AUTUMN KNOWLEDGE ORGANISER

YEAR 9

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Art & Design

Literacy / key words

Monoprinting – A printmaking technique where only one unique print is created by applying ink or paint onto a surface and transferring it onto paper using pressure.

Watercolour Wash – A painting technique using diluted watercolour paint to create a smooth, transparent layer of colour.

Observational Drawing – A method of drawing objects from real life, focusing on accurate proportions, detail, and shading to capture realism.

Texture – The way a surface appears or feels, which can be represented visually through drawing or painting techniques.

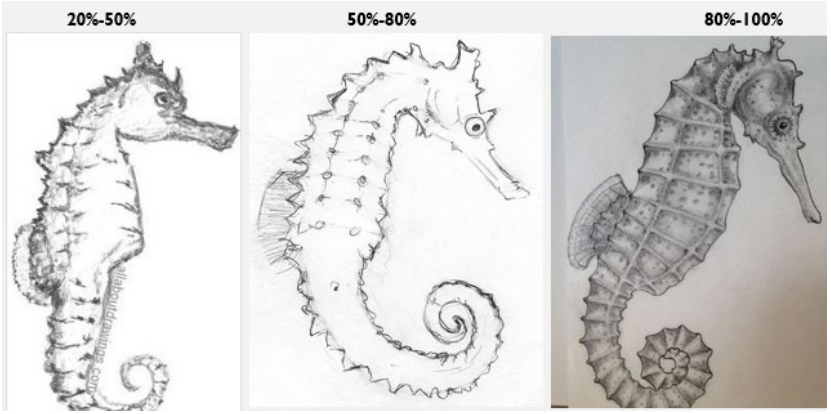
Tonal shading-

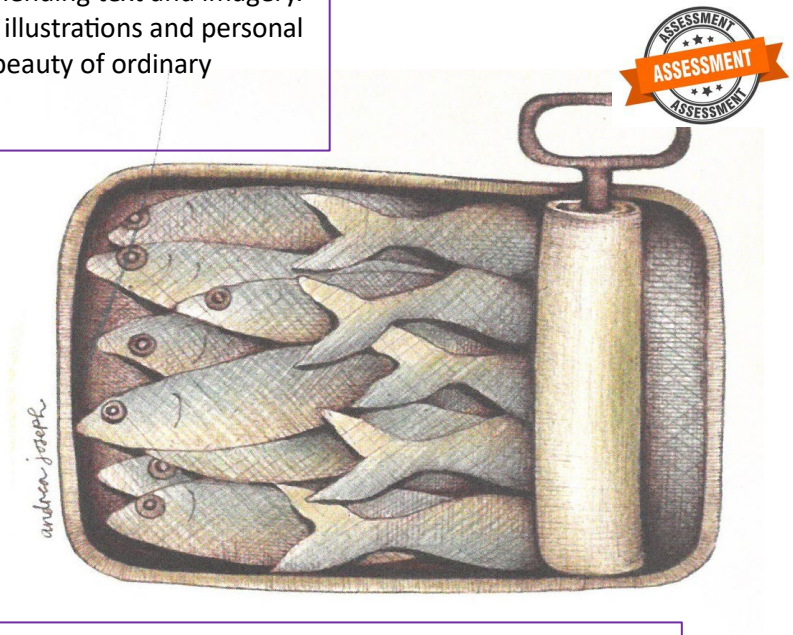
Tonal shading is a technique used in drawing to create the illusion of depth, form, and texture by gradually changing the lightness and darkness of an area. It helps to make objects appear more three-dimensional by mimicking the way light falls on them.

Tonal shading is essential in **observational drawing** to show light, shadow, and form realistically.

Andrea Joseph-

Andrea Joseph is a contemporary British illustrator known for her highly detailed pen drawings. She often works in fine-liner and ballpoint pen, creating intricate, textured illustrations of everyday objects such as shoes, stationery, and household items. Her work showcases strong observational skills, with a focus on cross-hatching and shading techniques to build depth and realism. Andrea Joseph's sketchbooks are widely admired for their creative compositions and storytelling elements, often blending text and imagery. She has also worked on book illustrations and personal projects that emphasise the beauty of ordinary objects.





YEAR 9 Autumn Term- Sealife

Extra - Read/watch/do

- **Andrea Joseph sketchbook tour**- https://www.youtube.com/watch?v=olDqQnUSfjI
- **Tonal shading-** https://www.bbc.co.uk/bitesize/guides/zkn9jfr/revision/4
- Create a drawing while following a YouTube drawing tutorial. Bring it in to show your teacher.

Andrea Joseph copy assessment

For this assessment, you will be assessed on your accuracy to the Andrea Joseph image as well as your use of mark making to show texture and tone.

Art & Design

Mark making:

Mark making refers to the different ways an artist applies lines, dots, textures, and patterns to a surface to create an artwork. It is a fundamental aspect of drawing, painting, and printmaking, used to convey texture, movement, and emotion.

There are many types of mark making, including:

- **Hatching & Cross-hatching** – Parallel or intersecting lines for shading.
- **Stippling** – Using dots to create tone and texture.
- **Scumbling** – Loose, scribbled marks for rough textures.
- **Sgraffito** – Scratching through a layer of paint or ink to reveal what's beneath.
- **Gestural Marks** – Expressive, free-flowing strokes to suggest movement.

Mixed media:

Mixed media is an art technique where an artist combines different materials and techniques within a single artwork. This can include drawing, painting, collage, printmaking, and even digital elements. Using mixed media allows for greater creativity, texture, and depth in a piece.

One colour Gradient

Observational drawing:

Watercolour is a painting method using water to spread colour smoothly and lightly across the paper. It's great for creating soft, transparent layers and blending colours easily.

Mono printing:

Mono printing is a type of printmaking where you create a one-of-a-kind print, meaning each print is unique and cannot be exactly repeated. It is a fun and experimental technique that allows for creative textures, marks, and layering of colours. Roll or paint a thin layer of ink or water-based paint onto the surface. Use tools like brushes, cotton buds, or even your fingers to draw patterns, textures, or images into the ink. You can also place paper over the ink and draw on the back to transfer the design.
Carefully press a sheet of paper onto the inked surface and smooth it down evenly.

What techniques will I learn?

Biro pen drawing:

Biro pen drawing is an art technique that involves using a ballpoint pen to create detailed and expressive artwork. This technique is popular for its precision, fine lines, and ability to build up tone and texture through different shading methods.

Artist research:

An artist research page is a section in a project where a student gathers and organises information about a specific artist to inspire or inform their own creative work. It is typically a part of the research and development process for an art project, often used to explore the techniques, themes, and styles of influential artists.

You will be assessed on

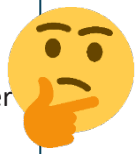
- Term 1 – Observational drawing (tonal shading)
- Term 2 – Biro pen drawing (Artist copy)
- Term 3 – Mixed media piece (Shepard Fairey inspired)

Links to curriculum

English and Science (biology) - In our lessons, we will look at environmental issues such as pollution, plastic in the ocean and marine life.

Role Play – The act of pretending to be somebody else, of taking on a role. Thinking and acting differently to your ordinary self can help you empathise with a person and better understand an issue or theme.

Thought Tracking - when a character steps out of a scene to tell the audience how they're feeling. Sharing thoughts in this way provides deeper insight into the character for an audience.



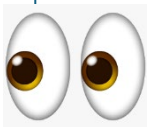
Narrating - A spoken commentary about the action onstage. A narrator is like a storyteller informing the audience about the plot.

Cross-cutting/Split Focus - a device to move between two or more scenes staged in the space at the same time.

Tableau – A still image which communicates meaning. It can provide insight into character relationships with a clear focus upon use of space, levels, body language and facial expression.

Hot Seating - An actor sits in the hot-seat and is questioned <u>in role</u>, spontaneously answering questions they may not have considered before. Hot-seating helps an actor become more familiar with their role.

Marking the Moment – A way of highlighting the most important moment in a scene in order to draw the audience's attention to its significance. This can be done by using tableau, repetition, slow motion, narration, thought tracking, lighting and sound.



Blood Brothers

Characters

Mrs Johnstone
The twin boys' mother. Loving. Very poor.

Mickey Johnstone
Friendly child. Grows up poor. Becomes unstable.

Linda
Practical & confident. Torn between twins.

Edward Lyons
Privileged upbringing. Kind, but naive.

Mrs Lyons
Adopts Edward. Manipulative. Protective.

The Narrator: A mysterious & unsympathetic figure.
Mr Lyons: Edward's adoptive father. Uncaring boss.
Sammy Johnstone: Mickey's brother. Naughty child. Turns to crime.
Chorus: Group that sings parts of story. Play minor characters too.

Context & Themes

Money & Social Class
Linked to power. Richer characters have choices in life — "talk of Oxbridge" for Edward.

Childhood & Growing Up
Childhood is a time of innocence & fun — "just a game". Also linked to class — lower-class characters have to grow up faster.

Gender
Husbands / dads absent or lacking. Women have motherly roles, but also act as breadwinners.

Fate & Superstition
Events seem fated, e.g. we know the twins will die. Superstition influences characters (e.g. Mrs J).

Friendship
Presented as carefree and positive for children. More difficult in adulthood.

Identity
The twins show identity is rooted in upbringing / class — they are genetically identical but lead very different lives.

Plot — Key Events

Act One

- Mrs Johnstone gives away one of her twin babies to Mrs Lyons.
- The twins (age 7) meet and become "blood brothers".
- The twins & Linda get in trouble with the police.
- The Lyonses move away & the Johnstones are moved too.

Act Two

- Mickey and Edward meet and become friends again.
- Linda gets pregnant and marries Mickey, who is also made redundant by Mr Lyons.
- Edward and Mickey fall out — they live different lives.
- Mickey is jailed for robbery, then becomes depressed.
- Mickey sees Edward and Linda together and goes to confront Edward. The boys find out they're related.

Mickey accidentally shoots Edward, and is killed by the police.

Stage Configurations

Proscenium Arch
Audience sat on 1 side

Theatre in the Round
Audience sat on all side of the stage

Promenade
Audience are led around a space e.g. a park or a castle

Traverse
Audience sat on 2 sides, facing each other

Thrust
Audience are sat on 3 sides

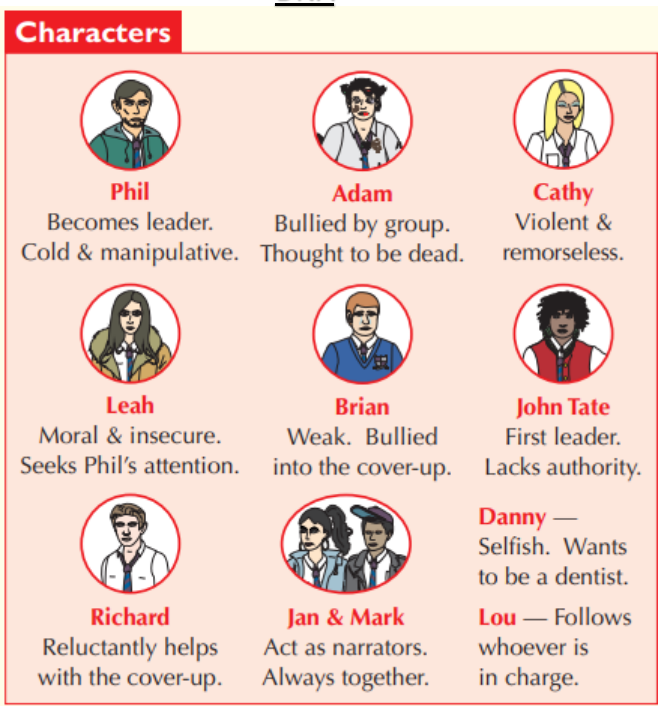
Roles & responsibilities of the theatre

- Set Designer
- Costume Designer
- Director
- Lighting Designer
- Sound Designer
- Performer
- Stage Manager
- Understudy
- Technician

Upstage right	Upstage Centre	Upstage left
Stage right	Centre stage	Stage left
Downstage right	Downstage centre	Downstage left

Audience

DNA



floodlight - a lantern with a wide beam that can cover a large area on stage, an effect called a wash

follow spot - a tight beam of light that can be used to highlight a particular area on stage, often used to highlight and follow a particular actor

Fresnel - a lantern that creates a soft beam of light

gel - a coloured filter that can be placed on a lantern in front of a beam of light to change the colour

gobo - a metal template positioned in front of a beam of light to create shapes of light on stage, eg a window frame or tree

Parcan - a type of lantern that produces an intense beam of light

practical - a light that is used as part of the set design, eg a desk lamp or torch

profile spot - a tight beam of light that can be used to highlight an area on stage

rigging - the structure that supports the lanterns, eg a lighting bar

strobe - a light that flashes quickly on and off to create the effect of slow motion on stage; a health and safety risk for people with certain health issues

Year 9 Autumn Term

Musical features of Reggae

- **Offbeat rhythms (back beat)**
- **Syncopated rhythms**
- **Verse-chorus song form**
- **Lead singer and backing singers using 'Call and Response'**
- **Reggae band backing: brass instruments, saxophones, electric guitars, bass guitar, keyboards, drums and percussion instruments**
- **Use of improvisation**
- **Slow, relaxed 'chilled' tempo in a 4/4 time signature**
- **Simple harmonies**

KEY WORDS – test yourself! (definitions on the next page)

Mento Ska Rock Steady Rastafarian Syncopation Offbeat Lyrics Riffs Strong beats/ Weak beat Call and Response Triad Tonic/ Dominant/ Subdominant

Reggae is one of the most traditional musical styles from Jamaica, first heard in the UK in the 1950's when immigrants began to settle here. During the 1960's, vinyl singles were imported from Jamaica to sell in UK shops. Reggae is now known as the national music of Jamaica. **It developed from:**

MENTO	SKA	ROCK STEADY
A form of Jamaican **folk music** like **Calypso** popular in the 1950's	**Fast dance music** that emerged in the 1050's fusing **American R&B with MENTO** rhythms and featuring electric guitar, jazzy horn sections and characteristic **offbeat rhythms**	A more **vocal style of dance music** which used riffs, simple harmonies, offbeat rhythms and a **strong bass line**

BOB MARLEY was a famous reggae singer, songwriter, and musician who first became famous in his band The Wailers, and later as a SOLO ARTIST. He was born Nesta Robert Marley in 1945 in Nine Mile, Jamaica. Although he grew up in poverty, he surrounded himself with music. Bob Marley became involved in the Rastafarian movement and this influenced his music style greatly. His career flourished and he became a cultural icon and an international star.

What are Reggae songs about?

The LYRICS of Reggae songs are closely linked to RASTAFARIANISM and are often political including themes such as love, brotherhood, peace, poverty, anti-racism, optimism and freedom.

Offbeat Rhythms and Syncopation

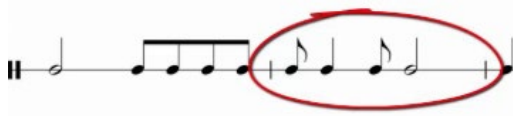
On beat = strong beats e.g.

1	2	3	4	1	2	3	4
★		★		★		★	

Offbeat = weak beats (BACK BEAT) e.g.

1	2	3	4	1	2	3	4
	★		★		★		★

Syncopation is a way of changing a rhythm by making some notes a bit earlier or later than the pulse. It makes the listener feel a little unsteady.



KEY WORDS AND MEANINGS:

Mento	A form of Jamaican folk music. Popular in the 1950s. Uses acoustic instruments, such as acoustic guitar, banjo, hand drums, and the rhumba box.
Ska	Fast dance music which emerged in the 1950s and fused R&B with Mento. Electric guitar, jazzy horns and offbeat rhythms.
Rock Steady	A more vocal style of dance music. Riffs, simple harmonies, offbeat rhythms and strong bass line.
Rastafarian	A religious movement worshipping Haile Selassie as the Messiah and that black people are the chosen people and will eventually return to their African homeland
Syncopation	A rhythm where the notes sound a little earlier or later than the main beats.
Offbeat	Rhythms that stress the weak beats of the bar e.g. 2 and 4. A feature of Reggae is the back beat – an offbeat rhythm.
Lyrics	The words of a song
Strong beats/ Weak beats	STRONG = the main beats e.g. 1 and 3. WEAK = the 'back' beats e.g. beats 2 and 4.
Riffs	A short, repeated phrase, typically used as an introduction or refrain in a song.
Call and Response	Two distinct phrases usually written in different parts of the music, where the second phrase is heard in response to the first.
Triad	A chord made up of three notes (the root – or 1st, the 3rd and the 5th)
Tonic/ Dominant/ Subdominant	TONIC – the first note of a scale (the most important note) DOMINANT – the 5th note of a scale (the second most important) SUBDOMINANT – the 4th note of a scale (the third most popular)

PUCK

A fairy spirit and Oberon's jester. Also known as Robin Goodfellow, he is a mischievous fairy who delights in playing pranks on mortals.

OBERON

The King of the Fairies. Oberon is at odds with his wife Titania because she refuses to relinquish control of a young Indian prince whom he wants as a knight.

TITANIA

The beautiful Queen of the Fairies. Titania, under a magic spell, falls in love with Bottom who has been given the head of an ass.

LYSANDER

A young man of Athens, in love with Hermia. They run away to the forest but Lysander becomes victim of misapplied magic and wakes up in love with Helena.

DEMETRIUS

A young man of Athens. He thinks he is in love with Hermia but ultimately loves Helena. Chosen by Egeus for his daughter, Hermia, to marry despite her love for Lysander.

HERMIA

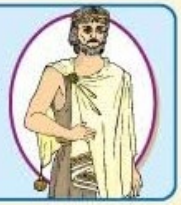
A young woman of Athens, in love with Lysander and a friend of Helena. As a result of the fairies' mischief, both Lysander and Demetrius fall in love with Helena.

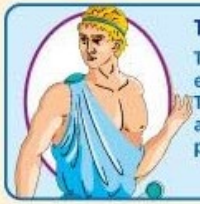
HELENA

A young woman of Athens, in love with Demetrius. They were once betrothed, but when Demetrius meets Hermia, he thinks he loves her and abandons Helena.

EGEUS

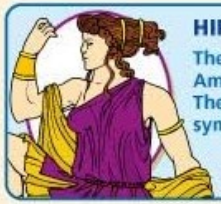
Hermia's father. Egeus gives Demetrius permission to marry Hermia, but Hermia is in love with Lysander.





THESEUS

The heroic Duke of Athens engaged to Hippolyta. Theseus projects confidence, authority, and benevolent power.



HIPPOLYTA

The legendary queen of the Amazons, engaged to Theseus. Like Theseus, she symbolises order.

BOTTOM

The weaver chosen to play Pyramus in a play put on for Theseus's wedding celebrations. Bottom is full of advice and self-confidence.

PETER QUINCE

A carpenter and the nominal leader of the craftsmen who attempt to put on a play for Theseus's marriage celebrations. Quince is often shoved aside by Bottom.

Verbs of Inference: (Q)

- Present/ show/ convey
- Creates/ illustrates
- Establishes/ develops/ concludes

Verbs of analysis: (T – effect of language)

- Emphasise/ highlight
- Has connotations of/ makes you think of
- Imply/ suggest

Verbs of intent: (author's purpose)

- Makes the audience think/feel/ like/dislike
- Warns
- Criticises
- Sympathises with
- Shocks/ horrifies/ saddens
- Encourages the audience to/has a message of

Great Chain of Being

Techniques (T)

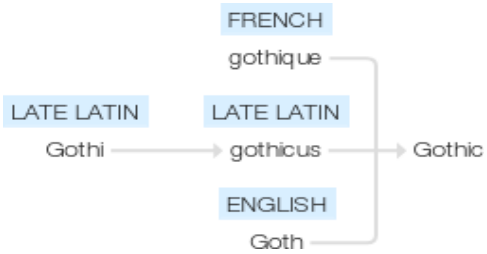
- **Simile** – comparing like/as
- **Metaphor** – comparing directly (is/are)
- **Juxtaposition** - clear contrast of opposites
- **Iambic pentameter** – poetic metre of alternating stressed/unstressed syllables (di-DUM, di-DUM)
- **Emotive language** – language with strong emotion
- **Personification** – describing non-humans as human
- **Motif -** repeated imagery
- **Oxymoron** – contradictory phrase e.g. 'bittersweet'
- **Hyperbole –** deliberate over-exaggeration for effect
- **Dramatic irony –** information the audience knows but the characters do not!
- **Soliloquy –**speech where characters speak their thoughts aloud on stage alone

Connectives...

Therefore	Whereas
Equally	Consequently
Similarly	Contrastingly
Moreover	However
Despite this	Crucially

Gothic Fiction- A genre of writing that is characterised by its exploration of darker themes, often featuring Gothic architecture, the supernatural, religion, and the past.

Book	Synopsis
The Castle of Otranto (1764) **Horace Walpole**	Manfred, the prince of Otranto, is keen to secure the castle for his descendants in the face of a mysterious curse. The novel begins with the death of Manfred's son, Conrad, who is crushed to death by an enormous helmet on the morning of his wedding to the beautiful princess Isabella. Faced with the extinction of his line, Manfred vows to divorce his wife and marry the terrified Isabella himself.
The Woman in Black (1983) **Susan Hill**	Arthur Kipps, a junior solicitor, is sent to settle the affairs of Alice Drablow. He sees a woman dressed in black at her funeral, though apparently no one else does. At Eel Marsh House, Arthur is haunted by the woman. It is explained that a child dies each time the woman in black is seen. At the end of the story, Arthur sees the woman in black again and his wife and son die.
Frankenstein (1812) **Mary Shelley**	*Frankenstein* tells the story of gifted scientist Victor Frankenstein who succeeds in giving life to a being of his own creation. However, this is not the perfect specimen he imagines that it will be, but rather a hideous creature who is rejected by Victor and mankind in general. The Monster seeks its revenge through murder and terror.
Dracula **(1897)** **Bram Stoker**	*Dracula* is an epistolary novel which tells the story of Jonathan Harker, who travels to Count Dracula's home in Transylvania, and Dracula imprisons him. Dracula then travels to London, where he targets Harker's fiancé, Mina Murray. Dracula attacks Lucy Westenra, Mina's friend, and turns her into a vampire. The group tracks Dracula back to Transylvania and kills him.
Wuthering Heights (1847) **Emily Bronte**	It details the story of two families on the Yorkshire moors called the Lintons and the Earnshaws. The Earnshaws adopt a boy called Heathcliff who is wild in his temperament. Heathcliff falls in love with Catherine Earnshaw who is torn between wanting to be the proper lady her parents want her to be and wanting to be wild with Heathcliff.
Jane Eyre (1847) **Charlotte Bronte**	The novel follows the story of Jane, a seemingly plain and simple girl as she battles through life's struggles. Jane has many obstacles in her life - her cruel and abusive Aunt Reed, the grim conditions at Lowood school, her love for Rochester and Rochester's marriage to Bertha.
Dr Jekyll and Mr Hyde (1886) **Charlotte Bronte**	A clever scientist, wanting to push the realms of science to its limits, creates a potion and experiments on himself. When he drinks the potion, the respectable Dr Jekyll transforms into a sinister version of himself called Mr Hyde. Mr Hyde is an animalistic and cruel man who commits many sins including murder. Eventually, Mr Hyde gains control over Dr Jekyll and no longer takes the potion.
Jamaica Inn (1936) **Daphne Du Maurier**	Mary Yellan moves to stay at Jamaica Inn with her Aunt Patience and Uncle Joss after the death of her mother. She quickly finds out that the inn is an unsavoury place, mistrusted by the locals, and that her uncle is closely linked with a group of suspicious men who appear to be smugglers.



Analytical (QTA) Sentence Starters:

X (the writer) presents the character/ theme of… as …

For example, when we are told "…"

This (technique) _____ suggests that…

Additionally, it further implies that…

The use of the word (aim to use specific word class), "…" implies…

Perhaps x (the writer) wanted to …

This could make the reader…

Overall, this is typically gothic because…

It is an effective example of ….. in the gothic genre as it shows…

WAGOLL- How is Isabella presented as an archetypal damsel in distress in this extract from The Castle of Otranto?

Walpole presents Isabella as an archetypal damsel in distress because she is confined and in desperate need of outside help. Whilst she is struggling to find a way out of the cloisters, Walpole tells the reader that she "frequently stopped and listened to hear if she was followed. In one of those moments she thought she heard a sigh." This adverbial phrase "frequently stopped" highlights the fact that she is frozen by fear as she does not know if she is still being chased. Additionally, she also checks "if she was followed" with the conditional "if" highlighting her paranoia, but also highlighting that she is totally alone with no hope of escape. Whilst trying to escape, the fact that she also "heard a sigh" suggests she is fearful of the unknown and does not know what fate awaits her. The onomatopoeic "sigh" creates fear as she does not know where Manfred is. Perhaps Walpole wanted to use the gothic convention of the archetypal damsel in distress in order to create sympathy for her. This could make the reader hope that she escapes Manfred's evil clutches because of the vulnerability Walpole has emphasised in her.

Gothic Conventions- An environment of fear; remote locations; the threat of the supernatural; the intrusion of one's past upon the present; feelings of entrapment/claustrophobia; ruined buildings in an otherwise thriving world. Plots often include: vengence, inprisonment and death; Framed narratives, or tales within tales; A damsel in distress, and a Byronic hero.

Word Classes

Noun- A person, place or thing, *e.g. class, teacher, canteen.*
Proper Noun- The name of a specific person, place or thing. These need a capital letter at the start! *E.g. Mr Rogers, Sale High School, Manchester.*
Abstract Noun- The name of an idea, feeling or concept which cannot be physically touched, *e.g. love, fun, ennui.*
Concrete Noun- The name of something physical, like an object, *e.g. desk, book, pen.*
Pronoun- A word that replaces a noun, *e.g. they, it, her, us.*
Verb- An action or 'doing' word, *e.g. studied, learning, enjoy.*
Dynamic Verb- Verbs that describe something happening such as an action, process or change, *e.g. transformed, fighting, diminished.*
Stative Verb- Verbs that describe a state that is unlikely to change and usually refer to things like thoughts, senses or feelings, *e.g. suspected, doubting, loves.*
Adjective- A word that describes a noun, *e.g. triumphant, vulnerable, tenacious.*
Adverb- A word that tells us how/when something is done, *e.g. melancholically, connivingly, today.*
Preposition- A word that shows time, place, location etc, *e.g. in, at, beneath.*
Conjunction- A word used to connect two clauses or ideas, *e.g. and, but, yet.*
Superlative- A word or group of words used to describe something being more than something else in some way, *e.g. biggest, hottest, most sublime.*

Language Techniques

Simile– A phrase comparing one thing to another, using as or like, *e.g. He felt like an elastic band pulled taut.*
Metaphor– A phrase comparing one thing to another, without using as or like, instead saying it **is** something else, *e.g. He was an elastic band, fully extended, taut and ready to snap.*
Personification– A phrase giving human characteristics to a non-human object, *e.g. Poison ivy climbed up the sides of the once-glorious skyscrapers, reaching towards the sun.*
Repetition– A word or phrase that is repeated for emphasis, *e.g. The room was empty. The building was empty. The city was empty.*
Zoomorphism- A phrase giving animal characteristics to something that is not an animal, *e.g. The teacher roared at the class to be quiet immediately!*
Sibilance– Words close together that begin with an 's' sound, *e.g. The air suffused with a sudden, sinister sound.*
Juxtaposition– Two concepts, themes, ideas or characters that are contrasting or opposite, *e.g. love and hate.*
Semantic/Lexical Field– A group of words that follow the same theme, *e.g. ranch, cow, farm, haybale.*
Oxymoron– A phrase using contradictory words, e.g. *The silence deafened her.*

Language Techniques (Persuasive)

Direct Address– Using pronouns to directly speak to the audience, *e.g. we, us, you.*
Alliteration– Words close together that begin with the same sound, *e.g. Our planet - our home - is being destroyed, degraded and demolished!*
Facts/Statistics– Using factual evidence to prove points, *e.g. 78.2% of people surveyed agree that footballers are simply paid too much money!*
Rhetorical question– A question that does not require an answer, *e.g. What does 'An eye for an eye' really mean?*
Emotive language– Words that create feeling and emotion, *e.g. These vulnerable, innocent children are being cruelly ejected from their homes.*
Rule of Three- Using three words to describe something or making three statements about something *e.g. Gothic Fiction is eerie, chilling and haunting.*
Cyclical Structure- Introducing an idea at the beginning of your writing which you return to at the end, creating a cycle, *e.g asking the same rhetorical question at the beginning/end of a speech.*

Key Vocabulary- Gothic Fiction

Pastiche- Work that imitates another work, artist, or period.
Byronic Hero- A melancholy and rebellious young man, distressed by a terrible wrong he committed in the past.
Femme Fatale- This means fatal woman in French. The femme fatale is a being of sexuality and femininity, enchantment and mystery. She uses her appeal/sexuality to entrap men.
Melancholy- Feelings of thoughtful sadness, sometimes for no reason.
Archetypal- A stereotypical example of a thing/character.
Damsel in Distress- A lonely, pensive, and oppressed heroine who is often alone and trapped and terrorised by a villain or monster. They are pure, innocent women who often faint/need saving.

Punctuation Reminder

Commas ,- Separate clauses or indicate a pause.
Apostrophes '- Indicate possession or ownership or to show omission in contractions.
Quotation (speech) marks " "- Used to quote from texts or mark out speech.
Semicolon ;- Used to separate two main clauses that are closely related, often replacing a connective.
Colon : - Used to introduce an idea or start a list, *e.g. She packed her hunting kit: gun, pepper spray, smoke bombs.*
Brackets ( )- Used to add additional or non-essential information. The sentence must make sense on its own without the writing in brackets. **Dashes - -** can be used in the same way.
Ellipsis … - Represents a pause or that something has been intentionally left out. Can be used to build tension, *e.g. He tried to wriggle free from his bindings, but then his world suddenly went black…*

Literacy (spellings)

1. Shakespeare
2. Soliloquy
3. Imagery
4. Contextual
5. Hierarchy
6. Metaphor
7. Simile
8. Figurative
9. Lysander
10. Demetrius

Adjectives - character (Q)

- Impulsive
- Romantic
- Idealistic
- Patriarchal
- Bitter/ jealous
- Mischievous
- Emotional
- Despairing/ desperate
- Manipulative
- Chaotic/ ordered
- Abusive/ controlling
- Supernatural
- Ridiculous/ absurd
- Naïve/ cunning

Autumn 1: *A Midsummer Night's Dream*

Context

Elizabethan era: the period in history when Elizabeth I was queen is often called the "Elizabethan era". This was the period when *A Midsummer Night's Dream* was written by Shakespeare.

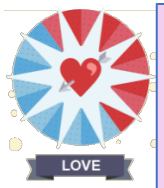
Comedy: a play that includes A) both a lot of humour and jokes and B) in Shakespeare plays, couples survive different struggles and barriers to finally be able to be happily married

Marriage: Wealthy Elizabethans would be expected to have arranged marriages by their parents and not marry for love

Patriarchy/ patriarchal: society controlled by men: Elizabethan women were expected to obey husbands/fathers

Petrarchan love = an idealised (not necessarily realistic!) view of love that believe men should 'worship' women and long for them. This romantic view contrasted with the reality of arranged marriages.

Great Chain of Being = Elizabethan view of the world that believed in a 'divine order' created by God. This created a social and gender hierarchy, and it was considered wrong to 'go against' the chain.



Sentence Starters (QTA)

Try to include one of each colour! (QTA)

Q. Shakespeare has created the character of ____ to…/ Shakespeare presents the theme of…

Q. This is shown in the quotation "…"

T. The *word/ techniques* suggests…

T. Also, the (word) emphasises…

T. Alternatively, it could also imply…

A: The audience will think/feel… because…

A: This links to the context of Elizabethan England because…

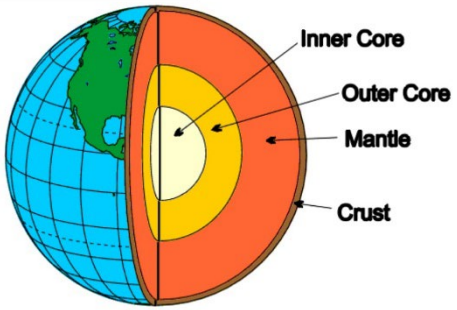
A: Shakespeare intended to…

GEOGRAPHY: Year 9 – Restless Earth

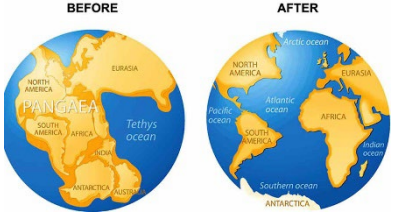
Key terms / Literacy:

Tectonic plate – large portions of the Earth's crust that have been broken up at plate margins.
Mantle – the thickest part of the Earth's structure below the crust. It is made up of molten rock and its temperature ranges between 500°C-4,000°C
Crust – The outermost layer of the Earth. It is broken into tectonic plates. These can be made of oceanic crust, which is old and dense, or continental crust, which is newer and less dense.
Magma – molten rock found beneath the Earth's surface.
Lava – molten rock found on the Earth's surface.
Subduction – when one tectonic plate sinks beneath another.
Primary effects – impacts that are a direct result of the hazard.
Secondary effects – impacts that may occur after the hazard, often caused by the primary effects.
Immediate responses – actions taken to reduce the effects of the hazard – minutes or hours afterwards.
Long term responses - actions taken to reduce the effects of the hazard – days/months/years afterwards.

Structure of the Earth



How has the Earth changed over time?

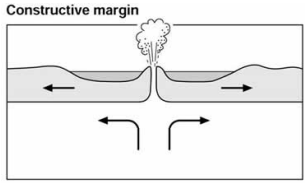


The theory of continental drift says that long ago, all the continents were one big landmass called Pangaea. Over millions of years, they slowly moved apart to become the separate continents we see today. This idea is supported by how the coastlines of South America and Africa fit together like puzzle pieces and by finding similar rocks and fossils on different continents.

Why do tectonic plates move?

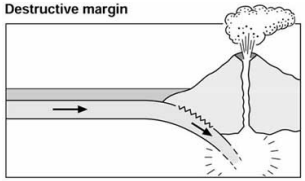
Ridge push – at constructive plate boundaries, where the plates are being pushed up by rising magma, a ridge is created. Gravity acts on the ridge, causing the plates to move downwards and away from each other.
Slab pull – At destructive plate boundaries, oceanic crust which is denser, sinks into the mantle as it is pulled down by gravity into the mantle, and the rest of the plate is pulled along behind.

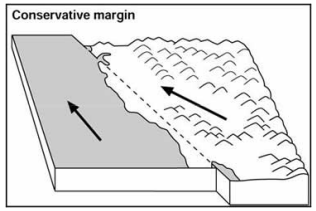
Tectonic plates



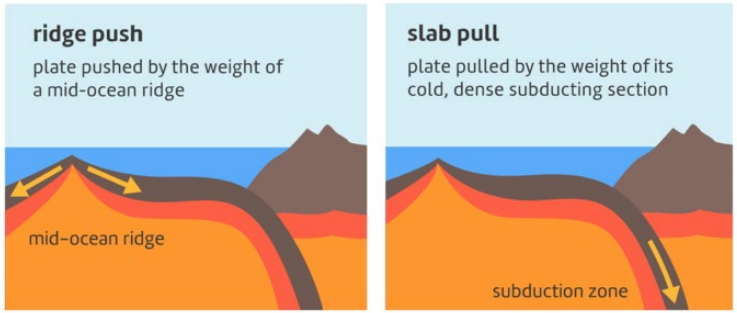
Plates move apart, creating new crust. Magma rises to the surface, leading to volcanic eruptions and earthquakes as the crust fractures and shifts.

Plates collide, causing subduction and destruction of crust. Intense pressure builds up, resulting in explosive volcanic eruptions, powerful earthquakes, and potentially tsunamis.





Plates slide past each other horizontally. Friction between the plates builds up, releasing energy in the form of frequent earthquakes, while no new crust is formed and no volcanic activity occurs.



GEOGRAPHY: Year 9 – Restless Earth

Case Study: Hunga Tonga Volcano

The Hunga Tonga eruption of **2022** was a significant volcanic event that occurred in the South Pacific. On **January 15**, a submarine volcano located near the island of Hunga Tonga-Hunga Ha'apai erupted explosively, sending plumes of ash, steam, and gas high into the atmosphere.

The eruption had significant effects:

- According to a World Bank impact report, the event has caused $90.4 million in economic damage.
- Waves reaching up to 15 metres hit the outer Ha'apia island group, in Tonga's main island, Tongatapu, 56 houses were destroyed or seriously damaged.
- According to the government, at least three people lost their lives in Tonga. Two people drowned off a beach in Peru after unusually high waves were recorded there.
- Ash damaged crops, especially bananas, tomatoes, pineapples and watermelon crops which impacted food supplies and their ability to earn money from selling them.

And required the following responses:

- The Fijian government issued a tsunami warning, telling people in coastal parts to move to higher ground due to "larger than usual waves".
- The Australian defence force sent a surveillance plane on Monday 17th January 2022 to assess damage to critical infrastructure such as roads, ports and power lines.
- After the ash descended on Tonga, young men from villages surrounding the capital travelled to the airport to clear the runways by hand.
- The World Bank provided $8 million to Tonga following the eruption

Why do people live at risk from tectonic hazards?

- Volcanic rock and ash provide fertile land which results in a higher crop yield for farmers.
- Tourists are attracted to the volcano, which increases money to the local economy.
- Geothermal energy can be harnessed, which provides cheaper electricity for locals.
- Minerals are contained in lava, e.g. diamonds - these can be mined to make money.

The risk of tectonic hazards DOES NOT automatically mean a place is cheaper to live. Think of Los Angeles - which often experiences earthquakes, but is very expensive.

Extra: Read / Watch / Do:
Do: Create a 3D model of an earthquake-proof building and justify its features.
Read: Read news articles about a recent tectonic event. What happened and how did people respond?
Watch a film about a tectonic event e.g. Dante's Peak – can you find any flaws in the representation of geographical processes?

Curriculum Links:
The content from this unit ties in with the Hazards unit that we study at GCSE. It also builds on prior knowledge about rocks from Y7, impacts and responses from weather hazards, as well as causes of poverty which is coming up later in Y9!

Assessment Skill - Writing to analyse:
Explain the importance of one thing over another, or make a decision based on an issue. You should:

1. Make an opening statement to set out your key decision, e.g. the secondary effects of the volcano were worse than the primary effects.
2. Give evidence for your argument e.g. the cost of the damage was $90.4mill, but only a few people died.
3. Explain thoroughly how this evidence proves your point e.g. the costs were bad because… Therefore… As a result…
4. Give evidence and an explanation that opposed your argument e.g. some people would argue that the primary effects were worse because… Therefore… As a result…
5. Conclude to give the main reason why you came to your final decision e.g. The main reasons the secondary effects were worse is because it had a long-lasting damage to the lives of many people who were living close to the eruption.

Writing to **evaluate**: weigh up the advantages and disadvantages equally, then conclude.

GEOGRAPHY: Year 9 – Development and Aid

Key terms / Literacy:

Development – the progress of a country in terms of economic growth, use of technology and human welfare.

High Income Country (HIC) – a richer country with a GNI per capita of $13,205 or above.

Low Income Country (LIC) – a poorer country with a GNI per capita of $1,085 or below.

Newly Emerging Economy (NEE) – countries that are experiencing higher rates of economic development which is pulling them out of the category of LIC.

Aid - assistance given from one country to another. It includes money, equipment, training and loans. It can be foreign aid from the government of one country to another - or from charities to a country or region

Gross National Income (GNI) per capita - GNI per capita is the total value of all the goods and services produced in a country in a year plus income from abroad, divided by the number of people (per capita) living in that country.

Human Development Index (HDI)

This is a development indicator made up of a number of social and economic measures - GNI per capita, number of years of education and life expectancy. HDI values can range from 0 (less developed) to 1 (more developed).

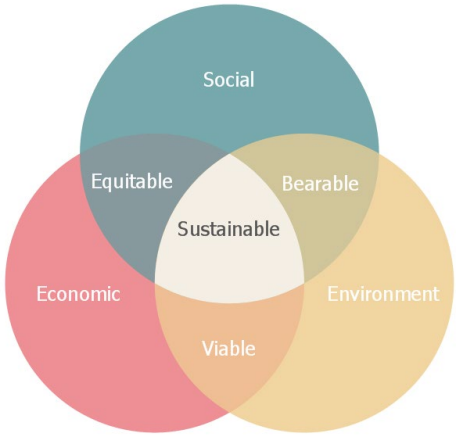
Literacy rates

Literacy rate is the percentage of people aged 15 years and above who can read and write.

What is development and why is it important?

Development is a measure of how advanced a country is socially, economically, or technologically. And countries around the world are at different stages of development.

Development must be equitable, viable and bearable to be considered **sustainable development**. This means it satisfies social, economic and environmental needs.



How can we measure development?

There is no single way to measure how developed a country is. However, development indicators can give some idea of a country's development.

- Gross National Income (GNI) per capita is useful when measuring the wealth of a country and deciding if a country is a HIC or LIC. Richer countries are often thought to be better developed, but if a country does not use their wealth to support their population, this will not be the case.
- Literacy rates are useful in understanding how good the social development of a country is. It tells us about the level of education within a country. Children who learn to read and write are more likely to get jobs when they are older. However, a country may be an NEE that has invested a lot of money into education, but not into other things such as healthcare, which could be damaging society in other ways.
- Birth rates may be affected by religious and cultural factors rather than economics or development.
- HDI is thought to be the most useful indicator because it combines three other indicators and includes both social and economic measures.

How is population affected by development?

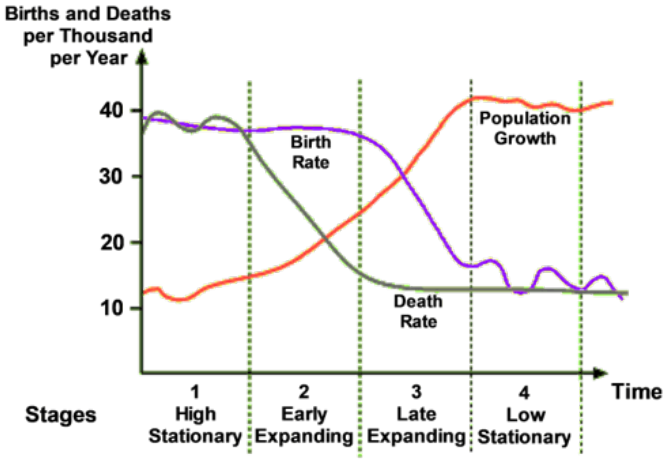
The Demographic Transition Model shows how the birth rate, death rate and overall size of the population may change as a country becomes more developed.

It shows that as development improves over time, death rate falls as health and diet improves. Birth rates then fall, again as health improves, but also due to cultural factors changing and because women are more likely to work and so they will have less time to look after children. These factors also support the development of a country as there are more people working so wealth increases.

When birth rates are higher than death rates the population increases.

Not all countries follow the model due to cultural differences. It also does not consider population changes due to migration.

Demographic Transition Model



GEOGRAPHY: Year 9 – Development and Aid

Why are some countries poorer than others?

Physical Factors: Some countries are poor because their climate prevent economic development. Droughts, poor soils or extreme temperatures can reduce how many crops are grown. Certain temperatures can also increase the spread of diseases such as malaria or tropical illnesses.

Historical Factors: Colonisation can also have long lasting impacts on poverty in some countries. Colonising powers often extracted valuable resources from colonised countries, depleting their natural sources. Colonized countries were often structured to serve the economic interests of the colonisers, with limited local industries and markets. This led to these countries depending on selling to their former colonisers to make money.

Economic Factors: When GNI is low the country will have a low income from tax revenues. This leads to less money to invest in infrastructure, healthcare and education, which leads to low-level jobs continuing to be the main source of income.

How do aid projects help a country to develop?

Example: Goat Aid

Background: Goats are given by the charity Oxfam to families and villages in countries such as Burundi or Malawi.

Advantages	Disadvantages
- Goat milk and meat can be used as a food source. - Brings village together as they look after the goats. - Goats breed which makes the strategy sustainable. - Manure can be used to fertilise crops. - Milk and babies can be sold to make an income.	- Family needs to provide shelter and food for the goat. - Families may need training how to look after the goat properly. - Veterinary care may be expensive and hard to find. - The income gained from the goats will only be small.

Extra: Read / Watch / Do:

- Do: Research an aid agency and consider how you could support them, either now, or when you are older.
- Read: *Factfulness* by Hans Rosling
- Watch: *Don't Panic – The Truth About Population* on YouTube.

Curriculum Links:

The content from this unit is important throughout most units of work in geography, because many human structures depend on the level of development in a place.

At GCSE we will study the theory behind economics, the economy of Nigeria and the economy of the UK.

Assessment Skill - Writing to analyse:

Explain the importance of one thing over another, or make a decision based on an issue. You should:

1. Make an opening statement to set out your key decision, e.g. the main factor determining development is historical factors.
2. Give evidence for your argument e.g. Events such as colonisation and war have held back the development of nations for over 100 years, for example many African nations which were colonised by Britain and France and are still some of the poorest nations in the world toady.
3. Explain thoroughly how this evidence proves your point e.g. This is because… Therefore… As a result…
4. Give evidence and an explanation that opposed your argument e.g. Some people may feel that physical factors have a greater influence on development, such as… because… Therefore… As a result...
5. Conclude to give the main reason why you came to your final decision.

Writing to **evaluate**: weigh up the advantages and disadvantages equally, then conclude.

Topic 2 – Road to WWII

Treaty	A written agreement between countries.
Versailles	The peace treaty after World War One that punished Germany.
Reparations	Money Germany had to pay for the damage caused in WWI.
Appeasement	Letting someone get what they want to avoid a fight.
Dictator	A leader who has total power and doesn't allow opposition.
Hitler	Leader of Nazi Germany who wanted to make Germany powerful again.
Nazi Party	Hitler's political party that took control of Germany in 1933.
Lebensraum	Hitler's idea that Germany needed more land to grow.
League of Nations	An international group that tried (and failed) to keep peace after WWI.
Anschluss	The joining of Germany and Austria in 1938.
Sudetenland	Part of Czechoslovakia that Hitler took over in 1938.
Munich Agreement	A deal where Britain and France let Hitler take the Sudetenland.
Nazi-Soviet Pact	An agreement between Germany and the USSR to not attack each other.
Invade	When an army enters another country by force.
Inevitable	Something that is certain to happen and cannot be stopped.

Consequences of World War One

- WWI ended in **1918** after four years of brutal trench warfare.
- Over **15 million people died**, and Europe was **economically and physically devastated**.
- The **Austro-Hungarian, German, Russian, and Ottoman Empires collapsed**.
- Many countries faced **political unrest**, revolutions, and economic problems.
- There was a strong desire to avoid another war, leading to the creation of the **League of Nations** in 1919 to keep peace.

Impact of the Treaty of Versailles

Term	Impact
Blame – Germany had to accept full responsibility for the war (War Guilt Clause).	Created resentment and a sense of injustice in Germany.
Reparations – £6.6 billion to be paid to the Allies.	Crushed Germany's economy, leading to hyperinflation in 1923.
Army – Limited to 100,000 men; no tanks, submarines or air force.	Germany felt defenceless and humiliated.
Territory – Lost land in Europe and all overseas colonies.	Millions of Germans lived outside Germany's new borders.
League of Nations – Set up to keep peace; Germany was not allowed to join at first.	Germany felt isolated and rejected.

Key Turning Points on the Road to War

Event	Details	Impact
1933 – Hitler becomes Chancellor	Begins to rearm Germany in secret.	Breaks Treaty of Versailles.
1936 – Remilitarisation of the Rhineland	German troops enter demilitarised zone.	France and Britain do nothing – Hitler grows more confident.
1938 – Anschluss with Austria	Germany and Austria unite.	Popular in both countries but banned under Versailles. No response from Britain or France.
1938 – Sudetenland Crisis	Hitler demands land in Czechoslovakia.	Britain and France agree in the Munich Agreement – appeasement in action.
1939 – Invasion of the rest of Czechoslovakia	Hitler takes over all of Czechoslovakia – not just German areas.	Appeasement ends – Britain and France realise Hitler cannot be trusted.
August 1939 – Nazi-Soviet Pact	Germany and USSR agree not to attack each other and secretly divide Poland.	Hitler avoids a war on two fronts.
1 September 1939 – Invasion of Poland	German troops invade from the west; USSR invades from the east.	Britain and France declare war – WWII begins.

Extra - Read/watch/do

Causes of WWII:
https://www.bbc.co.uk/bitesize/articles/zgtmm39

What is fascism?
https://www.youtube.com/watch?v=4ejvegGwXYs

You will be assessed on

The political spectrum, the rise of fascism in Italy, Germany and Britain

The Treaty of Versailles, turning points on the road to WWII

Links to curriculum

RE

English

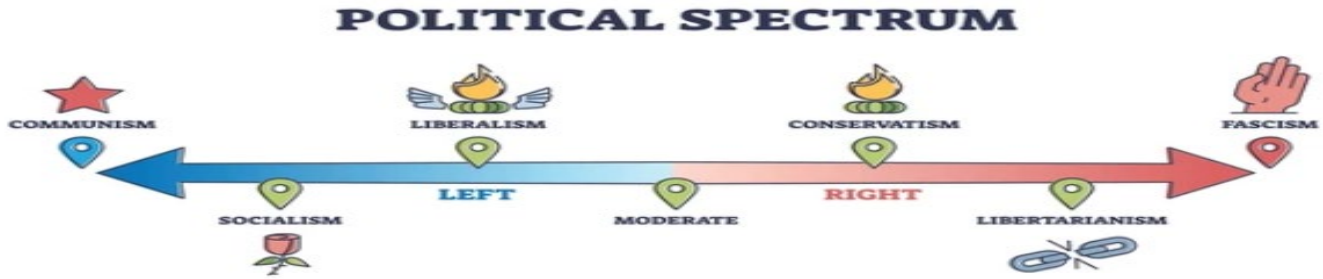
Geography

Topic 1 – Rise of Extremism

Totalitarian	A system where the state seeks to control every aspect of public and private life.
Dictatorship	A government controlled by one leader with absolute power.
Propaganda	Biased or misleading information used to influence public opinion.
Censorship	Controlling or limiting access to ideas, speech, or information.
Cult of personality	When a leader is portrayed as a heroic or godlike figure.
Secret police	Police used by a government to spy on, intimidate, and arrest opposition (e.g. Gestapo, OVRA).
Youth movements	Organisations aimed at indoctrinating young people with fascist values (e.g. Hitler Youth, Balilla).
Persecution	Cruel and unfair treatment of people, especially because of race, religion, or beliefs.
Anti-Semitism	Hostility or prejudice against Jewish people.
Aryan	Nazi idea of a "master race" that was used to justify racism.
Blackshirts	Mussolini's fascist paramilitary group.
Gestapo	Nazi Germany's secret police force.
Indoctrination	Teaching people to accept a set of beliefs without questioning.
Nationalism	Extreme pride in one's country, often at the expense of others.

Key Concept: What Is Fascism?

Ultra-nationalism: The nation is glorified above all else.
Authoritarianism: One-party state led by a dictator who demands loyalty and obedience.
Anti-communist & anti-liberal: Rejects democracy and Marxism; believes competition and hierarchy are natural.
Militarism & violence: War and struggle are seen as ways to prove national strength.
Cult of personality: Leader presented as a saviour (e.g. Mussolini's 'Il Duce', Hitler's 'Führer').
Control of society: Propaganda, censorship, secret police, youth groups, and persecution of enemies.



Why Fascism Became Popular in Italy:

Factor	Details
Post-WWI anger	Italy felt cheated at Versailles; huge war debt, 500 000+ dead.
Economic chaos	Inflation, unemployment, strikes (1919–22).
Fear of socialism	Upper & middle classes worried by Russian Revolution; Mussolini promised order.
Weak governments	Frequent coalition collapses in a parliamentary system seen as ineffective.
Blackshirt violence	Fascist squads broke strikes and intimidated opponents; elites tolerated them.
1922 March on Rome	King Victor Emmanuel III asked Mussolini to form a government, believing he could be controlled.

Fascism in Britain:

Why It Appealed	How It Grew	Public Response
Anxiety over unemployment (Great Depression).	**British Union of Fascists (BUF)** formed by Sir Oswald Mosley, 1932; black-shirted rallies.	Anti-fascist protests: *Battle of Cable Street* (Oct 1936) prevents BUF march through East End.
Admiration for Mussolini's "order".	Newspapers like the *Daily Mail* briefly voiced support ("Hurrah for the Blackshirts!").	Government passes **Public Order Act 1936** banning political uniforms & limiting marches.
Fear of communism spreading from USSR.	Membership reaches c. 50 000 but collapses by 1939 after violence, anti-Semitism, and Nazi links are exposed.	Most Britons favour democracy; WWII unites opinion firmly against fascism.

How Hitler Came to Power in Germany:

1. **1923** – Munich Putsch fails; Hitler jailed, writes *Mein Kampf*.
2. **1929-32** – Great Depression hits Germany hard (6 million unemployed); Nazi vote surges.
3. **January 1933** – President Hindenburg appoints Hitler Chancellor to break deadlock.
4. **February 1933** – Reichstag Fire → emergency decree suspends civil liberties.
5. **March 1933** – Enabling Act gives Hitler power to rule by decree → one-party state.
6. **June 1934** – Night of the Long Knives removes rivals; army swears loyalty.
7. **August 1934** – Hindenburg dies; Hitler merges offices of President and Chancellor → becomes **Führer**.

RELATIVE FREQUENCY/FREQUENCY TREE

Key Concepts

Experimental probability differs to theoretical probability in that it is based upon the **outcomes from experiments**. It may not reflect the outcomes we expect.

Experimental probability is also known as the relative frequency.

Estimating the number of times an event will occur:

Probability × no. of trials

A frequency tree shows the outcome of two or more events.

A tree diagram shows the probabilities of two or more events. It involves multiplying the probabilities along the branches.

Year 9

Examples

Colour	red	blue	white	black
Prob	x	0.2	0.3	x

A spinner is spun, it has four colours on it.

The relative frequencies of each colour are recorded.

The relative frequency of red and black are the same.

a) What is the relative frequency of red?

$\mathbf{1 - (0.2 + 0.3) = 0.5}$

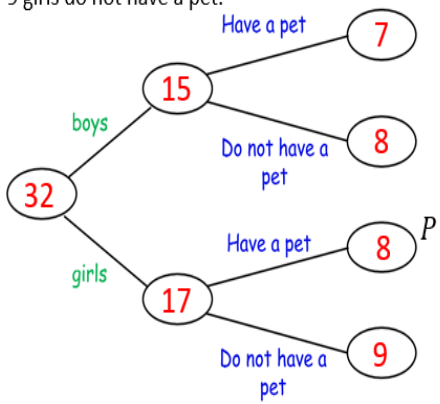
$x = \frac{0.5}{2} = 0.25$

b) If the spinner is spun 300 times, how many times do you expect it to land on white?

$$0.3 \times 300 = 90$$

Examples

In Hannah's class there are 32 students.
15 of these students are boys.
7 of the boys have a pet.
9 girls do not have a pet.



$P(boy) = \frac{15}{32}$

$P(Girl\ with\ pet) = \frac{8}{32}$

Key Words

Experimental

Relative frequency

Expected outcome

Mutually exclusive

Probability

Estimate

Number	1	2	3	4
Prob	x	0.46	0.28	x

A spinner is spun which has 1,2,3,4 on it. The probability that a 1 and a 4 are spun are equal.

a) What is the probability that a 4 is landed on?

b) If the spinner is spun 500 times how many times do we expect it to land on a 2?

ANSWERS: a) 0.13 b) 230

EXPRESSIONS/EQUATIONS/IDENTITIES AND SUBSTITUTION

Key Concepts

A formula involves two or more letters, where one letter equals an expression of other letters.

An expression is a sentence in algebra that does NOT have an equals sign.

An identity is where one side is the equivalent to the other side.

When substituting a number into an expression, replace the letter with the given value.

Examples

1) $5(y + 6) \equiv 5y + 30$ **is an identity as when the brackets are expanded we get the answer on the right hand side**

2) $5m - 7$ **is an expression since there is no equals sign**

3) $3x - 6 = 12$ **is an equation as it can be solved to give a solution**

4) $C = \frac{5(F-32)}{9}$ **is a formula (involves more than one letter and includes an equal sign)**

5) Find the value of $3x + 2$ when $x = 5$

$(3 \times 5) + 2 = 17$

6) Where $A = b^2 + c$, find A when b = 2 and c = 3

$A = 2^2 + 3$

$A = 4 + 3$

$A = 7$

Year 9

Key Words

Substitute

Equation

Formula

Identity

Expression

Questions

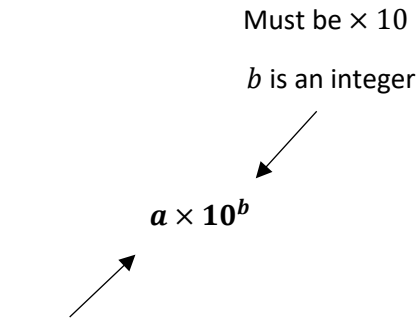
1) Identify the equation, expression, identity, formula from the list:
   (a) $v = u + at$ (b) $u^2 - 2as$ (c) $4x(x - 2) = x^2 - 8x$
   (d) $5b - 2 = 13$
2) Find the value of $5x - 7$ when $x = 3$
3) Where $A = d^2 + e$, find A when d = 5 and e = 2

ANSWERS: 1) (a) formula (b) expression (c) identity (d) equation 2) 8 3) A = 27

STANDARD FORM/ROUNDING/ESTIMATION

Key Concepts

We use standard form to write a very large or a very small number in scientific form.



A value of 5 to 9 rounds the number up.

A value of 5 to 9 rounds the number up.

Standard Form

Write the following in standard form:

1) **3000 = 3×10^3**
2) **4580000 = 4.58×10^6**
3) **0.0006 = 6×10^{-4}**
4) **0.00845 = 8.45×10^{-3}**

Rounding and Estimation

Round 3.527 to:

a) 1 decimal place
3 . 5 | 2 7 → 3.5

b) 2 decimal places
3 . 5 2 | 7 → 3.53

c) 1 significant figure
3 | . 5 2 7 → 4

Estimate the answer to the following calculation:

$$\frac{46.2 - 9.85}{\sqrt{16.3 + 5.42}}$$

$$\frac{50 - 10}{\sqrt{20 + 5}}$$

$$\frac{40}{5} = 8$$

Key Words

Standard form

Base 10

Integers

Negative Significant figures

Estimate

Questions

A) Write the following in standard form:

1) 74 000 2) 1 042 000 3) 0.009 4) 0.000 001 24

B. Round the following numbers to the given degree of accuracy

1) 14.1732 (1 d.p.) 2) 0.0568 (2 d.p.) 3)3418 (1sf)

ANSWERS: A1) 7.4×10^4 2) 1.042×10^6 3) 9×10^{-3} 4) 1.24×10^{-6}

B1) 1) 14.2 2) 0.06 3) 3000

Year 9

REARRANGE AND SOLVE EQUATIONS

Key Concepts

Solving equations:

Working with inverse operations to find the value of a variable.

Rearranging an equation:

Working with inverse operations to isolate a highlighted variable.

In solving and rearranging we undo the operations starting from the last one.

Examples

Solve:

$7p - 5 = 3p + 3$

$-3p \qquad -3p$

$4p - 5 = 3$

$+5 \qquad +5$

$4p = 8$

$\div 2 \qquad \div 2$

$p = 2$

Solve:

$5(x - 3) = 4(x + 2)$

expand $\qquad$ expand

$5x - 15 = 4x + 8$

$-4x \qquad -4x$

$x - 15 = 8$

$+15 \qquad +15$

$x = 23$

Rearrange to make r the subject of the formulae :

$$Q = \frac{2r - 7}{3}$$

$\times 3 \qquad \times 3$

$3Q = 2r - 7$

$+7 \qquad +7$

$3Q + 7 = 2r$

$\div 2 \qquad \div 2$

$$\frac{3Q + 7}{2} = r$$

Rearrange to make c the subject of the formulae :

$$2(3a - c) = 5c + 1$$

expand

$6a - 2c = 5c + 1$

$+2c \qquad +2c$

$6a = 7c + 1$

$-1 \qquad -1$

$6a - 1 = 7c$

$\div 7 \qquad \div 7$

$$\frac{6a - 1}{7} = c$$

Year 9

Key Words

Solve

Rearrange

Term

Inverse

Questions

1) Solve $7(x + 2) = 5(x + 4)$
2) Solve $4(2 - x) = 5(x - 2)$
3) Rearrange to make m the subject $2(2p + m) = 3 - 5m$
4) Rearrange to make x the subject $5(x - 3) = y(4 - 3x)$

ANSWERS: 1) $x = 3$ 2) $x = 2$ 3) $m = \frac{3 - 4p}{7}$ 4) $x = \frac{4y + 15}{5 + 3y}$

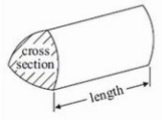
VOLUME AND SURFACE AREA OF PRISMS

Key Concepts

The volume of an object is the amount of space that it occupies. It is measured in units cubed e.g. cm³.

To calculate the volume of any prism we use:

$$area\ of\ cross\ section \times length$$



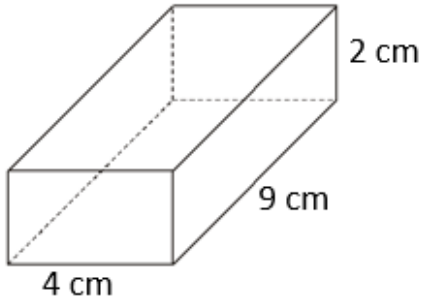
A prism is a 3D shape which has a continuous cross-section.

The surface area of an object is the sum of the area of all of its faces. It is measured in units squared e.g. cm².

Examples

$$\boldsymbol{Volume} = 4 \times 9 \times 2$$

$$= \boldsymbol{72cm^3}$$



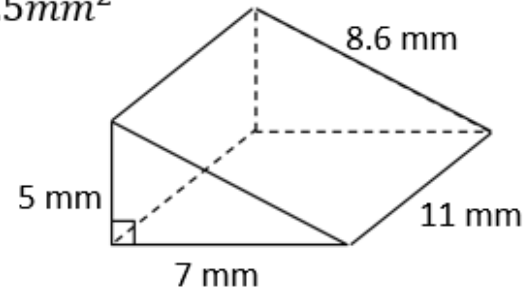
$$\boldsymbol{Surface\ area}:$$
$$Front = 4 \times 2 = 8$$
$$Back = 4 \times 2 = 8$$
$$Side\ 1 = 9 \times 2 = 18$$
$$Side\ 2 = 9 \times 2 = 18$$
$$Bottom = 4 \times 9 = 36$$
$$Top = 4 \times 9 = 36$$
$$Total = \boldsymbol{124cm^2}$$

$$Area\ of\ triangle = \frac{5 \times 7}{2}$$

$$= 17.5mm^2$$

$$\boldsymbol{Volume} = 17.5 \times 11$$

$$= \boldsymbol{192.5mm^3}$$



$$\boldsymbol{Surface\ area}:$$
$$Front = \frac{7 \times 5}{2} = 17.5$$
$$Back = \frac{7 \times 5}{2} = 17.5$$
$$Side = 5 \times 11 = 55$$
$$Bottom = 7 \times 11 = 77$$
$$Top = 11 \times 8.6 = 94.6$$
$$Total = \boldsymbol{261.6cm^2}$$

Year 9

Key Words

Volume

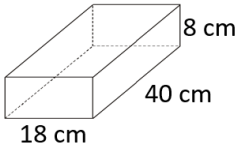
Capacity

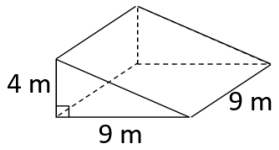
Prism

Surface area

Questions

Find the volume and surface area of each of these prisms:





ANSWERS: 1)Volume = 5760 cm³ Surface area = 2368 cm² 2) Volume = 162 m³ Surface area = 241.2m²

Morality	Principles concerning the distinction between right and wrong or good and bad behaviour.
Ethics	Moral principles that govern a person's behaviour or the conducting of an activity.
Sanctity of Life	The view that all life is sacred because it is made by God.
Quality of Life	The standard of health, comfort, and happiness experienced by an individual or group.
Natural Moral Law	A system of laws based on close observation of human nature, given to humans by God.
Reason	The power of the mind to think, understand, and form judgements logically.
Absolute	A value or principle which is regarded as universally valid.
Situation Ethics	The view that there should be flexibility in the application of moral laws according to circumstances.
Relativism	The view that morality exists in relation to culture, society, or historical context, and is not absolute.
Stewardship	The job of supervising or taking care of something.
Dominion	To be in charge of something or rule over it.

YEAR 9 – What are the questions of Life and Death?

Sanctity of Life vs Quality of Life

One important distinction to make in **Medical Ethics** is between **Sanctity of Life** and the **Quality of Life.**

Sanctity of Life is a belief held by many religions which states that all life is valuable because it is **holy** and made by God.

Others would argue for the **Quality of Life:** the belief that life is most **valuable** when it is satisfying and of a good quality.

This distinction will frame many of our debates around the different medical practices.

How ethical is Abortion?

An **abortion** is the termination of a pregnancy. The law in the UK states that an abortion has to take place before *24* weeks, as it is at this point that the baby could survive outside of the **womb.**

The global conversation around **abortion** is one which has been widely covered by the media during **pro-life** and **pro-choice** rallies and protests.

Pro-life refers to those who believe that abortion should not be allowed as the baby's life is valuable. Pro-choice refers to those who believe that the mother should have the final say over what happens to her body.

How ethical is Euthanasia?

Euthanasia is the painless killing of someone suffering from a terminal or incurable illness. This is currently illegal in the UK but it is legal in a few counties, such as Switzerland. There are some who believe that we should have the option to die with **dignity**, without pain and suffering. There are others who believe that this would be classed as **murder** as it requires ending a life. Religious views would often turn to the **sanctity of life** and consider it wrong as only God can take life.

Aquinas' Natural Moral Law:

Aquinas believed that God created the world with a purpose, and humans should use reason to follow it. His five main rules (called Primary Precepts) include preserving life, reproducing, educating children, living in society, and worshipping God. Actions like abortion and euthanasia are usually wrong because they go against preserving life. Natural Law gives clear guidance but can be seen as too strict.

Fletcher's Situation Ethics:

Fletcher taught that the most important rule is to do the most loving thing in each situation. This love is called agape – selfless and unconditional. Unlike fixed rules, Situation Ethics allows flexibility. Abortion or euthanasia might be right if they are the most loving choice. It's compassionate but can be hard to decide what love means in every case.

How ethical is Capital Punishment?

Capital punishment (the death penalty) is a controversial issue. Some people believe it is ethical because it delivers justice and protects society from dangerous criminals. Others argue it is wrong because it takes away a human life and mistakes can happen. Many religious believers say only God should decide when life ends. Critics also point out that it doesn't always reduce crime and can be unfairly applied. The debate focuses on justice, human rights, and the value of life.

Useful Links:

Morals, Ethics & Philosophy:
https://www.bbc.co.uk/bitesize/topics/zkdk382

Literacy / key words

Human Rights: The basic rights and freedoms that every person is entitled to, such as the right to life, freedom, and equality.

Social Justice: The idea of creating a society where everyone is treated fairly.

Discrimination: Treating someone unfairly because of characteristics (age, gender, sex, race, etc.)

Prejudice: Holding unfair and biased opinions based on appearance, background or belief.

Poverty: The state of having little or no money/resources, making it difficult to meet basic needs.

Activism: Taking action and campaigning to make a positive change in society, especially for human rights or social justice.

Human Rights and Social Justice

Human rights and social justice focus on ensuring **dignity, equality, and freedom** for all individuals, with key principles outlined in the **Universal Declaration of Human Rights (UDHR),** adopted by the United Nations in 1948. The UDHR advocates for rights such as the right to life, liberty, education, and non-discrimination.

YEAR 9 – What are the issues of Equality?

Religious Freedom

Religious freedom is the right to practice, change, or express one's religion **without persecution**. However, in many parts of the world, people face restrictions or discrimination due to their beliefs. The UDHR upholds this freedom, but individuals in some countries experience severe limitations.

Christian Responses to Human Rights

Christian responses to human rights emphasise **compassion, justice, and human dignity**, based on the belief that all are made in the image of God (Imago Dei). The **parable of the Sheep and Goats** (Matthew 25:31-46) teaches that helping the marginalised is a way to serve Christ. Similarly, the story of the **Rich Man and Lazarus** (Luke 16:19-31) highlights the moral responsibility of the wealthy to care for the poor.

Muslim Responses to Human Rights

Muslim responses to human rights are rooted in the principles of **justice, equality, and compassion**, as outlined in the Qur'an and Hadith. **Zakat**, one of the Five Pillars of Islam, emphasises the duty of Muslims to give to those in need, **promoting social welfare and reducing inequality**. The concept of ***khalifah*** (stewardship) outlines the responsibility of humans to care for others and the world, ensuring justice and the protection of rights, as Islam teaches that all people are equal in the eyes of God.

Sikh Responses to Human Rights

Sikh responses to human rights are grounded in the principles of equality, justice, and selfless service. The concept of ***sewa*** (selfless service) encourages Sikhs to support others without expectation of reward. ***Langar***, the free community kitchen, embodies this commitment by offering meals to all, regardless of background or status, reinforcing the belief in equality. The ***Khalsa***, established by **Guru Gobind Singh**, are called to protect human rights and fight against injustice.

Religious Charities

Muslim Aid® Serving Humanity

christian aid

CAFOD

Extra - Read/watch/do

What is Equality & Social Justice: https://www.bbc.co.uk/bitesize/articles/z42khbk

Human Rights and Responsibilities: https://www.bbc.co.uk/bitesize/articles/zdv646f#zt83239

Tenses

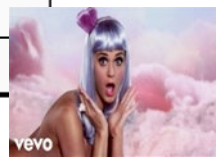
PRESENT	-ar verbs	-er verbs	-ir verbs
I	-o	-o	-o
you	-as	-es	-es
he/she/it	-a	-e	-e
we	-amos	-emos	-imos
you (pl)	-áis	-éis	-ís
they	-an	-en	-en

Son= they are
Hay - there is
Es - is
Tiene - has

FUTURE Saying what you are going to do

Voy	1 2 3	INFINITIVE *Ir*
vas		
va	a	*Tocar*
vamos		*jugar*
vais		*nadar*
van		*llevar*
		leer
		Ver

PAST preterit	AR	ER/ IR
I (yo)	é	í
You (tú)	aste	iste
He/she (él / ella)	ó	ió
We (nosotros)	amos	imos
You (pl) vosotros	asteis	isteis
They (ellos/ellas)	aron	ieron



Opinions & Pronouns

Lo que más me gusta es… =the thing I most like is
Creo que../pienso que= I think that

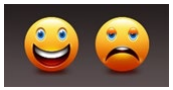
Me chifla

Me queda bien

(it suits me)

Me hace feliz

(it makes me happy)



Me enfada (angers)

Me repugna

Me irrita

Me aburre

Connectives

También / además	also/furthermore
Pero / sin embargo	but / however
que	which
Donde	where
Porque / dado que	because/ given that
Aunque	although
Así que / por eso	there fore /so

Complexity

Suelo + infinitive = I tend to ..
Suelo llevar = I tend to wear….
Tengo que + Infinitive = I have got to
Tengo que comprar = I have to buy
Puedo + inf = to be able to
¿Puedo probar los zapatos? = Can I try the shoes?

Adjectives

De moda	fashionable
Antecuado(a)	Old fashioned
Estrecho(a)	tight
Ancho(a)	Wide/ baggy
Largo(a) / corto(a)	Long/ short
Barato(a)	cheap
Caro(a)	expensive
elegante	smart
De colorines	coloured
Estampado(a)	patterned
De rayas	striped
Cómodo / incomodo	(un)omfortable
chulo	cool

El vestido **es más caro qu**e la falda = *is more expensive than*
Demasiado=*too*
realmente= *really*
Tan= *so (es tan barato =it is so cheap)*

TOPIC VOCABULARY TRANSLATED

LA ROPA

un traje	a suit
un jersey	a jumper
un abrigo	a coat
un top	a top
un vestido	a dress
Un cinturón	a belt
una camisa	a shirt
una blusa	a blouse
una falda	a skirt
una camiseta	a T-shirt
una corbata	a tie
una sudadera (con capucha)	a sweatshirt (with hood)
una gorra	a baseball cap
unos pantalones	trousers
unos zapatos	shoes
unos vaqueros	jeans
unos calcetines	socks
unas botas	boots
unas zapatillas de deporte	trainers

Los verbos

Comprar	to buy
Llevar	to wear
Probar	to try
Estar de moda	to be in fashion
Cambiar	to change
Ir de compras	to go shopping
Hacer la compra	to do the shopping
Poder	to be able to

LAS TIENDAS

en la zapatería	in the shoeshop
en la librería	in the bookshop
en la panadería	in the bakery
en la carnicería	in the butcher's
en la farmacia	in the chemist's
en la fruteria	in the fruit shop
en la tienda de regalos	in the gift shop
en la tienda de discos	in the record shop
en las tiendas de moda	in the Spanish fashion shops

españolas

Y9 Spanish - De Vacaciones

Tenses

PRESENT	-ar verbs	-er verbs	-ir verbs
I	-o	-o	-o
you	-as	-es	-es
he/she/it	-a	-e	-e
we	-amos	-emos	-imos
you (pl)	-áis	-éis	-ís
they	-an	-en	-en

FUTURE Saying what you are going to do

Voy	a	INFINITIVE *Ir*
vas		
va		*Tocar* *jugar* *nadar*
vamos		
vais		*leer* *Ver*
van		

PAST preterit	AR	ER/ IR
I (yo)	é	í
You (tú)	aste	iste
He/she (él /ella)	ó	ió
We (nosotros)	amos	imos
You (pl) vosotros	asteis	isteis
They (ellos/ellas)	aron	ieron

IR-to go
Fui *I went*
Fuiste
Fue
Fuimos
Fuisteis
fueron

Opinions & Pronouns

Lo que más me gusta es… =the thing I most like is
Creo que../pienso que= I think that

Me chifla

Me queda bien
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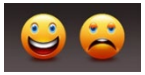


Me enfada (angers)

Me repugna

Me irrita

Me aburre

Connectives

También / además	also/furthermore
Pero / sin embargo	but / however
que	which
Donde	where
Porque / dado que	because/ given that
Aunque	although
Así que / por eso	there fore /so

Complexity

quiero + infinitive = I want to ..
Quise + inf = I wanted to

Tengo que + Infinitive = I have got to
Tuve que + inf = I HAD to

Puedo + inf = to be able to
Pude + inf = I could

Adjectives

Guay /chulo	cool
emocionante	exciting
Bonito / hermoso	beautiful
pinturesco	picturesque
limpio	Clean
sucio	dirty
impresionante	impressive
rápido	smart
gracioso	Funny
Pesado /aburrido	boring
fascinante	Fascinating
maravilloso	Marvelous

Inglaterra **es más caro qu**e Espana = *is more expensive than*

Demasiado=*too*
realmente= *really*
Tan= *so (es tan barato =it is so cheap)*

Y9 Spanish - De Vacaciones

TOPIC VOCABULARY TRANSLATED

DONDE fuiste?

Fui a…

La costa
El campo
Un pueblo
Un camping
Una ciudad

Inglaterra
Escocia
Francia
Gales
Irlanda
España
Francia
Italia
Grecia
Turquía

Me alojé en….
Un hotel
Una tienda – a tent
Un apartamento
Una casa

Transporte

En coche	by car
En tren	by train
En avión	by plane
En autocar	by coach
En barco	by boat

Lugares (places)

El museo	the museum
El espectáculo	the show
El palacio	the palace
El parque temático	the theme park
El paseo marítimo	the promenade
El Castillo	the castle
El partido de fútbol	the football match
El estadio	the stadium
El Puerto	the port
El centro comercial	the shopping centre
El mar	the sea

La playa	the beach
La costa	the coast
La plaza de toros	the bullring
La piscina	the pool
Las tiendas	the shops
La excursion	the trip
La cathedral	the cathedral

El tiempo / el clima

Hace (mucho) calor	it is (very) hot
Hace (un poco) frío	it is (a bit) cold
Hace (bastante) sol	it is (quite) sunny
Hace (demasiado) viento	it is (too) windy
Llueve (llover)	it is raining (to rain)
Nieva (nevar)	it is snowing (to snow)
Está nublado	it is cloudy

PAST TENSE WEATHER

Hace > HIZO

Llovió
Nevó
Estuvo

Los verbos

- Ir de excursion- to go on a trip
- Ir de paseo – tp go for a stroll
- Ir a discotecas- to go to clubs
- Ir de compras – to go shopping
- Descansar – to relax
- Tomar el sol – to sunbathe
- Nadar en el mar – to swim in the sea
- Montar en bicicleta – to ride
- Montar a caballo – to ride a horse
- Sacar fotos – to take photos
- Bañarse* – to bathe /swim
- Alojarse* - to stay (in accommodation)
- cenar en los restaurantes
- Hacer surfing- to do surfing

Important Spanish Question Words

¿Cuándo? - *When?*

¿Para qué? - *For what purpose?*

¿Cómo? - *How?*

¿Adónde? - *Where?*

¿Cuánto? - *How much / many?*

¿Quién? - *Who?*

¿Qué? - *What?*

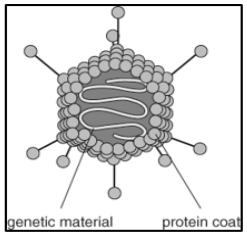
¿Por qué? - *Why?*

¿De dónde? - *From where?*

¿Cuál? - *Which one?*

Biology GCSE Transition

1. Diseases	
Disease	Something that makes you ill, such as infection by a pathogen or not having a healthy diet
Pathogen	A microbe that causes disease e.g., polio virus
Infectious disease	Caused by a microbe that gets into the body and changes how it works e.g., polio
Deficiency disease	Caused by the lack of a nutrient needed for good health e.g., anaemia
Genetic disease	Caused by a fault in DNA that changes how cells work e.g., haemophilia
Lifestyle disease	How we live can increase the risk of getting these diseases
Example of a lifestyle disease	Smoking can cause lung cancer
Autoimmune disease	When the body's immune system attacks and damages cells in the body e.g., Type 1 diabetes
Communicable disease (also called *infectious disease*)	A disease that can be passed from an infected person to an uninfected person
Structure of a virus	An outer protein coat that protects the genetic material inside
Why viruses are not a living organism	They cannot carry out all the life processes
How a virus infects a cell	It takes over the cell's genetic material and makes the cell produce more viruses, which break open the cell membrane and escape to infect other cells

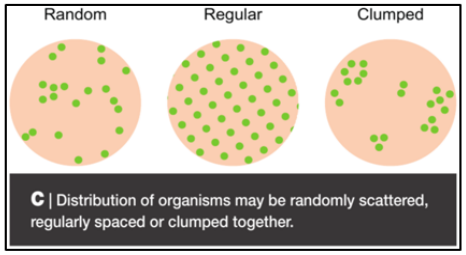


Structure of a virus

2. Control Systems	
How the nervous system works	**Receptor cells** in **sense organs** detect stimuli; a receptor cell produces **electrical impulses** that travel along **nerve cells** in **nerves** to the **spinal cord**, and then usually to the **brain**; the brain processes the information in the impulses; the brain sends electrical impulses through nerves in the spinal cord to **effectors** (muscles and glands); muscles respond by contracting; glands respond by releasing hormones
Hormone	A chemical messenger that is released from a gland into the blood and carried around the body
Target cell or organ	Cells or organs that respond to hormones by changing what they are doing
Example of a hormone and its effect	Oestrogen controls changes in a girl's body during puberty
How the nervous system is different to the hormonal system	Electrical impulses travel quickly along nerves; hormones travel in the blood

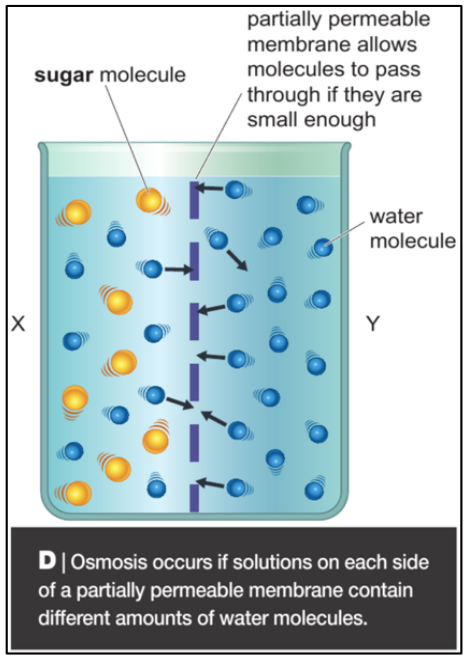
3. Testing Medicines	
Medicine	A drug that helps the body to ease the symptoms of a disease or cure the disease
Antibiotic	Treats bacterial infections by killing the pathogen
Antiviral	Treats viral diseases
Vaccine	Used to immunise people *before* they get ill so that they are protected from a particular pathogen
Side-effect	Unintended effects of medicines that may be harmful
Stages of testing new medicines	• Stage 1: on diseased cells or organs to see how well the medicine affects the pathogen and cells • Stage 2: on animals to see how a whole body reacts to the medicine, without risk to humans • Stage 3: on a few healthy people to make sure the drug is safe and to find general side-effects • Stage 4: **clinical trial** on many patients to make sure the drug works, to find the right **dose** and to check for side-effects in different groups
Using a control group	Group of people that is similar to the test group in stage 4 and receives a placebo, against which the results of the new treatment will be compared
Placebo	Something that looks like the real medicine but contains no drug
Why a placebo is taken	To stop the placebo effect (when a patient gets better because they think they have received a medicine, even when they haven't)
Getting the correct results in stage 4	Patients are randomly placed in each group to reduce the risk of bias

4. Ecology	
Abundance	The number of organisms in an area
Estimating population size	Population size = number of organisms in sample x (total size of area ÷ area of sample)
Distribution	How the organisms are spread throughout an area
Sampling techniques	Quadrat for organisms that don't move e.g., plants; pitfall trap for animals that crawl on the ground, e.g., beetles; sweep net for small organisms in tall plants e.g., insects sitting on long grass



C | Distribution of organisms may be randomly scattered, regularly spaced or clumped together.

5. In And Out	
Diffusion	When particles spread and mix with each other without anything moving them
Surface area : volume ratio	Larger organisms have a smaller SA : V ratio than smaller organisms
Osmosis	The type of diffusion that describes the overall movement of solvent molecules in a solution across a partially permeable membrane



D | Osmosis occurs if solutions on each side of a partially permeable membrane contain different amounts of water molecules.

Y contains more water molecules, so the overall movement of water molecules will be from Y to X by osmosis

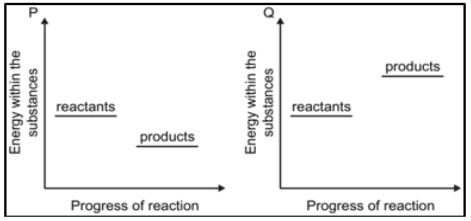
Chemistry GCSE Transition

1. Ions

Atom	Has no overall charge as the negative charge of the **electrons** balances the positive charge of the central **nucleus**
Ion	An atom that has a tiny electrical charge
How a positive ion is formed	When an atom loses one or more electrons
How a negative ion is formed	When an atom gains one or more electrons
Ionic bond	A strong force between oppositely charged ions
When ionic compounds can conduct electricity	Only if the ions can move e.g., when the compound is dissolved in water or is liquid
Structure of a metal	A lattice of positive ions sitting in a sea of negative electrons
Metallic bonding	Forces of attraction between the opposite charges that hold the metal together
Why metals can conduct electricity	The electrons can move

2. Energy Transfers

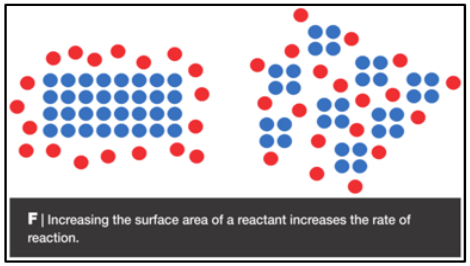
When metallic bonding is stronger	If there are more free electrons and ions with more charges
Endothermic	Any change that takes energy in from the surroundings, which normally decreases the temperature of the surroundings e.g., melting
Exothermic	Any change that gives out energy to the surroundings, which normally increases the temperature of the surroundings e.g., freezing
Reaction profile	Shows the changes in energy of reactants and products during a reaction



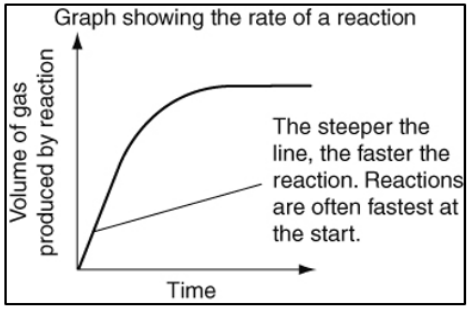
Q is an endothermic reaction because the products have more energy than the reactants

3. Rates Of Reaction

Rate of reaction	How quickly a reaction occurs
Example of a slow reaction	Iron rusting
How to measure the rate of reaction	Measure how quickly the reactants are used up or how quickly the products are formed
What is needed for two particles to react	They must collide hard enough or with enough energy
When reactions occur faster	If more reactant particles can collide with each other
How to increase the number of colliding particles	Increase the **surface area** of a reactant



Why reactions get slower as they progress	There are fewer and fewer reactant particles



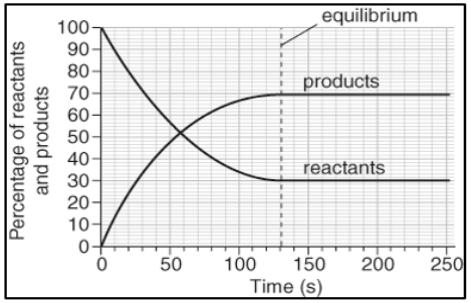
The horizontal line on the graph shows that the reaction has stopped

4. Chemical Equations

Salt	An ionic compound produced in a neutralisation reaction
Neutralisation reaction	An acid reacts with an alkali or a base to produce a salt and water
Example of a neutralisation reactions	Hydrochloric acid + copper oxide → copper chloride + water
State symbols	Solid (s); liquid (l); gas (g); aqueous (aq)

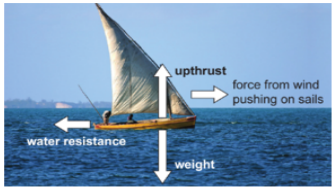
5. Equilibria

Reversible reaction	Can go both backwards and forwards
Example of a reversible reaction	$3H_2(aq) + N_2(g) \rightleftharpoons 2NH_3(g)$ A double arrow shows a reversible reaction
Dynamic equilibrium	When there are constant changes going on but these changes are equal and opposite and so do not affect the overall levels of something
A reversible reaction reaches a dynamic equilibrium	When the amounts of the products and the reactants do not change



At equilibrium, the rate of the forwards and backwards reactions are the same

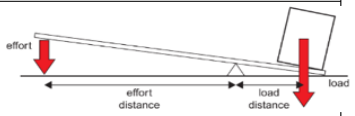
9I Forces and Motion

1. Forces and Movement	
Friction	Force between two surfaces sliding across each other.
Reducing Friction	Using rollers or wheels / sleds in snowy countries
Balanced	When a force acting on an object is the same size as the force in the opposite direction.
Constant Speed	Caused by balanced forces acting on an object.
Unbalanced	Forces acting in opposite directions are not equal.
Resultant	The difference between the forward and backward force.
Accelerate	Get faster- caused by unbalanced forces.
Boat Force Diagram	
Drag	Acts to slow down objects moving through fluids (liquids/ gases) *e.g. water resistance and air resistance*
Top Speed	Dependent on the maximum force a vehicle can move forwards an on the friction/ drag acting to slow it down.

2. Energy For Movement	
Food	Supplies humans the energy they need.
Solar Energy	Energy stored in food originally came from the Sun.
Kinetic Energy	Stored in anything that is moving.
Fossil Fuel	Fuels formed by remains of plants / animals that store large amounts of energy. *e.g. coal, oil, natural gas*
Non-Renewable	Resources that will run out one day like fossil fuels.
Using Fossil Fuels	Energy stored in oil and natural gas is used for transport. Energy released by burning fuels is transferred by heating for cooking or keeping warm
Gravitational Potential	Energy stored in raised objects.
Elastic Potential	Energy stored in stretched or squashed objects.
Thermal	Energy stored in the movement of particles. Transferred from hot objects to cooler ones by heating.
Renewable	Resources that will not run out. *e.g. wind, moving water*
Nuclear Energy	Non-renewable resource used to generate electricity.
Electricity	Cannot be stored, has to be generated by renewable or non-renewable resources.
Conservation of Energy	Energy cannot be created or destroyed, only transferred.
Efficiency	The useful energy transferred compared to the total energy transferred by a device.
Dissipated	Energy that spreads out.
Transfers	Energy is often transferred by heating or sound.

3. Speed	
Speed	How far something can travel in a certain time.
Units	Dependent on measurements taken *e.g. miles per hour, metres per second*

Speed Formula	$\text{speed} = \frac{\text{distance}}{\text{time}}$
Mean Speed	Total distance travelled, divided by the total time taken.
Distance-Time Graph	Used to show how fast someone travelled during a journey. Also called a displacement-time graph
Displacement	Distance in a straight line between an object and its starting point.
Horizontal Line	Shows an object isn't moving on the distance-time graph.
Steep Line	Shows an object is moving quickly
Relative	Looking speed compared to another object which may be moving.

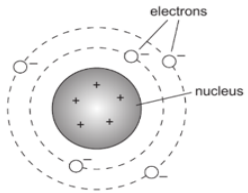
4. Turning Forces	
Lever	Long bar used to life heavy objects.
Pivot / Fulcrum	Point that the lever turns around.
Effort	Force applied down on lever.
Load	The object being lifted.
Lever Diagram	
Force Multiplier	Effort distance is greater than the load distance meaning that the effort force is smaller than the force lifting the load.
Distance Multiplier	Large effort force moves a small distance and the load is moved a greater distance.
Moment	The turning effect of a force.
Units	Moments are measured in newton metres (N m)

Moment Formula	moment of the force (N m) = force (N) × perpendicular distance from the pivot (m)
Equilibrium	Opposing forces are balanced.

5. More Machines	
Machine	Anything that helps us work with forces.
Ramp	A simple machine that means less force is needed to push an object up a slope compared to lifting.
Pulleys	Makes lifting a load easier by pulling down a rope.
Work	Amount of energy transferred when a force moves something.
Units	Work is measured in Joules (J)
Work Done Formula	work done (J) = force (N) × distance moved in the direction of the force (m)
Conservation of Energy	If a smaller force is needed to move something, the force has to move through a greater distance.

9J Force Fields and Electromagnets

1. Force Fields	
Force Field	The area around something where a non-contact force can affect things.
Non-Contact Force	A force which can affect something from a distance.
Magnetic Field	The space around a magnet where it can affect magnetic materials or other magnets.
Repel	To push away. Two of the same poles will repel each other.
Attract	To draw together. A north and a south pole will attract each other.
Earth's Magnetic Field	Protects the Earth from charged particles emitted by the Sun
Mass	The amount of matter that something is made up of- measured in grams / kilograms.
Gravitational Field	The space around any object with mass where its gravity attracts other masses.
Gravitational Field Strength	The force with which a gravitational field pulls on each kilogram of mass. Earths gravitational field strength is approximately 10 N/Kg.
Weight	The amount of force with which gravity pulls things. Measured in Newtons. Weight = mass x gravitational field strength
Gravitational Potential Energy (GPE)	Energy stored in objects in high places that can fall down.

2. Static Electricity	
Static Electricity	A positive or negative charge on an insulating material caused when rubbing transfers electrons from one material to another.
Nucleus	The central part of an atom- has a positive charge.
Electrons	Small particles moving around the nucleus in an atom- have a negative charge
Atom	
Charges	Something with a charge of static electricity can attract uncharged objects. Two charged objects can attract or repel each other.
Electric Field	The space around an object with a charge of static electricity where it can affect other objects.

3. Current Electricity	
Electric Current	The flow of electrons in a circuit.
Current in Series	The current is the same everywhere in a series circuit.
Current in Parallel	The current through the cell splits up when it comes to a junction in a parallel circuit.
Ammeter	Connected in series and used to measure the current flowing through a circuit- measured in amperes (A).
Voltage	How much energy is transferred by electricity by a cell / component.
Voltmeter	Connected in parallel and used to measure the voltage of a component- measured in volts (V)

4. Resistances	
Resistance	How difficult it is for electricity to flow through something.
Resistors	A component that makes it difficult for electricity to flow. Used to reduce the size of the current in a circuit.
Factors Affecting Resistance	Increasing the length of a wire or decreasing the thickness will increase the resistance.
Insulators	Do not conduct electricity- they have very high resistances.
Ohms	The units for measuring resistance- Ω
Calculating Resistance	Voltage = current x resistance

5. Electromagnets	
Electromagnets	A coil of wire with electricity flowing in it that has a magnetic field around it.
Increasing Electromagnet Strength	Increasing the number of coils. Increasing the current in the wire. Using a magnetic material as a core.
Relays	A small current is used to switch on a circuit that carries a much bigger current
Motor Effect	The force produced when a wire carrying a current is placed in a magnetic field.
Electric Motor	A coil of wire in a magnetic field. The coil spins when a current flows through it.

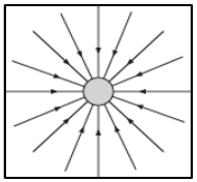
Physics GCSE Transition

1. Differences

Potential differences	Causes currents to flow in circuits
Temperature differences	Causes energy to be transferred between objects by heating
Why a cold drink taken from the fridge will warm up	The air in the room is warmer than the drink, so energy is transferred from the air to the drink until both are at the same temperature
Latent heat	The energy needed to break the bonds *between* particles in melting or evaporating, or the energy released when these bonds form in condensing or freezing
Specific heat capacity	The energy needed to raise the temperature of 1 kg of a substance by 1 °C
Convection current	A flow of liquid or gas caused by part of it being heated or cooled more than the rest
How a land breezes occur	At night the land cools down faster than the sea because it has a lower specific heat capacity, so the air above the land is cooler than the air above the sea; the air above the sea is less dense than the air above the land, and so it tends to rise and create lower air pressure over the sea; air above the land is at higher pressure, so it flows out over the sea; the breeze blows from land to sea

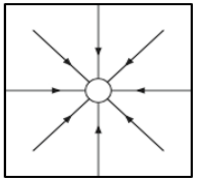
2. Fields

Force field	The volume around something where a non-contact force can affect things
Electric field	The space around an object with a charge of static electricity where it can affect other objects



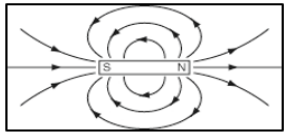
The arrows show the direction a positive charge would move

Gravitational field	The space around any object with mass where its gravity attracts other masses



The direction of a gravitational field is always towards the mass

Magnetic field	The space around a magnet where it can affect magnetic materials or other magnets



The arrows show the direction a north pole would move

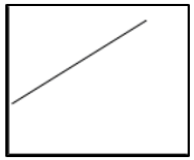
Calculating gravitational potential energy	Gravitational potential energy (in J) = mass (in kg) × height (in m) × gravitational field strength (in N/kg)

3. Cause And Effect

Correlation	When two things happen together, such as one variable increasing as another increases, or two variables changing with time in a similar way

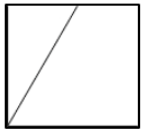
4. Links Between Variables

Equation for a straight line	$y = mx + c$ y is the dependent variable, m is the gradient, x is the independent variable, c is the point where the line crosses the vertical axis
Linear relationship	A relationship between variables that produces a straight line



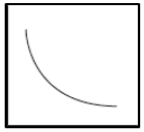
The line does not have to go through the (0,0) point

Direct proportion	A relationship between two variables where one variable doubles when the other doubles



The graph is a straight line through (0,0)

Inverse proportion	A relationship between two variables where one variable doubles when the other halves



Example: If the cross-sectional area of a wire is doubled, its resistance halves

Distance-time graph	The gradient of the line tells you the speed
Speed-time graph	The gradient of the line tells you the acceleration and the area under the graph tells you the distance the object has moved

5. Models

What models can be used for	To help us understand how things work; to test new technology
Abstract model	A model that only exists in your thoughts or as a computer program, formula or diagram
Physical model	A model that you can touch or a model that you could build e.g., wind tunnel

COMPUTER SCIENCE – Cybersecurity

Literacy / Key Words

- **adware:** adverts for products a user may be interested in, based on internet history
- **authentication:** verifying the identity of a user or process
- **biometrics:** 'password' created from the user fingerprint, iris, retina, facial, voice
- **blagging:** inventing a scenario to obtain personal information
- **CAPTCHA:** Completely Automated Public Turing Test To Tell Computers and Humans Apart
- **DoS/DDoS:** Denial of Service attack / Distributed Denial of Service
- **encryption:** mathematically converts data into a form that is unreadable without a key
- **firewall:** checks incoming and outgoing network traffic for threats
- **hacking:** gaining unauthorised access to or control of a computer system
- **malware:** a variety of forms of hostile or intrusive software
- **penetration testing:** testing a network/program for vulnerabilities
- **pharming:** redirecting web traffic to fake websites designed to gain personal information
- **phishing:** messages designed to steal personal details / money / identity
- **ransomware:** virus which locks a computer and encrypts files until a "ransom" is paid
- **script kiddies:** hackers with no technical hacking knowledge using downloaded software
- **shouldering:** directly observing someone enter personal details e.g. PIN number, password
- **social engineering:** manipulating people so they give up personal/confidential information
- **spyware:** gathers information about a person or organisation without their knowledge
- **trojans:** masquerades as having a legitimate purpose but actually has malicious intent
- **viruses:** self-replicating software attached to another program/file
- **worms:** replicate and spread through the network

Cybersecurity looking at common attacks and methods to protect ourselves and our networks against these attacks.

Network and System **security measures** include:

- Anti-malware
- Auto Update
- Biometrics
- Encryption
- Firewall
- Passwords
- User authentication
- User permissions

Hacking in the context of cyber security is gaining unauthorised access to or control of a computer system

Unethical versus ethical hacking

Penetration testers (pen testers) are people who are paid to legally hack into computer systems with the sole purpose of helping a company identify weaknesses in their system.

Data Protection Act 2018:

All organisations and people using and storing personal data must abide by the DPA principles . It states how data should be stored/accessed and what rights a data subject has for the protection of their data.

Computer Misuse Act 1990: It is an offence to:

1. have unauthorised access to computer material
2. have unauthorised access with intent to commit or facilitate the commission of further offences
3. commit unauthorised acts with intent to impair, or with recklessness as to impairing, the operation of a computer.

Extra – Read/Write/Do

- Read a news article about a recent cyber attack and identify what went wrong.
- Research how to set up two-factor authentication on a phone or account.

You will be assessed on:

- Key terms and examples of common cyber attacks (e.g. phishing, malware, DoS).
- Legal frameworks including the Data Protection Act 2018 and Computer Misuse Act 1990.
- Security measures to prevent attacks (e.g. firewalls, encryption, authentication).

Links to curriculum:

- Computer Systems: understanding how computer systems can be protected from threats.
- Ethical, legal, and environmental concerns: focusing on laws and responsibilities in relation to digital data.
- Security: identifying and preventing cyber threats.

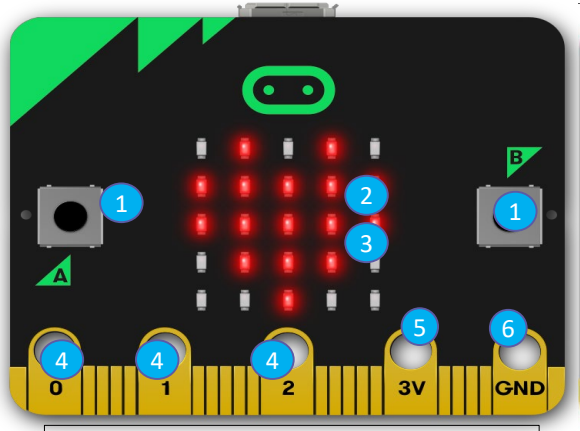
Literacy / Key Words

- **Micro:bit:** A small computer with a microprocessor that can execute a single program at a time.
- **Buttons:** Capture user input and makes things happen
- **LED display (Light Emitting Diodes):** 5x5 LED matrix output used to display information.
- **Light Sensor:** Input, measures how much light is falling on the micro:bit.
- **GPIO (General-Purpose Input Output) pins:** Input and output connects headphone, sense touch and add other electronics.
- **Temperature sensor:** Input measures how warm the environment is.
- **Compass:** Input, finds magnetic north or measures magnetic field strength
- **Accelerometer:** Input detects gestures and measures movement in 3 dimensions.
- **Radio:** Communication input and output allows communication with other devices
- **Algorithm:** A set of instructions to be followed to complete a given task or solve a problem.
- **Program:** A sequence of instructions used by a computer.
- **Sequence:** The order which the computer will run code in, one line at a time.
- **Selection:** A decision made by a computer, choosing what code should be run only when certain conditions are met.
- **Condition:** Checking to see whether a statement or sum is true or false.
- **Iteration:** When a section of code is repeated several times – also known as looping.
- **Variable:** Something which can be changed in a computer. Made up of a name and some data to be saved.

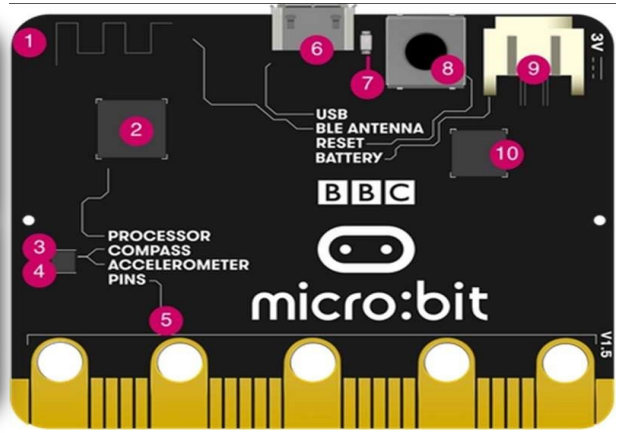
Python is a **text-based programming language** used to create programs, games, and apps.

A **program** is a set of instructions written in a programming language. To run it, a computer needs to **translate** the code using a **Python interpreter**, which executes the program.

The micro: bit is a pocket-sized computer that introduces you to how software and hardware work together. It has an LED light display, buttons, sensors and many input/output features that you can program and physically interact with.



1. Buttons: input
2. LED display: output
3. Light sensor: input
4. Pins – GPIO: input/output
5. Pin – 3 volt power
6. Pin - Ground



1. Radio & Bluetooth antenna
2. Processor & temperature sensor
3. Compass
4. Accelerometer
5. Pins
6. Micro USB socket
7. Single LED
8. Reset button
9. Battery socket
10. USB interface chip

Extra – Read/Write/Do

- Try a Micro:bit simulator online (e.g. Microsoft MakeCode).
- Explore the MakeCode tutorial “Flashing Heart” or “Name Tag”.

You will be assessed on:

- Identifying inputs and outputs on the Micro:bit.
- Understanding components like sensors, buttons, and LEDs.
- Writing and understanding simple programs using sequence, selection, and iteration.

Links to curriculum:

- Physical Computing: using code to control real-world inputs and outputs.
- Programming Concepts: using sequence, selection, iteration, and variables.
- Systems Architecture: how hardware and software interact.

Literacy / Key Words

Local software	• Needs time to be installed on all computers • Licences may be bought for staff who do not use all of the available software in the package • Has to be maintained and updated by maintenance people • Users must be using the computer on which the software is installed
Cloud storage	• Files are stored on remote servers • When you want to access the file or media, they are downloaded or streamed to your device • Files or media can also be uploaded to the cloud for storage (useful for backups) • Files or media can be synchronised on more than one device so that each device has the same content • The amount of storage can be increased or decreased as needed (it's scaleable)
Ad hoc network	• Created with a temporary device-to-device connection without the need for a connection to a Wi-Fi access point or router
VPN	• A VPN will route your data traffic via the virtual server. This will hide/cloak your data from potential hackers
Mental well-being	• Mental well-being describes your mental health, how well you cope with day-to-day life, how you feel, and how confident you are (good self-esteem).

Traditional vs modern workplace

Traditional	Modern
• Time spent commuting to work • Formal work wear • Desks/workstations • Labour-intensive tasks • Slow communication • Sociable • 9-to-5 hours	• Use of technology allows flexibility • Teams can be local, national, or global • Communication can be immediate • Data/information is sent digitally and quickly • Increased productivity • Can be isolating

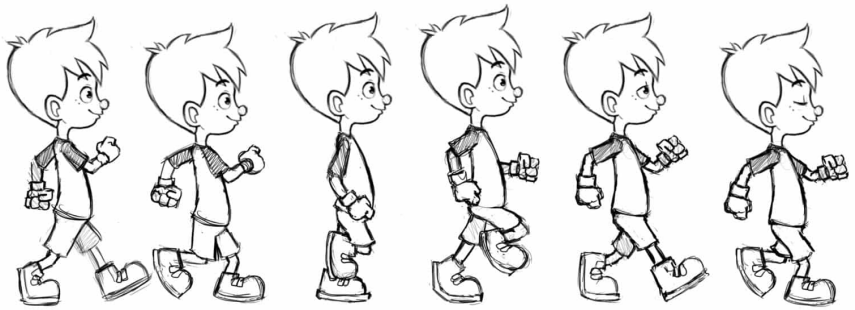
The impact of technology

Positive
- Apps can encourage physical activity
- Enhances access to learning
- Wearable technology can track heart rate
- Diabetics can track blood sugar levels and receive warnings if it is high or low, helping them to manage their well-being
- Allows flexibility in choosing a working style

Negative
- Can reduce sleep quality
- Eye strain/poor vision
- Repetitive strain injuries
- Physical inactivity can lead to weaker muscles
- Overuse can lead to: Loneliness, Depression, Anxiety

Accessibility tools

Technology is changing how people with disabilities access the world, opening up more career opportunities.
- Voice recognition that converts spoken word to digital text
- Screen readers that read screen text out loud
- Closed captioning or subtitles
- Motion or eye tracking
- Switch devices, which take the place of mice or keyboards



Stop motion vs Keyframe animation

Stop motion - manually animate every frame of the animation e.g. Shaun the Sheep

- Slower to make animations
- More difficult to edit

Keyframe animation - pick the important locations, the keyframes and the computer works out the rest (called tweening) e.g. Pixar films

- Faster to make animations
- Easier to edit
- Smoother animations
- Repeatable

Key Words

add	colour	cut	timeline
edge	knife tool	Extrude	subdivision
face	keyframe	focus	mode
edit	vertex	location	render
loop	tweening	object	ray tracing
organic	proportional	rotate	scale

Definitions

Face:	A surface made up of three or more sides. **Faces** are often referred to as **polygons.**
Vertex:	A point where one or more edges meet
Edge:	A line connecting two vertices
Objects:	Scenes are made up of geometric, control, lamp and camera objects
Keyframes:	Used for tracking change, a key is a marker in time
Ray tracing:	Rendering that involves tracing the path of a ray of light through the scene
Rendering:	The process of computationally generating a 2D image from 3D geometry
Subdivision:	Creating smooth higher poly surfaces which can take a low polygon mesh as input.
Proportional editing:	Transforming selected elements
Extrude:	Extend an object

Extra – Read/Write/Do

- Explore Blender's online manual to see what each tool does.
- Try animating a bouncing ball using keyframes and the timeline.

You will be assessed on:

- Knowing the difference between **stop motion** and **keyframe animation**.
- Identifying Blender tools and vocabulary (e.g. extrude, render, keyframe).
- Creating a short animated sequence using Blender features.

Links to curriculum:

- **Creative Media and Digital Literacy**: using industry-standard tools to create digital content.
- **Algorithms and Programming**: applying sequencing and change over time using keyframes.
- **Computational Thinking**: solving visual and design problems using digital tools.

Literacy / key words

Kosher: Prepared food that follows the requirement of Jewish dietary laws.

Halal: Slaughtered or prepared using a method that follows Islamic dietary laws.

Vegetarian: Someone who chooses to not eat any meat.

Lacto-ovo Vegetarian: someone who doesn't eat any meat or fish, but consumes milk, eggs and other animal products.

Vegan: Someone who doesn't eat any products derived from animals, e.g. meat, eggs and cheese.

Lacto-Vegetarian: Someone who doesn't eat any meat, fish or eggs, but consumes milk and other dairy products.

Ethical eating or food ethics: refers to the moral consequences of food choices.

Coeliac disease: where the digestive system is sensitive to gluten and can't digest it.

Gluten: a protein found in wheat flour, that makes dough stretchy.

Proteins: are made up of chemical 'building blocks' called amino acids.

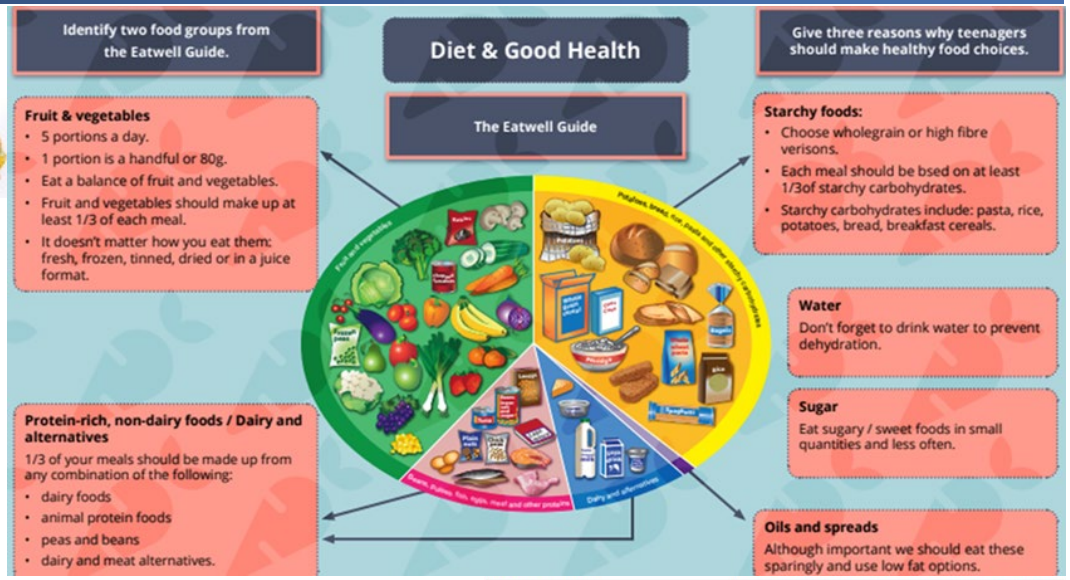
Malnutrition: a physical condition resulting from either a faulty or inadequate diet or from a physical inability to absorb or metabolize nutrients.

Lactose Intolerance: a digestive problem where the body can't digest lactose (milk sugars).

Allergy: an immune system response to a certain substance (an allergen), e.g. fish, nuts or eggs.

What makes us choose?

Special Occasions
Culture
Likes and dislikes
Time of Day
Morals
Health Conditions
Age
Cost
Religion



Religious Beliefs

Hinduism: most avoid beef & related products; some vegetarians; some avoid eggs

Judaism: kosher; avoid pork & shellfish;

Islam: halal; avoid pork & related products; no alcohol

Buddhism: most are vegetarian or vegan; avoid alcohol.

Type of vegetarian	Meat	Fish	Dairy	Eggs
Vegan	✗	✗	✗	✗
Pescetarian	✗	✓	✓	✓
Lacto	✗	✗	✓	✗
Lacto-ovo	✗	✗	✓	✓

Vegetarian alternatives to meat

Quorn- cultured fungus

Soya- soya bean

TVP- Textured vegetable protein

Tofu-soya bean curd

What is a Vegan diet	eat no animal flesh /meat/fish and poultry and no animal products
What is a lacto vegetarian diet	eat animal produce (Dairy) but not eggs or the flesh of animals/meat/fish/poultry
What is a lacto- ovo vegetarian diet	eat animal produce (Dairy and eggs) but not the flesh of animals/meat/fish/poultry
Why might someone choose to be a vegetarian?	Religious beliefs /Moral beliefs – cruel to kill animals/ Do not like the flavour, texture of meat / Land growing crops can feed many more people than land raising animals / Food scares – BSE, food poisoning, salmonella / Family influence/habits /Peer pressure
What foods can vegetarians get protein from?	Good vegetarian sources are Quorn, Tofu, Soya, Cereals, Pulses, Nuts & Lentils (some may also get this from diary and eggs)
What foods can vegetarians get non- haem Iron from?	Found in pulses, nuts, dried fruit, dark green leafy veg, dark chocolate, cocoa powder, black treacle, curry powder.
What foods can vegetarians get Vitamin B12	Found in yeast extract, marmite and fortified breakfast cereals
Vitamin B12 is needed to:	Needed for energy production, formation of red cells

Extra - Read/watch/do

https://www.youtube.com/watch?v=D6eor1wkNFY

You will be assessed on: Factors influencing food choices; Health Conditions and Fat; Macro-nutrients, energy and nutritional analysis; Life stages and nutritional needs; Food Science investigation Starch and sugars; Nutritional analysis of one dish.

Links to curriculum: Recognise the factors influencing food choice, including such as preference, ethical belief, availability, season, need, cost, packaging, food provenance, culture, religion, allergy/intolerance, advertising, body image and peer pressure;.

Diet Related Health conditions

Cardiovascular Disease (CVD)

This is the general term that describes disease of the heart or its blood vessels. The term includes coronary heart disease and stroke in which arteries carrying blood around the body become blocked with fatty deposits (cholesterol) and consequently blood flow is reduced. CVD is linked to poor diet and lifestyle traits such as obesity, high blood pressure, a diet high in cholesterol and lack of exercise.

To reduce the outcome of CVD it is important to follow dietary guidelines and eat a diet that is low in saturated fat and instead eat foods higher in unsaturated fat such as oily fish, nuts and seeds, olive oil and the recommended 5-a-day of fruit and vegetables.

Diabetes: Type 2

The body may produce too little insulin, or the body has become insulin resistant and cannot utilise the glucose produced by carbohydrates. To help prevent this condition, people should follow the healthy eating guidelines, exercise and maintain a healthy weight. This kind of diabetes usually affects people who are overweight or older. If a person is overweight, they are twice as likely to get type 2 diabetes. Therefore, a high-sugar diet and high-fat diet should be avoided.

Iron Deficiency Anaemia

Iron is important in making red blood cells, which carry oxygen around the body. Iron deficiency anaemia results in the person affected feeling tired and lethargic because organs and tissues will not get as much oxygen as they need.

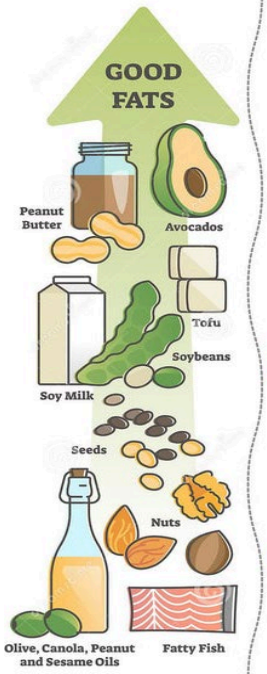
Good sources of iron include liver (avoid during pregnancy), eggs, red meat and dried fruit e.g. dried apricots and most dark green leafy vegetables.

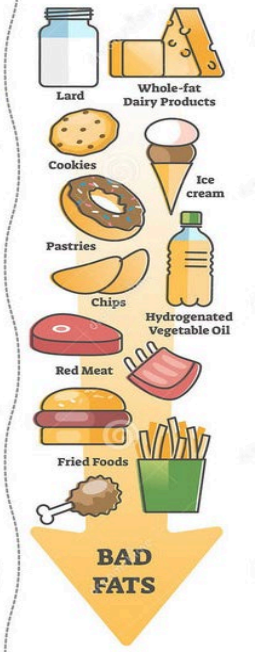
Obesity

This is the term to describe a person who is very overweight, with a lot of body fat. It is a common problem in Western society. The method to determine if a person is overweight is to measure their BMI.

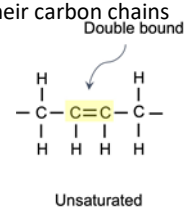
Nutrient Needs for Teenagers

Nutrient	Reason	Examples of Foods
Protein	Cope with growth spurts. Boys muscular tissue development.	Omelettes chicken
Iron	Girls loose iron during menstruation and could become anaemic if not replaced. Vitamin C helps absorb iron	Spinach, beef
Vitamin C		Peppers, strawberries
Calcium	Skeleton grows rapidly. These nutrients help reach peak size and bone density	Milk, yogurt, kale , tofu
Vitamin D		Tuna, Salmon, Mackerel



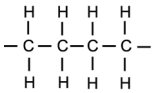


Unsaturated fatty acids contain at least one C=C bonds in their carbon chains



Unsaturated

Saturated fatty acids only have single C-C bonds



Saturated

Key Terms

BMR: Basal Metabolic Rate is the amount of energy we need to keep our body alive. Energy balance: the amount of energy we get from food each day is the same as the amount of energy we use each day.

BMI: This is a measure that adults and children can use to see if they are a healthy weight for their height.

Energy Dense: foods containing high amounts of fat and carbohydrates (especially sugar) e.g. pizza, pastry, chocolate bars, pastries, cakes, cookies, meat products i.e. sausages, burgers).

Kilocalorie (kcal)/ kilojoule (Kj): units used to measure energy.

PAL: (Physical Activity Level): the amount of energy we use for movement and physical activity every day.

Functions in the body:
Everyone needs energy to survive. It allows the body to:

- Move muscles and be physically active
- Produce heat to keep warm
- Send messages to the brain to make nerves work
- Allow the body to grow and develop

Sources:

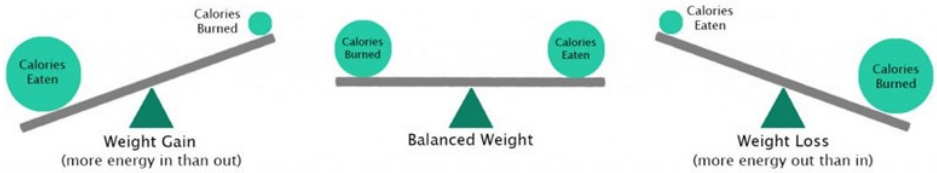
Carbohydrate: foods containing sugar and starch

(1g of carbohydrates = 3.75 /4 kcals of energy)

Fat: foods containing visible and invisible fats and oils. (1g of fat = 9 kcals of energy)

Protein: (1g of protein = 4 kcals of energy)

Amount of energy needed daily by each nutrient: Carbohydrate: 50%.
Most of which should come from starch, intrinsic and milk sugars.
No more than 5% of the energy from carbohydrate should come from free sugars, intrinsic sugar found in fruit and vegetables.
Fat: 35% or less eat less saturated fats.
Protein: 15%



Physical Activity Level: Regular exercise is an important part of a healthy lifestyle.

Physical activity :

- Reduces risk of developing heart disease, obesity and some cancers.
- Improves health of muscles and skeleton
- Keeps the brain alert and working
- Makes people feel good about themselves.
- Health experts are concerned about the sedentary (inactive) lifestyles due to too much sitting for long periods of time e.g. working at a desk, watching television, using the internet or playing computer games.

The recommended physical activity needed daily is suggested to be:

- 5-18 years: aim for an average of at least 60 minutes of moderate intensity physical activity a day across the week
- 19-64years: aim to do at least 150 minutes of moderate intensity activity a week or 75 minutes of vigorous intensity activity a week.

Energy Balance: The amount of energy we take in from food must be used up by our Basal Metabolic Rate and Physical Activity Level.

If we take in more energy from the food we use every day , the energy we do not use will be stored as fat and the body will gain weight.

If we take in less energy from food than we use every day, the energy stored in body fat will need to be used and the body will gradually lose weight.

This is the basis of weight reducing diets.

https://www.youtube.com/watch?v=D6eor1wkNFY

Literacy / key words

Gelatinisation: When starch particles swell and burst, thickening a liquid.

Viscosity: a measure of a food's resistance to flow, indicating how thick or thin it is.

Consistency: refers to the texture and form of food, which can range from liquid to solid.

Dextrinization: occurs when starch is exposed to dry heat. Starch in bread, biscuits and cakes with dry heat (toasting/baking) causes the starch molecules to break down to dextrin (brown colour)

Caramelisation: Sugar molecules break down when they reach a high temperature causing the sugar to turn brown and change flavour.

Roux: a sauce base made from plain flour and melted butter.

Carbohydrates: are sugar molecules. Along with proteins and fats, carbohydrates are one of three main nutrients found in foods and drinks. Your body breaks down carbohydrates into glucose. Sugars, starches and dietary fibre are carbohydrates.

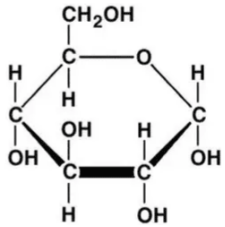
Glucose: or blood sugar, is the main source of energy for your body's cells, tissues, and organs.

Sugars:

- Monosaccharide are the simplest form of carbohydrate and can't be broken down.
- Disaccharide is the sugar formed when two monosaccharides are joined by glycosidic linkage.
- Polysaccharides are macromolecules made up of more than ten monosaccharides joined by glycosidic bonds.

Dextrinization

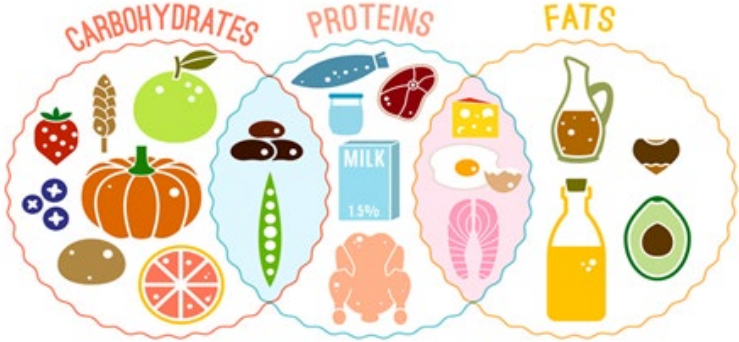
Chemical formula for glucose

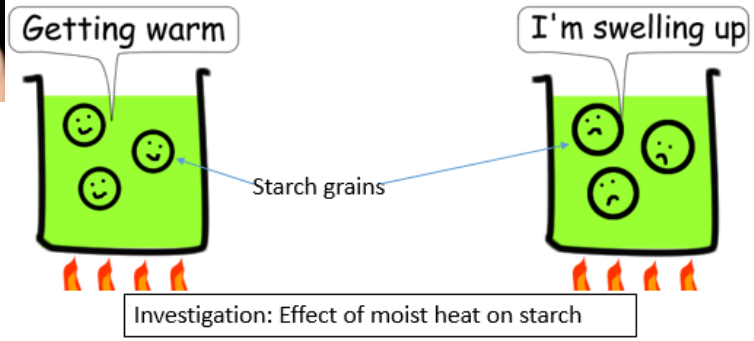


a. The starch grains when **heated** between 62◦C and 80◦ C with the liquid **absorbs the liquid.**
b. As it does so it **swells/expands.**
c. When it is no longer able to hold any more liquid the **starch grains burst** to release starch causing the **sauce to thicken.**

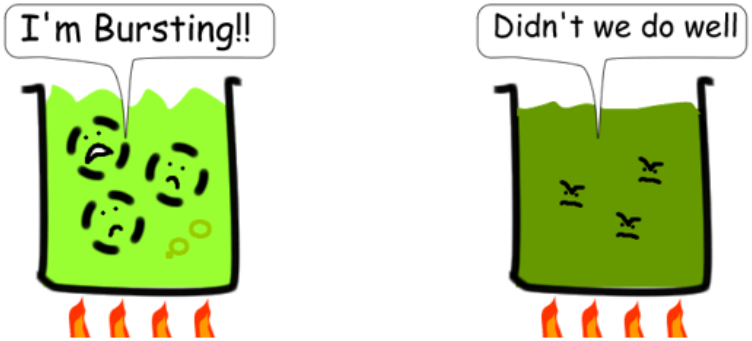
Gelatinisation: making a Roux Sauce

LOVE FOOD LOVE SCIENCE





Investigation: Effect of moist heat on starch



Gelatinisation occurs when the starch grains absorb water and ruptures to thicken a sauce or in the cooking of rice and pasta.

Design and Technology:

Literacy / key words

CAD and CAM
Computer Aided Design (CAD)
drawing allows products s to be manufactured using Computer Aided Manufacture (CAM)
Computer aided manufacture is very fast and accurate and requires less human intervention
One-off production: Making a single, unique product, often by hand, like a custom-made item or prototype.
Batch production: Making a set number of identical products in groups, like baking 50 cookies at once.
Mass production: Making thousands of identical products quickly using machines and assembly lines, like in a car factory.

CAD Computer Aided Design

This is using computer software to draw and model a product.
Examples:
2D Design, Photoshop, Macromedia Fireworks and Sketch Up
Advantages:
- Designs can be shared electronically
- Accurate
- Designs can be easily edited

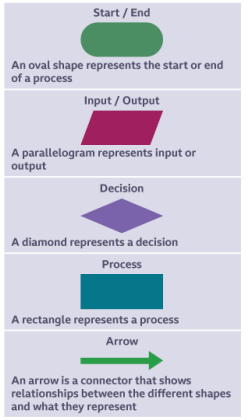
Disadvantages:
- Software and training can be expensive
- Security issues

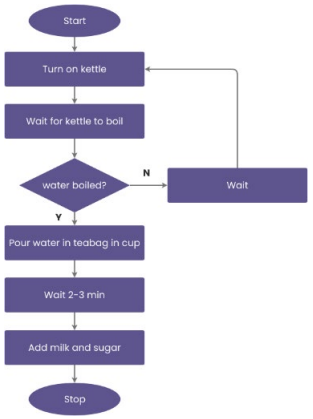
CAD Computer Aided Manufacture

This is using computer software to control machine tools to make products.
Examples:
Laser Cutter, 3D printer
Advantages:
- Faster
- Complicated shapes are easily produced
- Exact copied are easily made
- Machines can run 24/7

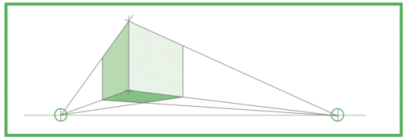
Disadvantages:
- High initial set up costs as CAM machines are expensive

Flow charts

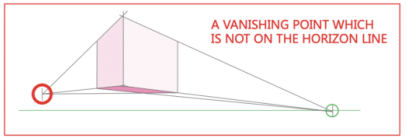




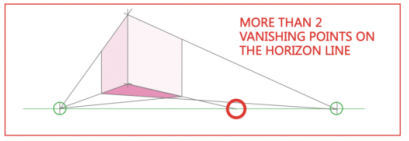
2 point perspective



PASS!



FAILED



FAILED

Extra - Read/watch/do

Watch and read
Who was Zaha Hadid

https://www.bbc.co.uk/bitesize/articles/zd48239#zqtsg2p

You will be assessed on
- Your knowledge of CAD CAM
- Your ability to write a specification
- Your completed product (cad and physical prototypes)

Links to curriculum

Make
select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture