Knowledge Organiser
Year 10

Term 3

Name _____

Tutor Group _____

This document is part of your compulsory equipment and must be taken to every lesson (with the exception of practical PE).

Table of contents

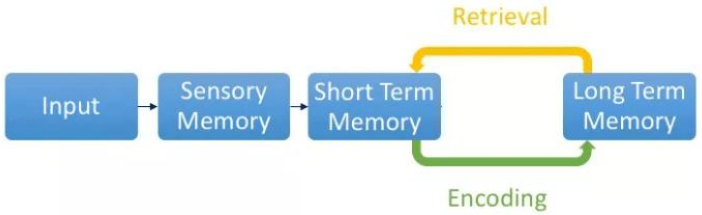
What is a Knowledge Organiser?

Your knowledge organiser summarises all the key facts and knowledge that you will need to have learned on a particular subject onto one side of A4. This information might include,

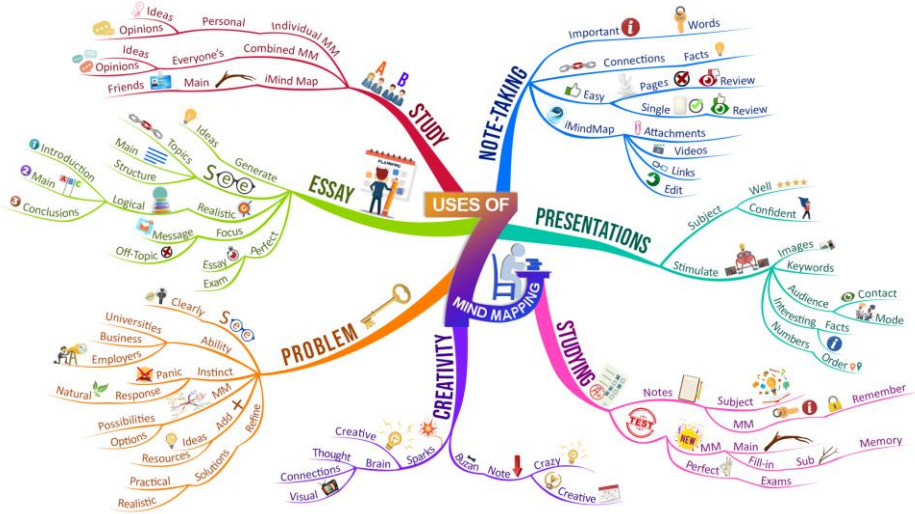
- key vocabulary
- key places and people
- useful diagrams
- key dates for a subject like history
- key themes
- important quotes
- stem sentences for a subject like Maths

How can you use your Knowledge Organiser most effectively?

1. Use it as a **checklist** to make sure you have notes and resources in your books or folders on each area. If you have a gap, talk to your teacher.



2. Use it to help get the information and knowledge into your **long-term memory**. Just reading over the pages does not help. You will need to put your knowledge organiser away and see how much you can remember. You could get a family member or carer to help test you on what you have remembered.



3. Knowledge organisers have already broken the knowledge down into chunks for you so they can be used to create **flashcards, revision posters or mind maps.**

4. Use your knowledge organiser **to get ahead on a topic**. Reading about what you are going to study and looking up any new or difficult words means that you are better prepared for your learning in the next lesson.

5. It is best to use your knowledge organiser for **short periods of time but regularly.** Choose a small part of a topic and practice writing it out with your organiser closed every day for 10 minutes.

THE KING SOLOMON STANDARD

Come to class fully prepared with correct equipment (Black / Blue Pen, pencil, glue stick, scissors, ruler, calculator, protractor and compass, exercise / text books). Form Tutors will check your equipment on a regular basis.

Presentation

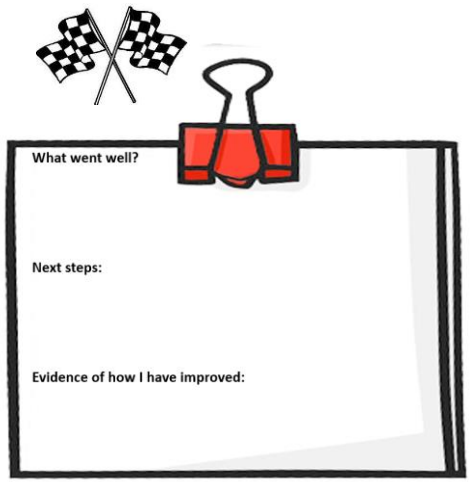
- Students write in black or blue inked pen only unless allowed by teachers to use another colour.
- Students ensure that all work has a Title and Hebrew and English dates, which are all underlined.
- Students take care of their exercise books and folders. There is no graffiti in, or on, books. All books must be covered and labelled clearly.
- Worksheets and Pit Stops slips must be stuck in or stapled.
- Pages must not be torn out of books.
- Work will be returned if it represents a significant lack of effort and students will be expected to resubmit the work.
- **PEEL** paragraphs must be labelled clearly and easy to spot.

Literacy marking symbols

Your teachers will be using the symbols below to mark your work.

S	Spelling mistake.
P	Punctuation mistake – either punctuation has been omitted, or has been used incorrectly.
??	Does not make sense/is not clear.
//	Start a new paragraph.
^	A word or sentence is missing.
C	Capital letter is needed.
DW	Choose a different word.

- *Correct all your class work and homework errors using a different coloured pen.*
- C3B4ME (See three before me; i.e. first try independently, check your class notes/resources or ask one of your peers before you ask your teacher ☺).



How to complete my Pit Stop slips

What went well….

Completed by your teacher or by you after receiving some guidance from your teacher.

Next steps….

Completed by your teacher or by you after receiving some guidance from your teacher.

Evidence of how I have improved:

Completed by student stating clearly where the work can be found. This is not a promise of what you will do but a clear indication of where to find the work of what you have done already in order to improve and following the advice from next steps.

THE PEEL PARAGRAPH

PEEL

***Point*: Your argument in one line.**

I think that ….. It is clear that…… In my opinion ….. The point is that….

***Evidence*: Reasons or evidence that back your argument up.**

This is because …… This is evidenced by ….. For instance ….. We can see that...

***Explanation*: Explain how your reasons or evidence prove your point.**

Therefore, this proves that….. because …… This shows that ….. This demonstrates…..

***Link*: Mini conclusion answering the question.**

In conclusion …… Overall …… To conclude ….. Finally…… To summarise…

How can I improve my writing?

Point

- I have included a point in my paragraph.
- The reader will be able to understand my entire argument just by reading the point.

Evidence

- My paragraph has at least two pieces of evidence.
- My evidence is in full sentences, carefully chosen and clearly helps prove my argument.
- My evidence is specific and detailed (includes quotes/facts/names/events/key words).

Explanation

- I explain how my evidence proves that my argument is right.
- My explanation is at least two or three sentences long.
- I have added some balance to my argument and shown how there may be other reasons or arguments to the question.
- I have explained why my answer is the right one rather than any of the other reasons, ideas or arguments.

Link

- I have included a link sentence in my paragraph.
- My link sums up my argument.
- My link uses the information I have used in my paragraph.

ART

KNOWLEDGE ORGANISER

YEAR 10 - SUMMER 1 AND 2

IDENTITY

'The fact of being who or what a person or thing is'.

- Identity **encompasses the memories, experiences, relationships, and values that create one's sense of self**. This amalgamation creates a steady sense of who one is over time, even as new facets are developed and incorporated into one's identity.

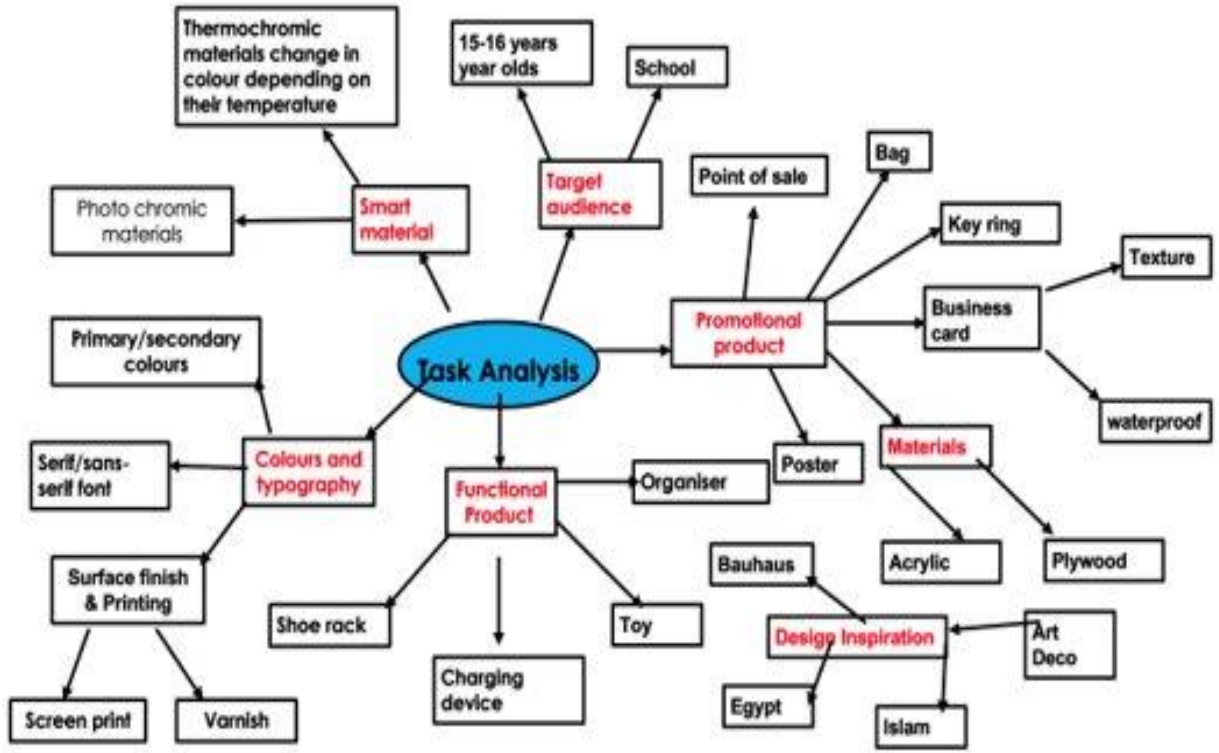
- Aspects of identity examples include our **gender, ethnicity, personality, religion, values, and hobbies**. Each aspect helps to make up who we are, and make us unique individuals.

- The "Big 8" socially constructed identities are: **race, ethnicity, sexual orientation, gender identity, ability, religion/spirituality, nationality and socioeconomic status.**

- **Students begin to explore the theme, choosing how they want to represent IDENTITY and the different sorts of media they want to work with. All students use drawing and photography as a framework for recording and developing their ideas.**

Task Analysis

A **Task Analysis** is where you explore, in depth, the tasks that the exam board have set. You can do this by creating a mind map. Add lots of information and suggestions about how you can research the design context. You can use images and text in the mind map. Your chosen images must reinforce the suggestions that you are making.



Summary: From creating this mind map I have been able to think about my options and possibilities for creating my product. I also have looked at **Design Movements** and decided **to incorporate** an Egyptian theme and I will take inspiration from this style for my **designing**.

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https://youtu.be/uBxD0VRQC3Y
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https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification-at-a-glance

PRIMARY RESEARCH - Questionnaire- USE MICROSOFT FORMS

Introduction: This questionnaire will help me find out what my target audience want most. This will allow me to make sure my product fits the most desired aspects and most people's needs. I mostly want to find out what the best design era would be used to influence my product.

Questions

Make sure you complete between 8-10 multiple-choice questions relating to what you want to find out for your topic.

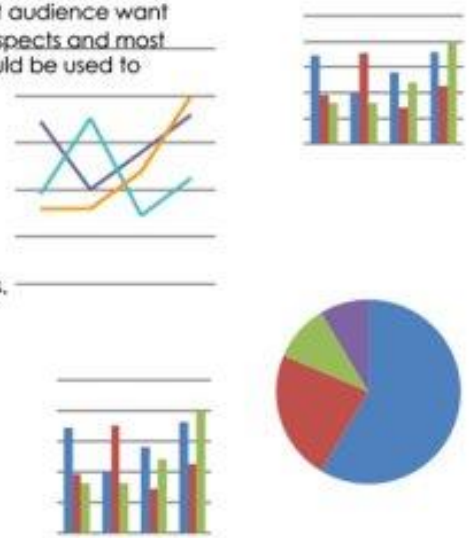
•What Art or design style do you prefer?
•1 Art Deco
•2 Memphis
•Surrealism

•What performance criteria do you want the product to include?
•1 lightweight
•2 waterproof
•3 non-slip rugged handle

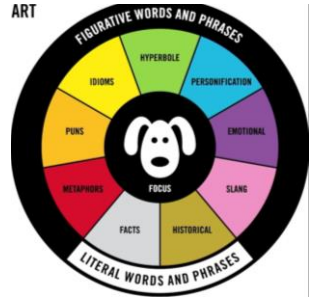
•How and where will you use it?
•1indoors
•2 outdoors
•3 Night time
•4 – bright light
•ETC ETC…..

Analyse the Results:

You must display and analyse all of the results visually using graphs presented clearly and then explain your findings.



Summary: From this research I can see exactly what most people want in this product, allowing me to incorporate their needs into my design process and make it successful.
I have shown the most important results which are represented in graph form.
From these answers, I can see that most of my target audience would like …….
I'm going to incorporate all these aspects in my design to appeal to my target audience.



Design & Technology – NEA Coursework

Research – Product Analysis Example

User and Target Market

Who is the product designed for?
Why is it aimed at this age group?
What makes it appeal to the target market?

Materials

What materials is the product made from?
Why have these materials been used?
What are the properties of the materials?

Aesthetics/Style

Is the product designed in a particular style?
Does it look attractive and appealing?
How do you feel about the product?

Environmental Concerns

Does making or using this product harm the environment in any way?
Does it use any recycled materials?

You will need to analyse at least 4 products that are similar to the product that you intend to make.

You will need to find details about the product and an image.

You will need to create 4 sheets like this and FULLY answer each question for each product!

Manufacture

How has the product been made?
What construction methods have been used?
One-off, batch or mass produced?

Function

What does the product do?
Does it work well?
Does it have any special features?
How does the product work?

Cost

What is the selling price of the product?
Why is it this price?
Does the quality of the product influence the price?

Ergonomics

Has the product been well designed to suit the user?
Which features make it easy to use, adjust or operate?
Is it comfortable to use, how do you know?

Justified Design Specification

A specification is a list of things that your product must aim to meet. Be realistic about your specification. REMEMBER at the end of the project you will be evaluating your finished product against your specification points.

Target Market: (Who will use it?)The product must be suitable for...BECAUSE

Performance and Function: (What should it do?)The product must be able to..... It must have.... BECAUSE

The performance criteria for the product is ...BECAUSE

Materials: (What will it be made from?) The product will be made from...BECAUSE

Aesthetics: (Appearance) The product will look... it will look modern/traditional... it will attract.... BECAUSE

Cost: (Making costs, selling costs) The product will cost no more than... The product will have a retail price of around... BECAUSE

Safety: The product will have to be safe to use .... BECAUSE

Weight/Transportation: The product will weigh no more than... **&** must be easy to transport and move.... BECAUSE

Size: The product can be no taller than... The product must fit... The product be able to hold the... BECAUSE

Manufacture: The product will be a prototype made by hand... some parts will be made using **3D printing/laser cutter** BECAUSE

Ergonomics and Anthropometrics: (Is it easy to use/operate/sit at/open etc) The user must be able to operate/use/hold... BECAUSE

Environmental Concerns: The product will use recycled materials... The product must be sustainable BECAUSE not pollute the planet BECAUSE

Life Cycle: The product will be designed to **be repaired/disassembled/upcycled/**.. BECAUSE

You will need to write a specification point for each bold heading – you may wish to include more JUSTIFIED specification points that are specific to your project

Key knowledge for NEA:

Design Context- The design theme that the examination board shares for the project.

Primary Research: Unique research that you will create to find out key information e.g client interview.

Secondary Research: Existing research that you can use which you can find easily in a book or on the internet.

Mood board: A collection of images which illustrate key areas of interest related to the design context.

Design Brief: A statement which explains what you are making and what problem it will solve. Often uses the WHO; WHAT; WHY; WHERE: WHEN and HOW prompts.

Key knowledge for NEA:

Design Specification: A justified list of points which explain how you will manufacture your product can use ACCESSFM prompts: Aesthetics; Customer; Costs; Ergonomics; Safety; Size; Function; Material & Manufacture.

Research Plan: An explanation of the steps you will take to find out the relevant information.

Social, moral, cultural, economic: Consider ethical design principles which include the social impact and the cultural influences; moral values and economic pressures.

MATHEMATICS - VOLUMES - REVISION CARDS

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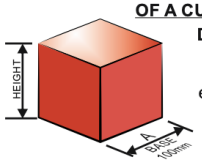
HOW TO CALCULATE THE VOLUME OF A CUBE



DEFINITION: A cube is a solid object, composed of six equal squares, with a 90 degree angle between adjacent sides.

All the sides of a cube are the same measurement. There are two similar formulas for calculating a cube's volume.

VOLUME (V) =A x A x A
OR A^3

EXAMPLE 1

If the measurement of one side is 100mm:

VOLUME = 100mm x 100mm x 100mm

VOLUME = 1000000mm³ or 1000cm³

EXAMPLE 2

If the measurement of one side is 320mm:

VOLUME = 320mm x 320mm x 320mm

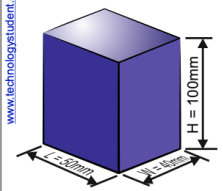
VOLUME =32768000mm³ or 32768cm³

HOW TO CALCULATE THE VOLUME OF A RECTANGULAR PRISM

DEFINITION: A rectangular prism is a solid object, composed of six rectangles, with a 90 degree angle between adjacent sides. Opposite sides of a rectangular prism are equal and parallel.

Unlike a cube, the area of the sides of a rectangular prism / cuboid are not the same, consequently the formula for calculating the volume is as follows:

VOLUME = LENGTH X WIDTH X HEIGHT
V=L x W x H



EXAMPLE: What is the volume of the rectangular prism shown opposite?

V=L x W x H

V=50 x 40 x 100

V=200000mm³

or

V=200cm³

HOW TO CALCULATE THE VOLUME OF A CYLINDER

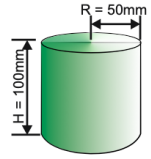
DEFINITION: A three dimensional geometrical shape, that has a circle at each end of a single curved surface.

FIRST, AREA OF A CIRCLE = π X R^2
CIRCUMFERENCE = 2 X π X R

In order to calculate the volume of a cylinder, the height and radius of the circular top /bottom must be known. The following formula is used to calculate the volume.

π (pi) = 3.14 $V = \pi r^2 h$

volume (v) = pi x radius² x height



v = 3.14x 50mmx50mmx100mm

v = 785000mm³

or

v = 785cm³

MATHEMATICS - VOLUMES - REVISION CARDS

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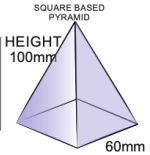
HOW TO CALCULATE THE VOLUME OF A REGULAR SQUARE PYRAMID

DEFINITION: A Regular Square Pyramid has a square base with triangular sides. The apex (highest point), is in line with the centre of the square base.

FORMULA

Volume = $\frac{1}{3}$ x Base x Height

$V = \frac{1}{3}$ x B x H



CALCULATE THE AREA OF BASE FIRST

AREA OF BASE = LENGTH²

AREA OF BASE = 60mm X 60mm = 3600mm²

THEN APPLY THE FOLLOWING FORMULA

Volume = $\frac{1}{3}$ x Base x Height

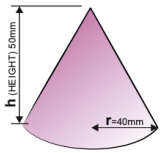
$V = \frac{1}{3}$ x 3600mm x 100mm

$V = \frac{1}{3}$ x 360000mm

$V = \frac{360000mm}{3}$ = 120000mm³

HOW TO CALCULATE THE VOLUME OF A CONE

DEFINITION: A cone has one surface with a circular base. The vertex is directly above the centre of the circular base.



FORMULA

$v=1/3\ \pi r^2 h$

the same as $v = \frac{\pi r^2 h}{3}$

pi (π) is 3.14

If the height (h) is 50mm and the radius is 40mm

Then:

$v=1/3\ \pi r^2 h$

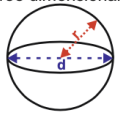
$v = \frac{1}{3}$ x 3.14 x (40x40)x 50

$v = \frac{1}{3}$ x 251200

$v = \frac{25177}{3}$ = 83733.33mm³

HOW TO CALCULATE THE VOLUME OF A SPHERE

DEFINITION: A sphere is an object that is absolutely symmetrical about it's centre. From any angle it appears to be a circle, but it is a true three dimensional object.



FORMULA

$v=4/3\pi r^3$

EXAMPLE CALCULATION

$v=4/3\pi r^3$

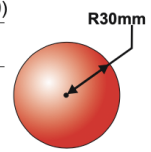
$v = \frac{4}{3} \times \frac{3.14 \times (30x30x30)}{1}$

$v = \frac{4}{3} \times \frac{3.14 \times (27000)}{1}$

$v = \frac{4}{3} \times \frac{84780}{1}$

$v = \frac{339120}{3}$

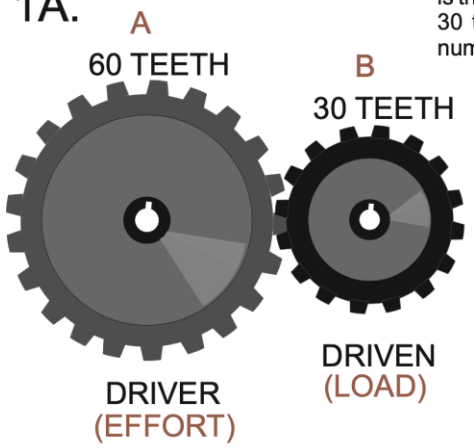
v = 113040mm³



CALCULATING GEAR RATIO (VELOCITY RATIO)

In examinations, one of the first questions will be - to work out the 'gear ratio' (sometimes called velocity ratio). As a guide - always assume that the larger gear revolves one revolution. The number of rotations of the second gear has then to be worked out.

1A.



In the example below, the DRIVER has 60 teeth and because it is the largest we say that it revolves once. The DRIVEN gear has 30 teeth. Simply divide 60 teeth by 30 teeth to work out the number of revolutions of the driven gear.

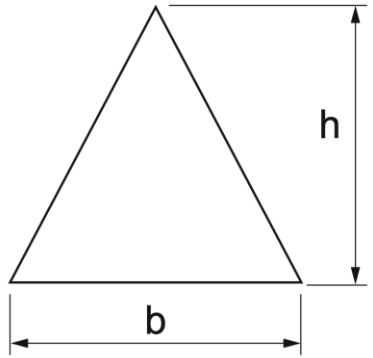
GEAR RATIO / VELOCITY RATIO

$\frac{\text{Distance moved by Effort}}{\text{Distance moved by Load}} = \frac{\text{60T (GEAR A)}}{\text{30T (GEAR B)}}$

$= \frac{1}{2} = \frac{\text{Input movement}}{\text{Output movement}}$

= Driver : Driven

1 : 2

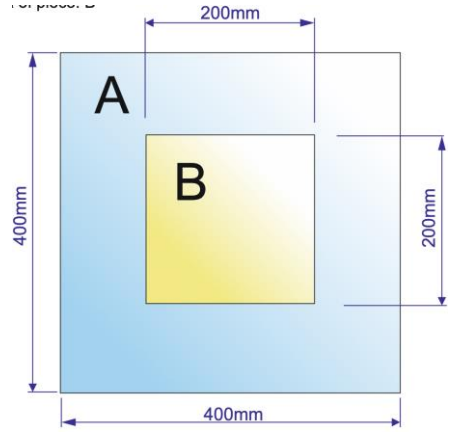


FORMULA

AREA = 1/2 X BASE X HEIGHT

AREA = 1/2 b x h

$AREA = \frac{b \times h}{2}$



FORMULA

AREA = X^2

OR X = X multiplied by X

FORMULA

AREA = X multiplied by Y

AREA =LENGTH x HEIGHT

FORMULA

AREA = πr^2

π (pi) = 3.14

FORMULA

CIRCUMFERENCE = 2 x π x r

π (pi) = 3.14

English Term 3A

An Inspector Calls

Acts

Act 1	Set in April 1912, Brumley, Midlands, UK. The Birling family and Gerald Croft are celebrating Sheila Birling's engagement to Gerald with a dinner. Mr Birling lectures his son, Eric Birling, and Gerald about the importance of every man looking out for himself if he wants to get on in life. Edna (the maid) announces that an inspector has arrived. Inspector Goole says that he is investigating the death of a young woman, Eva Smith, who committed suicide. Mr Birling is shown a photograph of Eva, after initially denying recognising the woman in the photo, he remembers firing her in 1910 for organising a strike over workers' pay. Sheila recalls also having Eva sacked about her manner when served by her in an upmarket department store. The Inspector reveals that Eva Smith changed her name to Daisy Renton. Gerald reveals to Sheila that he had an affair with Daisy Renton
Act 2	Gerald explains to The Inspector that he had an affair with Eva, but hasn't seen her since he ended their relationship back in Autumn 1911. Sheila gives her engagement ring back to Gerald. The Inspector turns his attention to Mrs Sybil Birling, she confesses that she also had contact with Eva, but Eva gave a different name to Mrs Birling. Eva approached a charity chaired by Mrs Birling to ask for help. Eva was desperate and pregnant but help was refused by Mrs Birling because she was offended by the girl calling herself 'Mrs Birling'. She tells Eva that the baby's father should be made entirely responsible. She also tells Inspector Goole that the father should be held entirely responsible and should be made an example of.
Act 3	Eric is revealed as the father. He stole money from Mr Birling's office to provide money to Eva. The Inspector delivers his final speech. After he leaves, the family begin to suspect that he was not a genuine police inspector. A phone call to the Chief Constable confirms this. Next, they phone the infirmary to be informed that no suicide case has been brought in. Mr Birling, Mrs Birling and Gerald congratulate themselves that it was all a hoax and they can continue as before. This attitude upsets Sheila and Eric. The phone rings. Mr Birling announces to the family that a girl has just died on her way to the infirmary, a police inspector is coming to question them.

Key Terms:

- Stage directions
- Dialogue
- Monologue
- Didactic
- Polemic
- Dramatic irony
- Foreshadowing
- Entrances and exits
- Props
- Sentence moods
- Social expectations
- Cliff-hanger
- Characterisation
- Dramatic device
- Timings
- Interruptions
- Tone
- Irony
- Imagery
- Symbolism
- Euphemism

Key Themes

- Social responsibility
- Truth and lies
- Hypocrisy
- Wealth, power and influence
Rights and responsibilities
- Morality versus legality
- Young versus old
- Capitalisation versus socialism

Context:

J.B. Priestley

• 1914-18: WW1, Aged 20, Priestley serves on the front line in France and is wounded.
• 1919: awarded place at Trinity Hall, Cambridge to study Literature, History and Politics.
• 1922: begins to work as a journalist in London.
• 1934: writes 'English Journey' about the poorer parts of Britain. • 1939-45: makes regular wartime radio broadcasts called 'Britain Speaks'.
• 1945: writes An Inspector Calls

1912 England

• Work strikes
• Workers' rights
• Pre WW1
• Suffragette movement
• Class system

1945 England

• Post WW1 and WW2
• Social levelling
• Women's rights
• Workers' rights
• Trade unions
• National Insurance
• Welfare system
• NHS

English Term 3A

An Inspector Calls

Plot

Set in April 1912, Brumley, Midlands, UK. The Birling family and Gerald Croft are celebrating Sheila Birling's engagement to Gerald with a dinner. Mr Birling lectures his son, Eric Birling, and Gerald about the importance of every man looking out for himself if he wants to get on in life. Edna (the maid) announces that an inspector has arrived. Inspector Goole says that he is investigating the death of a young woman, Eva Smith, who committed suicide. Mr Birling is shown a photograph of Eva, after initially denying recognising the woman in the photo, he remembers firing her in 1910 for organising a strike over workers' pay. Sheila recalls also having Eva sacked about her manner when served by her in an upmarket department store. The Inspector reveals that Eva Smith changed her name to Daisy Renton. Gerald reveals to Sheila that he had an affair with Daisy Renton. Gerald explains to The Inspector that he had an affair with Eva but hasn't seen her since he ended their relationship back in Autumn 1911. Sheila gives her engagement ring back to Gerald. The Inspector turns his attention to Mrs Sybil Birling, she confesses that she also had contact with Eva, but Eva gave a different name to Mrs Birling. Eva approached a charity chaired by Mrs Birling to ask for help. Eva was desperate and pregnant but help was refused by Mrs Birling because she was offended by the girl calling herself 'Mrs Birling'. She tells Eva that the baby's father should be made entirely responsible. She also tells Inspector Goole that the father should be held entirely responsible and should be made an example of. Eric is revealed as the father. He stole money from Mr Birling's office to provide money to Eva. The Inspector delivers his final speech. After he leaves, the family begin to suspect that he was not a genuine police inspector. A phone call to the Chief Constable confirms this. Next, they phone the infirmary to be informed that no suicide case has been brought in. Mr Birling, Mrs Birling and Gerald congratulate themselves that it was all a hoax and they can continue as before. This attitude upsets Sheila and Eric. The phone rings. Mr Birling announces to the family that a girl has just died on her way to the infirmary, a police inspector is coming to question them.

Characters

Inspector Goole	Priestley's mouthpiece; advocates social justice; serves as the Birlings' conscience	Socialist, moralistic, righteous, powerful, intimidating, unconventional, mysterious, imposing, sardonic, omnipotent
Mr Arthur Birling	Businessman; capitalist; against social equality; a self-made man (new-money)	capitalist, arrogant, foolish, Panglossian, emasculate, prejudiced, ignorant, selfish, stubborn, vainglorious
Mrs Sybil Birling	Husband's social superior; believes in personal responsibility	Arrogant, cold-hearted, insincere, prejudiced, naïve, conformist, bitter, controlling, remorseless
Sheila Birling	Young girl; comes to change views and pities Eva; feels regret	Transformative, remorseful, socialist, pseudo-inspector, sensitive, astute, strong-minded, empowered
Eric Birling	Young man, drinks too much; forces himself on Eva Smith; regrets actions	Rebellious, reckless, immature, insubordinate, compulsive, desperate, disgraced, dualistic, irresponsible
Gerald Croft	Businessman; engaged to Sheila; politically closest to Birling	Aristocratic, evasive, secretive, dishonest, disingenuous, oleaginous, chivalric, privileged, pragmatic
Eva Smith	Unseen in play; comes to stand for victims of social injustice (changes her name to Daisy Renton)	Suffragist, victim, emblematic, allegorical, vulnerable, desperate, socialist, moralistic, principled

Dramatic Stage Directions

Dramatic Irony	Birling's speeches, Mrs. Birling's witless implication of Eric
Stage Directions	Instructions for the actors; often revealing – such as the lighting change when the Inspector arrives: "Pink and intimate then brighter and harder
Setting	Constant throughout but subtle changes e.g., lighting; characters on/off stage
Tension	Builds up throughout the play ; interrogation of characters, personal relationships, secrecy
Foreshadowing	Symbolism (The Titanic), Mr. Birling's "knighthood", war
Time- Lapse	Set in 1912, written in 1945; audience in a privileged position.
The 4th Wall	The Inspector's final speech addressed directly to audience.

Links to previous units you have studied:

- Play writing conventions in Richard III (Year 7) Blood Brothers (Year 8)
- Understanding social class and backgrounds in Miss Havisham (Year 8)

Links to other units you are going to study:

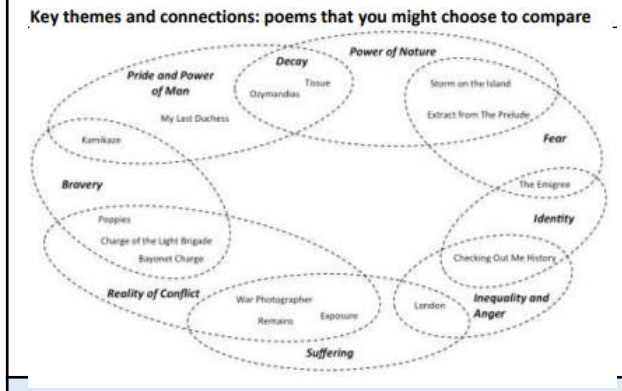
- Victorian/Pre- Edwardian society in Jekyll and Hyde (Year 10)

Power and Conflict Poetry

This is one of the questions on your paper 2 Literature exam and worth 30 marks. You need to make a comparison between the chosen poem in the exam and another poem of your choice.

English Term 3B

Key themes and connections: poems that you might choose to compare



Checking out me History by John Agard

Represents the voice of a black man who is frustrated by the Eurocentric history curriculum in the UK – which pays little attention to the black history. -Black history is quoted to emphasize how it has been kept separate and to stress its importance.

Language

Imagery of fire and light used in all three stanzas regarding black historic figures: "Toussaint de beacon", "Fire-woman", "yellow sunrise". -Uses non-standard phonetic spelling ("Dem tell me wha dem want", to represent his own powerful accent and mixes Caribbean Creole dialect with standard English.
"I carving out me identity": metaphor for the painful struggle to be heard, and to find his identity.

Form and structure Dramatic monologue. Stanzas concerning Eurocentric history (normal font) are interspersed with stanzas on black history (in italics to represent separation and rebellion). Black history sections arranged as serious lessons to be learned; traditional history as nursery rhymes, mixed with fairytales (mocking of traditional history). The repetition of "Dem tell me" shows frustration.

The Prelude by William Wordsworth

The story of a boy's love of nature and a night-time adventure in a rowing boat that instils a deeper and fearful respect for the power of nature. -At first, the boy is calm and confident, but the sight of a huge mountain that comes into view scares the boy and he flees back to the shore. We should respect nature and not take it for granted.

Language

'One summer evening (led by her)': 'her' might be nature personified – this shows his love for nature. -'an act of stealth / And troubled pleasure': confident, but the oxymoron suggests he knows it's wrong; forebodes the troubling events that follow. -'nothing but the stars and grey sky': emptiness of sky.

Form and Structure First person narrative – creates a sense that it is a personal poem. -The regular rhythm and enjambment add to the effect of natural speech and a personal voice.

Storm of the Island by Seamus Heaney

The narrator describes how a rural island community prepared for a coming storm, and how they were confident in their preparations. -When the storm hits, they are shocked by its power: its violent sights and sounds are described, using the metaphor of war. -The final line of the poem reveals their fear of nature's power.

Language

'Nor are there trees which might prove company': the island is a lonely, barren place. -Violent verbs are used to describe the storm: 'pummels', 'exploding', 'spits'. -Semantic field of war: 'Exploding comfortably' (also an oxymoron to contrast fear/safety); 'wind dives and strafes invisibly' (the wind is a fighter plane); 'We are bombarded by the empty air' (under ceaseless attack).

Form and Structure Written in blank verse and with lots of enjambment: this creates a conversational and anecdotal tone. -'We' (first person plural) creates a sense of community, and 'You' (direct address) makes the reader feel immersed in the experience.

London by William Blake

The narrator is describing a walk around London and how he is saddened by the sights and sounds of poverty. -The poem also addresses the loss of innocence and the determinism of inequality: how new-born infants are born into poverty. -The poem uses rhetoric (persuasive techniques) to convince the reader that the people in power (landowners, Church, Government) are to blame for this inequality.

Language

Sensory language creates an immersive effect: visual imagery ('Marks of weakness, marks of woe') and aural imagery ('cry of every man') -'mind-forged manacles': they are trapped in poverty. -Rhetorical devices to persuade: repetition ('In every..'); emotive language ('infant's cry of fear')

Form and Structure A dramatic monologue, there is a first-person narrator ('I') who speaks passionately about what he sees. -Simple ABAB rhyme scheme: reflects the unrelenting misery of the city, and perhaps the rhythm of his feet as he trudges around the city.

Bayonet Charge by Ted Hughes

Describes the terrifying experience of 'going over the top': fixing bayonets (long knives) to the end of rifles and leaving a trench to charge directly at the enemy. -Steps inside the body and mind of the speaker to show how this act transforms a soldier from a living thinking person into a dangerous weapon of war. -Hughes dramatizes the struggle between a man's thoughts and actions.

Language

"The patriotic tear that brimmed in his eye. Sweating like molten iron": his sense of duty (tear) has now turned into the hot sweat of fear and pain.
"a yellow hare that rolled like a flame. And crawled in a threshing circle": impact of war on nature – the hare is distressed, just like the soldiers.

Form and Structure The poem starts 'in medias res': in the middle of the action, to convey shock and pace. Enjambment maintains the momentum of the charge. Time stands still in the second stanza to convey the soldier's bewilderment and reflective thoughts. Contrasts the visual and aural imagery of battle with the internal thoughts of the soldier = adds to the confusion.

Exposure by Wilfred Owen

Speaker describes war as a battle against the weather and conditions. -Imagery of cold and warm reflect the delusional mind of a man dying from hypothermia. -Owen wanted to draw attention to the suffering, monotony and futility of war.

Language

"Our brains ache" physical (cold) suffering and mental (PTSD or shell shock) suffering. -Semantic field of weather: weather is the enemy.
"the merciless iced east winds that knive us…" – personification (cruel and murderous wind).

Form and structure Repetition of "but nothing happens" creates circular structure implying never ending suffering -Rhyme scheme ABBA and hexameter gives the poem structure and emphasizes the monotony.
Pararhymes (half rhymes) ("nervous / knive us") only barely hold the poem together, like the men.

War Photographer by Carol Ann Duffy

Tells the story of a war photographer developing photos at home in England: as a photo develops, he begins to remember the horrors of war – painting a contrast to the safety of his dark room. -He appears to be returning to a warzone at the end of the poem.

Language

"All flesh is grass": Biblical reference that means all human life is temporary – we all die eventually.
"He has a job to do": like a soldier, the photographer has a sense of duty.
"running children in a nightmare heat": emotive imagery with connotations of hell.

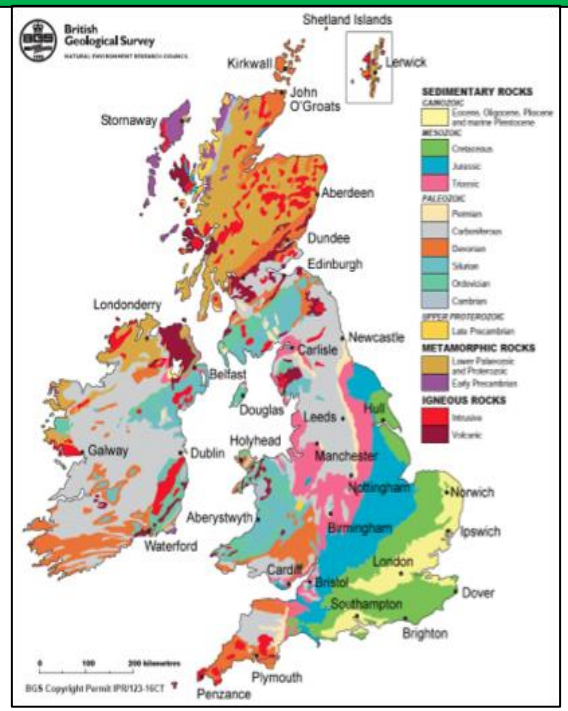
Form and Structure -Enjambment – reinforces the sense that the world is out of order and confused. Rhyme reinforces the idea that he is trying to bring order to a chaotic world – to create an understanding. Contrasts: imagery of rural England and nightmare war zones.

Kamikaze by Beatrice Garland	Remains by Simon Armitage	My Last Duchess by Robert Browning	Ozymandias by Percy Bysshe Shelley
In World War II, Japanese Kamikaze pilots would fly manned missiles into targets such as ships. -This poem explores a kamikaze pilot's journey towards battle, his decision to return, and how he is shunned when he returns home. -As he looks down at the sea, the beauty of nature and memories of childhood make him decide to turn back. **Language** The Japanese word 'kamikaze' means 'divine wind' or 'heavenly wind' and has its origin in a heaven-sent storm that scattered an invading fleet in 1250. "dark shoals of fish flashing silver": image links to a Samurai sword – conveys the conflict between his love for nature/life and his sense of duty. Also has sibilance. **Form and Structure** Narrative and speaker is third person, representing the distance between her and her father, and his rejection by society. The first five stanzas are ordered (whilst he is flying on his set mission). Only full stop is at the end of Stanza Five: he has made his decision to turn back. The final two are in italics and have longer line to represent the fallout of his decision.	Written to coincide with a TV documentary about those returning from war with PTSD. Based on Guardsman Tromans, who fought in Iraq in 2003. Speaker describes shooting a looter dead in Iraq and how it has affected him. to show the reader that mental suffering can persist long after physical conflict is over. **Language** "Remains" - the images and suffering remain. "Legs it up the road" - colloquial language = authentic voice "Then he's carted off in the back of a lorry" – reduction of humanity to waste or cattle "his bloody life in my bloody hands" – alludes to Macbeth: Macbeth the warrior with PTSD and Lady Macbeth's bloody hands and guilt **Form and Structure** Monologue, told in the present tense to convey a flashback (a symptom of PTSD). -First four stanzas are set in Iraq; last three are at home, showing the aftermath.	The Duke is showing a visitor around his large art collection and proudly points out a portrait of his last wife, who is now dead. He reveals that he was annoyed by her over-friendly and flirtatious behaviour. He can finally control her by objectifying her and showing her portrait to visitors when he chooses. **Language** 'Looking as if she was alive': sets a sinister tone. -'Will't please you sit and look at her?' rhetorical question to his visitor shows obsession with power. "My gift of a nine-hundred-years old name / With anybody's gift': she was beneath him in status, and yet dared to rebel against his authority. "I gave commands; Then all smiles stopped together': euphemism for his wife's murder. "'Notice Neptune, though / Taming a sea-horse': he points out another painting, also about control **Form and Structure** Dramatic Monologue, in iambic pentameter. -It is a speech, pretending to be a conversation, he doesn't allow the other person to speak! -Enjambment: rambling tone, he's getting carried away with his anger and is a little unstable.	The narrator meets a traveller who tells him about a decayed statue that he saw in a desert. -The statue was of a long forgotten ancient King: the arrogant Ozymandias, 'king of kings.' -The poem is ironic and one big metaphor: Human power is only temporary – the statue now lays crumbled in the sand, and even the most powerful human creations cannot resist the power of nature. **Language** 'sneer of cold command': the king was arrogant, this has been recognised by the sculptor, the traveller and then the narrator. 'Look on my works, ye Mighty, and despair.': 'Look' = imperative, stressed syllable highlights commanding tone; ironic. **Form and Structure** A sonnet (14 lines) but with an unconventional structure, the structure is normal until a turning point (a volta) at Line 9 (..these words appear). This reflects how human structures can be destroyed or decay. -The iambic pentameter rhyme scheme is also disrupted or decayed.
Charge of the Light Brigade By Alfred Lord Tennyson	**The Emigree by Carol Rumens**	**Tissue by Imtiaz Dharker**	**Poppies by Jane Weir**
Published six weeks after a disastrous battle against the Russians in the (unpopular) Crimean War -Describes a cavalry charge against Russians who shoot at the lightly-armed British with cannon from three sides of a long valley. -Of the 600 hundred who started the charge, over half were killed, injured or taken prisoner. **Language** "Into the valley of Death": this Biblical imagery portrays war as a supremely powerful, or even spiritual, experience. -"jaws of Death" and "mouth of Hell": presents war as an animal that consumes its victims. -"Honour the Light Brigade/Noble six hundred": language glorifies the soldiers, even in death. The 'six hundred' become a celebrated and prestigious group. **Form and Structure** -This is a ballad, a form of poetry to remember historical events – we should remember their courage. -6 verses, each representing 100 men who took part. -First stanza tightly structured, mirroring the cavalry formation. Structure becomes awkward to reflect the chaos of battle and the fewer men returning alive.	'Emigree' – a female who is forced to leave their country for political or social reasons. -The speaker describes her memories of a home city that she was forced to flee. The city is now "sick with tyrants". -Despite the city's problems, her positive memories of the place cannot be extinguished. **Language** "I left it as a child": ambiguous meaning – either she left when she was a child or the city was a child (it was vulnerable and she feels a responsibility towards it). "I am branded by an impression of sunlight": imagery of light - it will stay with her forever. -Personification of the city: "I comb its hair and love its shining eyes" (she has a maternal love for the city). **Form and Structure** -First person. -The last line of each stanza is the same (epistrophe): "sunlight": reinforces the overriding positivity of the city and of the poem.	Two different meanings of 'Tissue' (homonyms) are explored: firstly, the various pieces of paper that control our lives (holy books, maps, grocery receipts); secondly, the tissue of a human body. -The poet explores the paradox that although paper is fragile, temporary and ultimately not important, we allow it to control our lives. **Language** Semantic field of light: ('Paper that lets light shine through', 'The sun shines through their borderlines', 'let the daylight break through capitals and monoliths') emphasizes that light is central to life, a positive and powerful force that can break through 'tissue' and even monoliths (stone statues). **Form and Structure** The short stanzas create many layers, which is a key theme of the poem (layers of paper and the creation of human life through layers) -The lack of rhythm or rhyme creates an effect of freedom and openness. -All stanzas have four lines, except the final stanza which has one line ('turned into your skin'): this line focuses on humans and addresses the reader directly to remind us that we are all fragile.	A modern poem that offers an alternative interpretation of bravery in conflict: it does not focus on a soldier in battle but on the mother who is left behind and must cope with his death. The narration covers her visit to a war memorial, interspersed with images of the soldier's childhood and his departure for war. **Language** Contrasting semantic fields of home/childhood ("cat hairs", "play at being Eskimos", "bedroom") with war/injury ("blockade", bandaged", "reinforcements") -Aural (sound) imagery: "All my words flattened, rolled, turned into felt" shows pain and inability to speak. **Form and Structure** This is an Elegy, a poem of mourning. -Strong sense of form despite the free verse, stream of consciousness addressing her son directly – poignant -No rhyme scheme makes it melancholic -Enjambment gives it an anecdotal tone.

Geography

Paper 2 : Topic 4 – UK Evolving Physical landscape

Key Term	Definition
Igneous rocks	are formed by magma from the molten interior of the Earth.
Sedimentary rocks	are formed from sediments that have settled at the bottom of a lake, sea or ocean, and have been compressed over millions of years.
Metamorphic rocks	These are formed when either igneous or sedimentary rocks are changed. Heat and/or pressure will cause the elements in the original rock to react and re-form.
Scree	a slope of loose, large angular rocks broken away from the mountainside by freeze-thaw weathering.
Freeze-thaw weathering	Freeze-thaw weathering occurs when rocks are **porous** (contain holes) or **permeable** (allow water to pass through).
Biological weathering	Plants and animals can also have an effect on rocks. Roots burrow down, weakening the structure of the rock until it breaks away.
Chemical weathering	Rainwater and seawater can be a weak acid. If a coastline is made up of rocks such as limestone or chalk, over time they can become dissolved by the acid in the water.
Glaciation	Ice covered 30 per cent of the world's land 18,000 years ago. The formation of glaciers and the process by which they shape the landscape around them is called glaciation.
Mass movement	Material can be moved on a slope through **mass movement**. Mass movement is the downhill movement of sediment that moves because of gravity. Eg rockfall, mudflow, landslide, rotational slip
Soil creep	is a very slow movement, occurring on very gentle slopes because of the way soil particles repeatedly expand and contract in wet and dry periods.
Till	As the glacier melts, the water carries fine material which is eventually deposited. All of the material moved by the glacial melt water is called glacial drift or glacial till.
Alluvium	Rock particles (clay, silt, sand and gravel) deposited by a river.
Misfit river	After the ice has melted and the river returns to the valley, it often looks tiny and out-of-place in its huge U-shaped trough.
Glacier	An sheet of ice that moves slowly down a river valley under the influence of gravity. This is often described as a river of ice.
Interglacial	a warmer spell between ice ages, lasting about 10,000 years.
Glaciated Valley	or U-Shaped valley-a river valley widened and deepened by the action of glaciers (ice sheets



Igneous rocks can be found mainly in upland areas in Scotland, in the Lake District in North West England and Snowdonia in North Wales and Northern Ireland.
Metamorphic rocks are found in Northern Ireland and Scotland.
Sedimentary rocks can be found across lowland areas of southern and central parts of England.

The **Tees-Exe line** is an imaginary northeast-southwest line that can be drawn on a map of Great Britain which roughly divides the island into lowland and upland regions.

Rock type	How is it formed?	characteristics
Igneous	Granite Formed when magma cools deep underground Basalt- formed from lavas rich in metals	• Very resistant , Contains crystals • Almost black, heavy, v. resistant
Sedimentary	Chalk, clay, sandstone	some are porous, resistance varies
Metamorphic	Slate, schist, marble	Very resistant

Geography

Paper 2: Topic 4 – The UK'S evolving physical Landscape

The UK's landscape can broadly be separated into upland landscapes and lowland landscapes depending on the rock type and relief of the area. They are distinctly different from each other Upland areas of the UK consist of older and more resistant igneous, metamorphic and some sedentary rocks. Lowland regions consist of younger and less resistant sedimentary rocks.

Upland regions

Located north and the west of England, Wales and Scotland

You can find the majority of the UK's igneous and metamorphic rocks, for example, granite in the Scottish Highlands.
Upland landscapes are usually older and are more resistant to weathering and erosion. However, past tectonic processes have created faults and uplifts here.

Lowland regions

Located in the south and east of England

Sedimentary rocks such as clays and sands are usually found in the lowlands. These landscapes are much younger than the uplands, and sedimentary rocks erode very easily, creating landscapes formed through erosion and weathering processes.

The Lake District - an upland landscape

The Lake District's landscape is full of high mountains and low valleys due to the glacial and tectonic processes that have affected the area. However, other physical processes have also left their mark on the landscape:

Post-glacial river processes The Lake District was once covered in glaciers, which carved the landscape into deep U-shaped valleys. Over time, the valleys filled up with water to form lakes, and now many small rivers flow through the valleys (known as misfit rivers as they look out of place in these large, wide valleys).

Weathering and slope processes Many of the slopes surrounding the Lake District are covered in angular rocks called scree, These landscapes have been created by freeze-thaw weathering. When temperatures fall below freezing in the Lake District, water in the cracks of rocks freezes and expands, and this repeated process causes the rocks to break off from the rock face. As the area has a steep relief, rocks fall to the bases of mountains and in depressions, making some of the terrain very rocky.

- The Lake District is one of the wettest areas of the country, which leads to frequent landslides on the high relief slopes. Gullying (erosion from water flowing into small channels on slopes) is also common.
- Metamorphic rock and igneous rock are very resistant to erosion since the rocks are very compact from the extreme pressures when formed. This means metamorphic and igneous rock formations are usually very old, like in upland landscapes.

The Weald- a low- lying region

The Weald consists of gentle rolling hills that are located at much lower elevations than the hills and mountains of the Lake District, but still create distinctive landscapes.

Weathering and slope processes The Weald used to be a large mound of layered rocks called an anticline, caused by tectonic uplift. However, over time this mound has eroded away to create the hilly landscape seen today. This type of topography is known as scarp and vale topography.

- Chalk is resistant to weathering and erosion, it is only really affected by slow chemical weathering, when rainwater dissolves the calcium carbonate. The chalk forms steep escarpments, seen on the left of the image above.
- Softer, highly erodible clays lay below the chalk, forming low, flat vales

Post-glacial river processes When the climate was much colder, the ground over the Weald was frozen. Rivers flowed and created valleys and other river landforms over the landscape. However, when the climate warmed, the frozen land began to melt and water from the rivers seeped through the very permeable chalk and disappeared. This has left dry valleys in the Weald.

3 processes shaped the UK's upland regions:

Geology – more resistant rocks in the uplands and less resistant in lowlands

Tectonic processes- Rocks which form the upland areas were made when the UK had tectonic activity. Igneous rocks were formed from the cooling of molten rock (magma). Metamorphic rocks, when sedimentary rocks were heated and compressed during tectonic activity.

Glaciation-Much of Britain was covered by ice during several "Ice Ages" over the last 500,000 years. The most recent one ended only 10,000 years ago. Glaciers and ice sheets scoured the landscape, wearing away the rocks to form glacial landscapes in the Scottish Highlands, Lake District and N. Wales.

Food Preparation & Nutrition- Year 10: Term 3 – Where food comes from

Keywords and definitions:

Carbon Footprint: Carbon footprint is total amount of Carbon Dioxide and other greenhouse gases that is produced during the production process of a product
Factory Farming: See Intensive Farming
Fairtrade: Fairtrade works to ensure better prices, decent working conditions and a fairer deal for farmers in lower economic and developing countries.
Farm assured: Means that farms have met high standards of food safety, hygiene, animal welfare and environmental protection. The Red Tractor logo (Assured Food Standards) is used in the UK to show that farms have met these standards. It also means that the product can be traced back to the farm where it was produced.
Free Range: associated with the production of meat and eggs. Means animals are not confined to small spaces all day and do have some time to roam free.
Food Bank: some families do not have access to healthy nutritious foods on a regular basis, a food bank is a service that provides these families with foods if they are not able to afford it themselves. It is however only a short term solution.
Food Provenance: The place where food originates i.e. where it is grown, raised, reared or caught
Food Security: When all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active lifestyle
GM Foods: Genetically Modified or GM foods pinpoint the gene that has a desired outcome, extracting it and copying it into another organism. It is currently used in crops such as tomatoes and maize, and may be used in animals in the future.
Intensive Farming: Producing as much food as possible over a small amount of space to yield high profits. Sometimes called Factory Farming.
Malnutrition: not getting enough of the needed nutrients due to poor diet.
Organic Farming: produces food without the use of herbicides, fertilisers, pesticides. Also means foods are free from GM foods and most additives.
Yield: How much meat / eggs / crops are produced at any given time.

Intensive Farming:

- Animals and crops are packed closely together
- Lots of pesticides are used to prevent crops from becoming unhealthy – this can have a negative effect on the soil
- Many animals become sick due to being cramped together, especially battery hens in cages.
- Product quality is often lower
- concerns over welfare of animals.
- Produces a higher quantity of crops or meat / eggs in a shorter amount of time. It is more efficient for companies to produce different products.

Organic Farming:

- Generally higher quality food – some believe this results in greater nutritional benefits
- Many people believe it tastes better
- Better welfare for animals
- More expensive as yield is smaller and takes longer to produce
- Less ethical concerns
- Relies on crop rotation to preserve the soil

Seasonal Foods:

We often take for granted the range of foods available in the supermarket. However lots of foods are often not in season in the UK, meaning they do not grow at that time of year, and instead are imported so that we can buy them.
Seasonal foods are foods that are available at specific times of year e.g. cucumber, strawberries and plums in the summer.
Buying seasonal foods reduces food miles, supports the local economy, tends to be fresher and taste better.
People often think of fruit and vegetables, but seasonal can also refer to meat and fish.

GM Foods:

Advantages:
- Can increase yield
- Crops are resistant to diseases
- Plants can grow in harsher environments
- Cheaper
- Longer shelf life

Disadvantages:
- Altering DNA controversial – some people feel its tampering with nature
- GM food and labelling not always clear, sometimes cannot tell if you are eating GM foods
- May lead to new allergy outbreaks
- Cross-pollination, leading to a mix of GM and non GM crops

Sustainability of food :

Food sustainability looks at the impact of producing and consuming food worldwide. Food being sustainable means that the resources we use, should always be replaceable. Sustainable food should follow the following principles:

1. Aim to be waste free – by reducing food waste and package. Food should have minimum packaging and where possible be produced from recyclable / recycled material.
2. Buy local and seasonal foods – this minimises the energy used in food production, transport, and storage. It also helps the local economy
3. Eating a healthy diet – reducing foods with animal origins. Meat and dairy products are the largest producers of greenhouse gases in production
4. Choosing Fairtrade certified products – this scheme ensures workers are paid fairly
5. Only eating fish from sustainable sources – fish certified by the Marine Stewardship Council (MSC) has been caught sustainably. Overfishing is the biggest threat to marine wildlife and their habitats.
6. Getting the balance right – cut down on sugar, salt and fat and increase consumption of vegetables. In the UK poor diet is one of the leading health issues, whilst 15% of the world goes hungry.
7. Grow your own food – and buy the rest from small local businesses rather than relying on one large supermarket or corporation

Food Miles:

Food miles is a way of calculating how far food has travelled to get to the consumer. Food miles include everything from farm, to factory, to processing, to supermarket, to consumer.

The higher the food miles of a product, the more carbon emissions and the more harmful to the environment it is.

You can reduce the food miles of products by:
- Growing your own food
- Buying from local stores and farms
- Walk / bike / bus to the store rather than use a car
- Compost / recycle waste (reducing food miles to landfill)

Food Poverty:

Food Poverty is when people do not have access to affordable, nutritious, healthy food on a regular basis.
Effects of food poverty include:
- Restricted food choice resulting in poor diet
- Diet related disease e.g. diabetes, obesity & CHD
- Malnutrition
- Poor concentration and more health issues (young children).

The UK has seen a rise in food poverty and a rise in the amount of people relying on food banks. People can make their money & food go further by; bulk buying, meal planning, using leftovers, comparing prices, batch cooking, checking best before date, etc.

Food Preparation & Nutrition- Year 10: Term 3 – Food Science Terms

Keywords and definitions:

Amino Acids: small molecules that form long chains in proteins

Blanching: briefly immerse (an item of food) in boiling water, especially as a technique for removing the skin from nuts or fruit or for preparing vegetables for further cooking

Denaturation: changing protein function by heat, acid, pH or mechanical action.

Foam Formation: the creation of a foam by whisking eggs and sugar together. E.g. when making meringues.

Gluten: a protein found in wheat flour

Hydrophobic: one end of an emulsifier - hates water – forms chemical bonds with oils

Hydrophillic: one end of an emulsifier – loves water and forms chemical bonds with it

Irreversible: the changes are permanent and cannot be changed back

Kneading: working a bread dough to develop the gluten and smooth out lumps

Melting Temperature: The temperature that something melts at. Relevant to fats as different fats have different melting temoeratures.

Modified Starch: Starches that have been modified to perform additional functions

pH: The scale used to determine how acid / alkaline something is. 0 is neutral, 1 is the most acidic and 14 is the most alkaline

Pre-Gelatinised: a starch that is used to thicken instant desserts without heat e.g. angel delight

Short: the term used to describe a crumbly texture in food. E.g. shortbread biscuits or shortcrust pastry. Fat is used to coat flour particles during the rubbing in method. This keeps gluten strands short and creates the crumbly texture

Viscosity: how thick or thin a liquid is.

Food Science and Carbohydrates:

Gelatinisation

- Occurs when starches (wheat flour, cornflour or arrowroot) thicken liquids. It also occurs during cooking with starchy foods such as rice, potatoes and pasta.
- Starch particles absorb liquid, swelling up. As the temperature rises, the starch particles burst (80˚C), thickening the liquid e.g. in a roux sauce.
- The process needs heat and stirring, especially in sauce making to prevent lumps forming.
- More starch gives a thicker sauce, ratios can be changed to change the viscosity of the sauce
- Modified starches are used in convenience foods such as gravy granules, quick cook pasta and pot noodles. Pre-gelatinised starch is an example.

Dextrinisation

- Occurs when starch is toasted or cooked by dry heat e.g. bread / cake
- The starch breaks down to dextrins. Dextrins taste sweeter than starch and add flavour to bread / baked goods
- Dextrinisation changes the colour (longer it is heated the darker it gets) and texture (becomes more crispy) – e.g. toast getting darker

Caramalisation

- Causes sugar to change colour and texture due to dry or moist heat.
- Causes baked goods such as cakes to go golden brown.
- Changes properties of sugar, it turns to syrup and tastes sweet and is glossy

Food Science and Fats / Oils:

Shortening

- Process that creates a "short" crumbly texture e.g. pastry
- Rubbing in method used to coat flour particles in fat. Prevents long gluten strands forming.
- The shorter the gluten strands are, the more crumbly a pastry is.

Plasticity:

- Means the ability of a fat to change properties over a range of temperatures. This is due to the combinations of chemicals called triglycerides.
- Different fats have different melting temperatures. Some products are created with lower melting eg. Flora so it can be used straight from the fridge. Other fats such as lard will be solid in the fridge, but will soften as it gets warmer.

Aeration

- Helps a product have a light and open texture.
- Aeration increases the volume of a product by incorporating air through beating, whipping, creaming, and whisking.
- Fat & sugar beaten together trap air, known as the creaming method. Often used in cake making.

Emulsification:

- Emulsions are mixtures of liquids that normally do not mix eg water & oil (mayonnaise)
- Emulsifiers have a hydrophobic & hydrophilic end, meaning water & oil can be combined.
- Stabilisers keep emulsions mixed preventing them from spreading.
- Emulsification is the process of creating an emulsion.
- Egg yolks are a natural emulsifier as they contain lecithin.

Food Science and Proteins:

Protein Denaturation

- Denaturation occurs when the structure of amino acids is altered. They change shape or unfold because chemical binds are broken.
- Protein can be denatured by:

Heat	Proteins uncoil when cooked
pH	Reducing the pH (adding more acid such as vinegar / lemon juice in a marinade)
Enzymes	Helps tenderise meat causing denaturation
Mechanical Action	Whisking e.g. foam formation with eggs

Protein Coagulation:

- Is a type of Denaturation
- It causes a change in texture for example, runny eggs become solid. Examples are quiche and egg custard.
- It starts as 60˚C and is completed by 70˚C – it is an irreversible process

Gluten Formation:

- When water is added to wheat to form a dough. String bread flour is used for bread as it contains more gluten.
- Gluten makes bread dough stretchy and elastic. Salt and kneading help strengthen the gluten. Gluten forms the structure of baked bread.
- Gluten in pasta helps it hold its shape as well as making the dough flexible.

Oxidation:

- Oxidation causes discolouration
- Oxidation causes vitamins to be lost, especially Vitamin C
- It enables enzyme activity
- Can be reduced during preparation and cooking of food by;
  - Use small amounts of water to boil veg
  - Use a quicker method of cooking eg. steaming / stir fry
  - Serve veg immediately after cooking
  - Keep the lid on when boiling vegetables
  - Use the cooking water (this will contain lost water-soluble vitamins) to create other sauces e.g. gravy

Enzymic Browning:

- Occurs on the surface of cut fruit and vegetables such as apples & potatoes.
- happens due to cell enzymes reacting with the air.
- Can be prevented by:
  - Blanching
  - Dipping fruit or vegetables in acid (e.g. lemon juice)
  - Remove contact with air by submerging under water
  - Cooking as soon as vegetables are cut.

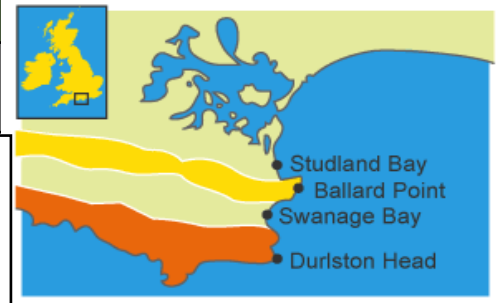
Paper 2: Topic 4 – The UK'S evolving physical Landscape

Discordant coastline

Coastlines where the geology alternates between strata (or bands) of hard rock and soft rock are called **discordant coastlines**. Bays and headlands are found.

Concordant coastline

A **concordant coastline** has the same type of rock along its length. Concordant coastlines tend to have fewer bays and headlands.



Mechanical weathering— freeze-thaw is most common in colder climates.
Chemical weathering—this happens when the rocks mineral composition is changed.
Biological weathering—Caused by plants and animals, this helps speed up erosion.

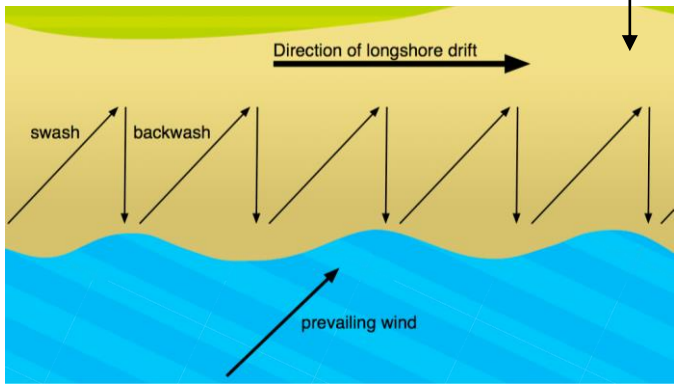
Coastal erosion is the wearing away and breaking up of rock along the coast.
Destructive waves erode the coastline in a number of ways:
Hydraulic action: Air may become trapped in joints and cracks on a **cliff** face. When a wave breaks, the trapped air is compressed which weakens the cliff and causes erosion.
Abrasion: Bits of rock and sand in waves grind down cliff surfaces like sandpaper.
Attrition: Waves smash rocks and pebbles on the shore into each other, and they break and become smoother.
Solution: Acids contained in sea water will dissolve some types of rock such as chalk or limestone.

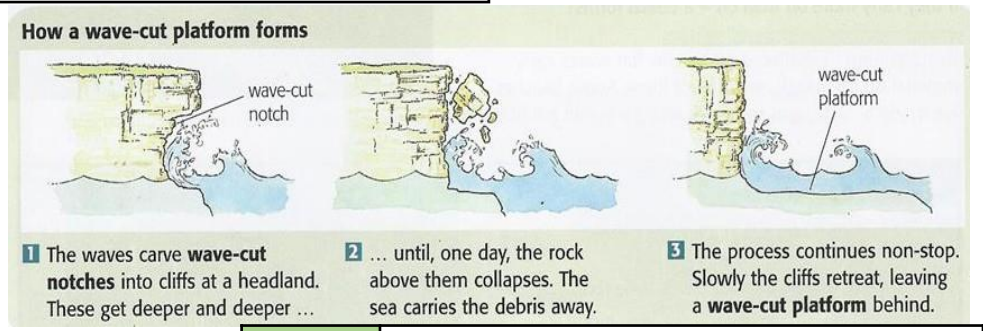
Transportation
- Suspension
- Traction
- Solution
- Saltation

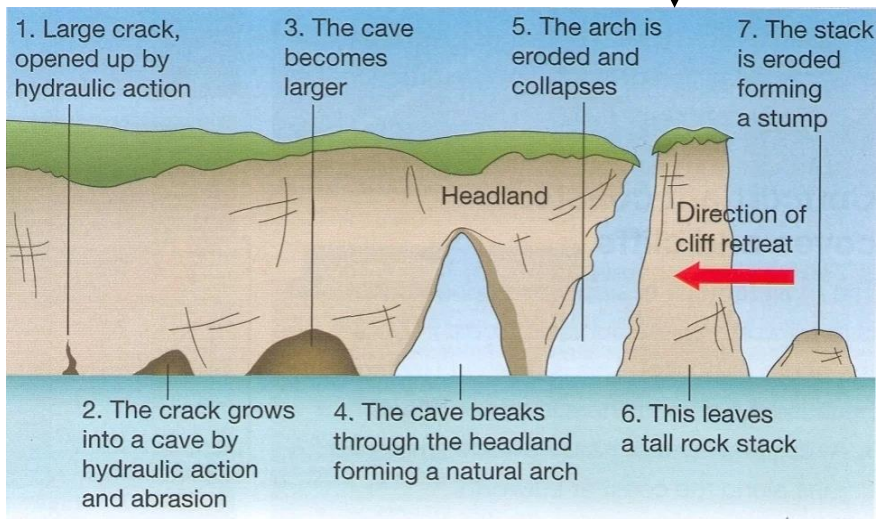
When the sea loses energy, it drops the sand, rock particles and pebbles it has been carrying.
This is called **coastal deposition.** Features of coastal deposition include , a spit, a bar, a lagoon and tombolo.

Sediment is carried by the waves along the coastline. The movement of the material is known as **longshore drift**:

Waves approach the coast at an angle because of the direction of prevailing wind. The **swash** will carry the material towards the beach at an angle. The **backwash** then flows back to the sea, down the slope of the beach. The process repeats itself along the coast in the zigzag movement.







Constructive waves	Destructive waves
- Strong swash - Weak Backwash - Deposit material - Calm weather - Summer months - Low energy	- Strong backwash - Weak swash - Erode sediment - Winter weather - Storms - High energy

Rock falls	Sudden movement of rock from the cliff that has either weathered or undercut causing the collapse
Sliding	loosened rocks and soil suddenly tumble down the slope usually a bedding plane.
Slumping	When permeable rock/ soil becomes saturated. Where permeable rock meets impermeable rock the saturated rock slumps and slips.

Housing	Industry	Agriculture
Many people who work in London can no longer afford housing there, so some commute in from coastal towns and cities (Brighton) Also a great place to retire – examples include Bournemouth and Blackpool. Impacts- House prices rise and this makes it expensive for local people to buy	Various locations across the UK have tourist areas next to industries. The Solant, Southampton, The Thames estuary, London Offices development-The high cost of London properties has led to businesses moving towards the coast Many UK coastal resorts have universities and young populations that allow companies to expand there Impacts- increased pollution, Traffic congestion	Marshland and wetland is used to by farmers for grazing pasture for cattle: Impacts- The price of good farmland has risen sharply. Farmers have to maximise their income by using whatever land they can. The need for extra grazing is putting pressure on wildlife. Climate change and rising sea levels are likely to lead to flooding by salt water during winter high tides, which could threaten the pastures.

Local councils can spend their money on one of the following choices:

- **Managing the coast**
- **Hold the line**
- **Advance the line**
- **Strategic Retreat**
- **Do nothing**

Challenges on the coast:

Climate change— As temperatures rise, it is likely the intensity and frequency of storms will increase.

Rising sea levels-A warmer climate means that sea water will expand, ice will melt and sea levels will rise.

Storms and Storm surges— large scale increases in seal level (3m)due to storms.

Case study: coastal management in Holderness

The Holderness coast is in the north east of England. This is one of the most vulnerable coastlines in the world and it **retreats** at a rate of one to two metres every year.

What causes the Holderness coastline to retreat?

- Strong prevailing winds creating **longshore drift** that moves material south along the coastline
- The cliffs which are made of a soft boulder clay, and will therefore **erode** quickly, especially when saturated.
- The village of Mappleton, has approximately 50 properties. Due to erosion of the cliffs, the village is under threat.

Steps taken to protect the village of Mappleton:

In 1991, the decision was taken to **protect** Mappleton. A coastal management scheme costing £2 million was introduced involving two types of hard engineering - placing rock armour along the base of the cliff and building two rock groynes.

- Mappleton and the cliffs are no longer at great risk from erosion.
- The rock groynes have **stopped** beach material being moved south from Mappleton along the coast. However, this has **increased** erosion **south** of Mappleton (Terminal Groyne Syndrome). The increased threat of **sea level rise** due to **climate change** means that other places will need to consider the sustainability of coastal defence strategies for the future.

Defence	Advantages	Disadvantages
Sea wall	Protects the base of cliffs, land and buildings Can prevent coastal flooding.	Expensive. may begin to erode. The cost of maintenance is high.
Groynes	Traps material along the coast carried by longshore drift allowing the build up of a beach a natural defence against erosion and an attraction for tourists.	Can be seen as unattractive. Costly to build and maintain.
Beach replenishment	Natural defence against erosion and coastal flooding. Beaches attract tourists. Inexpensive	Material is easily transported away, needs replacing
Planting vegetation	Keeps the beach stable and prevents erosion – Marram Grass is used.	Not reliable during storms

Coastal management strategies

Hard engineering e. g sea wall, building groynes, rock armour - tend to be expensive, short-term options. They may also have a high impact on the landscape or environment are seen as less sustainable.

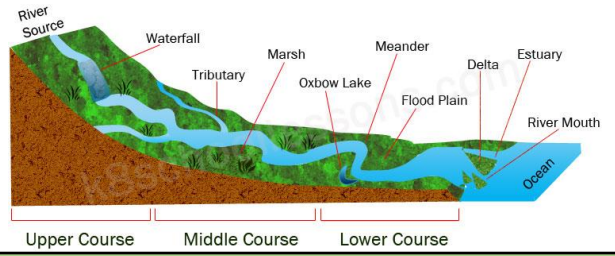
Soft engineering, Soft engineering options e.g beach nourishment, managed retreat are often less expensive than hard engineering options. They are usually more long-term and **sustainable**, with less impact on the environment.

Holistic management	Takes into account all social, economic and environmental costs and benefits. In coastal management this means looking at the coastline as a whole instead of an individual bay or beach.

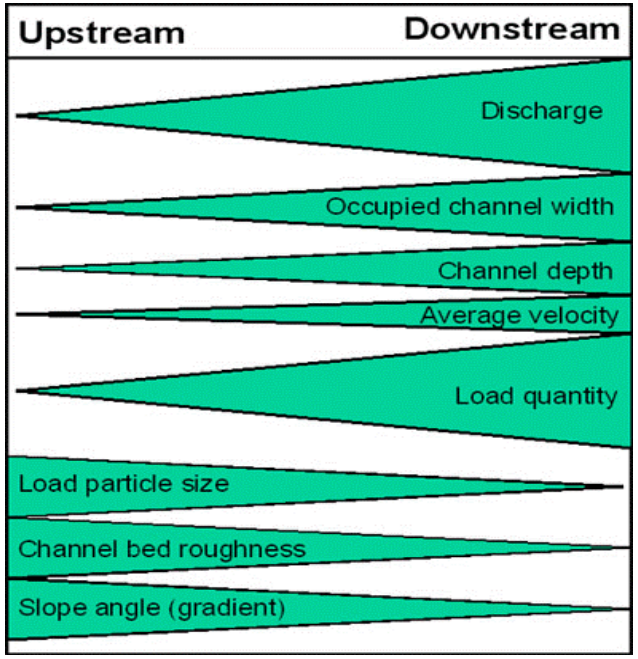
Key Term	Definition
Alluvium	All deposits laid down by rivers, especially in times of flood.
Antecedent rainfall	The amount of moisture already in the ground before a rainstorm.
Bankfull	The discharge or contents of the river which is just contained within its banks. This is when the speed (or velocity) of the river is at its greatest.
Delta	A low-lying area at the mouth of a river where a river deposits so much sediment it extends beyond the coastline.
Deposition	When a river loses energy and drops some or all of the material it is carrying.
Discharge	The volume of water in the river at any given point (measured in cumecs).
Drainage Basin	The area of land drained by a river and its tributaries.
Erosion	Means the wearing away of the landscape.
Estuary	Part of a river that is tidal.
Flood plain	Flat land around a river that gets flooded when the river overflows.
Geology	The nature and structure of rocks- type of rock.
Groundwater flow	Movement of water underground through rocks.
Impermeable	A surface that does not allow water to pass through it.
Infiltration	When surface water soaks down into the soil.
Interception	When water droplets collect on trees and plants.
Interlocking spurs	Hills that stick out on alternate sides of a V-shaped valley, like the teeth of a zip.
Percolation	Water moving downwards through the soil into the rocks below.
Permeable	A surface that allows water to pass through it.
Precipitation	Moisture that falls from the atmosphere e.g. rain, hail, sleet or snow.
Saturated	Soil is saturated when the water table has come to the surface. The water then flows overland.
Storm hydrograph	A graph which shows the change in both rainfall and discharge from a river following a storm.
Surface runoff	All water flowing on the Earth's surface.
Transpiration	Water vapour released by trees and plants.
Velocity	The speed of a river, measured in metres per second.

What are the different stages of a river?

Upper course: Shallow and narrow channel - Waterfall — Interlocking Spur — V-shaped Valley.
Middle course: Meandering River—Ox-bow Lake
Lower course: Wide & deep channel—Estuary — Delta



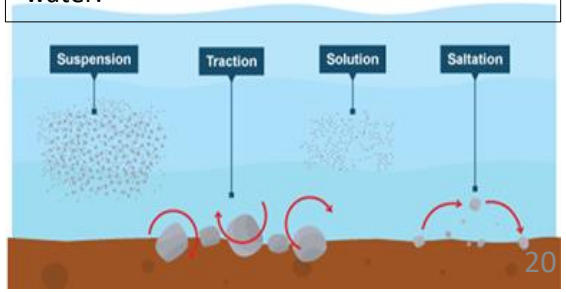
The Bradshaw Model shows the changes that occur as a river flows from its source to its mouth.



Drainage basins:
A drainage basin is the area of land around the river that is drained by the river and its **tributaries**.

- **Watershed** - the area of high land forming the edge of a river basin.
- **Source** - where a river begins.
- **Mouth** - where a river meets the sea.
- **Confluence** - the point at which two rivers meet.
- **Tributary** - a small river or stream that joins a larger river.
- **Channel** - this is where the river flows.

Transportation types:
Traction: large boulders and rocks are rolled along the river bed.
Saltation: small pebbles and stones are bounced along the river bed.
Suspension: fine light material is carried along in the water.
Solution: minerals are dissolved in the water.



Erosion types:
Abrasion: The force of rocks carried in the river currents hitting against the river bed or banks.
Attrition: Sediments knocked about as they are transported, and they gradually become more rounded and reduced in size.
Hydraulic Action: Water is forced into cracks which forces the material apart.
Solution: Chemicals in the water cause materials in rocks or riverbed to dissolve and erode away.

Why do rivers flood?

Physical causes	Human causes
Geology-Hard impermeable rocks will not allow water to be absorbed. Therefore there will be more surface run-off and a greater risk of flooding. **Climate**- if there has been a prolonged period of heavy rainfall, the ground will get saturated and the risk of flooding will increase. **Relief-** Surface run-off increases with steep slopes therefore river levels will rise leading to the river flooding.	**Urbanisation-** Water cannot pass through many of the materials houses are built from so it stays on the surface and floods. **Deforestation-**Permanent removal for trees. This leads to less infiltration and more surface run-off. Dredging- the theory is that deeper channels hold more water. This is true but deepening river channels only works for a while and the river will eventually flood. **Global warming-** The increase in global temperatures caused by the burning of fossil fuels.

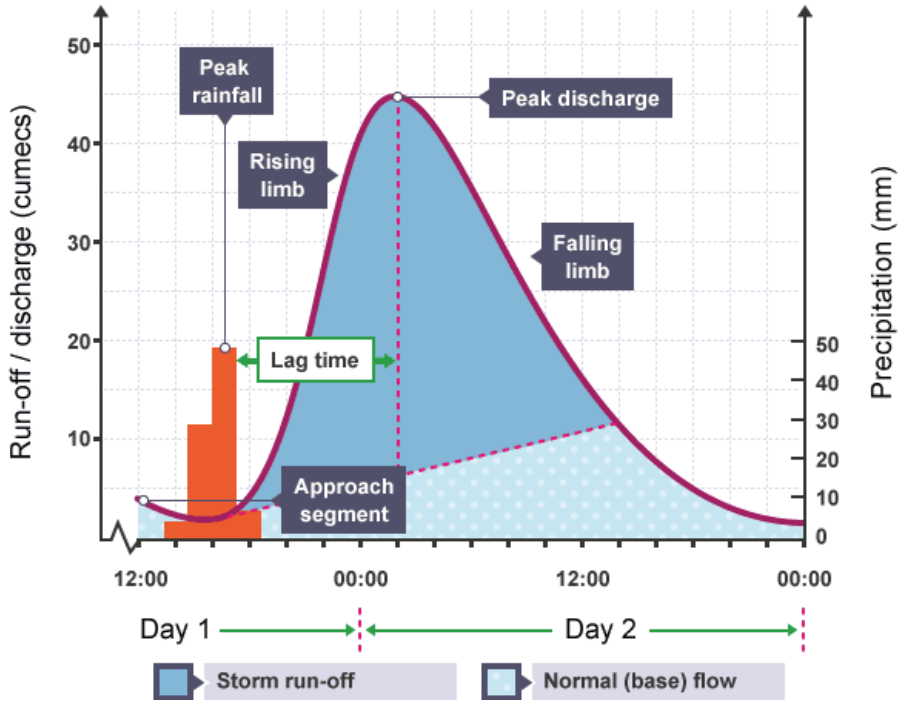
Flooding case study - Cumbria, 2021

Cumbria is in North West England. Severe flooding took place in 2009 and 2015. The 2015 floods affected around 50,000 homes, causing damage estimated to cost £500 million. After the events of 2015, the council spent £2.6 billion on flood defence schemes to protect the region from future flooding.

Causes of the flooding: In October 2021, a slow-moving weather system caused unusually heavy rainfall across many parts of the UK. More than a month's worth of rain (12in or 30cm) fell within Cumbria over a 24-hour period.

Effects of the flooding:

- 43 properties were flooded. Over 1400 properties were protected by the flood defences put in place in response to the 2015 flooding.
- Travel disruption took place. Many roads were closed, and some rail services were delayed or cancelled.
- Tourism was affected as hillwalkers were advised to stay off the hills and mountains. Sporting events were affected. Keswick Rugby Club was under water, so the weekend fixtures couldn't take place. The Original Mountain Marathon event was also cancelled.



A hydrograph shows how a river is affected by a storm. This helps to understand discharge patterns of a particular drainage basin and helps to predict flooding and plan flood prevention measures.

As you can see in the graph, the peak rainfall is the time of highest rainfall. The peak discharge is the time when the river reaches its highest flow. There is a delay because it takes time for the water to find its way to the river. This is called lag time.

Various human and physical factors will cause the lag time to be shorter or longer.

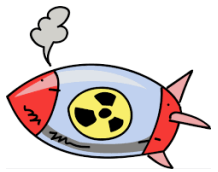
Hard Engineering	Advantages	Disadvantages
Embankments– high banks (levees)	Stop overflowing, covered in grass can blend with the environment.	Can burst under pressure, water can flow over the top.
Flood walls	Prevent water spreading in high impact areas e.g. housing	Expensive, cause flooding downstream, look unnatural
Flood barriers or storm surge barriers	Protect large areas, can be used at high tide or storm surge is forecast	High construction costs and regular maintenance needed

Soft Engineering	Advantages	Disadvantages
River restoration –rivers original course including meanders	More attractive for recreation, creates natural habitats	Some flood banks often still needed.
Floodplain retention-land use according to flood risk	Low risk areas are used for building, high risk land is used for parks/recreation.	Poor public accessibility to some areas

History: Paper 2 Superpower Relations and the Cold War

Key Topic 1: The Origins of the Cold War

The Soviet Union and the USA were allies in the fight against Hitler's Germany, but once WW2 was over there was no common enemy, the different **political systems** in the two countries made co-operation impossible. The **communist** Soviet Union and **capitalist** USA simply distrusted each other too much to remain on good terms. Instead they drifted into a 'cold' war. The Cold War was not an open military conflict, but it did have many characteristics of traditional war. **Military alliances** were formed and huge arsenals of conventional and **nuclear weapons** were developed. Fortunately, those weapons were never used in any direct fighting. SO the Cold War was limited to **a war of words**, fought through **diplomacy, propaganda** and **spying.** In the closing stages of WW2, the USA, Britain, and other allies had freed Western Europe from German occupation. The Soviet Red Army had taken control of much of Eastern Europe. This led to Europe being split in two, with a **capitalist**, **democratic West** and **communist East**. In the years that followed, Stalin tired to win security for the Soviet Union by consolidating his **control** over **eastern Europe** and, if possible, extending communism into Western Europe. At the same time, the USA gave support to Western Europe and worked to undermine communism in Eastern Europe.



1939	The Nazi-Soviet Pact (Aug)
1941	Germany invades USSR (June)
1943	The Tehran Conference (Nov)
1944	The D-Day Landings (June)
1945	The Yalta Conference (Feb)
1945	VE Day (May)
1945	The Potsdam Conference (July)
1945	The USA tests its first atomic bomb July)
1945	Atomic bomb dropped on Hiroshima and Nagasaki (Aug)
1946	Kennan's Long Telegram (Feb)
1946	Churchill's 'Iron Curtain' speech (March)
1946	Novikov Telegram (Sept)
1947	Communist government elected in Poland (Jan)
1947	The Truman Doctrine (March)

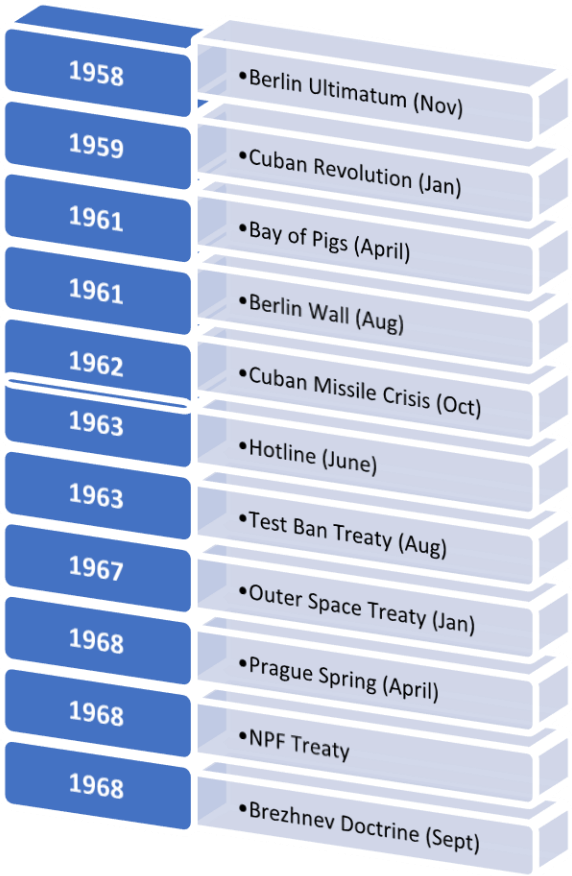
1947	Truman Doctrine (March)
1947	Marshall Plan (June)
1947	Cominform (Sept)
1947	Bizonia (Jan)
1948	Communists seize power in Czechoslovakia (Feb)
1948	Trizonia (March)
1948-9	Berlin Blockade (June)
1949	Comecon (Jan)
1949	FRG (May)
1949	GDR (Oct)
1949	NATO (April)
1955	Warsaw Pact (May)
1956	Secret Speech (Feb)
1956	Hungarian Uprising (Oct)

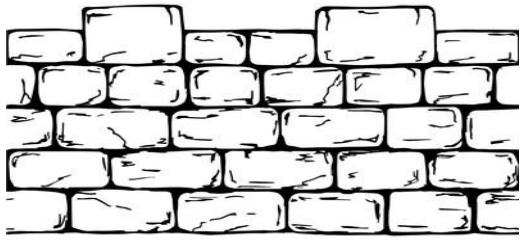
Superpower	A country or state that has great power and influence globally.
Ideology	A key set of ideas. The USA and the USSR had different ideologies about how a country should be governed and how its society should work.
Capitalism	Capitalists believe everyone should be free to own property and businesses and make money.
Communism	Communists believe that all property, including homes and businesses, should belong to the state, to ensure that every member of society has a fair share.
Soviet Union	Short for Union of Soviet Socialist Republics (USSR). The republics included Russia, Ukraine, Belarus, Kazakhstan and others.
Grand Alliance	The name of the partnership between America, Britain and the Soviet Union in WW2. The big three were the 3 people who represented each country.
Buffer zone	A zone of friendly countries in Eastern Europe to protect it from future attacks from the West.
Domino Effect	The domino theory suggests a communist government in one nation would quickly lead to communist takeovers in neighbouring states, each falling like a perfectly aligned row of dominos.
Iron curtain	A metaphorical divide between East and West Europe, a term coined by Churchill.
Satellite state	A nation that was once independent but is now under the control of another.
Atomic monopoly	Possessing and having control of nuclear weapons.
Arms race	A race in which countries compete to build more powerful weapons.
MAD	Mutually assured destruction. Policy in which the USA and the Soviet Union hoped to deter nuclear war by building up enough weapons to destroy each other.
Brinksmanship	Belief that only by going to the brink of war could the USA prevent war.
Containment	Using US power and the military to prevent the spread of communism into new countries. This is the policy of the Truman Doctrine.
Marshall Aid	US financial aid that was authorised. $13 billion dollars was given freely to European countries so that that they 'did not fall prey to communism'. This was the action of the Truman Doctrine.
Comecon	The Council for Mutual Economic Assistance, established on 25 January 1949 by the USSR, two years after the Marshall Plan was announced.
Cominform	The Communist Information Bureau, created by Stalin to link Communist Parties in Europe and place them under direct Moscow control
Berlin Blockade	When Stalin closed the roads, railways and canals that entered West Berlin in June 1948.
Hungarian Uprising	An uprising against harsh Soviet rule. 20,000 Hungarians and 7,000 Russians perished.

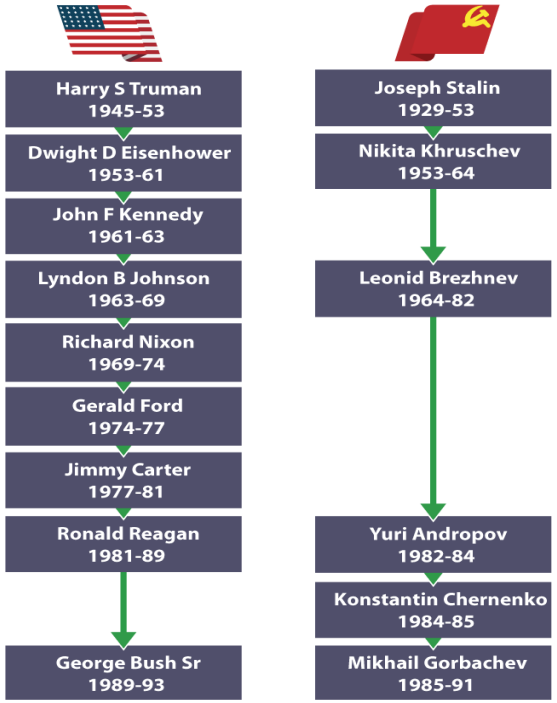
History: Paper 2 Superpower Relations and the Cold War

Key Topic 2: Cold War Crisis, 1958-1970

The events of the **Hungarian Uprising** in 1956 destroyed the cooperative atmosphere of the **Geneva** talks in 1955. international relations became ever more tense and strained in the following years and 1958-70 was the most difficult period of the Cold War. Crises in Berlin, Cuba and Czechoslovakia all added to the tension between the USA and the Soviet Union. Tension over the **control of Berlin** and a mounting **refugee c**risis led Khrushchev to order the building of the **Berlin Wall**, creating a physical barrier between the East and West sides of the city. When the Soviets based **nuclear missiles** on the island of **Cuba**, within striking distance of the US mainland, tension between the Soviet Union almost resulted in a **nuclear war**. And tension between the Soviet Union and the USA was also increased when the Soviets sent tanks into **Czechoslovakia**, to stop **reforms** that threatened Moscow's control of the county.





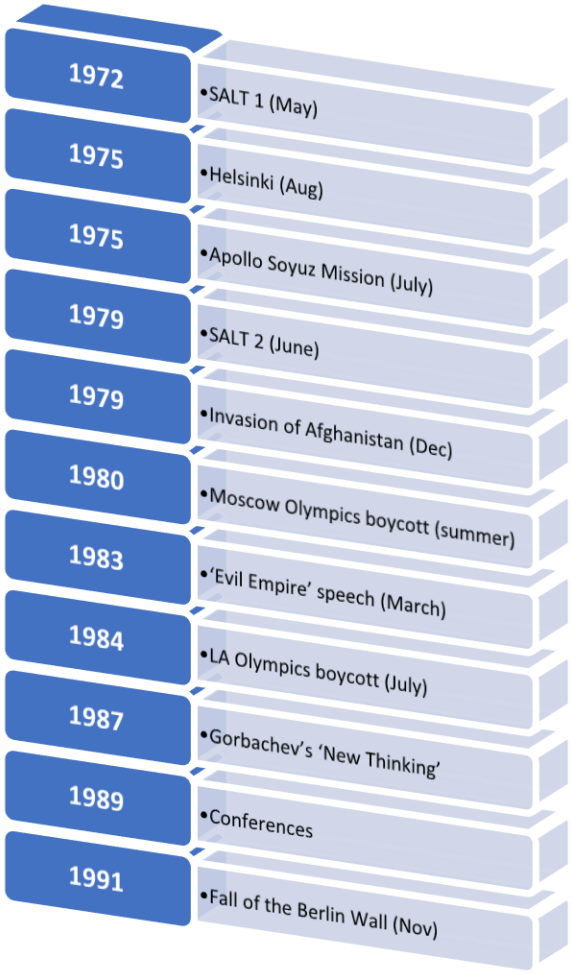


Refugee crisis	By 1958, 3 million east Germans, over a 6th of the country's population, had crossed to the West. They all wanted to escape communism because of the falling standards, whereas the West had higher standards of living, assisted by Marshall Aid, compared to the East which received much less from Comecon.
Brain drain	East Germany urgently needed to build up their economy, but with the refugee problem, many skilled workers, such as engineers, technicians and teachers left, knowing that they could earn much higher salaries in West Germany.
The Berlin Ultimatum	In November 1958, Khrushchev demanded that the Western countries should officially recognise East Germany as an independent country. They refused and on the 27th of November Khrushchev issued his ultimatum and demanded that: Berlin should be demilitarised and western troops withdrawn; Berlin should become a free city.
U-2 crisis	On 1st May 1960 the USSR had shot down an American U-2 spy plane as it flew over the Soviet Union. The Americans tried to claim it was a weather plane that had blown off course, but the Soviets interrogated the pilot, Gary Powers, who admitted to being a spy on a mission. Although Eisenhower was embarrassed he refused to apologise, and Khrushchev walked out of the Paris Summit meeting.
Berlin Wall	On August 13 1961, the East German Police force used barbed wire to swiftly seal off most of the places that people could cross over into West Berlin. This became an actual wall over time and remained until November 1989.
Cuban Revolution	Fidel Castro, communist with the support of the Cuban people loved him, overthrew Batista in 1959.
Bay of Pigs	With CIA funding, a group of armed Cuban exiles tried to land in Cuba at the Bay of Pigs (Cochinos Bay). The USA hoped to overthrow Castro and put a new US-friendly government in control, but it was a complete failure.
The Thirteen Days	During the Cuban Missile Crisis, leaders of the U.S. and the Soviet Union engaged in a tense, 13-day political and military standoff in October 1962 over the installation of nuclear-armed Soviet missiles on Cuba, just 90 miles from U.S. shores.
Hotline	A direct telephone line between Moscow and Washington after the Cuban Missile Crisis. This allowed the USSR and USA to communicated directly and quickly rather than relying on telegrams and letters.
Test Ban Treaty	This prohibited the testing of nuclear weapons on land, under sea and in outer space. It meant that the USA and USSR would stop testing new nuclear weapons.
The Outer Space Treaty	The two superpowers, together with Britain and several other countries promised to use outer space for peaceful purposes and not to place nuclear weapons in orbit.
Nuclear Non-Proliferation Treaty	This meant that the USA and USSR would stop sharing or selling nuclear weapon plans and designs to other countries. The idea was to stop the spread of nuclear technology across the world.
Socialism	An economic and political system where the community or state owns the general means of production (i.e. farms, factories etc).
Prague Spring	The reforms Dubcek introduced from April 1968, which became known as the 'Prague Spring', after the country's capital. They were met with great enthusiasm from the Czech people, but much less popular in Moscow.
Brezhnev Doctrine	Brezhnev announced that the actions of one individual communist country affected all communist countries. So if one country's actions threaten other countries, then it was the duty of all those countries to stop those actions.

History: Paper 2 Superpower Relations and the Cold War

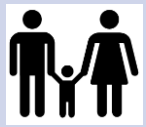
Key Topic 3: The End of the Cold War, 1970-91

The events in Berlin, Cuba and Czechoslovakia in the 1960s had highlighted just how far apart thinking was in Moscow and Washington. But one area where there was agreement was that the nuclear arms race threatened the future of mankind. This is one reason why the **1970s** saw an attempt to improve relations through a policy known as **détente**. By the end of tat decade, however, relations had once more deteriorated to a point where there was a **'Second Cold War'** as President Ronald **Reagan** took a much tougher approach to the Soviet Union. When Mikhail **Gorbachev** became Soviet leader in 1985, he realised that his country could no longer afford the cost of the nuclear arms race and that radical changes were needed in how the Soviet Union was governed. Little did he realise that his policies would bring about, not only the **end to the Cold War**, but also the **break-up of the Soviet Union**.



Détente	A period of peace between two groups that were previously at war, or hostile to each other, in this case the USA, USSR and China.
SALT 1	Strategic Arms Limitation Treaty signed by Nixon and the Soviet leader, Leonid Brezhnev. The agreement restricted the number of ICBMs both sides could have, but was criticised by some for not limiting the production of new nuclear weapons.
SALT 2	The US Congress refused to ratify SALT II, a second agreement of the Strategic Arms Limitation Talks, because it as far as they could see the USSR had broken its commitment to limiting the creation of new nuclear weapons.
Helsinki Agreement	Signed by 35 countries including the USA and the USSR. These countries were signing up to recognise the European borders established after World War Two as well as to some basic human rights such as freedom of speech. This effectively meant that the Western Allies recognised Soviet control over Eastern Europe. It also meant that, after decades of communist dictatorship, the Soviet Union had signed up to a basic human rights agreement.
Apollo Soyuz Mission	In 1975 American astronauts and Soviet cosmonauts met and symbolically shook hands in space.
The Mujahidin (Mujahideen)	A pro-Islamic guerrilla movement who received funds from the USA and Osama bin Laden (wealthy Saudi); after the withdrawal of the USSR the fighters split into many factions which eventually spawned the Taliban who took control of Afghanistan.
People's Democratic Party of Afghanistan	Pro-communist government that seizes power in 1978 – led by Taraki.
Shah	King or Emperor. Iran was ruled by shahs until the 1979 revolution
The Strategic Defense Initiative (SDI)	This was a series of satellites in orbit. These satellites would carry powerful lasers that could shoot down Soviet missiles and prevent them from harming the USA. This was against the terms of the Outer Space Treaty (1967).
Perestroika	Russian for 'reconstruction'. It was used in the Gorbachev era to describe his programme for reorganising and restructuring the Soviet State.
Glasnost	Russian for 'openness' or 'transparency'. In the 1980s and 1990s, it was used to describe Gorbachev's new, more open, attitude to government and foreign relations.
INF Treaty	The Intermediate-Range Nuclear Force (INF) Treaty. The treaty said that both countries would abolish all land-based missiles with a range of 500-5000km.
Solidarity	An independent trade union movement in Poland which developed into a mass campaign for political change and inspired popular opposition to Communist regimes

Theme A - Relationships and families

Topic	Judaism	Comparative faith/society
Sexuality/family planning 	Judaism allows contraception only under certain circumstances eg If the mother's life is in danger. Judaism does not allow permanent contraception as this goes against the commandment to "**Be fruitful and Multiply" (Torah).** Jews are instructed to not **"waste the seed" (Torah).** Men can therefore not use a condom. "Orthodox Judaism believes that **"man shall not lie with man as with women as it is an abomination" (Leviticus)** and does not accept same sex marriages or civil partnerships. The act of physical homosexual relations is considered wrong as it goes the commandment to be **"fruitful and multiply**". Reform Judaism has adapted Jewish law to fit in with modern society. It accepts same sex marriages and conducts them in some of their synagogues. It also allows contraception in all forms.	The Christian Church believes that **one of the key purposes of sex is to 'be fruitful and multiply'**. The Catholic Church does not permit contraception. The Church of England permits contraception giving couples a choice as to the size of their family. All churches see family planning as a natural method of contraception. **All forms of contraception are legal in Britain.** The Catholic Church believes that **"man shall not lie with man as with women as it is an abomination" (Leviticus)**. The Roman Catholic church teaches that sex between people of the same gender is 'disordered' and does not accept same sex marriages or civil partnerships. The Church of England does not accept same sex marriages or civil partnerships. Liberal Christians teach that Jesus wanted people to love each other and show mercy and that we should be accepting of homosexuals. **Modern society has accepted and legalised same sex marriages and civil partnerships.**
Marriage 	**Man should not be alone; I will create a partner for him" (Torah**). Orthodox Judaism teaches that men and women should be together in marriage and to have children once married. Orthodox Jews believe that marriage is essential for a stable society in which children can be brought up in a secure relationship. It sees marriage as the only acceptable relationship within which to have sexual relations. **"A man without a wife is incomplete" (Talmud)** Adultery is never acceptable. The 7th of the 10 commandments states **"You shall not commit adultery" (Exodus).** It is also one of the 36 crimes punishable by death in the Torah. Reform Judaism accepts cohabitation between committed couples.	Christians believe that **marriage is a gift from God, one that should not be taken for granted**. It is the right atmosphere to engage in sexual relations and to build a family life. Getting married in a church, in front of God, is very important. A marriage is a public declaration of love and commitment. The Church of England may accept cohabiting couples if they intend to get married. All Christians say adultery is wrong. **"You shall not commit adultery" (Bible).**Quakers viewpoint aligns with modern society. They believe that a couple can be faithful to each other in a committed relationship outside marriage. **British society accepts all committed relationships where both couple consent to sex.**
Family and gender equality 	Parents should provide their children with their needs (clothes, food, roof etc). **A father is obligated to teach his son Torah and the commandments.** Judaism believes **"we are created in the image of G-d" (Torah).**. Orthodox Jews believe men and women have equal but different roles . Men have a more public role in worship eg being part of a minyan for daily prayers. Women have a more private, spiritual role role, based in the home. Reform Judaism challenges this and strives for compete equality between men and women in all aspects of Jewish life.	**W**omen cannot be priests in the Roman Catholic church. They are scripturally excluded. Timothy states "**They could not teach or have authority over a man".** The Church of England has male and female clergy, including female bishops. In the UK, there is a demand for equality between the sexes in all aspects of life. IN reality, there are still many areas where women do not see themselves as having equal opportunities/treatment. What do you think? How would you define a family?

Theme A - Relationships and families

Topic	Judaism	Comparative Faith/society
Divorce 	Judaism does allow divorce, however it should be a last resort after counselling or attempts to save the marriage. **"G-d hates divorce" (Torah)** **"anyone who divorces his wife, even the altar weeps" (Talmud)** A Beit Din must grant the divorce by giving a 'get'. The man must give this and the woman keeps the actual 'get' document. Reform Judaism has adapted this and a man or woman can give the get.	Roman Catholics are against divorce and state it is always wrong. **"Whoever divorces … then remarries another; it is as if he committed adultery"** Other Christians consider it the lesser of two evils or even a necessary evil, but a divorced couple are not usually able to remarry in a church. **Divorce is legal in the UK**.
Remarriage 	Judaism allows remarriage once a woman has received a '**Get'.** A person should be given every opportunity to find a partner and be happy. A couple should wait for 90 days before remarrying to ensure the woman is not pregnant.	Catholics do not allow remarriage because a person has broken promises they have made in front of God once they should not be given the opportunity to do this again. An annulment (as if the marriage never took place). may take place after a few months if the relationship was not consummated (sex). Church of England does allow couples to remarry so they can be happy but does not allow for a religious ceremony due to the holiness of the vows they originally made.

Key word	Definition
Adultery	Having sex with someone who is not your husband or wife, outside of marriage
Artificial contraception	Methods of preventing pregnancy e.g., condoms, the pill, the coil
Cohabitation	Living and starting a family with someone who you are not married to
Divorce	The legal ending of a marriage
Family planning	Using a woman's natural cycle of fertility to try and avoid pregnancy
Gender discrimination	Acting against people based on their gender
Gender prejudice	Holding biased opinions about people based on their gender
Heterosexual	Sexual attraction to the opposite gender
Homosexual	Sexual attraction to the same gender
Marriage	A legal and religious ceremony joining two people together in love
Procreation	Bringing babies into the world
Remarriage	Marrying someone else after divorce

Key word	Definition
Beit Din	Jewish Court of Law
Get	Jewish document of divorce
Torah	Jewish holy book
Talmud	Jewish oral law
annulment	Legal process making a marriage no longer valid
minyan	10 men over 13 needed for a full service in synagogue
Nuclear family	Family made up of 2 parents and children

Theme B: Religion and Life

Topic	Religious Arguments	Scientific/Secular Arguments
Origin of Life 	Truths are based on a belief and tradition that Holy Scripture is the word and wisdom of GOD. God created the world (and Universe) in 6 days. This process ends with the creation of Man after all other life. All creation was made for Man, a *gift* for us from God. We must be grateful for this gift and we should live/behave as Gods wants us to.	Truths are based on a method of observation, experimentation and results. NEVER 100% CERTAIN. However, a scientific 'Theory' is *fact*. The Universe began over 13Billion years ago. The Earth is one of many planets, stars and other objects in a vast space. Humans are another type of animal life that has evolved on Earth over millions of years. The scientific explanation for the origin of life does not require God to cause things to exist.
The Environment 	Scripture can be interpreted to believe that we have Dominion (a right to conquer) and Stewardship (a responsibility to take care) of the world. In our modern world we are more aware of how much damage human activity is doing to the planet and how limited some resources are. Therefore there is now a greater emphasis on our duty to be caretakers.	Humans use natural resources for fuel, food, and material. We are overusing a lot of natural resources and damaging the environment (for example: Pollution and Deforestation). The result of all this human activity and damage has caused a change in the climate with extreme weather like floods and fires. Scientists would agree with religion that we must be more responsible.
Animal Life 	Animals were also given the gift of life from God. We should respect them as much as we respect the world. They were created for us to use, but not to abuse. Kosher rules around animal slaughter and meat preparation demonstrate regard and respect for animals. The rules forbidding work on Sabbath apply to animals as well. Humans need animals which is why God created them.	Humans use animals in all sorts of ways: food, clothing, labour, companionship, entertainment, and research/testing. Some people believe we can use animals for things (including blood sports, experimentation and hard labour) as their 'consent' is not a moral requirement. Others believe it is morally wrong to cause animals to suffer.
Human Life: Abortion 	Once 'Life' has begun it is equal to a life that is already being lived. This is the 'Sanctity of Life'. Every life is a gift from G-d and not up to us to take away. Life is precious ad holy. A foetus can be seen as a 'potential' life rather than an actual life. Judaism sees this as so. Religion might allow abortion under specific conditions, like if the mother's life is in danger. In other cases religion would prefer alternatives, such as adoption, or providing support for disabled children. The sanctity of the foetus' life might mean the woman has no choice about whether she wants to stay pregnant.	The option of abortion should be available for a woman to decide based on her own values. The wellbeing of the child could be affected if it is unwanted and/or given up for adoption. In the UK the NHS has a medical view (when could the foetus survive outside the mother). As medical technology improves, the availability of abortion through the NHS could change. The need for abortions is reduced by promoting all forms of contraception.
Human Life: Euthanasia 	Life is sacred no matter how bad or how much pain there is, only God can take it away. Killing out of mercy might be the lesser of two evils, or prohibited and a sin. Religions offer/run Hospice care for terminally ill patients as a way of dealing with terminal illnesses. They provide support to the families of patients. Religious views may vary depending on the type of Euthanasia.	Euthanasia is divided into Active/Passive (actively killing/withdrawing medical support) and voluntary or not (able to give consent). If unable to give consent then the decision must be made by a doctor or family. If a human has a right to life (in a way they chose, without pain), then surely they have a right to die (in a way they chose, without pain). This might also relieve the suffering of their families.

Jewish Studies Theme B

Key Words			
Abortion	The ending of a pregnancy	Evolution	Scientific theory of the development of humans from apes
Afterlife	What happens to the self/soul after we die	Fossil Fuels	Natural resources for energy: coal, oil and gas
Animal Rights	The idea that animals should have rights out of respect for life	Heaven	Paradise where those judged good go after death to be forever with God
Assisted Suicide	When a person wishes to die, but requires help. Linked to Voluntary Euthanasia	Hell	Damnation where those judged bad go after death to be forever without God
Big Bang Theory	Scientific theory of the creation of the universe through a large explosion	Hospice	A place that cares for the dying
Bodily Autonomy	The belief/right that an individual should have control over what happens to their own body. For example, organ transplants, suicide, abortion.	Judgement	The belief that you will be judged by God after death
Charles Darwin	Published On The Origin of Species, 1859; Theory of Evolution	Liberal	A person who believes their holy book is not literally true
Conception	When the egg is fertilised by the sperm. The beginning of pregnancy	Literalist (orthodox Jew)	A person who believes their Holy book is literally true + the word of God
Consent	When permission is given by a person for something to happen to them	Pro-Choice	Advocating for a person to have bodily-autonomy in issues about life and death
Conservation	To repair and protect various aspects of the natural world	Pro-Life	Advocating against a person to have bodily autonomy
Creation	The idea that God created the world	Quality of Life	How easy or difficult someone's life is – e.g. cancer causes a low quality of life
DNR	Do Not Resuscitate. A medical instruction. Linked to Passive Euthanasia	Sanctity of Life	The belief that all life is sacred as man is made in God's image
Dominion	The power humans have over God's creation	Scientific Theory	As close to 100% certain as science will allow
Environment	The world around us	Stewardship	The responsibility God gave humans to look after the world
Euthanasia	The painless killing of a terminally ill patient. A 'mercy killing'	Vegetarian	The choice not to eat animals

EVIDENCE

Jewish

Creation Story: Book of Genesis

"Be Fruitful and increase, fill the earth and master it" Genesis 1:28

Adam and Eve: Book of Genesis

"For your sake I created them all! See to it that you do not spoil and destroy My world; for if you do, there will be no one to repair it" Ecclesiastes 7:13

TIKKUN OLAM

A Righteous man knows the needs of his beast" Proverbs 12:10

"God made us in his image" Genesis 1:27

The foetus is 'mere water' until the 40th day of pregnancy: Talmud

"Thou shalt not Kill" 10 Commandments

"God gives life and takes life away" Psalms

Muslim

"It is HE who has made you successors on the Earth" Quran 6:165

"You were lifeless and HE gave you life" Quran 2:28

"Do not seek from it more than what you need" Hadith

"All the creatures that crawl on the earth and those that fly with their wings are communities like yourselves" Quran 6:38

"Do not kill your children for fear of poverty… We shall provide for them and you… killing them is a great sin" Quran 17:31

"Do not take life, which Allah had made sacred, except by right" Quran 17:33

Scientific

Big Bang Theory

Theory of Evolution

Rise in extreme weather conditions, including floods, fires, and droughts.

Industrial development is correlated with increases in global temperatures and environmental instability

Industrial methods of animal rearing reduce the quality of the meat and use up other natural resources

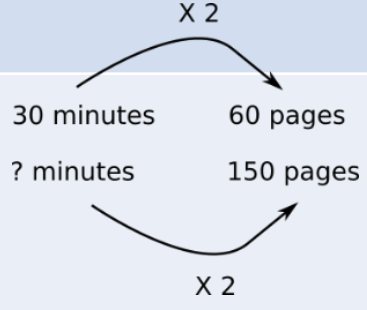
More efficient to use resources as direct foodstuffs rather than feeding animals.

Abortion is legal in the UK under certain conditions: Human Fertilisation and Embryology act 1990

Current medical guidance says abortion is acceptable up to 24 weeks

Euthanasia as a form as assisted suicide is illegal in UK: Suicide Act 1961

MATHS FOUNDATION UNIT 11: RATIO AND PROPORTION

Topic/Skill	Definition/Tips	Example
Ratio	Ratio compares the size of **one part** to **another part**. Written using the ':' symbol.	3 : 1 
Proportion	Proportion compares the size of **one part** to the size of the **whole**. Usually written as a fraction.	In a class with 13 boys and 9 girls, the proportion of boys is 13/22 and the proportion of girls is 9/22
Simplifying Ratios	**Divide** all parts of the ratio by a **common factor**.	5 : 10 = 1 : 2 (divide both by 5) 14 : 21 = 2 : 3 (divide both by 7)
Ratios in the form $1 : n$ or $n : 1$	**Divide** both parts of the ratio by one of the numbers to make **one part equal 1**.	5 : 7 = 1 : 7/5 in the form 1 : n 5 : 7 = 5/7 : 1 in the form n : 1
Sharing in a ratio	**1. Add** the total parts of the ratio. **2. Divide** the amount to be shared by this value to find the value of one part. **3. Multiply** this value by each part of the ratio. Use only if you **know the total**.	Share £60 in the ratio 3 : 2 : 1. 3 + 2 + 1 = 6 60 ÷ 6 = 10 3 x 10 = 30, 2 x 10 = 20, 1 x 10 = 10 £30 : £20 : £10
Proportional reasoning	Comparing two things using **multiplicative reasoning** and applying this to a new situation. Identify one multiplicative link and use this to find missing quantities.	

Topic/Skill	Definition/Tips	Example
Unitary method	Finding the **value of a single unit** and then finding the necessary value by **multiplying** the single unit value.	3 cakes require 450g of sugar to make. Find how much sugar is needed to make 5 cakes. 3 cakes = 450g So 1 cake = 150g (÷ by 3) So 5 cakes = 750 g (x by 5)
Ratio already shared	Find what **one part** of the ratio is worth using the **unitary method**.	Money was shared in the ratio 3:2:5 between Ann, Bob and Cat. Given that Bob had £16, found out the total amount of money shared. £16 = 2 parts So £8 = 1 part 3 + 2 + 5 = 10 parts, so 8 x 10 = £80
Best Buys	Find the **unit cost** by **dividing** the **price by the quantity**. The **lowest** number is the best value.	8 cakes for £1.28 à 16p each (÷by 8) 13 cakes for £2.05 à 15.8p each (÷by 13) Pack of 13 cakes is best value.

You must make sure that your ratio has been simplified fully by finding the highest common factor.

Simplify 12 : 20
÷ 4
= 3 : 5

This could have been done in two steps by dividing by 2 and then by 2 again.

Simplify 60 : 40 : 100
÷ 10
= 6 : 4 : 10
÷ 2
= 3 : 2 : 5

This could have been done in one step by dividing by 20.

Hegarty maths clip numbers

Clips 328 – 338

Topic: Writing ratios 330/331

Topic: Sharing ratios 333/334

hegartymaths

Sharing in a ratio

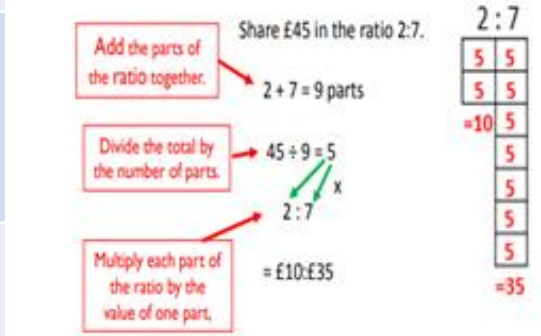
Sharing in a ratio: To share in a ratio we can use bar modelling to visualise the steps.

Share £45 in the ratio 2:7.

Add the parts of the ratio together. → 2 + 7 = 9 parts

Divide the total by the number of parts. → 45 ÷ 9 = 5

Multiply each part of the ratio by the value of one part. → 2 : 7 x 5 = £10:£35



Sharing ratio when given one part:

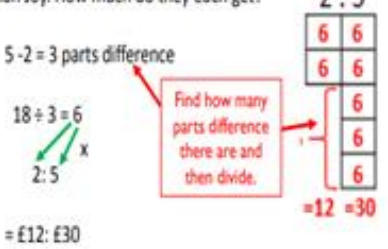
Joy and Martin share money in the ratio 2:5. Martin gets £18 more than Joy. How much do they each get?

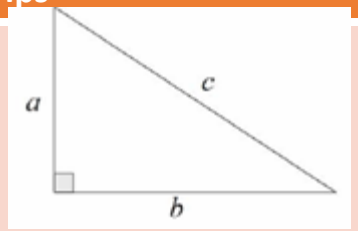
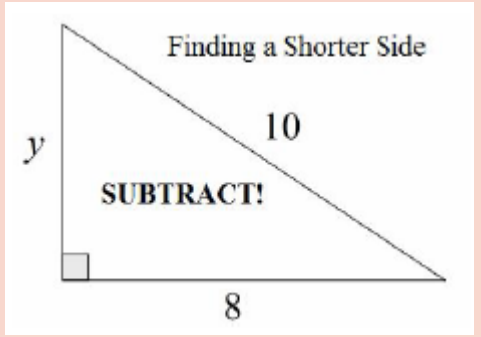
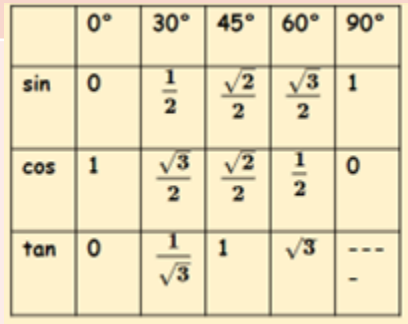
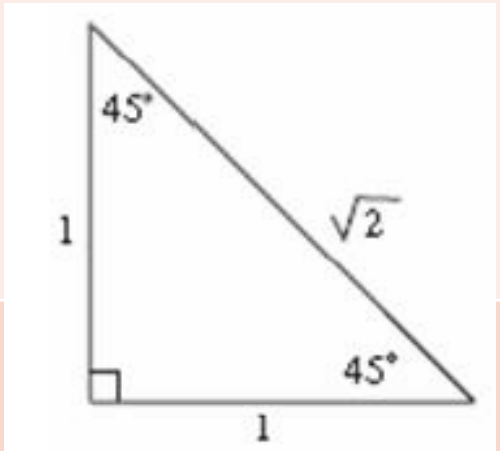
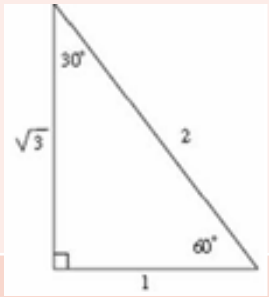
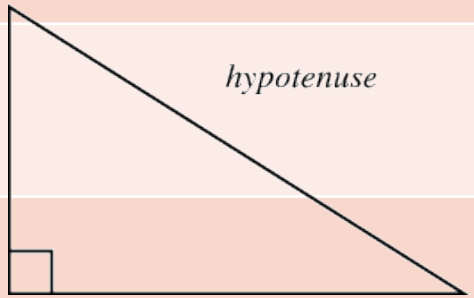
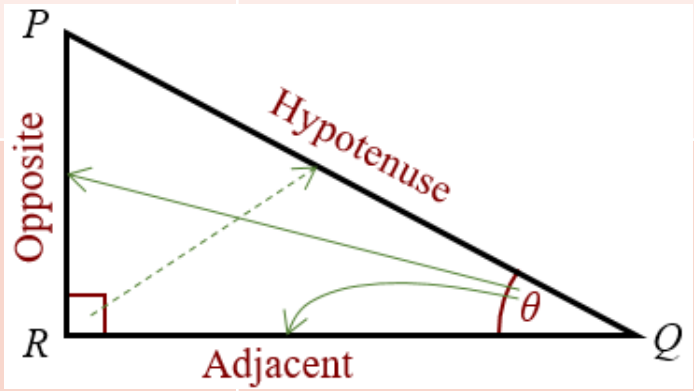
5 -2 = 3 parts difference

18 ÷ 3 = 6

2 : 5 x 6 = £12 : £30

Find how many parts difference there are and then divide.



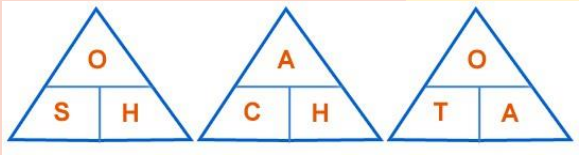
Topic/Skill	Definition/Tips	Example
Pythagoras' Theorem	For any **right-angled triangle**: $a^2+b^2=c^2$  Used to find **missing lengths**. a and b are the shorter sides, c is the **hypotenuse** (**longest side**).	 $a = y,\ b = 8,\ c = 10$ $a^2 = c^2 - b^2$ $y^2 = 100 - 64$ $y^2 = 36$ $y = 6$
Exact Values for Angles in Trigonometry		 
Trigonometry	The **study** of **triangles**.	
Hypotenuse	The **longest side** of a **right-angled triangle**. Is always **opposite** the **right angle**.	
Adjacent	**Next to**	

Topic/Skill	Definition/Tips	Example
Trigonometric Formulae	Use **SOHCAHTOA**.	Use 'Opposite' and 'Adjacent', so use 'tan'

$$\sin\theta = \frac{O}{H}$$

$$\cos\theta = \frac{A}{H}$$

$$\tan\theta = \frac{O}{A}$$



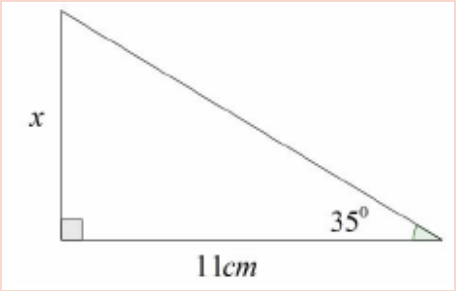
When finding a missing angle, use the 'inverse' trigonometric function by pressing the 'shift' button on the calculator.

$$\tan 35 = x/11$$

$$x = 11\tan 35 = 7.70\text{cm}$$

$$\cos x = \frac{5}{7}$$

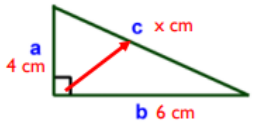
$$x = \cos^{-1}\left(\frac{5}{7}\right) = 44.4^{\circ}$$



What you need to know:

Pythagoras' Theorem - Hypotenuse

You should always label the hypotenuse first.
This is the side facing the right angle.



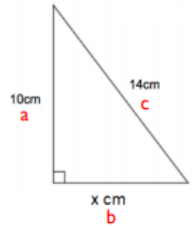
$a^2 + b^2 = c^2$

1) Substitute your values into the formulae:
$4^2 + 6^2 = x^2$
2) Work out the values that you can.
$16 + 36 = x^2$
$52 = x^2$
3) Now use inverse operations to isolate x.
$52 = x^2$
$(\sqrt{}) \quad (\sqrt{})$
$\sqrt{52} = x$
7.211102551 cm = x or 7.21 to 3 s.f

This is surd form. Sometimes you will be asked to leave your answer like this.

Pythagoras' Theorem – Shorter Sides

$a^2 + b^2 = c^2$



Sometimes you are asked to calculate the shorter sides, see below.
1) Substitute your values into the formulae:
$10^2 + x^2 = 14^2$
2) Work out the values that you can.
$100 + x^2 = 196$
3) Now use inverse operations to isolate x.
$100 + x^2 = 196$
$(-100) \quad (-100)$
$x^2 = 96$
$(\sqrt{}) \quad (\sqrt{})$
$\sqrt{96} = x$
x = 9.797958971 cm or 9.80cm to 3 s.f

You need to get the numbers on one side, the x on it's own. An extra step is needed.

Hegarty maths clip numbers

Pythagoras' 2D: 497 – 504

Pythagoras' 3D: 505 - 507

Trigonometry 2D: 508 – 515

Exact trig values: 845- 853

Trigonometry 3D: 854 - 863

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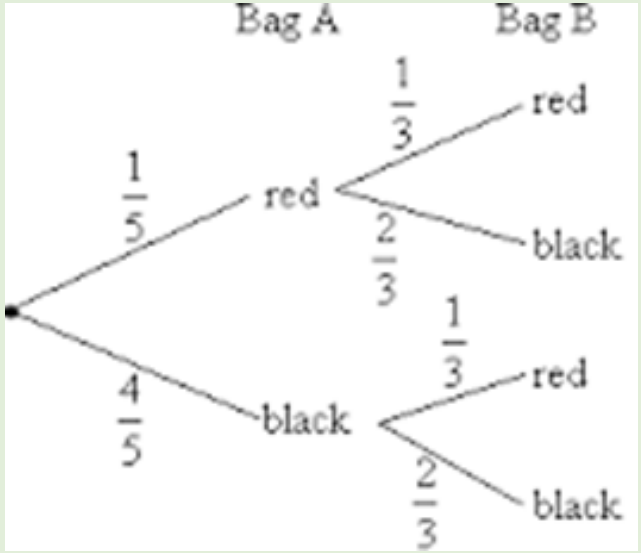
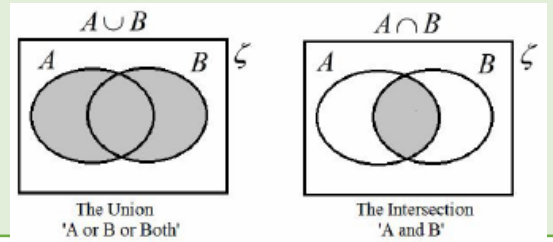
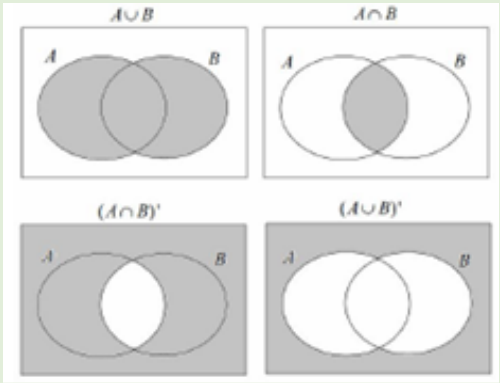
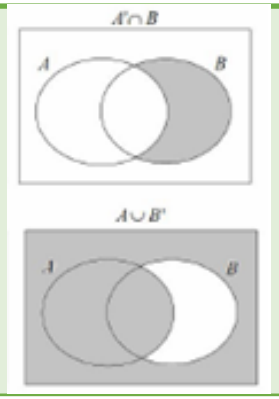
SOH SINE = OPP/HYP **CAH** COSINE = ADJ/HYP **TOA** TANGENT = OPP/ADJ

Topic/Skill	Definition/Tips	Example
Tree Diagrams	Tree diagrams show **all the possible outcomes** of an event and calculate their probabilities. **All branches must add up to 1 when adding downwards.** This is because the **probability of something not happening** is **1 minus the probability that it does happen**. **Multiply** going **across** a tree diagram. **Add** going **down** a tree diagram.	
Independent Events	The outcome of a **previous event does not influence/affect the outcome of a second event**.	An example of independent events could be <u>replacing</u> a counter in a bag after picking it.
Dependent Events	The outcome of a **previous event does influence/affect the outcome of a second event**.	An example of dependent events could be not replacing a counter in a bag after picking it. '<u>Without replacement</u>'
Probability Notation	**P(A)** refers to the **probability that event A will occur.** **P(A')** refers to the **probability that event A will <u>not</u> occur**. **P(A ∪ B)** refers to the **probability that event A <u>or</u> B <u>or</u> both will occur.** **P(A ∩ B)** refers to the **probability that <u>both</u> events A and B will occur.**	P(Red Queen) refers to the probability of picking a Red Queen from a pack of cards. P(Blue') refers to the probability that you do not pick Blue. P(Blonde ∪ Right Handed) refers to the probability that you pick someone who is Blonde or Right Handed or both. P(Blonde ∩Right Handed) refers to the probability that you pick someone who is both Blonde and Right Handed.

MATHS FOUNDATION UNIT 13: PROBABILITY

Topic/Skill	Definition/Tips	Example
Venn Diagrams	A Venn Diagram shows the **relationship between a group of different things** and how they overlap. You may be asked to shade Venn Diagrams as shown below and to the right.  	 
Venn Diagram Notation	∈ means '**element of a set**' (a value in the set) { } means the collection of values in the set. ξ means the '**universal set**' (all the values to consider in the question) **A' means 'not in set A' (called complement)** **A ∪ B means 'A or B or both' (called Union)** **A ∩ B means 'A and B (called Intersection)**	Set A is the even numbers less than 10. A = {2, 4, 6, 8} Set B is the prime numbers less than 10. B = {2, 3, 5, 7} A ∪ B = {2, 3, 4, 5, 6, 7, 8} A ∩ B = {2} What is the probability of rolling a 4 and flipping a Tails? $P(4 \text{ and } Tails) = P(4) \times P(Tails)$ $= \frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$
AND rule for Probability	When two events, A and B, are **independent**: $P(A \text{ and } B) = P(A) \times P(B)$	What is the probability of rolling a 2 or rolling a 5? $P(2 \text{ or } 5) = P(2) + P(5)$ $= \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$
OR rule for Probability	When two events, A and B, are **mutually exclusive**: $P(A \text{ or } B) = P(A) + P(B)$	hegartymaths 372-388, 391

Topic/Skill	Definition/Tips	Example
Percentages	You can calculate a percentage change using the formula $\text{Percentage change} = \frac{\text{actual change}}{\text{original amount}} \times 100$	
Growth and decay	Banks and building societies pay compound interest. At the end of the first year, interest is paid on the money in the account. The interest is added to the amount in the account. At the end of the second year, interest is paid on the original amount in the account and on the interest earned in the first year, and so on.	
Compound measures		
Metric System	A system of measures based on: the metre for length the kilogram for mass the second for time **Length: mm, cm, m, km** **Mass: mg, g, kg** **Volume: ml, cl, l**	

Percentage increase and decrease

Increase: To calculate a percentage increase we calculate the percentage and add the value on to the original amount.

Non Calculator: Increase 70 by 65%

10% = 70 ÷ 10 = 7 5% = 7 ÷ 2 = 3.5

60% = 6 x 7 = 42

65% = 60% + 5% = 42 + 3.5 = 45.5

Calculate 65% by splitting into 10% and 5% and then add the answer on to the original amount.

70 + 45.5 = **115.5**

Calculator: Increase 130 by 26%

Calculate 26% using a multiplier and add this answer onto the original amount.

26% of 130 = 0.26 x 10 = 33.8

130 + 33.8 = **163.8**

Decrease: To calculate a percentage decrease we calculate the percentage and subtract the value off the original amount.

Non Calculator: Decrease 20 by 35%

10% = 20 ÷ 10 = 2 5% = 2 ÷ 2 = 1

30% = 3 x 2 = 6

35% = 30% + 5% = 6 + 1 = 7

Calculate 35% by splitting into 10% and 5% and then subtract the answer off the original amount.

20 - 7 = **13**

Calculator: Decrease 65 by 14%

Calculate 14% using a multiplier and subtract this answer off the original amount.

14% of 65 = 0.14 x 65 = 9.1

65 – 9.1 = **55.9**

Copper has a density of 8.92g/cm³. Silver has a density of 10.49g/cm³. 20cm³ of copper and 5cm³ of silver are mixed to form a new metal.

a) What is the density of the new metal?

Step 1 – Calculate the mass of each metal Mass = Density x Volume

Copper = 8.92 x 20 = 178.4g

Silver = 10.49 x 5 = 52.45g

Step 2 – Add the masses together 178.4 + 52.45 = 230.85g

Step 3 – Use the formula for density using your new mass and volume Density = M÷V = 230.85 ÷ 25 = 9.234g/cm³

b) Convert your answer into kg/m³

g → kg = ÷ 1000

cm³ → m³ = x 1,000,000

Overall, we multiply by 1000

= 9.234 kg/m³

Growth and Decay

Mo invests £300 at a compound interest rate of 3% per annum. How much money is in his account after 4 years?

If the value was decreasing, our multiplier would be <1

Step 1 – Calculate the interest rate as a decimal multiplier = 1.03

Step 2 – Substitute values into the formula for compound interest

= £300 x 1.03^4

= £337.65

$\text{Final Amount} = \text{Starting Amount} \times (\text{Decimal Multiplier})^n$

Compound Measures

Don't forget your formula triangles.

Speed: D / S T

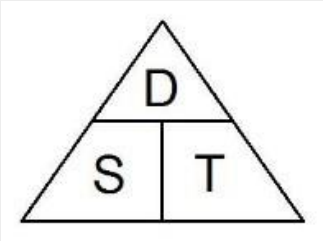
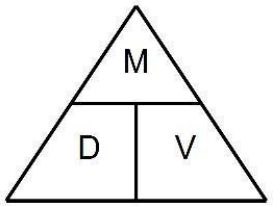
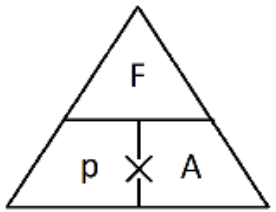
Density: M / D V

Pressure: F / P A

1kilometres=1000 metres1kilometres=1000 metres
1 metre=100 centimetres1 metre=100 centimetres
1 centimetre=10 millimetres1 centimetre=10 millimetres

1 kilogram=1000 grams1 kilogram=1000 grams

MATHS FOUNDATION UNIT 14: MULTIPLICATIVE REASONING

Topic/Skill	Definition/Tips	Example
Metric and Imperial Units	**Speed = Distance ÷ Time** **Distance = Speed x Time** **Time = Distance ÷ Speed** Remember the correct units. 	Speed = 4mph Time = 2 hours Find the Distance. D = S × T = 4 × 2 = 8 miles
Density, Mass, Volume	**Density = Mass ÷ Volume** **Mass = Density x Volume** **Volume = Mass ÷ Density** Remember the correct units. 	Density = 8kg/m³ Mass = 2000g Find the Volume. V = M ÷ D = 2 ÷ 8 = 0.25m³
Pressure, Force, Area	**Pressure = Force ÷ Area** **Force = Pressure x Area** **Area = Force ÷ Pressure** Remember the correct units.	Pressure = 10 Pascals Area = 6cm² Find the Force F=P×A=10×6=60 N
Direct and indirect proportion	Direct proportion: two quantities increase at the same rate. Indirect proportion: as one quantity increases, the other decreases at the same rate.	

Hegarty maths clip numbers

- Compound Interest: 94
- Proportion: 339 - 342
- Algebraic Proportion: 343 – 348
- Compound Measures: 716 – 738
- Best Buys: 763 – 772

What you need to know:

Direct vs Indirect Proportion

k is the constant of proportionality

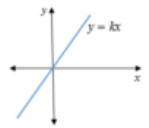
If y is directly proportional to *x*:

$y \propto x$ $y = kx$

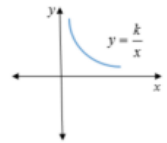
If y is indirectly proportional to *x*:

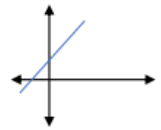
$y \propto \frac{1}{x}$ $y = \frac{k}{x}$

If the line does not pass through the origin, the relationship is not directly proportional.



If y=m*x* + c, then *k* represents the gradient of the line y = *kx*





If you are given a table of values, you can plot them to check

The height *h* cm of a plastic cylinder is inversely proportional to its radius *r* cm. A plastic cylinder of height 6cm has a radius of 4cm.
Work out the height of a cylinder with a radius of 3cm.

Step 1 – Write down the formula using *k* as the constant $h = \frac{k}{r}$

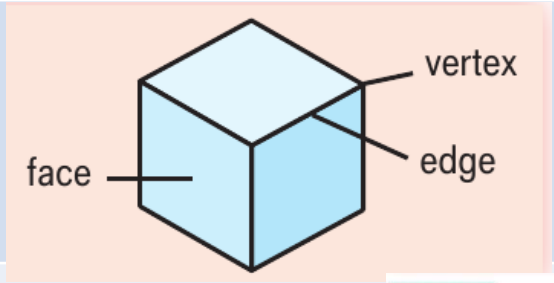
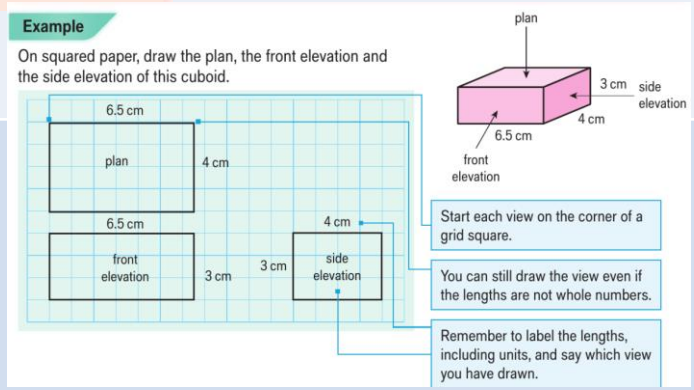
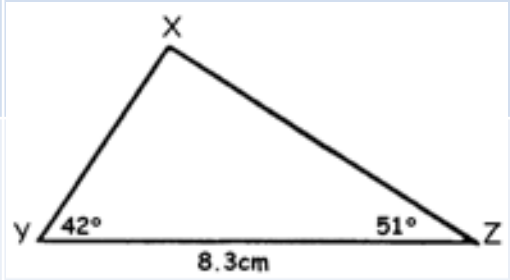
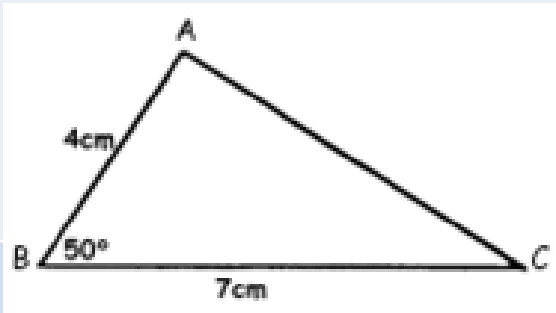
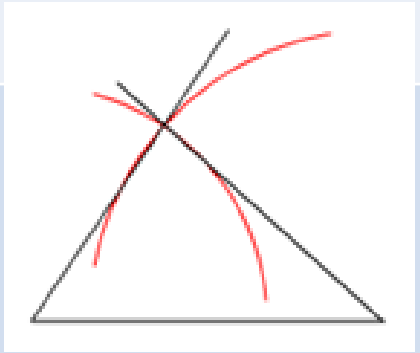
Step 2 – Substitute in the values of y and *x* $6 = \frac{k}{4}$

Step 3 – Solve the equation to find the value of *k* $k = 24$

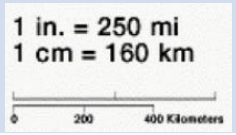
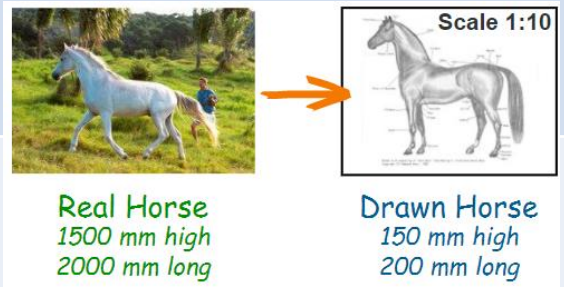
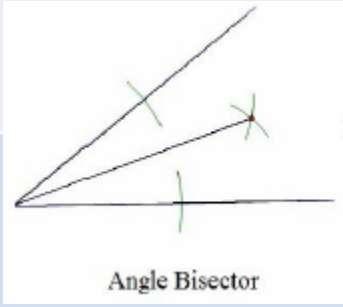
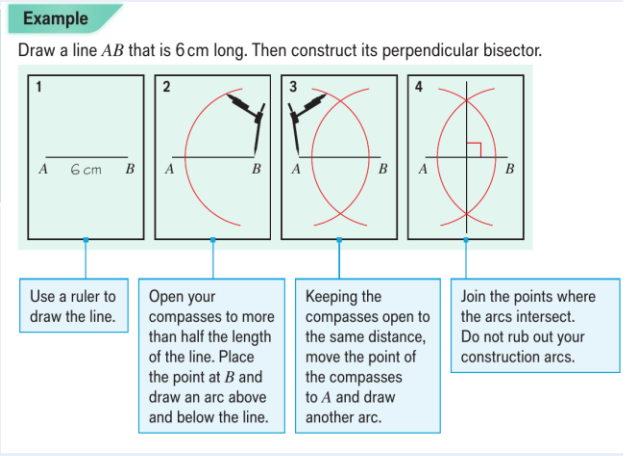
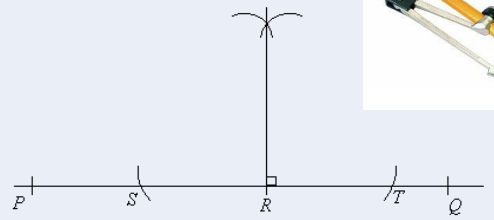
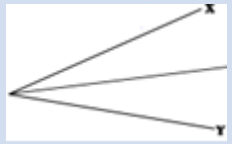
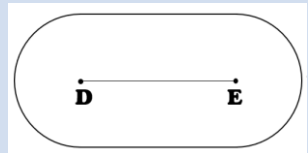
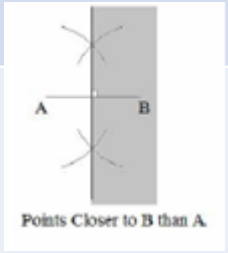
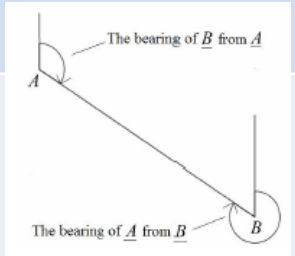
Step 4 – Re-write the original equation substituting *k* for the actual value $h = \frac{24}{x}$

Step 5 – Substitute the new radius into this equation $h = \frac{24}{3} = 8cm$

MATHS FOUNDATION UNIT 15: BEARING AND SCALE DIAGRAMS

Topic/Skill	Definition/Tips	Example
3D Solids	The flat surfaces of 3D shapes are called **faces**, the lines where two faces meet are called **edges** and the corners at which the edges meet are called **vertices** (the singular of vertices is **vertex**) Pyramids have a base that can be any shape and sloping triangular sides that meet a point. In a right prism, the sides are perpendicular (at right angles) to the base.	
Plans and elevation	The plan is the view from above an object. The front elevation I the view of the front of an object. The side elevation is the view of the side of an object.	
Constructing Triangles (Angle, Side, Angle ASA)	Draw the base of the triangle using a ruler. Measure one of the angles required using a protractor and mark this angle. Draw a straight line through this point from the same point on the base of the triangle. Repeat this for the other angle on the other end of the base of the triangle.	
Constructing Triangles (Side, Angle, Side SAS)	1. Draw the base of the triangle using a ruler. 2. Measure the angle required using a protractor and mark this angle. 3. Remove the protractor and draw a line of the exact length required in line with the angle mark drawn. 4. Connect the end of this line to the other end of the base of the triangle.	
Constructing Triangles (Side, Side, Side SSS)	1. Draw the base of the triangle using a ruler. 2. Open a pair of compasses to the width of one side of the triangle. 3. Place the point on one end of the line and draw an arc. 4. Repeat for the other side of the triangle at the other end of the line. 5. Using a ruler, draw lines connecting the ends of the base of the triangle to the point where the arcs intersect.	

MATHS FOUNDATION UNIT 15: BEARING AND SCALE DIAGRAMS

Topic/Skill	Definition/Tips	Example
Scale **Scale (Map**	The **ratio** of the **length** in a **model** to the length of the **real** thing. The **ratio** of a **distance on the map** to the actual **distance in real life**.	 
Constructions Perpendicular Bisector: Cuts a line in half and at right angles	1. Put the sharp point of a pair of compasses on A. 2. Open the compass over halfway on the line. 3. Draw an arc above and below the line. 4. Without changing the compass, repeat from point B. 5. Draw a straight line through the two intersecting arcs.	
Angle Bisector Cuts the angle in half.	1. Place the sharp end of a pair of compasses on the vertex. 2. Draw an arc, marking a point on each line. 3. Without changing the compass put the compass on each point and mark a centre point where two arcs cross over. 4. Use a ruler to draw a line through the vertex and centre point.	 
Perpendicular from a Point on a Line	Given line PQ and point R on the line: Put the sharp point of a pair of compasses on point R.Draw two arcs either side of the point of equal width (giving points S and T) Place the compass on point S, open over halfway and draw an arc above the line. Repeat from the other arc on the line (point T). Draw a straight line from the intersecting arcs to the original point on the line.	 
Loci and Regions	A **locus** is a **path of points that follow a rule**. For the locus of points **closer to B than A**, create a **perpendicular bisector** between A and B and shade the side closer to B. For the locus of points **equidistant from A**, use a compass to draw a **circle**, centre A. For the locus of points **equidistant to line X and line Y**, create an **angle bisector**. For the locus of points a set **distance from a line**, create **two semi-circles** at either end joined by **two parallel lines**.	  
Bearings	1. Measure from **North** (draw a North line) 2. Measure **clockwise** 3. Your answer must have **3 digits** (eg. 047°) Look out for where the bearing is measured <u>from</u>	 

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Constructions 660-662
Bearings 492-496

BTEC LEVEL 2 MEDIA – COMPONENT 2

LEARNING OUTCOMES

A. Develop and apply media pre-production processes, skills and techniques.

B. Develop and apply media production and post-production processes, skills and techniques to create a media product.

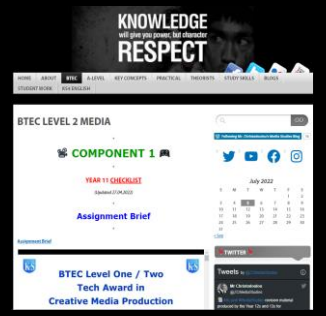
STEPS:

PLAN > PRODUCE > EDIT > EVALUATE

GLOSSARY OF KEY TERMS

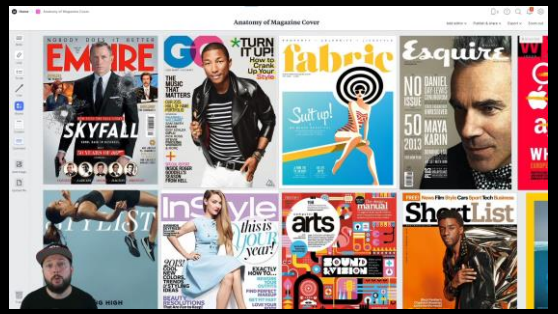
- AUDIENCE
- CODE
- CONVENTION
- GENRE
- HARDWARE
- JUXTAPOSITION
- MISE-EN-SCENE
- MODE OF ADDRESS
- NARRATIVE
- REPRESENTATION
- SOFTWARE
- STEREOTYPE

Magazine Cover Design with Photoshop



BLOG LINK HERE

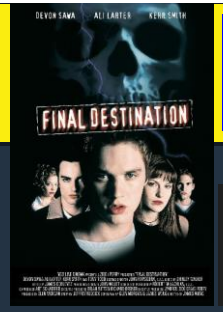
Magazine Terms and Definitions



MEDIA

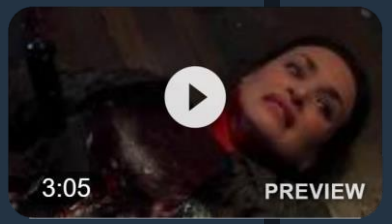
FINAL DESTINATION (2000)

Directed by **James Wong** | Distributed by **New Line Cinema**



IMDb RATING
★ 6.7/10
249K

Alex, an awkward teenager, cheats death after having a premonition of a catastrophic plane explosion. He and several of his classmates leave the plane before the explosion occurs. But, Death later takes the lives of those who were meant to die on the plane...



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IMDb
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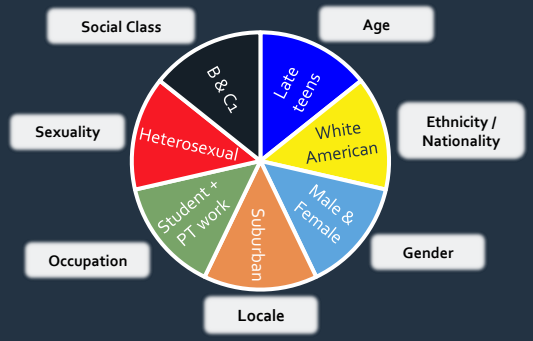
WIKIPEDIA
wikipedia.org/wiki/Final_Destination_(film)

AUDIENCE PROFILING

Demonstrating knowledge and understanding of the target market for a media text, such as a film. Data is collated and turned into a written profile.

DEMOGRAPHICS

Demographic analysis is the collection and breakdown of specific personal characteristics about groups of people.



TASK INFORMATION

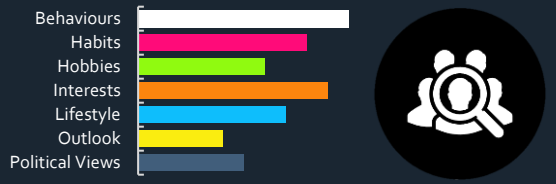
TASK ONE
Audience profiles + pleasures offered by the text.

TASK TWO
Key concepts analysis (Genre; Narrative; Representation; Audience Interpretation).

TASK THREE
Technical elements analysis
(Camerawork; Editing; Mise-en-Scene; Sound).

PSYCHOGRAPHICS

Psychographics is the analysis of specific psychological criteria that influences an individual's, or group's, mindset and behaviour.



REVIEWS

1. Empire
2. Rotten Tomatoes
3. The Guardian
4. Roger Ebert

KEY CONCEPTS

GENRE: The category of the text, based on conventions.

NARRATIVE: The structure of the storyline or plot.

REPRESENTATION: How a particular reality is recreated (people / place / time).

AUDIENCE INTERPRETATION: How the audience interprets, and reacts to, the text.

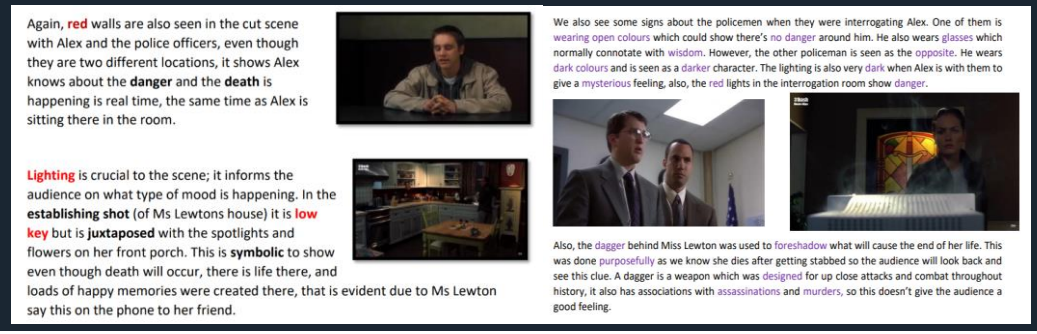
TECHNICAL ELEMENTS

CAMERAWORK: Angles; Framing; Movements.

EDITING: Combination of shots; Pace; Parallel editing; Shot-reverse-shots; Transition.

MISE-EN-SCENE: Characters; Costumes; Décor; Hair & Make-up; Lighting; Props; Setting.

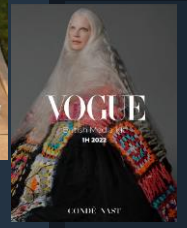
SOUND: Diegetic; Non-Diegetic; Synchronous; Asynchronous.



MEDIA

VOGUE MAGAZINE

Edited by **Edward Enninful** | Published by **Condé Nast**



Vogue is a fashion magazine owned and distributed by Condé Nast. A British Vogue editor once claimed that: *"Vogue's power is universally acknowledged. It's the place everybody wants to be if they want to be in the world of fashion"*. Around 85% of its readers agree that *"Vogue is the Fashion Bible"*. The magazine is considered to be one that links fashion to high society and class, teaching its readers how to *"assume a distinctively chic and modern appearance"*.

FACEBOOK
@BritishVogue

INSTAGRAM
@britishvogue

TWITTER
@BritishVogue

YOUTUBE
@BritishVogue

APP STORE
British Vogue

WIKIPEDIA
wikipedia.org/wiki/Vogue_(magazine)

AUDIENCE PROFILING

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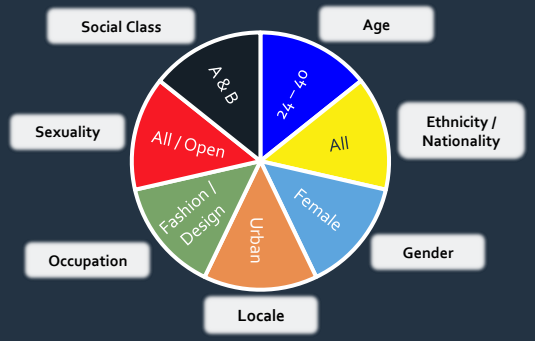

TASK INFORMATION

TASK ONE
Audience profiles + pleasures offered by the text.

TASK TWO
Key concepts analysis (Genre; Narrative; Representation; Audience Interpretation).

TASK THREE
Technical elements analysis
(Layout and design; Typography; Photography.

PSYCHOGRAPHICS

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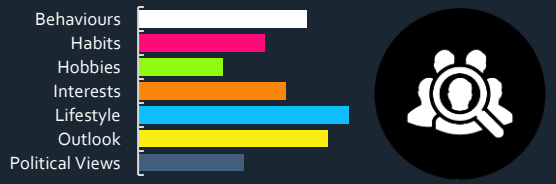


REVIEWS

1. The BBC
2. The NYT
3. The Guardian
4. The Telegraph

KEY CONCEPTS

GENRE: The category of the text, based on conventions.

NARRATIVE: The structure of the storyline or plot.

REPRESENTATION: How a particular reality is recreated (people / place / time).

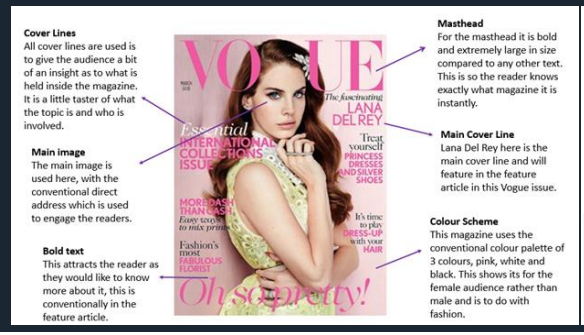
AUDIENCE INTERPRETATION: How the audience interprets, and reacts to, the text.

TECHNICAL ELEMENTS

LAYOUT & DESIGN: Positioning; Spacing; Design choices; Colour; Graphics.

TYPOGRAPHY: Font styles; Font sizes; Lexis; Mode of address.

PHOTOGRAPHY: Models; Camerawork; Lighting; Editing.



MEDIA

THE LAST OF US (2013)

Developed by **Naughty Dog** | Published by **Sony Computer Entertainment**

IMDb RATING
9.7/10
66K

Set in the [post-apocalyptic] United States, the game tells the story of **Joel** and **Ellie**, who are working together to survive a journey across (what remains of) the country. Their mission... to find a cure for the fungal plague that has devastated the human race.

FACEBOOK
@naughtydog

INSTAGRAM
@naughty_dog_inc

TWITCH
@naughtydog

TWITTER
@Naughty_Dog

YOUTUBE
@naughtydog

WIKIPEDIA
wikipedia.org/wiki/The_Last_of_Us

More than 60 Awards

AUDIENCE PROFILING

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DEMOGRAPHICS

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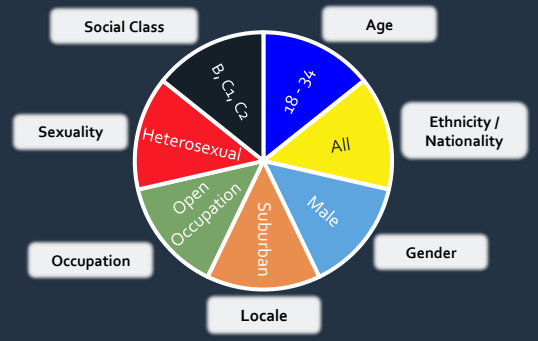


TASK INFORMATION

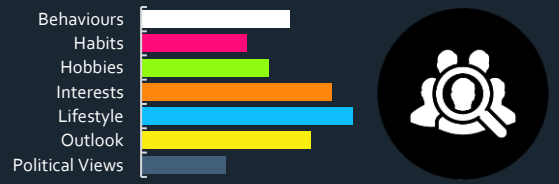
TASK ONE
Audience profiles + pleasures offered by the text.

TASK TWO
Key concepts analysis (Genre; Narrative; Representation; Audience Interpretation).

TASK THREE
Technical elements analysis
(Interactive elements; User Interface; Playability; Mise-en-Scene; Sound).

PSYCHOGRAPHICS

Psychographics is the analysis of specific psychological criteria that influences an individual's, or group's, mindset and behaviour.



REVIEWS

1. Eurogamer
2. Forbes
3. The Guardian
4. The NYT

KEY CONCEPTS

GENRE: The category of the text, based on conventions.

NARRATIVE: The structure of the storyline or plot.

REPRESENTATION: How a particular reality is recreated (people / place / time).

AUDIENCE INTERPRETATION: How the audience interprets, and reacts to, the text.

TECHNICAL ELEMENTS

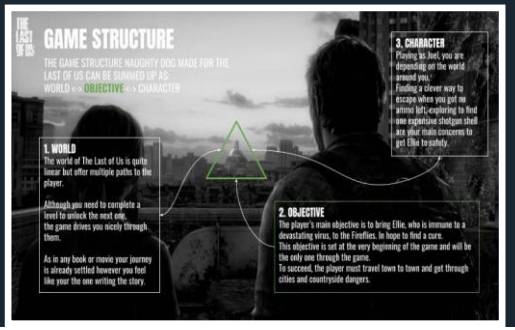
INTERACTIVE FEATURES: Galleries; Menus; Options; Navigation Screens.

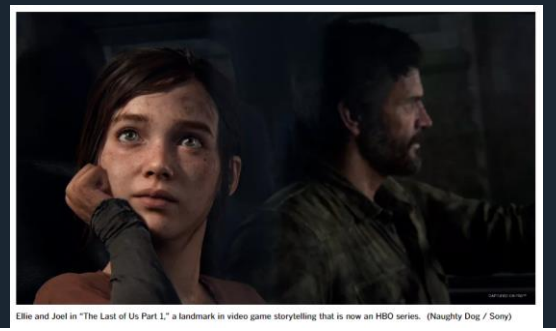
USER INTERFACE: Buttons; Graphics; HUD.

PLAYABILITY: Challenges; Game Controls; Navigation; Rules.

MISE-EN-SCENE: Characters; Costumes; Lighting; Props; Setting.

SOUND: Diegetic; Non-Diegetic.





Ellie and Joel in "The Last of Us Part 1," a landmark in video game storytelling that is now an HBO series. (Naughty Dog / Sony)

Performing Arts: Drama | Term: 3 | Unit: Set Text - Noughts & Crosses

Noughts & Crosses

Noughts & Crosses tells the story of two young people: a girl called Sephy, and a boy called Callum. Callum is a nought – he's white, from a poor family and lives on a rough estate. Sephy is a Cross – she's black, from a wealthy, powerful family and lives in a grand country house. The story takes place in world very similar to our own, apart from the massive split between noughts and Crosses. Crosses are the ruling class and noughts struggle against prejudice, poverty and low status. It's almost unheard of for a Cross to be friends with a nought, but Sephy and Callum are very close. Even so, Callum sometimes feels Sephy doesn't understand the prejudice he faces. Sephy is frustrated that Callum doesn't realise how hard she tries to understand and that she has her own problems with her cold, snobbish family.

Callum's dad and brother get involved with a nought terrorist organisation. Callum initially hates the violence but after his sister dies and his dad is killed in prison, he turns terrorist too. He hardens himself to the violence but when he is involved in kidnapping Sephy, he realises that he should never have joined the organisation. Despite Sephy and Callum's love for each other, there's no place in their society for a nought and a Cross who want to be together.

Playwright: Malorie Blackman

"Noughts & Crosses wasn't so much a book I wanted to write as a book I needed to write.
It was born of a… need to deal with a number of events from my past, a desire to tackle the subject of racism head on, and the burning anger I felt regarding the death of Stephen Lawrence and the subsequent mishandling of the police inquiry into his death."

"[Noughts and Crosses] is a game that once you've grasped its objectives and tactics, it invariably ends in a draw – a no-win situation. I think that pretty much sums up racism. Ultimately no one wins."

"I knew I was writing a book that would make some adults very uncomfortable (and it did!) because I was dealing with racism, terrorism, the class system and the artificial divides we always seem to put between ourselves and others. But it was a risk I was willing to take."

Key Themes

Racism and prejudice
In this world, society is turned on its head. It's a powerful, wealthy, black ruling class who are discriminating against whites. Crosses with dark skin are seen as the superior race and noughts with light skin are seen as inferior. The theme is explored throughout with a number of key scenes highlighting this theme, e.g. when the noughts go to Heathcroft for the first time. The world of the novel has many close parallels to the civil rights movement in the USA. The atmosphere of the play is permeated by tension because of the way the noughts are treated, e.g. the creation of the of the Liberation Militia (LM), the bombing, etc. To make the racism convincing, there are several incidents and details that have happened in realty, e.g. the colour of plasters.

Identity
In the play (and in reality), individuals are defined by their class and the colour of their skin. Because Callum and Sephy have grown up together and are friends, they can see beyond the labels. As the play progresses, they reject the labels and the prejudices that goes with them and make their own choices, even though there are terrible consequences.

Violent and peaceful protest
The play looks at the ways people respond to situations they believe are wrong. Oppressing the noughts results in terrible consequences, often for innocent people. The bombing of the shopping centre has terrible consequences for not only the victims but the McGregor family as well. The play also makes the audience think about why people turn to violence. Ryan, Jude and Callum join the LM because it's the only way they can try and make their voices heard. The play doesn't support violence but it does suggest that people without any political power may feel forced to make themselves heard.

Love and friendship
This is primarily explored through the relationship between Callum and Sephy; their friendship is warm and intense and, in spite of everything, remains strong until the end. Sephy decision to keep the baby and defend how it was conceived highlights the depth of the relationship. It stands as a symbol of hope in a desolate world.

Performing Arts: Drama | Term: 3 | Unit: Set Text - Noughts & Crosses

Vocal Skills	Definition
P - Pitch	How high or low you voice sounds.
I – Intonation	How clearly you speak
P - Pace	The speed in which you speak
E – Emphasis	The importance you put on certain words
D - Dynamics	The volume that you are speaking at.
B – Breath Control	How many breaths you take in a sentence.
A - Accent	The way you pronounce words
P - Pause	How many breaks you take

Physical Skills	Definition
P - Posture	The way you
E – Eye Contact	Where you are looking
T - Tension	How tight or relaxed your body is
F – Facial Expression	How you are modifying your face
L - Levels	The heights used within the performance.
A - Action	Movements that have specific meanings
G - Gait	The way you are walking
S - Space	The area that you are using

"You're a Nought and I'm a Cross and there's nowhere for us to be, nowhere for us to go where we'd be left in peace..."

Genre:

Noughts and Crosses is Dystopian with aspects of tragedy.

Dystopian = Imagines worlds or societies where life is extremely bad because of deprivation or oppression or terror, and human society is characterized by human misery, such as squalor, oppression, disease, overcrowding, environmental destruction, or war.

Tragedy = Drama based on human suffering and, mainly, the terrible or sorrowful events that befall a main character.

Key characters	Character Description
Callum	A nought who has a close relationship with his childhood friend Sephy. With the help of a scholarship, Callum can join Sephy's 'Cross' school, which leads to discrimination and bullying.
Sephy	A cross who has a close relationship with her childhood friend Callum. Sephy is naïve to the brutal world around her. However, she learns to sympathise with Callum's suffering.
Jude	Callum's older brother, who displays violent and aggressive tendencies.
Lynette	Lynette is Jude and Callum's older sister. Previously, she experienced trauma that affected her mentally.
Ryan	Callum's father. He does all he can to protect his family.
Meggie	Callum's mother. She was fired as a housekeeper for the Hadley family three years before the play begins
Kamal	Sephy's father. He is a government official who regards crosses as superior to noughts.
Jasmine	Sephy's mother. Her husband's neglect causes Jasmine to feel lonely, insignificant and powerless
Minerva	Sephy's older sister. They frequently disagree with one another.

Performing Arts: Drama | Term: 3 | Unit: Set Text - Noughts & Crosses

Original Staging

The play was first performed by Pilot Theatre on 1st February, 2019, at Derby Theatre on an end-on stage.

The set, designed by Simon Kenny, created a dystopian reality. A series of panels morphed from walls to apertures to cupboards. This structure was constantly folding and changing. The panels would suddenly transform into banks of video screens or live TV transmissions. The set created a recognisable world but also another, parallel world. Chairs and tables became mirrors. Barricades represented chaos as violence erupted.

The predominant colours were red tones: '…non-natural, lending a brutal, futuristic feel. Red is also the colour of blood and fire and sexuality, and the saturated, claustrophobia of the singular shade heightens the energy in the whole piece'. (Phillip Lowe, East Midlands Theatre online)

Props were simple and naturalistic to suggest both character and location, e.g. a crystal wine glass and decanter, a rucksack used as a school bag, etc.

The set was enhanced by Joshua Pharo's lighting design. He used neon, direct, mood and sectional lighting. This emphasised the structural qualities of the set and reinforced the modern setting. Strobes and haze were used to create atmosphere and location. Infrared was the dominant colour. Projections of news footage gave the play an authenticity and immediacy.

The sound and music had a cinematic feel and worked in conjunction with the lighting to conjure up locations and atmosphere, e.g. a secluded seashore and the terrorist atrocity.

Costume was naturalistic and gave the production a contemporary feel, reflecting the age and status of the characters. The colour used in the Crosses' costumes were 'bright and jewel-like in their wealthy fabrics; the noughts faded and wrung out'. The colour scheme of the set was echoed in the uniforms for Heathcroft School and the Liberation Militia.

Further Support:

Video 1: https://www.youtube.com/watch?v=lbFqHDyXo-o&feature=youtu.be
Video 2 : https://www.youtube.com/watch?v=UsMwXeF7K8o
Video 3: https://www.youtube.com/watch?v=cfLWccy_55Y&feature=youtu.be
Video 4: https://www.youtube.com/watch?v=5l0tPbRYKNg
Article: https://www.theguardian.com/stage/2019/jan/19/sabrina-mahfouz-interview-noughts-and-crosses-emma-watson
Podcast: https://www.bbc.co.uk/programmes/p06ykmfw
Podcast: https://player.fm/series/british-theatre-guide-podcast/new-consortium-for-theatre-for-young-people-stages-blackmans-noughts-and-crosses

The structure of the play

The structure of Noughts & Crosses is known as story theatre; characters stand back and comment on the action as well as take part. They share their thoughts and feelings, comment on events, provide transitional information from one episode to another and help to cover the expository material handled in the play's narrative.

Story theatre tends to use very little set and few props, which are carefully selected and designed. This way, action can proceed quickly without elaborate set changes.

Story theatre is highly episodic. The action takes place in a variety of places during many scenes. Each episode gives the audience an insight into characters and events that have played a significant part in Sephy and Callum's relationship and the society they are part of.

The episodic structure allows different perspectives to be viewed by the audience, e.g. Sephy and Callum's family life and their relationships within the family. The structure is also linear. Although the play begins with a flashback and there are flashbacks in Act 2 to suggest the passing of time, generally the play follows the story of Sephy and Callum from beginning to end.

Key Command Words:

Describe: Tell me what you see or do
Explain: Tell me why you did it or why they did it
Analyse: Breakdown into its fundamental parts and explore them in depth.
Evaluate: Tell me how it could be improved or what was good about it.

Performing Arts: Drama | Term: 3 | Unit: Set Text + LTA

Live Theatre Analysis

Live Theatre Analysis requires you to analyse and evaluate how and why performers and designers have created theatre and how they have shared their audience intent.

You must consider the role of the:

- **Actor** - interpretation of character / character interaction / vocal skills /physical skills
- **Designer** - creation of mood and atmosphere / use of performance space / lighting / sound / set and props / costume and make-up
- **Director** - interpretation and style / performance conventions / spatial relationships on stage / relationship between performer and audience
- **Audience** – individual / audience reaction and response.

How to Structure the Live Theatre Analysis section of the exam

Step One: Identify what play you saw, when you saw it and an overall description of the play, its main themes and the audience intent.

Step Two:

POINT	**Make a clear point about an actors use of:** **•Vocal & Physical skills.** **•Use of space to show relationship**	The actor who played Margaret Thatcher (Use their name if you can – e.g. Meryl Streep) used levels and body language to help show her authority in the scene.	*The actor used… to...*
EVIDENCE	**Provide a detailed example describing how the actor used the skill in your piece of work.**	For example, when Meryl Streep's character was told that she could not go to war she stood up towering above the other actors who were seated, rolled her shoulders back and pushed out her chest before speaking her next line.	*For example, the actor …*
EXPLAIN	**Explain the effect on the audience.**	This was effective because it showed the audience that Meryl Streep's character was dominant and in charge. Furthermore it created a tense atmosphere because we were not sure how the other actors were going to respond.	*This was effective because..*

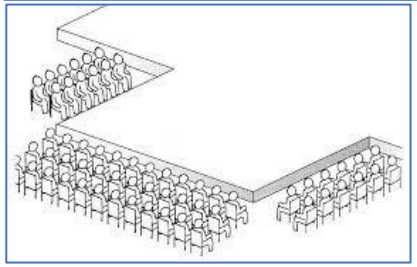
Step Three: Link – Summarise your overall point.

Step Four: Complete step two and step three again for another scene within the play.

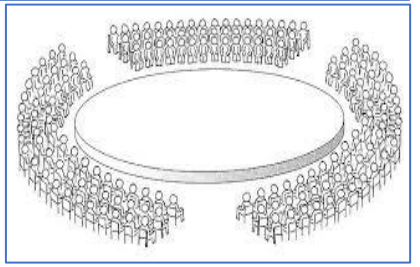
Step Five: Complete step two and step three again for one final moment within the play

The more skills you can add in the point section that you discuss in the evidence and explain sections the more marks you are able to gain.

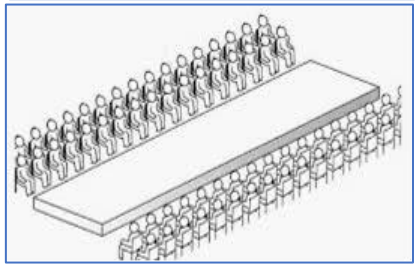
STAGE TYPES



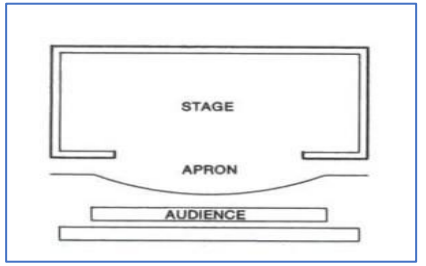
THRUST STAGE



THEATRE IN THE ROUND

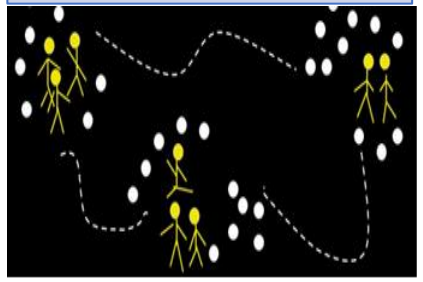


TRAVERSE STAGE



PROSCENIUM ARCH STAGE

END ON STAGE



PROMENADE

Key Command Words:

Describe: Tell me what you see.
Explain: Tell me why they did it
Analyse: Tell me how/why they did it with specific examples from the play.
Evaluate: Tell me how it could be improved or what was good about it.

DR FAUSTUS

Who are they?	Doctor at the University of Wittenburg, a brilliant and respected scholar.
Who are they in Splendid's Version?	Dr Faustus is a fallible human. He is one of hell's greatest celebrities: The Superb 'Dr Faustus' who achieved so much and traded his soul for very little. His hubris (excessive pride) causes his demise.
Status	Faustus has to work hard to be high status, it doesn't come naturally. His social power is flimsy – he was born of base stock - therefore he has to prove how clever and brilliant he is at all times. To sustain this status is exhausting.
Physical Qualities	Parading, Preening, Prancing, Spreading, Advancing, Rising & Opening.
Vocal Qualities	Faustus is verbally articulate. He confidently and obliviously takes up a lot of vocal space. His vocality is heightened at the start but towards the end of the play he is vulnerable and the artifice is stripped away to an honest voice.
Animalisation	Elements of a Lion (proud like a king, looking gorgeous with a big fluffy mane) and a strutting Peacock (testing its luck with the more powerful animals).
Laban Efforts	Light, Sustained, Direct: Gliding/Stroking – Heavy, Broken, Flexible: Stabber
Not/But	Not just the Genius But also the Fool
Audience	He's not sure if he loves the audience but the audience DEFINITELY loves them
Archetypes	The Hero, The Sage, The Everyman
Useful Words	Vain, Brilliant, Intellectual, Pompous, Entitled, Self-Centred, Superficial, Jaded.
Actioning Words	Educate, Master, Stimulate, Fascinate, Dazzle, Pester, Wring.

MEPHISTOPHELES

Who are they?	Mephistopheles is only referenced in literature in relation to the Faust myth - unlike Lucifer or Beelzebub. He is a tragic fallen angel who has to battle between pride and despair.
Who are they in Splendid's Version?	The ultimate professional: he has been thrown into a job he did not want and spends most of the time navigating and tolerating an unworthy human.
Status	Mephistopheles is naturally high status, so being a servant tests his patience.
Physical Qualities	Advancing in straight lines, Contained, Direct and Enclosing.
Vocal Qualities	Direct, professional with a clear forward momentum; his tone is contained and detached. When talking about he was thrown out of heaven with Lucifer, he is emotionally connected, dexterous and poetic.
Animalisation	Great White Shark – a large predator who takes time to manoeuvre.
Laban Efforts	Heavy, Direct, Sustained: Pressing.
Not/But	Not just the Good Servant But also the Snob.
Audience	Mephistopheles is aware of the audience. However, he doesn't seek or need their approval. When they are useful to him he will include them, when they aren't required they become observers.
Archetypes	The Nurturer (Caregiver), The Magician.
Useful Words	Tolerant, Prickly, Professional, Controlled, Direct, Insightful, Acute, Methodical.
Actioning Words	Contain, Shepherd, Moderate, Forward, Tantalise, Spark, Nudge.

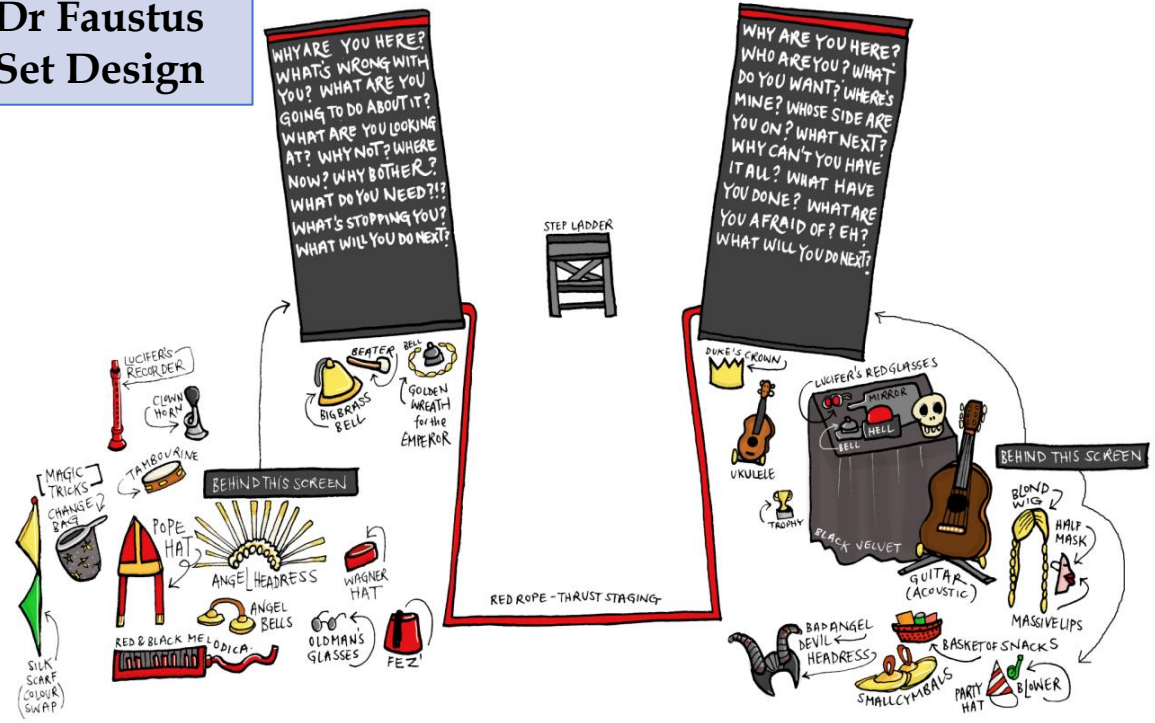
LUCIFER

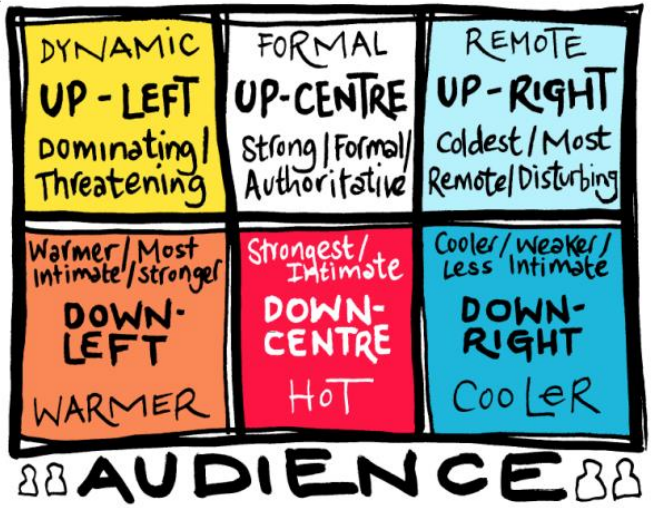
Who are they?	Lucifer The Prince of Devils and ruler of Hell 'morning star' or 'shining one'. An angel who was 'beloved of God' and cast down from heaven.
Who are they in Splendid's Version?	They are all things to all people, shape-shifting, ever present, always watching, on the moment (not 'in'), impulsive and captivating.
Status	↑ He is THE DEVIL & all powerful and therefore free in body and voice.
Physical Qualities	Unconstrained, Unbound. Moments of unpredictable juxtaposing movement. Spreading, Pressing, Advancing, Rising & Opening.
Vocal Qualities	Relaxed, flexible, dexterous, warm, open and precise.
Animalisation	Shifts between Seagull (air), Pedigree Cat (earth) & Octopus (water).
Laban Efforts	Light, Sustained, Direct: Gliding/Stroking – Heavy, Sustained, Direct: Pressing.
Not/But	Not just the Villain But also the Charming One.
Audience	They love the audience and the audience loves them.
Archetypes	The Ruler, The Revolutionary, The Jester.
Useful Words	Mercurial, manipulative, provocative, unpredictable, smooth, charismatic.
Actioning Words	Fascinate, Provoke, Trigger, Groom, Prod, Ruffle.

WAGNER

Who are they?	Dr Faustus's loyal servant.
Who are they in Splendid's Version?	A man who 'lives to serve' Faustus and has done so for a long time. When he is replaced by the demonic supernatural super servant Mephistopheles he loses his job, his purpose and identity. He is a broken man. He adopts the behaviour of his master to seek out a servant of his own.
Status	He's a servant who becomes a master. He's a contradiction.
Physical Qualities	Advancing and Retreating, Rising and Sinking his physical focus is outwards. Servant: Body is low, weight on the shoulders, arms are offered out in a permanent state of service, he moves in scoops, hovers around the edge waiting to be useful to whoever he is serving. Master: Upright posture, angular arms with movements that push downwards, hand like extended claws.
Vocal Qualities	Servant: Practical in tone, to the point, his volume is perfectly judged not too loud, or too quiet. Master: Quick to anger, spitting, direct and explosive. When talking about Dr Faustus his tone is warm, loving and expressive.
Animalisation	The little birds that sit on the back of large animals picking out the bugs. An obedient dog, loyal, sad when ignored can bite back if provoked.
Laban Efforts	Light, Direct, Sustained: Gliding/Stroking and Strong, Flexible, Broken: Slashing.
Not/But	Not just the Loving Servant but also The Bully.
Audience	He loves the audience, but he's not sure if the audience love him.
Archetypes	The Everyman.
Useful Words	Devoted, capable, neglected, incensed, seething, bullish, loving, cruel.
Actioning Words	Obey, Heal, Lift, Fortify, Champion, Worship, Intimidate, Thwack, Crush, Attack.

Dr Faustus Set Design





Staging

The diagram explains character relationship and character traits when standing in these sections.

Play Portfolio

To find out more about the play. Take a look at this:

https://drive.google.com/file/d/1mP9IxU5FWakrx9qTpNN0LnDK_tPYaJZH/view

OLD MAN

Who are they?	A mysterious figure who urges Faustus to repent and ask God for Mercy.
In Splendid's Version?	The Old Man represents God. Archetypally he is The Sage.
Status	At the top of Status Tree – he's the heavenly equivalent of Lucifer.
Physical Qualities	Still, Established, Controlled, Effortless, Smooth, slow.
Vocal Qualities	Deep-rooted, Rich in tone, Warm, emphatic, flowing, uses language in a vibrant way.
Animalisation	An ancient sea turtle that has seen everything. Carries the knowledge and debris of generations on their shell.
Laban Efforts	Strong, Direct, Sustained: Pressing & Light, Flexible, Sustained: Floating.
Actioning Words	Absolve, Calm, Cradle, Enfold, Smooth, Challenge, Coax, Guide.

Beelzebub: Is known as one of the Seven Princes of Hell and is featured in the Old Testament. In our production he is one of the chorus of three Devils.
Animalisation: Snapping Turtle with a spiky shell. Slow and deadly, steady, strong with a shield. Silver back gorilla-pure strength and dominance. Cool and relaxed, not flustered or panicked.

Good Angel: A spirit that urges Faustus to repent and return to God. For us he is part of Faustus's conscience. They are light physically and vocally, floating, stroking, open and hopeful. A Dove.

Bad Angel: A spirit that encourages Faustus to stay on the path of badness – a counterpoint to the Good Angel - and do whatever he wants. They are heavy, with a low-centre of gravity, growly, grotesque and tantalising. Tanya had the cartoon of a Tasmanian Devil in mind. "Bash Bash".

The Pope: The Head of the Catholic Church and a powerful political leader at the time the play was written. Most of the audience would have been Protestant (like Queen Elizabeth I) so they would have enjoyed this scene. For Splendid the Pope symbolises the extremity of Faustus' transgression. The ridiculing and mistreatment of such an important religious figure is provocative, even to a modern audience. **Animalisation:** Owl, flappy when flustered, wise and old with bug eyes.

Performing Arts: Drama | Term 3 | Unit: Composition

Dynamics:

- Have I added contrast using the following dynamics: pianissimo, piano, mezzo forte, forte, sforzando
- Have i added a crescendo or diminuendo?
- Is there any use of silence?

Tempo:

- What tempo am I working at? (Largo (slow), Andante (walking pace), Allegro (fast).

Instrumentation:

- How can I combine instruments appropriately (families/including voices)?
- Have I written appropriate parts (inc range)?
- Can all the parts be played live?
- Where would it be performed?

Melody:

What type of scale am I using?

- Is there a contrast between conjunct/disjunct?
- Are my phrases balanced?
- Am I using any interesting intervals?
- Have I included any ornaments?
- Have I used these devices appropriately?

Imitation/ Anacrusis/Sequence?

Rhythm:

- Have I combined long and short notes to different effect?
- Have I considered a dotted rhythms/ Syncopation/Triplets
- How about Hemiola/Cross rhythm
- Accelerando/Rubato?

AO2.1.a: Creativity/development of musical ideas

- Ideas offer potential for development
- The content is developed throughout the piece
- Use of contrasts in tone colour and moods

AO2.1b: Technical control of music elements/resources

- Choice of elements and resources
- How musical elements are used
- How resources, including technology, are controlled

AO2.1c: Structure and stylistic coherence

- Organisation of the piece and presentation of musical ideas
- Style and character in response to the chosen brief
- Coherency of final outcome

Texture:

Have I contrasted my piece using more than one of the following:

- Monophonic: Unison/ Octaves
- Homophonic: Parallel motion/Melody & accompaniment/ Chordal
- Polyphonic: Countermelody, Imitation

Context:

- Does your composition follow the set brief?

Articulation:

- Have I considered the different techniques on the instruments; Slurring//tremolo/pizzicato.
- Have I contrasted my piece with the following: Staccato/ Legato/ Accented notes?

Harmony:

What key am I working in? Major or Minor?

- Have I used any interesting chords; Sus4/Diminished/ Augmented/7th?
- Have I added a key change? Have I used a Pedal note/Drone?
- How often do the chords change?

Structure:

What would be an appropriate structure for my choice of brief?

- AOS1: Classical styles: Binary/Ternary/Rondo/Rounded binary?
- AOS2: Strophic/Verse-chorus/32 Bar form? Any other ideas?
- AOS3: Episodic? How can I add contrast?
- AOS4: If using verse-chorus can I add other sections e.g. Pre-chorus/instrumental section?

AM, I DEVELOPING MY IDEAS IF REPEATED?

- What is the length of the piece?
- How many sections will it have?
- Will sections repeat, and in what order?
- What form will the introduction and ending take? Will they use extracts from other sections?
- Is the structure of the piece appropriate for the style of music?

Term	Definition	Example
Dynamics	Dynamics is how loud or quiet the music is played.	The piece of music is Forte (loud).
Rhythm	Is created by combining a variety of notes of different durations.	The rhythm had two short notes and one long note.
Context	Context refers to the genre and or style of music.	The style of music was rock.
Articulation	How a particular instrument is played	The Violin is played with a bow (Arco).
Texture	Texture describes how melodies, rhythms and harmonies are layered in a piece of music.	The texture of the piece was monophonic. It only had one layer.
Structure	Structure (or form) is the overall plan of a piece of music.	The structure of the piece consisted of an Intro, verse, chords, bridge, verse, outro,
Melody	A Sequence of notes arranged in a definite pattern of pitch and rhythm	The melody of the piece was cheerful.
Instrumentation	The instruments that are used.	I could hear a guitar and drum kit being played.
Harmony	The combination of simultaneously sounded musical notes.	The harmony of the piece used G and C Chords.
Tempo	Tempo is how fast or slow a piece of music is played.	The tempo of the piece was fast (Presto).

MAJOR CHORD PROGRESSIONS

I	ii	iii	IV	V	vi	vii°
Major	Minor	Minor	Major	Major	Minor	Diminished
A	B	C#	D	E	F#	G#
B	C#	D#	E	F#	G#	A#
C	D	E	F	G	A	B
D	E	F#	G	A	B	C#
E	F#	G#	A	B	C#	D#
F	G	A	Bb	C	D	E
G	A	B	C	D	E	F#

MINOR CHORD PROGRESSIONS

i	ii°	III	iv	v	VI	VII
Minor	Diminished	Major	Minor	Minor	Major	Major
A	B	C	D	E	F	G
B	C#	D	E	F#	G	A
C	D	Eb	F	G	Ab	Bb
D	E	F	G	A	Bb	C
E	F#	G	A	B	C	D
F	G	Ab	Bb	C	Db	Eb
G	A	Bb	C	D	Eb	F

Film Music

Some film SOUNDTRACKS include specially composed SCORES, either for orchestra (e.g. composers like John Williams, Ennio Morricone) or songs written especially for the film (e.g. Disney films). Other films use pre-existing music e.g. popular songs from the era/place in which the film is set.

Keyboards

- Piano
- Electronic keyboard
- Harpsichord
- Organ
- Synthesizer

Percussion

- Bass drum
- Snare drum
- Triangle
- Cymbal
- Drum kit (untuned)
- Timpani
- Glockenspiel
- Xylophone (tuned)

Strings

- Violin
- Cello
- Viola
- Double bass
- Harp

WOODWIND

- Flute
- Clarinet
- Oboe
- Bassoon
- Saxophone

BRASS

- Trumpet
- Trombone
- French horn
- Tuba

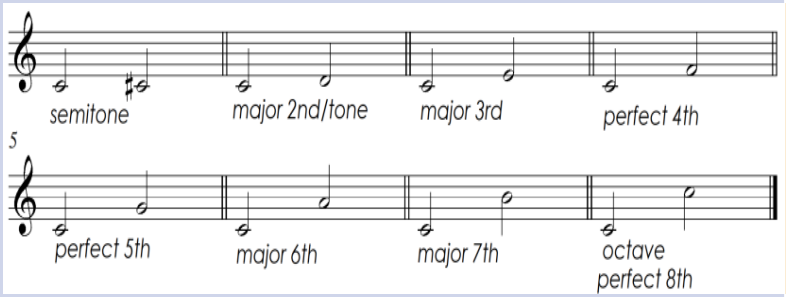
Other

- Electric guitar
- Bass guitar
- Spanish/ classical guitar
- Traditional world instruments

Intervals

Film composers often use intervals to create a particular effect (e.g. a rising perfect 4th sounds 'heroic', and a semitone can sound 'menacing').

An interval is the distance between two notes.



Rising interval: moving upwards (ascending)
Falling interval: moving downwards (descending)

Musical elements

Film composers use the MUSICAL ELEMENTS (Context, articulation, structure, instrumentation, tempo, texture, dynamics, timbre, tonality, rhythm, melody, harmony) to create mood and atmosphere to help to tell the story and enhance the action.

For example: In a sad, reflective scene, a composer might use slow tempo, minor tonality, soft dynamics, legato, homophonic texture, long sustained notes, and a conjunct melody.

An exciting car chase scene in a thriller might have a fast tempo, busy, polyphonic texture, dissonant chords, loud dynamics, syncopated rhythms, a disjunct melody and short riffs.

A scene where the superhero 'saves the day' might use a major tonality, brass fanfares, loud dynamics, accents, 4ths and 5ths (intervals).

Composers will often use CONTRASTS to create effect (e.g. using a wide range of pitch from very high to very low).

Term	Definition
Pizzicato	Plucking the strings.
Divisi	Two parts sharing the same musical line.
Double stopping	Playing two strings at the same time.
Arco	Using a bow to play a stringed instrument.
Tremolo	A 'trembling' effect, moving rapidly on the same note or between two chords (e.g., using the bow rapidly back and forth).
Tongued	A technique to make the notes sound separated (woodwind/brass).
Slurred	Notes are played smoothly.
Muted	Using a mute to change/dampen the sound (brass/strings).
Drum roll	Notes/beats in rapid succession.
Glissando	A rapid glide over the notes.
Trill	Alternating rapidly between two notes.
Vibrato	Making the notes 'wobble' up and down for expression.

Term	Definition
Theme	The main tune/melody.
Motif	A short musical idea (melodic or rhythmic).
Leitmotif	A recurring musical idea linked to a character/object or place (e.g., Darth Vader's motif in Star Wars).
Underscoring	Underscoring Music playing underneath the dialogue.
Scalic	Scalic Melody follows the notes of a scale.
Triadic	Triadic Melody moves around the notes of a triad.
Fanfare	Short tune, often played by brass instruments, to announce someone/something important; based on the pitches of a chord.
Pedal note	A long, sustained note, usually in the bass/ lower notes.
Ostinato/riff	A short, repeated pattern.
Conjunct	The melody moves by step.
Disjunct	The melody moves with leaps/intervals.
Consonant harmony	Sounds 'good' together.
Dissonant harmony	Sounds 'clashy'.
Chromatic harmony	Uses lots of semitones/accidentals that's not in the home key.
Minimalism	A style of music using repetition of short phrases which change gradually over time.

PE Unit 1: Principles of Training

TERM:3

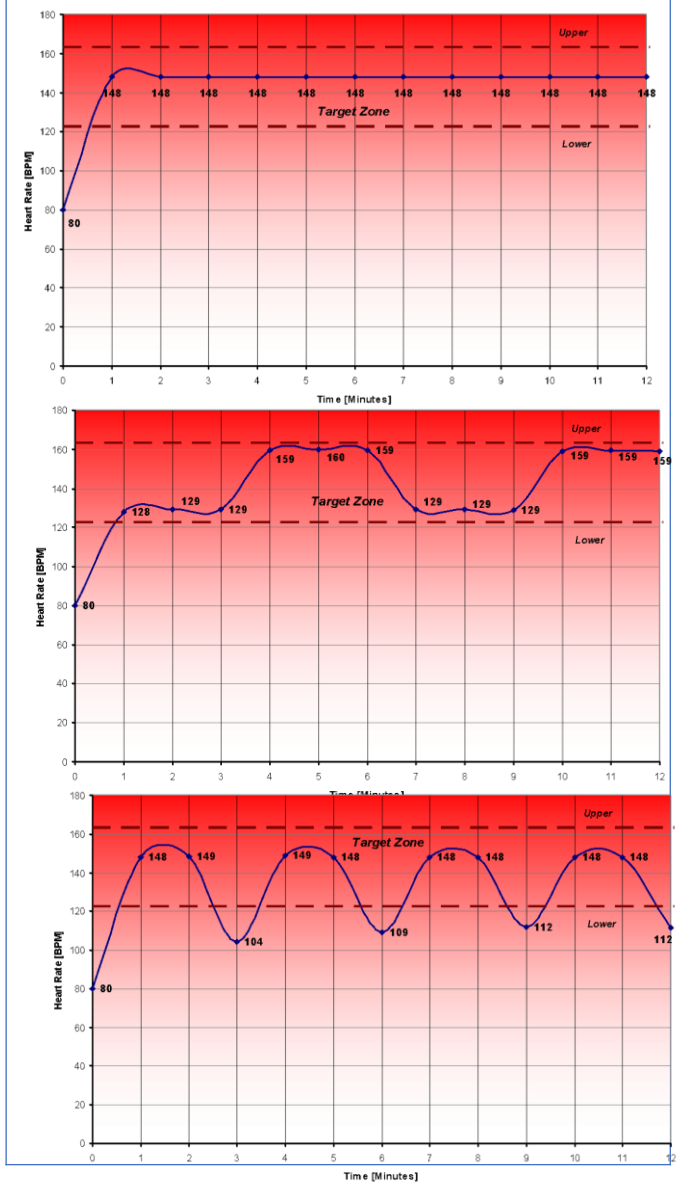
ONE: Key Vocabulary

Word	Definition
Warm up	Preparatory exercises done to prepare the body and mind for physical activity. Gradual reduction in intensity, maintain breathing and heart rate, stretching
Cool down	The act of allowing physiological activity to return to normal gradually after strenuous exercise by engaging in less strenuous exercise. Gradual pulse raising activity, stretching, skill activity, mental preparation
FIIT	FITT outlines the key components of an effective exercise program: Frequency – the number of times exercise takes place Intensity – how hard and intense the exercise is Time – how long you exercise for Type - the kind of exercise that takes place.
Specificity	The training must be matched to the needs of the sporting activity and individual.
Progression	Gradual increases in exercise in order for the body to adapt through overload.
Overload	A greater than normal stress that is applied on the body for training adaptations to take place.
Reversibility	Any adaptation that takes place as a result of training will be lost if you stop training.

TWO: Core Questions

Question	Answer
Describe continuous training	Training that involves activity without rest intervals. It can be performed at any intensity.
Describe fartlek training	Training which varies in intensity and duration and consists of bursts of intense effort alternating with less strenuous activity.
Interval training	Training that incorporates periods of exercise and rest.
Circuit training	– Series of alternate exercises performed at stations that focus on different muscle groups.
Weight training	A method of training that uses free weights or resistance machines
Plyometrics	Involves jumping, bounding, hopping exercise HIIT – exercise that alternates between high intensity and periods of recovery.
Describe static stretching	Training method that includes stretching to improve flexibility
High-Intensity Interval Training	Interval training that involves periods of high intensity exercise followed by recovery intervals

THREE: …

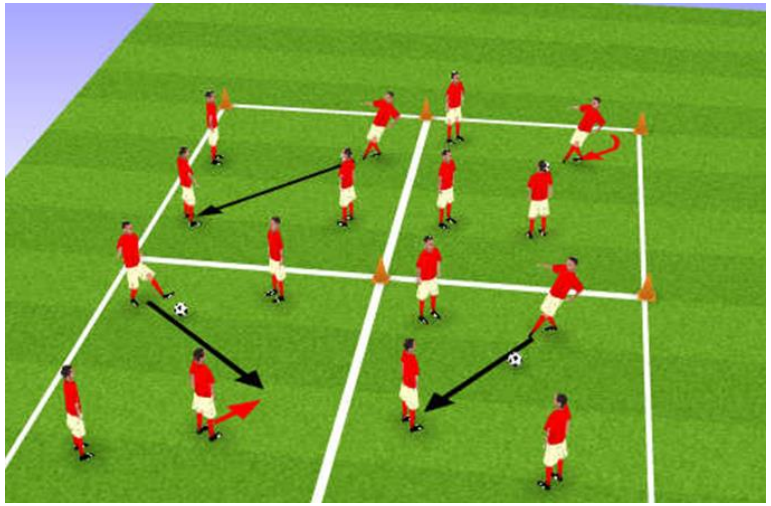


PE - GCSE PE: Analysing and Evaluating Performance (AEP)

Key Vocabulary

Evaluation	Evaluate questions refer to the end of the process and require you to look back on the effectiveness of something
Fitness Testing	Fitness testing consists of different types of tests and exercises used to determine your overall health and fitness levels.
Components of fitness	Every sport requires different components of fitness depending on the demands of the event.
Key skills	The important skills and qualities that are on display during a performance
Assessment	The act of judging or deciding the amount, value, quality, or importance of something
Movement analysis	An assessment of an individuals motion. It can combine the assessment of biomechanics by a trained individual or the use of technology such as video analysis.
Skill classification	Skills can be placed on a sliding scale called a continuum. A continuum is a visual guide to show where a skill fits into a specific category. Classification makes it clearer about what is required to learn and how to perform a particular skill.
SMART goals	Athletes use smart goals in order to stick to a training programme and motivate the performer to achieve their goal.

Key Images



Challenge Questions

- Why is it important to set SMART goals when trying to achieve a goal?
- What is the difference between speed and flexibility?
- How can you apply principles of training to a training programme?
- What is the difference between an open and closed skill?

Dig Deep & Discover

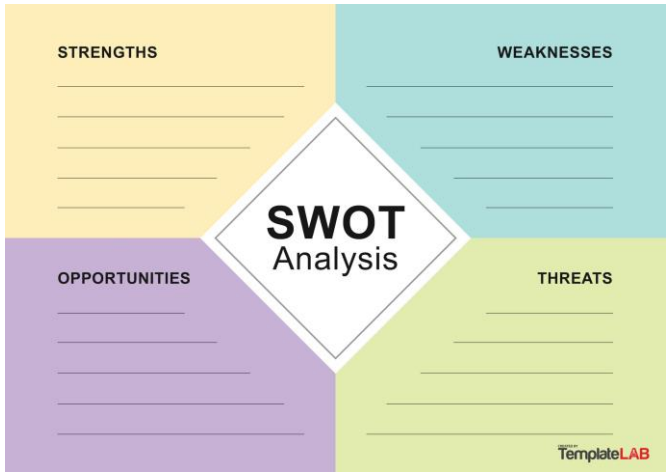
https://www.ocr.org.uk/Images/549207-performance-in-physical-education.pdf

https://www.ocr.org.uk/Images/421685-analysing-and-evaluating-performance-aep-task.pdf

Planning

- *Suitability of the groups*
- *Different abilities*
- *Order of activities effective*
- *Equipment is planned for number of participants*

Consider the strengths and weaknesses of the planning behind the session.



Improvements

Are there things that could have been done differently?
Adaptations to activities or how long you spent on them.
Specific things you could change to both the plan and the leading of the session

What opportunities are therefore you to gain more experience within this?

- Helping with extra-curricular clubs
- Coaching/leadership courses
- Observing

Leading

- Appropriate amount of time spent on each activity
- Participant motivation
- Using the space effectively
- Realising and adapting the session when its' not working out
- Positioning

Identifying strengths and weaknesses of the way you lead the session.

Combined Biology B5: Health and disease

Lesson sequence

1. Health and disease
2. Non-communicable disease
3. Cardiovascular disease
4. Pathogens
5. Spreading disease
6. Preventing infection
7. The immune system
8. Antibiotics

1. Health and disease	
Physical health	Being free from disease, active, fit, sleeping well and no substance abuse.
Mental health	Feeling good about yourself and being free of conditions such as depression and anxiety.
Social health	Having healthy relationships, loving and being loved.
WHO	World Health Organization – part of the UN responsible for monitoring global health.
Disease	Any problem with the body not caused by injury.
Communicable diseases	Diseases caused by pathogens, can be passed on.
Non-communicable diseases	Diseases caused by genes or, lifestyle. Cannot be passed on.
Correlated diseases	Getting one disease increases your chance of another due to diseases weakening organ systems, damaged immune system, weaker defences.

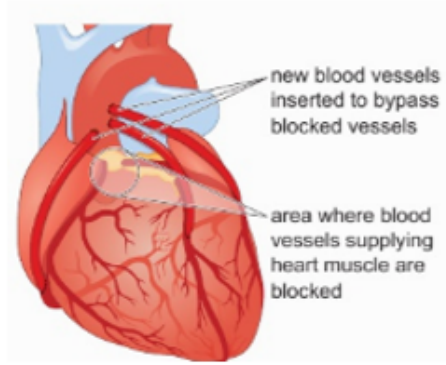
2. Non-communicable disease	
Genetic disorders	Diseases caused by inheriting faulty genes from your parents.
Malnutrition	Diseases caused by poor diet.
Anaemia	Lack of iron. Causes fewer and smaller red blood cells and low energy.
Kwashiorkor	Lack of protein. Swollen belly, small muscles, stunted growth.
Rickets	Lack of calcium or vitamin D. Causes weak bones leading to bowed legs.
Scurvy	Lack of vitamin C. Swollen bleeding gums, muscle and joint pain, lack of energy.
Ethanol	The drug found in all alcoholic drinks.
Drugs	Chemicals that change the way your mind and body works.
Cirrhosis	A fatal liver disease caused by drinking too much alcohol over a long period of time.
Social problems of alcohol	Missed work days, increased risk of other diseases, risky sexual behaviour, increased violence.

3. Cardiovascular disease	
Obesity	Being overweight to the extent that your health is at risk.
BMI	Body mass index, over 30 = obese.
BMI calculation	$BMI = \frac{mass\ (kg)}{height^2\ (m^2)}$
Problems with BMI	Someone with a lot of muscle could have high BMI without being obese.
Waist:hip ratio	The ratio of waist width to hip width. Over 0.9 (women) or 1.0 (men) = obese.
Calculating waist:hip ratio	$Waist:hip\ ratio = \frac{waist\ width}{hip\ width}$
Cardiovascular disease	Harmful substances in blood build up in the arteries around the heart. Blockages can form leading to heart attacks.
Stents	Used to treat cardiovascular disease. A tube of metal mesh is fed into the narrowed artery and opened up, holding the artery open.
Treating heart disease with lifestyle	More exercise and a better diet can treat cardiovascular disease, but this takes time.

4. Pathogens	
Pathogen	Microorganism that causes disease.
Types of pathogen	Bacteria, virus, protist, fungi.
Tuberculosis	Bacteria. Serious lung damage, bloody cough, fever.
Cholera	Bacteria. Sever life-threatening diarrhoea.
Chalara ash dieback	Fungi. Kills the leaves of ash trees, killing the tree.
Malaria	Protist. Sickness, fever and weakness.
Haemorrhagic fever	Virus, eg Ebola. Liver and kidney damage, internal bleeding.
HIV	Human immunodeficiency virus attacks white blood cells, causing AIDS.
AIDS	Acquired Immunodeficiency Syndrome. Weakened immune system making simple infections deadly. Caused by HIV.
Opportunistic pathogens	Pathogens that live in us causing no harm, but become dangerous when given the opportunity, such as *Helicobacter pylori* which cause stomach ulcers.

5. Spreading disease	
Airborne	Spreading through the air, such as colds and flu in infected droplets of saliva, and chalara ash dieback by fungal spores.
Waterborne	Spreading through contaminated water such as cholera.
Oral route	Eating food contaminated with a pathogen.
Vectors	Animals that spread pathogens in their bites, such as malaria that is spread by mosquitoes.
Bodily fluids	Spreading through contact with infected body fluids such as blood or semen, for example, HIV.

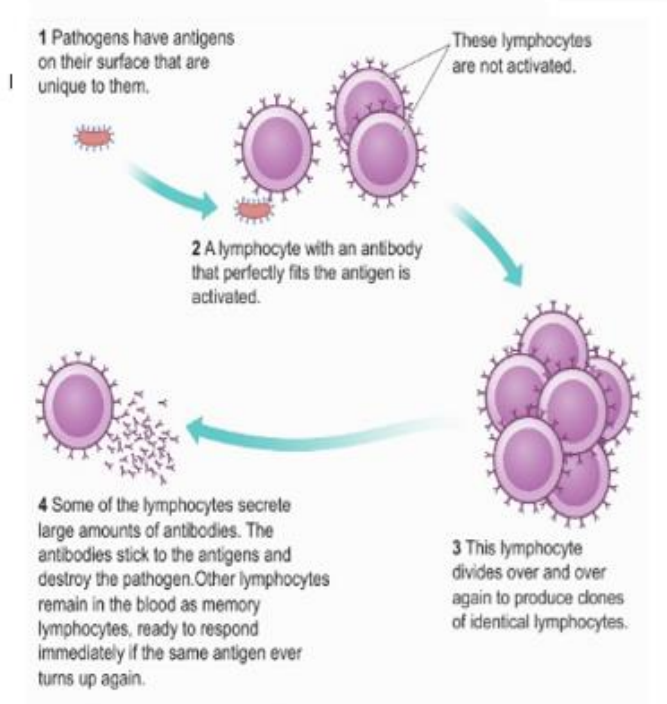
Nutrient	Disease caused by deficiency of nutrient	Symptoms of disease	Good sources in diet
protein	kwashiorkor	enlarged belly, small muscles, failure to grow properly	meat, fish, dairy, eggs, pulses (e.g. lentils)
vitamin C	scurvy	swelling and bleeding gums, muscle and joint pain, tiredness	citrus fruits (e.g. oranges) and some vegetables (e.g. broccoli)
vitamin D and/or calcium	rickets or osteomalacia	soft bones, curved leg bones	vitamin D: oily fish calcium: dairy products
iron	anaemia	red blood cells that are smaller than normal and in reduced number, tiredness	red meat, dark green leafy vegetables, egg yolk



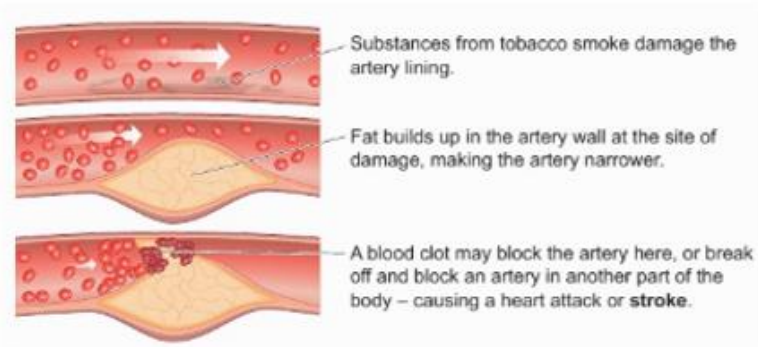
6. Preventing infection	
Chemical defences	Kill pathogens before they can infect us.
Lysozyme	Enzyme found in mucus, tears and sweat that kills *some* bacteria.
Hydrochloric acid	Found in the stomach, kills most bacteria on food.
Physical barriers	Block or trap pathogens so they can't enter the body.
Mucus	Sticky substance in most body openings that traps pathogens.
Ciliated cells	Have hairs that sweep mucus up and out of the body.
Skin as a physical barrier	Blocks pathogens from entering.
STIs	Sexually transmitted infections. Pathogens spread through sexual activity.
Preventing STIs	Use barrier contraception (such as condoms) to prevent mixing of fluids (semen, vaginal lubrication, blood).
Screening for STIs	Large scale testing of people to check if they have an STI so they can be treated. This helps to reduce the spread of STIs.

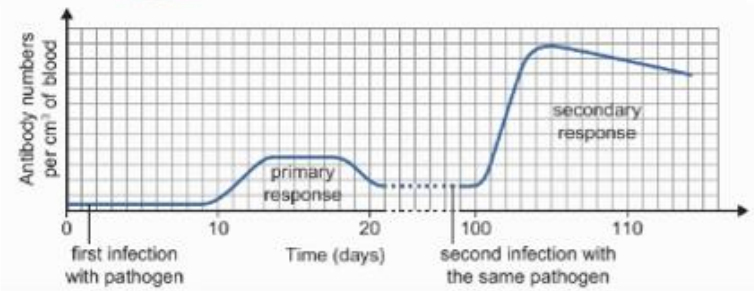
7. The immune system	
Immune system	Destroys pathogens that manage to infect us.
Primary immune response	How the body responds the first time it meets a new pathogen.
Antigens	Chemical markers on the surface of pathogens (and other cells) that identify them as a pathogen. Antigens are unique to each pathogen.
Lymphocyte	White blood cells that produce antibodies. Each lymphocyte makes a different antibody.
Antibodies	Chemicals with a specific shape that can stick to the antigens on a pathogen and kill it.

Activated lymphocyte	When an antigen sticks to an antibody, it activates the lymphocyte causing it to make many copies of itself that make the same antibodies.
Memory lymphocyte	Lymphocytes left over after an infection that retain the ability to fight the pathogen.
Immunity	When the body has the memory lymphocytes to fight a pathogen, so it can't be harmed by it.
Vaccine	A weakened version of a pathogen that trains the body to fight it, without causing disease.
How vaccines work	Vaccines are harmless versions of pathogen that still have the antibodies on them, so the immune response is triggered without any risk of disease.
Vaccine safety	Vaccines are safe, preventing about 6 million deaths per year.



8. Antibiotics	
Antibiotics	Substances that kill bacteria without harming human cells.
How antibiotics work	They inhibit (stop) an enzyme that maintains bacterial cell walls. This kills the bacteria.
Resistance	Widespread use of antibiotics has led to resistance, meaning many antibiotics don't work as well as they once did.
Drug development	Developing new medicines involves many stages that take a of time and money.
Discovery phase	Developing new chemicals that might work as medicines.
Pre-clinical testing	Testing on cells grown in the lab, or on animals, to see if the chemical has any useful effect.
Small clinical trial	Testing on a few healthy people to check for safety.
Large clinical trial	Testing on many patients to discover how effective the drug is and determine the dose.
Side effects	Unwanted effects of the medication, that can be quite harmful.





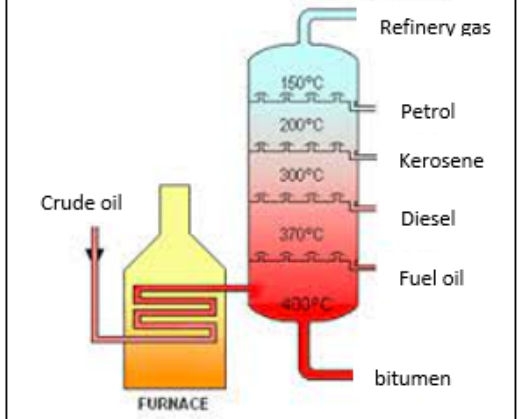
Combined Chemistry CC16: Fuels

Lesson sequence

1. Hydrocarbons
2. Fractional distillation of crude oil
3. The alkanes
4. Complete and incomplete combustion
5. Fuels and pollution
6. Cracking

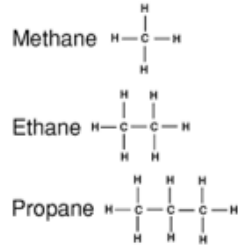
1. Hydrocarbons	
Hydrocarbon	A compound containing only hydrogen and carbon.
Crude oil	A thick brown liquid made of a mixture of many different hydrocarbons found in deposits underground.
Properties of hydrocarbons in crude oil	Most of the hydrocarbons in crude oil are liquids, but each of them has a different boiling point.
Hydrocarbons in crude oil	Mostly alkanes.
Uses of crude oil	Fuel, feedstock (supply of basic chemicals) for the chemical industry.
Crude oil as a finite resource	There is a limited amount: at some point it will run out.
Non-renewable	A resource that will eventually run out.

2. Fractional distillation of crude oil	
Fractional distillation	A type of distillation used to separate mixtures of two or more liquids.
Separation in fractional distillation	Fractional distillation separates compounds according to their boiling point.
Separating crude oil in a fractionating column	Crude oil is passed through a heater to heat it to about 400°C so that nearly everything is a gas. The hot gases rise up the fractionating column until cool enough to condense.
Fractions of crude oil	The separated liquids and gases collected at different temperatures.

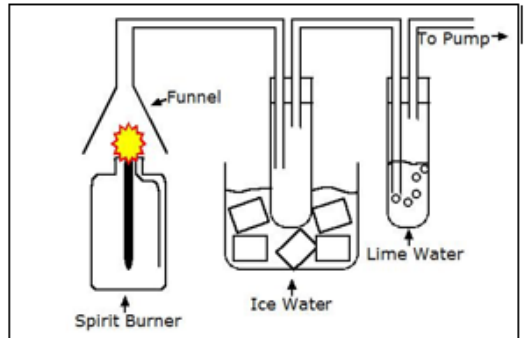


Fractions in order	Gases, petrol, kerosene, diesel, fuel oil, bitumen: - Smallest to biggest molecules - Lowest to highest boiling point - Lowest to highest viscosity - Easiest to hardest ignition
Viscosity	How easily a fluid flows – higher viscosity = runnier.
Ease of ignition	How easily a substance catches fire.
Gases	Used for domestic heating and cooking.
Petrol	Used as a fuel for cars.
Kerosene	Fuel for aircraft
Diesel oil	Fuel for larger vehicles such as lorries and trains
Fuel oil	Fuel for ships and power stations
Bitumen	Surfacing roads and roofs

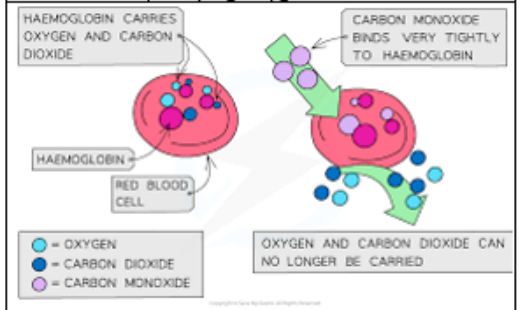
3. The alkanes	
Homologous series	A family of closely related compounds with molecular formulae that differ only in the number of 'CH_2's.
Physical properties in a homologous series	Vary gradually, for example the boiling point gradually increases.
Chemical properties in a homologous series	Very similar.
General formula	Describes the number of each atom in any member of a homologous series. Alkanes = C_nH_{2n+2}
Alkanes	Hydrocarbons containing only single bonds. The names end with '-ane'.
First three alkanes	Methane – CH_4 Ethane – C_2H_6 Propane – C_3H_8



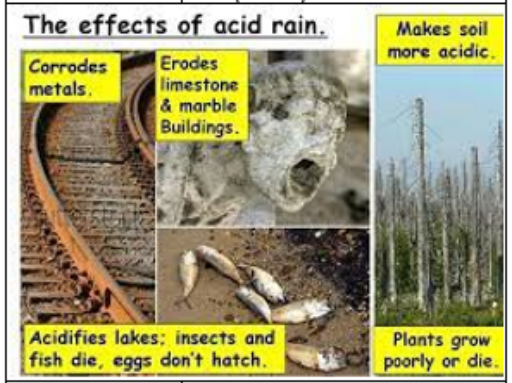
4. Complete and incomplete combustion	
Combustion	When a compound reacts with oxygen producing energy.
Complete combustion	Combustion that produces only water and carbon dioxide and releases the most possible energy.
Complete combustion equation	Fuel + oxygen → carbon dioxide + water $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$



Incomplete combustion	Combustion that produces a mixture of carbon dioxide, carbon monoxide, carbon and water and produces less energy.
Why incomplete combustion happens	When there is not enough oxygen for all of the reactants to be fully oxidised.
Carbon monoxide	CO. A colourless odourless a highly toxic gas.
How carbon monoxide kills	It sticks to haemoglobin in the blood which prevents it from carrying oxygen.



Soot	The small particles of carbon produced by incomplete combustion.
Problems with soot	- Causes lung problems when breathed in. - Blackens and dirties buildings
Preventing incomplete combustion	It is important that boilers at home have a good air supply to prevent incomplete combustion. For this reason a boiler's flue pipe should be checked for blockages every year.

5. Combustible fuels and pollution	
Sulfur	An impurity that is naturally present in small amounts in oil and coal.
Sulfur dioxide	SO_2. A gas formed from the sulfur in oil and coal when it is burnt.
Acid rain	Rain with a pH lower than 5.2
Formation of acid rain	Sulfur dioxide dissolves in water in clouds to form sulfurous acid (H_2SO_3) which oxidises to become sulfuric acid (H_2SO_4)
	
Nitrogen oxides	NO_x. Various gases formed at high temperatures inside internal combustion engines.
Problems of nitrogen oxides	- Can dissolve in clouds to form acid rain - NO_2 causes lung damage - NO_x can cause smog to form

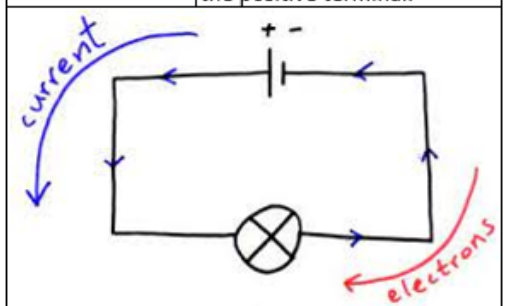
6. Cracking	
Cracking	Breaking down longer less useful hydrocarbons into shorter more useful ones.
How to crack hydrocarbons	Heat the hydrocarbons and pass the vapours over an aluminium oxide catalyst heated to 650^{o}C.
Products of cracking an alkane	An alkane and an alkene. Hexane → butane + ethene $C_6H_{14} \rightarrow C_4H_{10} + C_2H_4$

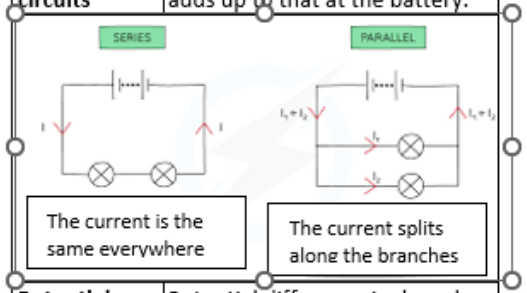
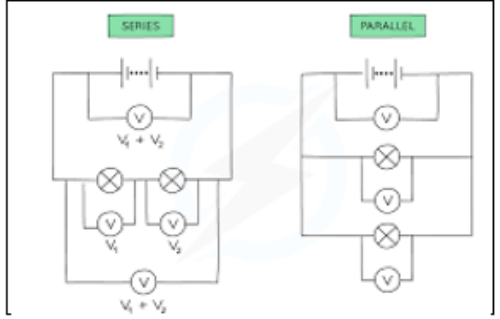
Alkene	A hydrocarbon containing a C=C double bond.
Usefulness of cracking	There is more demand for shorter hydrocarbons – such as petrol and gas – than longer ones such as bitumen. Cracking turns the less useful ones into more useful ones.
Hydrogen gas as a fuel	H_2. Hydrogen has the potential to be used as a fuel for cars.
Advantages of hydrogen as a fuel	- It only produces H_2O when burnt so does not directly contribute to global warming - It can be produced using renewable energy
Disadvantages of hydrogen as a fuel	- Most of it is currently produced in ways that also produce CO_2 which contributes to global warming - It is difficult to store

Combined physics CP9: Electricity

Lesson sequence

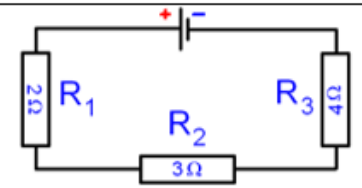
1. Electric circuits
2. Current and potential difference
3. Current, charge and energy
4. Resistance
5. More about resistance
6. Core practical – investigating resistance
7. Transferring energy
8. Electrical power
9. Transferring energy by electricity
10. Electrical safety

1. Electric circuits	
Delocalised electrons	Electrons that are free to move between many different atoms.
Conventional current	The flow of positive charge from the positive terminal towards the negative terminal (goes in the opposite direction to electrons).
Electron flow	Electrons flow from the negative terminal towards the positive terminal.
	
Series circuit	A circuit in which there is only one path for the current to flow.
Parallel circuit	A circuit with multiple paths for the current to flow.

2. Current and potential difference	
Amperes, A	The unit of measurement for current. Amps for short.
Ammeter	Used for measuring current. Connected in series.
Potential difference	Aka voltage. This is what pushes electrons around a circuit.
Volts, V	The unit of measurement for potential difference.
Voltmeter	Used for measuring potential difference. Connected in parallel.
Current in series circuits	The same at all points in the circuit.
Current in parallel circuits	Less on the branches than at the battery. Current on branches adds up to that at the battery.
	
Potential difference in series circuits	Potential difference is shared between the components on a circuit. It adds up to be the same as the battery.
Potential difference in parallel circuits	The same across each branch as it is across the battery.
	

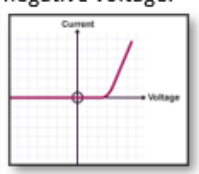
3. Current, charge and energy	
Charge	The amount electricity that has flowed through a circuit.
Coulombs, C	The unit of measurement for charge.
Current	The number of coulombs of charge that flows past a point each second.
Calculating charge	Charge = current x time Q = I x t Charge = coulombs Current = amps Time = seconds
The meaning of volts	The amount of energy transferred by each coulomb of charge. One volt = 1 joule per coulomb.
Calculating energy	Energy = charge x potential difference E = Q x V Energy = joules Charge = coulombs Potential difference = volts

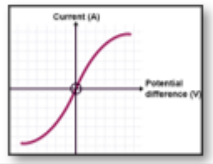
4. Resistance	
Resistance	The difficulty with which current passes through materials.
Ohms, Ω	The unit of measurement for resistance.
High/low resistance	Higher resistance → better insulator Lower resistance →better conductor
Calculating potential difference	Potential diff = current x resistance V = I x R Current, I = amps, A Potential diff, V = volts, V Resistance, R = ohms, Ω
Changing current	Higher voltage → higher current Higher resistance → lower current
Resistors	Circuit components with differing resistance to control how much current flows to parts of a circuit.
Resistors in series	Total resistance is the sum of each of the resistors.

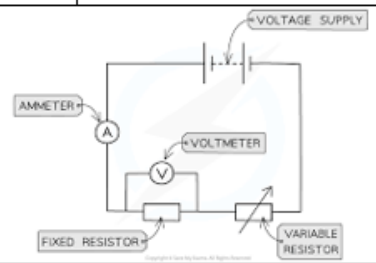


Total resistance = 2+3+4=9 Ω

Voltage and resistors in series	Voltage is shared in proportion to the resistance. The resistor with more resistance takes more of the voltage. Calculate this using V=IR.
Resistors in parallel	Think about each branch of the circuit as a different series circuit. Resistors on different branches do not affect each other.
Variable resistors	Resistors where you can change the resistance to adjust the current.

5. More about resistance	
Resistor	Circuit component with a set resistance to control the current.
Resistor graph	Current increases in direct proportion to voltage (straight line going through (0,0)). 
LDR	Light-dependent resistor. High resistance in dark, low resistance in light.
Thermistor	High resistance when cold, low resistance when hot.
Diode	High resistance in one direction, low resistance in the other.
Diode graph	Graph slopes up with a positive voltage but stays at 0 with a negative voltage. 

Filament lamp	High resistance causes the filament to heat up, producing light.
Filament lamp graph	Current increases as voltage increases, but levels out eventually. 

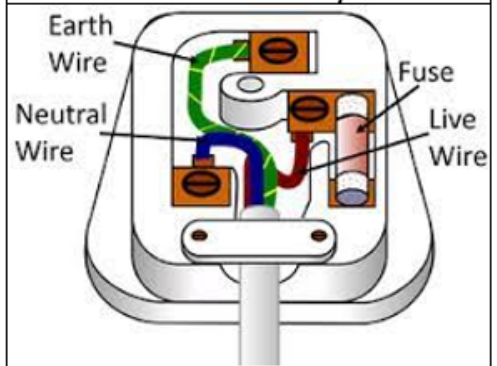
6. Core practical – investigating resistance	
Video link to practical	https://www.youtube.com/watch?v=O-zOvKK1w3A
Aim	To explore how resistance changes in different circuits.
	
Investigating resistance	Set up a circuit with an ammeter, resistor and voltmeter across the resistor. Use the variable resistor to vary the voltage and record voltage and current. Replace fixed resistor with two filament lamps and repeat.
Investigating series circuits	Set up a series circuit with an ammeter, two bulbs and voltmeters across each bulb and the power supply. Vary the voltage and record readings on the ammeter and the voltmeters
Investigating parallel circuits	Set up a parallel circuit with two bulbs and ammeters on each branch and an ammeter by the power supply, and voltmeters across each bulb and the power supply. Vary voltage, record all readings.

Results	Resistor – doubling voltage doubles current = proportional Series circuit – voltage at bulbs half of that at power supply Parallel circuit – voltage at bulbs equal to power supply, current half that at power supply

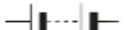
7. Transferring energy	
Calculating energy transfer	Energy = current x potential difference x time E = I x V x t Energy = joules Current = amps Potential difference = volts Time = seconds
Resistance and energy transfer	Electrons flowing through wires collide with atoms and lose energy. This energy is transferred to heat.
Electrical energy dissipation	When electrical energy is transferred to wasted heat energy by resistance.
Reducing resistance	Use thicker wires, use shorter wires, use lower-resistance metals, reduce the temperature.

8. Electrical power	
Power	The rate of energy transfer.
Watts, W	The unit of power: 1 W = 1 joule per second
Power and work done	$P = \frac{E}{t}$ Where 'P' is power in W, 'E' is work done in J, 't' is time in s.
Power, current and voltage	$P = I \times V$ Where 'P' is the power in W, 'I' is the current in A, V is the potential difference in V.
Power, current and resistance	$P = I^2 \times R$ Where 'P' is the power in W, 'I' is the current in A, 'R' is the resistance in Ω.

9. Transferring energy by electricity	
Mains electricity	The electricity supplied from wall sockets.
National grid	The systems of power lines and sub-stations that distributes electricity from power stations to homes and businesses.
Heaters	Transfer energy from electrical to thermal.
Motors	Transfer energy from electrical to kinetic.
Direct current	Current that flows in one direction.
Alternating current	Current that switches direction many times each second.
Frequency of mains current	Mains current alternates (switches direction) 50 times each second. The frequency is 50 Hz.
Power rating	Power rating of an appliance is measured in watts (W). e.g. A kettle with a power rating of 3kW transfers 3000 joules of energy each second.

10. Electrical safety	
	
Live wire	Brown, 230 V, connects the appliance to the power station.
Neutral wire	Blue, 0 V, completes the circuit.
Earth wire	Green and yellow, 0 V. Connects the appliance to the ground so current can flow there in the event of a short circuit.

Fuse	A thin metal wire that melts and breaks the circuit if there is too much current.
Circuit breaker	Breaks the circuit if too much current flows.
Advantages of circuit breakers	Quicker than fuses, just need switching rather than replacing.

Circuit symbols	
*Switch	
*Cell	
**Battery	
*Lamp	
*Ammeter	
*Voltmeter	
*Resistor	
**Variable resistor	
**Diode	
**LDR	
**Thermistor	

Separate Biology SB5: Health and disease

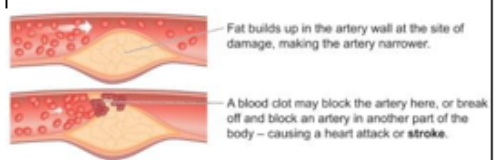
Lesson sequence

1. Health and disease
2. Non-communicable disease
3. Cardiovascular disease
4. Pathogens
5. Spreading disease
6. Viruses life cycles
7. Plant defences
8. Plant diseases
9. Physical and chemical barriers
10. Preventing infection
11. The immune system
12. Antibiotics
13. Core Practical: Antibiotics
14. Monoclonal Antibodies

1. Health and disease	
Physical health	Being free from disease, active, fit, sleeping well and no substance abuse.
Mental health	Feeling good about yourself and being free of conditions such as depression and anxiety.
Social health	Having healthy relationships, loving and being loved.
WHO	World Health Organization – part of the UN responsible for monitoring global health.
Disease	Any problem with the body not caused by injury.
Communicable diseases	Diseases caused by pathogens, can be passed on.
Non-communicable diseases	Diseases caused by genes or, lifestyle. Cannot be passed on.
Correlated diseases	Getting one disease increases your chance of another due to diseases weakening organ systems, damaged immune system, weaker defences.

2. Non-communicable disease	
Genetic disorders	Diseases caused by inheriting faulty genes from your parents.
Malnutrition	Diseases caused by poor diet.
Anaemia	Lack of iron. Causes fewer and smaller red blood cells and low energy.
Kwashiorkor	Lack of protein. Swollen belly, small muscles, stunted growth.
Rickets	Lack of calcium or vitamin D. Causes weak bones leading to bowed legs.
Scurvy	Lack of vitamin C. Swollen bleeding gums, muscle and joint pain, lack of energy.
Ethanol	The drug found in all alcoholic drinks.
Drugs	Chemicals that change the way your mind and body works.
Cirrhosis	A fatal liver disease caused by drinking too much alcohol over a long period of time.
Social problems of alcohol	Missed work days, increased risk of other diseases, risky sexual behaviour, increased violence.

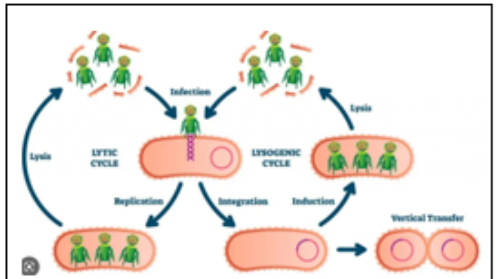
3. Cardiovascular disease	
Obesity	Being overweight to the extent that your health is at risk.
BMI	Body mass index, over 30 = obese.
BMI calculation	$BMI = \frac{mass\ (kg)}{height^2\ (m^2)}$
Problems with BMI	Someone with a lot of muscle could have high BMI without being obese.
Waist:hip ratio	The ratio of waist width to hip width. Over 0.9 (women) or 1.0 (men) = obese.
Calculating waist:hip ratio	$Waist{:}\ hip\ ratio = \frac{waist\ width}{hip\ width}$
Cardiovascular disease	Harmful substances in blood build up in the arteries around the heart. Blockages can form leading to heart attacks.
Stents	Used to treat cardiovascular disease. A tube of metal mesh is fed into the narrowed artery and opened up, holding the artery open.
Treating heart disease with lifestyle	More exercise and a better diet can treat cardiovascular disease, but this takes time.



4. Pathogens	
Pathogen	Microorganism that causes disease.
Types of pathogen	Bacteria, virus, protist, fungi.
Tuberculosis	Bacteria. Serious lung damage, bloody cough, fever.
Cholera	Bacteria. Sever life-threatening diarrhoea.
Chalara ash dieback	Fungi. Kills the leaves of ash trees, killing the tree.
Malaria	Protist. Sickness, fever and weakness.
Haemorrhagic fever	Virus, eg Ebola. Liver and kidney damage, internal bleeding.
HIV	Human immunodeficiency virus attacks white blood cells, causing AIDS.
AIDS	Acquired Immunodeficiency Syndrome. Weakened immune system making simple infections deadly. Caused by HIV.
Opportunistic pathogens	Pathogens that live in us causing no harm, but become dangerous when given the opportunity, such as *Helicobacter pylori* which cause stomach ulcers.

5. Spreading disease	
Airborne	Spreading through the air, such as colds and flu in infected droplets of saliva, and chalara ash dieback by fungal spores.
Waterborne	Spreading through contaminated water such as cholera.
Oral route	Eating food contaminated with a pathogen.
Vectors	Animals that spread pathogens in their bites, such as malaria that is spread by mosquitoes.
Bodily fluids	Spreading through contact with infected body fluids such as blood or semen, for example, HIV.

6. virus life cycle	
Capsid	The virus's protein coat.
Lytic	Viral DNA separate
Lysogenic	Viral DNA combines with host cell DNA
Zone of inhibition	Where the bacteria does not grow
Bacterial lawn	Bacteria grown in a petri dish
agar	Nutrient broth for bacteria to grow in



7. plant defences	
Cuticle	A water-impervious protective layer covering the epidermal cells of leaves and other parts.
Pests	An insect that feed on, compete for food with, or transmit diseases to humans and livestock.
Pesticides	Are substances that are meant to control pests, including weeds.
Plant Symptoms	A visible effect of disease on the plant.

8. plant diseases	
Yield	The amount of product obtained.
Lesions	Any damage or abnormal change in the tissue of an organism.
Distribution analysis	Looks at where the damaged plant occurs.
Diagnosis	The process of determining which disease or condition explains an organism's symptoms and signs.

9. Physical and chemical barriers	
Physical barrier	Provides a physical block against pathogens from entering the plant
Chemical barrier	There are two main chemical barriers to infection, the relatively low pH of parts of the body and antimicrobial molecules.
Lysozyme	An enzyme produced in **tears**, perspiration, and saliva can break down cell walls and thus acts as an antibiotic (kills bacteria).

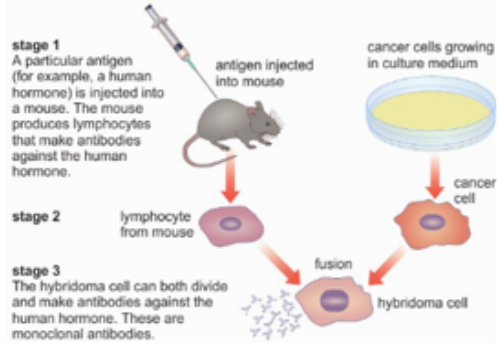
Mucus membranes	Produce mucus that trap microbes.
Ciliated cells	Cells that line the upper respiratory tract traps and propels inhaled debris to throat.
Hydrochloric acid	The acid found in your stomach that kills microorganisms.
Sexually transmitted infections (STIs)	Are infections you can get by having sex with someone who has an infection.
Chlamydia	A bacterial infection usually spread through sex or contact with infected genital fluids.
Screening	The evaluation or investigation of something as part of a methodical survey, to assess suitability for a particular role or purpose.

10 Preventing infection	
Chemical defences	Kill pathogens before they can infect us.
Lysozyme	Enzyme found in mucus, tears and sweat that kills *some* bacteria.
Hydrochloric acid	Found in the stomach, kills most bacteria on food.
Physical barriers	Block or trap pathogens so they can't enter the body.
Mucus	Sticky substance in most body openings that traps pathogens.
Ciliated cells	Have hairs that sweep mucus up and out of the body.
Skin as a physical barrier	Blocks pathogens from entering.
STIs	Sexually transmitted infections. Pathogens spread through sexual activity.
Preventing STIs	Use barrier contraception (such as condoms) to prevent mixing of fluids (semen, vaginal lubrication, blood).
Screening for STIs	Large scale testing of people to check if they have an STI so they can be treated. This helps to reduce the spread of STIs.

11. The immune system	
Immune system	Destroys pathogens that manage to infect us.
Primary immune response	How the body responds the first time it meets a new pathogen.
Antigens	Chemical markers on the surface of pathogens (and other cells) that identify them as a pathogen. Antigens are unique to each pathogen.
Lymphocyte	White blood cells that produce antibodies. Each lymphocyte makes a different antibody.
Antibodies	Chemicals with a specific shape that can stick to the antigens on a pathogen and kill it.
Activated lymphocyte	When an antigen sticks to an antibody, it activates the lymphocyte causing it to make many copies of itself that make the same antibodies.
Memory lymphocyte	Lymphocytes left over after an infection that retain the ability to fight the pathogen.
Immunity	When the body has the memory lymphocytes to fight a pathogen, so it can't be harmed by it.
Vaccine	A weakened version of a pathogen that trains the body to fight it, without causing disease.
How vaccines work	Vaccines are harmless versions of pathogen that still have the antibodies on them, so the immune response is triggered without any risk of disease.
Vaccine safety	Vaccines are safe, preventing about 6 million deaths per year.

12. Antibiotics	
Antibiotics	Substances that kill bacteria without harming human cells.
How antibiotics work	They inhibit (stop) an enzyme that maintains bacterial cell walls. This kills the bacteria.
Resistance	Widespread use of antibiotics has led to resistance, meaning many antibiotics don't work as well as they once did.
Drug development	Developing new medicines involves many stages that take a of time and money.
Discovery phase	Developing new chemicals that might work as medicines.
Pre-clinical testing	Testing on cells grown in the lab, or on animals, to see if the chemical has any useful effect.
Small clinical trial	Testing on a few healthy people to check for safety.
Large clinical trial	Testing on many patients to discover how effective the drug is and determine the dose.
Side effects	Unwanted effects of the medication, that can be quite harmful.

CORE PRACTICAL antibiotics
https://www.youtube.com/watch?v=Cl6EMg0zA-A



14. Monoclonal antibodies	
Monoclonal antibodies	An antibody produced by a single clone of cells.
Hybridoma cells	A hybrid cell used as the basis for the production of antibodies.
Cancer cells	A disease caused by an uncontrolled division of abnormal cells in a part of the body.
Platelets	Found in large numbers in the blood and involved in clotting.
PET Scan	Positron emission tomography (**PET**) **scan** is an imaging test that uses a special dye containing radioactive tracers.
Chemotherapy	An aggressive form of chemical drug therapy meant to destroy rapidly growing cells in the body.
Radiotherapy	A cancer treatment that uses high doses of radiation to kill cancer cells and shrink tumours.

Separate Chemistry SC10-12: Electrolysis, metals and reversible reactions

Lesson sequence

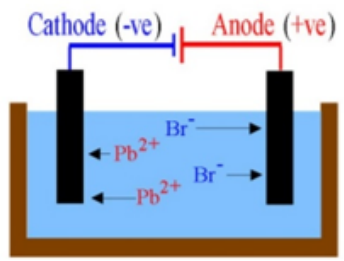
1. Electrolysis
2. Half-equations (HT)
3. Products of electrolysis
4. Core practical – electrolysis of copper sulfate solution (CP10)
5. Reactivity
6. Displacement reactions
7. Extracting metals from their ores
8. Oxidation and reduction
9. Life-cycle assessment and recycling
10. Dynamic equilibrium
11. Changes to equilibrium systems (HT)

1. Electrolysis	
Electrolysis	Using direct current to break compounds down into their elements.
Electrolyte	Liquid used for electrolysis because ions can move – either molten or dissolved ionic compounds
Electrolysis of solids	Does not work as ions can't move.
Cathode	Negative electrode where cations (+) are discharged.
Anode	Positive electrode where anions (-) are discharged.

2. Half-equations (HT)	
Oxidation	Loss of electrons (OIL)
Reduction	Gain of electrons (RIG)
AnOx	**An**ode is for ***ox***idation
CaRe	**Ca**thode is for **re**duction
Half-equations	An equation that shows what happens to just one of the ions during chemical reaction. Two half-equations combine to give the overall ionic equation
Half-equations in electrolysis	Show electron transfer: Cathode (reduction): $M^+ + e^- \rightarrow M$ Anode (oxidation): $X^- \rightarrow X + e^-$
Electrons in half equations	Cations will gain the same number of electrons as their charge. Anions will lose the same number of electrons as their charge.
Non-metals in half-equations	Most non-metals will form molecules: O_2, F_2, Cl_2, Br_2, I_2 etc – so you will need two of them in the half-equation. $O^{2-} \rightarrow O_2 + 4e^-$
Gas test for chlorine	Damp blue litmus paper Turns red, then white

3. Products of electrolysis	
Discharged	When an ion loses its charge to become an atom
Electrolysis of molten salts	Cathode: metal produced Anode: non-metal produced

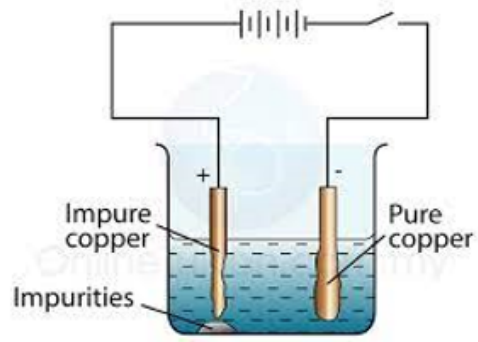
Electrolysis of molten lead bromide



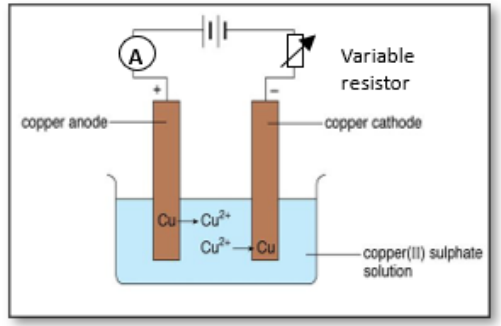
Lead produced at the cathode $Pb^{2+} + 2e^- \rightarrow Pb$

Bromine produced at the anode $2Br^- \rightarrow Br_2 + 2e^-$

Ions in salt solutions	Metal, non-metal and H^+ and OH^- from water
Electrolysis of salt solutions - cathode	Metal, unless reactive metal such as K, Na, Li, Mg, Ca in which case hydrogen.
Hydrogen half-equation	$2H^+(g) + 2e^- \rightarrow H_2(g)$
Electrolysis of salt solutions - anode	Non-metal if it is a halide ion. If sulphate salt oxygen from OH^- $4OH^- \rightarrow O_2 + 2H_2O + 4e^-$
Electrolysis of water	Cathode: hydrogen Anode: oxygen
Gas test for hydrogen	Lit splint Squeaky pop
Gas test for oxygen	Glowing splint relights
Purifying copper - setup	Anode: impure copper Cathode: pure copper Electrolyte: copper sulphate solution
Purifying copper - explanation	Copper atoms leave the anode ($Cu \rightarrow Cu^{2+} + 2e^-$), travel through solution and go to cathode ($Cu^{2+} + 2e^- \rightarrow Cu$). Impure atoms on the anode fall to the bottom as sludge.



4. Core practical – electrolysis of copper sulfate solution	
Link to video of practical	https://www.youtube.com/watch?v=AiEpVTySk70
Aim	To see how the changing the current affects the rate of electrolysis.
Prepare electrodes	Clean two copper electrodes, label one anode and one cathode, weigh each and record mass.
Setup	Connect a variable resistor to the negative terminal of a power supply then connect this to the cathode. Connect an ammeter to the positive terminal then connect this to the anode. Place both electrodes in a beaker of copper sulfate solution



Run the experiment	Switch the power supply on, adjust the variable resistor so the ammeter reads 0.2 A and leave for 20 minutes.
Record results	Carefully remove each electrode, rinse them with water and then with propanone. Re-weigh each and record.
Variations	Repeat the experiment with a current of 0.3 A, 0.4 A and 0.5 A.
Results	The anode loses mass whilst the cathode gains mass. The higher the current the greater the mass change.

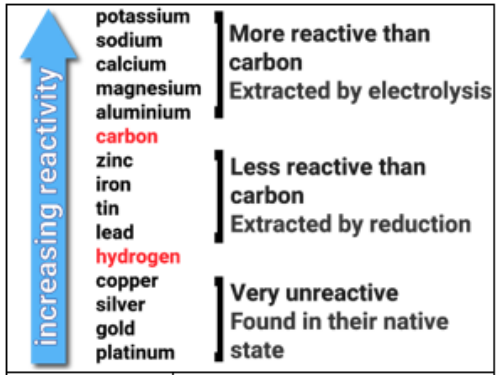
5. Reactivity		
potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt

Reaction with cold water	Metal + water → metal hydroxide + hydrogen Potassium, sodium and calcium
Reaction only with steam	Metal + water → metal oxide + hydrogen Magnesium, zinc, iron

Reaction with acid	Metal + acid → salt + hydrogen - Sodium, potassium – violent - Calcium, magnesium, zinc, iron – steady - Copper, silver, gold – no reaction
No reaction with water, steam or acid	Copper, silver, gold

6. Displacement reactions	
Displacement reactions	Reactions in which a more reactive metal displaces a less reactive metal from a salt *copper sulfate + zinc → zinc sulfate + copper*
Redox reactions	Reactions in which an oxidation and reduction happen at the same time, such as displacement reactions.
Redox during displacement	The more reactive metal gets oxidised, eg: $Zn \rightarrow Zn^{2+} + 2e^-$ The less reactive metal gets reduced, eg: $Cu^{2+} + 2e^- \rightarrow Cu$
Spectator ion	An ion that does not change during a chemical reaction.

7. Extracting metals from their ores	
Native state	When metals are found naturally in their pure form, such as silver and gold.
Ore	Rock containing enough of a metal compound to extract for profit. Normally oxides or sulphides of the metal.
Extracting metals by heating with carbon	For extracting metals less reactive than carbon, such as zinc, iron, copper. iron oxide + carbon → carbon dioxide + iron

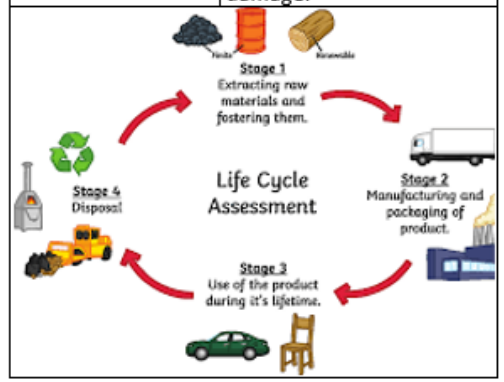


Extracting metals by electrolysis	Done with metals more reactive than carbon
Bioextraction	Using living organisms to extract metals.
Bioleaching	Growing bacteria on poor quality copper ore. The bacteria produce a solution of copper sulfate from which copper can be extracted by electrolysis.
Phytoextraction	Plants are grown that absorb metal compounds as they grow. The plants are then burnt to produce ash that is rich in metal compounds.

8. Oxidation and reduction	
Oxidation	Gaining oxygen
Reduction	Losing oxygen
Redox	When reduction and oxidation reactions happen together.
Reduction of iron	Iron produced from iron oxide by heating with carbon: *iron oxide + carbon → carbon dioxide + iron* Iron is reduced, carbon is oxidised.
Reduction of aluminium ore	Aluminium is produced from aluminium oxide by electrolysis: *Aluminium oxide → aluminium + oxygen* Aluminium is reduced, oxygen is oxidised
Corrosion	When metals slowly react with oxygen, making them weaker.

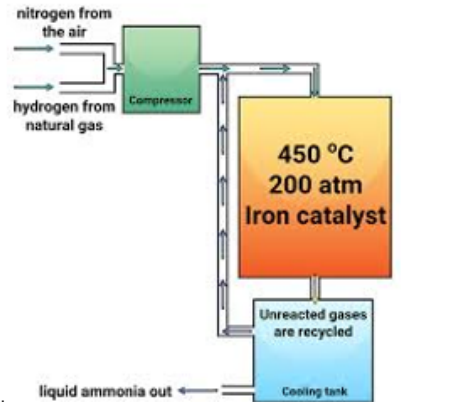
tarnish	A protective layer of oxide that stops the layers below from corroding.

9. Life-cycle assessment and recycling	
Recycling	Converting old waste metal into new metal that can be reused
Advantages of recycling	- Natural reserves last longer - Less pollution from mining - Less pollution from processing - Less waste in landfill - Often less energy used
Disadvantages of recycling	- Can be expensive - Can use a lot of energy in transporting, collecting and sorting
Life-cycle assessment (LCA)	Looks at environmental impact of all stages of a product's lifecycle. We should aim to reduce all damage.



10. Dynamic equilibrium	
Reversible reaction	Reactions that can go forwards as well as backwards
⇋	The arrow used for reversible reactions.
Dynamic equilibrium	The point at which the rate of the forwards reaction and backwards reaction are equal, so the concentrations of reactants and products stop changing.

Closed systems	Nothing can escape, so dynamic equilibrium can be reached.
Open systems	Gases can escape so dynamic equilibrium can't be reached.
Making ammonia	Nitrogen + hydrogen ⇋ ammonia $N_2 + 3H_2 \leftrightharpoons 2NH_3$
Haber process	Making ammonia in factories: Pressure - 200 atm Temperature - 450°C Iron

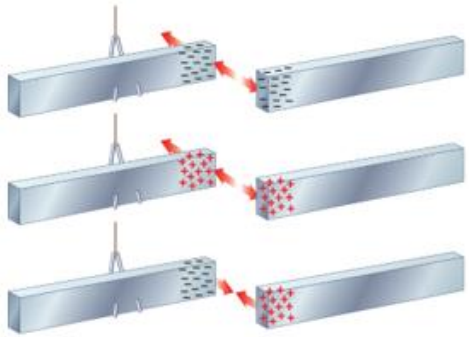
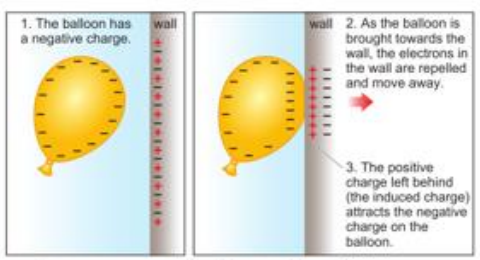


11. Changes to equilibrium systems (HT)	
Increasing temperature	Equilibrium shifts in the **endothermic** direction (to cool it down)
Decreasing temperature	Equilibrium shifts in **exothermic** direction (to heat it up)
Increasing pressure	Equilibrium shifts in the direction that forms fewer gas molecules (to reduce pressure)
Decreasing pressure	Equilibrium shifts in direction that forms more gas molecules (to increase pressure)
Increasing a concentration	Equilibrium shifts in direction that uses up the substance that has been increased
Decreasing concentration	Equilibrium shifts in direction that forms more of the substance that has been decreased.
Add a catalyst	No effect on equilibrium

Separate Physics SP11 : Static Electricity

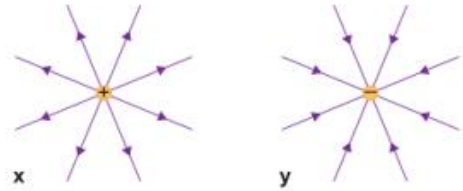
Lesson sequence

1. Charges and static electricity
2. Dangers and uses of static electricity
3. Electric fields

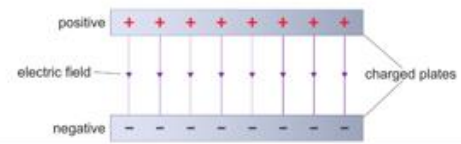
1. charges and static electricity	
Charge	Electron is negative, proton is positive
	
Induction	Eg. Positive charge made by a negatively charged object brought near to a neutral object
	
Insulator	Will not allow electrons to freely flow
Static electricity	Electric charges on the surface of an object

2. dangers and uses of static electricity	
discharge	Removal of electric charge by conduction
earthing	When charges flow to the Earth through a conductor
Electrostatic spraying	Droplets of liquid spray are given a charge

3 Electric fields	
Electric field	Space around electrically charged object where it affects other objects



Electrostatic field	Another term for electric field
Field lines	Show where forces are weaker or stronger and direction of the field
Force field	Space around something where a non contact force has an effect (magnetic, gravitational or electric)
Point charge	Charge with a very small volume, uniform sphere concentrated at centre
uniform	Same in all places



Sociology

Education knowledge organiser

Functionalist	Education is an important agency of socialisation, it maintains social stability and social cohesion. Prepares young people for working life and adulthood. Teaches specialist skills for work. Education is meritocratic.
Marxist	Prepares young people for a capitalist society. Education is not meritocratic. Encourages conformity and acceptance of social position. The hidden curriculum teaches young people the expectations of society.
Feminist	There are inequalities in the education system between boys and girls. It plays a role in socialisation of boys and girls. Even thought girls are outperforming boys, education still reinforces patriarchal views.

Why are independent schools favoured by some?	Why are state schools favoured by others?
• Lower teacher-student ratio which means smaller classes so students receive more attention • Resources/ facilities are better • Academic culture • Parental input, expectations and support tends to be higher	• Free and not based on ability • More socially mixed • Upward social mobility • Students do not have to travel far on a daily basis

The role of education in society.

1. The economic role-teaching skills for work.
Functionalists: Teaches skills and knowledge necessary for work. Preparation for real world.
Marxists: This is reinforcing the class system.

2. The selective role- Choosing the most able people for the most important jobs.
Functionalists: The system is a sieve. Meritocratic system, everyone has equal opportunities to succeed, those who work hard and achieve are rewarded with higher pay levels/status.
Marxists: Education does not provide equal opportunities. Designed to benefit the powerful. This is why working-class children underperform.

3. Social Control- teaching acceptance of rules and authority
Functionalists: Society must be regulated by rules. Schools are an agency of social control.
Marxists: Social control reflects social control in the wider society which benefits those in power.

4. The political role- teaching people to be effective citizens and creating social cohesion.
Functionalists: Acceptance of the political system and will exercise their rights wisely (voting)
Marxists: Only certain political opinions and ideas are tolerated, radical ideas are rejected.

The Hidden Curriculum:

1. **Hierarchy:** The hierarchy in school can be seen to reflect the structure of society and in the workplace.
2. **Competition:** School encourages competition between students e.g. sports, exam results.
3. **Social Control:** Rules, regulations, obedience and respect for authority.
4. **Gender role allocation:** teacher expectations and subject choice
5. **Lack of satisfaction:** Preparing students for boring, meaningless and repetitive jobs is a similar experience to employees at work,

Home education (home schooling): Teaching children at home rather than in a state or independent school. Parents or tutors usually carry this out. It is a legal option for people who with to provide a different learning environment or ethos to local schools. Recently raised issues around standards and impact on social development.

De-schooling: *Illich (1995)* argues that schools repress children and promotes passive conformity rather than developing creative individuals. He argues for de-schooling. School should be abolished and people should pursue knowledge and skills with like-minded individuals

Arguments **for** vocational education	Arguments **against** vocational education
• It will lead to a more skilled, better-qualified workforce that will make Britain more competitive • Functionalists believe it shows the importance the education system has to provide skills and expertise needed by industry & the economy.	• The emphasis on skills training disguises the fact that the problem is not that young people lack necessary skills for work it's that there is no work for skilled young people. • Marxists argue it is viewed as lower status compared to purely academic qualifications. • Seen as replicating the Tripartite system

Talcott Parsons-the school class as a social system (1961) (Functionalist)

- Schools prepare children for the same **universalistic standards**- the opposite of the **particularistic standards** from homelife.
- Schools promote a **value consensus**: encouraged to achieve high and the rewards encourage them to maximise their potential. Students are also competing on equal terms in the classroom.
- **Meritocracy:** students achievements are based on their abilities and efforts, not on social class, gender or ethnicity,
- **Role allocation:** matched to the correct job based on skill/knowledge.

Social Control: Formal
Discipline, punishment, school rules.

Social Control: Informal
Peer-group pressure, learning to live and work with others.

Pre-School (3-5 years). May be provided through the local authority or private.

Primary (5-11 years). Refers to both infant & junior schools.

Secondary (11-16 years). Most provided for by the state in comprehensive schools.

Further & Higher Education (16-18 years). Sixth Form, college or apprenticeships.

Key Sociologists

Emile Durkheim (1925) -Moral education (Functionalist)	**Bowles & Gintis (1976)-** schooling in capitalist America (Marxist)	**Ball, Bowe & Gewirtz (1994)- Parental Choice & Competition**	**Halsey, Heath & Ridge (1980)-**origins and destinations	**Ball (1981)-** Beachside Comprehensive	**Willis (1977)-** Learning to Labour (Marxist)
The major function of education is learning society's norms and values. Education provides the link between the individual and society. He believed that the school provides a context in which children learn to cooperate with those who are neither their kin nor their friends. Rules should be strictly enforced in order for children to learn self-discipline and to see that misbehaviour damages society as a whole.	The major role of education is the reproduction of labour power. There is a close relationship between the rules which govern the work place and the education system e.g. the creation of a hardworking, docile, obedient. They reject the view that capitalist societies are meritocratic and believe that class background is the most important factor influencing levels of attainment.	A study of fifteen schools in neighbouring areas with different population profiles (e.g. class and ethnicity). The study evaluates the impact of parental choice and the publication of league tables, e.g. the pressure to reintroduce streaming and setting and the tendency for some schools to focus on the more able.	The authors found evidence of clear class inequalities in education. They found that an individual from the service class, as compared to one from the working class, had four times as great a chance of being at school at 16. Whilst the chance of an individual from the service class attending university was eleven times greater than one from the working class.	This is a participant observation study. The study describes a school in the process of change and raises questions about the selection and socialisation experienced by two cohorts moving through the school, one banded by ability and the other taught in mixed ability classes.	He believes that education is not a particularly successful agency of socialisation and that education can have unintended consequences that may not be beneficial to capitalism. He described the existence of a counter culture, which was opposed to the values of the school. He concluded their rejection of the school made them suitable candidates for male dominated, unskilled or semi-skilled manual work.

Sociology

Education knowledge organiser

Types of Schools:

Comprehensive-One school for everyone	**Grammar School**- more academic	**Private Schools**- Charge fees	**Public Schools**- Older, more famous schools such as Eton & Harrow	**State Schools**- Free schools available for everyone of all abilities

Independent Schools- Public & Private Schools

Home education- teaching children at home using parents or tutors

Vocational education- work-related qualifications and training

Specialist schools- raise standards of achievement based on their strengths e.g. sport

Faith Schools- Schools that are run with a religious ethos

Academies- Taken out of local authority control. Private sponsors help to raise achievement

Free Schools- schools that can be set up and run by groups of parents, teachers, businesses etc.

Educational achievement

Social Class:
Statistics tend to show that the higher a student's social class background, the greater chance they have of achieving high educational qualifications.

Material deprivation: Costs of uniforms, sports kits and special materials may keep poorer children away from school.

Material environment: Living conditions such as poor housing, overcrowding, lack of privacy or quiet places to do homework adversely affect performance and attendance.

Parental attitudes:
Middle-class Values: Desire for control over their lives, emphasis on future planning, deferred gratification, individual achievement stress.
Working-class values- passive/fatalistic acceptance, emphasis on present or past, present gratification, collection action stressed.

Middle class parents know how to "work the system" such as how to hold disagreements with teachers, which educational resources to purchase. They may also expect more from their children and show more interest in their progress.

Social Capital: Middle-class children will socialise with children in a similar class to themselves. Their parents will be part of a network of social relationships that give them benefits e.g. friends with teachers, university lecturers, doctors etc.

Cultural Deprivation: A middle-class students upbringing may put them at an advantage over working-class students e.g. family visits to libraries, museums or holidays, homes filled with books, educational toys and electronic media are the norm in middle-class homes.

The School:
Teachers make judgments and classify students. These judgments can often affects a child's chances of educational achievement.

The 'self-fulfilling' prophecy If teachers have low expectations, or see a child as only being capable of reaching a certain level of academic achievement this can make students bring on their own 'self-image' into line with the teachers judgement.

The 'Halo effect' Judging a student as 'bright' while they tend to question the good performance of those children who are less well behaved.

Streaming Putting students into groups, based on assessment of general ability. This can lead to a "counter-culture".

Paul Willis- Learning to Labour- Anti School subculture

Gender:
Official statistics reveal some differences in educational achievement based on gender

Feminist Movement Change in attitudes towards women's roles and expectations- encouraging educational success and the ability to have a professional career.

Changing Job Opportunities Decreases in 'male' jobs in manufacturing and engineering, but an increase in 'female' jobs in the service industry.

Legal Changes The Sex Discrimination Act (1975) Raised awareness of equal opportunities.

Subject Choice. Gender stereotyping in textbooks, or role models of teachers in certain subject areas (male dominated maths & science) and continued gender stereotyping by teachers.

Ethnicity:
Statistics show some ethnic groups under achieve, whilst others over achieve.

Home and Social Class background. Class position may influence achievement dependant on the types of work offered to particular groups. In other words there is a 'doubling up' of factors. Some differences could be accounted for due to class and home life.

Teachers expectations. Some teachers may have higher or lower expectations of certain ethnic groups.

Parental expectations. Some research into different ethnic groups has concluded that some groups put more pressure on their children achieving at school, whilst others show less interest. Some have experienced poor education in their home countries and may therefore have a strong desire to help their children's education more. However, a poor education may results in a lack of ability to help their children with homework.

Cultural differences. Cultural norms and values may be different to 'mainstream' British norms and values. The language spoken at home may also be an important factor.

The Hidden Curriculum. It is argued that certain subjects are biased towards white European culture. Some books may present stereotypical images of some minority groups.

1944 Butler Education Act
- Equal chance to develop talents, free state run education
- Introduction of a meritocratic system in which children received an education based on their academic ability rather than the ability of their parents to pay.
- Introduction of the 11+ exam and the Tripartite System:
  - Secondary Modern
  - Secondary Technical
  - Grammar

1965: The Comprehensive System
- One school for everyone- all abilities and social classes.
- No labelling as a failure, seen as fairer.
- Each school has a specific 'catchment'

1988 Education Act
- Introduction of the marketisation of education- consumer choice and competition. Focus on parental choice, funding based on student numbers and more freedom for schools.
- The introduction of the National Curriculum- core subjects for ages 5-16.
- Introduction of testing- GCSE examination.

1997 New Labour Educational Policy
- Raising Standards: providing nursery places for 3-4 year olds, reducing class sizes, national literacy & numeracy schemes, 'special measures', 'value-added' feature on league tables.
- Reducing inequality: introduction of Educational Maintenance Allowance (EMA), Aim Higher Programme, The Sure Start programme and Connexions.
- Promoting Diversity & Choice- Introduction of specialist and faith schools.

Since 2010 educational policies.
- New style academies
- Free Schools
- Pupil Premium

SPANISH Module 8

Una dieta sana	*A healthy diet*
los alimentos	*foods*
Lácteos	*milk products*
carne, pescados y huevos	*meat, fish and eggs*
frutas y verduras	*fruit and vegetables*
Cereales	*cereals*
Fideos	*noodles*
Grasas	*fats*
Dulces	*sugars / sweet things*
Legumbres	*pulses*
frutos secos	*nuts and dried fruit*
los nutrientes	*nutrients*
Proteínas	*proteins*
Minerales	*minerals*
Grasa	*fat*
Sal	*salt*
Vitaminas	*vitamins*
Azúcar	*sugar*
Gluten	*gluten*
el sabor	*taste*
vegetariano / vegano	*vegetarian / vegan*
saludable / sano / malsano	*healthy / healthy / unhealthy*
(No) Tengo hambre / sed / sueño.	*I am (not) hungry / thirsty / tired.*
tiempo para cocinar	*time to cook*
contiene / contienen	*it contains / they contain*

La fibra...	*Fibre...*
protege contra el cáncer	*protects against cancer*
combate la obesidad	*combats obesity*
reduce el riesgo de enfermedades	*reduces the risk of diseases*
evitar comer / beber...	*avoid eating / drinking...*
cambiar mi dieta	*change my diet*
llevar una dieta equilibrada	*have a balanced diet*
preparar con ingredientes frescos	*prepare with fresh ingredients*
Engordar	*to put on weight*
saltarse el desayuno	*to skip breakfast*
practicar más deporte	*to do more sport*

Suelo Intento	comer beber evitar	mucho/a/os/as... demasiado/a/os/as... tanto/a/os/as...
(No) Se debe Es importante Es necesario Es esencial Hay que		
porque / aunque contiene(n)	mucho/a poco/a demasiado/a	azúcar fibra grasa sal
	muchos/as pocos/as demasiados/as	minerales proteínas vitaminas

The **pluperfect** is used to talk about what someone had done, referring to a past action which happened earlier than another action.

	haber	**past participle**
(yo)	había	
(tú)	habías	
(él/ella/usted)	había	trabaj**ado**
(nosotros/nosotras)	habíamos	quer**ido**
(vosotros/vosotras)	habíais	viv**ido**
(ellos/ellas/ustedes)	habían	

Remember that some past participles are irregular:

hacer → ***hecho*** (done) ***ver*** → ***visto*** (seen)

poner → ***puesto*** (put) ***decir*** → ***dicho*** (said)

¡Vivir a tope!	*Live life to the full*
Beber alcohol...	*To drink / Drinking alcohol...*
Fumar cigarrillos / porros...	*To smoke / Smoking cigarettes / joints...*
Tomar drogas blandas / duras...	*To take / Taking soft / hard drugs...*
Es / No es...	*It is / isn't...*
ilegal / peligroso	*illegal / dangerous*
un malgasto de dinero	*a waste of money*
una tontería / un problema serio	*stupid / a serious problem*
un vicio muy caro	*an expensive habit*
muy perjudicial para la salud	*very damaging to your health*
tan malo	*as bad*
provoca mal aliento	*causes bad breath*
daña los pulmones	*damages the lungs*
mancha los dientes de amarillo	*stains your teeth yellow*
causa el fracaso escolar / depresión	*causes failure at school / depression*
produce una fuerte dependencia	*produces a strong, physical*
física	*dependence*
tiene muchos riesgos	*has many risks*
afecta a tu capacidad para tomar	*affects your capacity to make*
decisiones	*decisions*
te relaja / te quita el estrés	*relaxes you / relieves stress*
te quita el sueño / control	*robs you of sleep / self-control*
te hace sentir bien / más adulto	*makes you feel good / more adult*
Es fácil engancharse.	**It is easy to get hooked.**
¡Qué asco!	How disgusting!
Cedí ante la presión de grupo.	I gave in to peer pressure.
Caí en el hábito de...	I fell into the habit of...
Empecé a...	I started to...
Perdí peso.	I lost weight.
No puedo parar.	I can't stop.
Ya he empezado a...	I've already started to...
Todavía no he dejado de...	I still haven't given up...
A partir de ahora intentaré...	From now on I will try to...

Una / Otra desventaja es...	*A / Another disadvantage is...*
el riesgo de ataques terroristas	*the risk of terrorist attacks*
el tráfico	*the traffic*
el dopaje	*Doping*
la deuda	*the debt*
el coste de organización de la seguridad	*the cost of organising the security*
la ciudad anfitriona	*the host city*
el voluntariado	*Volunteering*
Solicité un trabajo voluntario	*I applied for a volunteering job*
porque...	*because...*
(Nunca) Había sido...	*I had (never) been...*
Antes ya había trabajado como...	*Previously I had already worked as...*

¡El deporte nos une!	*Sport unites us!*
¿Para qué sirven...?	*What are...for?*
los eventos deportivos internacionales	*international sporting events*
los grandes acontecimientos deportivos	*big sporting events*
los Juegos Paralímpicos / Olímpicos	*the Paralympics / Olympics*
la Copa Mundial del Fútbol	*he Football World Cup*
Sirven para...	*They serve to...*
promover...	*promote / foster / encourage...*
la participación en el deporte	*participation in sport*
el espíritu de solidaridad	*team spirit*
regenerar los centros urbanos	*regenerate city centres*
elevar el orgullo nacional	*increase national pride*
transmitir los valores de respeto y disciplina	*convey / instil the values of respect and discipline*
unir a la gente	*unite people*
dar un impulso económico	*give a boost to the economy*
inspirar a la gente	*inspire people*

SPANISH Module 5

En mi ciudad	*In my town*
Hay… / Mi ciudad tiene…	*There is/are… / My town has…*
un ayuntamiento	*a town hall*
un bar / muchos bares	*a bar / lots of bars*
un castillo (en ruinas)	*a (ruined) castle*
un cine	*a cinema*
un mercado	*a market*
un museo / unos museos	*a museum / a few museums*
un parque	*a park*
un polideportivo	*a sports centre*
un puerto	*a port*
muchos restaurantes	*lots of restaurants*
un teatro	*a theatre*
una biblioteca	*a library*
una bolera	*a bowling alley*
una iglesia	*a church*
una piscina	*a swimming pool*
una playa / unas playas	*a beach / a few beaches*
una Plaza Mayor	*a town square*
una pista de hielo	*an ice rink*
una oficina de Correos	*a post office*
una tienda / muchas tiendas	*a shop / lots of shops*
muchos lugares de interés	*lots of sights*
algo / mucho que hacer	*something / a lot to do*
no hay nada que hacer	*there is nothing to do*

Vivo en un pueblo…	*I live in a … village*
histórico / moderno	*historic / modern*
tranquilo / ruidoso	*quiet / noisy*
turístico / industrial	*touristy / industrial*
bonito / feo	*pretty / ugly*
Está situado/a en … del país.	*It is situated in … of the country.*
el norte / el sur / el este / el oeste	*the north / the south / the east / the west*

¿Por dónde se va al / a la…?	*How do you get to the…?*
¿Dónde está el / la…?	*Where is the…?*
¿El / La …. está cerca / lejos?	*Is the …nearby / far away?*
sigue todo recto	*go straight on*
gira a la derecha / izquierda	*turn right / left*
toma la primera / segunda / tercera	*take the first / second / third*
calle a la derecha / a la izquierda	*road on the right / left*
pasa el puente / los semáforos	*go over the bridge / the traffic lights*
cruza la plaza / la calle	*cross the square / the street*
coge el autobús número 37	*take the number 37 bus*
está…	*it is…*
en la esquina / al final de la calle	*on the corner / at the end of the street*
al lado del museo / enfrente de…	*next to the museum / opposite…*

En la oficina de turismo	*At the tourist office*
¿Me puede dar…?	*Can you give me…?*
un plano de la ciudad	*a map of the town / city*
más información sobre…	*more information about…*
¿Cuánto cuesta una entrada?	*How much is a ticket?*
para adultos / niños	*for adults / children*
¿Dónde se pueden sacar las entradas?	*Where can you get tickets?*
¿A qué hora…?	*What time…?*
sale el autobús?	*does the bus leave?*
abre…?	*does…open?*
¿Hay visitas guiadas?	*Are there guided tours?*
¿Me puede recomendar…?	*Can you recommend…?*
un restaurante típico	*a typical restaurant*
un hotel / una excursión	*a hotel / a trip*

¿Qué haremos mañana?	*What will we do tomorrow?*
Sacaré muchas fotos.	*I will take lots of photos.*
Subiremos al teleférico.	*We will go up on the cable car.*
Bajaremos a pie.	*We will go down on foot.*
Pasaremos entre las nubes.	*We will go through the clouds.*
Iremos a la playa / a la montaña / de excursión en barco.	*We will go to the beach / to the mountains / on a boat trip.*
Haremos piraguïsmo.	*We will go canoeing.*
Podremos hacer paddlesurf.	*We will be able to go paddlesurfing.*
Podrás comprar regalos.	*You will be able to buy presents.*
será genial / mejor	*it will be great / better*
nos llevará	*he/she will take us*
Estoy (muy) a gusto.	*I am feeling (very much) at home.*
¡Buena idea!	*Good idea!*
de acuerdo	*OK*
¡Qué pena! / ¡Qué mal (rollo)!	*What a shame! / What a nightmare!*
¡Qué triste!	*How sad!*

¿Cómo es tu zona?	What is your area like?
está situado/a en un valle	*it is situated in a valley*
entre el desierto y la sierra	*between the desert and the mountqinw*
al lado del río / mar Mediterráneo	*by the river / Mediterranean sea*
Está…	*It is…*
rodeado/a de volcanes / sierra	*surrounded by volcanoes / mountains*
lleno/a de bosques / selvas	*full of woods / forests*
a … metros sobre el nivel del mar	*at… metres above sea level*
Tiene…	*It has…*
unos impresionantes paisajes Naturales	*some amazing natural landscapes*
varias influencias culturales	*various cultural influences*
el bullicio de una ciudad	*the hustle and bustle of a city*
El clima es…	*The climate is…*
soleado / caluroso / seco / templado / frío	*sunny / hot / dry / mild / cold*
llueve (muy) poco / a menudo	*it rains (very) little / often*
en primavera / verano / otoño / invierno	*in spring / summer / autumn / winter*
hay mucha marcha	*there is lots going on*

Es…	*It is…*
mi ciudad natal / mi lugar favorito	*My home town / my favourite place*
acogedor/a / atractivo/a	*welcoming / attractive*
famoso/a / conocido/a por	*famous for / well-known for*
una región muy húmeda	*a very humid region*
una zona muy montañosa / Pintoresca	*a mountainous / picturesque area*
tan fácil desplazarse	*so easy to get around*
Se puede…	*You / One can…*
estar mucho tiempo al aire libre	*spend lots of time in the open air*
subir a la torre	*go up the tower*
hacer un recorrido en autobús	*do a bus tour*
disfrutar de las vistas / del ambiente	*enjoy the views / the atmosphere*
viajar en el AVE	*travel on the AVE high-speed train*
pasear por los lagos artificiales	*go boating on the artificial lakes*
apreciar la arquitectura variada	*appreciate the variety of architecture*
aprovechar el buen tiempo	*make the most of the good weather*
Se pueden…	*You / One can…*
probar platos típicos	*try local dishes*
practicar deportes acuáticos	*do water sports*
ver edificios de estilos muydiferentes	*see buildings with very different styles*
alquilar bolas de agua	*hire water balls*
practicar senderismo y ciclismo	*go hiking / trekking and cycling*

Highly frequent verbs

Preterite		Imperfect		Present		Immediate future		Future		Conditional	
fui	*I was*	**era**	*I used to be*	**soy**	*I am*	**voy a ser**	*I am going to be*	**seré**	*I will be*	**sería**	*I would be*
fue	*S/he/it was*	**era**	*s/he/it used to be*	**es**	*S/he/it is*	**va a ser**	*You are going to be*	**será**	*S/he will be*	**sería**	*S/he would be*
fuimos	*We were*	**éramos**	*We used to be*	**somos**	*We are*	**vamos a ser**	*We are going to be*	**seremos**	*We will be*	**seríamos**	*We would be*
fueron	*They were*	**eran**	*They used to be*	**son**	*They are*	**van a ser**	*They are going to be*	**serán**	*They will be*	**serían**	*They would be*
hice	*I did*	**hacía**	*I used to do*	**hago**	*I do*	**voy a hacer**	*I'm going to do*	**haré**	*I will do*	**haría**	*I would do*
hizo	*S/he did*	**hacía**	*S/he used to do*	**hace**	*S/he does*	**va a hacer**	*S/he is going to do*	**hará**	*S/he will do*	**haría**	*S/he would do*
hicimos	*We did*	**hacíamos**	*We used to do*	**hacemos**	*We do*	**vamos a hacer**	*We are going to do*	**haremos**	*We will do*	**haríamos**	*We would do*
hicieron	*They did*	**hacían**	*They used to do*	**hacen**	*They do*	**van a hacer**	*They are going to do*	**harán**	*They will do*	**harían**	*They would do*
fui	*I went*	**iba**	*I used to go*	**voy**	*I go*	**voy a ir**	*I'm going to go*	**iré**	*I will go*	**iría**	*I would go*
fue	*S/he went*	**iba**	*S/he used to go*	**va**	*S/he goes*	**va a ir**	*S/he is going to go*	**irá**	*S/he will go*	**iría**	*S/he would go*
fuimos	*We went*	**íbamos**	*We used to go*	**vamos**	*We go*	**vamos a ir**	*We are going to go*	**iremos**	*We will go*	**iríamos**	*We would go*
fueron	*They went*	**iban**	*They used to go*	**van**	*They go*	**van a ir**	*They are going to go*	**irán**	*They will go*	**irían**	*They would go*

SPANISH

	Si + presente + futuro	***If + present + future***
(1st Type)	**Si tengo dinero, lo gastaré en ropa.**	*If I have money, I will spend it on clothes.*
	Si hace buen tiempo, iremos a la playa.	*If the weather is nice, we will go to the beach.*
	Si no llueve, iré al trabajo a pie.	*If it doesn't rain, I will go to work on foot.*
	Si + Imperf subj + condicional	***If + imperfect subjunctive + conditional **Hypothetical situation*****
(2nd Type)	**Si pudiera, trabajaría en España.**	*If I could, I would work in Spain.*
	Si tuviera dinero, compraría una casa enorme y moderno.	*If I had the money, I would buy an enormous modern house.*
	Si fuera rico/a, viviría en una mansión.	*If I were rich, I would live in a mansion.*
	Si + pluperfe subj + condicional pasado	***If + pluperfect subjunctive + past conditional **Hypothetical situation in the past *****
(3rd Type)	**Si hubiera podido ir, habría trabajado de azafata.**	*If I had been able to, I would have worked as an air steward.*
	Si hubiera tenido dinero, me habría comprado un coche.	*If I had had the money, I would have bought a car.*
	Si hubiera sido rico/a, habría vivido en una mansión con vistas al mar.	*If I had been rich, I would have lived in a mansion with sea views.*