = I will work
12- je vais habiter = I will live
13- je vais visiter = I will visit
14- je vais sortir = I will go out
15- je vais prendre = I will take
16- je vais acheter = I will buy

French GCSE Foundation

Core Language

KnowIT

TIME MARKERS

PAST
1- hier = yesterday
2- l'année dernière = last year
3- la semaine dernière = last week
4- le mois dernier = last month
5- avant = before
6- Il y a 3 ans = 3 years ago

FUTURE
1- demain = tomorrow
2- l'année prochaine = next year
3- la semaine prochaine = next year

1- Aujourd'hui = today
2- maintenant = now
3- quelquefois = sometimes
4- tous les jours = everyday
5- une fois par semaine = once a week
6- toujours = always
7- souvent = often
8- l'été = summer
9- l'automne = autumn
10- l'hiver = winter
11- le printemps = spring
12- soir = evening
13- matin = morning
14 – d'habitude = usually

OTHER VERY IMPORTANT PHRASES

1- je peux +inf = I can
2- je veux +inf = I want
3- je voudrais / j'aimerais = I would like
4- on peut = we can
5- on doit / il faut = you have to
6- depuis = for / since
7- il y a = there is
8- plus…. que = more…. than
9- moins que = less…. than
10- qui = who
11- où = where
12- dans = in
13- devant = in front of
14- derrière = behind
15- ne….pas = not
16 – ne……plus = not anymore
17- ne…. Jamais = never

CONNECTIVES AND INTENSIFIERS

1- d'abord = first
2- puis / ensuite = then
3- enfin = finally
4- et = and / ou = or
5- mais = but
6- cependant = however
7- si = if
8- quand = when
9- même si = even if
10- par contre = on the other hand

1- trop = too
2- très = very
3- assez = quite
4- un peu = a little
5- vraiment = really

OPINIONS

1- à mon avis / selon moi = in my opinion
2- je pense que / je trouve que = I think that
3- c'est = it is
4- c'était = it was
5- ce sera = it will be
6- parce-que / car= because

génial / chouette = great
Intéressant = interesting
marrant / drôle = fun
ennuyeux / barbant = boring
pénible = annoying
nul / horrible = rubbish

IMPERFECT

1- je faisais = I used to do
2- nous faisions = we used to do
3- je jouais = I used to play
4- nous jouions = we used to play
5- j'allais = I used to go
6- nous allions = we used to go
7- je regardais = I used to watch
8- nous regardions = we used to watch

CONDITIONAL

1- j'aurais = I would have
2- je serais = I would be
3- je ferais = I would do
4- nous ferions = we would do
5- je jouerais = I would play
6- je regarderais = I would watch
7- nous regarderions = we would watch
8- j'écouterais = I would listen

FUTURE

1- j'aurai = I will have
2- je serai = I will be
3- je ferai = I will do
4- nous ferons = we will do
5- je jouerai = I will play
6- je regarderai = I will watch
7- nous regarderons = we will watch
8- j'écouterai = I will listen

EXPRESSIONS WITH MULTIPLE VERBS

1- après avoir (+ fait / regardé/ joué/ visité/ écouté etc) = after (+doing / watching / playing / visiting / listening etc)
2- après être allé(s) = after going
3- j'espère pouvoir (+ aller / regarder / jouer etc) = I hope I will be able to (+go / watch / play etc)
4- j'aurais dû (+ aller / regarder / jouer etc) = I should have (+ gone / watched / played etc)
5- j'aurais voulu (+ aller / regarder / jouer etc) = I would have liked to (+go / watch/ play etc)
6- j'ai toujours rêvé de (+ aller / regarder / jouer etc) = I have always wanted to (go / watch / play etc)

French GCSE Higher

Core language!

Use It!

EXPRESSIONS THAT MAKE YOU SOUND GREAT (IDIOMS)!

1- c'est un perte de temps = it's a waste of time
2- quel dommage = what a shame
3- quel gaspillage = what a waste
4- quelle honte = how shameful
5- c'est le pied = it's awesome
6- ce n'est pas grave = it's not a big deal
7- j'en ai marre de (+ inf) = I'm fed up of…
8- ça vaut le coup = it is worth it
9- cela n'a pas de sens = it doesn't make sense
10- j'ai envie de (+inf) = I feel like (+ -ing)
11- ca m'est égal = I don't mind
12- j'ai horreur de (+inF) = I really hate..
13- ca me donne envie de (+inf) = it makes me want to ….
14- au lieu de (+inf), on devrait (+inf) = instead of (-ing) , we should …
15- il faut regarder le bon côté des choses = we have to look at the bright side

SUBJUNCTIVE

1- il faut que je fasse = I have to do
2- il faut que je sois = I have to be
3- bien que ce soit = although it is
4- il est possible que ce soit (vrai) = it's possible that it is (true)

OPINION – SYNONYMS!

1- génial = épatant, extra, top, sensass, formidable, splendide, merveilleux, inoubliable
2- intéressant = captivant, fascinant
3- nul = épouvantable, lamentable, affreux, horrible, désastreux
4- ennuyeux = barbant, monotone, razoir
5- stupide = ridicule, idiot, bête
6- pénible = agaçant, casse-pieds, énervant
7- triste => déprimant

Un oeil sur le monde – World, Social and Environmental Issues

Ce qui me préoccupe	What worries me
Ce qui est important pour moi dans la vie, c'est d'abord …	*The most important thing to me in life is above all …*
Ensuite, c'est …	*Then it's …*
le sport	*sport*
la musique	*music*
ma santé	*my health*
ma famille	*my family*
l'argent (m)	*money*
mes études	*my studies*
mes animaux	*my pets*
mes amis	*my friends*
Ce qui me préoccupe/m'inquiète (le plus), c'est …	*What worries me (the most) is …*
l'état (m) de la Terre	*the state of the Earth/planet*
le réchauffement climatique	*global warming*
la pauvreté dans le monde	*world poverty*
l'injustice (f)	*injustice*
l'environnement (m)	*the environment*
les sans-abri	*homeless people*
les personnes qui sont emprisonnées à tort	*people who have been wrongly imprisoned*
les enfants qui n'ont pas assez à manger	*children who don't have enough to eat*
On peut/Il est possible de …	*You can/It's possible to …*
parrainer un enfant en Afrique	*sponsor a child in Africa*
faire un don à une association caritative	*donate to a charity*
faire du bénévolat	*do voluntary work*
Il faut …	*We must/You have to …*
lutter contre la faim	*fight against hunger/famine*
lancer des pétitions	*launch petitions*
écrire à son/sa député(e)	*write to your MP*
participer à des manifestations	*take part in demonstrations*
agir maintenant	*act now*
faire des campagnes de sensibilisation	*carry out campaigns to raise awareness*
Il ne faut pas ignorer (ces gens).	*We must not ignore (these people).*

Notre planète	Our planet
Le plus grand problème pour la planète, c'est …	*The greatest problem for the planet is …*
le changement climatique	*climate change*
le déboisement	*deforestation*
la destruction de la couche d'ozone	*the destruction of the ozone layer*
la destruction des forêts tropicales	*the destruction of tropical rainforests*
la disparition des espèces	*species dying out*
la guerre	*war*
le manque d'eau douce	*the lack of fresh water*
la pollution de l'air	*air pollution*
la sécheresse	*drought*
la surpopulation	*overpopulation*
un incendie (m)	*a fire*
une fuite de pétrole	*an oil spill*
des inondations (f)	*flooding/floods*
un tremblement de terre	*an earthquake*
un typhon	*a typhoon*

Protéger l'environnement	Protecting the environment
Que devrait-on faire pour sauver notre planète?	*What should we do to save our planet?*
Actuellement, je ne fais pas grand-chose pour protéger l'environnement.	*Currently, I don't do much to protect the environment.*
Je fais déjà pas mal de choses.	*I already do quite a lot.*
Je pourrais/On devrait …	*I could/We ought to …*
trier les déchets	*separate the rubbish*
faire du compost à la maison	*make compost at home*
éteindre les appareils électriques et la lumière en quittant une pièce	*turn off appliances and the light when leaving a room*
baisser le chauffage et mettre un pull	*turn down the heating and put on a sweater*
utiliser du papier recyclé	*use recycled paper*
éviter les produits jetables	*avoid disposable products*
acheter des produits verts	*buy green products*
privilégier les produits bio	*where possible, choose organic products*
utiliser les transports en commun	*use public transport*
favoriser le covoiturage	*encourage car-sharing*
aller au collège à vélo	*go to school by bike*
refuser les sacs en plastique	*turn down plastic bags*
apporter une bouteille d'eau au lieu de prendre un gobelet jetable	*carry a bottle of water instead of using disposable cups*
récupérer l'eau de pluie pour arroser le jardin	*collect rainwater for watering the garden*
fermer le robinet pendant qu'on se lave les dents	*turn off the tap while you brush your teeth*
boire l'eau du robinet	*drink tap water*
prendre une douche au lieu de prendre un bain	*have a shower instead of having a bath*
tirer la chasse d'eau moins fréquemment	*flush the toilet less frequently*
faire plus	*do more*

Faire du bénévolat	Volunteering
Ça me permet d'élargir mes compétences.	*It allows me to expand my skills.*
Ça me donne plus confiance en moi.	*It gives me more confidence in myself/ makes me feel more confident.*
Ça me donne le sentiment d'être utile.	*It makes me feel useful.*
C'est important de participer à la vie en société.	*It's important to participate in society.*
On a la responsabilité d'aider les autres et de ne pas se focaliser sur soi-même.	*We have a responsibility to help others and not focus on ourselves.*
Il y a beaucoup de personnes qui ont besoin d'un peu de gentillesse.	*There are lots of people who need a little kindness.*
Je travaille …	*I work …*
sur un stand d'Oxfam	*on an Oxfam stand*
dans un refuge pour les animaux	*in an animal sanctuary*
Je fais partie de l'organisation X.	*I'm a member of X.*
Je rends visite à une personne âgée.	*I visit an elderly person.*
Je participe à des projets de conservation.	*I take part in conservation projects.*
J'aide des enfants du primaire à faire leurs devoirs.	*I help primary school children to do their homework.*
Je soigne les animaux.	*I look after/treat animals.*
Je soutiens les SDF.	*I support homeless people.*
On s'adresse aux …	*We appeal to …*
sensibiliser	*to raise awareness*
prendre conscience de	*to become aware of*
soigner	*to look after, treat*
accueillir	*to welcome*
affronter	*to face, confront*
soutenir	*to support*

D'où vient ton tee-shirt?	Where does your T-shirt come from?
Les ouvriers sont sous-payés.	*The workers are underpaid.*
Leur journée de travail est trop longue.	*Their working day is too long.*
Il faut/On doit …	*We must …*
forcer les grandes marques à garantir un salaire minimum	*force big brands to guarantee a minimum wage*
acheter des produits issus du commerce équitable	*buy fair trade products*

Geography - Climate Change 1

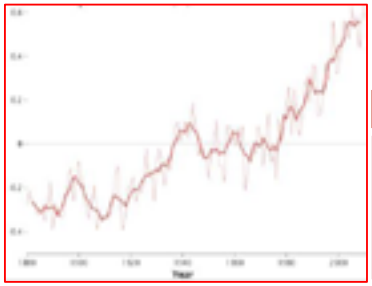
What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

Quaternary geological period

The quaternary period is the last 2.6 million years. During this period temperatures have always fluctuated. The cold 'spikes' are the glacial periods, whereas the warm points are the interglacial periods.

Today's temperature is higher than the rest of the period. Despite alternate cold and warm moments within this period, global temperatures have increased above average in the past 100 years. This current trend is what's become know as global warming.



Natural Greenhouse Effect

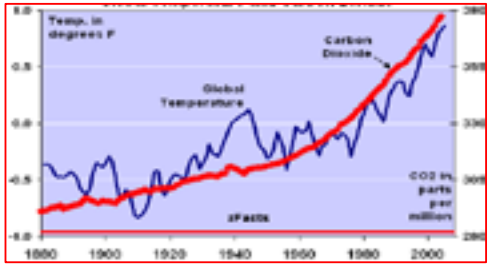
The Earth is kept warm by a natural process called the Greenhouse Effect. As solar radiation hits the Earth, some is reflected back into space. However, greenhouse gases help trap the sun's radiation. Without this process, the Earth would be too cold to support life as temperature would average as -18°C instead of +15°C.

Enhanced Greenhouse Effect

Recently, there has been an increase in humans burning fossil fuels for energy. These fuels (gas, coal and oil) emit extra greenhouse gases. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation but causing less to be reflected. As a result, our Earth is becoming warmer.

Linking CO_2 and Global temperatures

The rate of carbon dioxide and increase in global temperatures is strong. Scientist agree that this increase is cause by human activity.



Evidence for climate change

Earth's temperature has changed over the last 2.6 million years. Scientist know this by collecting a range of evidence that is trapped or stored in the environment around us.

Geological fossil evidence	Plants and animals fossils/remains which favour certain environmental conditions have been found in contractionary conditions, thus suggesting periods of a warmer and colder time. E.g. Mastodon in USA.
Ocean Sediment	Layers of sediment that has built up over time have provided scientist trapped oxygen isotopes. Scientist have used them to calculate and understand that atmospheric temperature have indeed changed.
Ice Cores	Ice cores are made up from different layers that each represents a different historical time. By exploring the water molecules of these cores, scientist have calculated fluctuating temperatures of the atmosphere.
Historical records	Historical records from ancient cave paintings, diaries and written observations have provide evidence of climate change through personal accounts from the people through them.

Retreat of the Columbia Glacier, Alaska, USA

Located in southern Alaska, it flows 50km to the sea. The glaciers has been retreated by 16km and has lost half of its thickness in the last 30 years. Scientist believed this is due to global warming, which if continued will contribute towards continued sea level rises.

Topic 2
CHANGING CLIMATE

Past Evidence: The Little Ice Age (1300-1870)

The Little Ice Age was a period of cooling that occurred after the Medieval Warm Period in parts of Europe and North America. Impacts included…

1. Price of grain increased and vineyards become unproductive.
2. Sea ice engulfed Iceland and the sea force around parts f the UK. Frost Fairs were held on rivers such as the River Thames.
3. People suffered from the intense cold winters as food stock were limited.

Greenhouse Gases

Most greenhouse gases occur naturally. Some greenhouse gases have greater potential to increase global warming than occurs as different gases trap and absorb different amounts of radiation.

Carbon dioxide	Accounts for 60% of the enhanced greenhouse gases. It is produced by burning fossil fuels through producing electricity, industry, cars and deforestation.
Methane	Accounts for 15% of the enhanced greenhouse gases. 25x more efficient than Carbon dioxide. Produce from landfills, rice and farm animals.
Halocarbons	Human made and makes a tidy proportion of all greenhouse gases. 15000x more efficient at trapping radiation than Carbon dioxide. Produced from air-conditioning, refrigerators and aerosols.
Nitrous Oxide	Accounts for 6% of the enhanced greenhouse effect. 250x more efficient than Carbon dioxide. Produced from fertilisers and car exhausts.

Recent Evidence for climate change.

In the past 100 years, scientists have become pretty good at collecting accurate measurements from around the world. These measurements have suggested a trend that the climate is yet again changing.

Global temperature data	Evidence collected by NASA suggests average global temperatures have increased by more than 0.6°C since 1950.
Ice sheets and glaciers	Evidence from maps and photos have shown many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by 10% in 30 years.
Sea Level Change	Evidence from the IPCC has shown that the average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from fresh water ice and thermal expansion of the ocean due to higher temperatures.

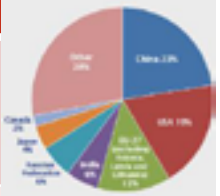
Evidence of natural change

Climate change has occurred in the past without human ever being present. This suggests that there are natural reasons for the climate to change.

Milankovitch cycle	Milutin Milankovitch argued that climate change was linked to the way the Earth orbits the Sun, and how it wobbles and tilts as it does it. There are three ideas that are thought to change climate. 1. **Eccentricity**: Changes in the shape of Earth's orbit. 2. **Obliquity**: Changes in how the Earth tilts on its axis. 3. **Precession**: The amount the Earth wobbles on its axis.
Sun Spots	Dark spots on the Sun are called Sun spots. They increase the amount of energy Earth receives from the Sun.
Volcanic Eruptions	Volcanoes release large amounts of dust containing gases. These can block out sunlight and results in cooler global temperatures.

Whose responsible?

LIDCs	Countries in Africa, such as Kenya, emit low levels of carbon dioxide. This is due to these countries not being industrialised or having a population wealthy enough to consume lots of energy
EDCs	Countries such as China and India are increasingly more industrialised and therefore are emitting more carbon dioxide. These increasing population sizes and steadily increasing wealth mean more energy is being consumed.
ACs	Countries such as the USA and UK are industrialised with a wealthier population that enjoy lifestyles which required a large consumption of energy.



Not what is seems

Although China is responsible for the highest amount of carbon emission, 1.4 billion people do live there. However, per person, the USA (320 million) actually contributes far more CO_2 emissions.

Geography - Climate Change 2

Global impacts of climate change

The impact of rising temperatures is affecting the world socially, economically and environmentally in several potential problematic ways.

Extreme Weather	Climate is causing more unpredictable and severe weather events. This includes more frequent and powerful tropical storms; more extreme heatwaves and lasting droughts. E.g. Typhoon Haiyan 2013
Rising sea levels	Sea levels have risen by 20 cm since 1901. due to thermal expansion, melting glaciers and ice caps. Some coastal countries are now disappearing such as the Maldives in the Indian Ocean.
Food supply	Warmer temperatures and changing rainfall will make it harder to produce a reliable source of food to sustain a rising global population. E.g. In 2011, Russia banned crop exports after a incline in yield.
Plants and Animals	About a quarter of animals and plants on Earth could become extinct. With warmer temperatures and changing rainfall environments will no longer be able to provide for the world's fragile ecosystems.
Disease and Health	Warmer temperatures will increase the spread of infectious diseases like malaria. In addition, more frequent floods could cause more waterborne disease such as dysentery.
Water Supply	People need freshwater to drink but with 1 billion people predicted to not have excess to enough water by 2025 due to climate change, this might cause several social, economic and environmental problems. E.g. fishing, irrigation and sanitation.
Climate refugees	Climate refugees are people who are forced to leave their home due to the impact of climate change. This can be due to sea level rises or extreme weather conditions such as drought.

Rising Sea Levels: Tuvalu

Tuvalu is a group of tiny islands in the South Pacific. Most islands are low-lying with the highest point being 4.5m above sea level. Population is 11,000 people and the economy relies mainly from exporting copra.

Impacts from climate change

Social	Economic	Environmental
- Water supply due to droughts becoming more common. - Wells are becoming polluted by seawater. - High tides are starting to threaten homes and roads.	- Increased levels of salinization affecting soil for agriculture. - Coastal erosion is destroying productive farmland. - Main runway threaten by flooding.	- Ocean acidification is reducing fish stocks around the island. - Warmer temperatures are destroying fragile ecosystems such as coral reefs.

Management

- Campaigning internationally for a reduction in carbon emissions.
- Migration to safer islands off the coast of New Zealand.
- Low sea walls have been constructed to prevent erosion and flooding.
- Japan supporting coral reef restoration by introducing new species to damaged reefs.

Climate change management: Paris Agreement 2015

Paris climate conference involved 195 countries making a legally binding global climate deal. This agreement objective is to limit global warming to below 2°C. The aims of this objective are…

- Limit emissions to pre-industrial levels.
- Meet every 5 years to set new targets.
- Communicate plans to the public.
- Provide support to developing countries at reducing emissions.

Extreme Weather: Brazilian Drought 2014

Brazil is a EDC in the continent of South America. Its population is 204 million. In 2014 it faced a record breaking dry season that resulted in serve drought conditions. Scientist believe that deforestation may have contributed in changing the climate.

Impacts from climate change

Social	Economic	Environmental
- Drought caused a reduction in the production of hydroelectric power. - Major cities faced water shortages.	- Shortage of water affected industrial production. - Coffee industry was severely affected due to the lack of rainfall.	- As reservoir levels dropped, levels of pollution increased. This damaged natural ecosystems and killed fish.

Management

- Introduction of water rationing and recycling more water.
- Repair leaking pipes to decrease water waste.
- Introduction of more natural gas to sustain energy demands.

Impacts of climate change on the UK.

The UK's climate is also changing. It is expected to…

- **Increase in average temperature.**
- **Have warmer, but wetter winters.**
- **Have warmer and drier summers.**

However, not all the impacts to the UK will be negative, there are clear benefits for a changing climate.

Negative impacts of climate change for the UK

Coastal Flooding

- Vulnerable low lying areas could flood homes and infrastructure.
- Increase of coastal erosion.
- Damage to the economy.

Extreme Rainfall

- Increase in extreme flash floods.
- Flood damage to homes and businesses.
- Soil contaminations on farmland.

Water Shortages

- Farmers will find it difficult to irrigate land.
- Water restrictions, with London being worst affected.

Extreme Heat

- Warmer weather can increase health problems.
- Infectious diseases such as malaria might spread.

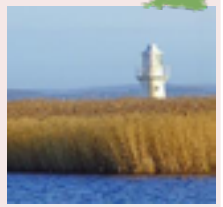
Positive impacts of climate change for the UK

Tourism

- More people likely to take holidays within the UK.
- The economy could be boosted: helping to create new jobs.
- More outdoor events could become common.

Environment

- New wetlands from coastal flooding could become established.
- New wildlife and plants could be drawn to the UK'.



Farming

- Agriculture productivity may increase under warmer conditions.
- Farmers could potentially grow new foods used to warmer climates.

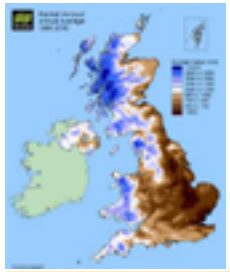
Industry

- Heating cost will fall.
- Construction industry will be boosted by the need to build sea defences.
- New designs produced to cope with conditions.

Geography - UK in the 21st Century 1

UK Physical Characteristics

- Most mountains are located in the **north** and **west**, such as Wales and Scotland.
- These areas have **few roads** and **settlements** but beautiful scenery. – Sparsely populated.
- **South** and **east** of the UK is **flat** with a few hilly areas.
- These areas are suited for **settlements**, **roads** and **railways** – Densely populated.
- Rivers flow from mountainous areas down to the sea.



UK Rainfall Patterns

- **Highest rainfall is in the north** and **west** where average rainfall is **2500mm**.
- **Lowest rainfall** is in the **south** and **east** with average rainfall of **500 – 625mm**.

UK Relief Rainfall

Most UK rainfall is caused by **prevailing wind** blowing from the southwest.	When air carrying moisture reaches upland areas, it is **forced up** to produce **relief rainfall**.	The other side of the upland area has **little moisture**, this is called the **rain shallow**.

Water stress in the UK

Water stress is when areas have limited water supply.

Problems	Solutions
• Most rainfall occurs in **North & West** but least rainfall in **South & East**. • South & East UK therefore have **High demands**. • Demands involve domestic, industrial & agricultural uses.	• Water can be **transferred** from the wetter west to drier east by **pipelines** or rivers. • Construct **new reservoirs** in the east to capture/store more water. • Greater **water conservation**.

Land use in the UK

Land use varies throughout the UK. However our land is always changing. Nonetheless, the vast majority of the UK is farmland.

Arable farmland dominates because of the warm, sunny and dry climate. Crops such as cereals and vegetables are found in the South and East.

UK mountain areas (Scotland) have rough pastures and moorlands. The climate is harsh and soil is poor for crops

Coniferous woodland are found in northern England, Wales and Scotland. There areas have poor soils and are remote.

Grasslands are found in the west. It is ideal for cattle and sheep because of the mild and wet climate.

Grasses	**52%**
Arable	**20%**
Urban	**14%**
Forest	**12%**
Water	**1%**
Other	**1%**

Urban areas are growing. This outward growth or sprawling urban developments is cased by population growth.

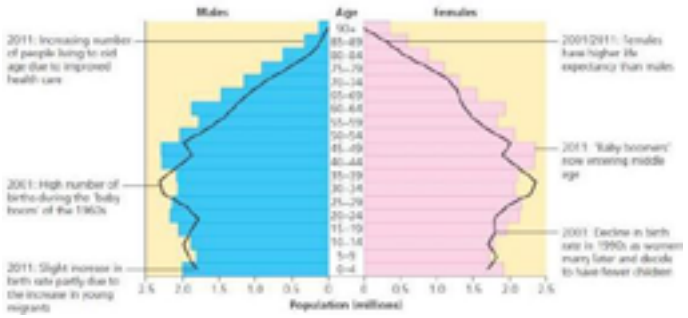
Topic 7

UK in the 21st Century

Population in the UK

The UK population is 65 million and still rising. It is predicted to reach 70 million by 2030.

Reasons for growth	Future of growth
Natural increase – the difference between deaths and births. **Net migration** – the difference between immigration to the UK and emigration from the UK. **Life expectancy** – the average age someone will live up to.	The UK's **population pyramid** shows that the country's birth rate is fairly low and death rate is also low meaning there are more elderly people. **Population pyramids** are useful to help plan for the future.



UK Population Distribution

Low

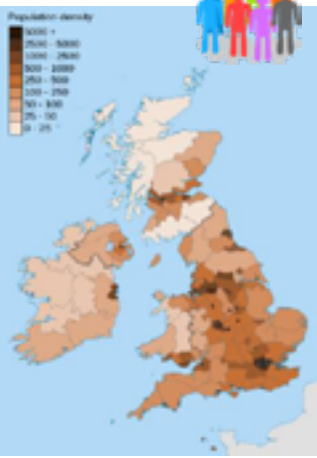
Much of Northern Scotland is **sparse** due to a **mountainous landscape** and **difficult climate**.

High

Rest of the UK because of the **gentle hills**, **moderate climate** and **good transport** routes.

Very High

Population is **concentrated** around the South East of England, in cities such as London, due to attractions of **employment**, **shops** and **entertainment**.



Factors affecting population density

Moderate climate.	**Remote and poor communications.**	**Opportunities for work**
A presence of raw materials.	**Steep and mountainous.**	**Fertile and suitable for farming.**
Poor quality of soil.	**Plentiful supplies of water.**	**Flat land for farming.**

UK Housing Shortage

Problem and Reasons

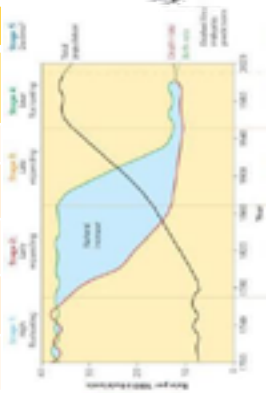
- The UK **population is rising** and therefore **more houses are needed**.
- UK needs to build **240,000 homes a year**, but only half that are built.
- As a result, **house prices are rising** and becoming too expensive.

- Planning permission for new houses leads to **local opposition**.
- **Green belt areas** prevents urban areas becoming bigger.
- The **price of lands keeps rising** due to demand.

Demographic Transition Model (DTM)

As countries experience economic development they also go through stages of population transition. The DTM describes this change and shows the UK in stage 4.

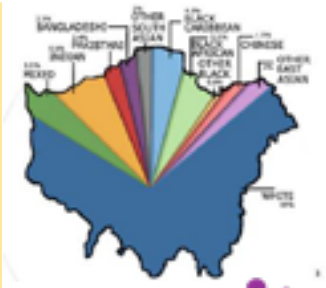
1	Birth rates high and death rates fluctuates.
2	Birth rate high but death rate is falling rapidly. Natural change increases.
3	Birth rate and death rate falling rapidly. Natural change is rapid.
4	Birth rate and death rate is low and fluctuating. Little Natural changes.
5	Birth rate is falling and death rate is rising slightly. Natural change falls.



Geography - UK in the 21st Century 2

Ethnic Diversity in the UK

- **13%** of the population in the UK where **born in another country**.
- In **London**, this value is about **37%**. This has increased between 2001 and the present day.
- The change was driven by an increase in **white non-British**, **Black African** and **Asian** people.



UK Ageing Population

Distribution of Ageing Population

Around 18% of the population are over 65. The distribution of older people is high in coastal areas, especially in east and south-west England. However, it is lower in Northern Ireland and Scotland and generally in big cities.

Causes

- Large number of people were born after the WW2 and are now moving into old age – **Baby boomers.**
- **Improved healthcare** and new treatments to prolong life.
- Greater awareness of the benefits of a **good diet and exercise**.

Effects

- **Healthcare cost are very high** and will increase with an increasing ageing population.
- **Shortage of places in care homes**, many of which are becoming **increasingly expensive**.
- Many older people join clubs and spend on travel therefore helping to boast the economy – **the grey pound**.

Response

- **Government pension bonds** to encourage older people to save money for the future.
- Pensioners receive **support in care, transport and heating** allowance to make life more comfortable.
- **Allowing more immigration** will provide the demand needed of a younger workforce needed for the economy.

UK's Changing Economy

- **UK has one of the largest economies in the world.**
- **The last few decades, heavy manufacturing industries have declined due to competition from aboard.**
- **Now the UK is moving into the service industry such as finances, technology and media.**

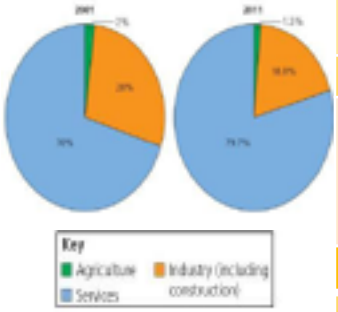
Political Changes

- Between **1997-2007**, the **UK economy grew strongly** & **unemployment decreased**. This was due to increase investment in **education & technology**.
- In **2008** the UK entered a **recession** and **unemployment increased**. Recession ended in **2009**, creating a strong focus for **decreasing the national debt** occurred in **2010 elections**.

UK Employment Sector

Key changes since 2001

- The **quaternary industry** has **increased**, whilst **secondary** has **decreased**.
- Number of people employed in **primary** and **tertiary industry** has **stayed the steady**.
- Big increase in **professional** and **technical jobs**.
- Employment in **manufacturing** has **decreased** the most due to **cheap labour abroad**.



UK Working Hours

- In **2011** the **average number of hours** worked in the UK was **42.7**.
- This figure is **the 3rd highest figure** within the **EU.**
- **Fathers now work fewer hours** to look after children.
- Number of **mothers in fulltime work has increased**.

UK's Core Economic Hubs

An economic hub is a central point or area associated with economic success and innovation. Many of these economic hubs are located near universities. Below is a selection of economic hubs throughout the UK.

Belfast Titanic Quarter
Film studio, offices and education based on the old shipyard.

Salford
Media industry including BBC and ITV. Manufacturing of chemicals.

Bristol
Creative and digital industries. Key services such as law and finance.

Aberdeen
Centre for the North Sea oil and gas industry, now developing as a research and development hub.

Silicon Glen
High-tech industries based in key Scottish cities. They focus on electronics and software.

Oxfordshire
High tech industries, space, medical and Oxford University.

Case Study: UK Economic Hub - Oxford

It is one of the UK's most important locations for scientific & technological industries. 1500 high-technology companies in the Oxford region from small start-ups to large multinationals such as Unilever and engineering, space & medical research. Employing 43,000 people, contributing hugely to the economy and make use of the talent in the world class universities locally.

Change Over Time

- The number and range of companies has increased over the year and science and research parks have expanded to accommodate.
- New road networks, leisure facilities and accommodation have been built.

Regional and national impact

Positives
- Employment has soared
- Area has benefited from retail, restaurants and shops

Negatives
- Demand on housing & infrastructure
- Commuting increases air pollution

The UK's Role in the World

The UK may be a small island state, but it does play a significant role in the wider world. It is also part of several key international organisations.

NATO

A group of **28 countries** who **work militarily and politically** to resolve conflict as a last resort.

UN

Is made up of **193 member states** with the aim of **maintaining peace** and **resolving issues**. UK is part of the **Security Council**.

G7

Involves **seven** of the **wealthiest western countries** to discuss relevant **issues** and come to **economic agreements**.

Case Study: The UK in Resolving Conflict in The Middle East (Iraq)

Basic Background

- The UK had a dominant **political role in the Middle East.** Until the mid 20th century, parts of the region were still in the **British Empire**. As the UK withdrew, the USA had influential power in the Middle East.
- **Many conflicts in the area in the past 50 years**.
- **The UK has a political interest** in the area due to: **trade** (oil, gas and weapons) and **terrorism** which threatens security in the UK

UK Involvement

- **NATO forces (including USA and the UK) invaded Iraq in 2003** after terrorist attacks in New York in 2001. The Iraqi government was overthrown but there has been a struggle for power ever since. Islamic extremists have spread to Iraq from Syria hoping to create an Islamic State.

UK Media Exports

- The UK exports many different types of media products such as **films, TV and music and books**.
- Exporting media is key to the UK economy as it **employs 1.7 million** people and **generates £17 billion**.
- ***Example: Harry Potter sold 400 million copies to 200 territories.***

UK's Media's influences

- Most exports are in English, meaning it **develops** other's **understanding of our language**.
- Many people around the world **copy fashion** & **styles** seen in UK media.
- Can **attract people to visit** the UK.

Multicultural UK

The UK is a multicultural country due to many ethic minorities moving here from India, Pakistan, Caribbean and parts of Africa. These groups have shared there culture and have influenced the UK in many ways.

Fashion

- Many shops sell **traditional clothing**.
- As these traditional clothing become **more common**, other cultures have started to wear them too. i.e. Saris
- **Hair styles** from other cultures such as dreadlocks from the Jamaica.

Media

- Many ethnic minorities have **influenced music** (i.e. dubstep) and **television** (i.e. Bollywood).
- With greater influence, **greater understanding** from other ethnic groups have been established.

Food

- Food that has originated from other countries have **become very established** (i.e. Curry and Pizza).
- Many mainstream **supermarkets sell** a great range of **ingredients** and ready made **foods** from **other cultures**.

HSC - Services & Values

Health and Social Care Knowledge Organiser: Component 2 Health and Social Care Services and Values

Learning Aim A: Understand the different types of health and social care services and barriers to accessing them

Learning Aim B: Demonstrate care values and review own practice

Providing good health and social care services is very important and a set of 'care values' exist to ensure this happens. Care values are important because they enable people who use health and social care services to get the care they need and to be protected from different sorts of harm.

A1 Health and social care services

1. **Different health care services and how they meet service user needs**
   a. Primary care, e.g. dental care, optometry, community health care
   b. Secondary & tertiary care, e.g. specialist medical care
   c. Allied health professionals, e.g. physiotherapy, occupational therapy, speech and language therapy, dieticians
2. **Different social care services and how they meet service user needs**
   a. Services for children and young people, e.g. foster care, residential care, youth work
   b. Services for adults or children with specific needs (learning disabilities, sensory impairments, long-term health issues) e.g. residential care, respite care, domiciliary care
   c. Services for older adults, e.g. residential care, domiciliary care
   d. Role of informal social care provided by relatives, friends and neighbours

B1 Care values

1. Empowering and promoting independence by involving individuals, where possible, in making choices
2. Respect for the individual by respecting service users' need, beliefs and identity
3. Maintaining confidentiality
4. Preserving the dignity of individuals to help them maintain privacy and self-respect
5. Effective communication that displays empathy and warmth
6. Safeguarding and duty of care
7. Promoting anti-discriminatory practice by being aware of types of unfair discrimination and avoiding discriminatory behaviour

A2 Barriers to accessing services

1. **Types of barriers and how they can be overcome by the service providers and users**
   a. Physical barriers, e.g. issues getting into and around the facilities
   b. Sensory barriers, e.g. hearing and visual difficulties
   c. Social, cultural and psychological barriers, e.g. lack of awareness, differing cultural beliefs, social stigma, fear of loss of independence
   d. Language barriers, e.g. differing first language, language impairments
   e. Geographical barriers, e.g. distance of provider, poor transport links
   f. Intellectual barriers, e.g. learning difficulties
   g. Resource barriers for service provider, e.g. staff shortages, lack of local funding, high local demand
   h. Financial barriers, e.g. charging for services, cost of transport, loss of income while accessing services

B2 Reviewing own application of care values

1. **Key aspects of a review**
   a. Identifying own strengths and areas for improvement against the care values
   b. Receiving feedback from teacher or service user about own performance
   c. Responding to feedback and identifying ways to improve own performance

History - Paper 1 - Overview

Part 1. Saxon & Norman 1060-1500

	Saxon Justice	Norman Justice – following the Battle of Hastings in 1066
Crime	Murder, theft	Forest laws, murdering a Norman
Punishment	Fines – Wergild, Execution, mutilation	Murdrum fine, Wergild paid to the King, stocks and pillory
Policing	Hue & Cry, Tithings	Constables, coroners
Trials	Trial by Jury, Trial by Ordeal	Trial by combat, Royal Courts

Case study: The role of the Church
Sanctuary, benefit of the clergy, church courts, trial by ordeal (Hot water, cold water, blessed bread, hot iron)

Part 2. Early Modern

	The Early Modern period
Crime	Heresy, Treason, Vagabondage, Witchcraft
Punishment	Hanging, drawing and quartering, Prison (awaiting trial or debt) Whipping/Flogging, Houses of correction, Transportation to America, The Bloody Code introduced
Policing	Habeas Corpus, Justices of the Peace, watchmen, constables, coroners, rewards
Trials	JP's – manor courts, quarter sessions, Royal judges

Case studies:
The Gunpowder Plot 1605; Matthew Hopkins (Witchfinder General) 1645-47

Crime & Punishment 1000-1999: Paper 1 OVERVIEW

Part 3. Industrial

	Industrial Period
Crime	Highway Robbery, Smuggling, Poaching, Tolpuddle Martyrs
Punishment	Bloody Code, Transportation to Australia, Prisons – Separate (1830's) and silent system (1860's), Gaols Act 1823, Prison reformers
Policing	Fielding Brothers and the Bow Street Runners, Metropolitan Police (1829)
Trials	Trial by Jury

Case studies:
The work of Sir Robert Peel – creation of the Gaols Act 1823; the creation of the Metropolitan Police 1829

Pentonville Prison and the separate system

Part 4. 20th Century

	20th Century
Crime	Car crime, terrorism, hate crimes, smuggling, violent and sexual crimes
Punishment	Prison, death penalty abolished, open prison, suspended sentences,
Policing	Police force, nation wide forces, specialisation of the police (Fraud squad, drug squad) PCSO's Police National Training, new technology in policing – fingerprinting, DNA testing
Trials	Trial by Jury

Case studies:
Conscientious objectors in both WW1 & WW2
Derek Bentley and the abolition of the death penalty

The '8 Factors'

Government and Lawmakers, Church & religion, beliefs & attitudes, individuals, urbanisation, travel & technology, wealth & poverty, the media.

Time periods

1000 – 1500 Medieval Period
1500 – 1700 Early Modern Period
1700 – 1900 Industrial Period
1900 – 2000 20th Century

Crime & Punishment 1000 – 1500 The Medieval Period

Crime

Anglo Saxon England:
Most common crimes were those **against property**, usually theft. More serious crimes included murder

Norman England:
Following the Norman invasion definitions of crime changed.
Killing a Norman and prevention of hunting, known as the **Forest Laws.**

Policing

In the absence of a formal police force communities would police themselves. People lived close together and thought it was their duty to help each other enforce the law. Both the following methods were continued following the Norman invasion.

Tithings: groups of 10 men over the age of 12 all responsible for each others behaviour. If one broke the law the others had to bring him to court or pay a fine.

Hue & Cry: If a crime was committed the whole village would be expected to hunt for the criminal. If someone did not join in then the whole village would pay a fine.

During the later middle ages:

Constables: appointed annually, unpaid volunteers, usually respected members of the community.

Coroners: Royal officials responsible for investigating unnatural deaths.

Sheriff: Each county had a Sheriff who would raise a Posse if the Hue & Cry failed to track down a criminal

Punishment

Anglo Saxon England:
Anglo Saxon punishments were mainly fines but they also used corporal and capital punishment.

Wergild: Compensation payment made to the victim of the crime, the level of which was set by the king's laws.

Execution: The death penalty was used for serious crimes, treason against the King or betraying your lord.

Mutilation: Reoffenders could lose a body part, usually a hand, an ear, nose or even be blinded.

Norman England:
Following the Battle of Hastings, William needed to control 2 million Anglo-Saxons with around 7000 Norman soldiers.

Murdrum fine: Payable by the whole village if a Norman was murdered,

Forest Laws: Trees could no longer be cut down and living near forest you were forbidden to own dogs or bows. If caught two fingers were chopped off, repeat offenders were blinded.

Trials

Trial by Ordeal – ended 1215

Trial by Cold Water: usually taken by men, accused lowered into water on the end of a rope; if they sank below 'pure water' they were innocent, if they floated guilty.

Trial by Hot Water: usually taken by men, accused hand in boiling water to retrieve an object. Hand bandaged, 3 days later if healing and clean deemed innocent.

Trial by hot iron: usually taken by women, three paces with a hot weight, again hands bandaged.

Trial by blessed bread: usually taken by priests

Trial by Combat: Introduced by the Normans, two people would fight to the death

Trial by local jury: Local people that knew both the accused and accuser

During the later middle ages:

Manor courts: local courts to deal with minor crimes

Royal judges: travelled around the country hearing more serious cases.

Case Study

Did the Church help or hinder justice in the Medieval Period? ***Hinder – to make things difficult**

Sanctuary: On the run from the law, you could claim sanctuary in a church, where you would be under the churches protection – 40 days to either, face trial or leave the country.

Church courts: Introduced by the Normans the church claimed the right to try any churchman accused of a crime. They were more lenient, never convicting someone to death.

Benefit of the Clergy: This was the claim by an accused person to be tried in the church courts. In theory only intended for priests but in reality anyone connected with the church used it.

Trial by ordeal: Trials took place inside the church or on consecrated ground, used if a jury could not reach an overall verdict.

Key words

Tithing
Hue & Cry
Wergild
Execution
Mutilation
Constable
Coroner
Trial
Normans
Community

Crime & Punishment 1500 – 1700 The Early Modern Period

Crime

Heresy: The crime of holding religious beliefs that differed from the monarch.
Treason: Disobedience or disloyalty to the monarch
Vagabondage: Being a wandering beggar, also called vagrancy
Witchcraft: regarded as a serious crime for many reasons including religious change, the media and the English Civil War.

Policing

Citizens were still expected to deal with crimes in the absence of a formal police force.
Hue & Cry: If a crime was committed the whole village would be expected to hunt for the criminal. If someone did not join in then the whole village would pay a fine. This method continued during this period
Constables: appointed annually, they continued to be unpaid volunteers, usually respected members of the community. They dealt with minor offences and had the ability to inflict punishments like whipping.
Coroners: Royal officials responsible for investigating unnatural deaths.
Watchmen: In larger towns Watchmen were employed to patrol the streets; expected to arrest drunks and vagabonds. They were poorly paid and were ineffective.
Rewards: These were offered for the arrest of particular criminals; rewards could be high, sometimes equal to a years income for a family.

Punishment

Hanging, drawing and quartering: The punishment was usually used for Treason. Offenders hanged by the neck, gutted, beheaded and cut into four pieces.
Burning at the stake: The punishment for Heresy, held in public
The swim test: Used on those accused of Witchcraft – if they floated they were deemed guilty.
Houses of correction: Inmates were whipped and made to do hard labour
Prison: Used for those in debt of those awaiting trial
The Bloody Code: Introduced in the 1680's; many more crimes were punishable by death
Transportation: In the 1660's criminals were transported to America on Hulks.

Trials

Manor courts: These still dealt with minor crimes such as drunkenness
Royal judges: Visited each country twice a year to deal with more serious offences, known as **County Assizes.**
Justices of the Peace (JP's): Assisted by the Constable they could issue fines or send people to the stocks.
Quarter sessions: held four times a year, JP's would come together to judge serious cases
Habeas Corpus Act 1679: Anyone arrested at the right to appear in court or be released.

Case Studies

The Gunpowder Plot 1605
- Robert Catesby plotted to blow up Parliament and Guy Fawkes placed 36 barrels of gunpowder under the Houses of Parliament
- An anonymous letter was sent to an MP warning them and The plotters were arrests and hanged

Matthew Hopkins and witchcraft
- Claimed to be the Witchfinder General due to his ability to spot witches
- Village tensions were a problem, vulnerable and elderly were accused
- Religious change led to superstition and talk of the Devil
- The English Civil War 1642-9 led to a breakdown in law and order
- Pamphlets were produced telling lurid stories of witches increasing fear

Key words

Pamphlets
Vagabondage
Poor rates
Heresy
Protestant
Catholic
Reformation
Treason
Familiar
Hinder
Watchmen
Habeas Corpus
JP's
Bloody Code

Crime & Punishment 1700 – 1900 The Industrial Period

Crime

Highway Robbery: The Crime of stopping a coach and robbing the passengers; more robbers because guns and horses were cheaper and lack of police meant it was easy to get away.
Smuggling: Bringing illegal goods into the country or bringing in goods and avoiding tax on them. Tax was a source of government income so had a huge impact on the economy.
Poaching: The illegal hunting of animals, poachers were regarded as a threat to wealthy landowners and their property. People considered this as a social crime as the poached food often supplemented the diets of poorer people.
Tolpuddle Martyrs: A group of 6 farm labourers in Tolpuddle Dorset. Having seen their wages cut several times they established a union and swore an oath of secrecy to support each other and the union. The Government were fearful that the ideas of unions would spread.

Policing

The Bow Street Runners

Created by London magistrates Henry and John Fielding, the Bow Street Runners were an organised group of 'thief-takers' who patrolled the streets of London in the evenings. They established a horse patrol to help stop Highway Robbery too.

The Metropolitan Police

The Metropolitan Police Act 1829 established a force of 3200 profession, full time police officers in London and later across the country.
1842: The Detective force was established by the Metropolitan Police
1856: Compulsory for each county to have a police force
1878: The Detective Force became the Criminal Investigation Department (CID)
1884: 39,000 policemen in Britain in over 200 separate forces

Punishment

Abolition of the Bloody Code

The Bloody Code was abolished in 1820's – crime was increasing, juries were not convicting people to death, ideas about punishments were changing; people began to think punishment should reform people.

Transportation to Australia

Considered by many juries as a suitable alternative to the Bloody Code and execution. Criminals were sent to Australia and made to work. It ended in 1860's as it was extremely expensive and the settlors felt that criminals were being 'dumped' in Australia.

Prisons

Following the ending of other methods prison became the main form of punishment. The work of Fry and Howard influenced improvements.
The Gaols Act 1823 meant that prison warders had to be paid, men and women were separate; prisoners were given food and clean water and magistrates inspected prisons in their area.
The separate system was introduced in the 1830's and the silent system from the 1860's.

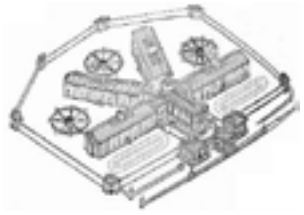
Case study

Sir Robert Peel

People initially worried that having a Police force would limit their freedom. However Peel's reform were successful for a number of reasons. Taxation had increased which could pay for the force; crime had risen again and there was a general fear of crime and protest; the growth of towns meant that the system of Watchmen was ineffective.

Pentonville prison and the Separate system

Built in 1842 Pentonville used the latest ideas to ensure that prisoners were kept separate from each other. Walls were thick; each prisoner had a basin, water and toilet; prisoner wore masks to ensure they could not see each other when exercising. The main aim of the prison was to reform prisoners, ensuring they returned to society better people and less likely to reoffend.



Prison systems

Separate system 1830's

Time alone in cells to reflect on behaviour; religious instruction to lead honest lives; work in cells to learn trade and hopefully secure work upon leaving prison. In the first 8 years of the system 22 went mad, 26 had breakdowns and 3 inmates committed suicide.

Silent system 1860's

Prisoners were kept silent at all times or face punishment; hard labour was completed for much of the day; the main idea was retribution.

Key words

Martyr
Trade Union
Rehabilitation
Retribution
Transportation
Pentonville

History - Paper 1 - Whitechapel

Part 1. Housing & poverty

- The problems of housing and overcrowding (30,000 people in 4000 houses). **Lodging houses**, **doss houses**, the **Workhouse** and the **Casual ward**. Links between housing problems and poverty. Orphanages (Barnardos- 1870) The unstable nature of employment, underemployment and unemployment. Many worked in **sweat shops** or tried to find daily work on the docks.
- Attempts to improve housing: the **Peabody Estate, 1881**. Good ventilation and brick built to prevent damp, rules but also high rents which forced some out.
- **Immigration** was a cause of tension. Competition for jobs and housing exacerbated by migration from Ireland and Eastern Europe.
- There was a link between immigration and **anti-Semitism**. Remember the Goulston street graffiti?
- The growth of **Feniansim, Socialism** and **Anarchism** in Whitechapel. These ideas were often blamed upon Immigrants (Russian anarchists or Irish Republicans).

Part 3. The national and regional context

- H Division is part of the **Metropolitan Police** force which covered all of London.
- Efforts were made to improve he quality of police recruits. They had to be literate, have no more than two children and not have business interests in the area.
- Beat constables walked the beat equipped with a whistle, truncheon and note book.
- **The CID (Criminal Investigation Department)** was established in 1842. By 1888 it was under the control of the Police Commissioner, Sir Charles Warren. There was some tension between Warren and the Home Secretary.

Working with historical evidence

- For questions about source utility (usefulness)- **NACHOS** (Nature, Author, Content, Happening, Omitted, Special reason). **Remember**: "**This is useful of this enquiry because**…"
- When following up an enquiry you need to consider **historical sources *from the time***; for example: housing and employment records, council records and census returns, Charles Booth's survey, workhouse records, local police records, coroners' reports, photographs as well as London and (perhaps occasionally) national newspapers.

Whitechapel Historic Environment 1870-1900: Paper 1

Part 2. The organisation of policing in Whitechapel.

- Whitechapel was policed by **H Division**. The rookeries, alleys and courts along with overcrowding and a multi-lingual population made it difficult to police.
- Police had to deal with problems caused by alcohol, prostitution, protection rackets, gangs, violent demonstrations (Bloody Sunday, 1887) and attacks on Jews.
- George Lusk set up the **Whitechapel Vigilance Committee-** frustrated at police failures to catch the Ripper. These vigilantes patrolled the area and offered rewards for information.
- How the police responded to **the Ripper case**: The developments in techniques of detective investigation, including the use of sketches, photographs and door-to-door enquiries. (Remember: No finger printing until 1900)
- Tensions between the Metropolitan Police and the **City of London Police.**
- Problems caused by the media reporting of the 'Ripper' murders**.** The press were critical of the police and also spread panic amongst the population.

Question types:

- Describe two features of…
- How useful are these sources for an enquiry into…?
- How would you follow up an enquiry?

Useful vocabulary:

Immigration/under-employment/ Provenance /Philanthropist/ Infirmary/ Anti-Semitism/ Socialist/ Anarchist/ Poverty/ Sweated labour/ forensics/ autopsy/ costermonger/ Fenianism/ Slumming/Social Reformer

Crime and Punishment example exam questions

Explain one way…(4)

- Policing methods were different in the later middle ages and the 19th century
- Smuggling was similar in the industrial period and the 20th century
- That the definition of crime had changed from the Medieval period to the Early modern period
- Policing methods were different during the later Industrial period and the 20th century

Explain why…(12)

- Heresy was punished so harshly in the Early modern period
- Punishments became harsher in the early modern period.
- Punishments changed in the industrial period.
- Crimes changed in the Industrial Period
- Policing has changed in the 20th century
- The definition of crime has changed in the 20th century

How far do you agree?…(16)

- The Norman Conquest saw a complete change to law enforcement and punishment in England, how far do you agree?
- Heresy was the most significant crime facing the lawmakers in England during the Early Modern Period, how far do you agree?
- The Tolpuddle Martyrs were the most significant threat facing the government and lawmakers in the Industrial Period, how far do you agree?

Whitechapel example exam questions

Describe two features…(4)

- Of the problems caused by alcohol in Whitechapel
- Of the difficulties policing Whitechapel
- Of a Whitechapel workhouse
- Of a slum
- Of the Peabody estate
- Of the racial tensions in Whitechapel

Follow up an enquiry about…(4)

- How would you follow up source B to find out more about how the public felt about the Ripper Investigation?

Detail I would follow up:
Question I would ask:
What type of sources I could use:
How this might help answer my question:

How useful are the sources…(8)

- How useful are Sources A & B for an enquiry into the problems the police faced when investigating the Ripper murders?

SOURCE A

Part of a picture printed on the front page of the Illustrated Police News, *October 1888.*

SOURCE B

From a report on a public demonstration in Bethnal Green, published in the Pall Mall Gazette, *1 October 1888.*

After several speeches upon the conduct of the Home Secretary and Sir Charles Warren, a resolution was unanimously passed that it was high time both officers should resign and make way for some officers who would leave no stone unturned for the purpose of bringing the murderers to justice, instead of allowing them to run riot in a civilised city like London.

History - Paper 2 - Cold War 1941-91

Part 1. Origins of the Cold War 1941-58

- **Ideological differences**: USA (Capitalist democracy versus USSR Communist dictatorship).
- The Grand Alliance (USA/GB/USSR). **1943 Tehran** (agreed to launch D-Day). **1945 Yalta** conference (Division of Germany & Berlin/free elections/Soviet sphere of influences).
- **Potsdam changes**: Death of Hitler, death of FDR, US atomic bomb leads to nuclear arms race, Soviet takeover of Eastern Europe.
- **Potsdam Conference** confirms Yalta & agrees to allow Soviet compensation from East Germany.
- **Long telegram** leads to **Containment** and the **Truman Doctrine/Marshall Aid (1947)**
- USSR sets up **Cominform** (1947) and **Comecon** (1949) to control Eastern Europe. and the formation of **NATO** (1949).

- 1948-49 **Berlin Crisis (blockade and airlift)**. Stalin shuts off access to West Berlin. Allies fly supplies into western sectors. Crisis ends with formation of the Federal Republic of Germany and German Democratic Republic and NATO (1949).
- **Warsaw Pact** formed 1955.
- **1956 Hungarian Uprising** following death of Stalin/Khrushchev's secret speech (de-Stalinisation).

Khrushchev responds with tanks following threat to leave **Warsaw Pact**. International community criticise but don't act. No further revolt in Eastern Europe until 1968.

Cold War 1941-91: Paper 2

Part 2. Cold War Crises 1958-70

- The building of the **Berlin Wall 1961**: Causes: the "brain drain" and Soviet fears of US espionage lead to Khrushchev's Berlin ultimatum (1958), and the summit meetings of 1959–61. JFK visits Berlin in 1963. Wall becomes concrete symbol of Cold War division.

- Cuba: **1959 Cuban Revolution**. USA refuses to recognise Castro's government. This leads to trade ban and the Bay of Pigs failure (1961).
- **1962 Cuban Missile Crisis**: Discovery of launch sites/naval blockade (quarantine). Resolution by faxes.
- Beginning of **détente**: Telephone hotline/Nuclear Test Ban treat 1963/Outer Space treaty 1967.

- **1968 Prague Spring (Czechoslovakia)**. Opposition to Soviet control leads to calls for reform under Dubcek. USSR sends in tanks and issues the **Brezhnev Doctrine**. USSR asserts right to interfere in Eastern Europe.

Part 3. End of the Cold War

- **Détente** continues into 70s with **SALT 1, Helsinki**, and **the Handshake in Space (1975**).
- Soviet invasion of **Afghanistan (1979)** ends détente and begins the **Second Cold War**. **Carter Doctrine** affirms US will interfere in Middle East. USA organises boycott of **1980 Moscow Olympics**.
- US President **Reagan** increased military spending including Strategic Defence Initiative (**Star Wars**)
- **Gorbachev** becomes leader of USSR- 'new thinking' (**Glasnost & Perestroika**) Gorbachev agrees to and the Intermediate-Range Nuclear Force (INF) Treaty 1987.
- Gorbachev's 'new thinking' shows weakening of Soviet grip on Eastern Europe. Criticism of Soviet economy and **Sinatra Doctrine** encourages calls for freedom in Eastern Europe. USSR refuses to help GDR crush freedom demonstrations. Hungary opens its borders with Austria.
- **1989 Fall of the Berlin Wall** shows beginning of collapse of the
- Soviet Union/end of Warsaw Pact

Question types:

- Give two consequences of (an event)
- Write a narrative account (tell the story in order with explanations and links between events)
- Explain the importance of x for the development of the Cold War.

Useful phrases

This led to/this caused/as a result/increased tension/ decreased tension/ kick started/ resulted in/thaw/escalation/ eroded trust

History - Paper 2 - Cold War Topic 1

Key topic 1: The origins of the Cold War

Early tension between East and West

- The **Grand Alliance** was formed of England, America and Russia – original delegates were Winston Churchill, Franklin Roosevelt and Josef Stalin.
- **Tehran November 1943:** Stalin, Roosevelt and Churchill

Key agreements: Russia to join war to fight against Japan; D-Day date was set; United Nations to be established post war.

- **Yalta Conference February 1945:** Stalin, Roosevelt and Churchill

Key agreements: Germany and Berlin divided – 4 zones; Stalin 'sphere of influence'; free elections in Nazi Occupied countries

- **Potsdam Conference July 1945:** Stalin, Truman, Attlee

Key Agreements: Finalise discussions from Yalta; but Poland now has Communist government in place and tension due to delegate change, Truman tested atomic weapon.

- **Soviet Expansion 1946-47:** USSR begin to take control of various Eastern European countries expanding area of control and spreading Communism. Hungary, Czechoslovakia, Yugoslavia and Bulgaria all became satellite states.
- **Iron Curtain speech 1946:** Winston Churchill talks of an imaginary line dividing the East and the West.
- **Long Telegram 1946:** Kennan – USA Chief working in US Embassy in Moscow, considers the USSR to be aggressive and suspicious.
- **Novikov Telegram 1946:** Sent in response to the Long Telegram sent by Novikov to Stalin.

Key words

Grand Alliance, Tehran, Yalta, Potsdam, Conference, Atomic, Satellite State, Ideology, Communism, Capitalism, Sphere of Influence, Containment, Comincon, Comecon, Trizonia, blockade, NATO, Warsaw Pact,

Key people

The development of the Cold War

- **The Truman Doctrine:** USA begins its policy of **Containment** The Doctrine meant that the USA could use military resources in an effort to prevent the spread of Communism.
- **Marshall Aid:** Truman supported his Doctrine with economic aid to Europe. Aid was offered to all countries impacted by war; money equipment and goods were offered to help rebuild industry, business and trade. By 1953 USA had provided $17million to European countries.
- **Cominform 1947:** The Communist Information Bureau establish to coordinate communist parties within Europe. Established to ensure that all states followed Soviet foreign policy and it also introduced economic policies like state control of industry.
- **Comecon 1949:** Council for Mutual Assistance was the soviet response to Marshall Aid. It was aiming to provide economic support for Communist countries, but in reality controlled finances and gave the Soviets access to resources.
- **The Berlin Crisis 1948-49:** Stalin blockaded all routes by land and rail into West Berlin in an attempt to starve West Berlin and force the allies out. The **airlift** was the USA response lasting 10 months. Planes flew in every 90 seconds and dropping 4,600 tons of supplies each day. A total of 275,000 flights. In May 1949 Stalin called off the blockade.
- **Trizonia** was formed – the Western Allies announced their zones would join forming the Federal Republic of Germany. Stalin later announced the formation of the German Democratic Republic.
- **NATO 1949:** The North Atlantic Treaty Organisation was formed, joining western allies together to prevent the spread of communism throughout Europe.

The Cold War intensifies

- **Stalin dies 1953:** Khrushchev establishes himself as leader and in 1956 denounces Stalin's policies in his **secret speech**. He announces **de-Stalinisation.**
- The **Warsaw Pact 1955**: A military alliance of 8 nations headed by the Soviet Union in response to NATO.
- The Soviet Union increases spending on armaments and tests its own atomic weapon.
- **Sputnik 1957:** The Soviet Union launches a rocket containing a satellite which could orbit the earth

The Hungarian Uprising 1956:

- **Matyas Rakosi** was the leader of Communist party in Hungary and considered himself **Stalin's best pupil.** Rakosi was forced from power and replaced with Imre Nagy.
- Demonstrations take place in **Budapest** and Khrushchev sends in troops to regain control.
- Nagy hold talks and it is agreed that troops will be removed. Nagy proposes reforms in Hungary.
- Nagy declares plan to leave the **Warsaw Pact** which angers Khrushchev. As new leader this puts him in a tricky position – seen as weak if he takes no action, but risks being like Stalin if he does.
- Following pressure from fellow Communist leaders Khrushchev sends in 200,000 troops and 6,000 tanks. The Hungarians fought back using Guerrilla tactics.
- Consequences: Kadar becomes new Hungarian leader; about 20,000 people died and 200,000 fled to Austria.
- The UN launched an inquiry, condemned the actions of the Soviet Union and Hungarian government under Kadar, but no further action was taken.

Key topic 2: Cold War Crises

Increased tension between East and West

Tension had increased for a number of reasons during this period. Firstly there were a huge number of refugees leaving the Eastern sector of Germany and moving into the West – the Brain drain. This was increasing clear in Berlin, where it was considered to be a centre of **Espionage.**

- **The Berlin Ultimatum:** Khrushchev feels that the West are breaking the agreements at Potsdam. He issues his Ultimatum telling the West they should leave Berlin within six months, suggesting it should become a neutral and free city.
- **The Paris Summit 1960:** 9 days before the conference the Soviet Union shot down an American U2 spy plane.
- **The Vienna Summit 1961:** A final conference with JFK, Khrushchev feels he can push him around a little, but in reality JFK is keen to uphold the policy of containment.

Meanwhile in Cuba:

- **The Cuban Revolution 1959:** Cuba was important to America, being so close to the American mainland it was a holiday destination for Americans and they had trade links.
- The revolution saw the overthrow of the president Batista by **Fidel Castro** who wanted greater independence from America. Castro removed US capitalist companies and installed a Communist regime, proving that the policy of containment was not really working.
- **Immediate US response:** In response the USA banned the import of Cuban sugar which threatened the Cuban economy.
- **Immediate Soviet response:** Khrushchev was delighted to have a communist ally so close to the American mainland and he offered to buy the Cuban sugar.

Cold War crises

- **The Berlin Wall:** On 13th August 1961 Khrushchev closed the border between East and West. The new boundary was erected within the boundary of East Berlin. Initially constructed out of any materials the final wall structure was 3.6m high and 1.2m wide making it almost impossible to cross. Escape was difficult; some managed to tunnel under the wall but many died trying. The wall became the symbol of the division between East and West.
- **The Bay of Pigs 1961:** Following the Cuban Revolution in 1959 the CIA created a plan to regain American influence in Cuban. The plan involved sending Cuban exiles back into the country to cause an uprising against the government. The exiles were called **La Brigada 2506** and there were around 1500. The operation cost $45 million. However Castro was popular and the invasion failed resulting in embarrassment for JFK and costing $50 million in medicines and baby food to get captured exiles back.
- **The Cuban Missile Crisis 1962:** Following the failed Bay of Pigs mission Cuba and the Soviets grew closer and JFK discovered missile launch sites being constructed on the island. A blockade (quarantine) was enforced around the island to prevent the delivery of missiles to Cuba; the blockade stretched 3,300km's around the island. Eventually the situation calmed down and the soviet ships returned home.
- **The Prague Spring 1968:** Similarly to Hungary the economy in Czechoslovakia was in decline, leading to a fall in the standard of living for normal people. In 1968 Dubcek replaced Novotny as leader. The Prague Spring refers to reforms put in place by Dubcek in April 1968, which lasted until August 1968. He wanted 'socialism with a human face' keeping communism but making it less restrictive, removing secret police and allowing more freedoms. Crucially Dubcek did not threaten to leave the Warsaw Pact. However Brezhnev now leader of the Soviet Union needed to secure his control over Czechoslovakia and sent troops into Prague.

Reactions to the crises

The Berlin Wall: Khrushchev felt that the wall 'guarded the gates of socialist paradise.' The Wall was a physical divide between East and West and for the people of Berlin a daily reminder of the tension between the two sides. When JKF visited Berlin in 1963 he made a speech to around1.5 million people near the wall, so the people of the East could hear too.

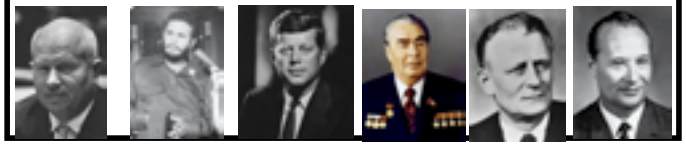
The Cuban Missile Crisis: Khrushchev was considered by his party of have failed, which led to his removal as leader. JKF was seen as a great leader.

- **A hotline** was established in 1963 allowing the two sides to talk directly, which arguably was the kick-start of Détente.
- **Limited Test Ban Treaty 1963** both sides agreed to stop testing nuclear weapons.
- **Outer space treaty** agreements not to place nuclear weapons in orbit.
- **Non proliferation treaty** designed to stop the spread of nuclear weapons.

The Prague Spring: Brezhnev created the Brezhnev Doctrine to justify his invasion of Czechoslovakia. This doctrine declared that the Soviets had the right to invade any Eastern European country that threatened the security of the Eastern Bloc.

- The USA did not send any help as they were busy in Vietnam.
- Dubcek was forced to resign as leader
- Western countries condemned the invasion but failed to send any assistance to the Czech people.

Key people



Key words

Ultimatum, summit, espionage, blockade, quarantine, CIA, refugee, socialism, doctrine, treaty, hotline, détente, brain-drain

Key topic 3: The end of the Cold War

Attempts to reduce tension

Following the tension during the Cuban Missile Crisis there had been an improvement in the relationship between the two superpowers which became known as Détente.

Détente:

- **SALT I 1972:** Strategic Arms Limitation Talks were clear sign that there needed to be limitations on weapons. A five year freeze on the total number of ICBM's was imposed.
- **Apollo Soyuz mission 1975:** The US Apollo spacecraft docked with the Soviet Soyuz one and there was a symbolic handshake in space, demonstrating the improved relationship.
- **The Helsinki Agreements 1975:** These agreements were about Human Rights, security and cooperation. Each signatory agreed to recognise human rights and basic freedoms; the Soviets agreed to recognise the existence of West Germany and there were calls for closer economic and scientific links.
- **SALT II 1974:** Was agreed and the treaty was signed in 1979. This contained a ban on production of new land ICBM's and limits on development of new types of strategic offensive arms.

New thinking:

- Gorbachev becomes Soviet leader in 1985 and being much younger wanted to improve relations between the Soviets and the USA. He developed his principles of 'new-thinking' which included a number of separate measures.
- **Perestroika –** restructuring of the economy allowing people to own businesses
- **Glasnost –** openness and freedom of speech
- **Ending the arms race** and signing arms limiting agreements
- **Abandoning the Brezhnev Doctrine** and ending Soviet interference within the Eastern Bloc.

Cold War flashpoints

Soviet Invasion of Afghanistan 1979

- **A Communist government** had been put in place by Amin but there was unrest due to many anti-Muslim policies.
- **The Mujahedeen:** Due to persecution many Muslims had joined a Guerrilla fighting force in the mountains who claimed to be on a holy mission for Allah. They declared a jihad on the Amin government.
- **Dependence on the Soviets:** Amin's government was dependant on the Soviets for military equipment and Amin was keen to improve relationships and links with the USA.
- **Islamic Fundamentalism:** Brezhnev was concerned and the spread of Islamic fundamentalism and how this could impact and threaten the Soviet regime.
- **The invasion:** December 1975 50,000 Soviet troops were sent to Afghanistan to restore order. Amin was shot and replaced with Kamal who had been in exile in Moscow, but his position depended on support from the Soviet government. Many afghan soldiers deserted to join the Mujahedeen. The Kamal government needed 85,000 soldiers to cling hold to power.

IMPACT:

- **Carter Doctrine:** This was the name given to Carter's response to the invasion. It stated that the USA would use military force if necessary to defend its national interests in the Persian Gulf region.
- **Moscow Olympics 1980:** Controversially Carter encouraged the USA to boycott the Moscow Olympic games and other countries followed their example.
- **Détente:** The invasion of Afghanistan ended the period of Détente. The USA refused to ratify SALT II.

The Second Cold War

- **Reagan** defeated Carter in the election and began taking a tougher stance on the Soviet Union.
- **Defence spending** was dramatically increased – a programme developed 1981-87 was set to cost a trillion dollars.
- **Strategic Defence Initiative:** known as the Star Wars programme it was a plan for a ground and space based, laser-armed anti ballistic missile system which would act as a shield against attack.

The collapse of the Soviet Union

Impact of Gorbachev:

- **Glasnost and Perestroika** was adopted in many countries in the Eastern Bloc and Gorbachev wanted the idea to spread further.
- **The Sinatra Doctrine:** This was the idea that countries within the Warsaw Pact could make their own decisions without outside interference.
- **Removal of troops:** The Soviet troops across eastern Europe were removed in an attempt to reduce costs and save money.

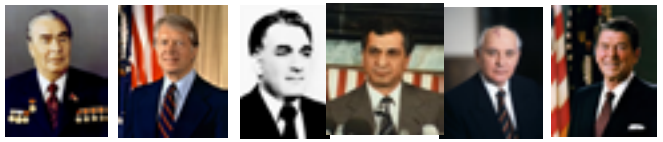
The fall of the Berlin Wall 1989

- **Demonstrations** began after East Germany embraced Glasnost and Perestroika. The people of East Berlin wanted democracy and freedom.
- **Democratic** elections took place in Hungary which led to a mass movement of people from East Germany, through Hungary and into West Germany. This led to announcements about greater freedom in the East, which resulted in the border being opened, leaving the people able to dismantle the wall.

The Collapse of Communism

- **Gorbachev** was considered the Darling of the West as his policies had led to the collapse of Communism.
- **The Warsaw Pact** was rejected by the countries rejecting communism and the Soviet Union was dissolved in 1991.

Key people



Key words

defence spending, perestroika, glasnost, Strategic Defence Initiative, fundamentalism, mujahedeen, jihad,

History - Paper 2 - Elizabethan England

Early Elizabethan England 1558-1588: Paper 2

Part 1. Early Challenges & the Religious Settlement

- England was in debt. The ***economy*** was weak due to poor harvest, the collapse of the wool trade and the devaluation of English coinage.
- Elizabeth inherited a predominantly Catholic ***government*** from her sister, Mary I. Should she remain Catholic or return England to Protestantism?
- Threat of ***invasion*** from Catholic Spain and France. There were French troops stationed in Scotland.
- Elizabeth was expected to marry and provide an heir. Some questioned her legitimacy following the execution of her mother (Anne Boleyn) by her father (Henry VIII)

Elizabethan Religious Settlement 1559

Act of **Supremacy**

Act of **Uniformity**

(Officially Protestant- but a "Middle Way" promising tolerance of Catholics in return for loyalty)

Part 2. Plots and Revolts

- **Mary Queen of Scots**

Arrives in England in 1568. Has claim to the throne. Links to Catholic France. Imprisoned in Carlisle.

- **Revolt of the Northern Earls 1569**

Northern rebellion aimed at Catholic restoration & putting MQS on the throne of England. Defeated near York.

- **Papal Excommunication 1570-** Catholics could win place in Heaven by killing Elizabeth.
- **Ridolfi Plot 1571**- Italian banker plots to use Spanish money to fund a French invasion of England.
- **Throckmorton Plot 1583**
- **Bond of Association 1584**
- **Babington Plot-** final proof that MQS was involved in a plot to murder Elizabeth.
- **Execution of MQS-** Elizabeth finally signs death warrant of MQS.

Part 3. War with Spain

Causes:

- **Piracy & the Americas**: English pirates are raiding Spanish treasure ships in the New World
- **French Civil War-** removes threat of French attack on Spain- frees Spain to attack England.
- **Spanish incursions in the Netherlands/Treaty of Nonsuch-** Elizabeth sends aid to Protestant rebels fighting the Spanish in the Netherlands.

Defeat of Spanish Armada

- *Ship design & tactics*: English ships redesigned to be faster than Spanish galleons.
- English *fire ships* used to break Armada formation. Spanish cut anchors to escape.
- *The weather*- The Protestant winds: storms drive Spanish into Atlantic. Wrecked on coast of Ireland.

Part 4. Colonisation & Exploration

Drake was able to ***circumnavigate*** the World. This was possible due to: Better navigation (astrolabes), Increased accuracy of maps, desire for new markets and access to things like the slave trade.

English ***colonies*** established at Roanoke (Virginia). 1585.
Failed due to infighting,
bad timing (arrived too late to plant crops)
and poor relations with the local Algonquin natives.

Part 4. Was there really an Elizabethan "Golden Age"?

For: Universities, Grammar schools, sport, dancing, theatre, music & rising literacy rates.

Against: poverty due to enclosure, rising population and poor harvest led to vagrancy,

Key names:

Elizabeth Tudor, Francis Walsingham, King Philip of Spain, Francis Drake, Walter Raleigh, John Howard, Mary Queen of Scots, Ralph Lane, William Cecil, Pope Pius V

Question types: Describe two features (4 marks)/Explain why (12 marks)/How far do you agree? (16 marks)

History - Paper 2 - Elizabethan England KT1

Key topic 1. Queen, government & religion 1558-69

Part 1 The situation on Elizabeth's accession

- Elizabeth inherited the throne from her sister, Mary I. Society was divided by years of religious turmoil (Catholic versus Protestant). Mary had converted England back to **Catholicism** following the reign of **Protestant** Edward.
- Elizabeth faced problems as she was a woman. Many in society feared another version of Mary I (Bloody Mary). Many Catholics saw Elizabeth to be **illegitimate** (bastard child of Henry VIII & Anne Boleyn).
- Elizabeth made it clear she didn't wish to marry. She refused a proposal from Philip of Spain. He had been married to Mary I.
- Elizabeth was cultured, well educated and a strong character- arguably due to experiences in her childhood. She was unwilling to share power with a husband.
- England was in debt. The ***economy*** was weak due to poor harvest, the collapse of the wool trade and the devaluation of English coinage. England had been almost constantly at war with France since the days of Henry VIII. The threat of invasion from France continued.

Part 2. The Religious Settlement

Elizabeth inherited a predominantly Catholic ***government*** from her sister, Mary I. Should she remain Catholic or return England to Protestantism?
England was a deeply divided community due to the religious rollercoaster of the previous years. As a result Elizabeth needed a religious settlement that would heal these divisions.

Elizabethan Religious Settlement 1559

Act of **Supremacy-** Elizabeth become Supreme Governor (avoiding "Head of Church" so as not to anger Catholics). Officially converts England to Protestantism. but a "Middle Way" promising tolerance of Catholics in return for loyalty).
Bishops run the Church and people swear an oath of allegiance.

Act of Uniformity: Protestant Prayer Book, services in English. Some decoration and vestments in churches. Act of communion open to individual interpretations. Clergy were allowed to marry.

Part 3. Challenges to the religious Settlement

Puritan Challenge

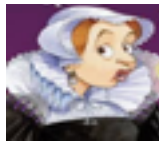
The Puritans were few in number and did not want to remove Elizabeth. They feared another Catholic Queen like Mary I. They occupied places in the Universities and some key members of Elizabeth's government were Puritans (e.g. Francis Walsingham)

Catholic Challenge

Many Catholics did not like the religious settlement.
England was now officially a Protestant and surrounded by hostile Catholic countries.

Part 4. The problem of Mary Queen of Scots

Mary QS was made Queen of Scotland as a baby. Sent to French court aged six. Married the heir to the French throne. So, strong links between France & Scotland. As a result the French placed troops in Scotland which was a threat to England.
1560 Returns to Scotland following the death of her husband (King Francis). Resumes position as ruler of Scotland. This is a divided society. Mary is hugely unpopular with many Scottish nobles
1565 Marries Lord Darnley, a bi-sexual alcoholic sex addict. They have a child which strengthens her claim to the throne.
Elizabeth angered as she wanted MQS to marry Dudley, Earl of Leicester.Darnley is murdered and Mary is implicated in the death.
Civil war in Scotland between Catholics & Protestants. MQS is imprisoned in Lochleven castle. She is forced to abdicate and her son is placed of Scotland as a baby. She escapes and flees to England.
Her arrival in Carlisle was a huge threat to Elizabeth. Mary is technically the heir to the English throne and Elizabeth has her imprisoned.



Key words:

Catholic, Protestant, Settlement, Illegitimate, Papacy, Puritan, heir, economy

History - Paper 2 - Elizabethan England KT2

Key topic 2. Challenges to Elizabeth at home & abroad 1569-88

Part 1 Plots & Revolts at home

- 1569 The **Revolt of the Northern Earls**; **Westmorland and Northumberland** led the Catholics of the North and 4500 supporters in an attempt to overthrow Elizabeth and replace her with Mary Queen of Scots. They forced their way in Durham Cathedral, destroy the new protestant prayer books and conducted a catholic mass. They did not appear to have the support of the Pope or any other nation and the revolt was easily stopped by Elizabeth and her army.
- In 1570 the Pope **Excommunicated** Elizabeth.
- **1571 Ridolfi Plot**: Italian banker Ridolfi was used by Mary Queen of Scots to send letters to the Duke of Alva in the Netherlands. They wanted to plan an invasion, to remove Elizabeth and replace her with Mary. However foreign forces not keen to invade until Elizabeth had been removed from power. Walsingham was aware of the plot and it was easily prevented; Elizabeth expels the Spanish Ambassador from court.
- **1583 Thockmorton Plot:** Following the assassination of William of Orange in the Netherlands there was a greater fear of Catholic uprising. Francis Throckmorton was used by Mary Queen of Scots to carry letters to the French and Spanish Ambassadors. They planned to start an uprising in the North and French to invade from the south. Throckmorton was already under surveillance so the plot was ended easily. As a result of the plot Elizabeth government put in place the **Bond of Association in 1584** which meant that if elizabeth's life was threatened Mary could be executed.
- **1586 The Babington Plot:** Anthony Babington was a young Catholic and he and Mary Queen of Scots sent letters to each other planning to remove Elizabeth and restore Catholicism in England. Walsingham suspects Mary is planning something and places spies in her household. They convince her it is safe to hide letters in barrels to correspond secretly. Mary agrees to Babingtons plan and Walsingham has the evidence he needs to put her on trial. She is moved to Fotheringhay Castle and executed in 1587.

Part 2. Relations with Spain

- The relationship between England and Spain had grown steadily worse. Owing to the fact that Elizabeth was deeply in debt when she acceded to the throne, Elizabeth took the opportunity to raise funds using **privateers.** Francis Drake went on various missions and destroyed Spanish ships and stole gold. These ventures were approved by Elizabeth and as a result she gained funds but created friction with the Spanish. In 1572 Drake stole silver worth £20,000 (about 30 million today)
- Following the various Catholic plots 1569 - 1986 Elizabeth had finally agreed to the execution of Mary Queen of Scots. The death of this Catholic anointed Queen seriously impacted the relationship with the Spanish. They were not happy that the prospect of a Catholic Queen in England once again was greatly reduced.
- The Spanish controlled large areas of territory in the Netherlands and in 1572 there was a Protestant uprising. The fact that Elizabeth was willing to help fellow protestants would have impacted on the relationship.

Part 3. Outbreak of war with Spain

- France had always been the traditional enemy of Spain, but when a civil war between Protestants and Catholics broke out in 1562 this left them dealing within an internal crisis until 1598. As a result France were no longer a real threat to Spain, freeing Spain up to focus on England.
- Following the Protestant uprising in the Netherlands in 1585 Elizabeth signed the Treaty of Nonsuch and sent an army of 7000 to help the protestants. This was direct military involvement and to Spain looked as if Elizabeth was laying claim on the Netherlands and the Spain territory. This of course angered Philip.
- In April 1587 Francis Drake was sent to Cadiz. The Spanish had begun the preparation of the Armada and Drake sailed into the harbour and destroyed numerous galleons and equipment. This event became known as the **Singeing of the King's beard.** This attack led to a delay in sending the Armada.

Part 4. The Armada.

- May 1588 ships leave Lisbon heading for England, commanded by the Duke of Medina Sidonia. The plan was to meet Spanish troops in the Netherlands, transport them to England and invade.
- June 1588 the fleet arrives in Corunna needing repairs and stays for one month.
- July 1588 the fleet passes Plymouth and heads for Calais, sailing in a close crescent formation.
- August 1588 the fleet arrives in Calais, aiming to meet 30,000 troops from Netherlands and the Duke of Parma, however these additional forces are delayed for a week. The English send fire ships causing chaos, resulting in the Spanish fleet having to cut their anchors to leave in a hurry.
- Following further fighting at Gravelines many of the Spanish fleet flee, sailing away towards Scotland. The weather has paid a huge role in the defeat of the Armada leaving many of the Spanish vessels shipwrecked.

Key words:

Plot, Bond of Association, Privateer, Spy Master, Ex-Communication, Treaty of Nonsuch, Galleon, Vessel, Ridolfi, Throckmorton, Babington,

History - Paper 2 - Elizabethan England KT3

Key topic 3. Elizabethan society in the age of exploration 1558-88

Part 1 Education & Leisure

- Many English people were **illiterate** and depended on signs with pictures to navigate their way around shops and businesses. Due to this there were books written in picture format to appeal to lower classes. More wealthy people would be able to read.
- Young boys would be able to attend **grammar schools**; these were mainly for the sons of **Yeoman** or **merchants**, but some were bright students from lower classes. Demand for grammar schools had increased as many classes had begun to want to educate their children.
- Many rich families had private tutors for their children; this would be the case for both boys and girls. Elizabeth herself had received a high level of education. However for poor families education is not a necessity and as a result only 1 in 10 women can read or write compared with 3 in 10 men.
- Poorer people enjoyed a variety of leisure activities including **bear baiting,** wrestling and football. Archery is also enjoyed by the lower classes along with hunting, although this is limited to smaller animals
- Richer people enjoy tennie, **bowls and fencing** in addition to archery and hunting - mainly deer.
- All classes enjoyed the theatre however the seats you had did depend on how much money you had. If you were poorer you would be in the **'pit'** as a **'groundling'** These people paid just one penny for their tickets, whereas three pennies would provide a seat under cover.

Part 2. The problem of the poor

Elizabeth came to the throne at a time of poor harvests. This meant less food grown and so prices were rising. At the same time the population was rising- putting further strain on resources. Henry VIII had closed the monasteries and this removed a source of help of the poor.

The wool trade with the Netherlands had collapsed and wages were stagnating- not keeping pace with rising prices.Farmers had begun to enclose their land and turn it over to sheep farming.As this required fewer people it also contributed to rising unemployment.

Elizabethan reactions

There was a fear that huge gangs of unemployed vagrants would damage the social order.

1572 Vagabonds Act: vagrants who could be whipped, bored through the ear and executed if repeatedly caught begging.

1601 Elizabethan Poor Law: brought in a **compulsory** nationwide **Poor Rate** system.

Everyone had to contribute and those who refused would go to jail. Begging was banned and anyone caught was whipped and sent back to their place of birth.**Almshouses** were established to look after the impotent (or deserving)poor.

Part 3. Exploration & Voyages

Trade expanded in this period, driven by war with Spain, a need to pay off debts and the need for new markets as the wool trade with Europe shrank. The Elizabethans cashed in on the trans-Atlantic slave trade and English privateers raided Spanish colonies in the New World.

This expansion was made possible by:

1. Improvements in ship design with Galleons capable of holding more cargo and carrying more guns.
2. Improvements in navigation such as astrolabes and printed maps. Thomas Harriot devised a method of determining a ships direction at sea using the sun. Elizabethan cartographers were able to draw and print increasingly accurate maps.
3. Investment in voyages by rich people, such as Elizabeth who funded and profited from these voyages.

As a result of these voyages Elizabethan finances improved (thanks to stolen Spanish gold). At the same time our Knowledge of the wider world was expanded.

Key words:

Illiterate, grammar schools, yeoman, merchant, bear baiting, fencing, bowls, pit, groundling, astrolabe, navigation, Almshouses, Poor rate, colonies

Part 4. Raleigh & Virginia.

The 1585 Expedition:

- Richard Grenville set off for Virginia in 1585, a total of 5 ships including the flagship The Tiger reached the coast of America in June. However strong winds and currents forced the fleet onto the sandbanks and the ships were battered by waves, causing seawater to ruin the supplies and nearly all the seeds for crops.
- To begin with relations with the Native Americans were good, but after Grenville noticed a silver drinking cup was missing a disagreement broke out leaving a village in flames and fear and suspicion growing. In addition Natives were beginning to die from unknown causes, which made them think the colonists had supernatural powers - in reality this was measles and smallpox, illnesses to which the natives had no immunity.
- Grenville returned to England for supplies leaving Ralph Lane in charge, but the soldiers remaining began to uprise and disobey orders. The fleet arrived too late to plant crops so there were food shortages and the natives initially were happy to help needed precious resources for themselves. Following orders from the Chief they decided to no longer help the colonists. Fortunately for the colonists help was on its way; Francis Drake arrived in 1586 to check in with the colony. The English were keen to leave as quickly as possible.

The 1587 Expedition

- Second Expedition tried to learn lesson of the first- for instance taking farmers rather than soldiers. It also failed for largely the same reasons; the fleet hit bad weather, supplies were ruined and they arrived at the wrong time to plant crops. The captain refused to land at Chesapeake Bay and stranded the settlers at Roanoke. Here they were attacked by Native Americans who remembered the first colony. Governor White also managed to attack the friendly Croatan tribe by accident and so alienated the only Native Americans who might help the colonists.
- Many historians think that the colony was finally wiped out by either the local tribes or by disease.

Superpower relations and the Cold War example exam questions

Explain two consequences of…(8)

- Of the Potsdam conference in 1945
- The Berlin Crisis 1948-49
- The Hungarian Uprising in 1956
- The building of the Berlin Wall in 1961
- The Bay of Pigs invasion in 1961
- The Prague Spring in 1968
- The Soviet Invasion of Afghanistan in 1979
- Gorbachev's 'new thinking' on eastern Europe.

Write a Narrative account…(8)

- analysing the key events of the peace conferences in the years 1943-45.
- analysing the main events of the East-West rivalry over Berlin 1958 - 1961.
- analysing the main events in superpower rivalry in Cuba in the years 1959 - 1962.
- analysing the key events of the Soviet invasion of Czechoslovakia in 1968.
- analysing the key events in attempts to reduce tension during the 1970's and 1980's
- analysing the key events in the Soviet Union and Eastern Europe in the years 1989-1991.

Explain the importance of…(8) x 2

- the Bay of Pigs for the development of the Cold War.
- the building of the Berlin Wall for the development of relations between USA and Soviet Union.
- Cuban Missile Crisis for the relationship between the USA and the USSR.
- of SALT 1 for the development of the Cold War.
- the Marshall Plan for the development of the Cold War.
- of NATO for the development of the Cold War
- the Soviet invasion of Afghanistan in 1979 for relations between the USA and the Soviet Union.
- Of Gorbachev's new thinking for the development of the Cold War

Early Elizabethan England 1558 – 1588 example exam questions

Describe two features of…(4)

- Activities for poorer people
- Activities for richer people
- Elizabeth's education
- The Babington Plot
- Early challenges facing Elizabeth
- The attack by the Armada
- Drake's circumnavigation of the globe
- Attempts to colonise Virginia
- Elizabethan theatres

Explain why…(12)

- Mary Queen of Scots created a problem for Elizabeth when she came to England in 1568.
- Mary Queen of Scots was executed in 1587.
- England went to war with Spain.
- England was able to defeat the Spanish Armada.
- Elizabethan's were worried about idle poor and vagabonds.
- Men such as Drake went on voyages of exploration

How far do you agree?(16)

- 'The threat of invasion was Elizabeth's main problem when she became Queen in 1558'
- 'Elizabeth dealt with the problems of 1558 successfully'
- 'Elizabeth's religious settlement was a successful compromise.'
- 'The Babington Plot was the main reason for Mary's execution in 1587.'
- 'Lack of foreign support was the main reason why Catholic Plots against Elizabeth failed.'
- 'Poor harvests were the main reason for poverty in Elizabethan England.'

History - Paper 3 - Germany 1918-39

Part 1. Early Challenges to the Weimar government

- Threat of Revolution: Germany in 1918 was very volatile. The navy mutinied at Kiel and there was threat of Communist revolution. The new government met in Weimar.
- The Weimar Constitution: Proportional representation, equality for men and women. Article 48 allowed President to ignore Reichstag in an emergency.
- Left & Right wing revolts: 1919 Spartacists Revolt and Red Rising in the Ruhr (left wing/crushed by Freikorps). 1920 Right wing Kapp Putsch (stopped by General strike in Berlin)

The Versailles treaty and its impact

Land: Germany lost land like Saar to France/Polish Corridor to Poland. Both rich in natural resources.
Army: Reduced to 100,000/no tanks/subs/planes- hard to defend & caused unemployment
Money: Germany to pay £6.6 billion in reparations (gold & raw materials)
Blame: Article 231- War Guilt clause

Ruhr invasion & Hyperinflation

- **1921** Treaty of London gives Germany reparations bill.
- **1923** Germany fail to pay second instalment so France & Belgium invade Ruhr (industrial area). German workers strike but government prints money in order to pay them.
- Value of currency ruined. **1924 Dawes plan** needed to fix.

Part 4. Securing control

- **February 1933 Reichstag fire**. Blamed on Communists and used as excuse to arrest and put into Concentration camp.
- **March 1933 Enabling Act-** Hitler persuades Reichstag to pass legislative powers to him.
- Communist party banned.
- **1934 Night of the Long Knives**. Murder of Rohm and leading SA members. Hitler secures control of Nazi party.
- **Death of Hindenburg-** Hitler combines offices of President and Chancellor to become Fuhrer.

Germany 1918-39: Paper 3

Part 2. Development of the Nazi Party

- Drexler sets up **Germany Workers Party** /D.A.P. (Hitler joins).
- Hitler becomes leader of D.A.P. Excellent speaking skills
- November 1923 Nazis led by Hitler and Ludendorff stage **the Munich Putsch** to seize power in Southern Germany.
- Putsch fails (but Hitler uses trial as propaganda platform).
- Hitler sent to Landsberg prison and writes **Mein Kampf.**
- "Lean years" 1924-29 Nazis make only small gains due to improvements in economy after **Dawes Plan** and US investment.
- 1926 **Bamberg Conference-** Hitler unites the Socialist and Nationalist sides of the party and adopts tactic of Winning power by election.

Part 3. The Great Depression and Nazi electoral success

- **1929 Wall St Crash-** USA recalls Dawes plan loans and Germany economy crashes.
- German unemployment hits 5.5 million by 1932.
- Nazis quick to offer **Work & Bread** to the unemployed.
- Middle classes fearing Communist revolution begin to support Nazis.
- Nazis train members in public speaking to encourage support.
- As Nazis win seats in
- Reichstag **Von Papen &**
- **Hindenburg** decide to offer Hitler a deal.
- **1933** Hitler becomes **Chancellor.**

Question types: Inferences from source (4 marks) Explain why (12 marks)/How (4 marks) and why (4 marks) do interpretations differ?/ How far do you agree? With the interpretation x? (16 marks) + 4 SPAG

Part 5. Life in Nazi Germany

- **Control** via: Gestapo. Block leaders, propaganda, People's Receiver & fear of concentration camps.
- **Unemployment** tackled via building of Autobahns, Rearmament (including conscription 1935) and removal of Jews & women from statistics. Germany Labour Front controls workers. Strength through Joy rewards workers.
- **Youth:** School curriculum controlled/Hitler Youth membership made compulsory (1936).
- **Women**; Removed from jobs. Encouraged to have babies (Honour Cross/Lebensborn project).
- **Policy on Jews**: 1933 Jewish shop boycott. Nuremburg laws- official anti-Semitic policies from 1935.
- **Resistance**: Edelweiss Pirates/Navajo/Roving Dudes.
- **Churches**: Concordat with Papacy (1933).

Some resistance from Germany Church e.g. Pastor Niemoller.

History - Paper 3 - Topic 1

Part 1. The Weimar Constitution & revolts

- **Armistice** November 1918. Germany agrees to peace talks. Nationalists begin to claim Germany was "stabbed in the back" by Jews & Communists. The government earn the nickname "**November Criminals**"
- Threat of Revolution: Germany in 1918 was very volatile. The Kaiser **abdicated**. The navy mutinied at Kiel and there was threat of Communist revolution. The new government met in Weimar because Berlin was regarded as too dangerous.
- **The Weimar Constitution**: Proportional representation meant that parties got the % of seats in the Reichstag that they had % of votes. Constitution agreed equality for men and women. Chancellor (Prime Minister) governed with support of Reichstag. Article 48 allowed President to ignore Reichstag in an emergency and pass laws himself.

Left & Right wing revolts:

1. 1919 **Spartacists Revolt**. Left wing rising led by Leibknecht & Luxemburg. Aimed at Communist style government. Ebert (Chancellor) used the **Freikorps** (Nationalist, ex-soldiers) to crush the revolt. Leaders were executed.
2. 1920 Dr **Wolfgang Kapp** led a Putsch of 5000 Freikorps which caused the Weimar government to flee to Dresden. Kapp declared himself leader and promised to scrap the Versailles treaty. The Putsch was only stopped by General strike in Berlin with workers shutting down the city.
3. **Red Rising** in the Ruhr. 60,000 Communist workers seize the industrial Ruhr and set up Soviet style workers councils. Crushed by Freikorps.
4. November 1923 Hitler persuades politicians in Munich to support an armed rebellion. 600 Nazis stage a failed putsch. **Munich Putsch** is Stopped by police. 16 Nazis killed and Hitler is sent to Landsberg prison.

Topic 1: Weimar 1918-29

Part 2. The Versailles treaty and its impact

Signed **28 June 1919**.

Terms of the Treaty:

Land: Germany lost land like **Saar & Alsace Lorraine** to France. **Polish Corridor** and Upper Silesia to Poland. Germany lost all overseas colonies. . Impact: Lost land was rich in natural resources. Millions of Germans were now living under foreign rule.

Army: Reduced to **100,000 soldiers**/no tanks/submarines/military aircraft. Impact: this made Germany very hard to defend & caused unemployment. Rhineland was demilitarised.

Money: In 1921 Germany to was ordered to pay **£6.6 billion in reparations**. Payable in gold & raw materials (iron ore, coal etc). Impact: Germany now in debt until at least 1984. Harms ability of Germany to recover from WWI.

Blame: **Article 231- War Guilt clause**. Germany was made to take blame for causing WWI. Impact: German people felt war was more due to Serb terrorism- so therefore unfair.

Part 3 Ruhr invasion & Hyperinflation

- **1921 Treaty of London** gives Germany reparations bill.
- **1923** Germany fail to pay second instalment so France & Belgium **invade Ruhr** (industrial area). The Weimar government instruct the workers in the Ruhr to adopt "**passive resistance**" to the French. German workers strike and refuse to work for the French. However, workers need to be paid and no goods are being produced so government prints money in order to pay them.
- Printing of money for which there is no supporting gold supply leads to **hyperinflation.**
- Value of currency ruined. Prices rise. Life savings wiped out. People on fixed incomes struggle to cope. Some use crisis to pay off debts and mortgages.
- **1924 Dawes plan** needed to fix the problem

Part 4. Stresemann & The Golden Years

- **Gustav Stresemann**: Chancellor & Foreign Secretary- works with American banker**, Charles Dawes** to arrange a loan to help fix hyperinflation. Loans allows for **a new currency- the Rentenmark**. Also encourages US investment in Germany and helps to create rising employment.
- **Foreign policy successes**: 1925 Locarno pact: Germany agrees to stick to its western borders from the Versailles treaty. 1928 Kellogg-Briand Pact: Germany joins other countries in agreeing to use peaceful means to solve international disputes. Germany is finally allowed to join the League of Nations. 1929 Young Plan allows Germany to re-negotiate the reparations bill (reduced payments).
- **Investment and improved economy** allows for cultural changes: Theatre and cinema boom. Architectural movements such as Bauhaus show off Germany's new confidence and success.
- Stresemann warns that Germany is "dancing on a volcano". This shows his awareness that German economic stability was based upon the Dawes plan loans.

Key people




Keywords

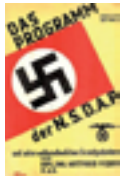
Armistice, abdicated, constitution, proportional representation, revolt, Putsch, Freikorps, Chancellor, reparations, passive resistance, hyperinflation, Rentenmark, communist, nationalist, Bauhaus,

History - Paper 3 - Topic 2

Topic 2: Hitler's rise to power

Part 1. The Early Years of the Nazi Party.

- Hitler is sent to Munich by the army after WWI. His mission is to gather intelligence on extremist political parties.
- Joins the **D.A.P. The German Workers Party** formed by Anton Drexler.
- Hitler becomes responsible for recruitment and propaganda due to his abilities as an excellent public speaker**. D.A.P. becomes N.S.D.A.P** (addition of National Socialist to German Workers Party)
- 1920 Hitler & Drexler issue **the 25 Point Programme-** includes Union of all German speaking people, abolition of Versailles, anti-Jewish measures and creation of a strong central government.
- 1921 Hitler becomes party leader and establishes the **Fuhrerprinzip** (total authority over Nazi party)



Part 2. The Munich Putsch & Lean Years

- November 1923 with the chaos of the Ruhr invasion and hyperinflation, Hitler and Ludendorff stage **the Munich Putsch** to seize power in Southern Germany.
- 600 Nazis meet in the Burgenbraukeller and take three local politicians hostage until they agree to support the Putsch.
- Expected support from police fails to appear and Nazis are met by armed resistance. 16 Nazis are killed.
- Putsch fails and Hitler is arrested. He uses his trial as a propaganda platform and via media attention begins to become a national name.
- Hitler sent to Landsberg prison and writes **Mein Kampf.**
- While Hitler is in prison support for the Nazis falls.
- "Lean years" 1924-29 Nazis make only small gains due to improvements in economy after **Dawes Plan** and US investment.
- 1926 **Bamberg Conference-** Hitler unites the Socialist and Nationalist sides of the party and adopts tactic of Winning power by election rather than by armed uprising. "We must hold our noses and enter the Reichstag."

Part 3. The Depression

- **October 1929 Wall Street Crash**. As US economy collapses they re-call all loans made under the Dawes plan. This causes collapse of German economy.
- As **unemployment rose**, Chancellor Bruning cut unemployment payments and raised taxes on basic goods.
- Six million unemployed by 1932.
- Nazis capitalise on **Depression**- offering "Work & Bread". Nazis train members in public speaking techniques to get across message that they are the only party capable of solving the Depression.
- **1932 Election campaign**, Hitler travels all over Germany by plane to give speeches and mass rallies. Nazi share of the vote increases dramatically (37% of seats).
- **President Hindenburg** begins to support idea of Hitler as Chancellor

Part 4. Hitler becomes Chancellor

- **1932 Elections** see Nazis win 230 seats in Reichstag.
- **Chancellor Von Papen** refuses to give up the post and make Hitler Chancellor. However, Von Papen's Centre Party have failed to win a majority in the Reichstag.
- Von Papen lost support from Hindenburg and resigned. He was **replaced by Schleicher** who tried to create a cross-party **coalition** (bringing left and right wing parties together to form a government.
- Determined to regain power, Von Papen meets with Hitler to propose that Hitler become Chancellor with Von Papen as Vice-Chancellor.
- Many **powerful industrialists and landowners** supported Von Papen's plan as they saw Schleicher as trying to hand power to the Communists.
- Hindenburg (President) supports the plan and **in January 1933 Hitler becomes Chancellor** of Germany.

Key people

Keywords

Propaganda, NSDAP, Putsch, Mein Kampf, President, Economic Depression, unemployment, Reichstag, coalition, industrialist, Chancellor,

Topic 3: Control & Dictatorship 1933-39

Part 1. Reichstag Fire & Enabling Act

- **February 1933 Reichstag fire**. The fire is blamed on Marius Van Der Lubbe, A Dutch Communist.
- Hitler uses the fire to persuade President Hindenburg to pass the **Decree for the Protection of the People and State**. This suspends the Constitution and places Germany into a state of permanent emergency.
- Communists, including their leader, Ernst Thalmann are arrested and put into Dachau, the first Concentration camp. Communist newspapers are banned.
- March elections, Nazis win the most votes but not a majority. They form a coalition with the German National Party.
- **March 1933 Enabling Act-**

Hitler persuades Reichstag to pass legislative powers to him. This allows Nazis to pass laws for the next four years without needing the approval of the Reichstag.

Part 2. Removing Opposition

Banning of trade unions
2 May 1933 All trade unions (who represented workers rights) were abolished. Nazis said that as they had created a national community these organisations were no longer needed. Nazis set up DAF (German Labour Front) to organise workers and set pay. Strikes were banned.

Ban on political parties
14 July 1933 Ban on Formation of new Political parties. Existing political parties severely restricted. November 1933 elections Nazis won 95.2% of vote.

Abolition of the Lander
January 1934 Nazis abolished the Lander (regional governments). This centralised all political power with the Nazis in Berlin.

Part 3. Night of the Long Knives

- **1934 Night of the Long Knives**. Murder of Rohm and leading SA members. Hitler secures control of Nazi party.
- The SA had been instrumental in helping Hitler get to power. They were the street fighting unit that had intimidated voters and beat up Communist rivals.
- Hitler was aware that the SA represented a private army within the Nazi party (under the leadership of Rohm).
- The SS (Hitler's personal bodyguard) led by Himmler wanted to break with SA. The SS were used to murder
- Rohm and SA leaders.
- **Death of Hindenburg-** Hitler combines offices of President and Chancellor to become Fuhrer.

Key people





Part 4. Securing support of the army

The SA had been unpopular with the leaders of the German army.
Night of the Long Knives helped Hitler to secure control over the regular German army (Wehrmacht)
1934 Following the death of President Hindenburg, the army swore a direct oath of support to Hitler as Fuhrer.

Keywords

Reichstag, Constitution, Enabling Act, Legislation, Trade Union, Abolition, Opposition, President, Fuhrer,

Topic 4: Life in Nazi Germany 1933-39

Part 1.Development of the Nazi Police State

The SS: 50,000 members by 1934. Total loyalty to Hitler. Ran concentration camps. Within SS were the SD (Security Division) responsible for security within the country & party.

The Gestapo: The secret state police led by Himmler. Relied upon a network of informers (including Block Leaders) to gather information on the German people. Most people arrested by Gestapo ended up in Concentration camps.

Concentration Camps: Allowed from removal of political opponents. Run by SS who also benefitted from using inmates as slave labour. Camps were constant threat to citizens of consequences of dissent.

Ministry of Propaganda

Run by Josef Goebbels. This ensured Nazi control of cinema, newspapers and radio broadcasts. Films were accompanied by news bulletins. Mass production of People's Radio receiver allowed Nazis to broadcast into homes.

Annual mass rallies were held at Nuremberg.

The Legal System: All judges had to be Nazis.

People's Courts allowed for death penalty for acts of treason.

Part 2. Church, Youth & Opposition

The Church

1933 Nazis signed a Concordat with the Pope. Agreement that Catholics could worship as long as they did not interfere in Nazi policies. Protestant Reich Church was run by a member of the NAZI party. Some Protestants resisted such as Martin Niemoller- who was sent to Sachsenhausen camp for preaching against the Nazis.

Hitler Youth

Compulsory membership after 1936. Preparation for life in the army plus propaganda and political indoctrination. Camping, wrestling, marching drills. Uniforms were worn. League of German Maidens for girls.

Schools

Textbooks re-written to emphasise German history and teach military skills. All teachers had to be Nazis. Day began with National anthem. Girls taught needlework and cooking skills. 1938 Jewish children expelled from schools

Edelweiss Pirates & Swing Youth

Resisted Hitler Youth by continuing to listen to banned music, smoke, drink, beat up Hitler Youth. Edelweiss Pirates wore clothes considered outlandish by Nazis. Created no-go areas for Hitler Youth in some cities. Swing Youth- more middle class. Listened to Swing music.

Part 3. Policies on women

The Nazis wanted women to stay at home and have children. (Kinder, Kuche, Kirche: Children, kitchen church). This also helped to reduce unemployment figures (as women were not included)

Marriage Loans

Newly married couples could borrow a years wages (for a worker). For each child born the re-payments on the loan were reduced.

Honour Cross of German Mother

Given out to encourage child bearing. Gold cross for eight babies.

Lebensborn

Policy allowing single girls to be paired up with members of the SS in order to "have a baby for Hitler".

Part 4. Persecution of the Jews

The Nazis aimed at creating a **Herrenvolk** or Aryan Master Race. This would be achieved by selective breeding and the destruction of the Jews.

1933 **Boycott** of Jewish shops. SA placed themselves in doorways of Jewish shops to discourage people from entering. Most Germans ignored the boycott.

1935 **Nuremberg Laws**.- only those of pure blood could be German citizens. Jews banned from voting. Marriages between Jews and Aryans banned.

1938 November- **Kristallnacht- Night of Broken Glass**. Attacks by Nazis on Jewish homes, businesses and Synagogues across Germany. 100 Jews were killed. 20,000 sent to concentration camps.

Part 5. The Nazi Economy

Reich Labour Service: Provided manual labouring jobs to men aged 18-25. Workers lived in camps, wore uniforms and received very low pay. Women and Jews were pushed out of jobs.

Re-armament created jobs: 1935 introduction of **conscription**: Army grew from 100,000 to 1,400,000 by 1939. Building motorways (**autobahns**) and other public construction works employed hundreds of thousands of workers. Building planes, tanks and other weapons further created jobs and stimulated the economy.

Strength Through Joy (KdF) aimed to reward workers with holidays, trips, theatre tickets.

Beauty of Labour Movement aimed to improve working conditions in factories.

Wages rose overall but cost of living also rose. Consumption of meat and fresh fruit fell. Many hated the lack of freedom caused by Nazi employment policies.

Key people

Keywords

Gestapo, Concentration camp, propaganda, Nuremberg laws, Kristallnacht, Lebensborn, Motherhood cross, Edelweiss Pirates, opposition, rearmament, conscription, autobahns

Weimar and Nazi Germany 1918 – 1939 example exam questions

1. Give two things you can infer about…(4)

- Infer – what you can gather or assume from the information.
- Add your proof (what the source says or shows to prove your inference)

2. Explain why…(12)

- **there were challenges to the Weimar Republic in the years 1919-1923.**
- **the Weimar Government recovered in the years 1924-1929.**
- **why there was a Golden Age in the Weimar Republic**
- **Hitler was able to secure the position of Chancellor in January 1933.**
- **Hitler was able to secure his position as Dictator in 1934.**
- **the police state was a success in removing opposition to the Nazi regime.**
- **there were changes to the lives of Jewish people in Nazi Germany in the years 1933 - 1939**

3a . How useful are the sources…(8)

- Use **NACHOS** to help with your answer here.
- **Nature** – What type of source is it? Photo, newspaper…
- **Author** – Who wrote it? Are they an expert? Might they be lying?
- **Content** – what does it actually tell you?
- **Happening** – What was going on at the time? Does the source match your knowledge?
- **Omitted** – Has anything been deliberately missed out?
- **Special reason** – Has it been produced for a special reason or purpose?

3b . How are the interpretations different?…(4)

- Read through, identify the main difference and prove it using quotes from both interpretations.

3c . Why are the interpretations different?…(4)

- Usually interpretations are different because people get their information from different sources. Try to match the interpretations to one of the sources in 3a and use these as examples to explain your answer.

3d How far do you agree with the interpretation about…?(16)

- Talk about the interpretation in the question
- Quote from the interpretation and add evidence to support the quotes
- Talk about the other interpretation
- Quote from it and add evidence to support
- Conclusion…your overall opinion

History - Paper 3 - Example Exam Questions 2

I have often listened to the debates with real concern, glancing timidly to the gentlemen of the Right, fearful lest they say to me 'Do you hope to give a parliamentary system to a nation like this, one that resists it with every sinew in its body?' One finds suspicion everywhere; Germans cannot shake off their old political timidity and their deference to the authoritarian state.
From a speech to the new Constituent Assembly, by Hugo Preuss, head of the Commission that drew up the Weimar Constitution in 1919. He was talking about the new constitution

How useful is source A for an enquiry about German attitudes towards the newly formed Weimar Republic in 1919?

No one knew how many of them there were. They completely filled the streets…They stood or lay about in the streets as if they had taken root there. The streets were grey; their faces were grey and even the hair on their heads and the stubble on the cheeks of the youngest there was grey with the dust and their adversity.
From 'A fairytale of Christmas' a short story written in 1931 by Rudolf Leonhard – a member of the Communist Party – writing about the unemployed in Germany.

How useful is source B for an enquiry into the effects of unemployment in Germany 1929-1932?

Interpretation 1: **An adapted extract from *Weimar and Nazi Germany* by John Hite and Chris Hinton an A Level text book published in 2000.**
'Many Germans actually benefitted from hyperinflation. Many people in debt, such as mortgage holders paid off their debt with the devalued currency. Businessmen used cheap credit to borrow, make profit then pay back to loans when the value of money dropped.'

Interpretation 2: **An extract from *Nazi Germany 1933-45* by Chris Culpin and Steve Mastin an A Level text book published in 2013**.
'Some of the images from this period of hyperinflation might seem funny to us: kites made of banknotes, housewives burning notes in their cooking stoves. But it was not funny really. Prices rose so fast that employees were paid every other day. But they never had enough to live on. Many starved and infant mortality (death of children under the age of one) rose. For those on fixed incomes it was a catastrophe.'

3d. How far do you agree about the effect of Hyperinflation in 1923?

1. Give two things you can infer about tactics used by the Nazi Party to gain support.

Hospitality & Catering Part 1

The hospitality and catering industry includes hotels, guest houses, bed and breakfasts (B&Bs), inns and pubs, restaurants, cafes and takeaways, contract catering (such as weddings), catering in leisure attractions (such as museums) and motorway service areas. It includes aeroplane meals and snacks on trains. It also includes food served in hospitals, prisons, schools and the armed services.

LO1 Understand the environment in which hospitality and catering providers operate

Commercial – make profit e.g. hotel

Non commercial – don't make profit e.g. prisons

Residential- can book in to stay over night

Non residential – cannot stay overnight

commercial	Non commercial
hotels	hospitals
B&B's	schools
pubs	army
Guest houses	Care homes
Holiday parks	prisons

Marriott Niagara

- 4 star Hotel
- 3 different themed restaurants
- Breakfast restaurant
- Room service
- Starbucks attached to ground floor!

Bristol hotel Gibraltar

- No food or restaurant on site
- Shared breakfast room across street with another hotel

Meals on wheels

Social meal service provided by volunteers, to people unable to prepare their own food.

Care home meals

food served may depend on the needs of the clients, some may have conditions which need special meals. Some residents may need help eating and drinking

Bed & breakfasts, Guesthouses, Farmhouses

Often showcase local themes or produce.
May be breakfast, Half board or full board, family run

Motels & Holiday parks

Lower standard than hotels, food is usually buffet style breakfast. Corporate or independen

CONTRACT CATERERS

These provide food and drink for a function where catering facilities are not already provided

They prepare the food for functions such as, weddings, banquets, garden parties, and parties in private houses. They may prepare and cook food in advance, and deliver it the venue, or they may cook it on site. They may also provide staff to serve the food if required.

Great for - **parties**

Weddings

Proms

Establishments that do not have facilities to provide food and drink

Armed services meals

Mass catering. Camps on active service. Canteens at bases.High energy, balanced nutritionally

Prisons

Food is prepared in by prison inmates to ensure that tight budgets for food are met

Restaurants

Variety of styles and food types, may be specialist eg italian, or gourmet or fine dining
Styles of service vary with types of food and cost
See styles of service section for more...

Cafes

Can vary from independent "greasy" spoon, Tea rooms or coffee shops.
Serve snacks and full meals.

Type of Service	Description
Plate	Meals are pre plated in the kitchen. Good portion control methods. All plates are consistent in the food presentation. The method relies more on skilled kitchen staff than serving staff. Time consuming for the kitchen staff.
Family	The food is placed on the table, spoons are provided and customers serve themselves. It is a sociable method and it is easy and quick to serve. It requires larger tables. There is less portion control. It suits families.
Silver	Food is served by the staff using a spoon and folk. Full silver service is when all the food is served in this way. It provides a more personal customer experience, service can be slow. It is expensive and staff costs are high as more serving staff are required.
Gueridon	A person serves food from a side table of trolley. Sometime dishes are cooked or assembled in front of the customer. This requires skilled service and is very specialist. It is time consuming with high staff and menu costs.

Type of Service	Description
Cafeteria	Counters displaying food. Customers queue up. Simple basic experience for customers. High turnover and fast method. Low skill of serving staff. Customers may impulse buy from the displays.
Buffet	Food set up along a table, can be self service or served by staff. Less formal than plated or silver service. Fast and simple method, can be low cost depending of the food served. Poor portion control.
Fast food	Take-away service with the option to eat in. Customers collect food from a counter. Quick and simple method. Can have a high customer turnover. Often limited menu choice. Food served in disposable packaging.
Tray or trolley	A meal provided in a tray or a choice of food from a trolley. Food is served like this on airlines and in hospitals.
Vending	Food service from a machine. Food can be served 24 hours. Usually snacks are served in this way but it can also be hot meals.
Home delivery	Delivered to a house. Can be a take-away such as a Chinese or Indian meal. Care services such as meals on wheels also use this type of food service.

Fast food

Chains eg KFC, Dominos or independent businesses
Limited menu, low cost, eat in or take away
Disposable packaging

Take aways

Dedicated take away or restaurant attached or may be just take away, most food is cooked to order.

Public houses

Can serve "basket" meals sandwiches or full table service. Some chain pubs have a fixed menu eg Wetherspoons.

Bars

more cosmopolitan menu than pubs , often themed to the type of establishment. Table service or eat at the bar

Main sectors of the Hospitality Industry are:

- Accommodation e.g. Hotels & guest houses
- Food and drink e.g. Pubs & restaurants
- Meetings and events e.g. hotels and conference centres
- Entertainment and leisure e.g. spas , leisure centres , golf clubs, bowling alleys
- Travel and tourism e.g. Aeroplanes , cruise ships and hotels

- 1.7 million people employed
- £85 billion brought into the UK economy
- £7.5 billion on accommodation

Hospitality & Catering Part 2

What are the benefits of ratings?

- Reviews can make or break a business! A good review can increase business for establishments, as people will often try an establishment based on a recommendation.
- Reviews and ratings generate publicity, awards get you in the press!
- Customers might come from further away to dine or stay or both based on reviews.
- Customers can identify less favourable establishments that they will then avoid.

Michelin and rosette inspections are anonymous and are just 1 persons opinion. Trip Advisor and The Good Food Guide are lots of peoples opinions, so likely to be accurate.

PERSONAL ATTRIBUTES TO WORK IN THE HOSPITALITY AND CATERING INDUSTRY ARE VERY IMPORTANT BECAUSE IT IS CUSTOMER DRIVEN

- Friendly personality
- Pleasant and polite manner
- Clean and proper clothing, possibly a set uniform
- Spotlessly clean hands and nails
- A pleasant smell, i.e. no overpowering after-shave or perfume and no body odour
- Fresh breath, discreet make-up, long hair tied back, well-groomed appearance
- Steady hands to be able to carry and serve food
- Knowledge of the menu in order to answer any customer queries and advise on allergies, etc
- Enthusiasm for the job and a willingness to serve others
- Good health because of long hours on feet
- Polite, calm and tactful even when dealing with awkward customers
- Loyalty to place of work and the ability to 'sell' and 'promote' facilities to customers
- Ability to handle compliments and complaints

- **Personal Qualities:** Reliable, punctual, team worker etc.
- Can operate machinery e.g. coffee machines.

The organisation depends on the type and size of the establishment;a large restaurant may include all these roles:

- Head Chef or Executive Chef
- One or two sous chefs
- Chefs de parties or sectional chefs looking after each section (e.g. pastry)
- A demi chef de partie, reporting to and working the opposite shift to the chef de partie
- One or two commis chefs per section per shift
- An apprentice per section per shift.

Restaurant manager

- The restaurant manager is in overall charge of the restaurant.
- Takes bookings, relays information to the head chef, completes staff rotas, ensures the smooth running of the restaurant

Maître d'Hôte

Staff structure in a hotel

Employers want to employ most workers when they have busy times

Busy times of year
- Christmas
- Tourist season
- School holidays
- Mothers day
- valentines

Days of the week
- Friday
- Saturday
- Sunday
- Pay day

Time of day
- Lunchtime
- Afternoon
- Dinner time
- (breakfast)

The kitchen brigade

PLONGEUR or ESCUELERIE

Kitchen Porter / Dishwasher.

ENTREMÉTIER/VEGETABLE CHEF

Entrée preparer/manager. Note that an entrée, under Escoffier, is a starter and not a main dish. Thus, the entremétier traditionally handles vegetable, egg, or soup dishes—generally things that do not involve meat. He or she may supervise the potager and legumier or take on these roles.

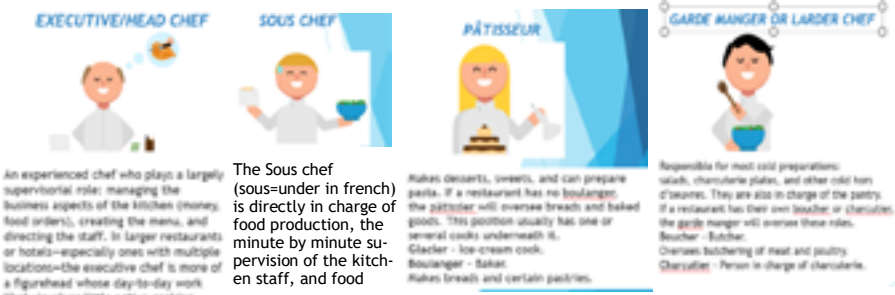
Full time

No specific number of hours that makes someone either full or part time, but a full time worker usually works more than 35 hours. The law says that workers don't usually have to work more than 48 hours a week on average, unless they choose to. This law is sometimes called the 'working time directive' or 'working time regulations'.

Part time

Part-time work is when a worker is contracted for anything less than the basic full-time hours. There are no set number of hours that makes someone full or part-time, however average part-time contracts are often 16-20 hours.

Hospitality Brigade



An experienced chef who plays a largely supervisorial role: managing the business aspects of the kitchen (money, food orders), creating the menu, and directing the staff. In larger restaurants or hotels—especially ones with multiple locations—the executive chef is more of a figurehead whose day-to-day work likely involves little active cooking.

The Sous chef (sous=under in french) is directly in charge of food production, the minute by minute supervision of the kitchen staff, and food

Makes desserts, sweets, and can prepare pasta. If a restaurant has no boulanger, the pâtissier will oversee breads and baked goods. This position usually has one or several cooks underneath it.
Glacier - Ice-cream cook.
Boulanger - Baker.
Makes breads and certain pastries.

Responsible for most cold preparations: salads, charcuterie plates, and other cold hors d'oeuvres. They are also in charge of the pantry. If a restaurant has their own boucher or charcutier, the garde manger will oversee these roles.
Boucher - Butcher.
Oversees butchering of meat and poultry.
Charcutier - Person in charge of charcuterie.

Considered the most respected of the chefs de partie, the saucier often reports directly to one of the sous-chefs. Their central role is preparation of sauces and possibly sautéed dishes.

Responsible for the roasting and braising of meats. In the traditional Escoffier brigade, the rôtisseur would also be in charge of the grillardin and friturier.
Today, he or she may simply take on these roles.
Grillardin - Grill cook.
In charge of the grill, specifically grilled meats.
Friturier - Fry cook.
Takes care of all frying, specifically deep frying.

Prepares and oversees all fish and seafood dishes. This position usually involves butchering the fish as well. Restaurants with an emphasis on shellfish may also employ an écailler.
An écailler prepares fruits de mer or shellfish (i.e., shucking oysters).

Work at specific stations under one of the chefs de partie. They are responsible for the tools at their station. Also described as a kind of apprentice who is usually a recent graduate of culinary school.

Agency Staff:
As an employer, you can hire temporary staff through agencies.
This means:
- you pay the agency, including the employee's National Insurance contributions (NICs) and Statutory Sick Pay (SSP)
- it's the agency's responsibility to make sure workers get their rights under working time regulations
- after 12 weeks' continuous employment in the same role, agency workers get the same terms and conditions as permanent employees, including pay, working time, rest periods, night work, breaks and annual leave
- you must provide the agency with information about the relevant terms and conditions in your business so that they can ensure the worker gets equal treatment after 12 weeks in the same job
- you must allow agency workers to use any shared facilities (e.g. a staff canteen or childcare) and give them information about job vacancies from the first day they work there
- you are still responsible for their health and safety

Casual/Seasonal

Casual workers are hired on an irregular basis for a short period of time (no more than 12 weeks). There is no continuing commitment from the employer to offer work, and no obligation on the part of the casual worker to do the work offered.

Staff can earn extra money if they are given tips because the service and food they have delivered has been good. It is sometimes considered rude not too tip. More expensive restaurants automatically add 10-12.5% extra to a bill to cover tips

Hospitality & Catering Part 3

Factors affecting success

Food costs are large **percentage** of costs for most **hospitality businesses.** When planning menus chefs must **calculate** how much dishes will **cost per portion** to be able to **justify** keeping it on the menu. **Expensive** dishes that are not ordered often may lead to **wasted ingredients** that are unused, which result in **less profit.** Chef's must design dishes that generate a profit to stay operational.

Costs for an establishment

Materials costs
Soap, loo roll,
Menus
Order pads
Cleaning materials
flowers

Food costs
Ingredients
Pre made foods
Bar food and drink
Food and drink for staff

Overhead costs
Heating, lighting
Furniture
Maintenance of equipment
Curtains, carpets

Personnel costs wages
Chefs
Kitchen assistants
Bar staff
Waiting staff
Managers
Casual staff

Benefits of portion control

- Keeps the food costs down
- Keep losses in food preparation and serving to a minimum
- Offer a consistent portion to customers
- Minimise waste eg leftovers
- To make a profit which is constant

Controlling portion size

Controlling portion size

Legislation that protects workers

- Disabled Discrimination Act 1995
- Equal Pay Regulations 1970
- Health and Safety At Work 1974
- National minimum wage
- Working Times Regulations 1998
- Part-time workers Regulations 2000

Cost per portion x 100

40

Independent shops may supply some establishments

Catering equipment

Specialist large scale catering and kitchen equipment from specialist companies

Specialist markets

Advantages	Disadvantages
• Large choice of commodities • Several suppliers at the market means costs are kept down by competition • Supplies are always at their freshest • New supplies in every day	• May not be easy to get to eg London • Work through the night and close early in the morning • Costs of transport back may be expensive • Purchaser has to judge quality for themselves before they buy

Type of staff	Benefits for employer	Benefits for employees	Disadvantages for employer	Disadvantages for the employees
Full-time 36 hours plus 28 days holiday	Reliable Permanent staff Staff have a good knowledge of services provided	Regular income Job security Permanent contract with holiday benefits. Regular hours of work Will receive sick pay	Bound by contract terms Has to pay sick pay, maternity leave and holidays. Expensive to employ Require lunch breaks unlike part time staff	Usually have to work shifts Less flexibility
Part-time 4-16 hours 28 days holiday	Can be employed at busier times of the day such as lunch or dinner service	Can be more cost effective with less wages needed	Will need to pay for training of more staff rather then small amount of full time staff	Need to work basic requirement of hours before they are entitled to holidays and sick pay
Casual	Can be employed for functions or busy times of the year	Can choose when they want to work	Can be unreliable Have to pay agency fees Don't know the routines Casual staff haven't been trained Unfamiliar with services provided	Called at short notice to work Not a regular income No sick pay Often don't know where they will be working until the week before

Local suppliers

Advantages	Disadvantages
• Local deliveries, less environmental impact • May use local farms and companies for commodities • Smaller firms, personal business relationship • May be able to change order at short notice	• May not have a wide selection • Smaller companies buy in smaller quantities so costs more • May not be able to supply large orders

Large Wholesalers

Advantages	Disadvantages
• Very large range of commodities and sundries • Can have in house butchery department • Pre made and pre portioned food • Large bulk packaging of ingredients	• May be expensive for pre made foods • Have to order well in advance • Set delivery days • Have to order large quantities to get a discount

It's important to remember that local sourcing can encompass much more than just using locally supplied and seasonal food. **Local sourcing can also include toiletries for guest rooms and flowers for reception**

Hospitality & Catering Part 4

Kitchen workflow

Workflow in the kitchen should follow a logical process by using different areas so that the clean stages in food production never come into contact with the "dirty" stages.

1. Delivery
2. Storage
3. Food preparation
4. Cooking
5. Holding
6. Food service area
7. Wash up
8. Waste disposal

Workflow

Organising the kitchen into separate areas for separate jobs is the heart of hygienic kitchen design. The e layout will depend upon the size of the kitchen as well as on the type of meals it prepares.

LO2 Understand how hospitality and catering provisions operate

Delivery
Goods vehicles should have adequate access to premises, providing direct deliveries to catering areas. This limits the length of time chilled foods may be in the danger zone. Have adequate space to check orders before they enter the catering area. Check temperature of van and visually examine goods.

Storage
Storage should be near to the delivery area to limit delivery staff entering the catering area. This also reduces the need to move heavy items of stock that may cause injury to staff. Make sure adequate room is available for stock.

Food Prep
Separate hand wash, pot wash and food wash areas/sinks need to be provided as well as separate areas for potential allergen containing food prep. Where premises are small, systems should be in place to ensure utensils are kept separate.

Cooking
Cooking equipment should be selected based on the menu being produced and the ability of the staff using it. State-of-the-art equipment such as water baths, programmable Rational ovens and computerised deep-fat fryers would be desirable, however, if they are not necessary they are a waste of money. Most importantly, the equipment layout should be safe and manageable to work around to prevent accidents.

First In, First Out (FIFO) is a system for storing and rotating food. In FIFO, the food that has been in storage longest ("first in") should be the next food used ("first out"). This method helps restaurants and homes keep their food storage organized and use food before it goes bad. First In, First Out is an effective system that should be standard operating procedure for every food service establishment.

Cooking
A 900mm corridor should be allowed for around the front of cooking equipment, ideally 1200mm. You may be limited by the energy supply available, gas may not be permissible in the building or the incoming electrical supply may be limited. Large scale equipment, whilst can be energy efficient and have energy saving features such as thermostats and auto switch-off, often requires a large electrical supply to run in the first place.

Holding
The food holding area should be near the food service area in order to keep the food at the right temperature (above 63°c). Some kitchens may require separate refrigerator areas to keep desserts chilled and away from raw foods.

Food Service Area
In an à la carte restaurant adequate space needs to be considered to allow plating up.

Food Service Area
In a buffet of canteen system, multiple food collection points can limit queuing. Large service areas may need stock replenished frequently, such as all you can eat buffets, therefore the food service area should be located near the kitchen area.

Wash Up Area
An integral part of the kitchen. If the dish washing area does not function, neither does the kitchen. Ample space should be given to both the size of dish washing area needed for the number of dishes, pots, pans etc. are used in one night as well as adequate space to store and sort washing up. As hot water produces steam, adequate ventilation is required.

Waste Disposal
Dirty plates and waste food needs to be kept separate from food prep and storage areas to prevent cross contamination. Ideally a separate refuse bay should be made available well away from the kitchen entrance (so customers do not see this side of the business)! Adequate changing rooms/facilities should also be provided for staff to change at the start and end of shifts and also easily accessible staff toilets nearby.

Hygienic kitchen design

Work surfaces
Must be strong, hard wearing and easily cleaned. Stainless steel with wheels that can be moved out of the way while cleaning

Floor
Hard wearing, easy to clean , non absorbent and non slip
Coving with the walls prevents dirt and food particles from accumulating

Walls
Smooth, can be tiled or lined with stainless steel as splashback light colour to show dirt easily

Hygienic kitchen design

Ventilation
Effective ventilation system to remove the heat, steam and condensation from the kitchen. Bacterial growth in moist conditions

Sinks
For washing food and utensils. Hot and cold water, stainless sinks are the best

Waste disposal
Waste disposal unit or separate waste bin with a lid that can be foot opened

Kitchen Layout

Importance of documentation

Why must they be completed?

1. Maintaining organisational procedures
2. Safety of staff and customers
3. Legal requirements
4. Complying with food safety legislation
5. Complying with accounting and taxation practices
6. Ensuring accurate payment of bills
7. Ensuring profitability of kitchen

Chef's uniform

- Chef's jacket
- Chef's pants
- Hat
- Neckerchief
- Apron
- Hand towel
- Slip-resistant shoes

Some establishments have staff wear the same uniform; this makes them easily identifiable for staff and customers. The uniform may change depending on which area of the establishment they work in.

Protective clothing as part of a uniform must be paid for by the employer.

Documentation and Administration

Types of Kitchen Documents

- Temperature charts – fridge, freezer, display, point of sale. Taken at least twice per day.
- Time sheets – logging staff working hours
- Accident report forms – used to report any accidents and near misses
- Food safety information – blast chill records, food related incidents and cleaning rotas
- Equipment fault reports – What was the issue and how was it dealt with.
- Stock usage reports– order books, stock control sheets, requisition books, invoice, delivery notes

Documentation and Administration

Complete kitchen documents:

- They must be legible (readable)
- At correct interval (daily, hourly)
- Completed accurately
- They must be signed and date.

Where do you get kitchen documentation from?:

- Purchased from stationers
- Designed in-house
- Central purchasing

Advantages
Effective work flow systems, both in the kitchen and front of house staffing, will lead to:

- Good communication between sections/ departments
- More efficient working (time/labour saving)
- Improved quality of the finished product
- Reduce the risk of accidents
- Maintain high standards of hygiene and food safety

All of the above will lead to better customer service and therefore satisfied customers.

In Summary:
When planning a kitchen you must consider:

- The type of customers you wish to attract
- The type of menu (à la carte, table d'hôte, seasonal, ethnic, children's, rotating ...)
- The type of service (self service, plated, buffet, fast food, canteen ...)
- The kitchen brigade structure and number of staff required to make your menu
- Compliance with legislation

Stock control

Staple foods and supplies that are canned, bottled, dried or frozen
These have a longer shelf life and so do not need to be purchased as frequently. Larger amounts can be bought to get cheaper prices and can be stored .

- Condiments,
- Canned vegetables
- Frozen foods including meat, fish and deserts
- Sauces
- Flour, sugar, fat,oil
- FIRST IN FIRST OUT stock rotation

Perishable food and products that do not stay fresh for very long

- Fresh fruit, vegetables
- Dairy products
- Meat and fish
- Only buy enough to last a few days because they will not last
- FIRST IN FIRST OUT- stock rotation

Hospitality & Catering Part 5

Food Service Equipment

Food service equipment is equipment used to **serve food** in the catering industry

Service equipment can be anything which is **used by customers** or to **serve food to the customers.**

Hand Held Equipment

Hand equipment is non-powered equipment which is used to serve or consume food and drink.

Tableware:
Equipment usually used to 'set' a table Includes crockery, glasses, cutlery etc

Serving equipment:
Equipment for serving food. This includes utensils for placing food onto tableware such as tongs and ladles.
It also includes items such as wine coolers, champagne buckets and bottle openers.

Care, Use and Maintenance of Hand Equipment

1. Equipment used by customers must be **cleaned at least once a day.**
2. Equipment must be cleaned according to the manufacturer's instructions.
3. Powered equipment **must be serviced** regularly.
4. Powered equipment should be switched off when not in use.
5. Equipment which requires training to use must not be available to customers.

Powered Equipment

Kettle
A jug for boiling water

Mincing machine
For mincing meat

Microwave
For defrosting, reheating and cooking

Food processor
For chopping, mixing and blending food

Blender
A jug with a rotating blade for blending foods to smooth texture

Large Powered Equipment

Identify the name and use of each item.

Specialist Hand Equipment

Hand Equipment: Knives

Care, Safe Use and Cleaning

- If equipment has a blade always take care when using and cleaning; **keep fingers away from sharp edges.**
- **Clean items as soon after use as possible.** If food dries on they will be harder to clean effectively.
- **Choose correct cleaning utensils** which can reach all parts of the equipment – such as a brush for between the wires in a whisk.
- Store small utensils in a drawer or on hooks so they are not lost easily.
- **All equipment should be cleaned in hot water using detergent.**

Powered Equipment: Care, Safe Use and Cleaning

Should be **serviced regularly** by an electrician. Usually at least once a year.

Should be cleaned according to a regular routine and a record kept of maintenance.

Staff must be trained in safe operation of larger equipment.

Manufacturers instructions for cleaning and use must be read, followed, and kept safely.

Equipment should be **switched off at the wall while not in use.**

Equipment must not be situated where it could create **a fire hazard.**

Safety notices should be placed on all large pieces of equipment.

Customer rights

- The right to be protected (against hazardous goods)
- The right to be informed (about quality, quantity, allergies etc)
- The right to have their complaints be heard
- The right to seek redressal (compensation.)
- Be right to receive satisfactory goods that match their product description

How can you reduce the risks?

- **Reduce cash handling** by staff, have specific staff take responsibility for money.
- Train staff to **identify suspicious packages** and **individuals.**
- Use **security passes;** ask visitors to sign in.
- **Restrict** workmen or outside agencies to certain areas.
- **Security mark** all equipment.
- Use strict **stock control** procedures, have a **checking system** in place.
- Keep all areas **well-lit.**
- Use **CCTV** cameras.
- Check **guest identification** on check-in with photo I.D.

Staff allocation

The restaurant manager coordinates all activities at the restaurant.

The restaurant manager must define the tasks that staff must perform Consider

- The size of the restaurant,
- Flow of customers, type of clientele and
- Menu offerings
- Different skills and personnel requirements related to changes of volume and customer preferences.

Customer trends

Customers are influenced by

- TV
- Magazines
- Health
- Travel abroad
- Technology
- Ratings and reviews

Safety and security

Health and safety, hygiene

- Fire certificate
- Staff training records
- Accident book
- Food hygiene checks
- Cleaning checks
- First aid records

Monitor stock levels for re ordering
Decide frequency of stock check
First in First out for items with a shelf life
Stock level checks could be for

- Wines
- Spirits
- Coffee
- Order pads
- Garnishes
- Cutlery
- Crockery
- Drinks in bar area
- Nuts, breadsticks
- Other consumables

Food service

Food can be served in many ways. The type of service depends on the following factors:

- The type of establishment or where it is
- The type of food or menu being served
- The cost of the meal or food
- The time available for the meal
- The type of customer
- The number of customers expected
- The availability of skilled serving staff

Documentation

A senior staff member such as the head chef or kitchen manager is responsible for carrying out administrative tasks that ensure the efficient working of all equipment and machinery.

Other documentation such as HACCP checks and accident records are kept up to date to comply with legislation.

Temperature control charts
Reading temperature of refrigerators, freezers and store cupboards

Hygiene information
Hazard Analysis Critical Control Points (HACCP)

Time sheets
Staff shifts, rotas

Accident forms
It is the law to report all accidents that occur on the premises

Equipment faults
Any equipment not working properly must be recorded and reported to the appropriate person. Where equipment is under warranty it must be reported to the manufacturer for repair.

Bookings and reservations

- Electronic booking system
- Electronic reservations system
- Diary with bookings and reservations
- Feedback forms

The EPOS system is a computerised piece of technology that **records data.** In the hospitality industry it is used when customers **purchase** services or food. It can be set up to **record bookings**, therefore preventing double bookings as well as updating **food stock levels** as menu items are purchased.

It can be used for –

- Recording sales
- Updating stock levels
- Providing accurate pricing information
- Enable fast and efficient customer service
- Keeping track of sales and taxes

Hospitality & Catering Part 6

Types of customer

Leisure	Local residents	Business / corporate
Customers who visit the establishments in their leisure time e.g. a meal with friends, a family day out, tourists,	Customers who live in the local area who visit the establishment often eg regular Sunday lunch, or get togethers	e.g. business lunches. Use business facilities in establishment for meetings or presentations . Courses and conferences

Leisure customers requirements

- Value for money
- Good facilities
- Families want child menus, play area, child friendly
- Tourists want local food, easy to communicate
- Older people may want more formal service
- Good customer service
- Varied choice of menu
- Dietary needs eg allergies, intolerances, vegetarian catered for without having to ask for special foods
- Facilities for physically impaired customers

Local customers requirements

- Value for money
- good standard of customer service so they return
- Catering for local needs (culture, religion)
- Consistent dishes served
- Loyalty schemes
- Recognised by staff- feel welcome
- Menu specials
- Theme nights
- OAP discount day
- Child friendly
- Entertainment
- Mailing list or email for special offers

Business customers requirements

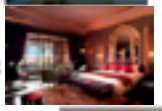
- Dedicated corporate (business) contact at establishment
- Discounted rates
- Meeting rooms
- Water, juice on tables
- Presentation equipment, projector, tv,
- Office facilities- printer, phone, fax, internet, stationery
- Tea and coffee for breaks
- Lunch or other meals- buffet or restaurant
- Accommodation if attendees are from a long distance
- Quick service for lunch meetings

What is good customer service?

Types of Bedroom Accommodation

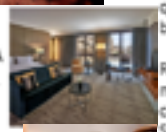
Youth hostel (YHA)
Accommodation is usually in comfortable bunk bedded rooms, sharing with people of the same sex.

Showers and toilets are shared. Bed linen, pillows, duvet and blankets are provided free of charge for you to make up your bed.

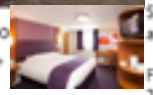


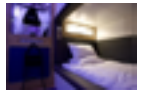
A full meal service is usually provided. Some locations also have self-catering kitchens. Most locations will have a sitting area, drying room and cycle store.

Hotel deluxe suite (Hilton)
Stylish suite with separate living room and large bathroom with free soap, shampoos and creams. A toweling bath robe and slippers are also provided.



Desk with high-speed Internet connection. Also provided: Safe, iron, ironing board, clock, radio and radio alarm, hair-dryer, sofa bed, trouser press, TV with teletext, satellite channels and on-demand films, tea- and coffee-making facilities, bottled water and biscuits.





Cabin room at airports (Yotel)
Book from just a few hours, day or night, to 24 hours or more. Large single bed 2m x 1m (large enough for one or two people at a push) with full sitting height.
Bathroom with shower, revitalising all-in-one body wash, heated mirror and soft towels.
Fold-out work desk and stool (doubles for unpacking), overhead hand-luggage stowage, suit-bag hanging and storage areas for small pieces.
Complete range of power and connectivity including free Internet access and local lighting.
20-inch flat-screen TV with choice of films, radio, games and Internet. 'Cabin'-service menu on screen, and 24-hour 'galley' café service.

Boutique hotel
Designed with a sophisticated and modern slant on the Moroccan theme. Funky leather bed and "bellydancing" ornate bottles. Luxury room featuring a chameleon-floor seating area in the bay window.

New luxury Italian tiled en-suite shower and toilet, CD player (with shower-room speakers), flat screen TV with Free view, fridge, hair-dryer and hot beverage facility.

Motel (Premier/Travel Inn)
Comfortable king-sized beds. Good quality duvets and pillows. En-suite bathrooms with shower gel.

Remote control TVs. Tea- and coffee-making facilities. Hairdryers. Heater control.
Spacious desk area with Internet access.

Family rooms, with cots on request. 24-hour reception. Restaurant and licensed bar nearby. Hot breakfast available.

If you provide any sort of accommodation, serviced or self-catering, the Equality Act 2010 applies to you.

Equality Act 2010

- The Act protects anyone who is disabled, is thought to be disabled or is associated with someone who is disabled.
- The Act gives these people rights of access to goods, facilities and services (including tourist accommodation) and ensures that they are treated no less favourably than other customers.
- You are also required to make reasonable adjustments to the way you deliver your services and to the physical features of your premises to make it easier for disabled guests to use them.

Why is customer service so important in the hospitality industry?

Customer service is what an establishment does in order to meet the **expectations** of their customers and generate customer satisfaction.

- **So customers return** - People will not return to a place where they were not satisfied with the service. Repeat business means a successful business.
- **Exceeding expectations**-This makes repeat business more likely
- **Growth of the business**- If customers receive a high standard of service and return, they will spend more money and also tell other people about the business

Risk and Security

Workers can be at risk from security hazards in the same way they are from safety hazards.
Security risks include

- Disagreements between customers
- Customers being intoxicated (alcohol)
- Customers who have used drugs
- Verbal abuse
- Physical assaults

Risk factors

- Handling large amounts of money in open areas
- Face to face contact with customers
- Opening late in the evening or early in the morning
- Dealing with customer complaints or disputes
- Selling high value items such as alcohol
- Establishment in an isolated area eg country pub
- Poor lighting
- Establishment in a high crime area

Staff (and customers) may feel threatened by physical assaults, threats and intimidation and verbal abuse
People at risk includes

- Young workers who have less experience
- Night shift workers where there are less people
- Lone workers e.g. people working early or late
- Customers in the establishment

Prevention

- Brightly lit areas
- CCTV
- Easy escape routes
- Area for handling larger sums of money
- Appoint more senior staff to deal with problems and complaints
- Train staff to diffuse angry customers
- Contact local police if necessary
- Make sure lone workers are aware of risks
- Keeping doors and windows secure and locked

Instruction	Guidelines	Sign
Stop	Prohibition Sign • Round shape. • Black pictogram. • White background. • Red edging.	
Danger	Warning Sign • Triangular shape. • Black pictogram. • Yellow background. • Black edging.	
Obey	Mandatory Sign • Round shape. • White pictogram. • Blue background.	
Safety	Emergency Escape or First Aid Sign	
Fire	Fire Fighting Sign. • Rectangular or square. • White picture. • Red background.	

Hospitality & Catering Part 7

LO3 Understand how hospitality and catering provision meets health and safety requirements

The Health and Safety at Work Act (HASAWA) 1974, regulates health and safety issues.

The act aims to:

- secure the health, safety and welfare of persons at work
- protect other people from health and safety risks caused by work activities
- control the use and storage of explosive and dangerous substances.

Under the Health and Safety at Work Act, employers have responsibilities to:

1. ensure the health, safety and welfare of employees
2. provide and maintain safe equipment and systems of work
3. make arrangements for safe use, handling, storage and transport of articles and substances
4. provide information, instruction, training and supervision
5. provide a safe place of work, safe entrance, exit, and work environment
6. provide adequate toilet, washing and changing facilities.

Under the Health and Safety at Work Act, employees have responsibilities to:

1. follow safety instructions and training received
2. co-operate with their employer
3. not to misuse or tamper with anything provided in the interests of health and safety
4. take reasonable care of their own and other people's health and safety
5. tell someone if you think the work or inadequate precautions are putting anyone's health and safety at serious risk.

PPER - Personal Protective Equipment

Employers have duties concerning the provision and use of personal protective equipment (PPE) at work.

PPE is equipment that will protect the user against health or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. It also includes respiratory protective equipment (RPE).

These prevent injuries to:

- the lungs, eg from breathing in contaminated air
- the head and feet, eg from falling materials
- the eyes, eg from flying particles or splashes of corrosive liquids
- the skin, eg from contact with corrosive materials
- the body, eg from extremes of heat or cold
- PPE is needed in these cases to reduce the risk.

RIDDOR - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013.

What to report?

- Deaths and injuries
- Occupational Diseases
- Carcinogens, mutagens and biological agents
- Specified Injuries to Workers
- Dangerous Occurrences
- Gas Incidents

Who should report it?

If you are an employer

If you are an employer, you must report any work-related deaths, and certain work-related injuries, cases of disease, and near misses involving your employees wherever they are working.

If you are in control of premises

If you are in control of premises, you must report any work-related deaths, certain injuries to members of the public and self-employed people on your premises, and dangerous occurrences (some near miss incidents) that occur on your premises.

Agency Workers/Casual Staff

Agencies should ensure that responsibility for reporting under RIDDOR is clearly assigned to the appropriate person based on the particular facts of the employment relationship. Agencies should ensure that reporting responsibilities are clearly understood by host businesses and the workers.

Accidents are reported to the **HSE** Health and Safety Executive

Record other accidents resulting in injuries where a worker is absent from work or is incapacitated for more than 3 days.

H.S.E Health and Safety Executive.

- H.S.E stands for the **Health and Safety Executive.**
- The H.S.E will investigate any complaints and safety incidents.
- The H.S.E employ Health and Safety Enforcement Officers who will inspect safety procedures being used.
- They have the power to serve notice and/or issue legal proceedings over safety incidents.
- It is compulsory to contact the H.S.E if an operative has an absence of more than three days following an accident at work.

First Aid

- Employers have to provide first aid facilities at work
- As a minimum, there should be a fully stocked green first aid box and a person appointed to take charge in an emergency
- Some workplaces have qualified first aiders and first aid rooms
- Green and white notices should inform you where the first aid box is kept and who the first aider(s) or appointed person(s) is/are

Fire safety

- Employers must have arrangements in place
  - to prevent fires
  - To raise the alarm
  - To fight fires (fire extinguishers)
  - Emergency evacuation (including a pre-arranged meeting place for staff to assemble following evacuation)
- Notices showing the safe evacuation routes from buildings should be green and white

COSHH - Control of Substances Hazardous to Health Regulations 2002

COSHH covers substances that are hazardous to health.

Substances can take many forms and include:

- chemicals
- products containing chemicals
- fumes
- dusts
- vapours
- mists
- nanotechnology
- gases and asphyxiating gases and biological agents (germs). If the packaging has any of the hazard symbols then it is classed as a hazardous substance.
- germs that cause diseases such as leptospirosis or legionnaires disease and germs used in laboratories.

Employers must display health and safety posters in work areas where necessary, especially related to COSHH.

Every substance that is a hazard has a COSHH safety sheet

Employees responsibilities under COSHH

1. Use control measures and facilities provided by the employer
2. Ensure equipment is returned and stored properly
3. Report defects in control measures
4. Wear and store personal protective equipment (PPE)
5. Removing PPE that could cause contamination before eating or drinking
6. Proper use of washing, showering facilities when required
7. Maintaining a high level of personal hygiene
8. Complying with any information, instruction or training that is provided

PPE in catering situations

- You **must** wear the p.p.e. if it has been provided for you. You could be held personally liable if you had an accident which could have been prevented by you wearing your p.p.e.
- You must care for it, store it and clean it as necessary;
- You must report any defects.

What Is Manual Handling?

- Any transporting or supporting of a load by hand or bodily force
- Lifting, putting down, pushing, pulling, carrying or moving

The top 4 injury types in Hospitality and catering

- Cuts
- Burns
- Sprains & strains
- Slips, trips and falls

How Can Cuts Be Prevented?

- To prevent knife cuts:

Cut properly, using the bridge and claw grips


incorrect


correct

- Carry knives with point down and backwards
- Wear gloves that protect your hands from cuts.

- To prevent machine cuts:
  - Be sure moving parts are covered by guards.
  - Turn off power and unplug to clean.
  - Keep your hands, face and hair away from moving parts.


Meat Slicer

Teens under the age of 16 are prohibited from operating food slicers.

- Not wearing clothing or jewelry that could get caught in machines.

- Not using equipment that you have not been trained to use.

How Can Strains Be Prevented?

- Ask for help with heavy loads.
- Ask for training in safe lifting methods.
- Push loads rather than pull them.

- Don't lift and then twist.
- Don't lean out drive-through windows.

How Can Slips, Trips & Falls be Prevented?

To prevent trips, slips and falls:

- Make sure your path is clear, clean and dry before carrying a load.

- Move boxes and carts out of the way.
- Watch for mop and broom handles

- Use non-slip floor pads.


Slip-resistant shoes

Customer safety

- Warning signs when cleaning is taking place
- Do not allow customers in areas where maintenance work is happening
- Signs "mind your head" "watch the step" "hot water"

- Use ladders correctly

- Don't lean out
- Move it closer
- Have a helper

Causes of fires

- **Equipment** that is not serviced regularly can cause over heating and cause fires.
- **Human Error** many fires that happen in catering. Such as fat fryers.
- **Electrical** smouldering wires can develop unseer overnight and be the cause of major incidents,
- **Arson** rare occurrence. grudge between employee and employer, or insurance fraud.
- **Chemical** not very common now due to the COSHH regulations.

How Can Burns Be Prevented?

- To prevent other oil and grease burns:
  - Watch out for spatters and spills.
  - Use protective apron and mitt.
  - Clean up spills as soon as they happen.


Protective Mitt

- To prevent burns from open flames:
  - Keep hair and clothes away from flames.
  - Keep flammable materials away from flames.

To prevent steam burns:

- Watch out for steam cloud when you open dishwasher, steam table or other places where steam occurs.
- Wear protective gloves whenever you open something filled with steam.

Action on Discovering a Fire.

- Raise the alarm. *Break the glass of the nearest alarm point.*
- Call the fire services.

- If safe to do so tackle the fire, if in doubt get out.
- Leave the building via the nearest exit calmly. DO NOT run or use lifts.
- Evacuate the premises and report to your designated assembly point.

Hospitality & Catering Part 9

BACTERIA

Bacteria are microscopic organisms which are commonly referred to as **'GERMS'**. They found everywhere including on and in people, on food, in water, soil and air. Some are **good** for us, and some are **bad!**

LO4 Know how food can cause ill health

MICROBES (or BACTERIA) are found in:

- Soil and Water
- Plant and Plant Products
- Air and Dust
- Animal Fur
- Gut of animals and humans
- Food handlers
- Food prep and serving utensils

Metals like lead and mercury stay in our body for a long time and make us ill. Foods may taste or smell funny.

Mercury is a naturally occurring element found in air, water and soil. A highly toxic form (methylmercury) builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans. Fish that typically have higher levels of mercury include **king mackerel, marlin, shark, swordfish, tilefish, and tuna.**

Many of these types of fish are used in sushi.

SIGNS AND SYMPTOMS

- Impairment of peripheral vision
- Disturbances in sensations 'pins and needles'
- Lack of coordination
- Impairment of speech, hearing, walking
- Muscle weakness

AT RISK GROUPS

COMMON CAUSES OF FOOD SPOILAGE

- Inadequate temperature storage
- Prolonged storage times
- Inadequate ventilation
- Cross contamination
- Delays between delivery and storage
- Delays between preparation and cooking

WHAT FOOD SPOILAGE LOOKS LIKE

Intolerance	Allergy	Poisoning
Hours to days to see effect	Can occur within minutes of exposure to food	From 30 min for toxins 12-48 hours bacterial
Digestive system cant process the food	Immune response to allergen	Bacteria poison or disrupt digestive system
Possible to eat a small amount without effect	Body reacts to tiny amounts of food	Toxins- few bacteria Large amounts colonise gut
Stop eating the food and it goes away	May need adrenaline or anti histamines	Runs its course of illness then ends
Easier to detect the food	Allergens may be small amount in ingredients	No smell, no taste, no sign
Symptoms if you eat a lot or frequently	Symptoms every time even tiny amounts	Symptoms if the food is contaminated
Moderate to serious illness	Can be fatal	Serious illness to fatal

Food intolerance

Mouth ,may be sore, bad breath

Skin rash, redness, itching swelling eczema

Gut abdominal pain, bloating, heartburn, cramping, vomiting, diarrhoea or constipation

Lungs chronic cough, wheezing

Head headache, brain fogginess, migraines

Perception irritable, moody, panic, depression

MOULDS

- Tiny fungi which grow from spores found in the air
- Settle on food products and multiply
- When visible, food is described as 'mouldy'
- Causes food spoilage

PARASITES

Parasites are organisms that derive nourishment and protection from other living organisms known as hosts. The most common foodborne parasites are protozoa, roundworms, and tapeworms.

Causes food poisoning when humans ingest undercooked meat products in which the parasite has often survived.

CHEMICALS

- Remnants of cleaning chemicals
- Pesticides
- Insecticides
- Paint (wall surfaces)

PHYSICAL

Physical Contaminants Include:

- Hair
- Finger nails
- Broken utensils
- Pests

POISONOUS PLANTS

Some plants naturally produce poisonous chemicals. If these are eaten they may cause death. Other foods may contain chemicals that give rise to allergies in some people.

Other poisonous plants: some fungi, rhubarb leaves, parts of potatoes which are exposed to the sun while growing.

PESTICIDES AND HERBICIDES

Some of the chemicals used in farming may remain on or in the food we eat. These may cause us harm.

Farmers spray pesticides on crops to kill the insects that may reduce crop yield. They also spray herbicides to kill weeds that may compete with the crops. Some of these chemicals may remain on the surface of, for example, fruit. Others may be absorbed by the plant and therefore be present in the crop.

The European Union has strict laws that determine how much of these chemical residues are permitted in foods.

If you suspect someone of going into anaphylaxis you must:

- Call an ambulance
- Check for the casualty's Epi-Pen and help them use it. **You may have to do this for them, all pens have instructions on the side.**
- Lie the casualty down with their legs elevated to treat for shock
- Stay with the casualty and reassure them while you wait for the ambulance

ALLERGENS

Some people may develop an allergy to peanuts or to the gluten in wheat. If they eat foods containing these, they may become very ill, and possibly die.

The 8 most common food allergies include:

- Cow's milk
- Eggs
- Tree Nuts
- Peanuts
- Shellfish
- Wheat
- Soy
- Fish

Symptoms can occur anywhere from a few minutes after exposure to a few hours later, and they may include some of the following:

- Swelling of the tongue, mouth or face
- Difficulty breathing
- Low blood pressure
- Vomiting
- Diarrhea
- Hives
- Itchy rash

COW'S MILK

Milk, Milk powder, Cheese, Butter, Margarine, Yogurt, Cream, Ice cream

TREE NUTS

Brazil nuts
Almonds
Cashews
Macadamia nuts
Pistachios
Pine nuts
Walnuts

SHELLFISH

Shrimp, Prawns, Crayfish, Lobster, Squid, Scallops

In more severe cases, a food allergy can cause anaphylaxis. Symptoms, which can come on very quickly, include an itchy rash, swelling of the throat or tongue, shortness of breath and low blood pressure. Some cases can be fatal.

Hospitality & Catering Part 10

INTOLERANCES: LACTOSE INTOLERANCE

What is the issue? Can't digest lactose.

What are the problem ingredients? Lactose can be found in dairy products.

What food products cannot be eaten by coeliac disease sufferers?

Milk, Milk powder, Cheese, Butter, Margarine, Yogurt, Cream, Ice cream

INTOLERANCES: COELIAC DISEASE/GLUTEN INTOLERANCE

What is the issue? Can't digest gluten.

What are the problem ingredients? Gluten can be found in wheat and other grains.

What food products cannot be eaten by coeliac disease sufferers?

Flours, Pasta, Bread, Cereal, Certain alcoholic drinks

What is an Environmental Health Officer?

EHOs are personnel qualified in Environmental Health laws, enforcement and inspection methods. They have a 3 year degree in Environmental Health

Many organisations employ EHOs including
- Local councils
- Private companies
- NHS
- Military
- Food Standards agency

EHO roles in the Hospitality and Catering industry

Legislation enforced by EHOs

The Food Safety Act.
Food safety from the manufacturer or producer to the point of sale. Might involve different companies or premises e.g. suppliers, manufacturers or kitchens, shops or restaurants.

The Food Safety Act (General Food Hygiene) Regulations.
Ensures food producers **HANDLE** all food hygienically.

Legislation enforced by EHOs

The Food Safety Act (Temperature Control) Regulations.
Temperatures at which to store or hold food.
- Freezers from –18°C
- Chillers from 3°C to 8°C
- Fridges from 0°C to 5°C
- Cooked core temperature at 75°C or above
- Hot holding above 63°C

The Food Composition Regulations.
Specifies what ingredients **CAN** or **CANNOT** be used in the manufacture of foods e.g. bread, breakfast cereals and use of additives

Inspecting businesses for food safety standards

- Powers of entry at any reasonable time
- Inspect food and premises
- Power to seize and detain food
- Serve notices
- Power to close
- Prosecute

Why do we have Food Hygiene Regulations?

- We have food hygiene regulations to prevent outbreaks of food poisoning.
- Customers need to know that food is safe to eat.
- Food safety regulations are constantly changing and establishments should follow the latest guidelines.
- Food safety and hygiene regulations are enforced by Environmental Health Officers (EHO) who regularly check all food premises.

The Environmental Health Officer's (EHO) role is to inspect premises in order to ensure the food a establishment produces is safe to eat.

At the end of their visit, in England, Wales, and Northern Ireland, they will present the establishment with a score from the **Food Hygiene Rating scheme of 0 - 5.** The scheme is standardised across England and Wales to maintain a consistent assessment of safety standards. Any business should be able to achieve a "5 - very good" rating.

These regulations cover three main areas:

- Food premises
- Personal hygiene of staff
- Hygienic practices

Food premises must:

- Be well maintained.
- Be regularly cleaned.
- Have lockers for employees.
- Have hand-wash facilities provided.
- Have clean cloakroom and toilet facilities.
- Have first aid available.
- Have clean storage areas.
- Have temperature-control fridges and freezers.
- Have equipment that is clean and in good working order.
- Be free from pets, pests, etc.

Food handlers must:

- Have a **certificate/regular training in food safety.**
- Be dressed in **clean** 'whites' or other uniform.
- Have **hair tied back** (and ideally wear a hat or hair/beard net).
- Have **short, clean nails** - no nail varnish or jewellery.
- Be in **good health** (they cannot work with upset stomachs).
- Have **'good' habits**, e.g. no coughing or sneezing over food.
- **Wash their hands** after handling raw meat, after blowing nose, after going to the toilet, etc.
- Cuts should be covered with coloured waterproof plasters.

Examples of good hygiene practices include:

- Food deliveries should be checked thoroughly.
- Food should be labelled and stored correctly (in freezers, chillers, fridges and dry stores).
- Food should be 'rotated' (first in, first out).
- Care should be taken with temperature control in the kitchen (i.e. food kept out of the danger zone of 5°-63°C).
- Food should be prepared quickly and as close to cooking time as possible.
- Hot food should be maintained at above 63°C.
- The core temperature of cooked food needs to be at least 75°C.
- Chilled food should be stored below 5°C
- Washing up should be done in hot soapy water if there is no dishwasher available.
- Waste should be disposed of safely.

Hospitality & Catering Part 11

HACCP (2006)

What does it stand for?

Hazard

Analysis

Critical

Control

Points

What does it mean?

- Legal requirement
- Identify the most critical (dangerous in terms of bacteria) areas of their business to make sure they are under control

HACCP System

Food companies need to:

- Analyse the hazards to food safety
- Assess the level of risk from each hazard
- Decide the most critical points that require controls
- Implement appropriate controls
- Establish a monitoring system
- Set up procedures to correct problems (corrective action)
- Review the system when operations change

Hazard **A**nalysis

A hazard is something that has the potential to cause harm.....

Type of hazard	Example
Biological	Salmonella in chicken
Chemical	Contamination from cleaning materials e.g. bleach
Physical	Damaged packaging, glass found in food

Critical **C**ontrol **P**oints

A critical control point is a step which eliminates or reduces the hazard

Control is essential to reduce the risk of food poisoning.

If a caterer gets it wrong they could be breaking the law

all stages from purchasing through to preparation and serving is controlled.

The Consumer Protection Act 1987

This protects the public by:

- prohibiting the manufacture and supply of unsafe goods
- making the manufacturer or seller of a defective product responsible for damage it causes
- allowing local councils to seize unsafe goods and suspend the sale of suspected unsafe goods
- prohibiting misleading price indications

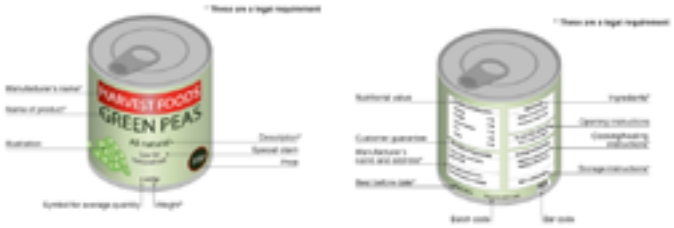
The Trade Descriptions Act 1968

The Trade Descriptions Act makes it an offence for a trader to make false or misleading statements about goods or services.

It carries criminal penalties and is enforced by Trading Standards Officers, making it an offence for a trader to:

- apply a false trade description to any goods
- supply or offer to supply any goods to which a false trade description has been applied
- make certain kinds of false statement about the provision of any services, facilities or accommodation

Food Labelling Regulations (1996)



Examples of CCP's (Critical Control Points) are:

- Inspection of goods on delivery
- Storage & handling of ingredients & finished product
- Temperature of fridges, freezers & ovens
- Cleaning procedures for equipment
- Cross-contamination
- Personal hygiene & health standards
- Proficiency of use and cleaning of equipment

Record Keeping

Legal requirement that certain records are kept as part of the HACCP-based food safety management system, eg:

- Fridge/freezer records
- Cooking/hot-holding temperatures
- Cleaning records
- Training records
- Pest control checks

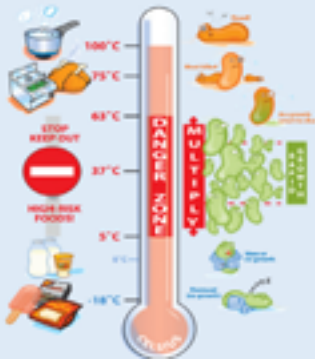
The Food Hygiene regulations 2006

- Applies to high-risk foods
- Cold foods- store below 8°C
- Hot foods – store above 63°C

During service :-

- Cold food max 4hrs at room temperature then discard or refrigerate
- Hot food maximum 2 hrs
- Buffet food 90mins at room temperature

Influence of temperature



Dead!.

Destroys most pathogens

Too hot (start to die 63°C)

Multiply rapidly

Spoilage slow growth, most pathogens no growth (<5°C)

Dormant (no growth – spoilage or pathogens).

Defence of Due Diligence

- The principal of defence under The Food Safety Act 1990
- A business must be able to demonstrate that it has done everything within its power to safeguard consumer health
- Accurate records are useful in proving this defence; these may include:
  - Temperature control records delivery/storage/cooking
  - Microbiological records
  - Hygiene training for staff
  - Use of HACCP system
  - Pest control records
  - Hygiene manuals, cleaning schedules
  - Hygiene policy

Food poisoning

Mouth increase in saliva

Head headache

Skin fever, shivering

Gut abdominal pain, nausea vomiting, diarrhoea

Circulation, low blood pressure, weak pulse, fatigue

The Food Safety Act 1990

Food businesses:

- Must ensure that the food served or sold is of the nature, substance or quality which consumers would expect, e.g. :
  - Nature - pollock rather than cod;
  - Substance - contains foreign material including glass or packaging;
  - Quality – mouldy bread or stale cake.
- Ensure that the food is labelled, advertised and presented in a way that is not false or misleading, e.g. photos on menus that do not look like the dishes served to customers.

Hospitality and Catering Businesses can be fined up to £20,000 or owners can face up to 2 years in prison for failing to comply with food laws.

1. Keep yourself clean.
2. Keep the workplace clean.
3. Wear suitable clothing.
4. Protect food from contamination.
5. Store, prepare & serve food at the correct temperature.
6. Inform a manager if you are ill.
7. Do not work with food if you have symptoms of food poisoning.

PREVENTION: Personal Hygiene

- Tie hair back
- Remove jewellery
- Roll up sleeves
- Wear an apron
- WASH HANDS THOROUGHLY

Campylobacter

Friend suggestions:
Salmonella
E-coli
Clostridium Perfringens
Listeria
Bacillus Cereus
Staphylococcus Aureus

Found in: raw meat and poultry

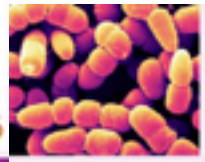
Contract Me!

Symptoms: Can last for 10 days

Fever
Headache
Abdominal pain
Diarrhoea

Illness caused by small numbers.

Most common form!



Clostridium Perfringens

Friend suggestions:
Campylobacter
Listeria
Bacillus Cereus
Staphylococcus Aureus
Salmonella
E-coli

Found in: animal poo, soil, manure, sewage, raw meat, and poultry

Contract Me!

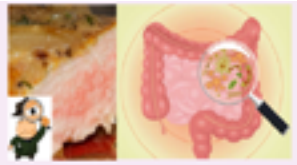
Symptoms: Can last for 3 weeks!

Can take 8-18hrs for symptoms to show:
Nausea
Abdominal pain
Diarrhoea
Can be fatal!

Produces spores which may not be killed by cooking!

E-coli

Friend suggestions:
Campylobacter
Clostridium Perfringens
Listeria
Bacillus Cereus
Staphylococcus Aureus
Salmonella



Found in: the gut of animals and humans

E Coli 0157 found in raw and undercooked meats and raw vegetables

Symptoms:

Can take up to 5 days for symptoms to show:
Diarrhoea
Can be fatal!

Can survive refrigeration and freezing

Illness caused by small numbers.

Salmonella

Friend suggestions:
Campylobacter
E-coli
Clostridium Perfringens
Listeria
Bacillus Cereus
Staphylococcus Aureus

Found in: raw meat, poultry and unwashed vegetables

Contract Me!

Symptoms: Can last for 3 weeks!

Can take 48hrs for symptoms to show:
Fever
Vomiting
Abdominal pain
Diarrhoea
Can be fatal!

2nd most common form of food poisoning!

Caused by large numbers

High Risk Foods

- Foods high in protein
- Foods high in moisture
- Stocks, sauces, gravies and soups
- Eggs
- Meat, poultry and other meat products
- Milk and dairy products
- Fish and Shellfish
- Cooked rice
- Foods which are handled and those which are reheated
- However, preserved foods, or those with high concentrations of vinegar, salt or sugar, are low-risk.

Listeria

Friend suggestions:
Campylobacter
E-coli
Clostridium Perfringens
Salmonella
Bacillus Cereus
Staphylococcus Aureus

Found in: soil, vegetation, meat, poultry, soft cheese and salad vegetables

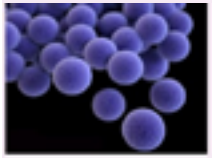
Contract Me!

Symptoms: Can last for 3 weeks!

Can range from:
Flu like symptoms
Meningitis
- Pregnant women
- Elderly
- Very Young

at greater risk!

Can grow at low temperatures



Staphylococcus Aureus

Friend suggestions:
Campylobacter
E-coli
Clostridium Perfringens
Salmonella
Listeria
Bacillus Cereus

Found in: on the skin, cuts and boils and up the nose!

Contract Me!

Symptoms: Onset within 6hrs

Two types:
Severe vomiting
Diarrhoea
Abdominal pain
Can last 6 days!

Transferred to food from hands, nose or mouth

Survives refrigeration

Caused by large numbers

Produces a toxin which may survive cooking

INFECTIVE POISONING
Result of eating contaminated food with bacteria itself;
Examples: Salmonella, Listeria

TOXIC POISONING
Some bacteria produce toxins, these toxins cannot be destroyed with cooking. Examples: Staphylococcus Aureus, Clostridium Perfringens

Bacillus Cereus

Friend suggestions:
Campylobacter
E-coli
Clostridium Perfringens
Salmonella
Listeria
Staphylococcus Aureus

Found in: soil and dust

Contract Me!

Frequently found in: rice dishes

Symptoms: Usually lasts less than 24hrs

Two types:
After 1-5hrs
Vomiting
After 8-18hrs
Diarrhoea and Abdominal pain

Forms spores that are resistant to heat

Illness can be caused by a small number of bacteria

Yr10 Cambridge National LO1

Key Words	
Workflow	What task is dependent on another
Contingency	Time in a project plan that has no tasks assigned. Making sure the project still meets the final deadline.
Milestone	A point in time when a task is expected to be started, completed or checked.
Interaction	How the phases link together.
Iteration	The repeating of a phase.
Data dictionary	A description of the structure, contents and format of a spreadsheet or database. The relationships within the database can be included.
Asset log	A list of all the resources used in a project
Iterative process	A process of repeatedly carrying out a process
Concurrent: Tasks	Tasks that can be completed at the same time
Dependency	A task that cannot be started until a previous task has been completed.
Feasibility report:	Created during the initiation stage and considers each of the questions and constraints. Success criteria and objectives are also defined.

Advantages of the Project Life Cycle

It provides a structured approach.
It shows clearly defined tasks to be carried out in each phase.
The inputs and outputs of each phase are defined
The roles and responsibilities of each project team member are defined.
Resources are allocated at the start of the project.
The project progress can be monitored to make sure the final product is delivered to the client on time.

Constraints:
Time
Resources
Regulations
Security/Risk management
Mitigation of Risks

Phase	Input	Output
Initiation	User requirements User constraints	Feasibility report Legislation implications Phase review
Planning	Feasibility report Legislation implications	Project plan Test plan Constraints list Phase review
Execution	Project plan Test plan Constraints list	Deliverable product Test results Phase review
Evaluation	Deliverable product Test results	Release of deliverable product User documentation Final review report

Planning Tools

Gantt Chart Components: Dates/days along the top, Tasks down the left side, Milestones, Dependent tasks, Concurrent tasks.

PERT chart Components: Nodes/sub-nodes, Time, Dependent taks, Concurrent tasks, Critical path.

Visualisation diagram Components: Multiple images, Position and style of text, Font, Annotations, Colours/themes.

Flow Chart Components: Start point, End point, Decisions, Processes, Connection lines, Direction arrow.

Mindmap Components: Nodes, Sub-Nodes, Branches/connecting lines, Key words, Colours, images.

Task list Components: Tasks, Sub-tasks, Start date, End date, Duration, Resources.

Time
- Is there enough time to reasonably develop the product?
- Is there extra time available if problems are found?

Resources
- What hardware is needed?
- Do you have access to them?
- Can you use them?
- What software is needed?
- Do you have access to them?
- Can you use them?

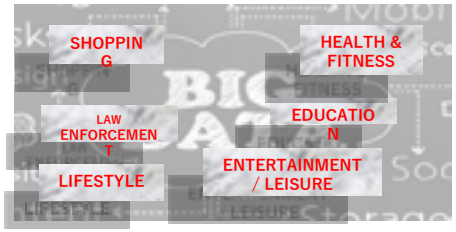
Regulations
- What laws do you need to think about?

Security
- What data needs to be protected?
- Who needs access to the data?
- Do different groups needs to be able to do different things?

Ethical and moral
- What data do you need?
- Who should not see it?
- What should not happen with the data?

Mitigating Risk

Cambridge National LO3



Key Words	
Bias	Considering only one point of view.
Closed question	A question with only a set of number of questions.
Open question	Allows the person completing the questionnaire to give a detailed answer in their own words.
Data subject	The person the data is being stored about.
Data types	A specific kind of data item that is defined by the values that can be stored using it.
Information	Processed data that has a meaning and is in context.
Interviewee	The person answering the questions.
Interviewer	The person asking the questions.
Record	A collection of data about a single item. Each record must be unique.
Personal data	Information held about an individual.
Primary research method	When the data and information collected is fresh data collected for a specific purpose.
Secondary research methods	Methods that use data and information that has already been collected
Validation:	Can include length checks, presence checks, format checks, range checks and input masks.
Validity:	How believable the data and information collected is.

Methods used to collect data

1. Questionnaire
2. Email
3. Sensors
4. Interviews
5. Consumer panels
6. Loyalty schemes
7. Statistical reports

Data Collection Tools

Barcode Reader
QR Codes
Web Based
Surveys
Wearable Technology
Mobile Technologies

Data	Raw facts collected for a purpose
Information	Data in Context - making sense of the data.

Data must be processed to become information.
Information = data + [structure] + [context] + [meaning]

Process

What is cloud storage?

Online devices to …
…place, keep and retrieve electronic data

What is physical storage?

Physical solid devices to …
…place, keep and retrieve electronic data

Data Types	
Text	Any character
Alphanumeric	Any combination of letters, symbols, spaces and numbers
Integer	Whole numbers
Real	Any number with or without a decimal place
Currency	Numbers in the form of money, sometimes with 2 decimal places and a currency symbol
Percentage	A number that includes decimal places and a % symbol
Fraction	A number which allows fractions to be input and manipulated
Decimal	A number which includes a decimal point.
Date/time	Different formats of the way he date and time can be displayed.
Limited choice	Restricts the choice by a user and used to gather information reducing data errors on input. (e.g. drop down lists, radio buttons, tick list)
Object	An additional component. It can consist of a chart graph or image.
Logical/Boolean	There are only 2 choices Yes/No True/False

Storage Methods

The Cloud - Hard Disk Drive - Solid State Drive - Optical Drive - Flash Memory

ICT Cambridge National LO4

Yr10 Cambridge National LO4

Vulnerabilities which can be exploited in a cybersecurity attack:
Environmental - natural disasters
Physical - theft of identity, theft of property
System - insecure software applications, weak passwords, insecure modems

Prevention Measures	
Physical:	Biometric access device Emerging measures
Logical:	Access rights and permissions including authentication, usernames and passwords - anti-virus software - encryption - secure backups of data.
Secure destruction of data:	Over writing - magnetic wipe - physical destruction

Malware		
Malware Type	**Why/how it's used**	**How to mitigate**
Adware	Generates revenue for its author; this is any software that shows adverts such as pop-ups.	Install, run and update a security software package. Do not run software/click links from unknown sources.
Bot	Takes control of a computer system; this is a type of malware that works without a user's knowledge. It can result in a 'botnet', which is a network of infected computer systems.	
Bug	Connected to flaws in software; usually the result of human error during coding of the software.	Check for and install any patches that are released from software vendors.
Ransomware	Holds data on a computer system to ransom; usually encrypts files and displays a message to the user. It spreads like a worm.	Install, run and update a security software package. Do not run software/click links from unknown sources.
Rootkit	Designed to remotely access a computer system; allows a remote cyber attacker access to steal/modify data and/or configuration on a computer system.	Difficult to detect as they are not usually detected by security software; regular software update, keeping security software up to date and not downloading suspicious files are the only ways to trying to avoid a rootkit being installed.
Spyware	Collected data from infected computers; usually hidden from the user and installed without the user's knowledge.	
Trojan horse	Standalone malicious program designed to give full control of a PC to another PC; can be hidden in valid programs.	Install, run and update a security software package. Do not run software/click links from unknown sources.
Virus	Attempts to make a computer system unreliable; replicates itself from computer to computer.	
Worm	Standalone program that replicates itself to other computers; almost always cause harm to networks even if only by using bandwidth.	

Current relevant IT legislation:

GDPR 2018	Aims to protect the rights of the owners of data – the data subjects. It does not protect the data itself.
Copyright, Design and Patents Act 1998	Makes it illegal to copy a work without permission from the owner or copyright holder. It is also illegal to make unauthorised copies of software.
Computer Misuse Act 1990	Aims to protect data and information that is held on computer systems.
Health and Safety at Work Act 1974	Provides guidance to employers and employees when working with computer systems. The act also defines actions that an employer should take to protect employees who work with computers in their job.
Freedom of Information Act 2000	Provides public access to information held by public authorities.

Security/risk Management

Logical protection methods include:
- Firewalls
- Encryption
- Access rights
- Usernames and passwords

Physical protection methods include:
- Locking rooms that computer equipment is located in.
- Bolting computers to desks.
- Using device locks.
- Using and closing blinds at windows.

LO4: Understand the factors to be considered when collecting and processing data and storing data/information

RFID: Radio Frequency Identification Tags can use radio frequency to transfer data from the tags to a computer system, for example to allow access to a room.

Access rights: Control over who has access to a computer system, folder, files, data and/or information.

Permissions: A set of attributes that determine what a user can do with files and folders, for example to read, write, edit or delete.

Encryption software: Software that is used to encrypt a file or data.

Encryption code/key: A set of characters, phrase or numbers that is used when encrypting or decrypting data or a file.

The impacts of a cyber-security attack
Denial of service (DoS) to authorised others
Identify theft
Data destruction
Data manipulation
Data modification
Data theft
Consequences of a cyber-security attack
Loss: financial - data - reputation
Disruption: Operational - financial - commercial
Safety: individuals - equipment -finance

ICT Cambridge National LO6

Yr10 Cambridge National LO6

LO6: Understand the different methods of processing data and presenting information

Distribution channel: The methods that can be used to share information by individuals

- Email
- Social Media
- Websites
- Intranet – private network
- Internet
- VoIP – enables voice calls to be made over the internet
- Multimedia – text, sound, video and graphics
- Cloud
- Mobile apps
- Integrated document – document containing components from other documents
- End user documentation – User guide

DISTRIBUTION CHANNELS

EXAMPLES OF ...

Messaging services	Websites	VOIP	Cloud Based
Email Social Media	Websites	Skype Podcasts Lync	Google Drive Office 365

Multimedia
YouTube & Web Conference

Mobile Apps
Fitness app: e.g. Couch to 5k ☺

Spreadsheet software

PROS
Stores and processes text and numerical data
Can create charts from processed data
Can carry out calculations

CONS
Data entry takes time
Easy to make errors in formulas
Needs experience to use effectively

Word Processing software

PROS
Easy to enter Text
Excellent for reports
Excellent for mail merge
CONS
Costly to buy
Takes time to learn mail merge
Limited to word processing

Presentation software

PROS
Easy to manipulate text & images
Excellent for slides

CONS
Costly to buy
Takes time to learn

Desk top Publishing software

PROS
Easy to manipulate text & images
Excellent for marketing

CONS
Costly to buy
Takes time to learn

Database software

PROS
Fewer data entry errors
More accurate data
Independence from applications programs

CONS
Skills are required to set up a database
Multiple tables can take time to set up
Lots of training required for all users

Key Words	
Table	Contains data about 'things'. EG A customer's table.
Validation	Can include length checks, presence checks, format checks, range checks and input masks.
Validity	How believable the data and information collected is.
vlog	A video blog.
VoIP	Voice over Internet Protocol is a system that enables voice calls to be made over the internet.
Workbook	A collection of worksheets.
Worksheet	One spreadsheet contained within a workbook.
Integrated document	A document featuring components from other documents.
Distribution channel	The methods that can be used by an individual or businesses to share information.
Blog	A regularly updated website that is usually run by one person.

TARGET AUDIENCE
Gender
Age
Ethnicity
Income
Location
Accessibility

CONTENT LIMITATIONS
A database is not suitable for presenting to an audience

AVAILABILITY OF INFORMATION
Real- Time
Location
Delay effects

IMPACT OF DISTRIBUTION
Grabbing the attention of the audience

PRESENTATION METHODS

Reports
Presentations
Graphs/ Charts
Tables
Integrated Documents
User End Documents

BIDMAS N3

...or BODMAS. Use the correct order of operations; take care when using a calculator.

- **B**rackets
- **I**ndices (or p**O**wers)
- **D**ivision and **M**ultiplication
- **A**ddition and **S**ubtraction

HCF, LCM N4

Highest **C**ommon **F**actor (HCF)

➔ Factors of 6 are 1, 2, 3, 6
Factors of 9 are 1, 3, 9
HCF of 6 and 9 is 3

Lowest **C**ommon **M**ultiple (LCM)

➔ Multiples of 6 are 6, 12, 18, 24, ...
Multiples of 9 are 9, 18, 27, 36, ...
LCM of 6 and 9 is 18

Prime factors N4

Write a number as a product of its prime factors; use indices for repeated factors:

➔ $720 = 5 \times 3^2 \times 2^4$

Powers and roots N6, N7

Special indices: for any value a:

$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

➔ $3^{-4} = \frac{1}{3^4} = \frac{1}{81}$

Surds N8

Look for the biggest square number factor of the number:

➔ $\sqrt{80} = \sqrt{16 \times 5} = 4\sqrt{5}$

Standard form N9

Standard form numbers are of the form $a \times 10^n$, where $1 \leq a < 10$ and n is an integer.

Standard units N13

1 tonne = 1 000 kilograms
1 kilogram = 1 000 grams

1 kilometre = 1 000 metres
1 metre = 100 centimetres
= 1 000 millimetres
1 centimetre = 10 millimetres

1 day = 24 hours
1 hour = 60 minutes = 3 600 seconds
1 minute = 60 seconds

Number

Types of number N4

Integer: a "whole" number
Factors; the divisors of an integer
➔ Factors of 12 are 1, 2, 3 ,4, 6, 12
Multiples; a "times table" for an integer (will continue indefinitely)
➔ Multiples of 12 are 12, 24, 36 ...
Prime number: an integer which has exactly two factors (1 and the number itself). Note: 1 is not a prime number.

Calculating with fractions N8

Adding or subtracting fractions; use a common denominator...

➔ $\frac{4}{5} - \frac{1}{3} = \frac{12}{15} - \frac{5}{15} = \frac{7}{15}$

Multiplying fractions; multiply numerators and denominators...

➔ $\frac{4}{7} \times \frac{2}{3} = \frac{8}{21}$

Dividing fractions; "flip" the second fraction, then multiply...

➔ $\frac{2}{7} \div \frac{5}{6} = \frac{2}{7} \times \frac{6}{5} = \frac{12}{35}$

Rounding N15

Truncate the number, then use a "decider digit" to round up or down.
Decimal places: use the decimal point

➔ 162.3681 to 2dp;
162.36 | 81 = 162.37 to 2dp

Significant figures: use the first non-zero digit.

➔ 162.3681 to 2sf;
16 | 2.3681 = 160 to 2sf

➔ 0.007 039 to 3sf;
0.007 03 | 9 = 0.007 04 to 3sf

Error intervals N15

Find the range of numbers that will round to a given value:

➔ $x = 5.83$ (2 decimal places)
$5.825 \leq x < 5.835$

➔ $y = 46$ (2 significant figures)
$45.5 \leq y < 46.5$

Note use of ≤ and <, and that the last

Fractions, decimals N10

Fraction is numerator ÷ denominator

➔ $\frac{5}{8} = 5 \div 8 = 0.625$

Use place values to change decimals to fractions. Simplify where possible.

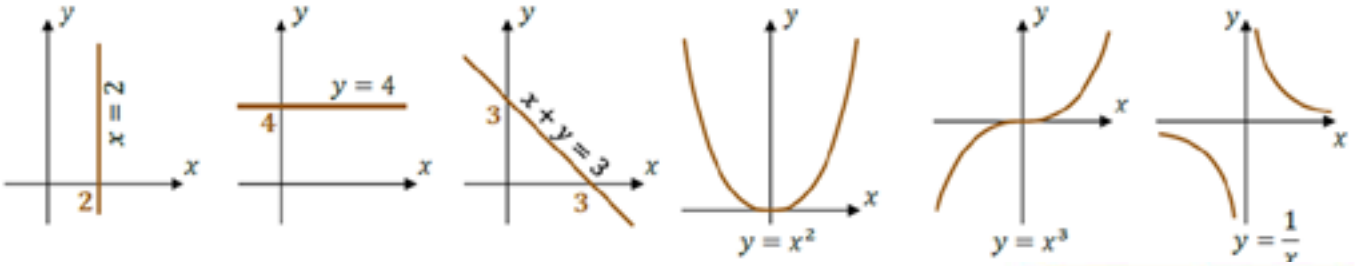
➔ $0.45 = \frac{45}{100} = \frac{9}{20}$

Learn the most frequently used ones:

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{4}$
0.5	0.25	0.1	0.2	0.75

Algebra

Standard graphs A12



Sequences A24, A25

Triangular numbers:

1st	2nd	3rd	4th	5th
1	3	6	10	15

Square numbers ($n^2 = n \times n$):

1^2	2^2	3^2	4^2	5^2
1	4	9	16	25

Cube numbers ($n^3 = n \times n \times n$):

1^3	2^3	3^3	4^3	5^3
1	8	27	64	125

nth term of an arithmetic (linear) sequence is $an + d$

➔ nth term of 5,8,11,14,... is $3n+2$ (always increases by 3; first term is $3 \times 1 + 2 = 5$.)

Geometric sequence; multiply each term by a constant ratio

➔ 3, 6, 12, 24, ... (ratio is 2)

Fibonacci sequence; make the next term by adding the previous two ...

➔ 2, 4, 6, 10, 16, 26, 42, ...

Expanding brackets A4

$$p(q + r) = pq + pr$$

➔ $5(x - 2y) = 5x - 10y$

$$(x + a)(x + b) = x^2 + ax + bx + ab$$

➔ $(2x - 3)(x + 5)$
$= 2x^2 - 3x + 10x - 15$
$= 2x^2 + 7x - 15$

Reverse of expanding is factorising - putting an expression into brackets.

Quadratics A18

Solve a quadratic by factorising.

➔ Solve $x^2 - 8x + 15 = 0$

Put into brackets (taking care with any negative numbers)...

$$(x - 3)(x - 5) = 0$$

...then either $x - 3 = 0$ or $x - 5 = 0$, so that $x = 3$ or $x = 5$.

Algebraic notation A1

$$ab = a \times b$$
$$3y = y + y + y$$
$$a^2 = a \times a$$
$$a^3 = a \times a \times a$$
$$a^2b = a \times a \times b$$
$$\frac{a}{b} = a \div b$$

Equations and identities A3

An equation is true for some particular value of x...

➔ $2x + 1 = 7$ is true if $x = 3$

...but an identity is true for every value of x

➔ $(x + a)^2 \equiv x^2 + 2ax + a^2$

(note the use of the symbol ≡)

Laws of indices A4

For any value a:

$$a^x \times a^y = a^{x+y}$$
$$\frac{a^x}{a^y} = a^{x-y}$$
$$(a^x)^y = a^{xy}$$

➔ $\left(\frac{2pq^4}{p^3q}\right)^3 = \frac{8p^3q^{12}}{p^9q^3} = \frac{8q^9}{p^6}$ or $8q^9p^{-6}$

Simultaneous equations A19

➔ Solve $\begin{cases} 2x + 3y = 11 \\ 3x - 5y = 7 \end{cases}$

Multiply to match a term in x or y

$$\begin{cases} 10x + 15y = 55 \\ 9x - 15y = 21 \end{cases}$$

Add or subtract to cancel...

$$19x = 76, \text{ so } x = 4$$

Finally, substitute and solve...

$$2 \times 4 + 3y = 11, \text{ so } y = 1$$

$y = mx + c$ A9

Equation of straight line $y = mx + c$
m is the gradient; c is the y intercept:

➔ Find the equation of the line that joins (0 , 3) to (2 , 11)

Find its gradient...

$$\frac{11 - 3}{2 - 0} = \frac{8}{2} = 4$$

...and its y intercept...

Passes through (0 , 3), so c = 3.

Equation is $y = 4x + 3$.

Parallel lines: gradients are equal;

➔ $y = 2x + 3$ and $y = 2x - 5$ both have gradient 2, so are parallel.

Rearrange a formula A5

The subject of a formula is the term on its own. Use rules that "balance" the formula to change its subject

➔ Make x the subject of

$$2x + 3y = z$$

Here, subtract $3y$ from both sides...

$$2x = z - 3y$$

...then divide both sides by 2...

$$x = \frac{z - 3y}{2}$$

Difference of two squares A4

$$a^2 - b^2 = (a + b)(a - b)$$

➔ $x^2 - 25 = (x + 5)(x - 5)$

Ratio, proportion and rates of change

Speed, distance, time R11

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

➔ A car travels 90 miles in 1 hour, 30 minutes. Find its average speed.
90 miles ÷ 1.5 hours = 60 mph

Percentages R9

$$y \text{ percent of } x = \frac{y}{100} \times x$$

➔ Increase £58 by 26%.

$$\frac{26}{100} \times £58 = £15.08$$

£58 + £15.08 = £73.08

$$y \text{ as a percentage of } x = \frac{y}{x} \times 100\%$$

➔ The population of a town increases from 3 500 to 4 620. Find the percentage increase.

$$\frac{1\,120}{3\,500} \times 100\% = 32\%$$

$$\text{Note: fraction} = \frac{\text{increase}}{\text{original}}$$

Learn the most frequently used ones:

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{100}$
50%	25%	10%	20%	1%

Division using ratio R5

Use a ratio for unequal sharing

➔ Divide £480 in the ratio 7 : 5

7 + 5 = 12, then £480 ÷ 12 = £40

7 × £40 = £280, 5 × £40 = £200

(check: £280 + £200 = £480 ✓)

Ratio and fractions R8

Link between ratios and fractions

➔ Boys to girls in ratio 2 : 3

$\frac{2}{5}$ are boys, $\frac{3}{5}$ are girls.

Probability

Probability rules P8, P9

Multiply for independent events

➔ P(6 on dice and H on coin)

$$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$$

Add for mutually exclusive events

➔ P(5 or 6 on dice)

$$\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$$

Apply these rules to tree diagrams.

Probability P8, P9

$$p = \frac{n(\text{equally likely favourable outcomes})}{n(\text{equally likely possible outcomes})}$$

$p = 0$	impossible
$0 < p < 0.5$	unlikely
$p = 0.5$	evens
$0.5 < p < 1$	likely
$p = 1$	certain

Statistics

Averages S4

Mode: most frequently occurring

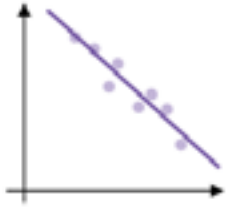
Median: put the data in numerical order, then choose the middle one

$$\text{Mean} = \frac{\text{total of items of data}}{\text{number of items of data}}$$

Correlation S6

Positive correlation

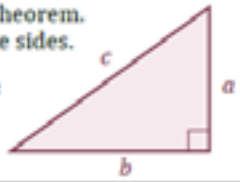
Negative correlation



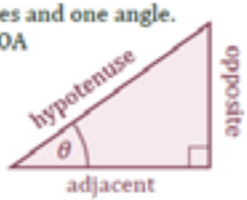
Right angled triangles

G20, G22

Pythagoras Theorem.
Links all three sides.
No angles.
$a^2 + b^2 = c^2$



Trigonometry.
Links two sides and one angle.
SOH | CAH | TOA



$\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$

Use "2ndF" or "SHIFT" key to find a missing angle

The longest side of any right angled triangle is the hypotenuse; check that your answer is consistent with this.

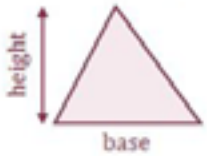
Special values of sin, cos, tan
Learn (or be able to find without a calculator)...

$\theta°$	$\sin\theta°$	$\cos\theta°$	$\tan\theta°$
0	0	1	1
30	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90	1	0	

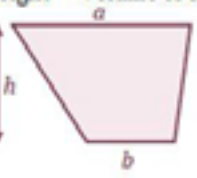
Areas and volumes

G16, G17, G18, G23

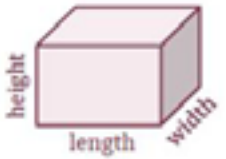
Area of triangle = $\frac{1}{2} \times$ base $\times$ height



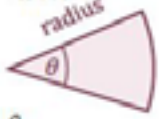
Area of trapezium = $\frac{1}{2}(a + b) \times h$



Volume of cuboid = length $\times$ width $\times$ height

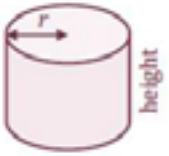


Circumference of circle = $\pi \times D$
Area of circle = $\pi \times r^2$



Arc length = $\frac{\theta}{360°} \times \pi \times D$

Area of sector = $\frac{\theta}{360°} \times \pi \times r^2$



Volume of cylinder = $\pi r^2 \times$ height

Volume of prism = area of cross section $\times$ length

Parts of a circle

G9

Geometry & measures

Transformations

G7, G8

Reflection
- Line of reflection

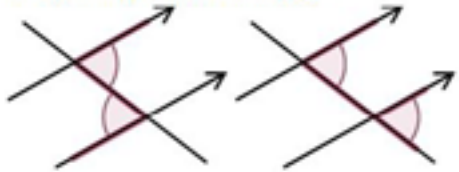
Translation
- Vector

Rotation
- Centre of rotation
- Angle of rotation
- Clockwise or anticlockwise

Enlargement
- Centre of enlargement
- Scale factor (if SF < 1 the shape will get smaller).

Angle facts

Equal angles in parallel lines: always use correct terminology...

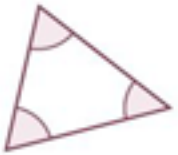


Alternate angles | Corresponding angles

Angles on a straight line total 180°

Angles in a full turn total 360°

Interior angles in a triangle total 180°



Use this for the interior angles of any polygon...

...or 180° × (n − 2)

Exterior angles always total 360°

Algebra

Laws of indices A4

For any value a:

$$a^x \times a^y = a^{x+y}$$
$$\frac{a^x}{a^y} = a^{x-y}$$
$$(a^x)^y = a^{xy}$$

→ $\left(\frac{2pq^4}{p^3q}\right)^3 = \frac{8p^3q^{12}}{p^9q^3} = \frac{8q^9}{p^6}$ or $8q^9p^{-6}$

Difference of two squares A4

$$a^2 - b^2 = (a+b)(a-b)$$
→ $x^2 - 25 = (x+5)(x-5)$

$y = mx + c$ A9

Equation of straight line $y = mx + c$
m is the gradient; c is the y intercept:

→ Find the equation of the line that joins (0, 3) to (2, 11)

Find its gradient...

$$\frac{11-3}{2-0} = \frac{8}{2} = 4$$

...and its y intercept...

Passes through (0, 3), so c = 3.

Equation is $y = 4x + 3$.

Parallel lines: gradients are equal; perpendicular lines: gradients are "negative reciprocals".

→ $y = 2x + 3$ and $y = 2x - 5$ are parallel to each other; $y = 2x + 3$ and $y = -\frac{1}{2}x + 3$ are perpendicular

Equations and identities A3

An equation is true for some particular value of x...

→ $2x + 1 = 7$ is true if $x = 3$

...but an identity is true for every value of x

Functions A7

Combining functions:

$$fg(x) = f(g(x))$$

→ If $f(x) = x + 3$ and $g(x) = x^2$

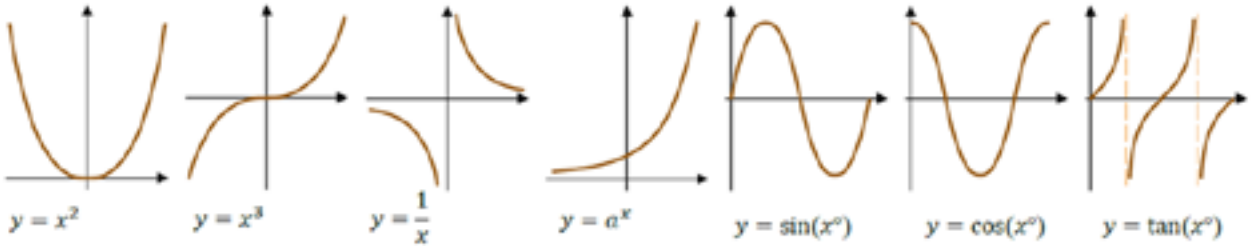
$$fg(x) = x^2 + 3$$
$$gf(x) = (x+3)^2$$

The inverse of f is f^{-1}

→ If $f(x) = 2x + 5$ then

$$f^{-1}(x) = \frac{x-5}{2}$$

Standard graphs A12



Iteration A20

You will be given the formula to use:

→ Solve $x^3 + 6x + 4 = 0$ by using the iteration $x_{n+1} = \sqrt[3]{6x_n - 4}$.

Start with $x_1 = -2.8$.

$x_2 = \sqrt[3]{6 \times (-2.8) - 4} = -2.750\ldots$

$x_3 = \sqrt[3]{6 \times (-2.750\ldots) - 4} = \cdots$

Repeat until you know the solution, or you do as many as the question says.

Transformations of curves A13

Starting with the curve $y = f(x)$:

Translate $\begin{pmatrix}0\\a\end{pmatrix}$ for $y = f(x) + a$

Translate $\begin{pmatrix}-a\\0\end{pmatrix}$ for $y = f(x + a)$

Reflect in x axis for $y = -f(x)$

Reflect y axis for $y = f(-x)$

Velocity - time graph A15

Gradient = acceleration (you may

Quadratics A11, A18

If a quadratic equation cannot be factorised, use the formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

→ Solve $2x^2 + 3x - 7 = 0$

$$x = \frac{-3-\sqrt{9-(-56)}}{2\times2} = -2.73$$

or $x = \frac{-3+\sqrt{9-(-56)}}{2\times2} = 1.23$

Complete the square to find the turning point of a quadratic graph.

→ $y = x^2 - 6x + 2$
$y = (x-3)^2 - 9 + 2$
$y = (x-3)^2 - 7$

Turning point is at (3, −7)

Equation of a circle A16

$x^2 + y^2 = r^2$ is a circle with centre

Rearrange a formula A5

The subject of a formula is the term on its own. Rearrange to

→ Make x the subject of

$$2x + ay = y - bx$$
$$2x + bx = y - ay$$
$$x(2 + b) = y - ay$$
$$x = \frac{y - ay}{2 + b}$$

Simultaneous equations A19

One linear, one quadratic;

→ Solve $\begin{cases} x + 3y = 10 \\ x^2 + y^2 = 20 \end{cases}$

Rearrange the linear, and substitute into the quadratic

$$x = 10 - 3y$$
so $(10 - 3y)^2 + y^2 = 20$

Expand and solve the quadratic

$$100 - 60y + 9y^2 + y^2 = 20$$
$$10y^2 - 60y + 80 = 0$$
$$y = 2 \text{ or } y = 4$$

Finally, substitute into the linear and solve pairing values

Functions A7

Combining functions:

$$fg(x) = f(g(x))$$

→ If $f(x) = x + 3$ and $g(x) = x^2$

$$fg(x) = x^2 + 3$$
$$gf(x) = (x+3)^2$$

The inverse of f is f^{-1}

→ If $f(x) = 2x + 5$ then

$$f^{-1}(x) = \frac{x-5}{2}$$

Sequences A24, A25

nth term of an arithmetic (linear) sequence is $bn + c$

→ nth term of 5,8,11,14,... is $3n+2$ (always increases by 3; first term is $3 \times 1 + 2 = 5$.)

nth term of a quadratic sequence is $an^2 + bn + c$

→ First three terms of $n^2 + 3n - 1$ are 3, 9, 17, ...

Geometric sequence; multiply each term by a constant ratio

→ 3, 6, 12, 24, ... (ratio is 2)

Fibonacci sequence; make the next term by adding the previous two ...

→ 2, 4, 6, 10, 16, 26, 42, ...

Listing strategies N5

Product rule for counting:

→ $4 \times 3 \times 2 \times 1 = 24$ ways to arrange the letters P, I, X and L.

Recurring decimals N10

Make a recurring decimal a fraction:

→ $n = 0.2\dot{3}\dot{6}$

(two digits are in the recurring pattern, so multiply by 100)

$$100n = 23.\dot{6}$$

(this is the same as $23.63\dot{6}$)

$$99n = 23.63\dot{6} - 0.2\dot{3}\dot{6} = 23.4$$

$$n = \frac{23.4}{99} = \frac{234}{990} = \frac{13}{55}$$

Error intervals N15

Find the range of numbers that will round to a given value:

→ $x = 5.83$ (2 decimal places)

$$5.825 \leq x < 5.835$$

→ $y = 46$ (2 significant figures)

$$45.5 \leq y < 46.5$$

Note use of ≤ and <, and that the last significant figure of each is 5.

Surds N8

Look for the biggest square number factor of the number:

→ $\sqrt{80} = \sqrt{16 \times 5} = 4\sqrt{5}$

Number

Powers and roots N6, N7

Special indices: for any value a:

$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

$$a^{\left(\frac{p}{q}\right)} = \sqrt[q]{a^p}$$

→ $3^{-4} = \frac{1}{3^4} = \frac{1}{81}$

→ $8^{\left(\frac{2}{3}\right)} = \sqrt[3]{8^2} = 4$

Rationalise the denominator N8

Multiply the numerator and denominator by an expression that makes the denominator an integer:

→ $\frac{4}{\sqrt{7}} = \frac{4 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{4\sqrt{7}}{7}$

→ $\frac{2}{4 + \sqrt{5}}$

$$= \frac{2}{4 + \sqrt{5}} \times \frac{4 - \sqrt{5}}{4 - \sqrt{5}} = \frac{2(4 - \sqrt{5})}{11}$$

Standard form N9

Standard form numbers are of the form $a \times 10^n$, where $1 \leq a < 10$ and n is an integer.

Ratio, proportion and rates of change

Percentages: multipliers R9, R16

Percentage increase or decrease; use a multiplier (powers for repetition)

➔ Initially there were 20 000 fish in a lake. The number decreases by 15% each year. Estimate the number of fish after 6 years.

$20\,000 \times 0.85^6 = 7\,500$ (2sf)

Formula for compound interest

$$\text{Total accrued} = P\left(1 + \frac{r}{100}\right)^n$$

➔ I invest £600 at 3% compound interest. What is my account worth after 5 years?

$$£600 \times \left(1 + \frac{3}{100}\right)^5 = £695.56$$

Direct & inverse proportion R10

y is directly proportional to x:
$y = kx$ for a constant k

➔ b is directly proportional to a^2; $a = 6$ when $b = 90$. Find b if $a = 8$.

$b = ka^2$; $a = 6$ and $b = 90$ for k;
$90 = k \times 6^2$ so $k = 2.5, b = 2.5a^2$
$b = 2.5 \times 8^2 = 160$

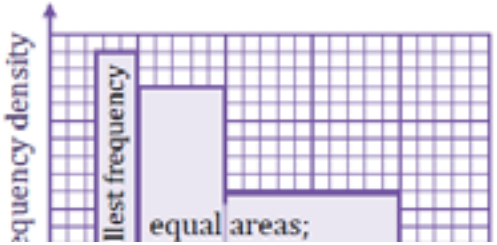
y is inversely proportional to x:

$yx = k$ or $y = \frac{k}{x}$ for a constant k

Statistics

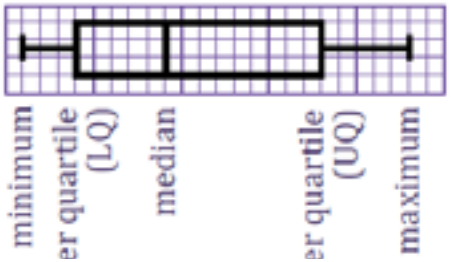
Histograms

Frequency = frequency density multiplied by class width. This means that bars with the same frequency have the same area.



Box plots S4

Interquartile range (IQR) = UQ – LQ



Probability

Probability rules P8, P9

Multiply for independent events

➔ P(6 on dice and H on coin)

$$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$$

Add for mutually exclusive events

➔ P(5 or 6 on dice)

$$\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$$

Apply these rules to tree diagrams.

In general...

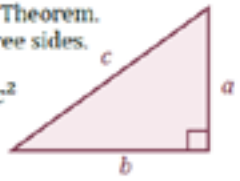
$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$P(A \text{ and } B) = P(A \text{ given } B) \times P(B)$

Right angled triangles

G20

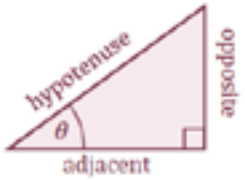
Pythagoras Theorem.
Links all three sides.
No angles.
$a^2 + b^2 = c^2$



Trigonometry.
Links two sides and one angle.
SOH | CAH | TOA

$\sin\theta = \frac{opp}{hyp}$ $\cos\theta = \frac{adj}{hyp}$ $\tan\theta = \frac{opp}{adj}$

Use "2ndF" or "SHIFT" key to find a missing angle



The longest side of any right angled triangle is the hypotenuse; check that your answer is consistent with this.

Circle theorems

G10

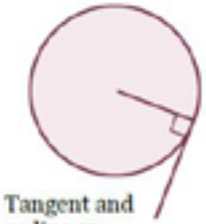
Angle in a semicircle is 90°

Angle at the centre is double the angle at the circumference

Angles in the same segment are equal

Opposite angles in a cyclic quadrilateral total 180°

Alternate segment theorem



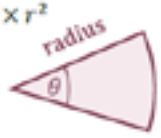
Tangent and radius are perpendicular

Geometry & measures

Areas and volumes

G16, G17, G18, G23

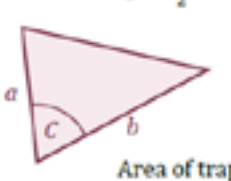
Circumference of circle = $\pi \times D$
Area of circle = $\pi \times r^2$

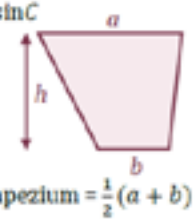


Arc length = $\frac{\theta}{360°} \times \pi \times D$

Area of sector = $\frac{\theta}{360°} \times \pi \times r^2$

Area of triangle = $\frac{1}{2}ab\sin C$





Area of trapezium = $\frac{1}{2}(a + b) \times h$

Volume of prism = area of cross section × length

Volume of cone = $\frac{1}{3}\pi r^2 h$

Volume of frustum is difference between the volumes of two cones

Similar shapes

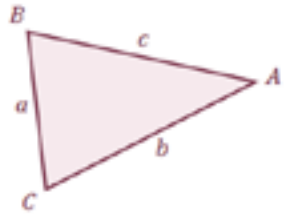
G19

Ratios in similar shapes and solids:

• Length/perimeter	$1:n$	$a:b$
• Area	$1:n^2$	$a^2:b^2$
• Volume	$1:n^3$	$a^3:b^3$

Advanced trigonometry

G21, G22



A is opposite *a*
B is opposite *b*
C is opposite *c*

Sine Rule
Use if you are given an angle-side pair

Missing side: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Missing angle: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Cosine Rule
Use if you can't use the sine rule

Missing side: $a^2 = b^2 + c^2 - 2bc\cos A$

Missing angle: $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

Special values of sin, cos, tan
Learn (or be able to find without a calculator)...

$\sin 0° = 0$, $\cos 0° = 1$, $\tan 0° = 0$

$\sin 30° = \frac{1}{2}$, $\cos 30° = \frac{\sqrt{3}}{2}$, $\tan 30° = \frac{1}{\sqrt{3}}$

$\sin 45° = \frac{1}{\sqrt{2}}$, $\cos 45° = \frac{1}{\sqrt{2}}$, $\tan 45° = 1$

$\sin 60° = \frac{\sqrt{3}}{2}$, $\cos 60° = \frac{1}{2}$, $\tan 60° = \sqrt{3}$

$\sin 90° = 1$, $\cos 90° = 0$

Transformations

G7, G8

Reflection
- Line of reflection

Translation
- Vector

Rotation
- Centre of rotation
- Angle of rotation
- Clockwise or anticlockwise

Enlargement
- Centre of enlargement
- Scale factor (if $-1 < SF < 1$ the shape will get smaller).

MEDIA LANGUAGE

Signs are designed to convey meaningful and important information in a condensed way.

The study and understanding of signs and the meaning they communicate is called semiotics.

In the media, it is agreed among producers and audiences that specific meanings can be attributed to certain signs.

Denotation refers to what is literally visible within a sign or symbol.

Connotations are the meanings associated with a sign or symbol.

Charles Sanders Peirce was an American philosopher who identified three different types of signifier.

An **icon** is a signifier which resembles. *For example, a bicycle is used to indicate a cycle lane*	
An **index** is a signifier which is physically or literally connected to what is being signified. *For example, the skull and cross bones indicates a toxic substance*	
With a **symbol** there is no resemblance between the signifier and the signified. *For example, the interlocking symbols indicate male and female solely due to a collective agreement among people*	

Ferdinand de Saussure was one of the key founders of semiotics. He proposed that signs have meanings via two elements.

1. **The signifier** is the form of a sign – something which can be seen, heard, touched, smelt or tasted.
2. **The signified** is the idea or meaning conveyed by that signifier. An example of these two elements working in correlation can be found in the theatrical poster for the film *Jaws* (1975). **The signifier** is a young woman swimming in the ocean with an open-mouthed great white shark swimming beneath the surface of the water. **The signified** is the idea that the shark is probably about to eat the woman. You are likely to find examples of this in all four media frameworks.

Roland Barthes was a French theorist and semiotician who suggested that a story's narrative uses five different types of *code*. These codes work together to enable the reader to make sense of what is happening in the story.

1. Action Codes – an object or event (often very simple) that leads to narrative progression *e.g. the drawing of a gun suggests that violence will occur*
2. Enigma Codes – the set-up and resolution of a puzzle, *e.g. a film poster might contain an image of a closed treasure chest (the puzzle). The audience must see the film in order to discover what is inside the treasure chest (the resolution).*
3. Semic Codes – signs referring to additional meaning through the use of connotation, *e.g. A model lifting weights implies that they are strong or like exercising*
4. Symbolic Codes – a range of non-literal references found in an image or a text, normally presented through two contrasting codes, *e.g. good vs bad, man vs woman*
5. Cultural codes – all references found within a text that can be understood with a good knowledge of news, events and culture, both contemporary and historical, *e.g. the image of the Union flag usually implies British pride*

Mode of address – The type of media language used to speak to audiences. *For example, in most lifestyle magazines the cover star will look into the frame (at the audience) creating a direct mode of address.*

Iconography – Visual codes that audiences associate with certain genres. *For example, frightening masks will often appear on the posters for horror films.*

Typography – The style of font. This helps to create a house style or brand identity for a print media product as well as helping to establish genre. *For example, large boldface typography is a common convention of tabloid newspapers.*

Intertextuality – When a media text references another text in order to shape meaning and affect audience interpretation. *For example, advertisements may contain references to a popular film in order to create comedy and make them stick in the audience's head.*

Genre provides us with a way of clearly categorising media products.

We can determine which products fit into which genre by looking out for the repetition of certain codes and conventions. ➡ *For example, a film is likely to fit into the crime genre if it contains certain character types (gangsters, detectives), narrative beats (a heist, an arrest), technical codes (rapid editing, low-key lighting) and familiar visual iconography (guns, dark suits, getaway cars).*

Producers incorporate new and unexpected codes and conventions into their products in order to maintain audience interest. **Genre hybridity** (the incorporating of codes and conventions from multiple genres into a single product) is an effective way of achieving this. ➡ *For example, the film Shaun of the Dead effectively blends elements of the horror genre with elements of the romantic comedy genre.*

NARRATIVE DEFINITIONS

Content	Refers to what happens in the story as well as the meaning behind it
Form	Refers to the text type that the writer uses *e.g. magazine, newspaper, website*
Plot	The term used to describe how the main events in the story unfold
Structure	Relates to the order of events in a narrative and the form in which it is told
Storytelling	The activity of presenting a story to an audience
Action	Either the physical movements of the people in the story or their behaviour
Dialogue	The engagement of conversation or vocalised thought of the people in the story
Conflict	The struggle that often presents itself in a story
Character	Any person, animal or figure presented in a story
Setting	The time and place in which the story takes place
Event	Something that will happen, has happened, or is thought to happen in the future

Vladimir Propp is a theorist whose work is derived from his studies of Russian folk tales with a particular focus on their characters. Through his studies, Propp identified eight types of character, not unlike stock characters, which he claims serve a specific purpose to the story's narrative. It is likely that different character types will overlap, e.g. the dispatcher and the princess's father.

Vladimir Propp – Character Types

1. Hero – the protagonist of the story. Embarks upon a journey motivated by the lack or loss of something.
2. Villain – an antagonistic character who wants to ruin the hero's journey
3. Donor – someone who provides the hero with either an object or the advice they need to complete their journey
4. Helper – someone who aids the hero on their journey (often described as a sidekick)
5. Princess/reward – someone who / something that is unattainable throughout the journey. The story usually ends with the hero acquiring this prize.
6. Princess's father – the person who rewards the hero with the prize at the end of their journey
7. Dispatcher – sends the hero on the journey and illustrates the importance of the journey
8. False hero – raises complications. Tries to take credit for the hero's action and obtain the reward.

Remember: the majority of media products are **polysemic**. This means that their meanings can be multilayered and interpreted in a number of different ways. For example, the image of a scantily clad woman in a fashion magazine might connote liberation and female empowerment for some viewers while connoting objectification and oppression for others.

MEDIA REPRESENTATION

When it comes to analysing representation in the media, it is useful to be aware of contextual factors that have affected cultural attitudes in Western society. Listed below are a number of specific or ongoing events that are likely to inform your analysis.

Gender	Ethnicity	Age
		
In 2017, there was a huge series of accusations from women accusing powerful men in the media of sexual harassment and assault. The hashtags #MeToo and #TimesUp were shared by thousands of women exposing an underlying sexism running through mainstream media (particularly the film industry). This movement has greatly enhanced conversations about female representation in the media.	Martin Luther King Jr's 'I Have a Dream' speech in 1963 was a defining moment for the civil rights movement. With it came a rapid change in rights for the US African-American community.	Traditionally in the media, children have often been depicted as being helpless and in need of saving. Particularly in mainstream cinema, recent representations, e.g. *Stranger Things* and *Pokemon*, have shown children to be capable and often 'more in the know' than their parents about important issues.
A recent statistic revealed that the greatest killer of men under 45 in the UK is suicide. A concerted effort has been made to counter hypermasculine representations in the media and allow men to be presented as being emotionally vulnerable.	The Black Lives Matter movement was founded in 2013 following a number of unprovoked shootings by police on African-Americans in the USA.	Historically, teenagers have been depicted either as stroppy or as violent and rebellious thugs. Over time, mainstream media has started to acknowledge the complex issues of adolescence, representing teenagers as ambitious and three-dimensional. This particularly caters to the **millennial generation**, largely defined by concerns about mental health and an uncertain job market.
According to certain statistics, women (on average) earn 78% of the average male salary in the United States. This inequality is largely reflected in the media. For example, only two of 2016's top 10 paid actors were women	The hashtag #OscarSoWhite was a retaliation to the abundance of white nominees at the 2015 Academy Awards. In June 2016, the British people voted to leave the European Union. Many believe that racist attitudes towards immigrants largely determined the result of the vote, e.g. a column in The Sun (the highest-selling newspaper in Britain) described Syrian migrants as 'cockroaches'.	The majority of the **baby boomer** generation are currently in their 60s or 70s. More so than in previous generations, many baby boomers are still healthy, highly active and in possession of significant disposable income. This is being reflected in the mainstream media, particularly in advertising as producers will often target the **grey pound** (a marketing term used to describe the high amounts of money older people have to spend on consumer goods).

Stereotypes are representations that reduce a person or a group of people to a narrow set of traits and characteristics, *e.g. all women want to be domestic housewives.*

Counertypes are representations that emphasise the positive attributes of a person or a group of people, often combating stereotypes in the process, *e.g. women are physically capable and courageous.*

Representation Terms

Passive objects are characters that have no active role in shaping the narrative. They are only there to be looked at as events unfold around them

Active subjects are characters that affect the progression of the narrative. They take action and make things happen.

Media representation is all about the way in which media producers choose to portray something or someone in a product. Reality is complex, so representing every part of society within a single product is impossible. This is why producers consciously decide who their product is being made for (i.e. its target audience) and then select the parts of life that this group of people can relate to. In doing so, producers construct a version of reality for this particular audience. Representation is often concerned with Gender, Age, Sexual Orientation, Social Class, Ethnicity and Religion. Use the acronym 'GASSER' to help you remember

Under-representation

Definition: People or social groups who do not appear (or who appear very briefly) in a media product which might benefit from an individual's or a group's perspective.

Example: Homosexual couples have been historically under-represented in television adverts.

Misrepresentation

Definition: When a media product depicts a person, a group of people or an event in a way that is misleading or unfairly negative.

Example: Many people accuse newspapers such as *The Sun* of misrepresenting the entire British Muslim community as a threat to traditional British values.

The process by which producers **select** and **combine/construct** elements of media language to feature in a media product is known as **mediation**. The messages and ideas that are shown in the product will often be constructed in a way that establishes a particular **point of view**. For example, a newspaper article might use first-person pronouns to align the audience with a particular person's point of view. This process is known as **audience positioning**.

The Theory of 'Otherness'

Representations in the mainstream media have been constructed and mediated by people who are in possession of great social, economic and political power. Stuart Hall argued that media representations often result in an emphasis on 'otherness'. For years this has had a negative effect on representations of active, three-dimensional characters that are not straight, white or male.

Important Theories for discussing Gender Representation

Male gaze – **Laura Mulvey was a feminist theorist who suggested that visual media (particularly mainstream cinema) is constructed in a way that caters specifically to the pleasure of a male heterosexual audience. This theory largely explains the various ways in which women's bodies have been objectified in mainstream media.**

Patriarchy – the idea that Western civilisation is structured in a way that provides socio-economic advantages for white heterosexual males (more specifically father figures) at the expense of women and minorities.

The development of the feminist movement throughout the past 100 years has majorly influenced representations of men and women in the media. The second wave of feminism in the 1960s and 1970s was a time of particular social change– *For example, the contraceptive pill wasn't made widely available in the UK until 1974.*

MEDIA AUDIENCES

Active audience: An audience that actively selects the types of media product they consume. They are also able to actively engage and interpret messages within a media text, applying different readings to different messages.

Passive consumer: An audience that consumes various types of media without actively engaging with the content's messages. They are also happy to accept the meaning of a media product on the most basic and superficial level.

Mass audience: A large audience with mixed interests that collectively consumes the same media product that appeals to the general interests of the masses. It is often mainstream media that appeals to mass audiences.

Niche audience: A small audience with specialised and particular interests. Producers often create much smaller-scale products for these audiences as the financial return is not often very high.

A **demographic** is a group of people distinguished by their identity or socio-economic status: gender, race, age, class, marital status, ability/disability.

A **psychographic** is a group of people distinguished by their lifestyle, habits and interests: Donald Trump supporters, sports enthusiasts, cinema goers, feminists, musicians, etc.

The **primary audience** is the main group targeted by a media product. For example, e.g. GQ magazine has a primary audience of young men.

The Effects Debate: For a long time, it was widely accepted that a large section of the general public were passive consumers, taking the messages encoded in media products at face value. This in turn sparked a debate as to whether the media could shape people's attitudes and behaviours for the worst. A key example of the effects debate taking place in British history is the outrage that was provoked by the release of video nasties: a list of unregulated horror films which began to circulate through video shops throughout the 1980s. Politicians and the popular press expressed their moral outrage and began a fierce campaign to have these videos banned. They argued that the general public (particularly young people) could be encouraged to commit violent behaviour if they were exposed to these films. In hindsight, this campaign is generally considered to be an extreme overreaction and a patronising way of viewing media audiences.

Stuart Hall – Reception Theory

It is widely agreed that media producers encode messages into their products in order to invoke a particular response from the audience.

The audience in turn will decode these messages. However, they will not always do this in the way the producer(s) intended.

Preferred Reading – The audience accepts the messages encoded in the text, interpreting the product in the exact way in which it was intended, e.g. 'Call of Duty is an exciting game with fantastically realistic graphics'.

Negotiated Reading – Certain encoded messages are accepted by the audience whereas others are challenged e.g. "Call of Duty is very well designed, but the gameplay becomes boring. I don't think I'm the target audience"

Oppositional Reading – The audience rejects the encoded messages entirely, e.g. 'Call of Duty is a disgusting game that encourages teenagers to become violent killing machines. It is also incredibly boring!'

The uses and gratifications model was originally proposed by Jay Blumler and Elihu Katz in 1974. These theorists developed the model based on the idea that media audiences are not passive. On the contrary, audiences have the ability to select what media they consume, based on their own needs and desires. To a large degree, this theory empowers audiences by suggesting that media producers acknowledge the requirements of an audience and fulfil these requirements in order to prevent their products from being left without an audience.

Uses and Gratifications

Entertainment/Diversion
e.g. The James Bond action films offer audiences escapism from the boredom of daily life.

Education/Information
e.g. BBC World Service informs audiences of the latest news and events.

Personal Identity
e.g. Many people read tabloid newspapers to have their political opinions reaffirmed.

Social Interaction
e.g. Many video games allow audiences to compete with their friends and exchange tactics.

Demographics

Media products tend to establish target audiences based on the following demographics:

Gender: Perhaps the most widely considered demographic in media. Magazines and advertisements in particular will usually establish a demographic based on gender, *e.g. GQ specifically targets young men.*

Age: Certain media industries will establish specific age bands. However, most will establish general age categories, *e.g. children, teenagers, adults, elderly people.*

Ethnicity: Audiences are rarely targeted based on ethnicity as racism remains such a contentious issue. There are notable exceptions, *e.g. Pride magazine specifically targets women of colour.*

Class: While it is rare for audiences to be targeted based on class, demographics in the UK can be broken down into the following socio-economic groups: A, B, C1, C2, D, E.

The **secondary audience** will be a group that consumes a media product even though they are not the main target audience, e.g. young women might also read *GQ* magazine in order to understand men's interests.

A **water-cooler topic** is a huge, widely recognised event or topic that can be discussed in the workplace during lunch breaks as well as in other public spaces.

The **mode of address** describes the way in which a media product communicates with its audience, e.g. adverts often use imperatives such as 'Buy this!'

Media conglomerate: A large media company that owns a number of smaller media companies

Vertical integration: The act of a media company owning most (if not all) of the chain of production for a media text

Horizontal integration: When a media company which is already established in creating a particular form of media text acquires another company operating within the same form. This may also be referred to as **diversification**.

Synergy: Different parts of a media conglomerate combining to promote two separate products

Cross-platform marketing: Involves campaigns that span across different media platforms

Viral marketing: Exclusive to the Internet (particularly to social media); its success is dependent on the success of, and awareness raised by, collective sharing and discussion of the product being marketed

Convergence: The act of media products that were previously perceived as being exclusively separate from one another coming together to enhance the media form in question or create a new one. Originally, mobile phones were used to make calls and text. Now, mobile phones can be used to enhance our lives in ways that were not considered possible before the creation of smartphones.

Instagram
Founded: 2010

Facebook
Founded: 2004

Twitter
Founded: 2006

The distribution and circulation of modern media products have been significantly affected by the development of online technology. Most media companies will maintain active social media pages, allowing them to target a wider range of audiences. *For example, distribution companies will generate hype for a new film by releasing posters and trailers through various social media accounts. They then rely on audiences to share this marketing material, building a larger audience through word of mouth.*

MEDIA INDUSTRIES

Every media product goes through three general stages...

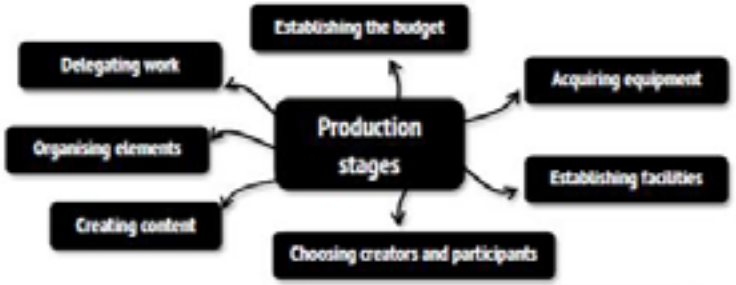
Production: the initial construction of a media product – e.g. writing, shooting and editing a film

↓

Distribution: the delivery of a media product through the appropriate platforms – e.g. stocking newspapers in shops / delivering newspapers to people's homes

↓

Consumption: the audience's experience of 'consuming' the media product – e.g. playing a video game



How are different media products distributed?

Media Form	Methods of Distribution
Magazines	Online editions, delivery through subscription, shops stocking physical copies, physical copies in public spaces (e.g. cafés, waiting rooms)
Newspapers	Online editions, delivery through subscription, shops stocking physical copies, physical copies in public spaces (e.g. cafés, waiting rooms), shares on social media
Advertisements	Television, cinemas, billboards, posters, pages in magazines and newspapers, official websites, shares on social media
Films	Cinemas, DVD, Blu-ray, streaming services, iTunes, television programming
Radio	Live broadcasts, repeat broadcasts, online catch-up services, iTunes, downloadable podcast
Video Games	Physical copies for consoles, console-specific store (e.g. Nintendo eShop), mobile app stores, PC, arcades

Regulation

The rise of online media has made regulation significantly more difficult. An effort has been made to establish online regulation for **video on demand** services such as BBC iPlayer under the watch of ***Ofcom*** (Office of Communications). However, it is almost impossible to effectively regulate online media, meaning more young people than ever before are exposed to adult content.

Many media products are produced by subsidiaries of large organisations. These products will usually have a high amount of financial backing, and access to the best resources and talent, and will, therefore, tend to have high production values (the technical quality of a media product). However, there is more pressure for these media products to appeal to a mass audience otherwise these large organisations risk losing huge amounts of money. *Notable examples: News Corporation, Channel 4, Sony*

VS

Many media products are produced by independent companies. While these products may lack a huge amount of financial backing, there are advantages for companies operating outside of the mainstream. These products are less restricted by the aims and political biases of media conglomerates. They can also be designed to target a more niche audience, without the producer's vision becoming compromised. *Notable examples: Pride Media Group, Atlantic Productions*

Magazine Covers

Genre Conventions of Lifestyle Magazines

- **High-key lighting** – *Lighting designed to create visual clarity and prevent shadows*
- **Mode of address** – *Direct: cover star makes eye contact with the reader*
- **Cover star** – *Will usually be a celebrity or an elite person*
- **Shot types** – *Cover stars are usually framed in full or medium shots*
- **List-based articles** – *A clear, readable way of conveying life advice*
- **Imperatives** – *Media language which instructs the audience: 'Do it!'*
- **Audience appeal** – *Highly gendered and generally appealing to 'aspirers'*
- **Ideology** – *Focus on buying products promotes* **consumerism**
- **Coverline features** – *Many include pull quotes from celebrity interviews*

Circulation	The number of people who exchange money for the consumption of a magazine
Readership	The number of people who consume a magazine regardless of whether they have bought it. *e.g. in a waiting room*
Selection	The combination and exclusion of elements in a magazine. Generally, current affairs will be selected over past affairs.
Construction	The way a magazine is pieced together before it is provided to consumers. This mainly refers to the layout and design stages.
Mediation	The final process the magazine goes through before it is released to consumers, usually overseen by editors and media owners

Dateline and **issue number** refer to information relating to the date of publication and the number of previous publications.

Cover price: information that reveals the price of the publication. In tabloid magazines, this will appear in a larger font.

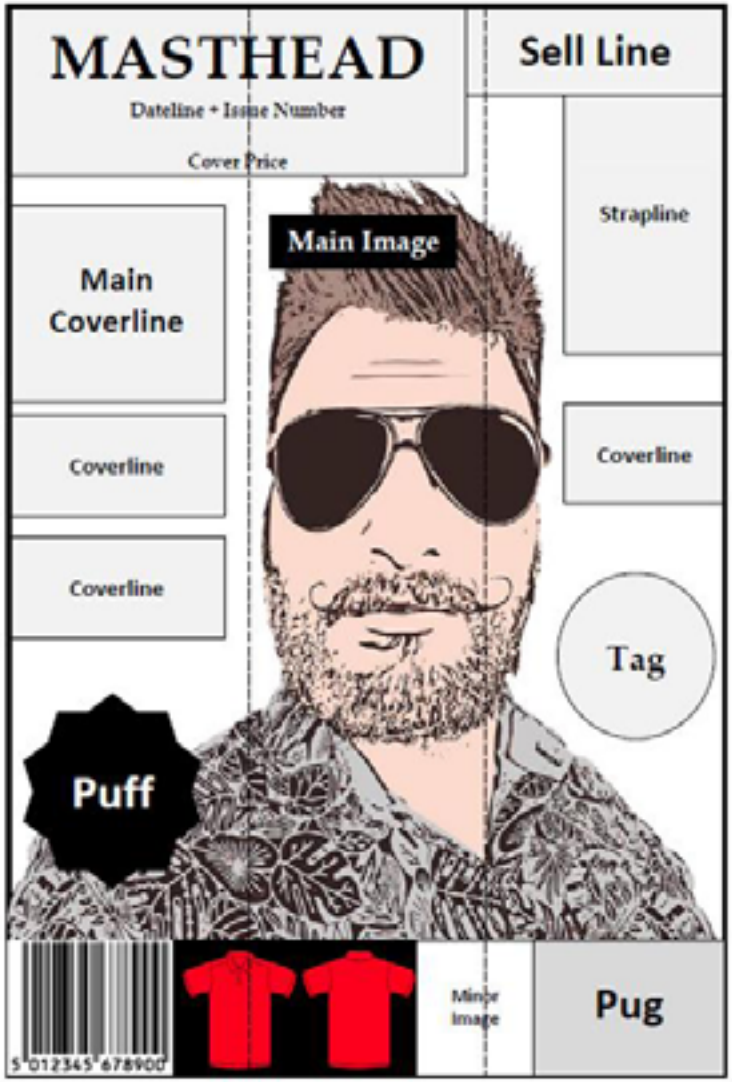
The **main coverline** is considered the main title of the cover page. This often corresponds to the main image or to the model of that issue.

Cover lines are titles/excerpts from articles found in the issue which appear on the front cover. Editors believe these will sell the issue if they feature heavily.

A **puff** is an added incentive featured on the magazine cover (e.g. a voucher or instructions for a new diet). This usually contrasts stylistically with the rest of the cover.

The **masthead** is the title of the magazine, designed and displayed on the front page.

The **sell-line** is generally found close to the masthead. It acts as a hook to gain audience interest and make the publication stand out.



A **barcode** will often feature in the bottom corner of the cover.

Most covers can be split into **thirds**.

Minor images are positioned in the outer sections of the cover and do not intrude on the main image.

A **strapline** is fairly similar to a sell line; however, it directly relates to articles found in the issue. Often located down the right-hand side of the cover.

A magazine cover will typically feature one **Main image** (sometimes called the **cover image**) – often of a model or a celebrity – that ties into themes of the issue.

Tags are phrases used to catch the reader's attention. Often sensational, with exclamatives such as 'Exclusive interview!' or 'Plus!'. Can also be called **buzzwords**.

Pugs are pieces of information located on the outer corners of the cover, used to catch the reader's eye and draw their attention to the magazine. Can be in the form of straplines, promo info and imagery.

Media - Magazines GQ

Language

Colour scheme
Colours carry dozens of meanings and connotations. Media producers are highly aware of the qualities that audiences associate with certain colours. Producers will use this knowledge to create a colour palette that helps to establish a particular tone or genre. In the case of *GQ*, the following colours combine to emphasise ideas of physical strength, determination and becoming the ultimate 'masculine man'.

Colour	Connotations
Red	anger, passion, danger, power, sexuality, courage
Black	strength, power, danger, mystery
White	goodness, perfection, a successful beginning


Imagery

Gaze
The Rock faces directly into the camera, making eye contact with the reader. Cover stars will almost always look outwards towards the reader in order to form a personal connection between the reader and the magazine.

Facial expression
Stern, brooding expression – invokes emotions often associated with traditional masculinity. Also a sense of Johnson challenging the reader to aspire to his success.

Shot type
Johnson's biceps is presented in an extreme close-up, placing emphasis on the actor's strong physical appearance rather than his clothes (which a fashion magazine may emphasise using a full shot).

Body language
The Rock's chin is resting on his flexed biceps, emphasising his muscular physique. This invokes themes of modern masculinity and being 'the perfect man'.

Magazines: Set Product
GQ (Gentlemen's Quarterly)

GQ © Condé Nast Publications Limited, 2016

Publisher	Condé Nast Inc.
Circulation (2018)	114,000
Readership (2018)	400,000
Founded in	1931
Catchphrase	'The magazine for men with an IQ'
Cover star	Dwayne 'The Rock' Johnson
Tone	Viola Beach were a British indie rock band whose members died in a car crash in Sweden (evidence of more serious journalism from the magazine).

3 THINGS TO KNOW ABOUT DWAYNE 'THE ROCK' JOHNSON

1. The Rock was the highest paid actor of 2016 with an annual income of $64 million (US dollars), a huge increase from 2015.
2. In the summer of 2016, The Rock was promoting *Central Intelligence*, one of 2016's most financially successful comedy films.
3. The Rock started his career as a professional wrestler. His muscular physique established him as a Hollywood action star.

The focus of *GQ* magazine...

Representation

The film industry has a particularly long history of under-representing non-white faces both on and off camera.

In 2015, April Reign (the editor of *Broadway Black*) initiated #OscarsSoWhite in response to the all-white list of acting nominees at the 2015 Academy Awards. This act of under-representation was repeated the following year.

Ethnicity in Magazines

The Rock is of mixed racial background (black Nova Scotian and Samoan).

The Rock's status as the highest paid actor in Hollywood has made him an inspiring role model for BAME audiences.

Gender: Stereotypes vs Countertypes

'Man Up!' (Coverline) → Stereotype
A common phrase associated with male bullying, toxic masculinity and representations of 'how a man should act' in the media.

'GQ's rebooted fashion guide' (Puff) → Countertype
Fashion has traditionally been represented as a 'feminine' interest in mainstream media.

'Mind, Body & Masculinity' (Strapline) → Combination
The importance of a strong body has been historically encouraged in men. The importance of a healthy mind is a more contemporary and sensitive approach to masculinity.

BAME – black, Asian and minority ethnic
Metrosexual – Heterosexual men living in urban environments who hold more 'feminine' interests, such as fashion and shopping
Spornosexual – men who care about their physical appearance but focus mainly on having a toned, muscular body
Hypermasculine – describes stereotypical 'male' qualities, such as strength and aggression

Media - Magazines Pride

CONTEXT

Distributor COMAG A subsidiary of Condé Nast Inc.	Catchphrase 'Celebrating the Woman of Colour'
Circulation 50,000 per month (as of 2018)	Readership 146,000 per month (as of 2018)
Founded in 1990	Cover star Naomie Harris

Cultural references
'Bond' (the popular British spy film franchise)
'FGM' (female genital mutilation)
'Harley Street' (a street in London known for private medical practices)

The Focus of *Pride* magazine...


Life stories


News


Hair and beauty


Entertainment


Fashion


Health

3 THINGS TO KNOW ABOUT NAOMIE HARRIS

1. Naomie Harris was still a rising star in the film industry in 2015. Her most recognisable role to date had been as Calypso in the *Pirates of the Caribbean* film franchise.
2. By November 2015, Harris had gained some global prominence due to having starred alongside Daniel Craig in the 24th Bond film: *Spectre* (2015).
3. Harris is the first black actress to play the iconic role of Eve Moneypenny in the James Bond franchise. (Her mother and father emigrated from Jamaica and Trinidad respectively.)

Magazines: Set Product
***Pride* magazine**

MEDIA LANGUAGE

Colour scheme: in this context, bright red is likely to connote power, passion and courage. White is likely to connote perfection and success.

Strapline: *Celebrating 24 years at the top!* – highlights an achievement. Lends a sense of accomplishment to loyal readers, providing a sense of community.

Masthead: hidden slightly by the cover star – this shows the editor's confidence that the magazine is established enough to still be recognised by the core target audience, even if the magazine's main identifier is not fully visible.

Coverlines
- Rhetorical questions
- Audience-specific subjects
- List-based articles
- Exclamatory sentences
- Direct mode of address

Intertextuality: *Bond And Beyond* – this cover was published in November 2015 while the James Bond film *Spectre* was enjoying its run in cinemas. The selection of Harris is significant considering that she was neither the lead actress (*Lea Seydoux*) nor the most high-profile actress (*Monica Bellucci*).

Thirds: the left third focuses on the strapline and coverlines. The right third focuses on the image of Harris. The right third focuses predominantly on the main coverline.

Imagery: like the majority of cover stars, Harris stares directly into the frame, looking outwards towards the audience. Harris is not sexualised in the image, nor is her skin Photoshopped to appear whiter (A common magazine convention).

Main coverline: simply states the name of the actress. The phrase 'Bond And Beyond' tells the audience that they can learn about Harris's involvement in the franchise as well as her wider career or personal life.

#BlackLivesMatter is a social movement which began in 2013 following a number of unprovoked shootings by American police officers on African-Americans.

Pride © Pride Media, 2015

REPRESENTATION

The word 'pride' has been historically associated with the civil rights movements of the 1960s and 1970s. As a result, *Black Pride* and *Gay Pride* have become common expressions. *Pride* magazine's title emphasises the idea that BAME British women should feel empowered and proud of their ethnicity. It has maintained its status as a market leader for BAME audiences.

The topics discussed on the cover are very representative of women in the twenty-first century: free and autonomous from men to some extent but still systematically oppressed by the opposite sex.

'Failed by Feminism' – feminism is a major hot topic in many social circles. Any article pointing out criticisms of this movement is likely to attract the attention of women with activist tendencies or just a passing interest in the matter.

Female Issues

'FGM on Harley Street!' – refers to the exposure of a horrific practice carried out on women of all ages happening in Central London.

'Objectified. Sexualised. Mocked.' –gives the target audience of black women a communal sense of concern about the ways in which their bodies are perceived in contemporary society.

Stereotypical representation	Pride representation
Women have historically been represented as the fairer sex and the homemaker.	The combination of Harris's confident body language and the controversial issues in the coverlines imply that women can be strong, independent and unafraid of a challenge
In lifestyle magazines, women are often sexually objectified for a heterosexual male gaze.	Harris wears a long dress and is standing upright, as opposed to lying down or sitting. The coverlines address issues of objectification and unrealistically high beauty standards.
Black women are often stereotyped as having thick, curly and unmanageable hair.	The juxtaposition of Harris with long, sleek, straight hair and 'The wig revolution is here!' suggests that Harris has hair women should aspire to have.
Lifestyle magazines often suggest women are primarily interested in fashion, beauty and physical appearance.	The coverlines featured on *Pride* cover a range of intellectual issues from social activism to feminism and political change to the exposure of FGM.

FILM MARKETING

MEDIA LANGUAGE AND REPRESENTATION

Different Types of Film Marketing

- Trailer
- TV spot
- Press pack
- Social media
- Website
- TV interview
- Merchandise
- Articles
- Poster

The Matrix © Warner Bros. / Village Roadshow Pictures / Silver Pictures, 1999

Star names: The names of the principal actors are included in order to bring in audiences. Marketing producers used the established fan bases of Keanu Reeves and Laurence Fishburne (who had previously appeared in *Speed* (1994) and *Boyz n the Hood* (1991) respectively) to sell the film.

Main image: A central image connoting the genre, characters or narrative of the film. The costumes and sunglasses of the characters connote the cyberpunk subgenre of the film. The guns connote the presence of conflict and binary opposites.

Title: Piques the audience's interest and reveals information about the film's tone, content or genre. 'Matrix' connotes deep intellectual themes surrounding society and culture. Its vagueness creates enigma and audience intrigue.

Billing block: Reveals the film's key creative contributors. Certain writers, supporting actors, composers and producers are famous enough to increase audience hype; for example, following the success of *The Matrix*, mentioning the Wachowskis as directors would be an effective method of selling a new film.

Tag line: A catchy slogan used to increase audience intrigue. This is a rare example of a tag line being blended with the release date. The words 'fight' and 'future' immediately connote the genres of action and science fiction. The line also invokes binary opposites through the promise of a fight between two sides.

Technical information: Situated below the billing block are the age rating (R is an American rating), the logos for the two major production companies (Warner Bros. and Village Roadshow Pictures) and a link to the film's official promotional website, encouraging active audience participation.

High-concept: Refers to a film in which the premise is striking and easy to summarise, e.g. a boy is transformed into a superhero when he is bitten by a radioactive spider.

Distributor: The company responsible for marketing a film and getting it seen in cinemas, on streaming services, on DVD, etc.

Terms that really need to be known!

Tent pole: A film with a significantly high budget, often designed to financially provide for a major film studio.

Franchise: A series of films that collectively cover a single narrative or character, e.g. *Star Wars*.

Tzvetan Todorov was a Bulgarian-French philosopher who proposed that there is a repeated structure for all linear narratives. He discovered this while researching classic folk stories and fairy tales. This structure can be particularly applied to mainstream cinema.

Equilibrium – A state of balance in the story. There is no conflict.
Disruption – The point at which equilibrium balance is disturbed by an action or event.
Recognition – The point at which the protagonist acknowledges that equilibrium has been disrupted.
Resolution – The character(s) attempt(s) to solve the problem.
New equilibrium – Balance is restored.

This poster is riddled with enigma codes. The costumes and sunglasses suggest that the characters are unified in some way, but we are not sure how. Furthermore, the vertical green computer coding layered over the background connotes something that needs solving in the narrative.

The thin, distorted typography of the title suggests that something in the story is broken or manipulated by a higher power. The sans serif font of the stars' names and the tag line resembles the typography seen online. This connotes modern technological themes and elements of the science-fiction genre.

Examples of Propp's character types in the *Bond* franchise

Hero – James Bond is always sent on a dangerous mission motivated by the desire to save the world and serve 'queen and country'.

Villain – Every *Bond* film has a main antagonist motivated by either a personal vendetta against Bond or a desire to destroy the world.

Princess/Reward – Every *Bond* film has a romantic interest. Their main function in the narrative is usually to be saved by Bond and to fall in love with him.

Helper – In most films, the 'Bond Girl' will take the role of the helper as well as the princess. They often share a similar motivation to Bond.

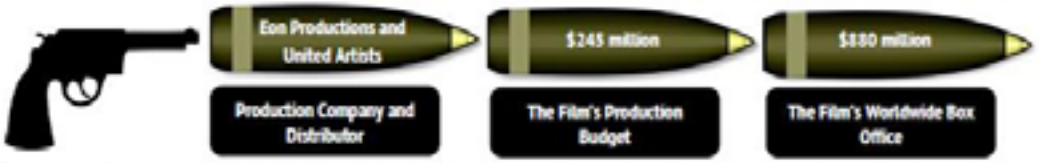
Dispatcher / Princess's father – 'M' is James Bond's boss. He/she appears in most films to give Bond his mission and congratulate him when he succeeds.

Dispatcher – 'Q' is James Bond's quartermaster. He is usually there to provide Bond with the gadgets he will need to complete his mission.

False hero – The majority of *Bond* films will feature an additional female character. Bond is attracted to her at first, but it is later revealed that she is working with the villain.

Media Marketing - Spectre

Set Product 1: *Spectre* (2015)



FILM MARKETING

Action code	Bond's pistol (fitted with a silencer) suggests that violent conflict will take place in the narrative.
Enigma code	The sinister figure in the background is wearing a skeletal mask to conceal his identity. The audience must watch the film to discover the identity of this figure and the true meaning behind the word 'Spectre'.
Semic code	Bond's white tuxedo implies that the character will have to infiltrate 'high-class' events. From previous films in the franchise, we can assume these might be casino nights or functions in private bars.
Symbolic code	The contrast between the sinister shades of dark blue and grey with Bond's white tuxedo and the elegant gold typography culminates in binary opposites: light and darkness; good and evil; the familiar and the unknown.
Cultural code	The figure in the background is dressed for the 'Day of the Dead' festival. This implies that Bond may travel to Mexico at some point in the story.

THREE EXAMPLES OF INTERTEXTUALITY IN THE *SPECTRE* POSTER

Daniel Craig's white dinner jacket and blood-red corsage directly mirror the tuxedo worn by Sean Connery in the classic James Bond film *Goldfinger* (1964).

The pistol fitted with a silencer is a piece of iconography historically associated with the James Bond character. There is not one major James Bond poster in which the titular character is not holding a gun.

Daniel Craig's cool and calm posture pays homage to previous images of the character in film marketing material (particularly Sean Connery, the first actor to play the role of James Bond).

Representation of Masculinity

Bond holds his iconic pistol close to his chest. This is iconography of the classic Hollywood action hero, who solves narrative conflict through violence. This stereotype almost always manifests itself in male characters, perpetuating the idea that men are physically stronger and more violent than women.

Bond's white tuxedo is a brand from celebrated designer Tom Ford. The image forms a glamorous and elegant representation of masculine values as the character is painted as a gentleman.

Bond is positioned centrally within the frame. His arms are folded and his legs are spread apart culminating, in a strong, secure posture. His masculine qualities are presented as strengths which contribute to his status as the film's hero.

Like all previous lead actors in the franchise, Craig is a white, middle-aged actor who speaks in an RP accent, connoting middle-upper-class roots. He possesses many of the same identifying qualities as classic action heroes from the early days of Hollywood cinema.

Bond stares into the camera with cold, glaring eyes. He fits into the stereotype of the stoic action hero who never shows emotional vulnerability and who will always 'get the job done'. This is a fairly old-fashioned representation of masculine values.

How do we know this is a darker take on the James Bond character?

The title in itself is an enigma code invoking images of a ghost or a mysterious and dangerous presence. It might also suggest that Bond is haunted by something in his past, suggesting a deeper look into the character's psychology.

The juxtaposition of cloudy blue and grey contributes to a bleak colour scheme connoting a sinister sense of the unknown.

The background image of a looming skeletal figure connotes themes of death and haunting. The fact that the image is faded and obscured in darkness could imply the skeleton represents Bond's inner demons, connoting themes of fear, guilt and mental health. This shows some evidence of movement towards a more complex representation of masculinity.

Bond's facial expression is cold and devoid of emotion. He is presented more as a ruthless killing machine than he is in posters for other *Bond* films, such as *The Man with the Golden Gun* (1974).

Technical information: A tent-pole film such as *Spectre* will often be marketed not just as a film but as a 'cinema experience'. This poster emphasises that the film will be screened in IMAX, a cinematography technique which significantly increases the size and richness of a film's image.

Day of the Dead: The pre-title sequence of *Spectre* takes place during the 'Day of the Dead' festival in Mexico City. The film inspired the Mexican government to organise a parade similar to the one seen in the film the following year. This was seen as a brilliant way of promoting the vibrancy of Hispanic culture, and the parade was attended by over 250,000 people. This is a core example of a mainstream film inspiring events in real life.

Media Marketing - The Man with the Golden Gun

Set Product: *The Man with the Golden Gun* Poster (1974)

Eon Productions and United Artists	$7 million	$97 million
Production Company and Distributor	The Film's Production Budget	The Film's Worldwide Box Office Takings

FILM MARKETING

Representation of Men	Representation of Women
Only the men hold guns in the poster	The character dressed in the karate outfit is the only example of a woman who is not represented as a sexual or domestic object
James Bond has his arms crossed, exuding strength, confidence and calm in the midst of chaos	The women are illustrated in a way which emphasises the shape of their bottoms and breasts for heterosexual male pleasure
James Bond and the henchman NickNack are dressed in full-piece suits	Both women are heavily sexualised by the fact they are wearing revealing bikinis
Roger Moore receives top billing followed by Christopher Lee reflects the way men were traditionally cast as the active leads in action films	Britt Ekland is the only woman to receive billing on the poster – suggests that women take a 'back seat' role in the story
Bond looks into the camera frame, establishing familiarity with the audience	Both women look into the camera, establishing familiarity with the audience

THREE THINGS TO KNOW ABOUT THE MAN WITH THE GOLDEN GUN

Laura Mulvey's theory of the male gaze can definitely be applied to the *Bond* franchise as a whole. Up until 1990, all major *Bond* posters depicted women in various states of undress, presumably for the pleasure of a heterosexual male audience.

The film was released shortly after the 1973 energy crisis. The poster's representation of power plants and explosions relates to certain Arab countries ceasing to supply oil to the West due to its involvement in the Egypt–Israel conflict.

The Man with the Golden Gun was the second film starring Roger Moore as Bond. He had appeared in *Live and Let Die* the previous year. Moore had also attracted a large fan base due to his playing the lead role in the TV series *The Saint* (1962–1969).

EXAMPLES OF ROLAND BARTHES' CODES

Action code: The golden gun being loaded with a bullet with '007' inscribed on it implies that the unknown assailant intends to shoot James Bond

Enigma code: The face and body of the man loading the golden gun are not visible. The audience must question who the man with the golden gun is – a question they can only answer by watching the film.

Semic code: The fact that both white women wear revealing bikinis suggests that these characters will form sexual or romantic relationships with Bond.

Cultural code: The man in the boat on the top right-hand side is wearing a conical hat, possibly hinting at an Asian setting.

Symbolic code: Multiple binary opposites are present in the poster: two women, one protecting Bond and one pointing him out to the shooter (good vs evil); Bond (the hero) facing off against the man with the golden gun (the villain); the blown-up beach hut on the left contrasting with the untouched hut on the right (chaos vs order).

The Man with the Golden Gun. © Danjaq/EON/UA/Eadaí, 1974

PROPP'S CHARACTER TYPES

Hero: James Bond – The main character who goes on a quest, often for the greater good. *Bond is positioned centrally within the poster, making direct eye contact with the audience. In the tradition of most action film heroes he is a white, handsome man holding an iconic weapon.*

Villain: the man with the golden gun – an evil character who wants to antagonise the hero. *The mysterious man in the foreground of the frame is pointing a gun directly at Bond. The fact he is not shown leads to enigma.*

Princess: blonde woman – the reward given to the hero for overcoming the villain. *Britt Ekland plays the bikini-clad woman who falls for Bond and must be saved by him. However, the fact that she is trying to shield Bond from a bullet suggests that she may also act as a helper in the film.*

The film's poster was illustrated by American artist Robert McGinnis, who worked on multiple *Bond* posters throughout the 1960s and 1970s.

ADVERTISE MENT

Context- Gender Roles in Society

In terms of women's roles, the 1950s are known as an era of domesticity and conformity. Having been forced into traditionally male jobs during the Second World War, women were largely encouraged to be domestic housewives and allow men to retain their positions as 'breadwinners'. Despite the social change that occurred as a result of the civil rights movement and the second wave of feminism in the 1960s and 1970s, advertisements (until quite recently) have primarily depicted white, middle-class models that conform to patriarchal ideas. Print advertising became a booming industry during the 1950s. The Conservative government at the time repeated the slogan 'Set the people free', promising to allow the general public more access to arts, entertainment and luxury. A similar technological boom has occurred in the last 15 years or so, with the invention of YouTube, Facebook, smartphones, etc.

Commercial advertising describes the promotion of goods or services for a consumer audience, *e.g. McDonald's, Gillette.* **Non-commercial advertising** seeks to provide the audience with public information relating to a certain issue. In most cases, this form of advertising will encourage the audience to take some form of action, *e.g. Think! ExCam*

Personification: When human characteristics or personality are applied to a non-human object. This can make advertising more vivid and allow audiences to view a product in a certain way.

'I really am that tasty'

'These are berry, berry tasty'

Wordplay: Experimenting with the multiple meanings or spellings behind words create humorous effect (often in the form of puns).

'Stupendous strawberries'

Alliteration: When the same consonant sound is repeated at least twice in a phrase or sentence in order to emphasise style or a particular emotion (often humour).

Rhetorical question: A question that dramatically implies an answer without stating it, allowing the audience to answer for themselves.

'What are you waiting for?'

Hyperbole: When language is used to exaggerate statements and make something sound larger or more extreme than it really is.

'The finest strawberries in the South'

'Ripe strawberries ripe'

Intertextuality: When a media text references another text in order to shape meaning and effect audience interpretation, e.g. 'Ripe strawberries ripe' references the musical: *Oliver!*

'Get them while they're half price!'

Imperatives: Media language which directly instructs or commands the audience to take action (in this case, the action is to buy a particular product).

Each of these quotes could qualify as the SLOGAN for a strawberry advertisement. Slogans are designed to summarise the benefits or importance of a product, service or message in a short, memorable manner.

'Ripe. Juicy. Jam-packed with flavour.'

Rule of three: The act of making speech or text more memorable, emotive and satisfying by breaking down ideas into three points.

Key Definitions!

Shock Tactics – when elements of media language are used to invoke a highly emotional response from an audience. *e.g. adverts tackling domestic abuse may use violent images to shock the audience into recognising the seriousness of the issue*

Advertising campaign – the strategy an advertising company will use to promote a particular product, service or message, possibly across multiple media platforms. *e.g. This Girl Can used a range of print and video advertisements to encourage women to participate in sport*

Public service announcement – the promotion of a message through the media on the basis of public interest or to raise social awareness. *e.g. anti-smoking adverts*

Targeting – the ways in which media producers select and mediate their content in order to appeal to a particular audience demographic. *e.g. adverts for toy lightsabers have traditionally targeted an audience of young boys*

Aspiration – describes the desire people have for greater levels of wealth or success. *e.g. advertisements for beauty products will often feature actors or models who present a high standard of beauty for audiences to strive to*

Advertising copy – the main body of text in a print advert explaining the functions and benefits of a product, service or cause. *e.g. an explanation of each flavour in a tin of chocolates*

HARD SELL – an advertisement which places sole emphasis on the promotion of a product, service or message

SOFT SELL – an advertisement which places less direct emphasis on the central product, service or message, rather it constructs a scenario which indirectly shows the benefits of this

Set Product 1 – Quality Street Advert

Framing – The male character is positioned centrally within the frame facing out towards the audience. This encourages the audience to identify primarily with his situation.

Advertising copy – The advert is mainly image-based. The most detailed copy comes in the form of the descriptions of the three individual chocolates in the bottom third of the page.

Typography – Tall, elegant characters emphasise the luxurious nature of the brand. The brand name is written in large text in order to catch the audience's attention.

Targeting – The age of the characters and the comedic approach to representing gender suggests that the target audience are young professionals aged between 21 and 40.

Alliteration – The use of repeated 'd' sounds ('delicious dilemma') rolls off the tongue, creating a sense of strength behind the brand.

Narrative – The male character is positioned as the hero (according to Vladimir Propp's character type theory). His dilemma in the story revolves around which of the two women (the princesses) he will choose.

Repetition – The word 'delicious' is repeated three times across the advertisement, emphasising the quality of the brand and implying that, above all else, the product tastes good.

Enigma codes – The advert sets up a puzzle by providing detail on only three of the individual chocolates. The audience must buy the entire tin in order to solve this puzzle.

Quality Street © Alamy Stock Photo, 1936

Mode of address – The advert establishes a mode of address which is playful and casual in its use of alliteration and hyperbole. However, the audience is not directly addressed through the image or the text.

Anchorage – The positioning of the male character's head in front of the golden frame forms the image of a halo, providing him with godlike status.

Cultural codes – The painting in the background shows a couple dressed in clothes reminiscent of the Regency era. Certain audiences will associate these characters with a sense of luxury and cultural development. Furthermore, certain audiences will recognise the couple as Miss Sweety and Major Quality from the 1930s adverts for Quality Street, solidifying the brand's identity.

The advert enforces the stereotype that there is a universal love of chocolate among women. Many chocolate advertisements identify young women as their key target audience due to scientific evidence that chocolate increases levels of serotonin in women's brains.

There is clear reinforcement of patriarchy: the two women are given a choice in the advert, but the man is allowing the women to select a chocolate. This is emphasised by centrally framing the male character and giving him possession of the product.

KEY REPRESENTATIONS

The male character's eyeline is directed at the product which is placed suggestively on his lap. This gives the product something of a phallic significance (it is an effective way of attracting the opposite sex).

By placing the audience's identification with the male character, the advert acts as a clear illustration of Laura Mulvey's theory of the male gaze (in which media is framed from the perspective of a heterosexual, patriarchal male audience).

How do we know this is an advert from the 1950s?

1. The male model wears a traditional pinstriped suit with a handkerchief.
2. The women wear colourful, long frilly skirts, typical of the period.
3. The pastel coloured illustration style is highly typical of the period. Photographic imagery is most commonly used for contemporary adverts.
4. The image shows a domestic environment in which characters are well dressed and conform to traditional gender roles.
5. Quality Street was still a fairly recent brand. It was still necessary to illustrate and describe the specific types of chocolate in the tin. Nowadays, a Quality Street advert is likely to be more enigmatic and focus on the already established brand identity.

ADVERTISE MENT

Little Boxes of Context on Quality Street

Quality Street chocolates were originally manufactured by Harold Mackintosh in 1936.

They were originally named after a theatrical play by JM Barrie.

Quality Street is currently produced by Nestlé.

Initially only families from middle- to upper-class backgrounds could afford to buy tins of chocolates.

Throughout the 1950s, Mackintosh endeavoured to make the product affordable for working-class families following the post-war rationing period.

The characters in the framed painting are typical of the Regency era (1811–1837), a time of great development in culture and architecture for the United Kingdom.

Colour Scheme

Colour is one of the most important indicators of meaning in print-based media. The colours in the Quality Street advert carry dozens of meanings and connotations.

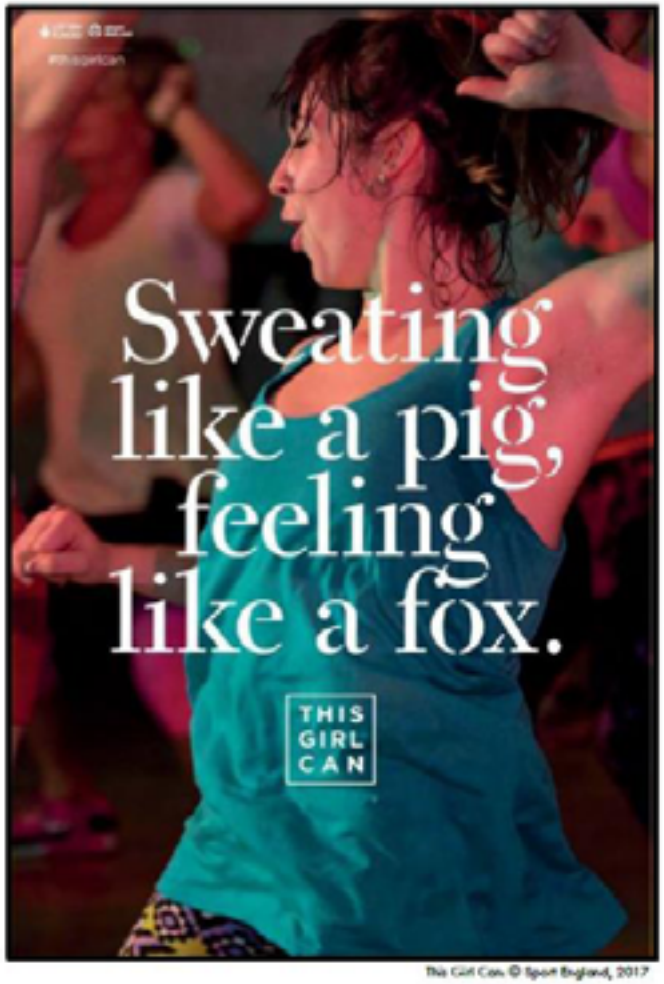
Red: love, passion, danger, power, sexuality, courage, fire, blood, anger

Purple: reflection, wisdom, royalty, luxury

Gold: extravagance, quality, value, wealth, status

Set Product 2 – This Girl Can Advert

ADVERTISE MENT



This Girl Can © Sport England, 2017

Framing – The young woman is framed centrally within the print advertisement. She is shown in a medium shot, allowing the reader to see not just her facial features but her strong, slim body as she exercises.

Model selection – The woman is neither a celebrity nor a spokesperson. She is more relatable to the general public. Audiences can realistically aspire to her level of fitness.

Colour scheme – The image is tinted with a red glow, creating a clashing colour scheme that connotes passion, strength and growth (principles that are likely to inspire women to participate in sport).

Audience participation – The hashtag in the top left corner draws attention to aspects of the campaign beyond those which are visible from the print advert. Women are provided with a sense of social cohesion as they can share their stories of getting fit and overcoming barriers through various social media sites, particularly Twitter.

Main image – The central character is visibly sweating. Her armpits are bare and her hair is stuck to her face. Instead of looking embarrassed, she is lost in the moment and has an expression of determination and pure satisfaction.

Advertising copy – The advert is mainly image-based with minimal text. The advert's catchphrase subverts the negative connotations of 'sweating like a pig' and reframes it as something to be proud of. The phrase 'feeling like a fox' contains alliteration, which implies a sense of strength and energy. Furthermore, negative connotations surrounding the word 'girl' are subverted; in this context, it is used to imply universality among women.

Traditional Connotations

The word 'girl' is often associated with negative connotations, *e.g. throwing like a girl, crying like a girl.* Furthermore, feminists argue that when it comes to the male sex, men are never referred to as 'boys', so it is rather demeaning that women are often referred to as 'girls' even as they enter adulthood.

'Sweating like a pig' is usually an unflattering phrase used to describe someone who is physically large and who tires easily while excercising.

'Feeling like a fox' – in many contexts, describing a woman as 'a fox' implies that she is sexually attractive, cunning and beautiful.

Subverted Connotations

The word 'girl' is used to describe women universally and express the idea that approaching a task like a girl is a positive and inspiring thing.

The juxtaposition of the active female model and the phrase 'sweating like a pig' produces positive connotations. Rather than being a sign of weakness, sweat is implied to be a satisfying result of the woman's hard work.

In this context, there is no sense of the model being sexualised as she exercises. The word 'fox' might instead refer to her qualities as a fierce and motivated woman.

The 'This Girl Can' campaign was promoted across multiple platforms ranging from print advertisements and television advertisements to social media campaigns and an official working website.

THIS GIRL CAN CONTEXT

- 1.6 million women have started exercising regularly as a result of the campaign.
- In a large-scale survey conducted by Sport England, women identified the 'fear of being judged' as the main factor preventing them from getting into sport.
- The central aim of the *This Girl Can* campaign was to help women overcome social barriers and excel within sport.
- The This Girl Can campaign was developed by Sport England and is currently funded by the National Lottery, making it a prime example of non-commercial advertising.
- Sport England initiated the campaign having discovered a significant gender gap in the number of 14–40-year-olds regularly participating in sport.

Model Character Type – The Hero (Propp)

By fiercely exercising, the woman in the advert is embarking on a journey with the central motivation of becoming healthier. On the other hand, the audience is arguably positioned as the hero. In this sense, the model acts as the **donor**, providing the audience with the inspiration they need to exercise. This is a more abstract reading of the advertisement.

Media - Newspapers

News Conglomerates

There are generally considered to be three media conglomerates that own over 70% of news publications in the UK. These are:

- **DMGT** – *Daily Mail, Metro*
- **Reach PLC** – *Daily Mirror, Mail on Sunday*
- **News UK** – *The Sun, The Times*

Note: **Reach PLC** was formerly known as **Trinity Mirror** until 2018

Rupert Murdoch – owner of News UK

KEY TERMS

Red top: an identifying feature of British tabloids where the masthead is positioned in front of a red backdrop

Anchorage: how the meaning of a picture is shaped in a newspaper through the captioned text associated with it

News values: various factors that newspapers take into account before deciding whether to publish a particular story

Gatekeepers: the producers who decide which stories are included in a final news publication. They 'filter' through the content provided by journalists.

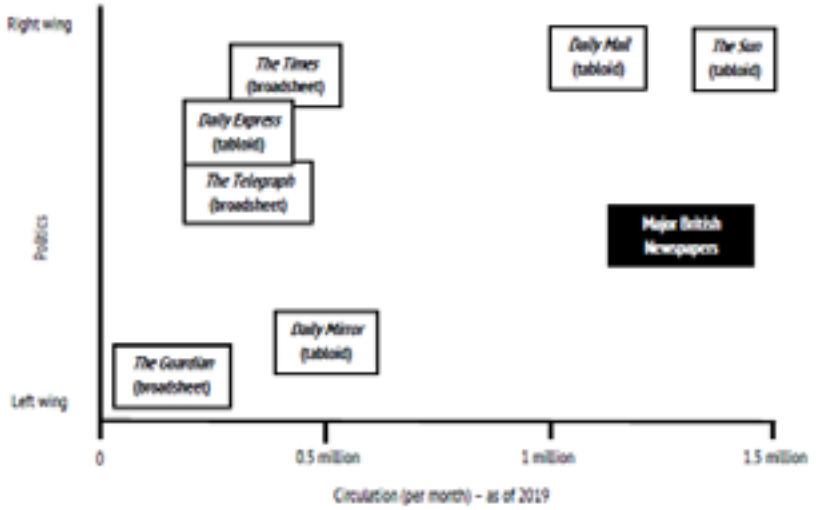
Continuity: the development of certain news stories will be covered across multiple editions of the same publication

Left Wing – Believes in government support and intervention, *e.g. Labour Party*

Right Wing – Believes in the rights of the individual, *e.g. Conservative Party*

Newspapers –

Media Language and Representation



Tabloids often use layman's terms (simplistic language) and sensationalist imagery	VS	Broadsheets will often use formal language, factual evidence and tasteful imagery
Tabloids tend to target an audience between C2 and E of the British social grade classification	VS	Broadsheets tend to target an audience between A and C1 of the British social grade classification
Tabloids include shorter articles with minimal content on the front page	VS	Broadsheets feature much longer articles, including multiple stories on the front page
The layout of tabloids will often consist of bold typeface, vibrant colours and huge headlines	VS	The layout of broadsheets will often consist of smaller typeface, limited colours and reasonably sized headlines
Tabloid stories will evolve around celebrity gossip, national issues, scandals and stories about 'ordinary' people	VS	Broadsheet stories will evolve around politics, cultural issues and economics, as well as national and international stories

Codes and Conventions

Masthead	The title of the newspaper, designed and displayed on the front page (usually in the top left corner)
Headline	The title of a news article, summarising the topic (usually in a large font size and style in order to command the reader's attention)
Byline	The name of the author (*remember: a 'line' of text that tells you who the story is 'by'*)
Standfirst	Presented in a different size or font to the rest of the article, the standfirst is a small paragraph of text summing up the story or enticing the audience to read on
Imagery	Pictures used to provide further context, suggest thought or provoke information
Caption	A description of the image, normally in a way that relates to the story
Pull quote	An important quote from the article that is enlarged and used to break up the story
Subhead	A subtitle for the article, normally expressed in a single line
Crossheads	Extracts from the main text (displayed in a large font) used to break up the article and add more white space. These are utilised in the same fashion as pull quotes but they do not quote a source directly.
Body text	The main text of the article. On many occasions this will not appear on the front page (particularly in tabloids).
Imprint	Information found in the newspaper that contains the publisher's information and contact information
Lead story	The story that is considered 'most important' by newspaper producers

Media - The Sun Newspaper

THE Sun

The main body of text is cut off mid-sentence so the audience is encouraged to read the rest of the article on later pages. This teasing of information could be identified as an enigma code, according to the narrative theory proposed by Roland Barthes.

Masthead: Written in a large, bold font, allowing it to stand out for readers. The text is written in italics (slanting forwards), connoting the paper's informal cutting-edge style and setting the paper apart from the competition posed by other red tops, such as the *Daily Mirror*.

Masthead Caption: 'For a Greater Britain' is a slogan that clearly attempts to appeal to the reader's sense of national pride. The implication is that *The Sun* is fighting to make Britain as glorious a nation as possible.

Puff Box: Draws attention to the publication's reasonable pricing, particularly for audiences in the C2DE class bracket. An opportunity is also taken to criticise rival tabloid *The Daily Mirror*.

Red Top: Includes a date line, cover price and official website address. Positioned in the top third of the page, ensuring that the paper will stand out on shop shelves and appeal to *The Sun*'s loyal target audience.

Main Headline: Highly emotional and sensationalist, appealing to an audience of passive consumers. It makes strong use of **binary opposites** ('Great Britain or Great Betrayal') and first-person pronoun ('We say to them') in order to empower readers and persuade them to adopt a pro-Brexit ideology.

Colour Scheme: The Alpha jets create the colours of the Union Jack, a national symbol of British pride and patriotism. By using a symbol of British nationalism, the paper is provoking its readers' patriotism to elicit a response.

Main Image: Britain is shown to be made up of glorious countryside. The image could act as a reference to the lyrics 'green and pleasant land' from the song 'Jerusalem' (originally written as a poem by William Blake). This is considered by many to be the most patriotic British anthem of all time.

Digitally Imposed Images: Implies that Britain is responsible for extraordinary achievements in terms of architecture (The Shard), industry (the steam from cooling towers), sporting achievements (a football), fascinating history (Windsor Castle), and brands (Minis and red double-decker buses).

Standfirst: Highly emotive terms such as 'Rebels' and 'destroy' emphasise a sense of conflict. The line ('The 17.4 million majority voted for') is the only point on the front page in which *The Sun* backs up its political opinions with facts and logic.

Layout and Design: The high ratio of images to text appeals to an audience that might not have the time or the desire to read large portions of text. Furthermore, the headline takes up the majority of the page space. This appeals to an audience who are more willing to take information at face value.

The Sun © News UK, 2019

THE SUN – FACT SHEET

Format: Tabloid

Date of Publication: 12th June 2018

Average Circulation: 1,302,951 (As of May 2019)

Core Demographic: C2DE. 52% male readership

Politics: Right wing, pro-Brexit

Ownership: News Corporation (owned by Rupert Murdoch)

Sister Papers: *The Sun on Sunday* (previously *News of the World*)

Online Readership: 5,310,000 (daily)

Dominant Image: A digital composition of the British countryside featuring quintessentially British elements including the Shard Tower in London, the Houses of Parliament, a double decker bus, Stonehenge, and the Angel of the North, among other things

The Sun has a long history of constructing highly negative representations of certain individuals and groups. Notable examples of this are listed below...

Positively represented	Negatively represented	Under-represented
• Hard Brexit • Tougher laws for immigration • British sovereignty • *The Sun* • *The Sun*'s readers • Boris Johnson	• European Union • Rebel Tory MPs • Jeremy Corbyn • The Labour Party • Islam	• Migrants • Left-wing voices • Pro-EU voices • Muslim voices

Brexit Timeline

February 2016 – Despite publicly claiming that he wishes for Britain to remain a part of the European Union, Prime Minister David Cameron calls for a referendum to decide whether Britain should leave the EU

23 June 2016 – The British people vote to leave the European Union (51.9% voted to leave, 48.1% voted to remain). David Cameron resigns as prime minister the following day.

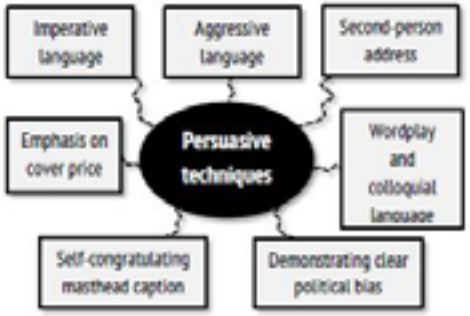
13 July 2016 – After little competition or objection in the leadership race, Theresa May becomes prime minister of the UK.

18 April 2017 – Theresa May calls a snap election in the hope that the Conservatives will win a larger majority in the House of commons, thus strengthening the party's position to negotiate Brexit deals with the EU

8 June 2017 – The Conservatives lose their overall majority and are forced to form a coalition with the Democratic Unionist Party of Northern Ireland. May's party is left weakened and divided by the result.

12 June 2018 – Theresa May's government narrowly wins a Brexit bill vote ensuring that pro-Remain Conservative MPs don't override her Brexit negotiations. (*Date of Set Product Publication*)

24 May 2019 – Having suffered three defeats in the House of Commons, Theresa May announces her resignation as prime minister



the guardian

THE GUARDIAN – FACT SHEET

Format: Broadsheet (compact since 2018)
Date of Publication: 12th September 2018
Average Circulation: 134,567 (as of April 2019)
Core Demographic: ABC1. 52% male readership
Politics: Liberal (left wing). anti-Brexit
Average Age of Readers: 44
Ownership: Owned and published by Ghe Guardian Media Group (This allows the paper to maintain editorial independence)
Sister Papers: *The Observer*; *The Guardian Weekly*
Online Readership: 42.6 million
Dominant Image: Conservative MPs (Boris Johnson. Peter Bone and Jacob Rees-Mogg) are shown looking bored and frustrated during a gathering in the House of Commons
Secondary Images: An image of Hungarian Prime Minister Viktor Orbán: a hand-drawn animated image of a young woman skating with her dog

The Guardian represents itself as a serious paper by covering serious topics: The financial crash; the economic effects of Brexit; A scientific approach to Health and Fitness

CONTEXT: THE MEN ON THE COVER

Boris Johnson: Previously famous for being Mayor of London from 2008 to 2016. Johnson was one of the most notable Leave campaigners in the run-up to the Brexit vote and was consistently critical of Prime Minister Theresa May's failed attempt to negotiate a Brexit deal. In July 2019, Boris Johnson replaced May as Prime Minister of the United Kingdom.
Jacob Rees-Mogg: A Conservative MP who (as of July 2019) is serving as Leader of the House of Commons. Rees-Mogg has remained one of the most notable Leave campaigners and has continually supported Boris Johnson throughout his political career.
Viktor Orbán: The Conservative Prime Minister of Hungary who has received international criticism for his socially conservative attitudes and his moderate support of nationalism. Many critics have described Orbán as an authoritarian leader.

Boris Johnson was accused of peddling lies ahead of the Brexit referendum; most notably, that Britain would be able to put an extra £350 million towards the NHS if it left the EU.

Representations of Right-wing Figures in a Left-wing Paper

***The Guardian* is able to maintain a certain level of journalistic integrity because it is not largely owned by shareholders. While it makes no claims of political bias, its content generally suggests a left-wing ideology.**

Representation	Context	Implication
Main Image shows bored and exhausted looking Conservative MPs, ironically juxtaposed with the sign in the background: 'From Project Fear to Project Prosperity'	Johnson and Rees-Mogg are often controversial politicians due to their stances on Brexit among other political issues, e.g. immigration, abortion	The three Tory MPs are either not taking Brexit seriously enough or are unsure of how Britain will be able to leave the European Union
Image is anchored by a caption revealing that these men are Brexit supporters gathering at the House of Commons	*The Guardian* has consistently supported the Remain campaign and is often quick to produce articles calling out racism, sexism and right-wing nationalism	The men leading the Leave campaign are struggling to come up with an effective way of exiting the European Union
Headline: Theresa May has come under criticism from one of Britain's most successful business owners for using 'tactics' and risking 'thousands of jobs'	*The Guardian* has consistently criticised the Conservative Party and its leaders, particularly since the party's policy of austerity began in 2010	Although the criticism is subtly implied, May is represented as a weak and careless leader. This is framed through the viewpoint of an influential business owner.
Juxtaposition of 'Orbán v the EU' and an image of Orbán looking aggressively into the camera frame	*The Guardian* is both pro-Europe and left wing (politically the opposite to Orbán)	Orbán is an aggressive and authoritarian leader who is causing problems for the European Union

Puff Box Image: Unusual to see an animated image in a broadsheet newspaper; however, it accompanies a light-hearted self-help/lifestyle article. Such an image would not be used to accompany a story focusing on politics or economics

Colour Scheme: The colours are noticeably less bright and vibrant compared to tabloid papers. The majority of the front page is comprised of a formal black-and-white colour palette. The top third of the page is mostly dark blue, connoting a sense of strength and reliability. There is also bright yellow text to highlight a less serious article on staying fit.

Imprint: Very detailed in the context of all British newspapers. It reveals the price of the publication, the date and the issue number.

Masthead: The use of small typeface and curved font gives the paper a unique style that differentiates it from the competition. The style invites connotations of subtlety and approachability.

Secondary Headline: Focuses on issues of healthy eating: something audiences with disposable income are more likely to consider. The headline justifies itself as front page news as it contradicts a wide consensus that dairy food can be unhealthy if not eaten in moderation.

Trail: Directs audiences to the page on which they can continue to read the story in more detail. It is a convention of both tabloids and broadsheets to have these break up sentences mid-flow.

Secondary Image: Right-wing PM pointing aggressively at a document. This implies that he is a confrontational and untrustworthy public figure.

Body Text: The language used is formal and serious in tone and there is a much higher proportion of text to images. This is thought to be appropriate for a well-educated, ABC1 target audience.

Image Caption: Clarifies that the three politicians are in a meeting with Brexit supporters. They look bored and exhausted, implying that even these men who have supported Brexit are doubting whether leaving will lead to a positive outcome.

In October 1929, the United States stock market crashed, leading to the Great Depression, which lasted 12 years and had a serious effect on the economy of most Western countries. 'The Great Crash' was a term coined in 1955 by an author exploring the causes of the crash.

Main Headline: The use of emotive language ('warns' and 'risks') creates a sense of danger. *The Guardian* use the audience's assumed knowledge about the Brexit deadline to create a compelling story. The reference to Jaguar (one of Britain's most recognisable manufacturers) lends a sense of legitimacy to the headline.

Main Image: Juxtaposition of the background poster with the deflated politicians creates a sense of irony as they do not appear to actually believe prosperity is on the horizon. The image is taken from close proximity (a convention of broadsheet papers).

FILM INDUSTRIES

Audiovisual material: Links are provided to the film's three main trailers. There are also links to featurette videos and lyric videos for songs which appear in the film.

Technical information: The film's high budget spectacle and unique animation style make it an event film. Much emphasis is placed on the availability of 3D screenings in cinemas.

Critical reception: Since the film's release, *Spider-Man: Into the Spider-Verse* has received extreme critical acclaim and an Academy Award. This information is regularly added to the

Sponsorship: Unusually, the film directly promotes its sponsorship partners by advertising McDonalds Happy meals and Jordan trainers, among various other associated brands.

Interactive features: An augmented reality feature is available on the website for smartphone and tablet users. This demonstrates that the film's producers are aware of the ways in which films and video games can converge.

Narrative and character: There is a 'Gallery' page and a 'Characters' page included, encouraging audiences to become familiar with the film's characters.

Link to Website: https://sites.sonypictures.com/spiderverse/site/

Did you know?
A decent number of mainstream films earn over 30% of their gross profit in the opening weekend that they are released.

Disney is a media conglomerate that owns both its films and the merchandise associated with those films.

Horizontal Integration

Vertical Integration

Disney has bought film franchises such as *Star Wars* and *MCU*, reducing competition from other studios.

Key Stages of Mainstream Film Production
The budget is decided
Rights are purchased; particularly as so many modern films are based on existing properties or franchises
The script is written
Shooting locations are selected
The cast and crew are hired
The production schedule is created
The film is shot
The film is edited
If necessary, digital effects are added
Any sound effects or soundtracks are added
The film is distributed; usually through cinema screenings or streaming services
Marketing campaigns are launched
Trailers, TV spots, promotional interviews, press packs and posters are released for public consumption

British Film Regulation

1. Discrimination
2. Drugs
3. Imitable behaviour
4. Offensive language
5. Nudity
6. Sex
7. Threat
8. Violence

Age ratings applied to films in the UK are decided by the British Board of Film Classification (BBFC). Films are assigned one of several core age certificates, based on a set of eight content categories.

DISTINGUISHING RATINGS

Remember that films are only rated **12A** when they are distributed to cinemas. This rating means people under the age of 12 can see the film, providing they are accompanied by an adult. Home media releases are rated **12** and can only be purchased by those who are older than 12.

KEY DEFINITIONS

A distribution company is responsible for the marketing and promotion of the film, as well as the channels which the film will go through in order to reach audiences, e.g. cinemas, television rights, streaming services, DVD

Sponsorship describes deals between film companies and alternative companies, which allow them to promote one another, e.g. James Bond will often be shown drinking Heineken beers on screen. This is known as product placement.

Syndication is the process in which the rights to a media company's material are sold to another company for exhibition or integration with their material

Blockbusters are high-budget films designed to appeal to a wide demographic and make studios a lot of money, e.g. Spectre, Skyfall

A production studio is responsible for the development and creation of the film e.g. casting, shooting, editing, soundtrack

Independent forms of media are free from the influence of government or corporate interests. Independent films tend to be made with a great deal of creative freedom, e.g. *Lady Bird*, *I, Daniel Blake*.

Mainstream media products are considered to be most popular at the time of their release. It is often films produced in Hollywood that fit the mainstream criteria, e.g. *Star Wars*, *Avengers*, *James Bond*.

Exhibition is the process in which films are presented on various platforms, such as television, streaming services and, most commonly, cinemas

Film Industries

Production studio: Eon Productions and United Artists	Budget: $245 million (approx.)	Director: Sam Mendes
Distributors: MGM and Columbia	Profit: $880 million (approx.)	Producers: Michael G Wilson and Barbara Broccoli
Exhibition: 4,000 cinemas (approx.)	Release date: 26/10/2015 (UK)	Original author: Ian Fleming

Daniel Craig: Since being cast as James Bond in 2005, Craig has achieved international stardom, appearing in films ranging from *Cowboys & Aliens* (2011) to *The Girl with the Dragon Tattoo* (2011). For many audiences, Craig has become the quintessential Bond actor, appearing in some of the franchise's most critically acclaimed films, as well as in a video segment at the 2012 London Olympics.

Sam Mendes: Following an Academy Award for his feature film debut *American Beauty* (1999), Mendes continued to direct critically acclaimed dramas throughout the 2000s. In 2012, Mendes directed *Skyfall*, arguably the most critically and financially successful *Bond* film of all time. Mendes demonstrated here that mainstream cinema and artistic film-making can sometimes be one and the same.

Christoph Waltz: This German actor shot to fame playing the infamous 'Jew hunter' in the film *Inglorious Basterds* (2009). Waltz has since become one of the most iconic screen actors of recent years, bringing his sinister charm to the role of Bond's most classic nemesis, Blofeld (a character who had already appeared in six films in the franchise prior to *Spectre*).

Naomie Harris: Despite working as a character actress throughout the noughties, Harris rose to fame thanks to her co-starring role in *Skyfall* (2012) and *Spectre* (2015) as the iconic character of Moneypenny. Appearing in such a large franchise has put Harris on the road to global stardom. In 2017, Harris received an Academy Award nomination for her performance in *Moonlight* (2016).

Comparing the production budgets and worldwide gross (not adjusted for inflation) for the oldest *Bond* films against the most recent *Bond* films

Film	Production Budget	Worldwide Gross
Dr. No	$1.1 million	$59.6 million
From Russia with Love	$2 million	$79 million
Goldfinger	$3 million	$124.9 million
Thunderball	$9 million	$141.2 million
Casino Royale	$150 million	$599 million
Quantum of Solace	$200 million	$586.1 million
Skyfall	$200 million	$1.18 billion
Spectre	$245 million	$880.7 million

Analysing the official poster for *Spectre* can offer good insight into the ways in which producers have attempted to market the film. As shown above, the producers of *Spectre* have utilised exciting technologies to create a sense of grandeur around the film's opening. The film was released in IMAX theatres, demonstrating to the audience that the film would be of a high visual quality and require viewing on the big screen.

The Appeal of *Spectre*

- Daniel Craig has established star appeal and become the quintessential Bond for many contemporary audiences.
- The soundtracks to *Skyfall* and *Spectre* (sung by Adele and Sam Smith respectively) have both won Academy Awards and reached number one in the UK charts. *Bond* themes have arguably become as iconic – in some cases, more so – than the films themselves.
- *Spectre* fulfils the minimum requirements of a mainstream film produced for a mass audience. It is a big-budget action film with a familiar genre, a three-act structure and a satisfying resolution.
- The franchise has largely remained popular on account of its use of exotic locations. For example, scenes from *Spectre* were shot across Rome, Soelden, Morocco, Austria and Mexico City (the setting of the opening scene).

SPECTRE Marketing Strategies

A James Bond themed comedy sketch was released on Red Nose Day, featuring the film's principal cast

Companies sponsoring the film, such as Heineken and Omega, integrated aspects of the film into their advertisements in exchange for product placement

The Aston Martin DB10 was revealed as Bond's official car for the film at a press conference

Video logs and production stills were posted on Eon's social media pages

Production Issues

Since *Die Another Day* (2002), every James Bond film has received a 12A rating. However, producers at Sony were forced to cut certain images of violence in order to secure a 12A rating in the UK and allow a family audience to see the film. It is likely that this decision was made without the approval of director Sam Mendes, demonstrating that the generation of profit is more important to the film's producers than artistic integrity.

The complicated process of film production is reflected in the fact that the James Bond franchise was very nearly cancelled. The production of the 2012 Bond film *Skyfall* was suspended when MGM Studios were revealed to be on the verge of bankruptcy. The company eventually managed to secure $500 million revolving credit.

Newspaper: Audience and Industry

Traditional ways in which newspaper readers could become active audiences

Writing letters to editors; holding a protest; calling the paper's offices and lodging a complaint; taking legal action; boycotting the paper

Contemporary ways in which newspaper readers can become active audiences

Sending direct emails; joining online message boards; condemning the paper on social media; promoting protests online (e.g. through Facebook, YouGov)

Greater public exposure to issues relating to the ethics of journalism, particularly through cases such as the Leveson Inquiry

An increasing access to news from different types of media platform (e.g. unedited long-form podcasts). Audiences have to be more selective about the form of news they choose to consume.

How have newspaper audiences become more active over time?

The rise of the Internet and digital media platforms has made audiences increasingly aware of tabloids and their habits of not reporting fully accurate information (e.g. an apology for printing false information is made public)

Multiple news platforms are increasingly contradicting each other, forcing people to interpret information that claims to be factual

Newspapers such as the *Metro* and *The London Evening Standard* that are given out for free are often called **free sheets**. The vast majority of free sheets are tabloids as they aim to appeal to as universal an audience as possible. They tend to generate profit solely through advertising revenue

The vast majority of newspapers in the UK have experienced a steady decline in profits throughout the past several years. This is mostly down to the increasing availability of news online, e.g. through phone apps and social media. For instance, look at the daily readership figures for *The Guardian* for each media platform:

Print: 741,000 adults

PC: 1,492,000 adults

Mobile: 3,347,000 adults

Key Terms

Gatekeepers are the people responsible for dictating, filtering and disseminating the information which is broadcast or uploaded. These are usually the owners of the media company, *e.g. Rupert Murdoch.*

Opinion leaders are people in society who have the power to affect what people think about things. Celebrities are easily identifiable opinion leaders in today's society, but sports personalities, journalists, politicians, religious leaders and activists are also appropriate examples.

Bias is an inclination or prejudice for or against something, *e.g. The Sun is currently biased in favour of the Conservative Party.*

Columns are short, compressed newspaper articles in which a writer or opinion leader will express their opinion on a certain topic or issue, *e.g. Katie Hopkins and Giles Coren are notable examples of this.*

News of the World © News International, 2011

News of the World **used to be *The Sun*'s sister paper and another successful subsidiary of News Corp. In 2011, the paper was forced to close when a number of its journalists were implicated in the phone-hacking scandal and advertisers withdrew their support.**

REGULATION OF UK NEWSPAPERS

Until recently, British newspapers and magazines were regulated by the Press Complaints Commission (PCC), a body of voluntary representatives of each major publisher. However, the PCC was disbanded in 2014 following the infamous phone-hacking scandal in which the private voicemail messages of various celebrities, politicians and murder victims were illegally accessed and listened to. Much of this misconduct was discussed and exposed in the Leveson Inquiry, an investigation into the ethics of the British Press announced by then Prime Minister David Cameron. It was agreed in the inquiry that British news publications should be self-regulated but ultimately monitored by an unbiased organisation that has the liberty to respond to public complaints and hold British publications to proper professional standards. Most British newspapers are now regulated by the Independent Press Standards Organisation (IPSO), an independent body created to advise journalists and editors of appropriate ethical approaches, uphold standards and handle complaints from the public in a fair and balanced way.

The Editors' Code of Practice promises to....

1. Set out the standards to which most British news publications are now held
2. Deal fairly with complaints from the general public
3. Conduct investigations from an unbiased perspective
4. Balance both the rights of the individual and the public's right to know
5. Uphold general standards to which all publications are held: journalistic harassment: accuracy: privacy: intrusion into grief: reporting of suicide: reporting on children: confidential sources: payments received by criminals. etc.

Set Product: Audience and Industry

	2019	2018	2017	2016	2015
Daily circulation (January)	1.596 million	1.545 million	1.667 million	1.787 million	1.978 million

Did you know?
One-seventh of all the money spent on groceries in the UK is spent by a reader of *The Sun*.

Uses and Gratifications

	*The Sun* provides **information** by printing contemporary news stories, particularly those relating to human interest, sport and national politics.
	*The Sun* provides **entertainment** and **diversion** to its readers by featuring celebrity gossip, strong opinion pieces, human interest stories, various brainteasers and crosswords.
	*The Sun* appeals to its audience's sense of **personal identity** by featuring stories about ordinary people while endorsing certain sociopolitical ideologies and presenting news in layman's terms.
	*The Sun* encourages **social interaction** by enabling online comments on its website and providing material for water-cooler topics (things that can be discussed casually in a place of work).

Tactics used	• Bright, flashy colours • Bold layout • Shocking headlines • Sensationalism • Clear political bias
The risk of these tactics	• Perceived lack of quality • Misinformation • Lack of journalistic integrity • Greater focus on scandal than on truth

Core Demographic

There are two main sources of revenue: payment for physical issues and advertising. The news industry's heavy focus on advertising has led many to start seeing journalism as a commodity rather than an impartial form of delivering information.

Making money → The Sun → Losing money

A growing reduction of publishing rights, advertisers moving from print to digital media, paying redundancies when employees are no longer required and legal payments for the ongoing phone-hacking scandal. The latter has cost News Corp. £366 million in legal payments.

Political Allegiance

In **1964**, *The Sun* was founded as an independent publication: it had no loyalty to any particular political party until it was purchased by Rupert Murdoch's News Corporation UK five years later.

In **1979**, *The Sun* responded to Margaret Thatcher's Conservative government by dramatically changing its political stance as expressed in the headline 'VOTE TORY THIS TIME'.

In **1997**, the following headline was printed: 'The Sun backs Blair'. This saw the paper switching its political allegiance back in favour of Labour.

In **2009**, shortly after the financial crash, *The Sun* published the headline 'Labour's lost it': it has consistently supported the British Conservative Party ever since.

The Hillsborough Disaster: In April 1989, 96 people were crushed and killed at the Hillsborough Stadium in Sheffield during a football match between Nottingham Forest and Liverpool. A few days later, *The Sun* newspaper printed a headline entitled 'The Truth', in which it accused Liverpool fans of stealing from victims of the tragedy, assaulting police officers and preventing efforts to save lives. The people of Liverpool were outraged at the way in which *The Sun* had used sensationalist language and unverified facts to portray Liverpool supporters as hooligans with no remorse for their fellow fans. *The Sun* later apologised for the way in which it had reported the tragedy. Since The Hillsborough disaster, there has been a widespread boycott of *The Sun* throughout Liverpool leading to a significant reduction in readership. Journalists are taught to 'never bite the hand that feeds you' in relation to the owners of media companies. What this shows is that betraying your audience can prove costly.

The Sun: Stuart Hall's Audience Reception Theory

Preferred	A Conservative voter in their 50s who voted Brexit and wishes their news to be entertaining
Negotiated	A Conservative voter in their 20s who voted Brexit but prefers to read news that is more densely packed with information
Opposed	A Labour voter in their 20s who voted Remain and wants their news to adopt an impartial, informative mode of address

Between 2013 and 2015, *The Sun* provided an online subscription called ***Sun+***. This service generated approximately £24.5 million during its run, averaging at around £250,000 per week.

Sun+ cost £2 per week for audiences to access. However, too many other British newspapers (including the *Daily Mail* and *The Guardian*) were already offering the same kind of online service for free, so News Corp. scrapped its service.

Radio Technology

The most common types of radio found today in the UK are digital or **DAB** (digital audio broadcasting). Unlike **analogue** radios which used to be most common, digital radios:

- have a much higher sound quality
- can transmit more information
- allow more stations to be received, due to their higher bandwidth

Despite its many benefits, digital radio is still in its infancy. For a long time, **FM** (frequency modulation) has been the most widely used form of radio broadcasting in the UK. The change in frequency compared to analogue meant there was no **static** (unwanted noise).

In a wider sense, digital technologies are turning radio into more of an online industry; the rise of streaming services allows people to listen to the radio on a wider range of technological platforms (e.g. tablets, androids), audiences can listen to their favourite programmes through catch-up services like BBC iPlayer, and audiences can access radio through various social media channels).

Did you know? As of 2018, 61% of listeners consume radio via a digital platform.

Key Definitions

Public service broadcaster

A broadcasting company that is financed by public funding and, therefore, is obliged to offer its content as a form of public service.

Commercial broadcaster

A broadcasting company financed through advertising or subscription revenue. Its main concern is to create content with the aim of making as much profit as possible.

A royal charter

When a monarch approves the creation of an organisation through an official document. For example, King George V approved the BBC in 1922 as a media platform designed to entertain and inform the British public.

Radio Regulation

Ofcom (Office of communications) is the regulatory body that oversees the UK's mass communications industry from broadcasting to telecommunications and postal services. Ofcom is responsible for setting the standards that all businesses are expected to abide by, and for addressing any complaints raised by audiences. Any mass communications company that breaches set standards can receive penalties from Ofcom, ranging from large fines to broadcasting suspensions.

Things to remember about Ofcom

- Ofcom has the responsibility of regulating the BBC's content. The organisation achieves this by setting out a framework of conditions that all BBC content must adhere to.
- Ofcom states that content which is likely to harm or damage the development (physically, mentally or otherwise) of under 18s should not be broadcast.
- Very much like the BBFC (British Board of Film Classification), Ofcom bases its judgement of potentially harmful content on the following factors: the featuring of drug taking or illegal substances; violent or dangerous behaviour; bad language; sexual acts; nudity; and, in the case of Ofcom, depictions of exorcisms and the paranormal.

Radio

The BBC

The UK's official public service broadcaster, widely considered to be owned by the British public

Strictly concerns itself with the policy of informing, educating and entertaining its audience

Responsible for delivering a public service in exchange for the public's finance through TV licence payments

There is no advertising on public service broadcasters

Political Bias

Considering that the BBC is run by the government on behalf of the British people, most believe that the organisation should not express support for one political ideology over another. In recent years, many have accused the BBC of promoting a liberal/left-leaning agenda. For example, the journalist Peter Hitchens has criticised *The Archers* for promoting left-wing ideas. He argued that by enforcing these political points into the show the characters become less realistic as a result.

Audience Appeal of Radio

- Celebrity interviews
- Music exclusives
- Information
- Subject-specific entertainment
- The comfort of background noise
- Diversion from the stresses of modern life
- Relaxation
- Companionship for car journeys and time alone at home

Did you know?

In 2017, RAJAR revealed that 89% of British people over the age of 15 listen to the radio at least once a week. On average, it is estimated that the average radio listener in the UK consumes approximately 21 hours of radio a week

RAJAR

Radio Joint Audience Research

Radio — The Archers

The Archers Fact Sheet

- *The Archers* is set in the fictional farming community of Ambridge
- As of January 2019, 18,800 episodes of *The Archers* have been aired in total
- *The Archers* was first broadcast in 1951
- The initial aim of the show was to educate farmers and encourage greater food production following the rationing period after the Second World War
- The show's aims satisfied those of the Ministry of Agriculture at the time
- There is a 75-minute **omnibus** every Sunday at 10am

In the context of radio, an **omnibus** is a collection of several episodes broadcast in one sitting

Uses and Gratifications

Personal identity: Recognisable for audiences living in farming communities; multiple characters experiencing a range of universal issues; ongoing narratives allow audiences to empathise with specific characters; relatable themes, such as marriage, family and financial strain

Information: Facts about rural life; insight into British life for international audiences; developments on topical issues (e.g. 9/11, foot-and-mouth disease)

Social interaction: Engagement over social media; cliffhanger endings make for good **water-cooler topics**; on certain occasions, the opinions of fans are used to shape the story

Entertainment/Diversion: The fictional rural community acts as an idyllic escape from the stresses of city life; multistranded narratives cover a range of interesting plots; effective balance of drama, suspense and humour; suspenseful cliffhangers; long-running intricate character arcs; hard-hitting and sensationalist storylines

Good to Know: Every episode of *The Archers* is available on BBC iPlayer Radio for up to 30 days following its initial broadcast

Main Target Audience

The Archers' main demographic is thought to be white British; female; ages 40–59; educated; middle class

When the show was initially launched in 1951, its themes and the times at which it was broadcast meant that it was listened to mainly by domestic women. This was reflected in the show's focus on issues such as domestic life, marriage and family.

In recent years, *The Archers* has been particularly praised for its representation of matriarchs (strong and complex female characters) that have hugely resonated with the target audience.

RAJAR (Radio Joint Audience Research) recently identified that the average *Archers* listener is currently a 56-year-old middle-class woman.

The Archers has earned praise for the way in which it has incorporated real-life events into the show's plotline. This is possible as the show takes place in **real time**. The following news stories have all been incorporated in some way into *The Archers* narrative: the attack on the World Trade Center on September 11th 2001; the death of Princess Margaret; the 7/7 bombings in London; the crisis of foot-and-mouth disease in 2001.

Examples of Active Audience Interaction

- The Ambridge Observer fan blog was set up as a place where audiences can exchange theories and observations
- The creation of an ongoing pastiche of the programme called *Shambridge*
- The creation of the Facebook group 'Archers Addicts'
- #FreeHelen began to trend on Twitter
- In 2017, *Archers* listeners were invited to speculate on who was behind the wheel of the car that hit the character of Matt Crawford, sparking huge audience debate
- Fans collectively raised over £100,000 for charities dedicated to tackling domestic abuse due to the disturbing storyline about Rob and Helen Titchener
- A campaign called Solidari-tea was set up, allowing fans to express their support for the character of Helen and any other people suffering from domestic abuse across the world

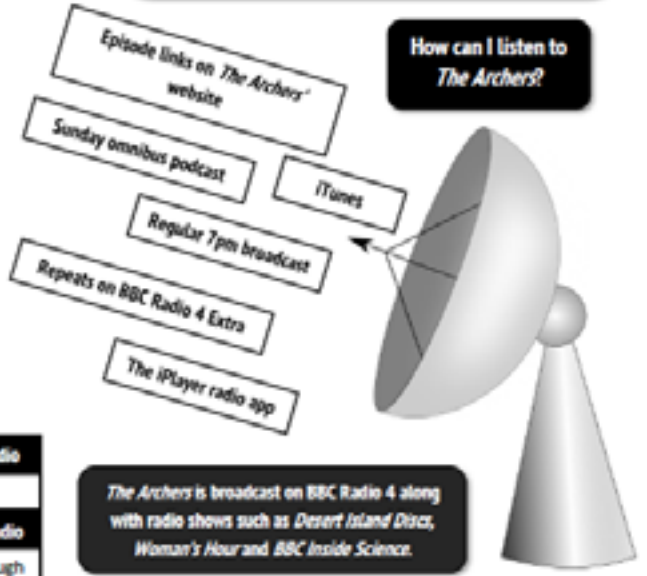
Production Process for *The Archers*

- ★ The show's scriptwriters meet on a monthly basis
- ★ Sometimes a years' worth of storylines will be planned in a single meeting
- ★ Recording takes place every four weeks
- ★ Production takes place on an extremely tight schedule: 24 episodes will be recorded in a six-day window, and actors will have only a few days to practise with their scripts before an episode is recorded. In order to cut down on costs, just two hours are set aside for one 13-minute episode.

Archers Themes

- Marriage
- Friendships
- Working relationships
- Farming
- Community
- Drug addiction
- Rape
- Interracial marriage
- Animal ethics

How can I listen to *The Archers*?



Traditional ways audiences could listen to the radio

At home; in the car; in cafés/restaurants

Contemporary ways audiences can listen to the radio

Computers; phones; tablets; iPod; laptop; through televisions; portable radio

The Archers is broadcast on BBC Radio 4 along with radio shows such as *Desert Island Discs*, *Woman's Hour* and *BBC Inside Science*.

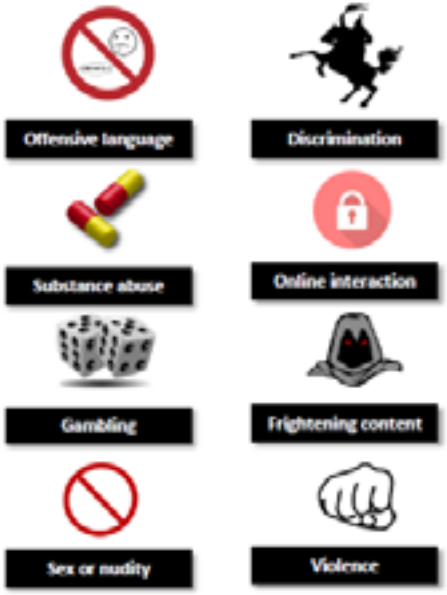
Video Games

REGULATION

PEGI (Pan European Game Information) is the European regulator for video game content. The organisation's central aim is to create video game ratings which will protect minors from harmful content. PEGI sets the standards by which video games released in countries residing in the European Union are regulated. This also applies to several other countries including Pakistan, Israel and India. Germany is one of the few exceptions as its video game content is regulated by USK (Entertainment Software Self-Regulation Body).

PEGI organises games into six age classifications

There are eight content indicators that PEGI considers before assigning classification:



USES AND GRATIFICATIONS MOBILE GAMING

- **Entertainment/diversion:** addictive nature of mobile games keeps audiences distracted from daily life; audiences can become immersed in the impressive special effects of certain games; can be played while on public transport or in a waiting room
- **Information:** certain mobile games test the audience's trivia skills; certain games test skills in maths and problem-solving; allows gaming enthusiasts to remain updated with the latest technological trends; players learn the skills and techniques required to complete the game
- **Personal identity:** provides the opportunity for audiences to overcome challenges; increased sense of pride when levels, costumes and bonuses are unlocked; Players must learn from their mistakes and improve; audiences can affirm their status as gamers
- **Social interaction:** audiences can share achievements with their friends online and in person; certain games require multiple players; Games such as *Fortnite: Battle Royale* enable hundreds of players from around the world to play against each other live.

Genre	Definition	Notable examples
Platform games	*Player must navigate various ledges, drops and obstacles to reach goal*	*Donkey Kong, Dustforce, Super Mario Bros*
Racing games	*Player must compete against opponent(s) or time in transport or on foot*	*F1 2018, Need for Speed, Go Kart Go Ultra!*
Stealth games	*Player must navigate landscape and achieve goal without being noticed*	*Assassin's Creed, Hitman: Absolution, Aragami*
Rhythm games	*Challenges the player's sense of rhythm, e.g. reflexes, hand–eye coordination*	*Rock Band, DJ Hero, Beat Saber*
Survival games	*Player is challenged to keep character alive for as long as possible against opponent(s)*	*Slender Man, DayZ, Fortnight*
Puzzle games	*Tests the player's ability to problem solve – can be visual or intellectual*	*Tetris, Candy Crush Saga, Brain Age*
Shooter games	*Player must use a range of weapons to fire at opponent(s)*	*Call of Duty, Grand Theft Auto, Paintball Wars*
Construction games	*Player builds, grows and develops a fictional landscape or community*	*Planet Coaster, Minecraft, SimCity*
Fighting games	*Player must battle opponent(s) in close contact to progress*	*Dragon Ball FighterZ, Injustice, Mortal Kombat*
RPG games	*Role-playing game: allows player to slowly build on a character's skills and experience*	*Fable, Fallout, RuneScape*
Augmented reality	*Game which allows virtual objects to appear digitally over the top of real-world images*	*Pokémon Go, Ingress, Harry Potter: Wizards Unite*

Twitch is an online subsidiary of Amazon that allows people to live-stream videos of themselves playing popular video games. Popular Twitch users include Ninja, Turner Tenney (TFUE) and KittyPlaysGames.

Cross-media Convergence is when separate media brands form a partnership in order to enhance or promote one another, e.g. Fortnite has incorporated features into its gameplay that have promoted popular films and television shows such as *Avengers: Infinity War, Godzilla* and *Stranger Things*.

E-sports consists of organised competitions in which multiple players (usually from around the world) can compete for a prize. Over the past few decades, the most talented players have made successful careers for themselves through e-sports, eventually rising to celebrity status. It is predicted that up to 580 million people will either be playing or spectating e-sports on a regular basis by 2021.

Remember: It is the Video Standards Council Rating Board that is actually responsible for applying the appropriate PEGI classifications to games and apps released in the UK.

Remember: Certain video games receive different classifications on different platforms. For example, *Pokémon Go* received a 3+ rating on the Google Play store and a 9+ rating on the Apple iTunes store.

Statistical projections and industry forecasts from *Newzoo* (2018)

- It was predicted that approximately $137.9 billion would be spent on games in 2018
- For the first time in history, revenue for mobile games was predicted to overtake all other platforms, most notably game consoles
- **Remember:** The percentages and figures are projections and not final figures, but they are a strong indication of the global worth of the industry
- Revenue for games played on mobile devices was predicted to reach $70.3 billion

FOR THE PAST SEVERAL YEARS, THE VIDEO GAME INDUSTRY HAS HAD A HIGHER TURNOVER THAN THE HOLLYWOOD FILM INDUSTRY

THE CURRENT VALUE OF THE UK'S VIDEO GAME INDUSTRY CONTINUES TO INCREASE, AND IS CURRENTLY ESTIMATED TO BE £5.7 BILLION

1958 is considered by many to be the year in which video games were born due to the creation of *Tennis for Two*. This was the first-ever video game created for the purpose of entertainment. The 1970s is also an important decade in video game history as this was when video games started to become largely commercialised in the form of the arcade games that dominated 1980s entertainment.

Media - Video Games - Fortnite

Video Games Fortnite

Audience Breakdown

- 78% male
- 22% female
- 53% under the age of 25
- 42% in full-time employment

There have been many concerns about the negative effects Fortnite might have on its players...

- In April 2019, a GP allegedly prescribed an 11-year-old boy a 14-day ban from playing video games, citing Fortnite as a key example to avoid
- Research suggests that in 2018 alone, Fortnite was referenced as a contributor to over 200 divorces
- On a public visit to a school to talk about mental health in young people, Prince Harry criticised Fortnite, claiming that it was designed to keep children addicted to their screens and saying that parents should not allow their children to play it
- The inclusion of in-app purchase mechanics is of concern to parents as the press has regularly reported on young people amassing huge bills through their purchase of micro-transactions with Fortnite

On the contrary... Andrew Reid, a researcher at Glasgow Caledonian University, criticised the assumption that all gamers are addicts. Reid claimed that there were potentially positive effects of playing Fortnite, *e.g. problem-solving, hand-eye coordination and creativity*, and that it is not helpful to stigmatise typical gamers based on flimsy evidence.

12 www.pegi.info

Fortnite received a 12 age rating from PEGI. This was mainly due to the moderately graphic violence inflicted against human characters in the gameplay. However, the game world is presented in a bright, cartoonish fashion, which enables the game to avoid a higher game rating from PEGI despite featuring human characters. The game has a similar age rating of 12+ on the app store for iOS users.

Fortnite can be played on the following operating systems

- Android
- PlayStation 4
- Nintendo Switch
- Xbox One
- iOS
- Microsoft Windows
- Macintosh Operating Systems

Uses and Gratifications

Information
- Die-hard video games fans can maintain a good knowledge of one of the world's most culturally significant games
- Regular seasonal updates (*e.g. competitive events, new tie-ins*) are available on the official website

Social interaction
- Gamers can communicate with each other via voice-chat headsets
- Multiple players from around the world can share the same virtual space as they play
- Fortnite: creative players can invite online friends to visit their island and take part in races and jumping competitions
- E-sports bring the most skilled players to a single location to play
- Official website offers links to several social media sites where players can interact with like-minded people

Entertainment/diversion
- Simple structure of Battle Royale makes for an addictive game
- Expansive sci-fi setting offers escapism
- Difficult and violent gameplay offers catharsis
- Challenging gameplay adds a sense of excitement and immediacy
- Game requires focus and attention in order to be successful. Involves skill and strategy: opportunities to secure locations, build hideouts and set traps for other players

Personal identity
- Competitive aspect: being the last player standing affirms the audience's status as a skilled gamer
- In Battle Royale, the player is in competition with themselves
- Customisation options allow players to personalise characters
- Players can take pride in unlocking emotes, traps, weapons, etc.
- Most-skilled players can enter into tournaments and compete for the status of being the world's best Fortnite player

How does Fortnite make money?

Audiences are able to purchase weapons, traps, emotes (player dance moves), skins (character appearances) and upgrades on Fortnite using V-bucks, the in-game currency. V-bucks can be purchased in exchange for real money.

Battle Passes are extremely popular among players who don't have the time or the patience to earn all achievements through the gameplay. A Battle Pass costs the equivalent of £9.50 in V-bucks.

According to a LendEDU survey, approximately 70% of players are thought to make in-game purchases.

In order to play Fortnite: Save the World, audiences must buy a pack through the official website. There is a standard edition that costs £34.99 and a deluxe edition that costs £49.99. Occasionally, large discounts will be offered.

Fortnite was developed by Epic Games and People Can Fly

Darren Sugg is responsible for designing the game

Epic Games was previously credited with developing the Unreal Engine. This has enhanced the experience of playing shooter, stealth and fighting games, including Gears of War.

In 2018, Fortnite: Battle Royale won 'Best Ongoing Game' at the PC Gamer and IGN awards

Streamer Celebrities

Fortnite attracts large numbers of gamers streaming their gameplay via social media platforms (particularly Twitch). High-ranking players are now achieving global celebrity status within the gaming community. Tyler 'Ninja' Blevins and his Twitch channel amassed 218 million hours of watched content in 2018.

In 2018, Fortnite: Battle Royale was found to be the highest grossing free-to-play game of all time

As of April 2019, there were 200 million registered players worldwide

Fortnite: Financial Achievements

The launch of Season 5 achieved a generated income of $3 million in the first 24 hours after its release

Fortnite was the first free game to net $1 billion in the first year of release

Figures from Superdata suggest that the game's revenue decreased by a third in the 12 months between May of 2018 and 2019

The game has become an instant global success and has gained more than 125 million players within the first year of release

Fortnite Timeline

- 1991 – Epic Games is founded by Tim Sweeney
- 1997 – Ultima Online becomes the first online, mass multiplayer game to be released through origin Systems
- 1998 – The unreal engine is released in association with Unreal, a first-person shooter game
- 2003 – Distribution platform 'Steam' revolutionises the market by allowing players to download and update games
- 2014 – Unreal Engine features in the *Guinness Book of World Records* as the most financially lucrative video game engine of all time
- 2017 – Fortnite: Save the World is released to the
- 2017 – Fortnite: Battle Royale is released to the general
- 2017 – The Battle Royale game mode becomes available for anyone to play free of charge

Crime Dramas
Language and Representation

Effect of Context on Representations

The second wave of feminism became prominent throughout the 1960s and 1970s. This movement had a huge effect on the increasingly prominent and complex representations of women on television throughout the following decades. Notice how independent and empowered the female characters in *Luther* are in 2010 compared to those in *The Sweeney* from 1975.

The embracing of ethnic diversity in film and television has been a fairly slow process. Despite the power of the civil rights movement in the 1960s and the Civil Rights Act of 1991, it is only in the last decade that British television has truly embraced ethnic diversity. Remarkably, Idris Elba was the first black actor to be cast in the lead role of a British crime drama.

Major Crime Dramas

- *Dixon of Dock Green* (1955)
- *The Sweeney* (1975)
- *Minder* (1979)
- *21 Jump Street* (1987)
- *Inspector Morse* (1987)
- *Twin Peaks* (1990)
- *Prime Suspect* (1991)
- *Silent Witness* (1996)
- *MI5* (2005)
- *Life on Mars* (2006)
- *Luther* (2010)
- *Sherlock* (2010)
- *Line of Duty* (2012)
- *Broadchurch* (2013)
- *Mindhunter* (2017)

Key Character Types

Crime dramas typically include several (or all) of the following stock characters. The assumptions audiences make about these characters based on previous crime dramas they have watched can either be embraced to make the storytelling clear, or be subverted to keep the audience on their toes!

The Detective	Usually the protagonist; given the task of catching the criminal
The Rookie	The detective's junior partner; will usually help the detective catch the criminal
The Superior	The detective's boss; will usually give the detective an assignment and rein them in when they threaten to break police protocol
Forensics	Specialists who will often provide the detective with the evidence they need to solve the crime
Crime Boss	A powerful and influential criminal who the protagonist must struggle to bring down
Henchman	The criminals who work for the crime boss. Henchmen tend to physically act out the crimes that their boss is responsible for organising.
Serial Killer	Crime dramas that focus less on organised crime might instead feature a serial killer, a lone villain who must be stopped by the detective
Victim	Someone who is killed by the villain or that must be saved from the villain by the main detective
Witness	A character who provides the detective with the crucial information they need to solve the crime or catch the criminal(s)
Informant	Has the same function as the witness but will usually give the detective information because they have been complicit in the crime being solved

Binary Opposites

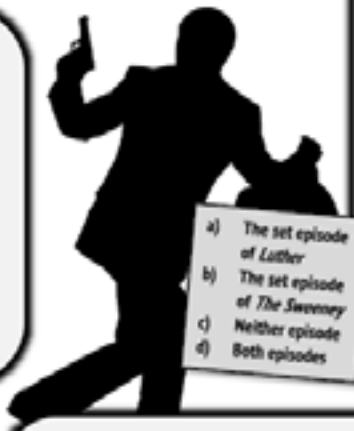
The progression of crime drama narratives relies heavily on conflict. This can be easily established through the use of **binary opposites** (two elements that oppose each other). Typical examples of the genre include...

Cops vs Criminals

Good vs Evil

Law and Order vs Chaos

Innocence vs Guilt



Typical Narrative Beats of a Crime Drama

- A crime occurs *(a robbery, a murder)* D
- The detective visits the crime scene A
- The investigation is planned and specific roles are assigned A
- Witnesses are interviewed D
- Suspects are put under surveillance B
- Suspects are arrested B
- Suspects are interrogated D
- The villain learns the identity of the protagonist D
- The villain threatens or hurts someone close to the protagonist D
- The team investigating weigh up all existing evidence D
- The detectives collaborate with the forensics department C
- A red herring *(a false arrest)* C
- A suspect is put on trial C
- A suspect is sentenced for their crime C
- The detective confronts the main villain one-to-one A

Technical codes commonly found in crime dramas

- ★ **Low-key lighting:** A strong source of light is used to emphasise shadows and darkness. This invokes a sense of mystery and fear.
- ★ **Partial Vision:** A film-making technique used to restrict the audience's view contributing to a sense of enigma (perfect for withholding the identity of a killer or informant)
- ★ **Close-up Shot:** A shot in which the camera films a subject at close range, drawing attention their facial expressions and the emotions they feel
- ★ **Shaky Cam:** A shaky shooting style used to make the audience feel disorientated and immersed, particularly in an action sequence or a chase sequence

Differentiating between episodic and serial crime dramas

The main distinction between an **episodic** crime drama and a **serial** crime drama is implied in the name. **Episodic** crime dramas (also known as **procedurals**) feature one-off storylines that are set up and resolved within a single episode. Most story arcs are not developed over multiple episodes. However, each episode will feature the same (or similar) characters, settings and themes.

Conversely, **serial** crime dramas have a serialised nature, so each episode leads straight on from the previous episode and into the next. Storylines continue from one episode to the next and the crime in question takes a number of episodes (usually an entire season) to solve. While procedurals are often American, serialised crime dramas are more popular in the UK and Scandinavia. Because European crime dramas have fewer episodes, exploring longer-running storylines is more feasible, since crime dramas produced in these countries usually have between four and 10 episodes. Therefore, a serialised series feels less long-winded.

In a sense, *Luther* follows a 'villain of the week' structure. However, Luther's relationships with Zoe and Alice are developed throughout the series, lending the programme elements of the serial crime genre. *The Sweeney* is more of an episodic crime drama as there are very few narrative or character arcs which develop over multiple episodes.

Subsidiary – Small company working as part of a larger company, e.g. BBC Studios (the distributor of *Luther*) is a commercial subsidiary of the BBC

Global Marketing – Methods used to promote a media product in multiple countries, e.g. trailers, pre-roll advertising, and social media marketing for crime dramas is accessible for audiences across the globe

Regional Marketing – Methods used to promote a media product within a smaller geographical area, e.g. outdoor advertising, TV conventions and private panel shows are only available to audiences within a specific country or region

Synergy – Two media companies working in accordance with each other to increase profits and audience engagement, e.g. graphic novels and a prequel novel have been released alongside the BBC crime drama *Luther*. Different media platforms are used to attract audiences to the same series.

Piracy – The illegal access and consumption of media products. This includes peer-to-peer file sharing and illegal streaming. Piracy is currently the biggest threat to the profits made by television series.

Shareholders – Individuals or businesses that legally own profit shares of a media production company, e.g. as a commercial broadcaster, ITV has a number of shareholders, including Liberty Global Inc. and Capital Research

Syndication – A television product is sold and distributed across numerous platforms and organisations, sometimes on a global scale, e.g. *Luther* was originally broadcast on the BBC but has since been made available on Netflix, DVD, BBC America and the Chinese streaming service PPTV

CRIME DRAMA INDUSTRIES AND AUDIENCES

THE BBC Commissioning Process

Option 1: The BBC may have an idea for a new television show. It will then approach any independent production companies that might be interested in developing the script. These independent companies will primarily be involved in the creative process of a television series.

Option 2: Independent artists or companies will send in and pitch their ideas to the BBC. The BBC chooses whether or not to develop these ideas depending on the extent to which they adhere to its wider aims as an organisation.

BBC Genres: Children's; Comedy; Drama; Entertainment; Factual; Learning; Music; News; Religion and Ethics; Sport

Transmission – The broadcast of a television or radio programme to multiple audiences simultaneously

Ofcom – The regulatory body that oversees the UK's mass communications industry

Production Costs – The money put towards the creation of TV shows, e.g. the cost of pre-production, filming, post-production, marketing, etc.

On Demand Services – These allow audiences to stream or download television programming by means of an internet connection, e.g. BBC iPlayer allows audiences to binge-watch their favourite crime dramas

The main factors media producers use to target audiences

This is not to say that crime dramas cannot be enjoyed across multiple demographics (e.g. male and female, teenagers and baby boomers). However, the creator (with instruction from the broadcaster) will produce every crime drama with a specific target audience in mind.

- Gender
- Age
- Ethnicity
- Social Class
- Upbringing

TRUST THE CRITICS!

Positive reviews on sites such as Metacritic and Rotten Tomatoes can allow television shows to reach huge international audiences as these sites can be accessed across the globe. *Luther* still appears on the Internet Movie Database's top-rated television shows according to audiences.

PROBLEM WITH PIRACY!

Television crime dramas are often pirated online through peer-to-peer downloading and illegal streaming. This has a huge negative impact on the money that can be put towards creating new programmes. Piracy is currently the biggest threat to the television industry. *Game of Thrones*, *The Walking Dead*, *The Big Bang Theory* and *Ricky and Morty* have been among the most pirated television programmes over the last couple of years. Piracy is a huge issue among UK audiences for US programmes as UK audiences do not want to wait weeks to watch an episode after it has already been broadcast in America.

Risks to the UK licence payer's fee

More and more audiences are subscribing to streaming services such as Netflix and Amazon. These audiences are consuming the majority of their television through these platforms rather than public service broadcasters such as the BBC. Many of these audiences feel, therefore, that they should not be obliged to financially contribute towards a TV licence.

HOWEVER

Traditional channels such as the BBC and Channel 4 have a long-established history of producing high-quality television

According to Ofcom, approximately 70% of the television watched in 2016 was accessed on the UK's four main channels: BBC, ITV, Channel 4, and Channel 5

Terrestrial channels such as the BBC and Channel 4 have consistently invested in new innovations (BBC iPlayer, More 4, the red button, active social media accounts, online forums) in order to maintain a large audience

Convergence – The increasing availability of a single media product across multiple technological platforms, e.g. shows such as *The Sweeney*, that were once only available on cable television, can now be accessed on multiple platforms, such as Blu-ray

Pleasures of the Genre

The genre will often feature exciting set pieces and extreme situations making for effective escapism. Crime drama episodes will often have one of two general narrative structures, each one possessing their own pleasures...

- **Restricted narrative:** A drama in which the identity of the criminal(s) is kept a mystery until the end of the episode, allowing the audience to actively uncover the mystery while watching
- **Inverted narrative:** The identity and plans of the criminal(s) are revealed very early on. Pleasure is derived from the satisfaction of watching the detective(s) solve the case.

Press Release – A public announcement made by a company regarding any news or developments. The purpose of this is to attract as much news coverage as possible, e.g. a television production company will publicly announce each new series of a show such as *Luther* at least a few months in advance.

Distribution – The delivery of a television programme to appropriate media platforms, e.g. rights to screen *Luther* have been purchased by Netflix

The increasing popularity of DVD box sets and online streaming services over the last 20 years has largely affected the pleasures audiences receive from watching crime dramas. Before these innovations, audiences would have to wait a week between episodes, giving them time to predict what would happen in the next episode. Nowadays, there is a culture of binge-watching in which audiences will watch an entire series in a very short space of time.

The Benefit of streaming services: crime dramas produced by traditional broadcasters will often be sold to online streaming services such as Netflix and Amazon. Keeping the series readily available for audiences is an effective way to maintain its relevance in an age of such heavily saturated media content.

HOWEVER

Pilot – The first episode of a television programme. This will be assessed and a decision will be made as to whether an entire series is broadcast, e.g. both set products in the crime drama genre are pilot episodes

Pitch – A statement that summarises the premise and ideas of a television programme, usually directed towards a particular organisation, e.g. Neil Cross pitched the idea for *Luther* to the BBC based on the organisation's values and capacity to produce the script

Exhibition – The way a television programme is screened, streamed or broadcast to an audience, e.g. *Luther* has been exhibited on BBC One, BBC iPlayer, DVD release and Netflix, providing audiences with a range of opportunities to watch the show

Commercial Broadcasters – Provide programming with the end goal of making money via advertising or subscription fees, e.g. ITV (the original network for *The Sweeney*)

Public Service Broadcasters – Provide programming to audiences but the end goal is solely to inform, educate and entertain the public, e.g. BBC (the original network for *Luther*)

Watershed – The rule stating that programmes featuring adult content should not be broadcast before 9pm. This was designed by Ofcom to protect young people from viewing potentially harmful material, e.g. *Luther* and *The Sweeney* were both broadcast after the watershed.

Spin-off – A media product which acts as an extension of an existing product, e.g. *Better Call Saul* is a spin-off series from the popular AMC crime drama *Breaking Bad*

Subscription – Payments made on a regular basis in exchange for goods or services, e.g. in order to access Netflix in the UK and watch shows such as *Luther*, audiences have to pay a subscription fee of £5.99 per month

Media - Luther - Language

LUTHER MEDIA LANGUAGE

Character	Character Type (Crime Genre)	Character Type (Vladimir Propp)
DCI John Luther	Detective	Hero
Alice Morgan	Serial Killer / Criminal	Villain
DCI Ian Reed	Colleague/Friend	Helper
Zoe Luther	Detective's Wife	Princess
Rose Teller	Boss / Senior Officer	Dispatcher
Justin Ripley	Detective's Partner	Helper
Mark North	The Other Man	False Hero

Remember: Over the years there has been a demand for crime dramas to become more complex and morally ambiguous. While the characters in *Luther* can be basically categorised according to Vladimir Propp's character types, in many ways they are too complex to be labelled in such a restrictive fashion.

Example: Some of Luther's personality traits are not particularly heroic. He is physically aggressive to Mark, he is willing to break police protocol in order to confront Alice and he allows Henry Madsen to fall to his death.

Example: Certain characters shift character type throughout the course of the series. Ian Reed begins the series as Luther's friend but eventually goes on to accidentally kill Zoe and frame Luther for the murder. On the contrary, Mark North begins the series as Luther's rival but eventually helps him bring Zoe's killer to justice.

Technical Code	Definition	Example
Establishing Shot	A shot which shows the location in which a scene is about to take place	The episode begins with a slow zoom in to an abandoned factory (the main location for the opening scene)
Over-the-shoulder Shot	A shot in which the camera is positioned behind (and usually slightly above) a character's shoulder following them through a location	As Luther pursues Madsen through the factory, the camera closely follows him as if attached to his shoulder. This obscures his face, creating an enigma.
Extreme Close-up	Captures a very specific part of a subject; usually used to create an intense mood and emphasise a particular emotion	Once Luther has cornered Madsen, there is an extreme close-up of his eyes, emphasising his anger and his primal desire to hurt Madsen
Low-angle	Sequences or images taken by a camera, situated below the main subject, often to make them appear large or powerful	Shots of Henry Madsen dangling from the bridge are filmed from below, emphasising how far off the ground he is and that if he falls, he is likely to die
High-angle	The camera is positioned up high and looks down at the subject. It has the effect of belittling the subject.	Low-angle shots are intercut with images of Madsen's face from Luther's perspective, emphasising Madsen's fear and lack of power in the situation
Tracking Shot	When the camera moves in conjunction with a person or subject in order to keep it/them in the frame	As Luther walks towards the Morgan family crime scene, the camera closely follows him, implying that he is an important and authoritative presence
Zoom in	A camera technique used to magnify focus on a subject within a single shot	As Luther is about to enter the interrogation room, the camera zooms in on his face as he takes a deep breath, emphasising how important this moment is for him
Canted Angle	A shot in which the camera is slanted so horizontal lines do not run in parallel with the bottom of the frame, traditionally used to imply that 'all is not well'	The opening chase sequence is primarily made up of canted angles, contributing to the scene's sense of tension and conflict
Panning Shot	A shot in which the camera remains stationary but rotates on a horizontal access	As Luther explains how he knows Alice killed her parents, the camera follows him as he paces from side to side, capturing the exhilaration he feels

NARRATIVE STAGES

Cold Opening: Detective John Luther allows the child murderer Henry Madsen to fall to his death

Equilibrium: After a seven-month absence, Luther is reassigned as a detective to investigate the murder of Alice Morgan's parents. Meanwhile, he feels ready to rekindle his marriage with Zoe.

Disruption of Equilibrium: Luther interrogates Alice only to discover that she killed her own parents. Meanwhile, Zoe is revealed to be seeing Mark North behind Luther's back.

Recognition of Disruption: Zoe breaks Luther's heart when she tells him of her new relationship with Mark. Luther attempts to distract himself by thinking of ways to prove Alice is guilty.

Attempt to Repair Disruption: Luther visits his wife at work and demands an explanation. He also visits Alice in her home where she proudly admits to the murder of her parents. He discovers that Alice has kept the murder weapon.

Resolution: Luther allows Alice to keep the murder weapon on the condition that she never hurts Zoe. He goes on to visit Zoe and tell her that he is ready to move

ROLAND BARTHES' CODES

Action Codes – Alice calling in the death of her parents: this phone call sets the central plot into motion

Enigma Codes – The opening enigma of where the young girl is hidden and whether she is alive or not is a fairly common narrative device in crime dramas. These kinds of enigma give the plot direction and make the story more exciting and intense as a young life is at stake.

Symbolic Codes – Throughout the episode, John Luther is framed in wide-angle shots. This imagery of the character alone within vast rooms or landscapes suggests that his character is lonely and emotionally isolated

Cultural Codes – It is established that Alice Morgan attended Oxford University at the age of 13. Most audiences will immediately understand how intelligent the character is considering that most people attend university when they are 18 and that Oxford is one of the most prestigious universities in Britain.

Luther makes effective use of **chiaroscuro lighting:** With its name based on a combination of the Italian words 'dark' and 'light', this lighting technique is noted by dramatic contrasts of light and shadows. It aims to focus attention, articulate space, create drama and bring out the 3D properties in an image. This style of lighting was heavily utilised in the film noir movies of the 1940s and 1950s to emphasise a sense of mystery and moral ambiguity. The inclusion of harsh shadows and dark urban landscapes appropriately connotes a sense of evil and corruption being around every corner.

CRIME DRAMA ICONOGRAPHY IN *LUTHER*

EDITING TECHNIQUES

Pacing – In the opening sequence, the shots of Luther are fairly sustained in length. However, when the camera follows Madsen, the editing is quick and sporadic. This implies that Luther is more calm and controlled in the situation compared to Madsen, who is panicking.

Continuity Editing – The events of the story are presented in chronological order. In the opening scene, the editing style is frantic and rapidly intercut. However, the shots of Luther chasing Madsen through the old brewery are still edited in a way which makes it clear where the characters are in relation to one another.

Cross Cutting – The shots of Luther searching through Alice's apartment for the remains of the gun are intercut with shots of Alice walking back to the apartment. The audience can automatically tell that these events are happening simultaneously, heightening the tension.

Match Cut – The shot of Rose telling Luther to arrest Alice 'the right way' is immediately followed by a Polaroid photo of the dead dog. These shots are thematically linked as the dog turns out to be the key piece of incriminating evidence Luther needs to beat Alice.

Media - Luther - Representation

Ethnicity in *Luther*

Idris Elba was the first black actor to be cast as the protagonist of a crime drama, making *Luther* a culturally significant television series

Historically, black actors have been cast regularly as criminals and rarely as detectives, a stereotype that is subverted through the casting of Idris Elba as the programme's titular detective

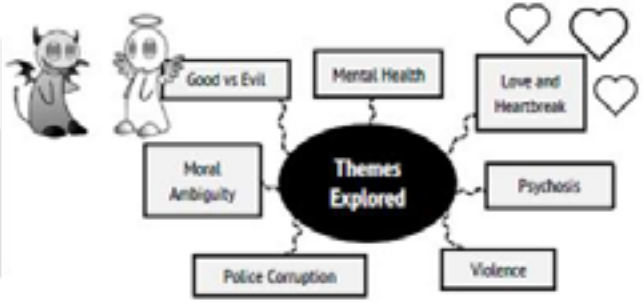
The casting of non-white actors (Idris Elba, Indira Varma) as characters in senior positions represents the growing multiculturalism of London as well as the growing diversity in places of work

The opening sequence appears to deliberately play with the audience's expectations by creating the illusion of negative representations. It shows a smartly dressed white man (Henry Madsen) running through an abandoned brewery, pursued by a large, physically imposing black man (John Luther). Well-lit close-ups of the frightened white man are provided while the black man remains hidden in shadow, making him seem more sinister. The audience's point of identification is aligned with the white man. It is only when the men come face-to-face that we realise we have been made to sympathise with a child killer and distrust the black detective trying to stop him.

The characters in Luther are constructed as three-dimensional individuals transcending the stereotypes that the crime drama genre has historically depended on. In a programme in which moral ambiguity is such a prominent theme, the major characters all have flaws, virtues and their own sense of complexity...

John Luther	Alice Morgan	Zoe Luther	Rose Teller	Justin Ripley	Ian Reed	Mark North
Dominant male Tough Muscular Intelligent Reckless Rule breaker Workaholic Good detective Protective Rage issues	Intelligent Manipulative Femme fatale Psychopathic Meticulous Self-obsessed Smartly dressed Flirtatious Sexually confident	Successful Career woman Scared of Luther Compassionate Afraid to be honest Needs protection Intelligent Quick-witted	Good boss Practical Compassionate Knowledgeable Respects police Procedure Tough Eager for justice Defends Luther	Loyal Honest Empathetic Gentle nature Straight-faced Observant detective Openly respects Luther	Corrupt World-weary Listens to Luther Cares for Luther Encourages Luther to slow down	Gentle Good-natured Considerate of Luther's feelings Protective of Zoe Non-violent Not used to confrontation

LUTHER REPRESENTATION



Significant Lines of Dialogue

Luther: 'but Criminals aren't as smart as they think they are' – **implies he is a smart and experienced detective**

Zoe: 'Now when I wake up I feel sick, I've got this permanent knot in my stomach... It's gonna kill him' – **her decisions are largely driven by her emotions. She is flawed but compassionate.**

Alice: 'Love is supposed to dignify us, exalt us. How can it be love, John, if all it does is make you lonely and corrupt?' – **she completely lacks sentimentality and mocks the idea of love: an unusual representation of femininity**

Teller: 'Rule number one, don't get yourself into this situation again which means you observe case management protocol' – **she is practically minded and not afraid to assert authority over the men in her precinct**

Justin: 'I've lobbied to be stationed with you, put in the request nine months ago, chased it up three times a week in writing' – **he is not afraid to show sincerity and modesty in a largely male-dominated environment**

Mark North: 'You can't keep lying. It's cruel' – **he is sensitive and concerned about the feelings of others**

Luther: 'One minute I'm one place then the next minute I'm 15,000 miles away and I know that I've travelled because I'm dizzy and I just wanna throw up' – **he struggles with his mental health**

Luther © BBC Drama Productions, 2010

A character's appearance can be a huge indicator of the way in which they are represented. **John Luther** is simultaneously presented as a professional and a maverick. His shirt, tie and jacket suggest that he is professional while his undone top button and loose tie indicate that he does not always follows rules or care about conventions. Ripley wears a similar outfit, demonstrating that he is also a high-ranking detective, but both his jacket and top button are fastened up, connoting a more measured approach to police work. Ripley's costume is black and white, demonstrating his stable moral sense of right and wrong. Luther's costume is comprised of different shades of brown and grey, possibly connoting that he is more morally flawed. Furthermore, his red tie invites connotations of passion and rage. This partnership creates an interesting representation of age. Despite being older and more experienced, Luther is a hothead who plays by his own rules. Ripley's status as the junior and yet significantly more sensible police officer demonstrates television's increasing ability to represent young professionals as capable and intelligent.

REPRESENTATION OF LONDON

London is depicted as a nihilistic and violent environment. Luther is forced to confront child murderers, psychotic killers and ruthless hitmen throughout the series.

The shots of high-rise towers and modern office buildings emphasise London's status as a busy and developing metropolis

Unlike in *The Sweeney*, London is represented as a place in which positions of responsibility are distributed fairly equally amongst different ages, genders and ethnicities, e.g. female boss, Black detective

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Media - Luther - Industries

LUTHER– FACT SHEET

- **First trailer release:** 16 April 2010 (Official BBC YouTube channel)
- **Initial date of broadcast:** 4th May 2010
- **Time of broadcast:** 9pm (after the watershed)
- **Original network:** BBC One
- **Original target audience:** Adults aged 25–54
- **Series creator:** Neil Cross
- **Producer:** Katie Swinden
- **Production Company:** BBC Drama Productions
- **Distributor:** BBC Studios
- **Pilot episode length:** 52:28
- **Opening credits song:** 'Paradise Circus' (Massive Attack)
- **Episode 1 UK viewing figures:** 6.35 million
- **Series 1 average UK viewing figures:** 4.83 million

LUTHER MEDIA INDUSTRIES

***Luther* has been made available on the following platforms...**

- BBC iPlayer
- BBC One
- Netflix
- BBC America
- DVD Box Set

BBC America came on board as *Luther*'s co-producer in 2012

The series premiered on the Australian channel ABC1 and BBC America in October 2010. All series since have also been broadcast on these networks.

Luther's international syndication

Luther's first season is now available to view online through the popular Chinese streaming service PPTV

Luther has been broadcast in France, Germany and Denmark and several countries in Africa and Asia

***Luther* was a major investment for the BBC**

The show was originally broadcast on BBC One, the organisation's main channel

The show was originally broadcast at 9pm on Tuesday nights, the prime-time slot in which networks bring in their highest viewing figures. Crucially, it was broadcast after the **watershed**, a rule enforced by Ofcom stating that adult content may only be broadcast between 9pm and 5.30am

The show was immediately made available on BBC iPlayer, allowing audiences to catch up if they weren't available for the 9pm slot

The BBC's decision to allow Netflix to screen *Luther* has significantly increased the show's global reach

The BBC is a public service broadcaster. The organisation's primary obligation is serving the public. Funding comes from the public, and in turn the broadcaster is perceived to be owned by the public. Public service broadcasters are often run by the state on behalf of the public.

Evidence of *Luther*'s success...

The first episode of *Luther* attracted approximately 6.35 million viewers. *EastEnders* and *Doctor Who* were the only television shows to bring in higher audience figures that week.

In 2011, *Luther* was one of BBC America's most popular shows, only surpassed by *Dr Who* and *Top Gear*

Luther currently holds a score of 8.5/10 on the Internet Movie Database and an impressive 90% fresh rating on Rotten Tomatoes

Online Convergence
As of 2019, *Luther* is available to watch on Netflix in 32 countries. Producers recognised this as an effective way of allowing audiences to binge-watch the series all over the world.

BBC One Programming Requirements...

- Originality
- High quality
- Innovation
- Challenging
- Content which nurtures UK talent

These requirements were set out by the BBC Trust Service licence (2016–2017), which in itself is committed to ensuring diversity and quality within the BBC's programming

Good to Know: BBC America is a subsidiary of BBC Worldwide, a commercial branch of the BBC maintained without funding from the UK's licence fee, rather being commercially funded through the sale and redistribution of existing BBC programmes. BBC Worldwide distributes huge amounts of TV programming on behalf of both independent producers and the BBC. In 2014, BBC Worldwide sold 670 hours of drama to countries across multiple continents, most notably China, where there is increasingly high demand for British programming.

FEATURES OF *LUTHER*'S OFFICIAL WEBSITE

- Links to active social media accounts
- Popular clips from the show including 'the bus killer scene that terrified fans!'
- Links to interviews with Neil Cross, the creator of the show
- Usable links to each episode on BBC iPlayer
- Video logs with cast members
- Graphic novels depicting episodes from *Luther*
- Profiles on all major characters and the actors that play them
- Trailers for each season

Inspiration: Neil Cross claimed that the construction of Luther's character is influenced both by Sherlock Holmes' detective skills and *Colombo*'s 'inverted detective' approach to structuring the story. In *Luther*, both the crime and the criminal are known to the audience quite early on in the episode. The tension in the episode comes from watching the detective attempt to solve the crime.

LUTHER AUDIENCES AND CONTEXT

Uses and Gratifications	Explanation
Entertainment / Diversion	• Effective use of enigma codes, growing tension and mystery, e.g. the killer of Alice's parents; Alice thoughtfully watching Henry Madsen in the hospital • Standard of dialogue and storytelling is high for the genre • Cliffhanger endings make audiences want to watch the next episode • Award-winning performances • Flawed and morally complex characters make for unpredictable television • The psychology of the criminals is explored in more depth than is traditional for the genre, making the show unusually interesting
Information	• Arguably lends some insight into how real-life police procedures work
Personal Identity	• *Luther* has a diverse cast in terms of ethnicity, social background and personality; a wide range of characters for audiences to identify with • Combination of highly relevant and timely issues such as mental health, masculinity and morality • Possible to connect emotionally with the characters and their experiences, e.g. Luther losing his wife, Rose wrestling with her responsibilities
Social Interaction	• The continuous narratives and cliffhanger endings make for appropriate **water cooler topics** (cultural events that can be discussed casually within the workplace) • The show has attracted wide global audiences thanks to Netflix and international broadcasting. Audiences from different countries are able to bond through discussing the show. • Audiences can exchange their opinions about the series over social media, particularly over Twitter using #Luther

John Luther shares a name with pioneering leader of the civil rights movement Martin Luther King Jnr. This could be a reference to the fact that Luther is an intelligent and courageous man working in a job that has been primarily occupied by white men throughout history.

The pilot episode of *Luther* was broadcast during the run-up to the 2010 general election. Britain's economy had been hit hard by the 2007 financial crash so people were anxious to see which political party would be elected to implement their policies. In this sense, *Luther* provided audiences with escapism from the threat of an uncertain future.

Four Key Facts

The second wave of feminism took place in the 1970s, when the representation of women in the media, marital rights, contraceptive rights and workplace rights became huge points of discussion among the general public. This progress is somewhat demonstrated by the group of strong and complex female characters in *Luther*.

The early seasons of *Luther* were highly criticised for primarily depicting acts of violence against women. Idris Elba and Neil Cross responded to these audience criticisms and attempted to balance this out in later seasons. This is a prime example of audiences actively influencing the direction television programmes move in.

Idris Elba rose to fame when he was cast in the highly popular American crime drama *The Wire*. On the back of this success, Elba appeared in films such as *Rock N Rolla* and *American Gangster*, as well as the American remake of *The Office*. Elba received rave reviews for his performance as Luther and won a Golden Globe award in 2011.

Film noir is a genre that became popular during the 1940s and 1950s in American cinema. Film noir films were usually bleak and violent, focusing on a flawed detective's attempts to uncover a mystery. A common character type in film noir was the **femme fatale**, a young, sexually attractive woman who uses her feminine charm to manipulate the protagonist and eventually betray him. The juxtaposition of Alice Morgan's violent behaviour, intelligence and sexual charm make her a modern reinterpretation of this classic character type. Since the 1970s, more and more high-profile female serial killers have entered the popular consciousness, e.g. Aileen Wuornos, Rose West and Myra Hindley. In recent years, crime dramas such as Luther have increasingly attempted to reflect this trend more accurately.

***Luther* Website – Active Audience Interaction**

- ★ **Crime Board** – A video was made available in which the character of DSU George Stark speaks directly into the camera, showing the audience a 'crime board' of evidence proving that Luther is a corrupt police officer. This is designed to immerse audiences further into the story and make them feel a part of the story.
- ★ **Postcards from Alice** – In 2013, fans of the show were encouraged to create their own postcards from Alice Morgan to Luther and send them to the show's creators. The winning postcards appeared in an episode of the following series. The clip was made available on Luther's official website with the winning participants being congratulated below.
- ★ **Links to Social Media Pages** – *Luther* maintains active social media accounts for Facebook, Twitter and Instagram. In 2015, the hashtag #LutherIsBack was initiated in the run-up to a new series. The show's Facebook account is fairly tongue-in-cheek, including video clips such as "Your Luther life lessons" and a *Luther* parody video independently made by Cassetteboy.

Critical Praise for *Luther*

- Crimes reflect those currently covered in the news (e.g. kidnapping, shooting and stabbing)
- Luther's intelligent and resourceful approach to solving crimes
- The episode's conclusion effectively captures reality in that criminals are not always brought to justice
- Interesting and subversive to see a young, conventionally attractive woman cast as a psychotic killer
- Effective use of harsh shadows and bleak cinematography
- A detailed focus on the psychology of the police and (unusually) criminals. More focus is given to who they are and why they choose to commit crimes.
- Complex and flawed protagonist wrestling with mental health issues
- Engaging use of enigma codes (particularly cliffhanger endings)

Criticisms of *Luther*

- Luther is too flawed and aggressive a protagonist to sympathise with
- Too gruesome and disturbing
- Audiences that prefer narratives with traditional resolutions may find the endings of episodes unsatisfying
- Too serious and lacking any element of fun
- Generic procedural show elevated by strong performances

Luther's Depiction of the Police

The casting of Saskia Reeves as Luther's boss in 2010 demonstrates the media's acknowledgment of gender equality within the police service

However, the department is still overwhelmingly male, suggesting that the character may have been included as a 'token' female detective

Showing a black man in the lead role may act as a rare inducement to encourage more people from BAME communities to join the police force

Luther depicts policing that reflects modern values, such as not beating up suspects or forcing confessions, and respecting victims

As of 2018, 30% of police officers in the UK were women

20% of senior police service roles in the UK have been occupied by women

In 2017, Cressida Dick became the first woman to be appointed as Commissioner of London's Metropolitan Police Service

Historically, the police services in Britain have been accused of 'institutional racism'. This was fiercely debated throughout the case of Stephen Lawrence: a black teenager from South East London who was murdered by a group of white teenagers. It took decades of public pressure and criticism for the police to bring these killers to justice.

THE SWEENEY MEDIA LANGUAGE

Character	Character Type (Crime Genre)	Character Type (Vladimir Propp)
DI Jack Regan	Detective	Hero
DS George Carter	Detective's Junior Partner	Helper
Frank Kemble	Crime Lord / Villain	Villain
Jenny Peters	Detective's Girlfriend	Princess
Dave Brooker	Henchman/Criminal	Villain
Billy Martin	Informant/Thug	Villain/Donor
Chief Inspector Frank Haskins	Superior Officer	False Hero

Character Profile

Behaviour: Regan is quick to lose his temper and will often resort to violence. This is particularly evident when he interrogates Billy Martin and his friend. Regan also has little respect for authority and is happy to use language that would now be considered politically incorrect, e.g. saying 'through there love' to a female police officer would probably be considered sexist and patronising in the modern day.

Nickname: Regan is referred to as 'the gunner' by his colleagues connoting his high status

Costume: Regan wears a suit and tie, showing that he is a professional detective and that he is higher status than uniformed police officers. His tie is often loosened, implying that he is willing to break rules.

Roland Barthes Codes	Examples
Action Codes 	• The large gun Brooker takes out of the van tells the audience that a violent crime is likely to take place • Regan taking photos of Kemble's men with a long lens camera tells us that he is building an investigation • Regan's office phone ringing moves the plot along. He learns that Jenny has been threatened which gives him more information he'll need to stop Kemble's men.
Cultural Codes 	• Brooker's flat cap implies that he might be an old-school, working-class 'Londoner' • The references to Brixton and Fulham provide certain audiences with a greater sense of where certain locations are in relation to one another • Characters smoking cigarettes indoors tells contemporary audiences the series is set in an older time when such activities weren't illegal in most places
Enigma Codes 	• Brooker is handed money in the opening sequence but we don't know what he has done (or is going to do) to earn this • Regan tells Carter that in the next few hours they have to figure out what Kemble is planning, when it will happen and where will it be. The audience are left in the same state of confusion.

Crime Genre Iconography

- Shotguns
- Batons
- Police bikes
- Pistol
- Long lens surveillance camera
- Cigarettes and alcohol
- Police uniform
- Police paperwork

Crime Genre Location

- London Docklands
- Police station office
- Interrogation room
- Dark room
- Detective's apartment
- Criminal hideaway

Binary Opposites in *The Sweeney*			
Cops	Rules	Interrogators	
vs	vs	vs	
Criminals	Results	Suspects	

Narrative Stages – *The Sweeney* Pilot Episode

Cold Opening: In the pre-credits sequence, the criminal Dave Brooker is shown picking up a shotgun from a mysterious van driver

↓

Equilibrium: Jack Regan leaves his girlfriend, Jenny, to go to work in the morning. He is shown taking surveillance photos of Frank Kemble and his men. Meanwhile, we are introduced to George Carter and Frank Haskins in the police headquarters.

↓

Disruption of Equilibrium: Regan's car (containing the surveillance photos) is stolen by two young criminals. The more dominant criminal, Billy Martin, recognises the men in the photos and takes them to Frank Kemble.

↓

Recognition of Disruption: Regan and Carter find Billy and learn that he has alerted Kemble and his men about the photos. Regan's fears are confirmed when his girlfriend is threatened by Kemble's men.

↓

Attempt to Repair Disruption: Regan and Carter follow various leads in order to work out what Kemble and his men are up to. Regan is put under extra pressure when his superiors threaten to punish him if Kemble and his men aren't stopped.

↓

Resolution: Regan and Carter discover that Kemble and his men are planning to hatch an escape plan for a prisoner who is being transported across London. They manage to prevent the crime. Eventually Kemble is accidentally shot by his own men.

↓

New Equilibrium: Having successfully foiled the crime, Regan is able to relax in his apartment with Jenny, a cigarette and a glass of scotch

THE SWEENEY SHOOTING STYLE

16mm: An old-school style of film reel usually used for documentaries or low-budget film-making. It allows for flexible shoots and helps create gritty and realistic looking imagery.

Static Shot: A shot that does not feature any form of manoeuvre (e.g. tilt, pan, and track) from the camera operator. When used effectively, this shot can draw attention to elements such as performance or dialogue.

Close-up: A very intimate shot where the background is out of focus. This allows the audience to concentrate on a specific subject, e.g. a facial expression or a small object

Lightweight: Camera equipment which can be transported easily and used effectively to shoot on-location

On-location: Shooting that is achieved outside of production studios in public or privately owned spaces, e.g. streets, parks, real houses

Key Camera Manoeuvres

There is a sharp **zoom out** when Regan is photographing Kemble's men. This manoeuvre invokes a similar style of shooting to that of the 'paranoid thrillers' of the 1970s, such as *The French Connection* and *Day of the Jackal*.

There is a **panning** shot that follows Carter and Regan as they chase a suspect across a railway platform. This has the effect of making the chase easier to follow.

A **tracking shot** follows Dave Brooker as he moves towards the van doors in the opening sequence. This contributes to a sense of gritty realism.

A **low-angle shot** shows Billy excitedly driving Regan's car. This connotes his temporary power and high status.

Notice: The cinematography produces a very different effect from that in contemporary crime dramas such as *Luther*. The colour palette is primarily made up of pastel greens, yellows, blues and browns. Almost the entire episode is shot in daylight (this is probably because on-location shooting at night is more expensive).

THE SWEENEY REPRESENTATION

Significant lines of Dialogue for John Regan...

'I'll rip his ears off when I find him'
John considers himself a tough man and is happy to show off this side of himself in front of his colleagues

'I'm gonna drown you in your own sweat if I find out you're involved'
John is represented as a detective who is happy to threaten suspects with extreme violence

[Responding to 'There's a woman asking for you Guv'] 'Ooh Good'
John is represented as someone who is happy to make subtle sexist comments among his (all-male) co-workers

'We're the sweeney son and we haven't had any dinner'
Regan is represented as an experienced and infamous detective among London's criminals

Underrepresentation
The main characters in the episode are overwhelmingly white and male. Furthermore, all characters speak in either Estuary English or a cockney accent. The show's producers made no clear attempt to represent London's growing multiculturalism throughout the 1970s.

Stereotypical Representations
The only two teenagers (Stupid Hawes and Billy) are presented as reckless criminals stealing Regan's car with little motivation. The episode was released at a time when the representation of teenagers on British television was still fairly undeveloped. They would usually be presented as violent thugs or spoilt and disobedient.

Thaw and Carter collectively form an old-fashioned and stereotypical representation of masculinity. Whereas Regan is tougher and more aggressive, Carter is more measured and professional. They share an interest in smoking, drinking, cracking jokes, solving crimes and socialising with beautiful women.

Unlike *Lather*... *The Sweeney* constructs a more simplistic representation of right and wrong. While Regan is shown to make mistakes (e.g. leaving his car unlocked, not spotting an impending heist sooner) he is generally shown to have the moral high ground in the narrative. Regan and Carter's loyalty to each other is represented as positive and Regan's challenging approach to authority figures is represented as a necessary means of catching criminals.

Representation of London: The pilot episode was predominantly filmed in West London. Much of the on-location shooting was done in London's Docklands, a derelict area perfect for shooting action sequences. The show's producers made a big effort to depict London as a gritty and violent location for a crime drama, overrun by organised crime as opposed to killers and kidnappers. In line with this approach, there are no shots of London's city centre or major tourist attractions. This adds to the sense of gritty realism whilst showing audiences a side of London they will be less familiar with.

Estuary English: A British accent associated with people living in and around the vicinity of London. It is thought to combine elements of RP (an accent commonly associated with the English upper class) and London speech.

Agency: In the context of television, this term is a quality possessed by characters that make things happen and take action in order to affect the outcome of a narrative

REPRESENTATION OF MASCULINITY

- The men are never shown to be discussing or wrestling with their mental health
- When challenged, the men are either aggressive or unemotional and professional
- The men are never shown to be emotionally vulnerable
- The men all appear to be heterosexual
- The men all appear to possess patriarchal attitudes
- Most of the men are physically capable and willing to use violence
- The men (Kemble's men in particular) objectify women to varying degrees

Representation of women in *The Sweeney*

- Following her interrogation, Jenny has to be comforted and put to bed by Regan. As she lies in her bed, overwhelmed and delirious, she is watched over by another police officer.
- Edie Driscoll (the owner of the pet store) and Mrs Martin demonstrate more **agency** than Jenny. They are able to offer helpful information to the police and they do not appear to be afraid of Kemble and his men. In particular, Mrs Martin says: 'I knew Frank Kemble when he 'ad holes in his shoes'.
- The three women with speaking parts are respectively the girlfriend, mother and wife of three major male characters. The women have little agency and are underdeveloped compared to the male characters.
- Regan's girlfriend, Jenny, is introduced lying on his bed. The camera never focuses on her face, placing more emphasis on her body than her emotions or personality.
- Jenny's status as the submissive half of the relationship is emphasised when she says to Regan: 'I was thinking, the sort of experience I had this afternoon is the sort you go through all the time'
- Jenny is shown to be passive and physically incapable when she is threatened by Kemble's men
- Kemble's henchmen objectify Jenny when they comment on her air stewardess uniform and exchange the following dialogue: *'Pretty isn't she?' 'Darling'*
- All senior detectives and gangsters (those directly involved in the action) are male
- In the final scene of the episode, Regan's dominance in the romantic relationship is visually demonstrated as he sits in an armchair with Jenny sitting at his feet

Media - Industries: The Sweeney

THE SWEENEY – FACT SHEET

Creator: Ian Kennedy Martin

Original Network: ITV

Original Date of Broadcast: 2 January 1975

Production Companies: Euston Film Ltd and Thames Television

Distributor: Fremantle Media

Number of Series: Four

Episode Running Time: 50 minutes

Time of Broadcast: 9pm (Monday evenings)

The fourth and final season of *The Sweeney* was broadcast in December 1978

The part of Regan was written specifically for John Thaw, a friend of the series creator Ian Kennedy Martin. This demonstrates how certain television producers (particularly in the 1970s) had the power and influence to cast their friends in major roles. Thaw went on to be cast as Inspector Morse whilst Dennis Waterman went on to be cast in *Minder* and *New Tricks*. Both actors are consistently associated with Police drama genre demonstrating how major *The Sweeney*'s influence has been over British television

The production schedule for each episode was usually eight-and-a-half weeks:

2 weeks – Pre-production: *casting, location scouting, costume, storyboards*

2 weeks – Shooting

2 weeks – Image editing and reshoots

2 weeks – Sound editing

Half week – Sound dubbing

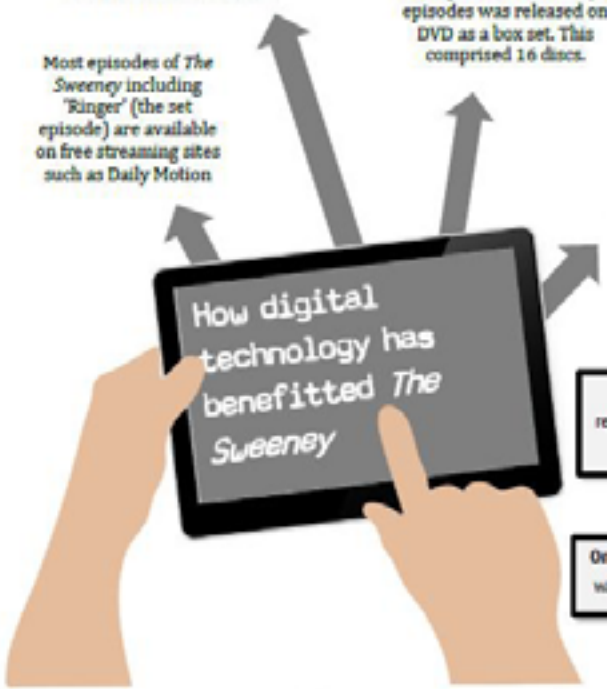
This strict process made for a very quick turnaround. The cast and crew had limited time to rehearse and were forced to quickly adapt to any problems posed by on-location shooting, e.g. poor weather conditions, noise pollution. Despite these restrictions, each episode was allowed a high production budget (approx. £266,000 per episode), allowing for a significant focus on shooting action sequences.

THE SWEENEY MEDIA INDUSTRIES

In November 2018, all episodes of *The Sweeney* became available on ITV4 and ITV Hub. This has substantially increased the show's modern audience.

In 2004, the entire back catalogue of *The Sweeney*'s episodes was released on DVD as a box set. This comprised 16 discs.

Most episodes of *The Sweeney* including 'Ringer' (the set episode) are available on free streaming sites such as Daily Motion



In 2012, the entire series was re-released on high definition Blu-ray, once again paving the way for a new generation of audiences to enjoy the series

Remember: Catch-up television, streaming services and home media were not available in 1975. Even video tape recorders only became widely available in the early 1980s. This meant that audiences for *The Sweeney* would either have to watch the programme live or tune in for repeat broadcasts.

On the other hand: In the period between 1975 and 1978, there was a limited number of television channels so the show was able to attract a greater proportion of TV audiences. The show's viewing figures peaked at approximately 19 million.

CENSORSHIP

The Sweeney was commercially funded, meaning its producers had the freedom to move away from the conservative attitudes of the BBC towards an approach to storytelling that was less comforting and more controversial. *The Sweeney* was significant at the time for depicting high levels of on-screen violence. The show's producers were not afraid to show blood on screen or include several major deaths per episode. Throughout the mid to late sixties the establishment of the MPAA film rating system allowed films to be released that contained extreme adult content audiences weren't used to. *The Sweeney* was one of the earliest television shows to follow this trend.

FUNDING

ITV is a commercially funded broadcaster owned by private corporations. Funding typically (but not exclusively) comes from advertising. Due to their corporate nature, commercially funded broadcasters have no public service obligations. This often allows such channels to broadcast riskier content than the BBC.

REGULATION

The DVD box set for *The Sweeney* was given a '15' certificate by the BBFC for its frequent depictions of violence. Although the series' violence might seem innocuous compared to that in a programme such as *Luther*, there are still moments, e.g. the interrogation of Jenny, which are unsuitable for younger viewers.

Ways in which Euston Films revolutionised British television...

- Produced episodes filmed entirely on location
- Produced episodes with quick production schedules and minimal rehearsal time
- Produced shows which helped pave the way for grittier, less-optimistic television dramas

THE SWEENEY
AUDIENCES AND CONTEXT

Uses and Gratifications	Explanation
Entertainment/Diversion	• The gritty realism was seen as excitingly ahead of its time • Three-part structure – each section ends with a cliffhanger, which keeps the viewer engaged • Satisfying familiarity – despite the exciting conflict, the criminals are always caught or killed at the end of the episode • Modern audiences can enjoy the show's 'retro' style – it is dated in an entertaining way • The series includes car chases, violence and gun fights – elements of film and television that have proven highly popular with audiences
Information	• Arguably lends some insight into how real-life police procedures work • Audiences interested in television history can discover what inspired shows such as *The Professionals* and *Life on Mars*
Personal Identity	• *The Sweeney* received rating figures as high as 19 million – would undoubtedly make for a good water cooler topic
Social Interaction	• Characters were more relatable compared to those in previous police dramas – they made mistakes and had the flaws of normal people • For audiences of a certain age, the show might appeal to a sense of nostalgia

***The Sweeney* is a programme that can easily be discussed in association with Stuart Hall's reception theory due to its capacity to divide audiences**

Preferred Reading	Opposed Reading
• Characters are flawed and relatable – Regan makes mistakes and experiences pressure from his superiors while also wanting to protect his girlfriend • Circular narrative structure is comfortable and familiar. Audiences know that a crime will be committed and solved within a single episode. • Audiences in the 1970s may have enjoyed the quotable dialogue and comedic exchanges between the detectives • Modern audiences may enjoy the 'retro' feel having enjoyed recent homages such as *Life on Mars*. The enduring popularity of the show will largely be down to nostalgia among audiences of a certain age.	• Modern audiences may dislike the central protagonists for their violent methods and lack of respect for correct procedures • Modern audiences may oppose the show's lack of ethnic diversity. The multiculturalism of London is not effectively represented. • Narratives cover 'old-school' crimes such as robberies and police corruption – topics that are probably less interesting to a modern audience • Women may find the representation of female characters to be limited and insulting. Jenny is a typical 'damsel in distress', while the remaining female characters act as wives or mothers.

The real-life flying squad were responsible for tackling organised crime in London. The broadcast of the series coincided with a period in which the real flying squad were investigated for various forms of bribery and corruption and links to the criminal gangs they claimed to oppose. Detective Chief Superintendent Kenneth Drury, the commander of the flying squad, was arrested and convicted to eight years in prison in 1977. This was arguably a factor that determined the series coming to an end the following year. Drury's arrest was acknowledged as a major plot point in the film spin off: *Sweeney 2*.

The international oil crisis of 1973 led to electrical deficiencies in Britain

Further electrical deficiencies were caused by the miners' strike in 1972

The hardship of living in London in the 1970s

There were also strikes by hospital workers, refuse collectors, postal workers

There was an economic recession between 1973 and 1975 in both Britain and the United States once the efforts to expand the economy after the Second World War began to die down

In the early 1980s, an investigation by the Metropolitan Women Police Association established that approximately 6% of detective constables in London were women. Women positioned in the higher ranks of the Metropolitan Police Force were few and far between. This is reflected by the overwhelming number of male officers in the set episode. There is one woman on the force and she is a low-ranking, uniformed police officer. Even more so, ethnic minorities are underrepresented in the set episode. Despite the city of London becoming increasingly multicultural throughout the 1970s, the speaking cast are entirely white.

Cultural Impact

- Nine books based on the series were published in 1977
- Three film adaptations of the series have been made: *Sweeney!* (1977), *Sweeney 2* (1978) and *The Sweeney* (2012), the latter being a remake starring Ray Winston and Plan B in the lead roles
- The series has been referenced and parodied in shows ranging from *Black Books* to *Diagnosis: Murder*
- The creators of the popular television series *Life on Mars* (2006–2007) claim to have been heavily inspired by *The Sweeney*. The series follows Sam Tyler, a twenty-first-century police officer who is transported back to the 1970s where he must work under the orders of DCI Gene Hunt, an officer who shares many of the same qualities as Regan in *The Sweeney*: short temper, casually sexist views and violent approach to criminal suspects. By aligning the audience with Tyler's perspective, the series demonstrates how radically social attitudes in Britain have developed since the period depicted.

The Sweeney – Historical Context

The film *Regan* was released in 1974, acting as a pilot of sorts for *The Sweeney*

The series shook up the television crime drama genre, adding a sense of gritty realism and violence

The series was one of the first crime dramas to show a darker, more violent side to police work. Regan and Carter are aggressive and physically threatening towards suspects. They show a disregard for laws and authority, often claiming that police procedure does not matter as long as they 'get the job done'. The Metropolitan Police had never been depicted this way before on British television. Shows such as *Dixon of Dock Green* (1955–1975) depicted a 'by-the-book' representation of police work assuring British audiences that they were in safe hands.

In recent years, London's Docklands have been redeveloped, becoming one of London's most affluent areas. Canary Wharf, in particular, has become one of London's leading business districts, occupied by a series of skyscrapers and office buildings (this is the bustling London depicted in programmes such as *Luther*). In the pilot episode for *The Sweeney*, the final confrontation takes place in the heart of London's Docklands. The down-trodden industrial locations added an appropriate sense of grit and authenticity to the programme. Furthermore, it was easier to shoot in such locations where there would be less people around to disrupt the shoot.

MUSIC INDUSTRY AND AUDIENCES

Horizontal Integration: When a media company which is already established in creating a particular form of media text acquires another company operating within the same form, *e.g. Facebook acquired Instagram in 2012*

Vertical Integration: The act of a media company owning most of the chain (if not the entire chain) of production for a media text, *e.g. Sony Music, Universal Music Group and Warner Music Group are all examples of record labels that control multiple stages of music production and distribution*

- **MTV** is an American television channel launched in 1981. Initially, the channel mostly broadcast music videos, but in recent years it has begun to focus more on original reality TV shows. Popular programmes include *Teen Mom* and *Ex on the Beach*
- YouTube is a successful platform as viewers can choose the music videos they want to watch, making it more of an on-demand service.
- MTV is successful as it can expose viewers to music videos that they may not have thought to look for, thus increasing the exposure of a band or artist's work.

List of ways in which music videos can be accessed
- Music television channels *(e.g. MTV, 4Music, Trace)*
- Streaming websites *(e.g. YouTube, Vimeo, Vevo)*
- Band's/artist's website
- Radio station website
- Music streaming services *(e.g. Tidal, Spotify)*
- iTunes store
- DVD release *(e.g. Michael Jackson Greatest Hits, One Direction: Up All Night Live Tour)*
- Social media pages *(e.g. Twitter, Facebook)*

There are three notable record labels that have ownership over numerous smaller record companies. These labels have experienced horizontal integration.

Sony Music Entertainment: Arista Records; Columbia Records; Epic Records; Syco Entertainment

Universal Music Group: Capitol Records; EMI; Geffen Records; Island Records

Warner Music Group: Atlantic Records; Asylum Records; Elektra Music Group

Music Industry: Key Contributors
- **Composers** – responsible for the instrumental arrangement of an artist's song (sometimes this is the artist themself).
- **Songwriters** – responsible for writing the lyrics of an artist's song (sometimes the artist does this themself).
- **Record Producers** – responsible for overseeing all aspects of a song's recording within a studio setting.
- **Audio Engineers** – responsible for overseeing the technical aspects of the recording process, and for operating studio equipment.
- **Booking Agents** – responsible for generating work for an artist; this typically takes the form of booking tours, live shows, paid interviews and paid appearances.
- **Talent Managers** – responsible for overseeing the day-to-day affairs of an artist (their client). They do this in exchange for a percentage of an artist's income.

Things to consider about music audiences

The idea of popular music is thought to have begun during the 1950s with the rise of rock and roll. This happened during the post-war period in which young people finally had disposable income (money that can be spent on leisure activities and consumer goods).

Certain genres of music have become synonymous with their own specific set of fashion choices, activities and ideas, *e.g. fans of punk music are known for their embrace of leather jackets, outlandish hairstyles, body modifications and views that go against mainstream values*

Subcultures relating to certain genres of music are often occupied by teenagers and young adults who are looking for a sense of community and to establish their own sense of personal identity

Regulation
- **The Parental Advisory Scheme:** The organisation responsible for identifying music content that might be inappropriate or harmful to younger viewers in the UK.
- The BPI (**British Phonographic Institute**) is responsible for overseeing the Parental Advisory Scheme which sets out guidelines as to the suitability of music video content.
- Record labels are responsible for ensuring music is distributed to age-appropriate audiences. They achieve this by ensuring that the Parental Advisory logo is added onto the physical copies of their products, e.g. Vinyl and CDs. The logo should also appear next to the product if it is being accessed online.
- Music videos normally have a Parental Advisory warning if they contain any of the following: bad language; violence or criminal behaviour; sexual activity or nudity; dangerous behaviour presented as safe; drug misuse or substance abuse.
- The **BBFC** is responsible for regulating music videos released on DVD.
- Since 2013, the BBFC has been working with YouTube and Vevo to improve **online safety** for viewers.

Distribution Process

Radio: In order to gain permission to play a song on their broadcast frequency, radio broadcasters purchase the rights to the song. These rights are known as **performance royalties**. The broadcasters themselves will be paid via advertising in the case of commercial broadcasters such as Apple Beats 1 Radio or via the TV licence in the case of public service broadcasters such as the BBC.

Streaming Services: Senior company members gain permission to play a song on their streaming service by purchasing the **performance royalties**. Individuals working for streaming services get paid through subscription fees from consumers or from advertising revenue.

Retailers: Retailing companies purchase music in the form of physical media (e.g. CDs, vinyl records) from distributors (who themselves acquire this media from the record label). Retailers then sell this media to the end consumer.

Function of music videos
- Help to promote the artist and increase sales of their song
- Emphasise the artist's brand identity
- Illustrate the narrative or concept of a song using film
- Create a sense of familiarity and connection between the artist and the audience
- Push artistic boundaries within the form of music videos

Did you know? Over 50% of music listener engagement in the UK is down to streaming services. Spotify has hugely changed the landscape of the modern music industry. Spotify is free to download, but between every two or three songs, an advertisement appears. In order to prevent ad interruptions, people can download Spotify Premium, allowing audiences to listen to music without adverts for £9.99 a month. The producers of songs downloaded will receive a fraction of this revenue.

Uses and Gratifications of Music Videos	Explanation
Entertainment/Diversion	• Can showcase an artist's diverse range of skills, *e.g. dancing, acting, creativity* • Music videos can be narratively or visually engaging in their own right • Enrich the experience of listening to a song by adding visual context
Information	• Informing audience of further music in the artist's collection • Educating audiences on issues that the artist is singing about
Personal Identity	• Usually stimulate discussion and debate surrounding the artist and the song, particularly over social media
Social Interaction	• Relating to the artist based on similar experiences tackled in themes of their songs/videos • Fans can aspire to present themselves in the way the artist does by mimicking their style, fashion sense or outlook on life

Taylor Swift
Bad Blood

Vladimir Propp's Character Types

Character Type	Character	Explanation
Hero	Catastrophe (Taylor Swift)	A tough action hero who wants revenge on the best friend who betrayed her
Villain	Arsyn (Selena Gomez)	The previous ally who betrays Catastrophe and pushes her out of a window
Donor	Welvin Da Great (Kendrick Lamar)	The leader of the mysterious organisation that resurrects and trains Catastrophe
Helper(s)	Catastrophe's Allies	The women that join Catastrophe on the battlefield to fight Arsyn

Bad Blood © Max Martin, Shellback, Ilya, 2015

Bad Blood has a linear narrative structure...

Equilibrium: Swift as Catastrophe and Selena Gomez as Arsyn are in a high-rise office building fighting against several men. The women easily beat the men as Catastrophe comes into possession of a suitcase.

Disruption: In a surprise twist, Arsyn knocks Catastrophe out with some form of powder, steals the case and pushes her out of the window. Catastrophe crashes onto the roof of a car below, causing the song to start.

Recognition: Catastrophe begins to sing the chorus, establishing that she and Arsyn have 'Bad Blood'. Catastrophe is rebuilt in a robotics laboratory. Throughout this process, Catastrophe seems determined to exact vengeance on Arsyn.

Attempt to repair: Catastrophe pursues training following her resurrection. She trains with a variety of strong women, learning skills that include sword fighting, shooting and driving. Once her training is complete, Catastrophe is ready to exact revenge on Arsyn.

Resolution: Catastrophe and Arsyn meet on the edge of a city that is in ruins. The narrative arguably concludes with a cliffhanger as it is not revealed which side has won the battle. In some ways, Catastrophe's character arc has reached a new equilibrium in which she acknowledges that sometimes people have enemies, and that is a way of life; however, with a good support system of friends and allies you can overcome any obstacle.

Female Stereotypes

- The women are all slim and provocatively dressed while also fulfilling traditional standards of beauty in the media. Therefore, the video could be accused of holding women to unrealistically high standards of beauty and creating the impression that strength is synonymous with good looks.
- Women will go to extreme lengths to exact revenge following a betrayal.

Female Countertypes

- Women can be as **active** and strong as men.
- Women can be courageous and stand up for each other.
- Women can successfully carry out activities typically associated with men (motorcycling, combat, use of lethal weapons).

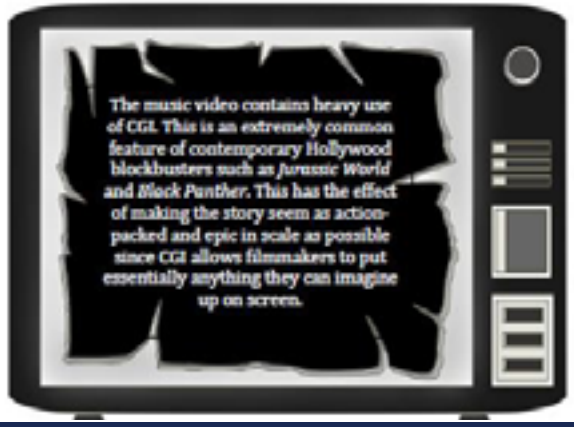
Cameos in the music video

Selena Gomez; Kendrick Lamar; Lena Dunham; Hailee Steinfeld; Ellie Goulding; Zendaya; Cara Delevingne; Jessica Alba, etc.

Key functions of cameos...

- Illustrates Swift's status as a popular and influential woman in the industry
- Inspires female audiences by featuring as many women role models as possible
- Enables active audience interaction. Viewers can attempt to identify all the celebrities.

The music video is almost entirely populated by female characters, all of whom are presented as strong, independent women. The one exception is Kendrick Lamar. His character 'Welvin Da Great' is introduced in a futuristic office building, with his feet on the desk – connoting both dominance and a relaxed quality. It is implied that he is the boss of the training camp the audience is about to see (*this is informed by intertextual knowledge of the Charlie's Angels series in which three female spies answer to a male boss*) Lamar comes across as something of a **patriarchal** figure as a result.



Context

In an interview with *Rolling Stone* magazine, Swift revealed that the lyrics of *Bad Blood* described her relationship with a fellow female popstar. Many believe that Katy Perry is the mysterious star Swift is referring to.

Bad Blood won best music video at the Grammy awards, beating *Freedom* by Pharrell Williams and *Alright* by Kendrick Lamar.

Key Definitions

Patriarchy: The idea that society is structured to provide men with systematic power while largely excluding women and minorities from positions of influence. *Kendrick Lamar comes across as a patriarchal figure.*

The actions of an active character will have a major effect on the people around them and the progression of a narrative. A passive character has little to no effect on the progression of a narrative. *Bad Blood* constructs a positive representation of women by featuring active female characters.

Facts you need to know about *Bad Blood*...

- **Release Date:** 17th May 2015
- **Album:** 1989 (2014)
- **Label:** Republic Records
- **Conglomerate:** Universal Music Group
- **Certification (UK):** Gold
- **Certification (US):** 5x Platinum
- **Peak Chart Position (UK):** 4
- **YouTube Views (2019):** 1.29 billion

Music Video: Codes and Conventions

- **Binary Opposites** – Good vs evil, betrayal vs loyalty. The battlefield at the end connotes a clash between two sides.
- **Timed Editing** – Catastrophe and the warriors move to the beat of the music in a militant fashion
- **Lip-Synching** – There are moments in which Swift and the other warriors sing directly into the frame
- **Costume** – Swift and the warriors wear a selection of revealing costumes that are stereotypically sexual
- **Diegetic Sound** – No dialogue, but the music video begins with an action sequence in which the sounds of crashing through windows and breaking bones can be heard

Bad Blood is a typical example of a **narrative music video**. The lyrics of the song which relate to the betrayal of a friend are re-contextualised into a story about a feud between two spies. This story follows a clear narrative structure. There are arguably elements of a **performance music video** as Taylor Swift will often lip-synch directly into the camera.

CODES AND CONVENTIONS: SCI-FI AND ACTION FILMS

- Catastrophe being rebuilt in a robotics laboratory
- The futuristic technology *(invisible car, virtual reality computers)*
- Heavy artillery and weapons
- Close combat training
- Apocalyptic scenes
- London setting (possibly an intertextual reference to British spy films such as the *James Bond* franchise).
- The provocative costumes of the women might act as an intertextual reference to the girls of old town from the 2005 film *Sin City*.
- In the same fashion as many Hollywood action movies, an early shot consists of the director's name (Joseph Kahn) and the title 'Bad Blood' digitally imposed onto a wide shot of Swift lying on the room of a car. This is a fairly unusual device for music videos and will usually be reserved for films with higher production values.

Media - Bruno Mars

Facts you need to know about *Uptown Funk*...

- **Release Date:** 10th November 2014
- **Album:** *Uptown Special* (2015)
- **Label:** Columbia and Sony and RCA
- **Conglomerate:** Sony Music Entertainment
- **Certification (UK):** 5x Platinum
- **Certification (US):** 11x Platinum
- **Peak Chart Position (UK):** 1
- **YouTube Views (2019):** 3.56 billion

Bruno Mars
Uptown Funk

Performance Video

Mars and Ronson were the subject of some controversy as they were accused of plagiarising multiple existing songs ranging from 'Funk You Up' (1979) to 'Oops Up Side Your Head' (1979). The writers of these songs were eventually acknowledged as co-writers on *Uptown Funk* due to how similar the songs sound.

Controversy

Prior to the song's release, *Uptown Funk* was performed on the X Factor live shows by the contestant Fleur East. East's version of the song was extremely popular, reaching number one in the UK iTunes charts. The song's official release was brought forward a month or so in order to reduce the risk of piracy and to ensure that audiences didn't overplay the song before it had even been released. Mars and Ronson's version also reached number one, demonstrating that the X Factor version, if anything, brought in a wider audience and contributed to the song's success. This situation is, therefore, a key example of successful horizontal interration.

Representation of Men

- The images of Mars and Ronson sitting in a salon with hair rollers subverts the stereotype that men do not care about looking fashionable or beautiful.
- Men come in all shapes and sizes, not just muscular and rugged
- Mars has a high-pitched soulful voice and is dressed in the traditionally effeminate colour combination of pink and white
- Men are consistently pursuing women as sexual conquests
- Male pop stars are 'players' and often get what they want with little consequence or rejection, as suggested by the song's lyrics

Representation of Women

- Certain shots focus on parts of women's bodies not covered up by clothing *e.g. bare legs*. The manner in which these images are shot presents women, to an extent, as sexual objects for men to gaze at
- The women who appear in the video all adhere to a stereotypical idea of feminine beauty: young, slim figure and long hair
- The woman that the singer is focusing on only appears briefly at the beginning; so there is not a lot of visible **objectification** (although this is somewhat contradicted by the lyrics)

Objectification: Representations that reduce characters (often women) to objects. This often occurs when the character's physical features are emphasised to make them look sexually desirable.

Uptown Funk © Mark Ronson, Jess Bhasker, Bruno Mars, 2015

Iconography traditionally associated with black musicians is used in the music video, such as chunky gold chains, the white Cadillac and oversized suit jackets

Black culture is represented through the depiction of elements traditionally associated with black economy. This includes barber shops, shoe-shiners and jazz clubs.

Ethnicity

The shoe-shiners are old white males, subverting the traditional perception that this job is generally carried out by black males shining white males' shoes. In the video the white males are shining Mars' shoes. This shows how, in some instances, ethnic roles have changed in contemporary society.

The video promotes the idea that ethnicities tend to segregate – Mars' band of hooligans is made up entirely of black males, with the exception of the song's producer, Mark Ronson.

Mark Ronson produced the music video for *Uptown Funk*. He appears in the music video as one of the singing and dancing hooligans. The song is inspired by a style of music known as Minneapolis Sound, popularised by artists such as Prince throughout the 1980s.

Audience Responses

- The successful model/actor Cara Delavigne released an homage to the music video over Instagram the following year. As a celebrity and an aspirer for young people, Delavigne's endorsement contributed to the song's popularity.
- There have been many online fan recreations of the music video, numerous covers by professional artists and YouTube tributes to the song including *Old movie stars dance to Uptown Funk* and *Crazy Uptown Funk flashmob*, which have received millions of views.

Music Video: Codes and Conventions

- **Lip-synching:** Mars does this consistently throughout the music video (usually directly into the camera)
- **Locations:** Shooting took place on practical sets or on location where Mars was touring
- **Technology:** No signs of CGI or digital post-production
- **Performance:** Choreographed dance routines
- **Timed editing:** Mars, Ronson and the hooligans walk, bob and dance to the upbeat rhythm of the song

Uptown Funk Visual Codes

Choreographed dancing: Contributes to Mars' brand identity as an entertainer as well as a singer
Low-angle shots: Make Mars and the hooligans look larger and, by extension, more powerful to the audience
Vibrant colours: Contributes to Mars' brand identity as an eccentric artist with an eye for fashionable trends
Brightly lit shots: A conventional aspect of mainstream music videos used to maintain a light-hearted tone
Mostly mid shots: Effectively captures Mars' entire body and his ability to sing, dance and perform simultaneously
Direct audience address: Creates a sense of personal connection between Mars and the audience
Fast-paced editing: Matches the rhythm of the music and maintains a sense of high energy

Uptown Funk was extremely successful upon release...

- The song topped the official US charts and remained there for 14 weeks
- It is the fourth most highly viewed music video on YouTube of all time
- It earned $100,000 on a weekly basis from Spotify alone
- The song was the first in history to be streamed over two million times in the UK within the first week of release
- By the end of 2015, *Uptown Funk* was the bestselling single of the whole year
- It won Best Music Video of the Year at the MTV Video Music Awards

Technical Codes: *Uptown Funk*

Tracking shots: Mainly used for comedic purposes. Firstly at the start of the second chorus when Mars and the hooligans shuffle casually past a shop window. Secondly, the gradual track across the hair salon in which Mars and Ronson are shown to be moving to the beat of the music in their seats.

Panning shots: Create a sense of fluidity to the filmmaking while ensuring that Mars and the hooligans remain in shot as they dance and travel through the street setting.

Low-angle shots: Used to make Mars, Ronson and the band of hooligans look larger and, by extension, more powerful. As they dance and sing into the camera, the style of shooting connotes that these are men who should be looked up to.

Wide-angle shots: Bruno Mars is famous for being a great dancer and performer as well as a vocalist. These shots capture the choreographed routines, more clearly emphasising the singer's skills.

Rotating camera: Serves to capture the up tempo, high energy soaring of the song's chorus. The movement arguably captures the sensation of dancing to such a song in a club or live concert.

ONLINE MEDIA

Taylor Swift

Twitter followers: 83.4 million
Facebook followers: 68.6 million
Instagram followers: 110 million

Taylor Swift Twitter Page: *zzzed.uk/99chSwift*

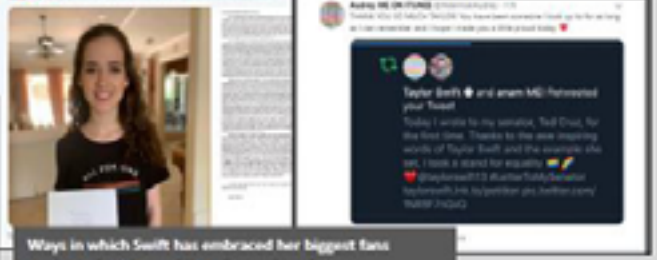
The cover photo advertises Swift's most recent single 'Me!' Before this, the cover photo consisted of the artwork marketing her *Reputation* tour, which was available to stream over Netflix.

Swift's profile picture contains artwork for her latest album which possibly connotes the rainbow colours that represent the LGBTQ movement. It is unusual for a pop artist's profile picture not to feature their face.

A pinned tweet is a post that remains at the top (the most visible point) of an account holder's Twitter feed.

In June 2019, Swift's pinned tweet was an open letter to her senator Lamar Alexander imploring him to support LBGTQ rights in her home state of Tennessee. This demonstrates Swift's willingness to use her fame to support positive socio-political change. This will most likely resonate with her audience, made up heavily of young progressive women and people in the LGBTQ community.

Twitter offers a list of similar music artists that Swift's fans are recommended to follow.



These images collectively show how Taylor Swift interacts with her fans through Twitter. The artist retweets one of her fans who has led by Swift's example and written a letter to her senator to argue for LGBTQ rights. The fan responds to Swift's retweet by thanking her and expressing how much Swift has inspired her.

Ways in which Swift has embraced her biggest fans

- Attending the wedding of one of her fans
- Buying a house for another fan
- Inviting 'super fans' to her house to hear her new album

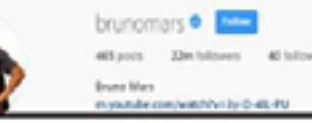
- **Taylor Swift tweets: her own merchandise; upcoming concert and tour dates; promotion of new singles and albums; vlogs addressing fan base; retweeting fans; personal pictures, *e.g. Swift in her bedroom, Swift with her pet.***
- **Swift launched her own social media app called *The Swift life*. This provided an opportunity for the artist's fan base (the 'Swifties') to engage with her.**
- **Swift has had public social media 'fights' with other major stars such as Kanye West and Kim Kardashian which have alienated some sections of the public.**
- **Swift directly follows and retweets many of her fans. She comments on their accounts and follows their live streams; the direct communication with fans is unusual for a major star and enhances the close connection with her fans and makes her more relatable to her audience.**

Bruno Mars

Twitter followers: 42.9 million
Facebook followers: 51.1 million
Instagram followers: 22 million

Mars' profile picture shows him posing in casual, loose clothing with gold jewellery. This helps to establish his brand identity as a young, cool hip-hop artist.

Mars is known for publicly engaging with fans online. Across Twitter and Instagram, Mars will reply to comments, retweet fans and generally enter into the conversation.



Like Facebook and Twitter, the artist's Instagram page establishes the number of followers he has, the number of people he follows and the number of posts he has made in total.

There is a link to the artist's most recent music video. In this case: 'Please me', a single he released with Cardi B in March 2019.

Bruno Mars Instagram Page: *zzzed.uk/99chBmars*

The photos Mars posts show him in a variety of settings and situations.

An image of Mars performing on stage with a live band. Affirms his status as a confident performer while also demonstrating his passion for other genres of music such as jazz, funk and soul.

A professional high-quality picture in which Mars poses seriously, maintaining his brand identity as a serious musician.

Mars is shown to be skilled in playing the electric guitar as well as singing and dancing. Again, the image is high quality, capturing the atmosphere of one of the artist's live gigs.

Perhaps the artist's most informal post. A humorous video Mars appears to have taken himself in his spare time. He sets up the camera, brings our attention to his UFC hoodie and starts performing karate moves. Vlogs such as this help build a sense of personal connection between him and his fan base. The juxtaposition of the handheld camera and his silly behaviour may encourage fans to recognise that behind all the fame and fortune, Mars is just a normal guy.

Another post that makes the artist appear more relatable. Mars posts a personal photo of his meal to give his fans a sense of what he does when he is not singing and performing.

Bottom right image: A thumbnail image for a teaser clip of Mars in a new music video he is releasing with Cardi B. Fans benefit from following his Instagram account as they receive early information about the artist's latest musical endeavours.

Fans are able to comment on the artist's posts, creating the illusion that they are interacting with him directly. In reality, it is rare for Williams to respond to comments from fans. This could suggest that he does not directly run his own social media pages.

Like all social media platforms, fans have the opportunity to comment on the artist's post, allowing audiences to feel directly connected to Bruno Mars. The comments are generally very flattering, consisting mainly of compliments for the artist and expressions of love. While it is rare for music artists to reply directly to their fans on social media, Mars has been known to do so.

TLC WATERFALLS

Context: The song was written by band member Lisa 'Left Eye Lopes'. Lopes performs the rap section of the music video herself, a public response to the troubled relationship she had with the American footballer Andre Rison. In 1994, Lopes burned Rison's shoes in the bath of his $2 million mansion, eventually leading to the entire mansion going up in flames. Lopes pleaded guilty to arson and later reconciled her relationship with the sports star.

Facts you need to know about *Waterfalls*...

- **Release Date:** 29th May 1995
- **Album:** *CrazySexyCool* (1994)
- **Label:** LaFace and Arista
- **Conglomerate:** Sony Music Entertainment
- **Producer:** Organised Noise
- **Peak Chart Position (UK):** 4
- **Peak Chart Position (US):** 1
- **YouTube Views (2019):** 89 million

Director

The music video was directed by F Gary Gray, a film-maker who had already established himself directing music videos for popular R&B artists such as Ice Cube, Cypress Hill and Queen Latifah. Gray has gone on to direct a number of feature films, ranging from critically acclaimed personal projects such as *Set It Off* and *Straight Outta Compton* to big Hollywood blockbusters such as *Fast & Furious 8* and *Men in Black: International*. This illustrates a way in which mainstream music videos can be constructed with the same artistic vision as feature-length films.

Themes Explored

- Drug dealing
- Inner-city crime
- The strains of single-parent households
- Promiscuous sex
- HIV and AIDS

Use of Technology

- The performance sequences were filmed on a soundstage surrounded by water at Universal Studios
- Later in the video, the three performers are replaced with computer-rendered versions of themselves (see below) performing as if they are made entirely from water. This effect was achieved using CGI (computer-generated imagery)
- In 1995, CGI technology was still in its infancy having been used to pioneering effect in Steven Spielberg's *Jurassic Park* (1993). The use of this technology in *Waterfalls* demonstrates the high production costs available to the globally successful performers of TLC. While the effects may seem dated to contemporary audiences, the effects were highly impressive for a music video released in 1995.

Won four MTV Music Awards: Video of the Year; Best Group Video; Best R&B Video and Viewer's Choice

Two Grammy Nominations: Record of the Year; Best Pop Performance by a Duo or Group with Vocals

Social and political issues of the time

- Concerns over inner-city crime/gangs/drugs were at the forefront of America in the mid-1990s, as was the impact of HIV and AIDS (on a more global scale). Group member Lopes would attach condoms to her clothing during public appearances in order to promote safe sex.
- The music video was released just a few years after Ronald Reagan's two terms as president of the United States. This is widely thought to be a time in which the devastating effects of HIV were largely ignored on the basis of homophobia and in which young black men were sentenced to prison in disproportionately high numbers.

Received huge amounts of praise from critics and is generally considered to be one of the greatest R&B tracks of the 1990s

Waterfalls © LaFace & Arista, 1995

***Waterfalls* features elements from three types of music video**

Narrative Video: Two different stories play out which reflect the lyrics of the song. Firstly, a young black male living in an American inner city who is tragically drawn into a life of crime despite the pleas of his mother. The second story shows a man engaging in a sexual relationship with a woman. After they choose not to use a condom, the man discovers that he has contracted HIV and that he will now face huge consequences for having unprotected sex.

Performance Video: There are a range of shots showing the group performing in a water-themed set up. There are consistent shots of the band members dancing in unison and singing directly into the camera.

Conceptual Video: The images of waterfalls and the band members as supernatural beings made of water are used to symbolise the dangers of chasing certain dreams without thinking.

Codes and Conventions

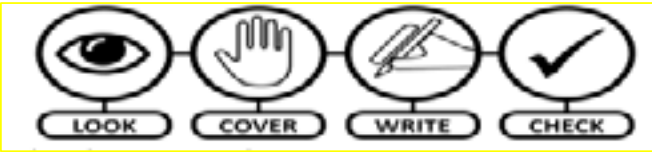
Tracking and panning shots: Lends the music video a cinematic feel. It also creates a sense of fluidity which ties in with the theme of water.

Long shots: Shows the band members performing a choreographed dance routine. This demonstrates their ability to perform and emphasises how organised and established the women are as a group.

Close-ups: Usually used to capture the faces of the band members as they sing directly into the lens. This creates a connection between audiences and TLC's individual personas as presented by the record label.

Extreme close-ups: Used for dramatic effect in the narrative sequences, *e.g. there are two extra close-ups of eyes. Firstly, there is one of the drug dealer, emphasising his threatening status. Secondly the eye of the man who catches HIV is shown staring wildly into the mirror.* These shots demonstrate a certain artistic flourish more commonly associated with feature-length films.

KNOWLEDGE ORGANISER – Year 11 – Rehearsal and Performance



Performing:	To play an instrument (including voice) to an audience.
Practice:	To do something repeatedly in order to acquire or polish a skill.
Rehearsal:	To prepare for a performance, typically as part of a group.
Maintenance:	Activities required or undertaken to conserve the original condition of an item.
Health & safety:	Regulations or procedures intended to prevent accident or injury.
Technical ability:	Precise control; a skillful or efficient way of doing something.
Dexterity:	Readiness and grace in a physical activity; skill and ease in using the hands/voice manually.
Stamina:	The ability or strength to keep doing something for a long time.
Control:	Ability to manage an instrument; remaining in control of an instrument or piece.

Performance Skills: What makes a great live performance?

- **Practise makes perfect** - You must rehearse your performance beforehand
- **Always warm up** - this will enable you to sing/play confidently
- **Balance of sound** - check all the instruments can be heard
- **Intonation** - make sure your movement between notes is accurate
- **Learn your music from memory** - it allows you to communicate more
- **Don't stop the music** - no long pauses between songs
- **Timing** - make sure you are in time with other musicians
- **Communicate** - without talking on stage with eye contact or hand signals
- **Engage with your audience** - eye contact, talking between songs, movement.
- **Be confident** - sing/play/dance like no one's watching

Tick when done	Watch the following videos:
	How to create a setlist: www.youtube.com/watch?v=yC93lDE5WmY
	How to improve your stage presence: www.youtube.com/watch?v=B2M346F53-g
	What should musicians wear on stage? www.youtube.com/watch?v=7DUlh-906k4

Evaluation Structure

1. **WHAT** is the skill?
2. **HOW** do you know you if this skill was a **strength** or **weakness**?
3. **WHY** is this skill important from a musician's perspective?
4. **IMPACT** that this skill has on the audience?
5. **IMPROVEMENT** - strategy for improvement.

M	A	D	T	S	H	I	R	T
melody	**articulation**	**dynamics**	**texture**	**structure**	**harmony**	**instruments**	**rhythm**	**tempo**
the tune	how notes are played	loud / soft and any other volume changes	layers of sound and how they fit together	sections of music and how they are organised	chords used	types of instruments heard	the pattern of notes	the speed

Music - Practice Techniques

PRACTICE TECHNIQUES
WARM UP - Technical exercises: scales, arpeggios, strokes, etc. - Understand the music – identify as much theory as possible – look for keys, scales, chords, patterns, rhythms).
SET A TARGET - Know what you want to achieve in the session - Be realistic
RECORD YOURSELF Compare this with what the piece **should** sound like and identify the problem areas
IDENTIFY THE PROBLEM AREAS Practice the parts you can't play (not the parts you can) first: - Use a metronome - Play it slowly, then speed it up - Try the part in different rhythms so that you get the pitches accurate - Aim to play it correctly **three time in a row** – if you make a mistake, start again!
BREAK IT DOWN - Play the piece section by section: split the piece into **small** parts; practice each one until right; combine each section as you work through the piece - Don't just play through the whole piece repeatedly, be focused - Try to memorise sections
IF YOU CAN PLAY IT – ADD EXPRESSION! - Add dynamics - Play with the tempo - Think about articulation & phrasing
PLAY ALONG WITH A RECORDING/ANOTHER PERSON
REWARD YOURSELF

Analysis of your Clients Health and Lifestyle

Food Diary

It is important that you analyse your Clients diet with a **food diary.**
Carbohydrate (50-60%) Most energy that your body needs comes from these. They are either **Simple** Sugars (sweets, biscuits, fruit) or **Complex** Starch(Pasta, rice, bread, potatoes.
Protein – (15-20%) This is broken down to **amino acids** by the body. These help the body with growth and repair. They are very important for building muscle in your client. Eg chicken, fish, eggs, meat, nuts, milk, tofu/ Quorn.
Fat – (15-20%) – Your client needs fat in their diet to help maintain skin, protection for vital organs, give body warmth and help absorb vitamins. Fats are either saturated (meat, butter, milk, cream and cheese), or unsaturated (oily fish, such as salmon and mackerel, nuts and seeds).
Fibre - This helps to keep the digestive system healthy, lower cholesterol levels and reduce the risk of bowel cancer eg Wholemeal bread rice , potato , nuts, baked beans , carrot
Water – (6-8 cups per day) – can also be fruit juices and other drinks. Your client will need this to cool their body, carry nutrients in the blood.
The **Eatwell** plate is one way to analyse your clients diet. It recommends

- five portions of a variety of fruit and vegetables a day
- Meals based on starchy foods, such as bread, rice, pasta and potatoes
- Some dairy foods (or alternatives), such as milk, cheese and yoghurt
- Sources of protein, such as fish, eggs, meat and pulses
- At least two portions of fish every week (one of which should be oily, such as salmon or mackerel)
- Only small amounts of foods that are high in fat, salt and sugar

Energy balance – If your client eats more than the recommended 2000 kcal per day and does limited/ no exercise they will gain weight. If your client is eating less than 2000kcal per day and or completing a lot of exercise they will lose weight and struggle to build muscle / repair the body after exercise.

Lifestyle Questionnaire
This is a crucial tool when analysing your Client's health and lifestyle . You will need to ask questions about the following factors –
1.Activity Levels
Sedentary Lifestyle This means your client does very little or no physical activity. Instead, much of their time may be spent sitting, reading, watching TV, playing video games, using a computer, etc. This can bring on **Chronic long-term diseases**, such as heart disease, stroke and type 2 diabetes, as well as weight gain, high blood pressure, anxiety, depression, osteoporosis.
2 Stress can cause or exacerbate many serious health problems, including: Mental health problems, such as depression, anxiety, and personality disorders. Cardiovascular disease, including heart disease, high blood pressure,
3 Smoking - lungs can be very badly affected by smoking. Coughs, colds, wheezing and asthma are just the start. Smoking can cause fatal diseases such as pneumonia, emphysema and lung cancer.
4. Alcohol - Organs known to be damaged by long-term alcohol misuse include the brain and nervous system, heart, liver and pancreas. Heavy drinking can also increase your blood pressure and blood cholesterol levels
Exercising will deduce the severity of many of the factors above . Guidelines state that for young people (aged 5 to 18 years) to stay healthy, they need to do:

- At least 60 minutes of physical activity every day – this can be made up of moderate activity, such as walking and vigorous activity, such as running.
- Exercises for strong muscles (such as sit-ups, press-ups) and exercises for strong bones (such as jumping, skipping,) – three times per week.

PAR-Q – This is a screening tool that your client must complete before the program starts about medical history and current conditions

Clients Goals – After analysing your Client's lifestyle and fitness levels you can now set meaningful goals for improvements. These are based on the acronym **SMART.**

- **Specific** - Matched to your Clients likes & dislikes, components of fitness to be developed and initial levels of fitness within these, plus Clients general health.
- **Measurable** – Your Client's goals will normally be based upon increasing their score in a fitness test.
- **Achievable & Realistic** – You must set goals that will stretch and motivate your client so not too easy or hard. Also think about how long the program will be.
- **Time Bound** - Goals need to have a start and end point. They can be Short-term (1 day to 1 month) Medium-term (1 to 6 months) or Long-term (6 months plus)

Planning your Clients Training Programme

Methods of Training
Interval - alternating between periods of hard exercise and periods of rest/recovery. Intervals can be short such as a 10 second sprint and very intense for speed, or longer such as 10 minutes for muscular endurance / cardiovascular endurance.
Circuits -uses a variety of different exercises or activities that are commonly known as 'stations' with rest periods in between. Can be used to develop strength, muscular endurance, power and cardiovascular (aerobic) endurance depending on type of exercise / duration of exercise and rest .
Continuous - involves working at a steady pace without resting in order to keep the heart rate high over a sustained period of time (usually at least 30 minutes). Can be cycling, running etc. Develops cardiovascular endurance.
Fartlek - this is continuous with no rest period – however, the intensity of the training is varied by working at different speeds or on different terrain. Develops cardiovascular endurance**.**
Resistance - also referred to as weight training . This is any form of exercise that involves lifting or pulling against resistance (for example, using dumbbells, weight machines, kettlebells etc). Develops strength, or muscular endurance or power
Body Weight – resistance from own body weight eg-plank, press ups, pull ups etc. Develops strength, or muscular endurance or power

Optimising Training
Repetitions – For example, one shoulder lift = one repetition. For strength = 5-8 reps of heavy weights , for power 3-4 reps of heavy weights , for muscular endurance = over 15 reps light weight until total fatigue
Sets – For example, every time you complete a series of 8 shoulder lifts, this is one set. For strength and Muscular Endurance – 2-6 sets.
Rest between sets needed - Strength / power training - 2 to 5 minutes to total recovery. Muscular endurance – under 1 minute (shorter rest = higher overload)
HR Zones For cardiovascular (aerobic) training it is 60-80% of MHR
For strength, power and muscular endurance it is 80-100% MHR

Health Related Components of Fitness and tests for each	Skill Related Components of Fitness and tests for each
Cardiovascular Endurance - Multistage, cooper test, Harvard step test	**Agility** - Illinois agility run
Muscular Strength -Hand dynamometer	**Speed** – 30m sprint
Muscular Endurance – Press ups, sit ups,	**Coordination –** Wall toss test
Body Composition – BMI, body callipers	**Power –** Vertical jump test
Flexibility –Sit and reach, Static shoulder	**Balance –** Stork Stand
	Reaction Time – Ruler drop test

Principles of Training (SPORT)
Specificity - This is all about making sure that training needs are relevant to an individual's sport, activity or fitness goals. For example, a marathon runner would make sure that their training helped to increase levels of cardiovascular endurance, while a weightlifter is more likely to will
Progression- This principle can be closely linked to overload and it is all about gradually increasing the level of overload that you include in a fitness programme. This avoids 'plateaus' where performance stays the same.
Overload - challenge your body beyond its current capacity when training. This is gained by increasing (FITT). When this happens, the body must adapt in response to this
Reversibility- This is the opposite to progression. Basically, if you reduce training levels too much or stop training altogether, then all of the positive effects that you have achieved can be lost This is sometimes referred to as 'detraining'.
Tedium - Tedium means boredom and the focus of this principle is to incorporate a variety of training methods to prevent boredom and lack of motivation in training
Principles of Overload (FITT)
Frequency - How often you train over a set period of time
Intensity - How hard you work during a training session. It's important to get the level right. If you don't work hard enough, no significant adaptations will occur;
Time -How long you train for/the duration of each training session
Type - This is all about using the right method of training to achieve the desired fitness goals. The chosen method should also suit individual needs, type of fitness to be developed, equipment available etc.

The Structrure of a Session in your Clients Program
Warm up - **Benefits** are that it gradually increases heart rate, mobilises joints, increases blood flow to the muscle and prevents injury.
Three Phases of a Warm up are mobilisation, pulse raiser, static and dynamic Stretches (10 seconds)
Main Activity – Choose your method of training , exercises very carefully in relation to clients levels of fitness from the tests, Component of fitness to be developed and likes / dislikes, medical history. Make sure you increase the overload using (FITT) each session.
Cool Down –**Benefits** are that it gradually decrease breathing rate, heart rate and body temperature all back to normal. It also removes waste products from the muscles
Three Phases – Static stretching (30 seconds), pulse lowering activity such as a gentle jog, loosen muscles with muscle shake outs.

Review of the Important Aspects of the Body Systems needed for your Clients Program

The Skeletal System – Joint Actions
Abduction: this is movement away from the mid-line of the body.
Adduction: this is movement towards the mid-line of the body.
Extension: this is when we straighten the limbs (arms/legs) at a joint.
Flexion: this is when we bend the limbs (arms/legs) at a joint.
Rotation: this is a circular movement around a fixed point, either inward or outward.

Types of Synovial Joint
Hinge - Located at elbow and knee. Allows flexion and extension
Ball and Socket – Located at the hip and shoulder. Allows rotation, abduction and adduction.

The Cardiovascular (CV) System
The main functions of the CV system during exercise are -

1. **Transport oxygen** and **nutrients** to fuel vital organs and muscles in the body.
2. **Transport carbon dioxide** and **waste products** away from organs & muscles.
3. **Regulate** body temperature.

4. Redistribution of Blood during Exercise (**vascular shunt)** during exercise . Here blood is diverted away from areas of the body with low demand, in order to increase blood flow to the muscles with greater demand eg – to the biceps when performing a bicep curl and away from the quadriceps in the leg

CV Measurements
Heart Rate (HR) - the number of times your heart beats in a minute. A normal resting heart rate is 70 to 100 beats per minute.
Cardiac output (CO) = Heart rate (HR) x Stroke volume (SV)
Maximum Heart Rate (MHR) = 220 minus your age

Energy Systems
Aerobic – produces the large amount of energy and needs oxygen in order to be able to do this (it makes energy by burning fuel with oxygen). Can be sustained for long periods of time in activities such as longer distance running. Carbon dioxide and water are waste products . Uses slow twitch muscle fibres
Anaerobic –used for activities that involve short, fast, powerful bursts of energy (such as sprinting, powerlifting, throwing), but only for around 10 seconds. Lactic acid is a by-product of this system . Uses fast twitch fibres

Location and Movement Functions of Key Muscles
Biceps – Found in Upper front Arm and allow flexion of the elbow
Triceps –Found in upper rear arm and allow extension of the elbow
Hip Flexor- – Found in hip and allow flexion of the hip
Gluteus Maximus – Found in rear of lower torso and allow extension of legs at hip
Abdominals – Found in lower front torso and allow flexion of the spine
Quadriceps – Found in upper front leg and allow extension of the knee
Hamstring - Found in upper rear leg and allow flexion of the knee
Pectorals – Found in upper torso and allow adduction of the arm
Deltoids - Founds in the neck and allow abduction of the deltoid

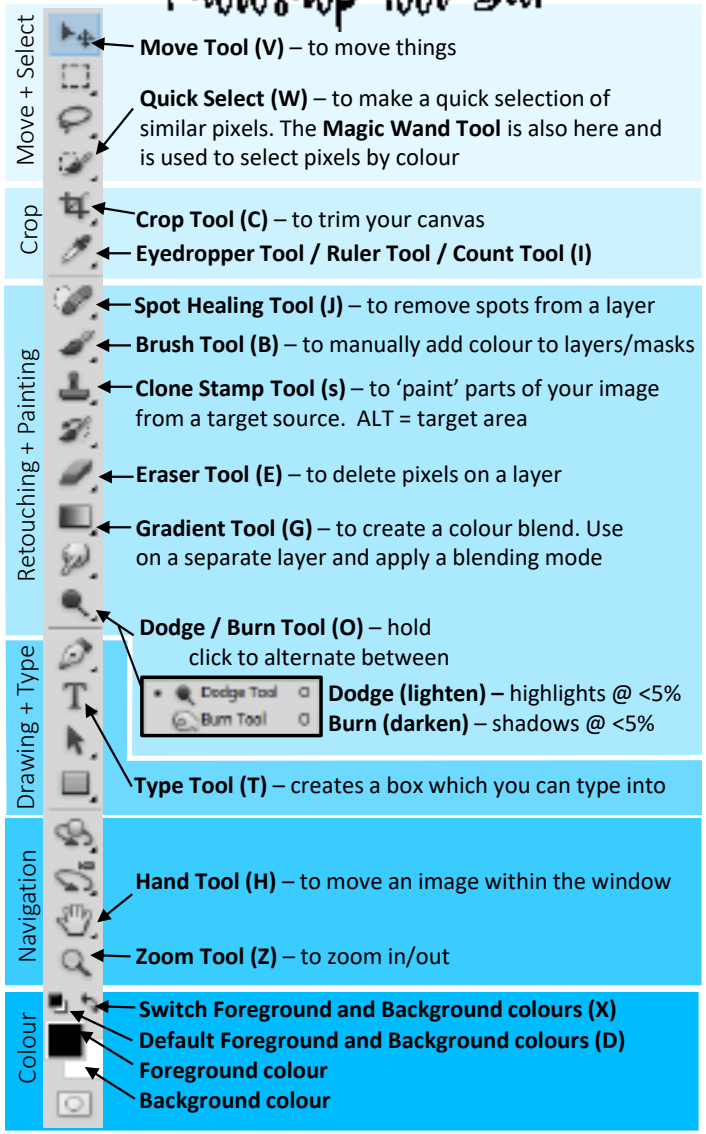
Antagonist Pairs
Each pair of muscles has an agonist (the muscles that pull, produce the movement and shorten) and antagonist (the muscle that relaxes and lengthens). An example of an Antagonist Pair is the biceps and triceps. When the elbow flexes the bicep is the agonist and triceps' is the antagonist .

Muscles Fibre Types
Type 1 - Slow twitch – used in low intensity long duration aerobic activities eg – marathon. Developed during CV and muscular endurance training.
Type 2 – Fast Twitch – used in high intensity low duration anaerobic activities eg sprinting. Developed during speed, strength and power training**.**

Long Term Effect of Exercise on the Body Systems	Aerobic Exercise	Anaerobic Exercise
Increased stroke volume / decreased resting HR	✓	
Increased vital capacity	✓	
Increased number of capillaries and alveoli's	✓	
Increased tolerance to lactic acid	✓	
Increased cardiovascular endurance / VO2 max	✓	
Muscle hypertrophy		✓
Increased strength of ligaments, tendons and bones		✓
Increased strength, speed, muscular endurance		✓

Photography - Photoshop

Photoshop Tool Bar



Move + Select

Move Tool (V) – to move things

Quick Select (W) – to make a quick selection of similar pixels. The **Magic Wand Tool** is also here and is used to select pixels by colour

Crop

Crop Tool (C) – to trim your canvas

Eyedropper Tool / Ruler Tool / Count Tool (I)

Retouching + Painting

Spot Healing Tool (J) – to remove spots from a layer

Brush Tool (B) – to manually add colour to layers/masks

Clone Stamp Tool (s) – to 'paint' parts of your image from a target source. ALT = target area

Eraser Tool (E) – to delete pixels on a layer

Gradient Tool (G) – to create a colour blend. Use on a separate layer and apply a blending mode

Dodge / Burn Tool (O) – hold click to alternate between

Dodge Tool
Burn Tool

Dodge (lighten) – highlights @ <5%
Burn (darken) – shadows @ <5%

Drawing + Type

Type Tool (T) – creates a box which you can type into

Navigation

Hand Tool (H) – to move an image within the window

Zoom Tool (Z) – to zoom in/out

Colour

Switch Foreground and Background colours (X)
Default Foreground and Background colours (D)
Foreground colour
Background colour

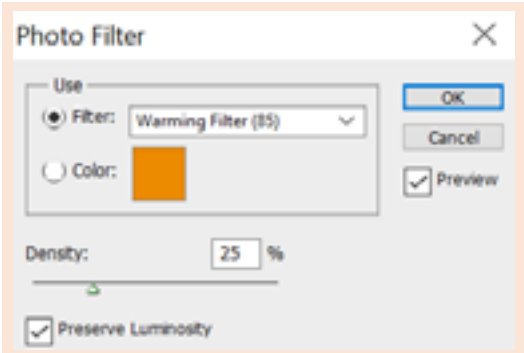
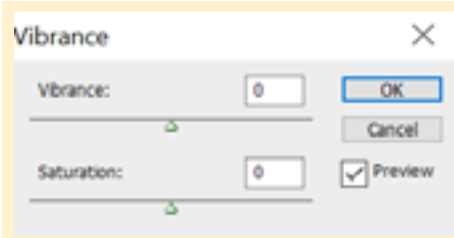
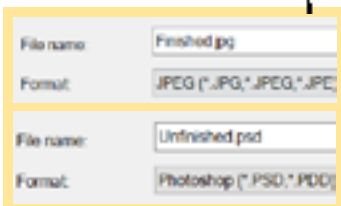


Photo Filter (*Image> Adjustments> Photo Filter*)
Use to mimic the effect of lighting gels



Vibrance (*Image> Adjustments> Vibrance)
Saturation is the intensity, or richness of the colour/hue. **Vibrance** will only increase the intensity of the more muted hues and leaves already bright hues alone- this protects skin tones.

Gcse Photoshop

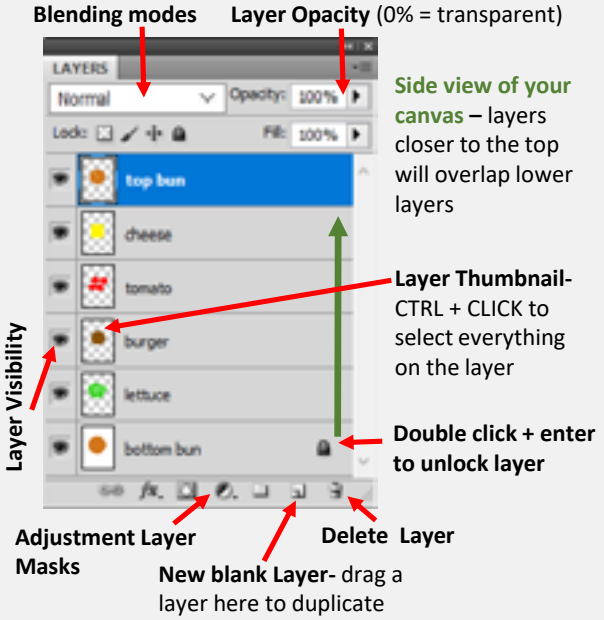


Saving Work
Finished work must be saved as a **JPEG** (not JPEG 2000).
Unfinished work needs to be saved as a Photoshop PSD file.

Useful Shortcuts

1. **CTRL+T –** Transform Tool- use to resize elements
   Hold down **shift** to keep your proportions
2. **CTRL+D** – Deselects your selection
3. **CTRL+ / CTRL—** – zoom in / out
4. **[/] (square brackets** when using a brush based tool)
   will make your brush size smaller / bigger
5. **CTRL+C** – copy a selected area
6. **CTRL+V** – paste a copied area
7. **Shift** (when using a brush based tool) – hold down shift to connect brush strokes to form a straight line
8. **Space** – hold space to pan around your screen
9. **ALT** – when using the Clone Stamp Tool, use ALT to define your source
10. **F7** – Layers- if you layers palette disappears
11. **CTRL+R** – rulers
12. **Filter> Blur> Gaussian Blur** – add a level of blur to a layer
13. **File> Automate> Merge to HRD Pro** – create a HRD image

Layers Palette



Photography - Assessment Objectives

Assessment Objectives

AO1: Develop

- Find relevant artists/photographers to look at
- Find links between the work of others and your theme
- Produce research pages showing your understanding
- Make personal comments about their work
- Use this work to inspire your work- create your own version

AO2: Refine

- 'Evidence of exploration'
- Explore different media and materials
- Use different techniques and processes
- Use 'digital' manipulation
- Show a connection between experimentation and outcomes
- Show skill and achievement
- Show accuracy in content

AO3: Record

- 'Ability to reflect on work and progress'
- Quality in photography
- Directly support ideas, try things more than one way
- Show skill when using materials or alternative media
- Annotate your work, evaluate how successful it is

AO4: Present

- 'Realisation of intensions' – does your work show a journey?
- Includes every best piece of work
- Is your work presented well? Stuck in straight, mounted nicely, with readable handwriting?
- Ensure your work relates to the preparatory work and artists studied
- Remember 'quality' not 'quantity'

How your book should look

PHOTOGRAPHER / DESIGNERS NAME

Artist work

Name and date if known

Artist work

Name and date if known

Artist work

Name and date if known

- BRIEF background of the artist. "_____ takes photographs which feature/ show us the importance of/ about..." Do not copy and paste from Google.
- Explain why you have picked the contextual references that you have, what do you like most about the work?
- How does the artist relate to the theme? For example- if you looked at Titarenko, his TECHNICAL ability might be something you'd explore (long shutter speeds) or it might be the MESSAGE/ MOOD of his work (being a shadow/ loneliness...). Both could relate to your theme- but what's your link?
- Analyse ONE image in detail- can you pick it apart? How was the photo taken? What lighting? How has light been used? What set up? How was it edited? Informed guesses!

YOUR RESPONSE

Your work

Labelled with meta data (ISO, aperture and shutter speed)

Y11 EXAM ONLY

Try to come up with at 3 ways you could respond to the Artist AND the theme.

For example (Confectionery & Billy Kidd- decay work)

1. Still life sweets- same background and lighting setup
2. Sweets next to fruit rotting away (and the sweets not)
3. Sweet jars filled with photos of decayed teeth and overweight people (the effects of too much)

This could be a spider diagram, or a small list.

Try at least one of these ideas- experiment and refine!

Evaluate your response and include

- Technical details- What did you do? How did you set up your shoot? How did you edit your work? What lighting setup did you use? Why?
- What are your thoughts towards your work? Is your work successful? Why?
  - If you're going to say it's not- fine- do another shoot that works better
- Does your work fit the theme? How? What was your idea?

You could add before and after images that show how you edited your photo (definitely do this if you've combined more than one photograph). You can tie work in the middle.

Photography - Vocabulary

Photography Vocabulary

Connectives	Form & Shape	Space	Texture	Mood	Technique	Colour	Light	Composition
However	2D / 3D	Above	Bumpy	Atmospheric	Animated	Bright	Balanced	Abstract
Although	Angular	Below	Cracked	Calm	Burnt	Clash	Bright	Background
On the other hand	Obscure	Between	Flat	Depressive	Collaged	Contrasting	Dull	Balanced
Whereas	Geometric	Illusion	Glossy	Emotive	Digital	Cool	Direct	Blurred
Similarly	Perspective	Negative	Grainy	Exciting	Edited	Dark	Dramatic	Bold
Furthermore	Proportion	Open	Hard	Fearful	Film	Dull	Fade	Centred
In addition	Simple	Positive	Matte	Humorous	Filmed	Highlight	Harsh	Depth /of field
Additionally	Silhouette	Shallow	Reflects	Joyful	Layers	Muted	High Key	Distance
It seems	Scale		Rough	Peaceful	Mixed media	Rich	Low Key	Empty
			Shiny	Provoking	Painted	Saturation	Limited	Foreground
			Smooth	Sad	Projected	Shadow	Natural	Horizon
			Spiky	Uplifting	Stop frame	Warm	Soft	Juxtaposed
					Sewn	Vibrant	Strong	Rule of Thirds
					Transfer	Black & White	Subtle	Perspective
							Tonal range	Strong
								Vanishing

Photography Key Words

1. **Exposure:** How light or dark an image is. Can be described hen too much or too little light is in your photo. The exposure is controlled by the aperture, shutter speed and ISO
2. **Aperture**: The size of the hole which controls how much light is allowed into the camera when taking a photograph. The higher the aperture the smaller the hole (less light): This is measured in f/stops, eg, f/16
3. **ISO**: ISO is a camera setting that will brighten or darken a photo. As you increase your ISO number, your photos will grow progressively brighter, but also grainier
4. **Shutter speed**: How long the cameras shutter is kept open . This is measured in seconds and fractions of seconds, eg, 1/125s
5. **Highlight/ shadow:** Light and shadow in your photo can be created and controlled with artificial light (lamps or flash) or natural light (sun)
6. **Contrast:** the difference between the darkest and lightest area in your photograph (high contrast = strong colours- punchy, Low contrast = grey/foggy)
7. **Focal Point:** The part of the photograph that the eye is immediately drawn to
8. **Subject matter:** What is represented in the photograph, a basic breakdown of what can be seen
9. **Composition:** To arrangement of the subject matter and how they relate to one another within the photograph
10. **Crop:** To select an area of an image and remove surrounding area
11. **Perspective:** The position or angle of the shot in relation to object being photographed- this is usually done looking through the viewfinder before you take your photo but can also be adjusted after using the crop feature of Photoshop
12. **Forced Perspective:** A technique that employs optical illusion to make an object appear bigger/smaller/closer/further away than it actually is
13. **Focus:** Areas of an image may be in focus (clear and sharp) and some areas may be out of focus (blurry and difficult to see or make out)
14. **Depth of field:** How much of the image is in focus. It can be described using a scale of two terms- shallow/small and deep/large
15. **Rule of thirds**: A technique used to create a successful composition. The rule states that the focal point should not be dead centre in the image but either one third from the top, bottom or from one side of the image ie, in one of the intersecting points. In landscapes, the horizon line should fall on one of the horizontal grid lines
16. **Leading lines:** A composition technique used to guide the audience to a specific area of your photo through the use of lines
17. **Bokeh:** the orbs created when light is out of focus in an image
18. **Collage:** an image that is created by using layers of other images and/or materials
19. **Mixed Media:** Using a variety of different media to create an artwork.

Photographer Bank

Landscape
Ansel Adams, Joe Cornish, Bill Brandt, Edward Weston, Guy Edwardes, Jem Southam, Adam Burton, Fay Godwin, Michael Kenna

Portrait
Martin Parr, Steve McCurry, Diane Arbus, Sally Mann, David Bailey, Richard Avedon, Nan Goldin, Jane Mown, Martin Schoeller, Alexander Rodchenko

Documentary
Henri Cartier-Bresson, Eve Arnold, Martin Marr, Steve McCurry, Robert Frank, Jan Grurup, John Hilliard,

Architecture
Alexander Rodchenko, Rob Watkins, Simon Doling, Ivan Baan

Fashion
Annie Leibovitz, Corrine Day, Mario Testino, Helmut Newton, Cecil Beaton, Richard Avedon, David Bailey, Lord Snowdon, Dani Carrig, Steven Meisel
Fashion/ Fairy-tale/Illustration
Annie Leibovitz, Tim Walker, Cindy Sherman, Zev Hoover, Slinkachu

Wildlife
Colin Varndell, Xavi Bou, Marina Cano, Nick Brandt

Photography - Lighting Setups

Camera techniques
Long exposures
Quick exposures
Panning
Tracking
Cinematic conventions
Panning with flash
Zoom during exposure
Experiment with depth of field (aperture)
Tilt shift
Macro /wide angle / fish eye
Home made cameras / pinhole / matchbox
Shoot from the Hip
Scanography
Moving image capture
Filters polarizing and neutral density
Microscopy
Blurring
Continuous sequence
Vignette
Low fi

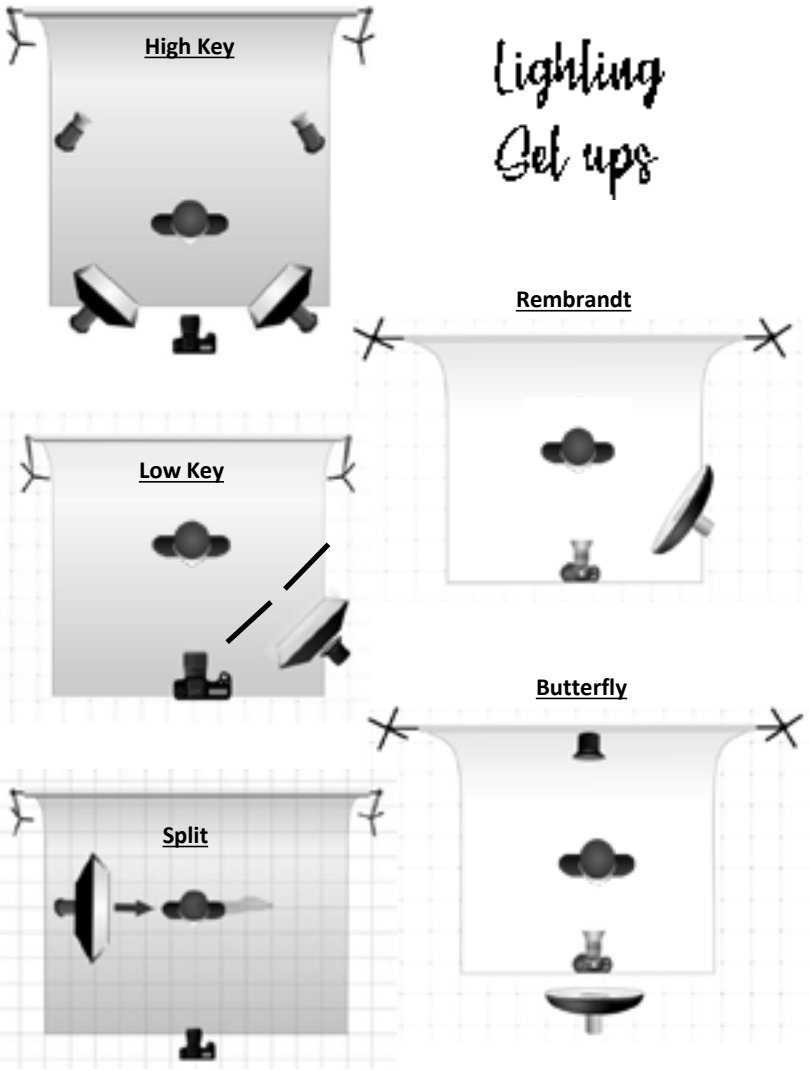
Photoshop
HDR
Panoramic stitching
Repetition and rotation kaleidoscopic
Pattern
Composite montage
Image manipulation
Colour correction
Merging images double exposure
Enhancing
Moving image (cinemographs / stop motion / time-lapse / film)
Over time
Infrared processing

Lighting
Portrait lighting Rembrandt,
Noir style
Hair lighting
Butterfly lighting
Levels of diffusion, (soft light hard light)
Background lighting
Natural
Silhouettes
Shadows
Jill Greenberg
Use of reflectors / mirrors
Use of key and fill lighting
Painting with light
Strobe lighting (Edgerton style)
Colour gels / acetates
Vignette

Further media / format
Sculpture
Sewing
Projection
Framing
Distressing printouts
Triptych
Narrative
Mobiles
Boxes
Books
Obscure formats
Printing on range of surfaces / tracing paper / acetate
Re-photography Combining secondary source
Combining image with text

Types of Photography
Abstract
Architecture
Black & White
Candid
Close-up
Children
Commercial
Cityscape
Composite
Documentary
Double Exposure
Editorial
Fashion
Fairy- Tale
Fine Art
Food
Golden Hour
Interior
Landscape
Long Exposure
Love
Macro
Photojournalism
Photo manipulation
Portraiture
Seascape
Sport
Still Life
Surreal
Street
Time-lapse
Wildlife
War

Ways to experiment



RE - Islam Beliefs 1

YR11 Spring Knowledge Organizer

The Life of Muhammad.

Muhammad was born an ordinary man who was illiterate yet his impact has been enormous. Muhammad is afforded the ultimate respect by Muslims and because of this they cannot draw him or depict him in any way. His name is often said with '*peace be upon him*' after as a mark of respect although many Muslims will say this about many prophets, especially Isa.

When the Qur'an was revealed to the Prophet, he couldn't read or write yet once he was commanded by Jibr'il he could.

Muhammad is regarded as the ultimate role model and many sayings/acts are attributed to him. He advised people to look after their animals (not a popular view in Arabia at the time) through the Crying Camel story.

When giving advice to a man who asked him 17 times how he should behave he said 17 times 'do not get angry'.

He was a warrior and took an army to seize the Ka'ba and re-dedicate it to Allah.

The Sunnah are the practises of the Prophet Muhammad.

The Hadiths are the sayings of the Prophet Muhammad.

Both incredibly important and give advice to Muslims on how to live.

Kutub; holy books (not Qur'an)

The Qur'an is the perfect revelation although it should be read in Arabic. Some Muslims are able to recite the entire Qur'an by heart because they learn it by rote.

Muslims believe it is the most important revelation but they don't ignore the Bible (they don't call it that, see below for names) and parts such as the Decalogue they observe more stringently e.g. not making images of God.

They believe other revelations have been misused in various ways and mistranslated.

Laylat al Qadr; night of power; when the Qur'an was revealed to Muhammad by Jibr'il and is celebrated during Ramadan.

Injil	Zabur (Psalms)	Tawrat (Torah)	Sahifah (scrolls of Ibrahim)
The teaching given to Isa, it is the last revelation before Muhammad's receiving of the Quran. Followers of Isa were criticized for their error of teaching.	These were given to Dawood and Muslims recognized that he glorified God and was a devout prophet. Sometimes portrayed as a model Muslim; fasting, praising God.	Revelation given to Musa and contains laws (Decalogue) and teaches the unity of God. Muslims believe it falls short of the original revelation but it is a guidance to follow it.	No remaining copies even though he was the 3rd most important prophet.

YR11 Spring Knowledge Organizer

AKHIRAH; afterlife

al-qadr (predestination)

- Everyone has free will
- Humans are not puppets or robots
- Each person can choose right/wrong.
- God holds everyone accountable for their decisions.
- Life is a test and we need to learn how to turn from evil.

Human freedom and the D of J

- The dead are raised and face God
- Every human should check if they are ready to face judgement.
- A book showing every action is presented
- Good/bad deeds are weighed
- Niyyah (intentions) are also weighed.
- If book goes to right hand you walk over as-Sirat bridge
- If book goes to left hand you fall off bridge into hell

Janna (heaven)

What? It is a state of peace joy and happiness. It will contain everything longed for on earth and is full of beautiful gardens, sparkling fountains and flowing rivers, reclining sofas and delicious food. Controversial idea of 72 maidens.

When? When the dead are raised, after the sounding of the trumpet by Israfil, the two angels Munkar and Nakir will question each individual. Dorrect answers can only be given by those who can recite the Shahadah and have true faith living in submission to God. For those who die before the Day of Judgement the angel of death, Azrail, takes their souls and keeps them in a state of barzakh (waiting)

What is the purpose? A reward for living a faithful and moral life or suffering persecution because of faith, or fighting in the cause of God (controversial jihad link). Your niyyah or intentions are counted as well as your acts.

Jahannam (hell)

What? A place of terror, with boiling water, fire and smoke as well as physical suffering. You are separated from God with chance to escape as it is permanent although some believe if you repent you can leave.

When? After judgement the souls will have to cross the Bridge of As-Sirat and those whose bad intentions and actions outweigh their good will fall off the bridge. For those who die before Day of Judgement Azrail will keep the souls in barzakh until ready.

What is the purpose? It is a punishment for those who haven't led a good life and have not followed the rules and laws of God.

Science - Biology - Inheritance 1

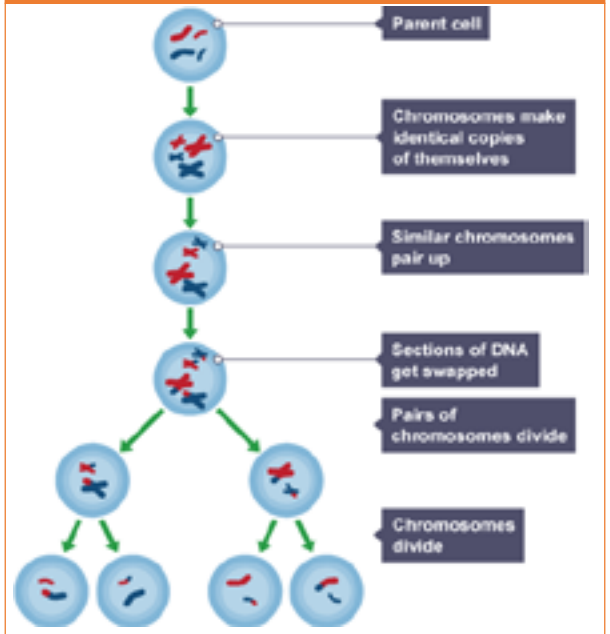
Section 1: Definitions

1	Sexual Reproduction	Fusing of gametes mixing the genetic information which leads to variety in the offspring. The formation of gametes involves meiosis.
2	Asexual Reproduction	Reproduction only using one set of parents. Identical offspring are produced
3	Meiosis	A form of cell division that halves the number of chromosomes to produce gametes
4	Gamete	Sperm and egg (in animals)
5	Alleles	Alleles, operate at a molecular level to develop characteristics that can be expressed as a phenotype
6	Homozygote	Two of the same alleles
7	Heterozygote	Two different alleles
8	Genotype	The genes responsible fro the characteristic (e.g. xy or xx)
9	Phenotype	The characteristic displayed by the gene (e.g. blue eyes or brown eyes)
10	Dominant	A dominant allele is always expressed, even if only one copy is present
11	Recessive	A recessive allele is only expressed if two copies are present (therefore no dominant allele present)

Section 2: Sexual & asexual reproduction

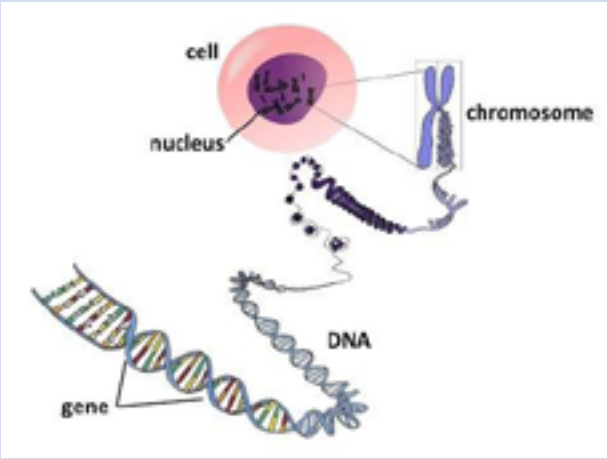
Sexual Reproduction	Asexual reproduction
Involves 2 parents Involves the fusion of male & female gametes. Information inherited from 2 parents. Offspring are genetically different to parent.	Involves 1 parent. Doesn't involve the fusion of gametes Information inherited from 1 parent. Offspring are clones of the parent organism

Section 3:Meiosis



Section 4: DNA

The genetic material in the nucleus of a cell is composed of a chemical called DNA.



DNA is a polymer made up of two strands forming a double helix.

The DNA is contained in structures called chromosomes

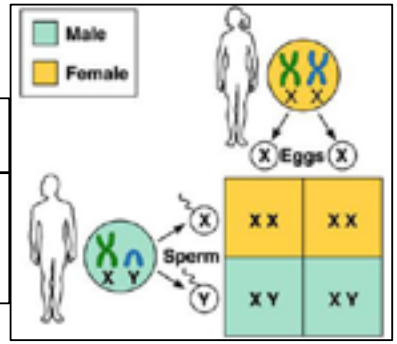
A gene is a small section of DNA on a chromosome. Each gene codes for a particular sequence of amino acids, to make a specific protein.

The genome of an organism is the entire genetic material of that organism.

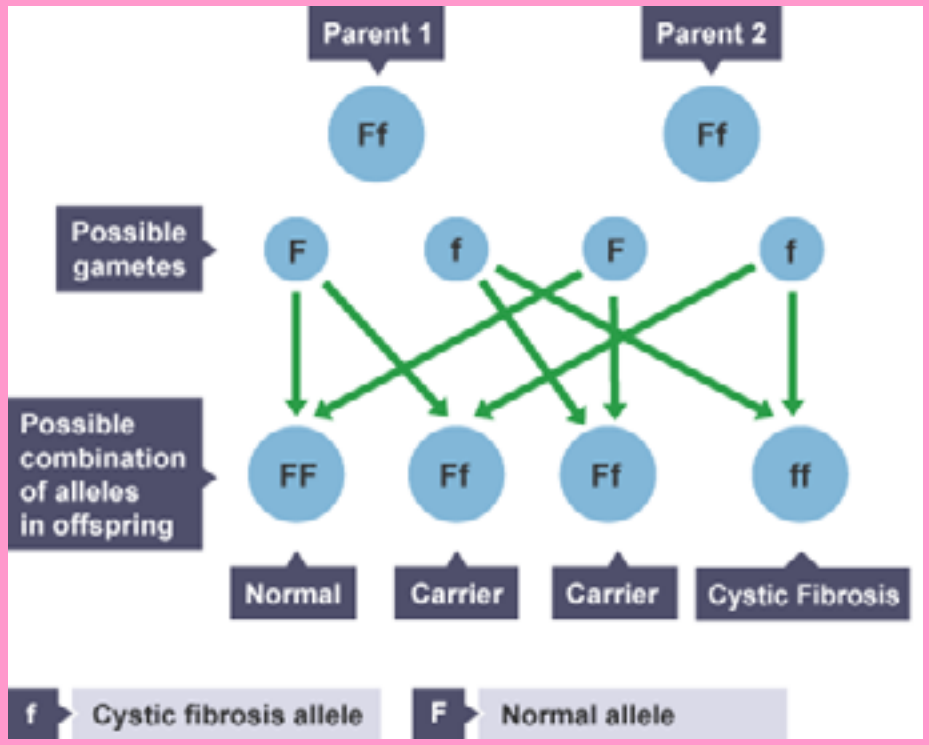
Paper 2: Inheritance Part 1

Section 5: Sex determination

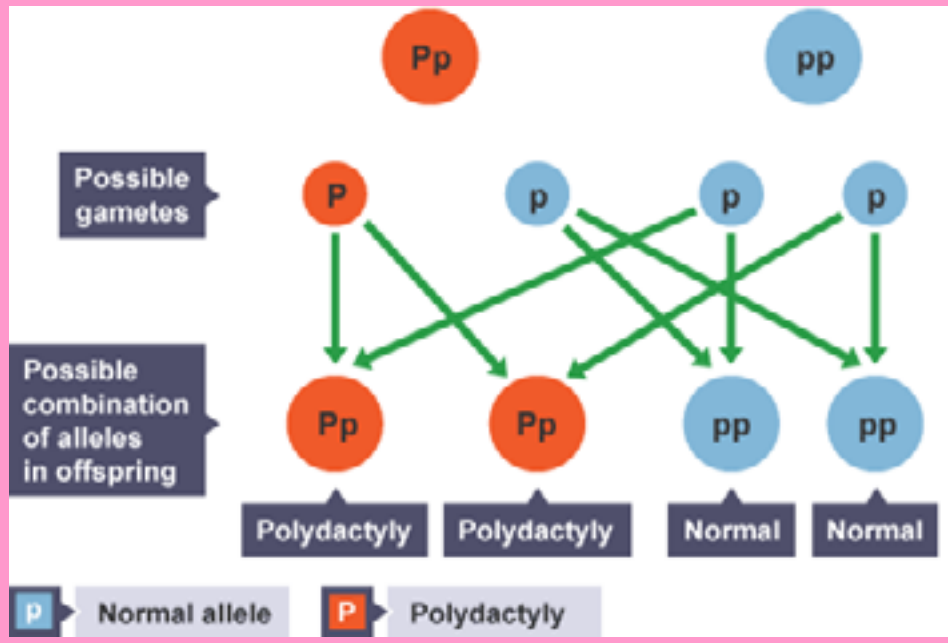
Ordinary human body cells contain 23 pairs of chromosomes. 22 pairs control characteristics only, but one of the pairs carries the genes that determine sex.
In females the sex chromosomes are the same (XX).
In males the chromosomes are different (XY)



Section 6: Inherited diseases



Cystic fibrosis (a disorder of cell membranes) is caused by a recessive allele



Polydactyly: (having extra fingers or toes) is caused by a dominant allele.

Variation and Evolution 1

Section 1. Definitions

1	Variation	The differences in the characteristics between individuals in a population.
2	Genome	is all the genetic material of an organism.
3	Inherited variation	Features that are passed from parents to their offspring through their genes
4	Environmental variation	Feature that are due to the surrounding and conditions where an organism lives.
5	Mutation	are changes in the DNA code
6	Selective breeding	The **process** where humans breed plants and animals for desired characteristics.
7	Clone	An individual produced by asexual reproduction. It is genetically identical to the parent.
8	Genetic engineering	changing the genome of an organism to introduce a desired characteristic
9	Vector	A vector is used to insert gene into cell; eg a bacterial plasmid or a virus

Variation
Differences in the characteristics of individuals may be due to:
- genes they have inherited
- environmental causes
- a combination of genetic and environmental causes.

Mutations
These are changes in the DNA code. They may lead to more rapid evolution, although mutations that result in a new phenotype are rare. Organisms of the same species can interbreed to produce fertile offspring.

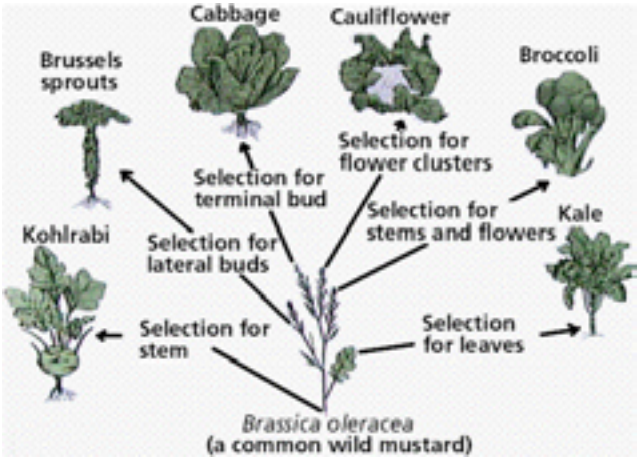
Section 2. Selective breeding

Selective breeding (artificial selection) is the **process** by which humans breed plants and animals for particular genetic characteristics.

Selective breeding involves; Process
1. choosing parents with the desired characteristic from a mixed population.
2. They are bred together.
3. From the offspring those with the desired characteristic are bred together.
4. This continues over many generations until all the offspring show the desired characteristic.

Benefits of selective breeding:
- Disease resistance in food crops.
- Animals which produce more meat or milk.
- Domestic dogs with a gentle nature.
- Large or unusual flowers.

Problems
Selective breeding can lead to 'inbreeding' where some breeds are particularly prone to disease or inherited defects.



Section 3. Genetic engineering

Genetic engineering involves changing the genome of an organism to introduce a desired characteristic.

Benefits
- Bacterial cells have been genetically engineered to produce useful substances such as human insulin to treat diabetes.
- Plant crops have been genetically engineered to be resistant to diseases or to produce bigger better fruits.
- Crops that have had their genes modified in this way are called genetically modified (GM) crops. GM crops generally show increased yields.

Concerns about GM crops –
effect on populations of wild flowers and insects, and uncertainty about safety of eating them.

Genetic engineering – Process Higher tier only
Genes can be cut from the chromosome of a human or other organism and transferred into the cells of other organisms.
1. Enzymes are used to isolate and cut the gene from a chromosome;
2. The gene is inserted into a vector, eg bacterial plasmid or virus
3. The vector is used to insert gene into cell
4. The cell then makes a new protein to produce the desired characteristic.

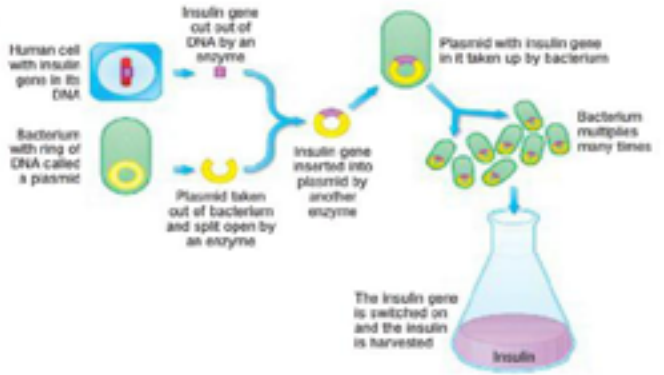


Figure 1 The principles of genetic engineering. A bacterial cell receives a gene from a human being so it makes the human hormone insulin.

Variation and Evolution 2

Section 1. Definitions

	Mutation	are changes in the DNA code
1	Evolution	Is a change in the inherited characteristics of a population over time through a **process** of natural selection which may result in the formation of a new species.
2	Natural selection	Organisms of a species which compete with each other and gain an advantage so are more likely to survive and breed.
3	species	The smallest group of organisms that can breed together and produce fertile offspring.
4	speciation	The **process** where populations evolve and become so different that interbreeding is no longer possible.
5	Fossils	Fossils are the 'remains' of organisms from millions of years ago, which are found in rocks.
6	Extinct	The permanent loss of all members of a species from an area or from the world.
7	classification	Organisation of living things into groups according to their similarities
8	Domains	New classification groups based on the biochemistry of cells and how they reproduce and which contain six kingdoms.
9	Evolutionary tree	Models used to explain the evolutionary links between groups of living things.

Carl Linnaeus produced the following order to classify organisms.
He grouped animals together based on their structure and characteristics.
When giving an organism it's scientific name, we use a binomial (2 name) system of Genus and Species.
For Example, the binomial name for a Human is *Homo sapiens.*

Rules:
1st name is the name of the genus and starts with a capital.
2nd name is the species name and it starts with a lowercase letter.
The two names are underlined if hand written or in *italics* if printed.

Section 2 Evolution

Evolution is a change in the inherited characteristics of a population over time through a **process** of **natural selection** which may result in the formation of a new species.
Darwin's theory of evolution by natural l species of living things have evolved from simpl eveloped more than three billion years ago.

Natural selection – The process
1. Within any population there is **variation** (caused by a **mutation**)
2. Organisms within the population compete for resources
3. The organisms that are **adapted** the best to compete will survive
4. These organisms will breed and **pass on** the adaptations to the

MRSA – An example of evolution
Bacteria can reproduce rapidly. Mutations cause new strains
Some strains maybe resistant to antibiotics and so are not killed.
They survive and pass on their gene to the next generation.

Speciation
If two populations of one species become so different in phenotype that they can no longer interbreed to produce fertile offspring they have formed two new species.

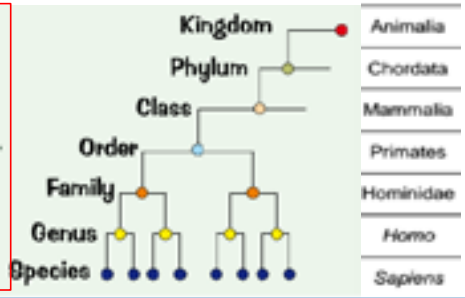
Fossils - are the 'remains' of organisms from many years ago, which are found in rocks.
Fossils may be formed:
- from parts of organisms that have not decayed because one or more of the conditions needed for decay are absent
- when parts of the organism are replaced by other materials as they decay
- as preserved trac ; foot ows and rootlet traces

Scientists cannot be certain about how life began on Earth because many early forms of life were soft-bodied, so few traces remain. What traces there were have been destroyed by geological activity.

Extinction may be caused by:
- changes to the environment over geological time
- new predators
- new diseases
- new, more successful competitors
- a single catastrophic event, eg volcanic eruptions or collisions with asteroids.

Section 3. Classification

King
Prawn
Curry
Or
Fat
Greasy
sausages



The three domain system
A new classification system by Carl Woese
Developed due to new evidence from:
- Improvements in technology (microscopes)
- Chemical analysis
- Understanding of biochemical processes

Archaea	Bacteria	Eukaryota
Primitive bacteria (extremophiles)	True bacteria	Protists Fungi Animals plants

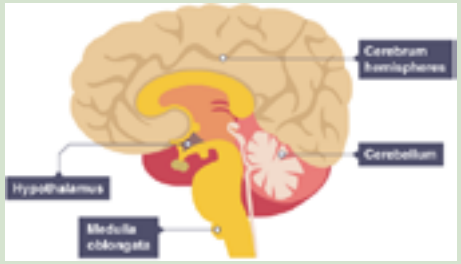
Science - Biology - Triple Content 1

Section 1: Definitions

1	The brain	It is made of billions of interconnected neurones and has different regions that carry out different functions
2	Cerebral cortex	Outer part responsible for consciousness, Intelligence, memory and language
3	Medulla	Controls unconscious activities (breathing and heartbeat)
4	Cerebellum	Responsible for muscle coordination.
5	Accommodation	The process of changing the shape of the lens to focus on near or distant objects.
6	Myopia	Short sightedness
7	Hyperopia	Long sightedness
8	Thermoregulatory centre	Area in the brain that contains receptors sensitive to the temperature of the blood
9	Kidney	Maintain water balance in the body
10	Gibberellins	Initiate seed germination
11	Ethene	Controls cell division and ripening of fruits

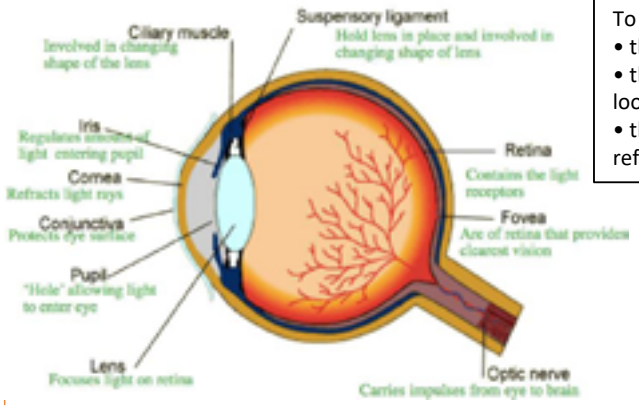
Paper 2: Biology Homeostasis

Section 2: The brain



Neuroscientists have been able to map the regions of the brain to particular functions by studying patients with brain damage, electrically stimulating different parts of the brain and using MRI scanning techniques.
The complexity and delicacy of the brain makes investigating and treating brain disorders very difficult.

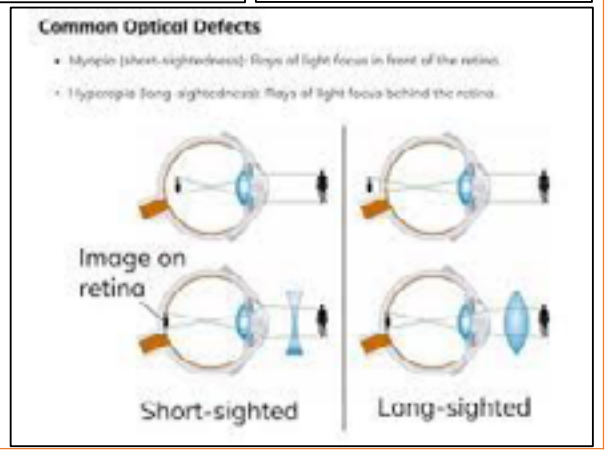
Section 3:The eye



To focus on a **near object**:
- the ciliary muscles contract
- the suspensory ligaments loosen
- the lens is then thicker and refracts light rays strongly.

To focus on **a distant object**:
- the ciliary muscles relax
- the suspensory ligaments are pulled tight
- lens is then pulled thin and only slightly refracts light rays.

Treatment for sight correction:
1. spectacle lenses which refract the light rays so that they do focus on the retina.
2. hard and soft contact lenses
3. Laser surgery to change the shape of the cornea 4. replacement lens in the eye.



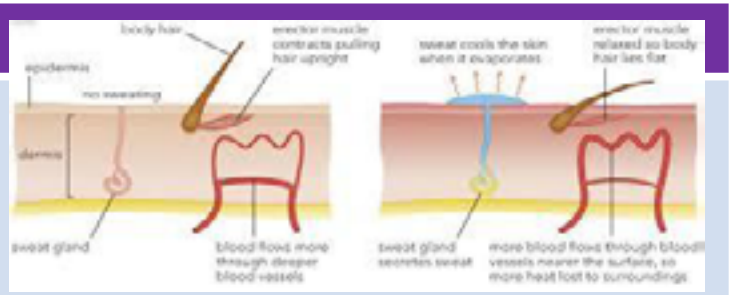
Section 4: Temperature

Body temperature is monitored and controlled by the thermoregulatory centre in the brain.

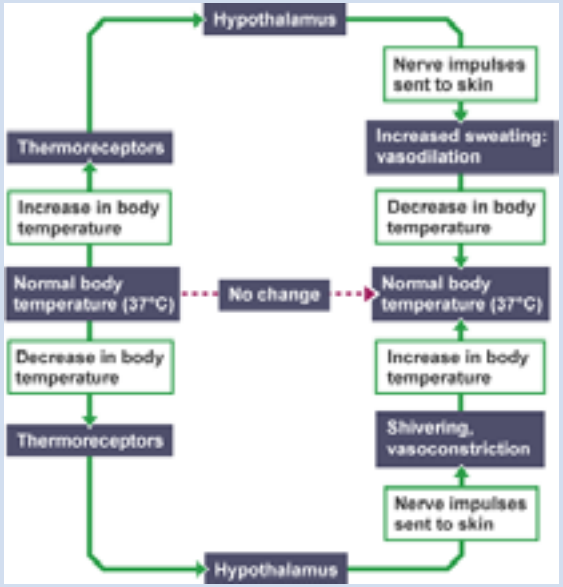
The skin contains temperature receptors and sends nervous impulses to the thermoregulatory centre.

Too high, blood vessels dilate (vasodilation) and sweat is produced from the sweat glands.

Too low, blood vessels constrict (vasoconstriction), sweating stops and skeletal muscles contract (shiver).



Section 4: Temperature Regulation

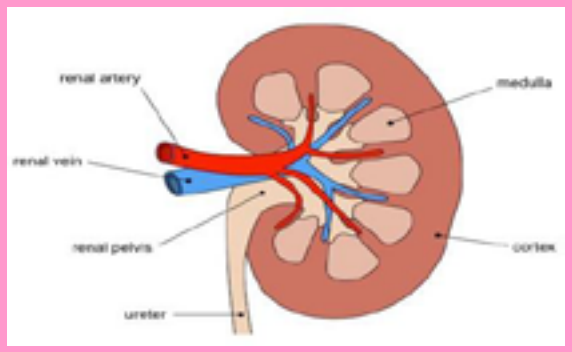


Section 5:The Kidney

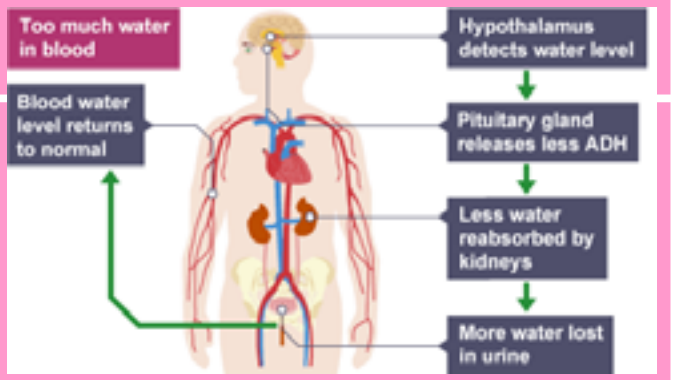
Osmotic changes in body fluids:

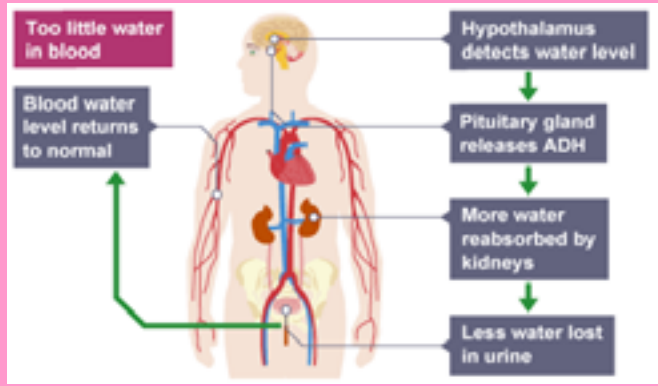
1. Water leaves the body via the lungs during exhalation.
2. Water, ions and urea are lost from the skin in sweat.

There is no control over water, ion or urea loss by the lungs or skin.
Excess water, ions and urea are removed via the kidneys in the urine.
If body cells lose or gain too much water by osmosis they do not function efficiently.



The kidneys produce urine by filtration of the blood and selective reabsorption of useful substances such as glucose, some ions and water.





Digestion of proteins from the diet results in excess amino acids which need to be excreted safely. In the liver these amino acids are deaminated to form ammonia. Ammonia is toxic and so it is immediately converted to urea for safe excretion

Section 6: Plant hormones and uses

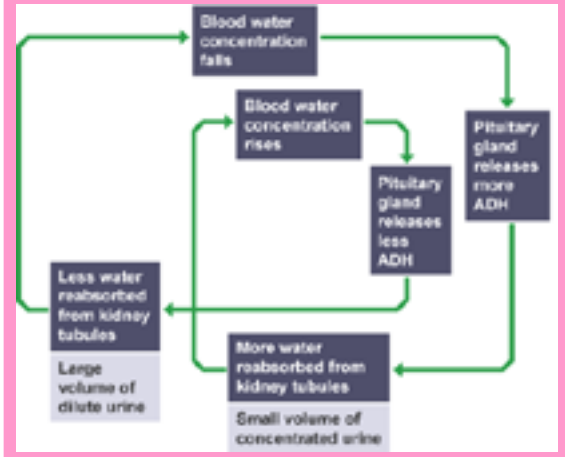
Plants produce hormones to coordinate and control growth and responses to light (phototropism) and gravity (gravitropism or geotropism)..

Unequal distributions of auxin cause unequal growth rates in plant roots and shoots

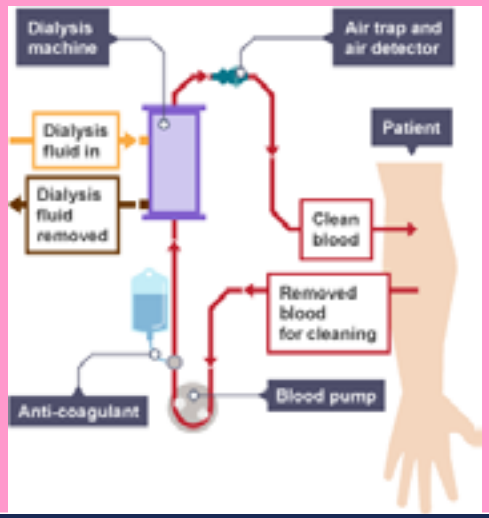
Auxins are used:
- as weed killers
- as rooting powders
- for promoting growth in tissue culture.

Ethene is used in the food industry to control ripening of fruit during storage and transport.

Gibberellins can be used to:
- end seed dormancy
- promote flowering
- increase fruit size



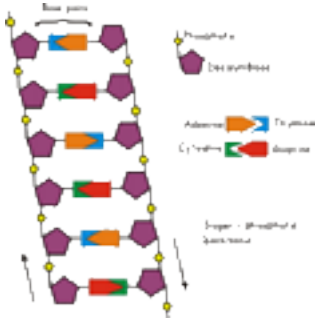
1. Dialysis - A dialysis machine carries out the same functions as a kidney. A person's blood flows between partially permeable membranes. Dialysis fluid is on the other side of the membranes.
2. Kidney transplants - Diseased kidneys can be replaced using a single healthy kidney from a donor. The donor kidney is joined to the blood vessels in the groin of the patient.



Paper 2: Biology Inheritance, Variation and Evolution

Section 1: Definitions

1	DNA	A polymer made from 4 different nucleotide
2	Nucleotide	Made from a common sugar, a phosphate group and one of four different bases attached to the sugar
3	Bases	A, T, G , C
4	Mutation	Change within the genetic code
5	Ribosome	Organelle that is the site of protein synthesis
6	Synthesis	Creation of new proteins
7	Natural selection	Theory proposed by Charles Darwin
8	Clone	Identical offspring to its parents



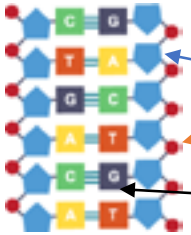
Section 2: Sexual and Asexual Reproduction

Advantages of sexual reproduction:
- produces variation in the offspring
- if the environment changes variation gives a survival advantage by natural selection
- natural selection can be speeded up by humans in selective breeding to increase food production.

Advantages of asexual reproduction:
- only one parent needed
- more time and energy efficient as do not need to find a mate
- faster than sexual reproduction
- many identical offspring can be produced when conditions are favourable.

Sexual reproduction	Asexual reproduction
Fungi reproduce sexually to generate variation	Fungi release spores by asexual reproduction
Plants use sexual reproduction to produce seeds	Plants such as strawberries reproduce asexually by sending out runners, or daffodils when their bulbs divide
Malarial parasites reproduce sexually in the host mosquito	Malarial parasites reproduce asexually in the human host

Section 3:DNA

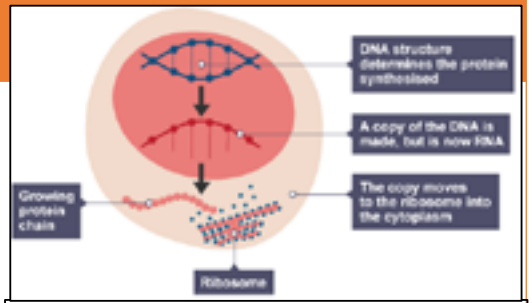


The long strands of DNA consist of alternating sugar and phosphate sections. Attached to each sugar is one of the four bases.

C is always linked to a G on the opposite strand and a T to an A.

Not all parts of DNA code for proteins. Non-coding parts of DNA can switch genes on and off, so variations in these areas of DNA may affect how genes are expressed

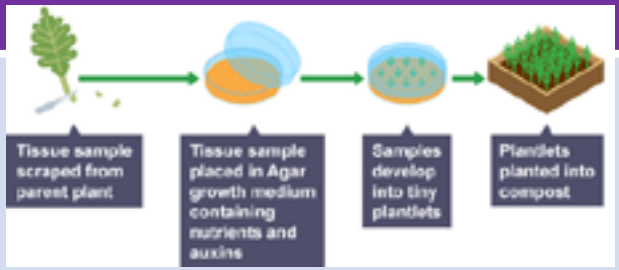
Mutations occur continuously. Most do not alter the protein, or only alter it slightly so that its appearance or function is not changed.
A few mutations code for an altered protein with a different shape.
An enzyme may no longer fit the substrate binding site or a structural protein may lose its strength



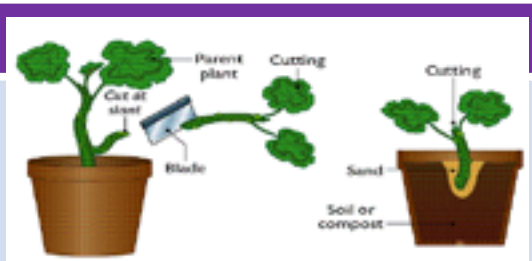
Proteins are synthesised on ribosomes, according to a template.
Carrier molecules bring specific amino acids to add to the growing protein chain in the correct order.
When the protein chain is complete it folds up to form a unique shape.
This unique shape enables the proteins to do their job as enzymes, hormones or forming structures in the body such as collagen.

Section 4: Cloning

Tissue culture: using small groups of cells from part of a plant to grow identical new plants. This is important for preserving rare plant species or commercially in nurseries.

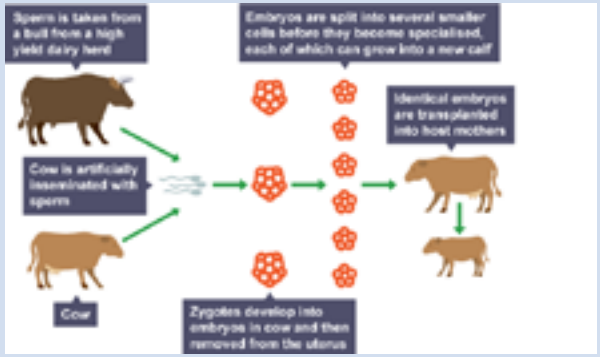


Cuttings: an older, but simple, method used by gardeners to produce many identical new plants from a parent plant.



Science - Biology - Triple Content 4

Section 4: Animal cloning



Embryo transplants: splitting apart cells from a developing animal embryo before they become specialised, then transplanting the identical embryos into host mothers.

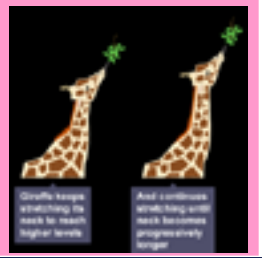
Adult cell cloning:
- The nucleus is removed from an unfertilised egg cell.
- The nucleus from an adult body cell, such as a skin cell, is inserted into the egg cell.
- An electric shock stimulates the egg cell to divide to form an embryo.
- These embryo cells contain the same genetic information as the adult skin cell.
- When the embryo has developed into a ball of cells, it is inserted into the womb of an adult female to continue its development.

Section 5: Theory of Evolution

Charles Darwin, "On the Origin of Species" (1859), theory of evolution by natural selection:
- Individual organisms within a particular species show a wide range of variation for a characteristic.
- Individuals with characteristics most suited to the environment are more likely to survive to breed successfully.
- The characteristics that have enabled these individuals to survive are then passed on to the next generation.

The theory of evolution by natural selection was only gradually accepted because:
- the theory challenged the idea that God made all the animals and plants that live on Earth
- there was insufficient evidence at the time the theory was published to convince many scientists
- the mechanism of inheritance and variation was not known until 50 years after the theory was published.

Other theories: Jean-Baptiste Lamarck, based on the idea that changes that occur in an organism during its lifetime can be inherited (giraffes). Now disproved.

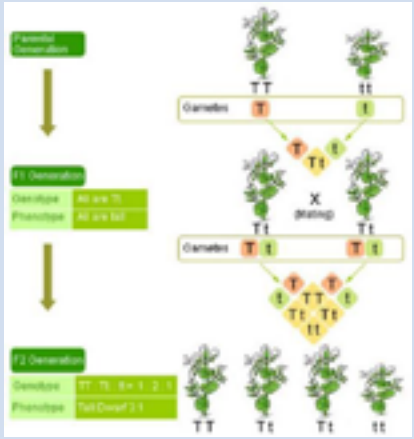


Section 6:Speciation

Alfred Russel Wallace independently proposed the theory of evolution by natural selection. He published joint writings with Darwin .
Alfred Wallace did much pioneering work on speciation but more evidence over time has led to our current understanding of the theory of speciation.

Section 7: Genetic understanding

In the mid-19th century Gregor Mendel carried out breeding experiments on plants. One of his observations was that the inheritance of each characteristic is determined by 'units' that are passed on to descendants unchanged. In the late 19th century behaviour of chromosomes during cell division was observed.



Our current understanding of genetics has developed over time.
In the early 20th century it was observed that chromosomes and Mendel's 'units' behaved in similar ways. This led to the idea that the 'units', now called genes, were located on chromosomes. In the mid-20th century the structure of DNA was determined and the mechanism of gene function worked out.

Science - Biology - Triple Content 5

Section 1: Definitions

1	Producers	Green plants - they make glucose during photosynthesis
2	Primary Consumers	Usually eat plant material - they are herbivores
3	Herbivore	Only eat plants
4	Omnivore	Eat plants and animals
5	Carnivore	Only eats other animals
6	Decomposers	Break down dead plant and animal matter by secreting enzymes into the environment. Small soluble food molecules then diffuse into the microorganism
7	Predators	Kill for food. They are either secondary or tertiary consumers.
8	Prey	The animals that predators feed on.
9	Scavengers	Feed on dead animals. For example, crows, vultures and hyenas are scavengers.
10	Apex predators	Carnivores with no predators
11	Food security	Having enough food to feed a population

Paper 2: Biology: Ecology

Section 3: Impact of Environmental Change

Environmental changes affect the distribution of species in an ecosystem.
These changes include:
- temperature
- availability of water
- composition of atmospheric gases.

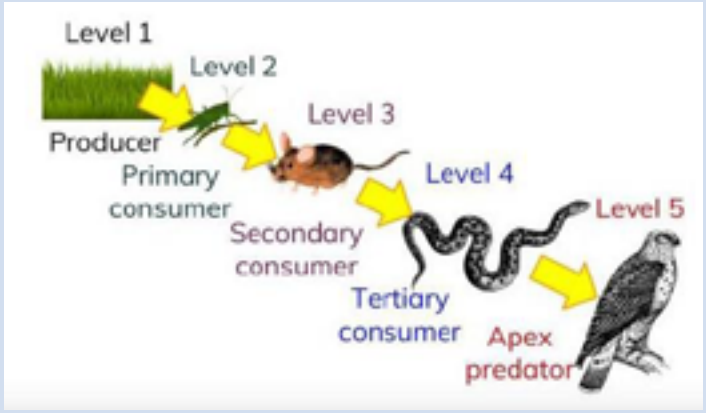
Section 2: Decomposition

Gardeners and farmers try to provide optimum conditions for rapid decay of waste biological material.

The compost produced is used as a natural fertiliser for growing garden plants or crops. Anaerobic decay produces methane gas.

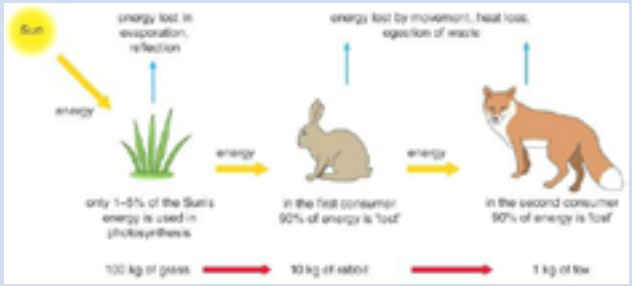
Biogas generators can be used to produce methane gas as a fuel.

Section 4: Trophic levels and Biomass



Losses of biomass are due to:
- not all the ingested material is absorbed, some is egested as faeces
- some absorbed material is lost as waste, such as carbon dioxide and water in respiration and water and urea in urine.

Large amounts of glucose are used in respiration.



Only approximately 10% of the biomass from each trophic level is transferred to the level above it

Producers are mostly plants and algae which transfer about 1% of the incident energy from light for photosynthesis.

$$efficiency = \frac{energy\ transferred\ to\ next\ level}{total\ energy\ in} \times 100$$

Science - Biology - Triple Content 6

Section 5:Food security

Biological factors which are threatening food security:
• the increasing birth rate has threatened food security in some countries
• changing diets in developed countries means scarce food resources are transported around the world
• new pests and pathogens that affect farming
• environmental changes that affect food production, such as widespread famine occurring in some countries if rains fail • the cost of agricultural inputs
• conflicts that have arisen in some parts of the world which affect the availability of water or food.

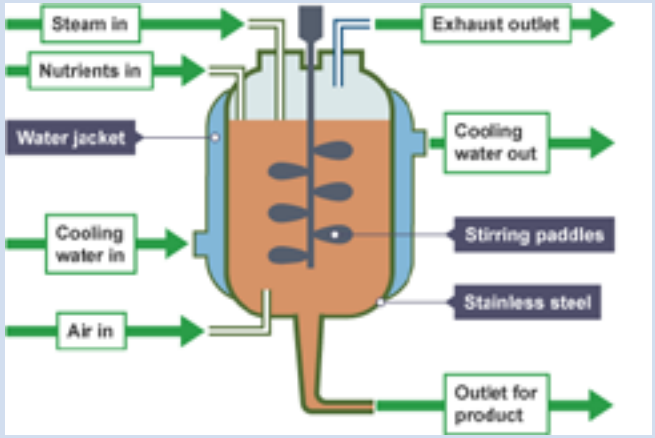
Section 6: Farming food and Fisheries

The efficiency of food production can be improved by restricting energy transfer from food animals to the environment.
This can be done by limiting their movement and by controlling the temperature of their surroundings.
Some animals are fed high protein foods to increase growth.

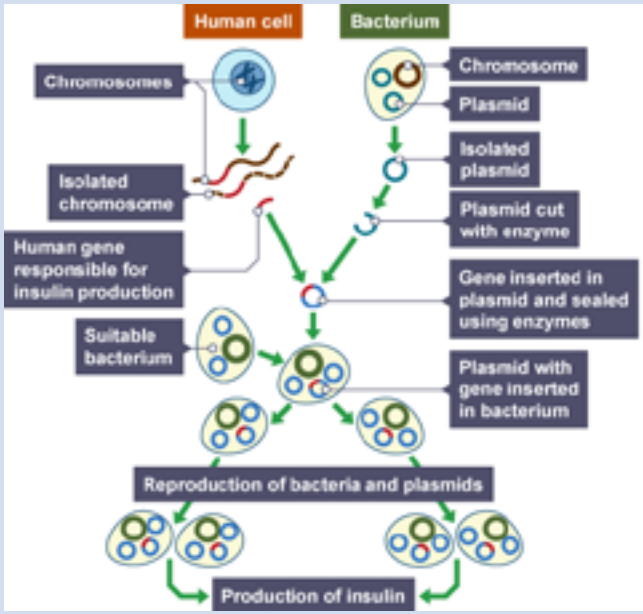
Fish stocks in the oceans are declining. It is important to maintain fish stocks at a level where breeding continues or certain species may disappear altogether in some areas. Control of net size and the introduction of fishing quotas play important roles in conservation of fish stocks at a sustainable level.

Section 7: Biotechnical and Agricultural Solutions

Modern biotechnology techniques enable large quantities of microorganisms to be cultured for food



The fungus Fusarium is useful for producing mycoprotein, a protein-rich food suitable for vegetarians.
The fungus is grown on glucose syrup, in aerobic conditions, and the biomass is harvested and purified.



A genetically modified bacterium produces human insulin.
When harvested and purified this is used to treat people with diabetes.

GM crops could provide more food or food with an improved nutritional value such as golden rice.

Chemistry Paper 2 – Organic Chemistry

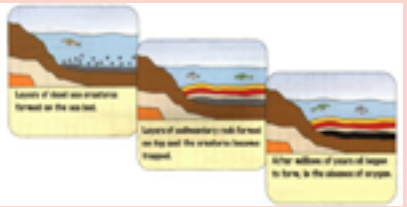
Section 1 – Key Terms

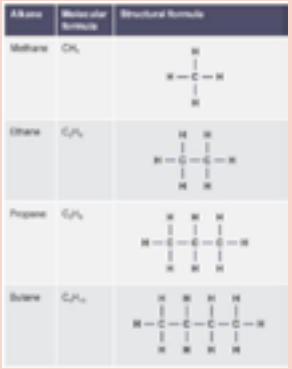
Key term	Definition
Biomass	A resource made from living or recently living organisms.
Hydrocarbon	A compound containing hydrogen and oxygen only.
Alkanes	A homologous series of saturated hydrocarbons with the general formula C_nH_{2n+2} . Contain single bonds
Alkenes	A homologous series of unsaturated hydrocarbons with the general formula $C_nH_{2n..}$ Contains a double bond
Saturated	A molecule that only contains single covalent bonds. It contains no double covalent bonds
Displayed Formula	Drawing of a molecule showing all atoms and bonds.
Fractional Distillation	A method used to separate liquids with different boiling points.
Fraction	A mixture of molecules with similar boiling points.
Complete Combustion	When a substance burns with a good supply of oxygen. Products are carbon dioxide and water.
Flammability	How easily a substance catches fire; the more flammable, the more easily it catches fire.
Viscosity	How easily a liquid flows; the higher the viscosity the less easily it flows
Polymer	A long chain molecule in which lots of small molecules (monomers) are joined together

Section 2: Uses of crude oil fractions

Section 3 - Hydrocarbons

- Crude Oil is made from the remains of living sea creatures decayed in mud millions of years ago
- It is a finite resource
- It is made of a mixture of hydrocarbons
- Hydrocarbons are made of hydrogen and carbon only
- The main hydrocarbons in Crude Oil are alkanes

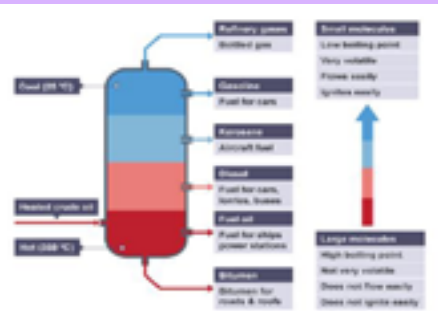




Section 4 - Fractional Distillation

Method used to separate the mixture of hydrocarbons in crude oil. Works by evaporation and then condensation.

1. Heat the crude oil to evaporate it.
2. The gases rise up the column.
3. The different fractions condense at different temperatures.



Chemistry Paper 2 – Organic Chemistry

Section 5 - Combustion

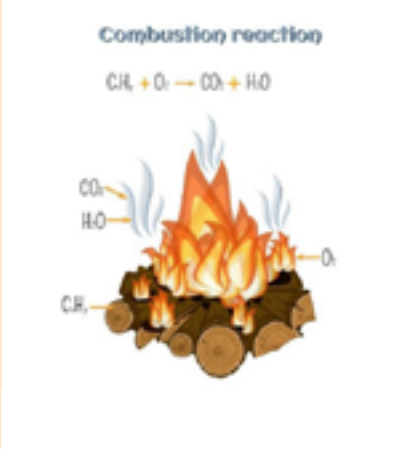
Combustion (burning) is a reaction with oxygen

A reaction with oxygen is called 'oxidation'

When hydrocarbons burn a lot of energy is released.

Complete combustion happens if there is plenty of oxygen

During complete combustion of hydrocarbons the products are **carbon dioxide and water**

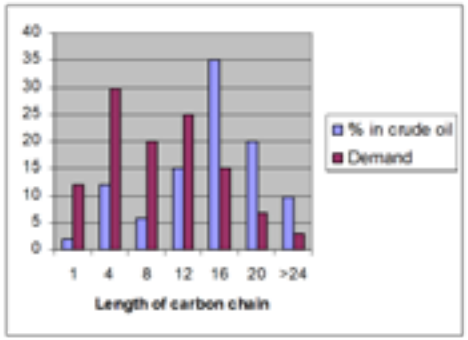


General equation
Fuel + Oxygen → Water + Carbon dioxide

General equation
Propane + Oxygen → Water + Carbon dioxide
$C_3H_8 + 5O_2 \rightarrow 3CO_2 \rightarrow 4H_2O$

Example Question: $C_{16}H_{34}$ is an alkane which can be used as the starting chemical in cracking. One of the products of cracking this compound is an **alkane** which has **10 carbon** atoms in it. **Write a balanced symbol equation for this cracking reaction.**

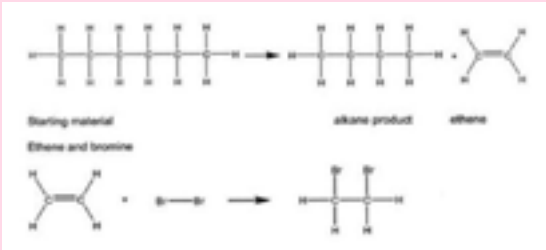
Answer:
$C_{16}H_{34} \rightarrow C_{10}H_{22} + C_6H_{12}$



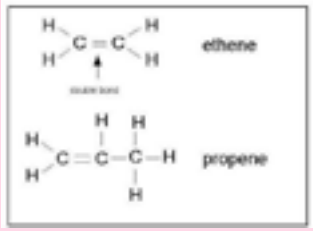
Section 6 - Cracking

The larger molecules from fractional distillation are less useful. We can break them down into smaller, more useful molecules – this is called cracking.

Cracking produces a mixture of **alkanes and alkenes**.

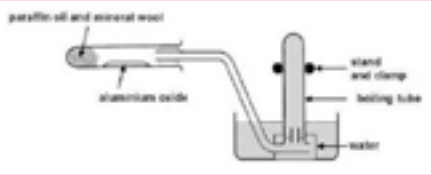


Alkenes contain a double bond



Bromine water is used to test for alkenes.

Apparatus used for cracking:



Conditions for cracking: High temp and a catalyst!

1. Catalytic cracking – catalyst and high temp

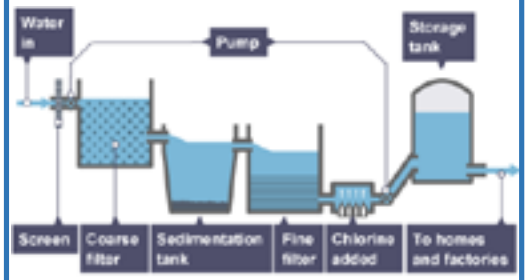
2. Steam cracking – Steam cracking – steam and high temp

Using resources 1
water

Section 1 Potable water

Fresh water has to be treated to make it safe to drink. This is **potable water.**
This is done by passing it through

- **filter beds** to remove solids and
- **Sterilizing it** by adding chlorine. Ozone and UV light



Converting salty water to usable water is called **desalination.**
Salty water can be purified by

- **Distillation** – this requires a lot of energy and so is expensive
- **Reverse osmosis** – this uses membranes to separate the water and the dissolved salt. This requires energy and high pressure.

Section 2 Waste water treatment

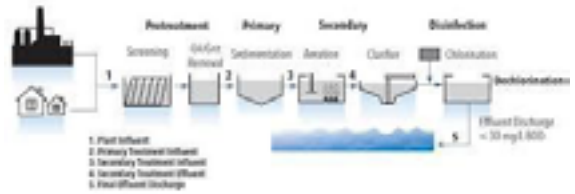
Urban lifestyles and industrial processes produce large amounts of waste water (sewage) that require treatment before being released into the environment.
Sewage treatment includes:

1. Screening
large objects and grit are removed by passing them through a metal grid.

2. Primary Treatment –
the solids are allowed to settle out from the mixture, then large paddles push the solids (sludge) to a storage tank for further treatment. The watery liquid is pumped to the next tank.

3. Secondary treatment
bacteria feed on remaining organic matter and harmful micro-organisms, breaking them down aerobically. Air is bubbled through the water waste

4. Final treatment
The useful bacteria are allowed to settle out to the bottom of the tank as sediment which is recycled back into the secondary treatment or passed into the sludge tank. The water is then safe enough to be passed into the river.

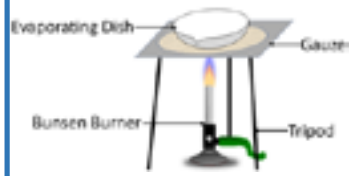


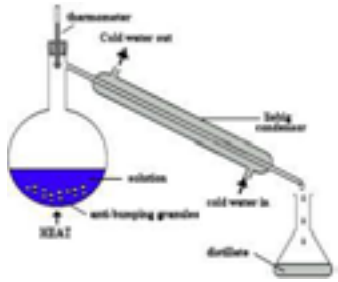
Section 3 Required practical 13
The analysis and purification of water

Analysing the pH of water samples
Test the pH of each water sample using a pH meter or universal indicator (using a pH chart)

Analysing the mass of dissolved solids

1. Measure 50cm^3 of the water sample using a measuring cylinder
2. Measure the mass of an evaporating dish using a balance
3. Pour the 50cm^3 water into the evaporating dish
4. Heat gently using a Bunsen burner until all the water has evaporated
5. When cool measure the mass of the evaporating dish again
6. Calculate the mass of the dissolved solids





Purifying water – distillation

- Set up apparatus as in the diagram
- Put the water sample in the round bottom flask
- Heat the sample gently
- The water will evaporate at 100 °C
- The dissolved solids will be left behind
- As the water vapour(steam) cools in the condenser it will turn back into a liquid.
- This is pure water.

Using resources 2

Section 1 Definitions

Finite resource	A resource that cannot be replaced once it has been used.
Renewable resource	A resource that we can replace once we have used it.
Sustainable development	Using resources to meet the needs of people today without preventing people in the future from meeting theirs.
Potable water	Water that has been made safe to drink or for use in food preparation.
Desalination	Process to remove dissolved substances from sea water.
Life cycle assessment	An examination of the impact of a product on the environment throughout its life.
Value judgement	An assessment of a situation that may be subjective, based on a persons opinion and / or values.
Ore	A rock from which a metal can be extracted for profit.
Phytomining	The use of plants to absorb metal compounds from soil as part of metal extraction.
Bioleaching	The use of dilute acid to produce soluble metal compounds from insoluble metal compounds.
Leachate	A solution produced by leaching or bioleaching.

Section 4 Life cycle assessments

A life cycle assessment is a way of analysing the 'life' of a product to see how much water and energy is used and the effects on the environment of each stage:

- Getting and using raw materials
- Making the product (and any packaging)
- Distributing the product
- Using, reusing and maintaining the product
- Disposal of the product at the end of its useful life

Section 5 Re-using resources

To reduce the use of limited resources, energy, waste and impact on the environment we must:

- Reuse eg. glass bottles (washed / sterilised/reused)
- Recycle
- Reduce use

Metals, glass, building materials, clay ceramics and most plastics are made from limited **natural resources**.
Other products cannot be reused in this way, but they can be **recycled**.

Advantages of recycling	Disadvantages of recycling
• fewer **quarries** and mines are needed to extract finite reserves of metal ores • less **crude oil** needs to be extracted from the crust as a raw material for making plastics • less energy is needed for recycling compared with making a new product from natural resources, so the emission of **greenhouse gases** is reduced • the amount of waste that is disposed of in **landfill** is reduced	• the collection and transport of used items needs organisation, workers, vehicles and fuel • it can be difficult to sort different metals from one another • the sorted metal may need to be transported • The amount of sorting required depends on the purity of the mixture of metals/materials, and also on how pure you need the final recycled metal to be. This needs energy

Section 6 Extracting metals H only

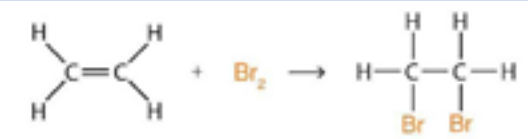
Phytomining	Bioleaching
A technique used to extract copper from the remaining low grade ores. Some plants absorb copper compounds through their roots. They concentrate these compounds as a result of this. The plants can be burned to produce an ash that contains the copper compounds.	A technique used to extract copper from the remaining low grade ores. Some bacteria absorb copper compounds. They then produce solutions called leachates. The leachate solution contains copper ions, which can be extracted.

Chemistry paper 2 triple extra content
Organic chemistry:

Section 1: Reactions of alkenes

Alkenes react with hydrogen, water and halogens by the addition of atoms across the double bond, making the double bond a C-C single bond. This is an addition reaction.

Alkene + hydrogen → alkane



Alkene + bromine → dibromoalkane

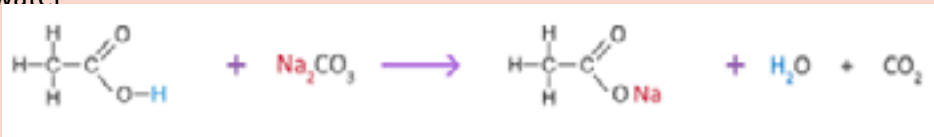
Alkene + steam → alcohol

Section 2: Carboxylic acids

Carboxylic acids have the functional group –COOH. They are weak acids, which means they partially ionise when dissolved in water. They react in a number of ways:

- Carboxylic acid + Metal carbonate: form carbon dioxide (this is the test for carboxylic acids) e.g.

Ethanoic acid + sodium carbonate → sodium ethanoate + carbon dioxide + water



- Carboxylic acid + alcohol → ester + water

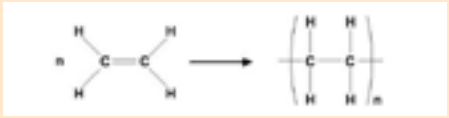
e.g. ethanoic acid + ethanol → ethylethanoate + water

Esters are used as perfumes, additives and can be polymerised to form polyesters. The first part of the name of the ester comes from the alcohol, the second part comes from the acid.

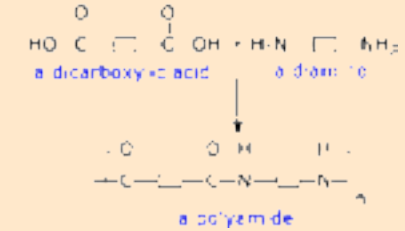
Section 3: Polymers and polymerisation

A polymer is a long carbo chain which has been made from many small molecule (monomers) joining together.

Addition polymerisation: alkene molecules join together to form polymers e.g. ethane → polyethene



Condensation polymerisation: involves monomers with two functional groups. When they react they lose small molecules such as water.

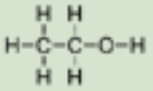


Naturally occurring polymers :

1) Amino acids → proteins: amino acids have two different functional groups in their structure, An amine group and an acid group. They react in condensation reactions to form polypeptides.
2) DNA: most DNA molecules are two polymer chains, made from four different monomers (A,T,G,C) called nucleotides, in the form of a double helix.
3) Starch and cellulose are also biological polymers

Section 4: Alcohols

Alcohols have the functional group –OH



- Alcohol + oxygen → carboxylic acids + water
- Alcohol + sodium → sodium alkoxides + hydrogen
- Sodium will sink in alcohol but float on water

Alcohol production: by fermentation of sugars using yeast. Must be warm and anaerobic. Ethanol is used in drinks and as a biofuel

Chemistry paper 2 triple extra content

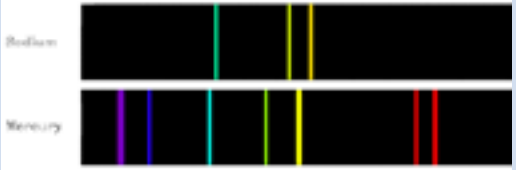
Chemical analysis:

Section 1 spectroscopy/flame tests

Flame tests can identify metal ions. Use a strong acid to clean the nichrome wire in between tests.

- Lithium = crimson
- Sodium = yellow
- Potassium = lilac
- Calcium = orange-red
- Copper = green

Light from a flame test can be passed through a spectroscope to determine the line spectrum of the cation. Each element gives out light at a characteristic wavelength so each element has a different line spectrum.



Section 2 Identification by chemical means

Sodium hydroxide can be added to some compounds to identify the metal ions. Different coloured precipitates form:

Metal	Colour
Copper	Blue
Iron (II)	Light green
Iron (III)	Brown

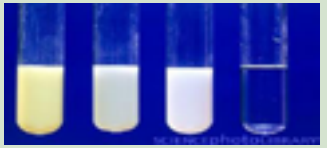
Aluminium, calcium and magnesium ions all form white precipitate when sodium hydroxide is added.
Aluminium hydroxide precipitate will dissolve in excess sodium hydroxide.

Section 3 Identifying anions

Carbonates can be identified with dilute acid. The reaction produces carbon dioxide gas which can be identified with limewater. Carbonates tend to be insoluble white powders.

Halides can be identified by reacting with nitric acid and silver nitrate – they produce coloured precipitates:

chloride	White
bromide	Cream
iodide	Yellow



Sulfate ions can be identified with barium chloride and hydrochloric acid – it makes a white precipitate.

Chemistry paper 2 triple extra content
Atmosphere and resources:

Section 1: Alloys

Alloys are mixtures of metals and other elements to make more useful materials. They are harder than pure metals because the layers in a pure metal are distorted by the different sized atoms.

Alloy	Mixture	Property and use
Bronze	Copper, Tin	Resistant to corrosion - used for statues
Brass	Copper, Zinc	Harder than copper – used in electrical fittings and door fittings/taps.
Duralumin	Aluminium, Copper and other metals	Lightweight but strong – used in aircrafts, armour plating
18 caret Gold	75% Gold, 25% Copper	Wears away less than gold – jewellery.

Steel alloys:

- High carbon steels = very hard but brittle
- Low carbon steel = softer and malleable
- Stainless steels = resistant to corrosion

Section 2: Polymers

Changing the reaction conditions will change the properties or the polymer produced.

- Thermosoftening polymers will soften easily when heated, due to weak intermolecular forces.
- Thermosetting polymers will not soften because of their cross linking between chains.

Section 4 Glass ceramics and composites

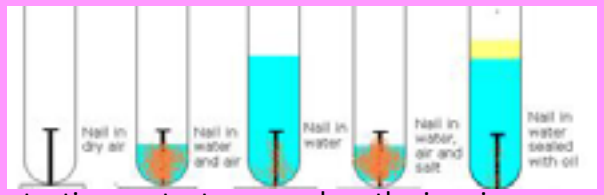
Glass – made by heating a mixture of sand, limestone and sodium carbonate

Ceramics – clay contains compounds of metals and non-metals with ionic and covalent bonds. Water molecules get between the layers when the clay is wet, these are removed in a furnace and strong bonds are formed.

Composites – usually made of two materials, with one acting as a binder for the other. They are tough and flexible e.g. fibreglass, plywood, concrete.

Section 3: Rusting

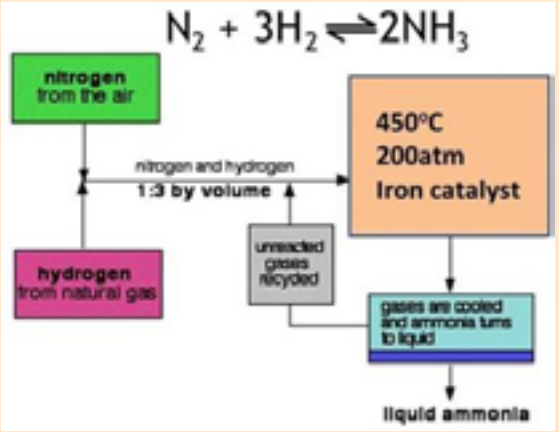
Both oxygen and air are needed for iron to rust. Providing a barrier between iron and any air (oxygen) protects the iron from rusting e.g. paint, oil



Sacrificial protection protects even when the iron is exposed to air and water. The iron is attached to a more reactive metal (zinc, magnesium)

Section 5: The Haber process

The Haber process combines nitrogen from the air with hydrogen derived mainly from natural gas (methane) into ammonia, the reaction is reversible and exothermic.



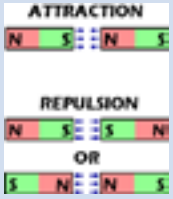
The conditions to increase yield and rate – it's a compromise!!

- Catalyst = iron
- Pressure = 200 atmospheres – this favours the forward reaction but requires a lot of energy and therefore money to create
- Temperature = 450°C – this means the rate of reaction is faster but does favour the reverse reaction. The unreacted gases are recycled back into the reactor and the ammonia is removed as it is produced to favour the forward reaction.

Physics Paper 2 – Magnets and Electromagnets

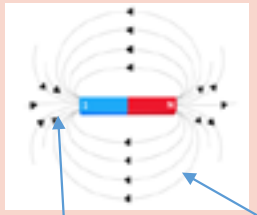
Section 1 – Magnets basics

- The strongest part of the magnet is at the **poles**
- The poles of a magnet are **North** and **South**
- Opposites **attract** (e.g. N and S), like poles **repel** (e.g. S and S)



- There are 3 magnetic materials, **Iron**, **Nickel** and **Copper** (Monsters INC)
- **Steel** is also magnetic as it contains **Iron**.

Section 2 – Magnetic Fields

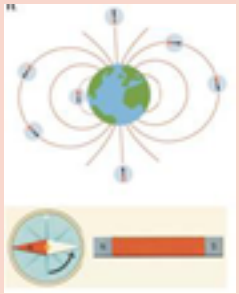


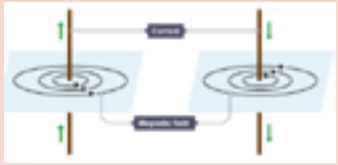
- This it the **magnetic field** of a bar magnet.
- The direction of magnetic field lines point from **North to South**
- Field lines have arrows on them

The magnetic field is weakest away from the poles, where the lines are least concentrated

The magnetic field is strongest at the poles, where the lines are most concentrated

- The Earth's **core** is made from iron and molten nickel. It has a magnetic field.
- The needle on a compass points towards the Earth's North pole.



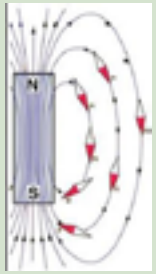


- When a current flows in a wire, it creates a **circular magnetic field** around the wire

Section 3 – Showing the magnetic field

<u>How to use a plotting compass to find the shape of a magnetic field</u>:

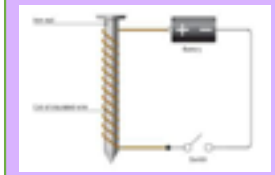
1. Place the bar magnet in the middle of the paper. Trace the outline of the magnet.
2. Place the compass at one pole of the magnet and make a dot next to it showing the direction the compass arrow points.
3. 3. Move the compass so that the base of the arrow is at the dot you have just made. Now make a new mark where the tip of the arrow is pointing this time.
4. 4. Keep doing this until you reach the other end of the magnet.
5. 5. Connect the dots. You have just drawn one magnetic field line! Go back and begin again, starting at a different spot than you did the first time. Repeat the above steps.



<u>You can also show the magnetic field using a bar magnet underneath a piece of paper and sprinkling iron filings over the top.</u>

Section 4 - Electromagnets

1. Coil a piece of metal wire around an iron core
2. Use a power supply/battery to provide an electrical current to the circuit



3. Pass the current through the coil
4. To turn the magnet off, turn the power supply off

<u>Advantages of an electromagnet over a permanent magnet</u>

1. Electromagnet can be turned on and off
2. Strength of electromagnet can be changed

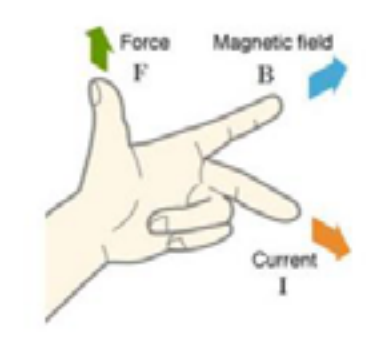
<u>How to increase the strength of an electromagnet</u>

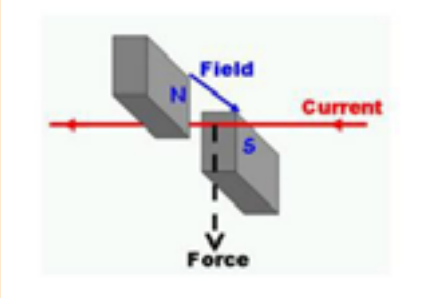
1. <u>Increase voltage</u>
2. <u>Increase no. turns in coil</u>
3. <u>Use iron core</u>

Physics Paper 2 – Magnets and Electromagnets (HIGHER)

Section 5- The motor effect (HIGHER ONLY)

- A magnetic field is produced when a current flows through a wire.
- If this wire is place in a magnetic field, a force is produced on the wire. This is called the **motor effect**.
- Use Fleming's Left Hand Rule to work out directions:





- There is no **motor effect** force if the current and magnetic field are parallel to each other.

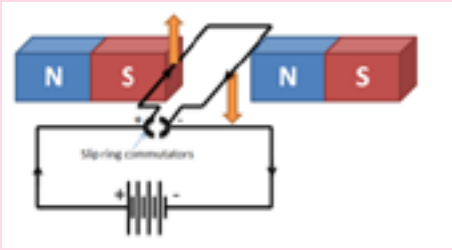
The force on a wire in a magnetic field increases when:

1. the current in the wire increases
2. the strength of the magnetic field increases

The direction of the force is reversed when:

1. The direction of the current is reversed
2. The direction of the magnetic field is reversed.

Section 6 – The Electric Motor (HIGHER ONLY)



In this example:

- The current flowing through the **right hand wire** out of the page in a field running from N to S, causes a **force downwards**
- The current flowing through the **left hand wire** into the page in a field running from N to S, causes a **force upwards**
- This causes the coil to rotate

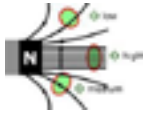
Section 7 – F=BIL equation (HIGHER ONLY)

This equation is given to you.

F = B x I x L

Force in N
B= Magnetic Flux Density in T
I=Current in A
L = length in m

What is magnetic flux density?



The closer the magnetic field lines, the higher the density of magnetic flux

As the magnetic field strength, current or length of wire within the field increase so does the force

Science - Physics - Triple Content 1

Separate Science Content: Physics Paper 2

Changes in momentum

When a force acts on a moving object there is a change in momentum.

Force (N) = Change in momentum (Kg/m/s) / Time (s)

Examples of levers

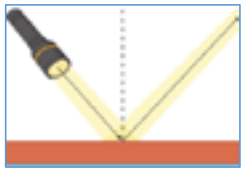
Reflection of Waves

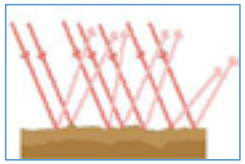
When a wave comes into contact with a surface it can be reflected or absorbed.

There are two types of reflection

Specular Reflection – When a wave if reflected in one direction.

Diffuse Reflection – When a wave is reflected in multiple directions.





Moments and Levers

A moment is the turning effect produced by a force.

Moment (Nm) = Force (N) x Distance (m)

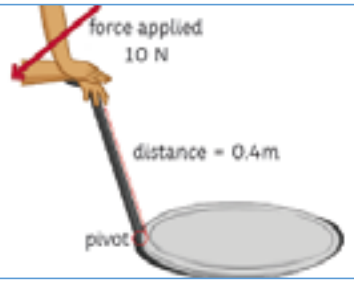
Worked example:

A crowbar is being used to lift a manhole cover. Calculate the moment produced.

M = F × d

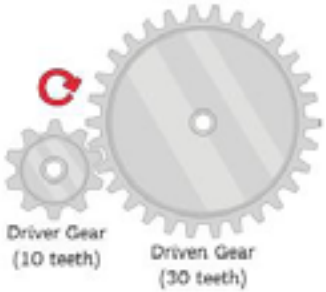
M = 10 × 0.4

m = 40Nm



Gears

When gears are connected they produce the same force, however if they are different sizes they will produce different moments



Pressure in Fluids

Pressure (Pa) = Height of the column (m) x density of the liquid (Kg/m³) x Gravitation Field Strength (N/Kg)

Sound Waves

Sound Waves travel faster through solids as there is less space between the particles

The Speed of Sound in Air is 300 m/s

Human's can hear in the range 20Hz to 20KHz

The Ear

Sound travels down the ear canal to the ear drum which vibrates and transmits to the ear bones and then along the cochlea. The auditory nerve converts the vibration into electrical impulses that does to the brain.

Waves for Detection and Exploration (Higher tier only)

Waves can be used to detect objects underwater, in the earth and even inside the human body.

Sonar systems used to explore deep seas use high-frequency sound waves. A sound wave is sent out from the device through the water and the time taken for the pulse to reflect from the surface is measured. The time taken with the speed of sound in water is used to find the distance of the object.

The equation used is:

distance (m) = speed (of sound) (m/s) × time (s)

Separate Science Content: Physics Paper 2

Lenses

Lenses use **refraction** in order to work. **Projectors, microscopes** and **telescopes** all use lenses to allow an object or image to be enlarged or viewed more easily.

The **human eye** contains a lens which enables us to see objects at a range of distances.

Depending on the type of **lens**, the light waves will be **refracted** differently to produce a different image.

The two main lenses are **convex lenses** and **concave lenses**. The table below compares them briefly.

convex lens	Lens	concave lens
	Ray Diagram	
	Illustration	
Causes parallel waves to **converge** at the principal focus.	Action	Causes parallel waves to **diverge** from the principal focus.
real or virtual	Type of Image	always virtual

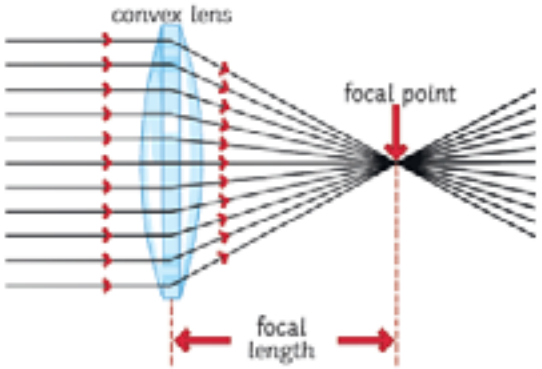
A **real image** is when light reflected from an object converges to form an image on a surface. For example, on the retina of the human eye.

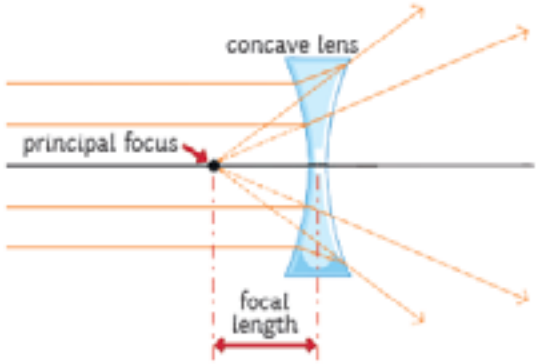
A **virtual image** occurs when the light waves are diverging and so appears to be coming from a different place. A virtual image cannot be projected onto a screen. For example, a mirror produces a virtual image.

A magnifying glass uses a converging (convex) lens. It produces a virtual image which appears larger than the actual object. The magnification can be calculated using the equation:

$$\text{magnification} = \frac{\text{image height (mm)}}{\text{object height (mm)}}$$

An imaginary horizontal line through the middle of the lines is called the **axis** and this is where the **principal focus** forms. In a **convex lens**, the light rays enter the lens **parallel** to one another and then **converge** at the principal focus **after** the lens. In a **concave lens**, the light rays enter the lens **parallel** to one another and then **diverge**. The principal focus is the virtual source of the diverging rays **before** the lens.





$$\text{power (D)} = \frac{1}{\text{focal length (m)}}$$

- D stands for dioptres which is the unit of measurement for lens power.
- In a converging lens the power is a positive value.
- In a diverging lens the power is a negative value.

Focal length depends on two factors: the **refractive index** of a material and how **curved** the surfaces of the lenses are. A higher refractive index makes the lens **flatter** in shape. To make a powerful lens thinner, a material with a higher refractive index can be used.

Objects which are a distance **greater than one focal length** away from a converging lens will produce a **real image**. Objects which are closer than one focal length from the converging lens will produce a **virtual image**.

The **lens equation** can be used to show the relationship between focal length, position of the object and position of the image.

$$\frac{1}{\text{focal length}} = \frac{1}{\text{distance between lens and object}} + \frac{1}{\text{distance between lens and image}}$$

This equation can also be written as:

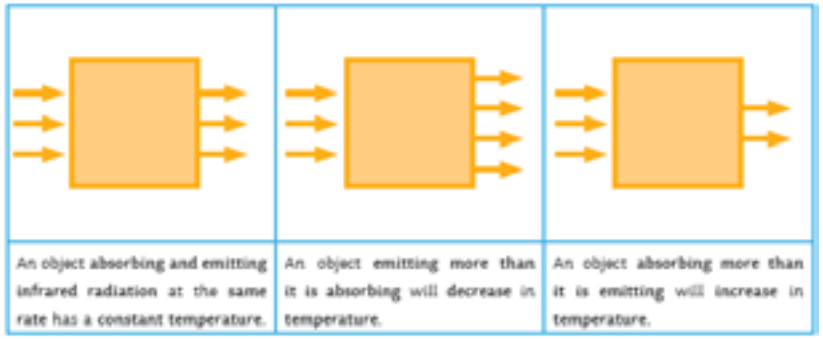
$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

Science - Physics - Triple Content 3

Separate Science Content: Physics Paper 2

Black Body Radiation

All objects emit and absorb infrared radiation. An object that absorbs all the radiation it is exposed to is called a perfect back body



An object absorbing and emitting infrared radiation at the same rate has a constant temperature.

An object emitting more than it is absorbing will decrease in temperature.

An object absorbing more than it is emitting will increase in temperature.

The Solar System

The solar system is part of the milky way. It is made up of the sun, eight planets. There is also a dwarf planet, Pluto.

The Big Bang

In the beginning the universe was in a very small space. This space became hot and caused an explosion 13.7 billion years ago.

The Big Bang is the best theory we have at the moment.

Expanding Universe

Evidence suggests that the Universe is expanding. Galaxies are moving further away, red-shift is evidence for this. Light coming from galaxies further away has a longer wavelength.

Galaxies which are further away have a greater red-shift, suggesting further galaxies are moving faster.

Formation of a Star

1. Stars are made from a cloud of dust and gas – a **nebula**. Gravity pulls the dust and gas together, forming a **protostar**.
2. The more dense the star, the hotter it becomes. Fusion of the hydrogen nuclei starts, emitting a lot of energy.
3. The next stage is the **main sequence star**. This stage will last for a few billion years. This is a stable phase as the force of gravity and fusion of hydrogen are balanced. Hydrogen is fused and forms helium; as this happens, energy is released.
4. Hydrogen begins to run out, turning the star into **a red giant (like the Sun)** or a **red super giant**, depending on the size of the star.
5. A red giant will become a **white dwarf** by getting rid of the outer layers of dust and gas. It will then cool down and become a **black dwarf**.
6. Red super giants will initially glow brightly. Then, they will explode into a **supernova**. The supernova will get rid of its outer layer of dust and gas and will form a black hole.

Spanish - Global Issues 1

Spanish Yr 11 – Global Issues (1)

¿Cómo se debería cuidar el medio ambiente en casa?		How should you look after the environment at home?	
Para cuidar el medio ambiente se debería…	To care for the environment you should…	Me preocupa(n)	I am worried about…
apagar la luz	turn off the light	el paro / desempleo	unemployment
ducharse en vez de bañarse	shower instead of bath	el hambre / la pobreza	hunger/poverty
separar la basura	separate the rubbish	la diferencia entre ricos y pobres	the difference between the rich and poor
reciclar el plástico y el vidrio	recycle plastic and glass	la salud / la obesidad	health / obesity
desenchufar los aparatos elétricos	unplug electric appliances	los sin hogar / techo	the homeless
ahorrar energía	save energy	Los animales en peligro de extinción	animals in danger of extinction
cerrar el grifo	turn off the tap	Es necesario que..	It is necessary that
hacer todo el posible	do everything possible	cuidemos el planeta	we look after the planet
No se debería…	You should not	apoyemos proyectos de ayuda	we support aid projects
malgastar el agua	waste water		
usar bolsas de plástico	use plastic bags		

¡Actúa localmente!	Act locally
Hay demasiada…	There is/are too much/many…
basura en las calles	rubbish on the streets
gente sin espacio para vivir	people with nowhere to live
desctrucción de los bosques	destruction of the forests
pollución de los mares y los ríos	pollution of the seas and rivers
No corte tantos arbóles	Don't cut down so many trees
No tire basura al suelo	Don't throw rubbish on the floor
No malgaste energía	Don't waste energy
Recicle el papel/vidrio	Recycle paper/glass

¡Actúa localmente!	Act locally
El techo	roof
El agua de lluvia	Rain water
Los paneles solares	Solar panels
La arena	Sand
Los (eco)ladrillos	(Eco)-bricks
Una fábrica	A factory
mudarse (de casa)	To move house

Una dieta sana		A healthy diet	
Los alimentos	food	sal/azúcar	salt / sugar
carne, pescado y huevos	meat, fish, eggs	El sabor	taste
verduras/fruta	vegetables/fruit	saludable / sano / malsano	Healthy Unhealthy
fideos	noodles	Tengo hambre/sed/sueño	I am hungry/thirsty/sleepy
grasas	fats	evitar	To avoid
dulces	Sugar / sweet things	engordar	To put on weight
legumbres	pulses	salrarse el desayuno	To skip breakfast

Spanish - Global Issues 2

Spanish Yr 11 – Global Issues (2)

¡Vivir a tope!	Live life to the full
Es/ No es…	It is / isn't…
ilegal / peligroso	illegal / dangerous
un malgasto de dinero	a waste of money
una tontería	stupid
un problema serio	a serious problem
un vicio muy caro	an expensive habit
muy perjudicial	very damaging
Fumar cigarrillos / porros…	To smoke/smoking cigarettes/joints
Tomar drogas blandas / duras…	To take/taking soft/hard drugs
provoca mal aliento	causes bad breath
daña los pulmones	damages the lungs
tiene muchos riesgos	has lots of risks
Es fácil engancharse	It is easy to get hooked
¡Qué asco!	How disgusting!
Perdí peso	I lost weight
¡fue un éxito!	It was a success

temblor	tremor
incendio forestal	forest fire
huracán	hurricane
tornado	tornado
terremoto	earthquake
tormenta de nieva	snow storm
inundaciones	floods

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