YEAR 10

Knowledge ORGANISER

2025-26

SEMESTER 2

WHO CAN I GET *support* FROM?

You can also speak to your check-in tutor, all your subject teachers, your PD teacher and all your pastoral staff: Miss Leonard, Miss Howe, Mr Sykes. If you are unable to speak to any member of staff, please contact:
studentsupport@bentonpark.mlt.co.uk

My Year 10 Leader
Mrs Sykes

KEY STAGE LEADER
Miss Dobby

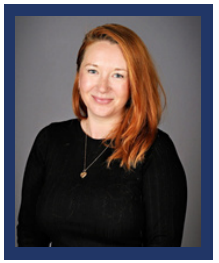
MY SLT LINK
Miss Taylor

OTHER YEAR LEADERS

Year 7 – Miss Downing

Year 8 – Miss Bannister

YEAR 9 - MISS CHARLTON



Designated Safeguarding Lead / Assistant Headteacher
Mrs Howard

KS4 Safeguarding Officer
Mrs Kelly

SENCo / Assistant Headteacher
Miss Tyldsley

Key Stage 3 Leader
Mrs Collins

HOME-SCHOOL *Communication* LOG

DATE	NOTE

SUBJECT: English Language Paper 2 **YEAR:** 10

TOPIC: Writers' Viewpoints and Perspectives **SEMESTER:** 2

WORD REVOLUTION

Viewpoint Perspective	The perspective from which the story is narrated.
Anecdote	A short story about a real incident or person
Rhetorical questions	A question asked for effect, not requiring an answer. *Surely you can see that this is unacceptable?*
Emotive language	Language used to evoke anger, sympathy, guilt, hope etc in the audience
Superlatives	Tallest, smallest, most interesting, least important, best, worst
Tripling	Also known as rule of three. Three related elements used together.
Cohesion	Connected ideas and paragraphs for a clear, organised text.
Audience	Who the intended listener/reader is of the text
Form	What you are being asked to write; a letter, an article or a speech.
Personal pronouns	I, you, us, we, our
Imperatives	Language used to give instructions or commands. *You must take action on this issue.*
Modal verbs	Must, shall, might, may, should, would, could, can.

Section A Reading 40 marks total	**Two thematically linked texts: one non-fiction text and one literary non-fiction text** Questions: 1 short form question (x4 marks) 2 longer form questions (1 x8 marks, 1 x12 marks) 1 extended question (1 x 16 marks)
Section B Writing 40 marks	A **single writing task** related to the theme of section A. It will specify **audience, purpose and form**, and will use a range of opinions, statements and writing scenarios to provoke a response. You will be asked to write a **letter, article or speech.** (24 marks for content and organisation, 16 marks for technical accuracy)

Language techniques to present a viewpoint

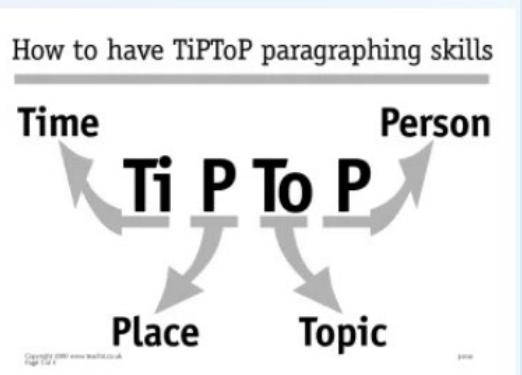
D – Direct address
A – Alliteration and anecdotes
F – Facts and figures
O – Opinions
R – Rhetorical questions and repetition
E – Emotive language and experts
S - Statistics
T - Tripling
S - Superlatives

Sentence types

- Do you ... then you should sentence
- More, more, more sentence
- If, if, if sentence
- Not only, but also sentence
- 'Imagine this' sentence
- Scenario, question, answer sentence
- What if sentence
- Triple noun sentence
- Triple adjective sentence
- Ask yourself a question sentence
- 'If you ask me' sentence
- The last word, first word sentences.

Sentence Structures

Simple	An independent clause.	There is no excuse for this.
Compound	Two independent clauses joined by a conjunction	We will fight and we will win.
Complex	One independent clause + one or more subordinate clauses.	Without significant changes, there is no hope for this organisation.
Minor	Used for effect.	What nonsense!
Exclamatory	Express a strong emotion.	This is a ridiculous situation!
Interrogative	Asks a question.	How can you allow this?
Declarative	States a fact or opinion.	This has been the case since 2022.



SUBJECT: English Language Paper 2 YEAR: 10

TOPIC: Writers' Viewpoints and Perspectives SEMESTER: 2

Reading Assessment Objectives	**AO1** - Identify and interpret explicit and implicit information and ideas **AO2** - Explain, comment on and analyse how writers use language and structure to achieve effects and influence readers, using relevant subject terminology to support their views. **AO3** - Compare writers' ideas and perspectives, as well as how these are conveyed, across two or more texts. **AO4** - Evaluate texts critically and support this with appropriate textual references.
Writing Assessment Objectives	**AO5** - Communicate clearly, effectively and imaginatively, selecting and adapting tone, style and register for different forms, purposes and audiences. Organise information and ideas, using structural and grammatical features to support coherence and cohesion of texts **AO6** - range of vocabulary and sentence structures for clarity, purpose and effect, with accurate spelling and punctuation

Writing form that you could be asked to write in Section B

Features of a letter

- Address Top Right
- Date below Address
- *Dear … Mr/Sir/Madam*
- *To whom it may concern …*
- Named Recipient: *Yours sincerely,*
- Unnamed Recipient: *Yours faithfully,*

Features of an article

- Catchy Headline
- You **can** use sub-headings.
- Aim for strong opening and closing statements.
- Link your paragraphs, especially the first and last one.
- Use 'quotations'!
- Imagine it will be printed in a newspaper.

Features of a speech

- Welcome! Thanks.
- Strong opening and closing statements.
- Use all your persuasive rhetoric (DAFORREST)
- Imagine standing and giving a speech in the assembly hall. Strong closing statement: link it back to the beginning!

Synonyms	
Unforgivable	Inexcusable, unjustifiable, indefensible
Relentless	Persistent, continuous, unabated
Change	Revision, modification,
Unbelievable	Incredible, inconceivable, unthinkable
Consider	Contemplate, examine
Unacceptable	Unforgivable, disgraceful, intolerable

Model response for Section B -

Welcome everyone.

Today, we stand united against the tyranny that has oppressed us for far too long. Our world, once vibrant and free, has been plunged into darkness by those who seek to control every aspect of our lives. But we are not powerless. We are the spark that will ignite the flames of change.

Look around you. See the faces of those who have suffered, who have lost loved ones, who have been denied their basic rights. We fight not just for ourselves, but for them, for the future generations who deserve to live in a world of freedom and hope.

If asked to write a speech, imagine standing in front of an audience and delivering this. You need to engage them and involve them.

SUBJECT: ENGLISH LITERATURE PAPER 2 **YEAR:** 10

TOPIC: POWER & CONFLICT POETRY Cluster 3 Nature **SEMESTER:** 2

WORD REVOLUTION	
dramatic monologue	A poem or speech where a single character speaks to a silent listener.
speaker	The voice or persona telling the poem; not always the poet themselves.
tone	The attitude or mood expressed by the speaker, such as angry, joyful, or sad.
sibilance	The repetition of soft 's' or 'sh' sounds in words, often creating a hissing effect.
plosives	Harsh sounds made by letters like **p**, **b**, **t**, and **d**, often used for impact.
stanza	A group of lines in a poem, like a paragraph in prose.
anaphora	Repeating the same word or phrase at the beginning of successive lines.
juxtaposition	Placing two contrasting ideas or images close together to highlight their
volta	A sudden shift or change in tone, argument, or perspective in a poem,
sonnet	A 14-line poem with a specific rhyme scheme, often about love or deep
rhyming couplet	Two lines of poetry that rhyme and usually have the same rhythm.
Romantic poetry	Poetry from the Romantic era (late 18th–early 19th century) focusing on
irony	When the opposite of what is expected happens, or when words mean
Iambic pentameter	A type of rhythm in poetry where each line has 10 syllables, made up of 5 pairs.

KEY QUESTIONS	What perspective is the poem written from? What historical factors are important in helping us to understand the poem? How is the poem relevant today? What ideas about power are explored in the poem? What are the key methods used to convey ideas? Why are they effective?
ASSESSMENT OBJECTIVES	**AO1** – Develop a personal response to set poems, supporting ideas with evidence and using appropriate terminology. **AO2** – Comment on the effect of form, structure and language features used **AO3** – Comment on key ideas and messages and understand how poems relate to the context in which they were written.

What is POWER?

Power can take many different forms and lots of the poems in the anthology explore different ideas relating to power and how it can be used or abused. Some ideas in the first cluster of poems we cover include: the power of rulers and institutions, patriarchal power, the power of nature, the powerlessness of the working classes, physical power and violence.

Language for analysis

The use of _____ creates a feeling of…
The poet uses _____ to create the effect of…
The word _____ has connotations of…
The structure of the poem helps to reinforce its message because…
The title of the poem is significant because…
The poet could be suggesting that…
Alternatively, this could also be interpreted as…

Language for comparison

When poems have similarities:
Similarly… Both poems convey / address…
Both poets explore / present… This idea is also explored in… In a similar way, … Likewise, …
When poems have differences
Although… Whereas… Whilst… In contrast, …
Conversely, … On the other hand, …
On the contrary, …
Unlike…

How could this image relate to each poem?

SUBJECT: English Literature Paper 2 **YEAR: 10**

TOPIC: Storm on the Island – Seamus Heaney **SEMESTER: 2**

Summary:	**"Storm on the Island" by Seamus Heaney** describes the experience of people living on a small, exposed island as they face a powerful storm. The speaker uses the collective voice ("we") to emphasise the shared experience of the community. At first, the islanders appear confident and prepared: their houses are built strong and there are no trees to be blown down. However, as the storm arrives, the wind and sea become increasingly violent and threatening. The storm is portrayed as **unpredictable and invisible**, attacking from all directions and creating fear through sound and force rather than sight. Military imagery is used to present nature as an enemy, suggesting that the wind "dives and strafes" like a fighter plane. Despite human preparation, the poem shows that **nature is far more powerful than people**, and the islanders feel helpless as they are "bombarded by the empty air."
Context:	Heaney was born in 1939 as a Catholic in Northern Ireland, at a time when Catholics were essentially the 'underclass' as they still lived under the rule of the Protestant government. They faced discrimination and persecution from the government and police, and although the civil rights movement did not gain its full momentum until after Heaney wrote the poem, there was a strong political movement again the injustice against the Irish Catholics which included the 'Border Campaign' between 1956 and 1962. Heany lived through this ongoing battle to overthrow British rule and reunite Ireland under Irish rule. The first eight letters of the title of the poem spell out 'Stormont', the name of the building which housed the Parliament of Northern Ireland when Heaney wrote the poem.

Poetic devices used in the poem

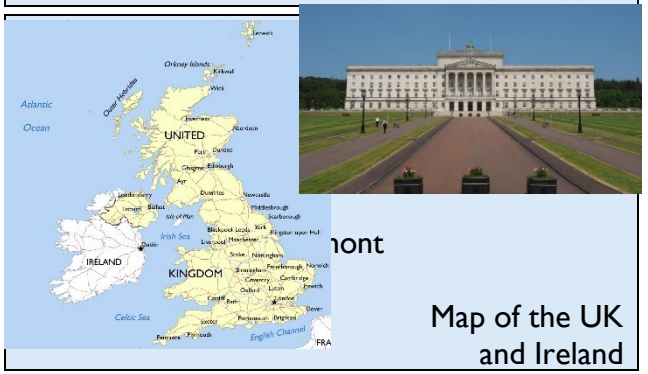
Personification	'the wizened earth'
Military imagery	'exploding', 'strafes', 'bombarded', 'salvo', 'blast'
Auditory imagery	'blast', 'chorus', 'listen', 'exploding'
Collective pronouns	'we are prepared', 'we build our houses squat'
Simile	'spits like a tame cat turned savage'
Juxtaposition	'exploding comfortably'
Semantic field	'trees', 'sea', 'hay', 'natural', 'leaves', 'branches'
Enjambment	'Nor are there trees/ Which might prove company when it blows full blast'

"We sit tight while wind dives / And strafes invisibly"

Key messages from the poem

In *Storm on the Island*, Heaney presents nature as an overwhelming force that exposes human vulnerability. Although the islanders believe they are prepared, with strong, well-built houses and shared experience, the storm reveals the limits of human control. The wind's power is most frightening because it is largely invisible, creating fear through sound and force rather than sight.

Through violent, military imagery, Heaney shows nature as unpredictable and aggressive, ultimately undermining human confidence and reminding the reader that even careful preparation cannot protect people from the power of the natural world. The poem can also be interpreted as an **allegory** for political tensions in Northern Ireland, commonly referred to as "**The Troubles**", where the islanders can be understood to represent the Irish people and the storm represents oppressive British rule, and the brutality of war and conflict in general.



Map of the UK and Ireland

SUBJECT: English Literature Paper 2 **YEAR:** 10

TOPIC: Kamikaze - Garland **SEMESTER:** 2

Summary:	A poem about a kamikaze pilot who returns home and faces rejection. In this narrative poem, Beatrice Garland explores the testimony of the daughter of a kamikaze pilot. Unlike many of his comrades, this pilot turns back from his target and returns home. The poem vividly explores the moment that the pilot's decision is made and sketches out the consequences for him over the rest of his life. Not only is he shunned by his neighbours but his wife refuses to speak to him or look him in the eye. His children, too, gradually learn that he is not to be spoken to and begin to isolate and reject him.
Context:	During the Second World War, the term 'kamikaze' was used for Japanese fighter pilots who were sent on suicide missions. They were expected to crash their war planes into enemy warships. The word 'kamikaze' literally translates as 'divine wind'. Beatrice Garland's poem reflects the immense social pressure brought to bear on the pilots to carry out kamikaze missions as part of Japan's war effort during World War Two.

Poetic Devices used in Kamikaze

Enjambment	Supports the conversational tone
Repetition	'Must have'
Sibilance	'dark shoals of fishes / flashing silver as their bellies / swivelled towards the sun'
First person	The daughter speaks directly in the final two stanzas
Third person	Reporting what the daughter says about her father
Natural imagery	'green blue translucent sea', 'loose silver'
Juxtaposition	Safe return of the grandfather / shameful return of the father
Irony	'they treated him as if he no longer existed'

Key vocabulary:
Embark (verb): To start something; to leave on a trip
Incantations (noun): Words used in a chant or to cast a spell
Translucent (adjective): partially see through
Arching (verb): To move in a curved path
Shoals (noun): A large group of fish
Cairn (noun): A heap of stones built as a memorial or landmark
Turbulent (adjective): Moving unsteadily; not stable

Message of the poem

The poem perhaps prompts us to think about the impact of war on those not directly involved. Kamikaze addresses the effects on a family unit and the consequences of suicide missions for families in the modern world as well as in past conflicts. Although the pilot chose to avoid dying in the war, his family still lose him and the daughter's statement that he *'was no longer the father that we loved'* hints at the pain that this emotional loss caused both the pilot and his family.
The poem can also be seen as a critique of government propaganda. Garland shows the destructive impact that patriotism can have by presenting that shame that the family felt when the father returned home, rather than joy.

A kamikaze plane

SUBJECT: ENGLISH LITERATURE PAPER 2 YEAR: 10

TOPIC: Extract from *The Prelude* – Wordsworth SEMESTER: 2

Summary	*Extract from The Prelude* is an autobiographical poem in which William Wordsworth secretly takes a boat out on a lake at night. At first, he feels confident and excited, enjoying the calm beauty of nature and believing he is in control. The water is still, the moonlight is peaceful, and the experience feels magical. However, this mood changes dramatically when a huge mountain suddenly appears to rise up behind him. The mountain seems alive and threatening, symbolising the immense power of nature. This frightens Wordsworth, making him feel small, guilty, and overwhelmed. He realises that nature is far more powerful than humans and cannot be controlled. After this encounter, the poet explains how the experience affects him long after it ends. He feels disturbed and anxious, and even familiar sights and sounds seem frightening. This shows how deeply the event has shaped his understanding of the world.
Context	Overall, the poem explores themes of **the power of nature**, **loss of innocence**, and **the impact of childhood experiences**. Wordsworth suggests that nature plays an important role in teaching humans humility and shaping their emotional and spiritual development. Wordsworth was a **Romantic poet**, and Romanticism was a literary movement that began in the late 18th century. Romantic poets believed: • Nature is powerful, important, and spiritually meaningful • Emotions and personal experiences matter more than reason or science • Childhood experiences strongly shape who we become

POETIC DEVICES

Wordsworth employs **rich sensory description** to evoke and sense of place and atmosphere.
The poem is written in **blank verse** with lines of **iambic pentameter** to emulate everyday speech.
The **metaphor** of a 'fairy boat' makes the scene seems magical and otherworldly.
He **personifies** nature as a goddess or maternal force and the mountain as powerful and in control.
The **volta** introduces a complete change in tone; it becomes darker after a carefree start.
The **natural imagery**

<u>Key Vocabulary</u>:
Stealth (noun)- Secrecy
Pinnace (noun)– A small boat
Lustily (adverb) - Enthusiastically
Elfin (adjective) – Something small and delicate
Covert (noun) - Shelter
Bark (noun) – An old type of sailing boat

IDEAS & MESSAGES

The poem has different **tones –** at first, fairly light and carefree, then it becomes darker and ends reflectively.
The poem is a **first person narrative** because it is about a key moment in Wordsworth's life.
The narrator's initial confidence in himself and the world around him is shaken.
Nature is shown to be more powerful than humans.
The narrator has awe and respect for nature, but is also scared by it.
The narrator is changed by his experience.
His thoughts and dreams are troubled by his experience.
Nature is not just beautiful and gentle; it can have a powerful effect on humans.

'One night (led by her) I found a little boat'

How will I be assessed?	**Paper 2 English Literature** – One essay question comparing two poems on a similar theme. One poem will be named in the question and printed in the exam paper, the other is your own choice. *e.g. Compare how writers present ideas about the power of nature in 'Storm on the Island' and one other poem (30 marks)*

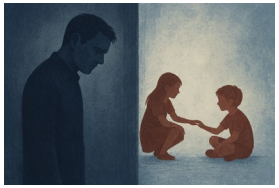
Exemplar paragraph	What makes it successful?
Both *'Storm on the Island'* and *'Extract from The Prelude'* present nature as an overwhelming and dominating force that challenges human confidence. In *'Storm on the Island'*, Heaney portrays nature's power as relentlessly aggressive through violent imagery such as "**bombarded by the empty air**," suggesting that even something invisible like wind becomes weapon-like, making the islanders feel under attack. The use of militaristic language emphasises humanity's vulnerability and conveys how nature strips people of control. Similarly, in *'The Prelude'*, Wordsworth presents nature as powerful and terrifying when the speaker encounters the "**huge peak, black and huge**," which suddenly appears and induces fear. The repetition of "huge" highlights the mountain's overwhelming presence, while personification makes nature seem alive and threatening.	▪ Clear, focused point. ▪ Names the writer and focuses on his intentions. ▪ Short, embedded quotations. ▪ Comments on big ideas / messages. ▪ Comments on methods and effects. ▪ Makes connections and comparisons between the poems.

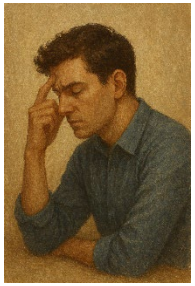
Key ideas to connect the poems
The Prelude and SOTI both end with a fear of nature.
In Kamikaze and The Prelude, nature has a profound effect on the person.
People fear situations that they cannot understand or control.
Civilians are affected by conflicts too.
Mental conflict can be significant and have long lasting ramifications.

Useful phrases for big ideas / messages
Garland draws attention to…
Wordsworth could be saying that…
Heaney encourages the reader to consider…
One of the key messages in the poem is…
Through the depiction of …. Garland criticises…

Picture Quiz

Which poem does each image relate to? How is it significant?





Recall Questions
1. In Kamikaze, how does the pilot's family react when he returns home?
2. Why does the pilot originally set out on his mission, and what is he expected to do?
3. What sights does the pilot notice during his journey, and how do these affect him?
4. How is the story of the pilot passed down?
5. In SOTI, how are the houses on the island described at the start of the poem?
6. Where does the poem take place?
7. What natural elements are used to show the power of the storm?
8. What unusual comparison is made to describe the sound of the storm?
9. What activity is the boy doing at the start of the extract, and where is he?
10. What natural feature causes the boy to feel fear during his experience?

SUBJECT: English Literature Paper 1 YEAR: 10

TOPIC: Macbeth SEMESTER: 2

WORD REVOLUTION

Dramatic Irony	When the audience knows something characters do not: creating tension or humour.
Hamartia (fatal flaw)	The character's fatal flaw or mistake that often leads to tragedy.
Hubris (excessive pride/ ego)	Excessive pride, arrogance or overconfidence.
Tragic hero	A central character who starts off in a position of power or respect but suffers a downfall because of a fatal flaw (often hubris or excessive pride).
Nihilism/nihilistic	A school of thought that asserts the absence of inherent meaning or value in life and the universe.
Equivocal/equivocator	An individual who uses vague or ambiguous language, especially to avoid speaking directly or honestly.
Machiavellian	Someone who is sneaky, cunning, and lacking a moral code.
Treason/treachery	Violation or betrayal of the allegiance that people owe to their sovereign or their country, especially by attempting to
Catharsis	The pity and fear felt by the audience.
Regicide	A person who kills a king/queen or is responsible for their death.
Duplicity	Contradictory doubleness of thought, speech, or action.
Macabre	Used to describe something that is very strange and unpleasant because it is connected with death or violence.

What will I study in this topic?	• **AO1:** Read, understand and respond to texts using a range of carefully selected evidence. • **AO2:** Analyse the language, form and structure used by a writer to create meanings and effects, using relevant subject terminology where appropriate. • **AO3:** Show understanding of the relationships between texts and the contexts in which they were written. • **AO4:** Use a range of vocabulary and sentence structures for clarity, purpose and effect, with accurate spelling and punctuation.
What will I be able to do by the end of this topic?	• Draw confidently on a range of evidence from the text to develop clear arguments about characters and themes (AO1) • Comment in detail on characters, understanding them as constructs with a specific function within the text (AO2) • Make detailed comment on characterisation using a range of supporting evidence. (AO1/AO2) • Explain the beliefs and messages that Shakespeare wanted to present through the play (AO3)

SOCIETY AND ATTITUDES

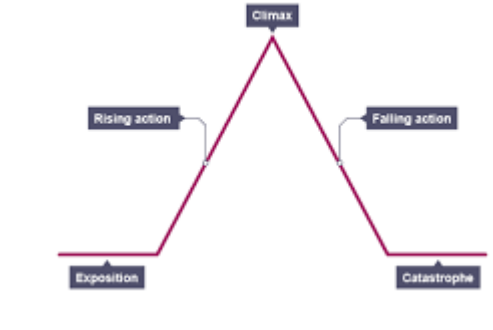
- Jacobean England
- Oppression and hierarchy
- Patriarchy
- Religion
- Good and evil
- The supernatural

PEOPLE & RELATIONSHIPS

- Families
- Friendship
- Power struggles
- Deceit
- Manipulation
- Ambition
- Guilt

FORM

A Shakespearean tragedy usually adheres to a set of conventions: The play centres around **a tragic hero.** Usually he is male, usually with high status at the start of the play and some moral virtues. Through a combination of the character's **fatal flaw (their hamartia**) and the intervention of **fate**, the character is set off on a path of self-destruction from which they cannot escape. They may have a moment of realisation in which they realise their mistake, but it is too late to turn back. The play ends with their death, and then the natural order is restored. Audiences were meant to feel a sense of **catharsis**—that is, they could experience the intense emotions of the plot without making the same mistakes as the **protagonist**.



SUBJECT: English Literature Paper 1 **YEAR: 10**

TOPIC: Macbeth **SEMESTER: 2**

Key Questions:	To what extent is Macbeth's ambition responsible for his self-destructive path? | Does Shakespeare suggest that dabbling in supernatural forces is dangerous? | How does the play challenge the Jacobean idea of masculinity? | How does Shakespeare portray the abuse of power in the play? | What role does the patriarchy play in Lady Macbeth's downfall? | How far can Macbeth be viewed as a tragic hero?
Curriculum Connections:	**Protest Poetry** (Y9) – literature with a political message | **Animal Farm** (Y9) - political allegory/moral message | **Power and Conflict Poetry** (Yr10/11) | **Jekyll and Hyde** (Yr 11) – duality, sin, ambition, temptation, corruption, hierarchy | **Speech writing and rhetoric** (Y9/10/11) **Romeo and Juliet** – Shakespearean language and tragedy (Y9)

DRAMA AND THEATRE – KEY TERMS

Stage Directions	Instructions in the script that describe movement, tone, and setting.
Monologue	A long speech by a character, often revealing inner thoughts.
Soliloquy	A long speech by a character on stage **alone**, revealing thoughts.
Dialogue	Verbal exchanges between characters that drive plot and reveal relationships.
Aside	A short comment or speech delivered by a character directly to the audience, **unheard by the other characters on stage**. It reveals the character's inner thoughts, feelings, or intentions, often providing insight or dramatic irony.
Tension	Building suspense and emotional intensity.
Symbolic Props	Objects with deeper meaning (e.g. the dagger).
Lighting	Used to create mood, shift scenes, or focus attention.

KEY THEMES IN THE PLAY

Ambition	Despite being a loyal and brave soldier at the beginning of the play, Macbeth cannot resist the power of his ambition (his fatal flaw). Lady Macbeth's ambition also knows no bounds. Both characters are willing to disobey God to fulfil their ambitions. Consider where ambition leads these characters.
Appearance vs reality (deception / the supernatural)	Shakespeare introduces this theme immediately when the Witches chant 'Fair is foul and foul is fair' in the very first scene. This is a play where people's outward appearances cannot be trusted. What might initially appear good, often turns out to be evil.
Loyalty and guilt	Both Macbeth and Lady Macbeth are plagued by guilt after the regicide. As a result of this, the mental stability of both characters suffers a dramatic decline. Lady Macbeth grossly underestimates the power of guilt and is made to pay for this with her life. In the play the motif of blood represents guilt.
Power	The battle for power can be seen throughout the play. Arguably, some of the most powerful characters are female: Lady Macbeth and the Witches. Both forces are able to manipulate the play's protagonist: Macbeth. However, the power of God cannot be ignored. Are Macbeth and Lady Macbeth punished for committing regicide (a sin against God)?
Chaos and disorder	At the beginning of the play, everything is in order. However, when the Divine Right is challenged, with the murder of King James, the balance of The Great Chain of Being is offset. The play's events that succeed the regicide are marked by chaos and disorder, be it the mental state of the play's protagonists: Macbeth and Lady Macbeth; the state of Scotland or the weather/nature. Order is only restored at the very end of the play when Malcolm becomes king.

SUBJECT: English Literature Paper 1 **YEAR:** 10

TOPIC: Macbeth **SEMESTER:** 2

Characters In The Play	
Macbeth	A captain in Duncan's army, later the Thane (Lord) of Glamis and Cawdor. When Three Witches predict that he will one day be king of Scotland, he takes his fate into his own hands, allowing his ambition and that of his wife's to overcome his better judgement. His bloody reign culminates in a battle against Malcolm and the English forces. Macbeth is the epitome of a tragic hero. He represents the dangers of overstepping your position in life (The Great Chain of Being).
Lady Macbeth	Macbeth's wife whose ambition helps to drive her husband toward the desperate act of regicide. Subsequently, her husband's tyranny and her own guilt recoil upon her, sending her into a madness from which she never recovers and leads to her suicide. Shakespeare demonstrates how a powerful, ambitious and ruthless character cannot escape the consequences of their own actions. She defies gender expectations of women at the time.
Banquo	Macbeth's close friend and ally who also receives predictions from the witches. His response, however, is more cautious than Macbeth's. The prediction, that Banquo's child will become king, is sufficient to spell Banquo's death, ordered by an increasingly resentful and paranoid Macbeth. The vision of Banquo's ghost later haunts Macbeth. Banquo represents rationality and reason in contrast to Macbeth.
King Duncan	King of Scotland. His victories against rebellious kinsmen and the Norwegians have made him a popular king. When Macbeth initially decides not to kill the king, he gives Duncan's many qualities as his reasons. He names his eldest son—Malcolm—as his heir. He dies at the hands of Macbeth and therefore the Chain of Being or Natural Order is disrupted. Too trusting—his trust in the original Thane of Cawdor was betrayed—as was his trust in Macbeth.
Macduff	The Thane of Fife. He is loyal to Duncan and becomes suspicious of Macbeth early on in the play. He leaves Scotland to join Malcolm in England. The witches warn Macbeth to "Beware Macduff" prompting Macbeth to have Macduff's family killed. Macduff's role is vital as his killing of Macbeth allows the Natural Order to be restored. He remains the noble hero throughout and serves as a contrast to Macbeth.
Malcolm	Duncan's rightful heir. He leaves for England after his father's murder and enlists the support of the English king and English lords. He is shown as being noble and deserving of the throne. Malcolm is the embodiment of all that is good in kingship, and this is seen particularly in Act 4, Scene 3, in which he tests the allegiance of Macduff. His restoration to the Scottish throne is essential for the Chain of Being/Natural Order to be regained.
The witches	The witches directly influence the actions of Macbeth. He did not have to act on their prophecies, but when he did, his death was sealed. This conflict between man and the supernatural runs throughout the play. The witches represent the dangers of the supernatural.

Language Techniques/Methods:

Pathetic Fallacy - consider how the weather is highlighted by Shakespeare at key points in the play and how the weather reflects the mood, e.g. the play opens with special effects for 'thunder and lightning' - Shakespeare immediately sets an ominous mood. Think about the night of the murder and the weather/reaction of the earth to the murder.

Symbolism/motif - when an object is used to represent a deeper more significant meaning, e.g. blood as a symbol of guilt in the play. Another important symbol is sleep (or lack of) - references to sleep and sleeplessness reveal the deterioration of Lady Macbeth and Macbeth's turmoil too.

Dramatic irony - when the audience knows something that one or more characters do not, e.g. We know Duncan shouldn't trust Macbeth. We also witness Macbeth lie to Banquo about the witches when he says "consider it not so deeply" and we've just seen him "consider it deeply!"

Contrasting imagery e.g. Heaven/hell light/dark good/evil occurs throughout the play. Notice what these images suggest, e.g. Evil is sometimes shown through dark imagery.

SUBJECT: English Literature Paper 1 **YEAR:** 10

TOPIC: Macbeth **SEMESTER:** 2

The Plot

Act 1:

- Three witches meet on a bleak moorland and plan to meet Macbeth.
- We learn that Macbeth has been instrumental in the success of a recent battle.
- The witches prophesise that Macbeth will become Thane of Cawdor and then King. Banquo will not be a king but his children will.
- Macbeth learns that he is to be named Thane of Cawdor. He then implies that he will have to commit murder to become king.
- Lady Macbeth reveals that she is planning to help Macbeth kill King Duncan. Macbeth arrives home and they agree to murder him.

Act 2:

- Macbeth murders Duncan and is full of regret. Lady Macbeth takes the weapons away and hides them.
- Duncan's body is discovered by Macduff and his sons, Malcolm and Donalbain, flee to England and Ireland.

Act 3:

- Macbeth becomes king but is plagues by feelings of insecurity about Banquo and his descendants.
- Banquo is suspicious of his former friend and Macbeth arranges to have him murdered.
- Banquo is murdered but his son, Fleance escapes.

Act 4:

- Macbeth seeks out the witches who say that he will be safe until a local wood, Birnam Wood, marches into battle against him. He also need not fear anyone born of woman.
- Macbeth sends murderers to kill Macduff's family.
- Macduff is in England and meets with Malcolm who tests his loyalty but then reveals that he is mounting an army against Macbeth.
- Macduff is pained with grief as he learns of the loss of his wife and children. He vows to lead the army and defeat Macbeth.

Act 5

- Macbeth feels safe in his remote castle at Dunsinane until he is told that Birnam Wood is moving towards him.
- Malcolm's army is carrying branches from the forest as camouflage for their assault on Macbeth's stronghold.
- Lady Macbeth walks in her sleep and tells her secrets to her doctor. She takes her own life as she cannot handle the grief.
- Macbeth hears of Lady Macbeth's suicide. In the midst of a losing battle, Macduff challenges Macbeth.
- Macbeth learns Macduff is the child of a caesarean birth (loophole!), realises he is doomed and is killed. Malcolm is crowned king.
- Macduff triumphs and brings the head of the traitor Macbeth to Malcolm.

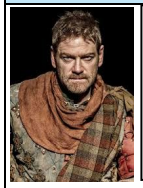
Key Quotations

1) "Look like the innocent flower but be the serpent underneath it," Act 1, Scene 5 (Lady Macbeth).
2) "O full of scorpions is my mind, dear wife", Act 3, Scene 2 (Macbeth).
3) "A little water clears us of this deed", Act 2, Scene 2 (Lady Macbeth).
4) "Be innocent of the knowledge, dearest chuck, until thou applaud the deed," Act 3, Scene 2 (Macbeth).
5) "Come you spirits...unsex me here," Act 1, Scene 5 (Lady Macbeth).
6) "For brave Macbeth… Smoked with bloody execution," Act 1, Scene 2 (Captain).
7) "Would all great Neptune's ocean wash this blood from my hands?" Act 2, Scene 2 (Macbeth).
8) "Out, damn spot!" Act 5, Scene 1 (Lady Macbeth).
9) "Dead butcher and his fiend-like queen," Act 5, Scene 8 (Malcolm).
10) "Stars hide your fires, let not light see my black and deep desires," Act 1, Scene 4 (Macbeth).
11) "Macbeth has murdered sleep," Act 2, Scene 2 (Macbeth).
12) "Fair is foul and foul is fair" Act 1 scene 1 (The witches).
13) "I have … only vaulting ambition" Act 1, Scene 7 (Macbeth).
14) "When thou durst do it then thou were a man" Act 1, Scene 7 (Lady Macbeth).
15) "Never shake thy gory locks at me" Act 3, scene 4 (Macbeth).

SUBJECT: English Literature Paper 1 **YEAR:** 10

TOPIC: Macbeth **SEMESTER:** 2

How will I be assessed?	English Literature Paper 1 is 1 hour and 45 minutes long and is worth 64 marks. This paper has one question on Macbeth and one question on Jekyll and Hyde (Year 11 text). Each question comes with an extract. There are some examples below. You have to analyse the extract and then link it to the rest of the play. **At the end of the unit in Year 10, you will have a 50 minute assessment on an extract to whole question. You will also do several practice tasks in the lead up.**



Macbeth:

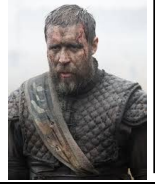
Ambitious

Guilty

Lady Macbeth:

Scheming

Manipulative



Banquo:

Sceptical

Suspicious

Witches

Ambiguous

Malevolent

Macduff

Emotional

Patriotic

Duncan

Honourable

Trusting

Sentence Starters For Essay Writing

Shakespeare presents… /shows… /hints... /creates… /uses ...
Through the character of… Shakespeare shows /explores /questions...
Shakespeare challenges the belief that...
Shakespeare asks his audience to question/consider...
Shakespeare reinforces this idea earlier/later in the play when…
Shakespeare sends a clear message to his audience...
Shakespeare explores the theme of … through the use of …
Shakespeare uses a metaphor/personification/alliteration/rhyme …

Sample Essay Questions

Starting with this speech, explore how Shakespeare presents ambition in Macbeth.
Starting with this moment in the play, explore how Shakespeare presents the attitudes of Macbeth and Banquo towards the supernatural.
Starting with this speech, explore how far Shakespeare presents Macbeth as a violent character.
Starting with this speech, explore how far Shakespeare presents Lady Macbeth as a powerful character.
Starting with this speech, explore how Shakespeare presents the differences between appearance and reality in Macbeth.

Further Reading and Other Resources

- https://www.bbc.co.uk/bitesize/topics/zgq3dmn
- Mr Bruff's revision videos: https://www.youtube.com/watch?v=NmMAO82R8Cg
- Physics and Maths Tutor: https://www.physicsandmathstutor.com/english-revision/ofgcse-aqa/macbeth/
- Mrs B's English revision cards: https://passgcseenglish.blogspot.com/

Recall Questions

1.	How is Macbeth Machiavellian?
2.	When does Macbeth become nihilistic?
3.	Who are equivocators in the play?
4.	When is dramatic irony seen in Shakespeare's dialogue?
5.	What is Macbeth's hamartia?
6.	Which character/s deliver a soliloquy and when?
7.	Which quotations are useful to contrast reactions to initial guilt?
8.	Which quotation demonstrates the idea of duplicity?
9.	Which quotation demonstrates the idea of duplicity?
10.	Which characters manipulate in the play?

SUBJECT: Maths **YEAR: 10**

TOPIC: Compound Measure **SEMESTER: 2**

WORD REVOLUTION	
Density	A measure of how much matter is in a certain volume
Pressure	Is a measure of how much force is acting upon an area
Newtons	The measure of force (N)
Mass	The amount of matter there is in an object, the units are kg or g

What will I study in this topic?	You will learn how to calculate density, understanding that an object will feel heavier because it is more dense, and pressure, helping to understand why ducks have developed wide webbed feet.
What will I be able to do by the end of this topic?	• Calculating with density • Calculating with Pressure

Pressure

$$F = P \times A$$

$$P = \frac{F}{A}$$

$$A = \frac{F}{P}$$

Density

$$M = D \times V$$

$$D = M \div V$$

$$V = M \div D$$

vegetable oil

water

washing-up liquid

maple syrup

honey

Pressure Formula

$$pressure = \frac{force}{area} \text{ or } P = \frac{F}{A}$$

It is the ducks wide, webbed feet that allow it to walk on a muddy riverbank.

The smaller the area the more pressure will be applied, that is why you can push a pin into a wall but you cannot make a dent with your thumb.

Density Formula

$$Density = \frac{Mass}{Volume}$$

Substances can be compared using density.

- If two liquids that are mixed have a different density, then the least dense liquid would float to the top
- Different types of wood have a different density. A hardwood has a great density than a softwood and would feel heavier

Pressure Example

A force of $600\ N$ acts on an area of $20\ m^2$.
Calculate the pressure.

$$Pressure = \frac{force}{area} = \frac{600}{20} = 30$$

Pressure is $30\ N/m^2$.

Density Example

An object is made from steel.
It has a volume of $25\ m^3$ and a mass of $425\ kg$.

Calculate the density of the object.

$$Density = \frac{Mass}{Volume} = \frac{425}{25} = 17$$

$17\ kg/m^3$

SUBJECT: Maths **YEAR: 10**

TOPIC: Ratio & Algebra **SEMESTER: 2**

WORD REVOLUTION	
Ratio	The relationship between two or more amounts
Equivalent	Have the same value
LCM	The smallest multiple that two or more numbers have in common
Combine	Bringing together two or more ratios

What will I study in this topic?	You will learn how to combine ratios together. You will also solve ratio problems that involve algebra, writing algebraic expressions to represent values. The final part will involve finding the new ratio after a change has occurred.
What will I be able to do by the end of this topic?	• Combine Ratios • Calculate with ratio and algebra • Change ratios

A combining ratio question is when you are given two ratios that have a common variable and are asked to combine them into one overall ratio.

For instance, you know the ratios **a:b** and **b:c** and you are then asked to find the ratio **a:b:c**

The way to find these is to find a common multiple of the part that appears in both ratios.

e.g.
Given that a:b = 3:7 and a:c = 4:3
Find the ratio a:b:c
Give your answer in its simplest form

In the example, **a** appears in both ratios so we find the lowest common multiple of 3 and 4 (which is 12). We multiply all parts of the ratio **a:b** by 4 and all parts of the ratio of **a:c** by 3. This gives the overall ratio **a:b:c**

Combining ratios: example

a:b = 3:7 x4 a:b = 12:28

a:c = 4: :3 x3 a:c = 12: :9

a:b:c = 12:28:9

Equivalent ratios to Equations

If $a:b = c:d$,
then $\frac{b}{a} = \frac{d}{c}$ (and $\frac{c}{a} = \frac{d}{b}$)

Combining involving Algebra

If $M:N = x:3y$ and $P:N = 2z:7y$. What is the ratio M

M	***N***	***P***
x	$3y$	
$\times 7$	$\times 7$	$\times 3$
$7x$	$21y$	$6z$

$\times 3$

$$M : N : P = 7x : 21y : 6z$$

Solving Linear Equations from ratios

Given that (3x-12):8x-34) = 1:2, determine x

$$\frac{8x-34}{3x-12} = \frac{2}{1}$$

$$8x - 34 = 2(3x - 12)$$

$$8x - 34 = 6x - 24$$

$$2x = 10$$

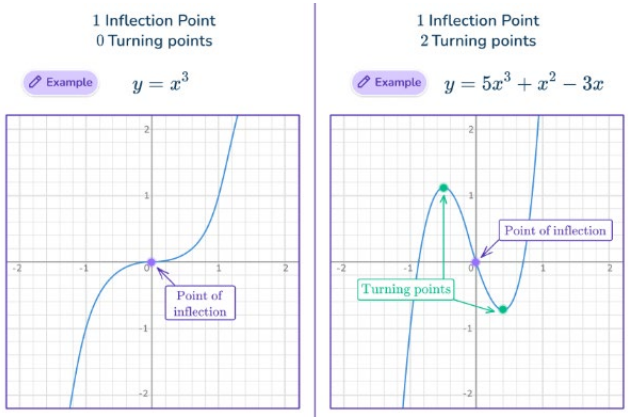
$$x = 5$$

SUBJECT: Maths **YEAR: 10**

TOPIC: Graphs **SEMESTER: 2**

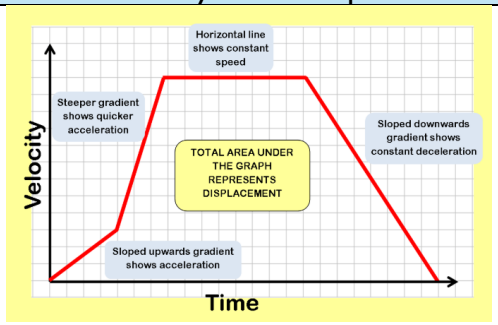
WORD REVOLUTION	
Velocity	The speed of something in a given direction
Acceleration	A vehicles' capacity to gain speed
Gradient	Measurement of a slope
Cubic Graph	A **cubic function graph** is a graphical representation of a cubic function.
Reciprocal Graph	A **reciprocal graph** is of the form $y = {}^{a}/_{x}$, where a is a constant.
Exponential Graph	Exponential graphs are graphs in the form $y = k^x$.

Cubic graphs have: a **point of inflection** where the curvature of the graph changes between concave and convex: either **zero or two turning points** (also referred to as **critical points** or **local minimum/maximum**).

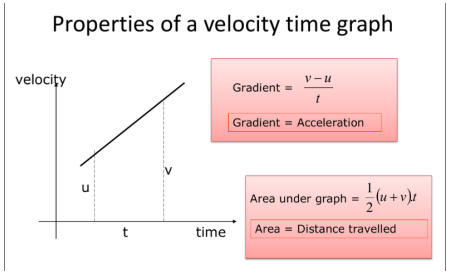


What will I study in this topic?	• Calculating acceleration from velocity-time graphs • Graphs of cubic functions • Graphs of reciprocal functions • Graphs of exponential functions *Higher Only* • Plotting velocity-time graphs
What will I be able to do by the end of this topic?	• How to calculate acceleration and distance from a velocity-time graph • Draw a velocity-time graph • Draw and use cubic graphs • Recognise and use reciprocal graphs • Recognise and use exponential graphs (Higer only)

Velocity-Time Graphs



Velocity-Time Graphs



Reciprocal Graphs

A **reciprocal graph** includes a $\frac{1}{x}$ term. The graph is a smooth curve called a hyperbola.

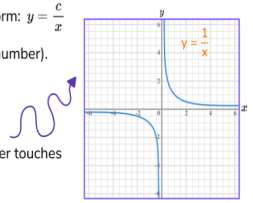
The general equation of a reciprocal graph is of the form: $y = \frac{c}{x}$

Where x and y are variables and c is a constant (a number).

The equation can be rearranged to: $xy = c$

E.g.

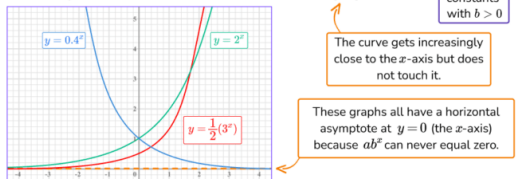
The curve gets very close to the x and y axes but never touches them.



Exponential Graphs

An **exponential function** is a mathematical function in the form $y = ab^x$

The graph of an exponential function has a **horizontal asymptote**.



SUBJECT: Maths **YEAR: 10**

TOPIC: Sequences **SEMESTER: 2**

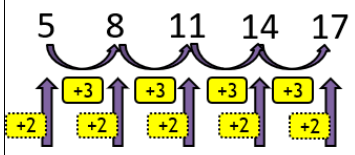
WORD REVOLUTION

Arithmetic Sequence	Also called a **linear sequence** is an ordered set of numbers that have a **common difference** between each consecutive term.
Geometric Sequence	A **geometric sequence** is an ordered set of numbers that progresses by multiplying or dividing each term by a common ratio.
Quadratic Sequences	A **quadratic sequence** is an ordered set of numbers that follow a rule based on the sequence n^2 = 1, 4, 9, 16, 25, … (the square numbers). The difference between each term is not equal, but the second difference is.

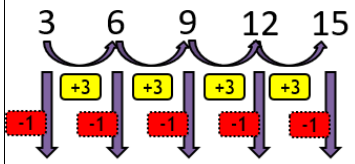
What will I study in this topic?	You will revisit the work covered in KS3 on arithmetic sequences and for sequences of patterns. You will also learn to find the position-to-term rule for geometric sequences. In addition, you will develop your understanding of quadratic sequences and learn about special sequences if you are studying for the higher tier GCSE.
What will I be able to do by the end of this topic?	• Find the n^{th} term rule for arithmetic sequences • Find the n^{th} term rule for sequences of patterns • Calculate the common ratio and find terms in a geometric sequence Higher Tier students will also be able to: • Find the n^{th} term of a quadratic sequence • Recognise and find the next term in special sequences such as the triangular number and Fibonacci sequences

Arithmetic Sequences

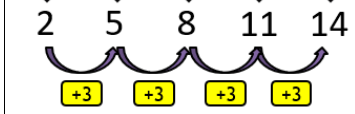
To start to find the n^{th} term of a sequence find the difference between the terms. Below are sequences with a common difference of 3 so they are related to the 3-times table.



3n +2 This sequence has jumps of +3 like the three times table... ... but it is shifted up by two at each term.



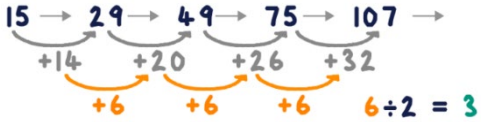
3n This sequence is the three times table.



3n -1 This sequence has jumps of +3 like the three times table... ... but it is shifted down by one at each term.

Quadratic sequences

If the sequence does not have a common difference, then check the second difference.



The common 2^{nd} difference here is 6. Next, we halve this to find the coefficient of the n^2 term. We can then create a table as follows:

n	1	2	3	4	5
sequence	15	29	49	75	107
$3n^2$	3	12	27	48	75
sequence-$3n^2$	12	17	22	27	32
		+5	+5	+5	+5

We subtract the $3n^2$sequence from the original. Now we are left with a linear sequence which has n^{th} term

$5n+7$

Finally, we combine the parts to find the n^{th} term of the original quadratic sequence.

$3n^2+5n+7$

Geometric Sequences

Geometric sequences have a common ratio **(r)**

$5, 10, 20, 40, 80, \ldots$

×2 ×2 ×2 ×2

The common ratio is $r = 2$

The first term $a_1 = 5$

The sequence can be generated by using a formula

$$a_n = a_1(r)^{n-1}$$

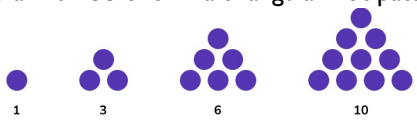
e.g.

$$a_2 = 5(2)^{2-1} = 5 \times 2^1 = 10$$
$$a_3 = 5(2)^{3-1} = 5 \times 2^2 = 20$$

etc

Special Sequences

Triangular numbers form a triangular dot pattern



We can generate the Fibonacci Sequence of numbers by adding the previous two numbers together to work out the next term. **0, 1, 1, 2, 3, 5, 8, 13, 21, …**

SUBJECT: Maths **YEAR: 10**

TOPIC: Proportion **SEMESTER: 2**

WORD REVOLUTION	
Proportion	A relationship that links two variables
Direct Proportion	The relationship shows that an increase in one value results in an increase in another
Indirect Proportion	The relationship shows that an increase in one value results in a decrease in another
Constant	A fixed value that does not change
Proportion Graphs	A graph that displays the proportional relationship between two quantities

What will I study in this topic?	You will look at the proportion equations for both direct and indirect (inverse) proportion. You will use the proportion constant *k*. You will identify graphs that show different proportional relationships
What will I be able to do by the end of this topic?	• Interpret (F) Construct (H) direct proportion equations • Interpret (F) Construct (H) indirect proportion equations • Identify (All) and construct (H) graphs that show proportion

The Proportion Symbol: α

The proportion constant: k

If y is proportional to x, when y = 68 x = 4.
a) write an equation of y in terms of x

$y \alpha x$ $y = kx$

$68 = k \times 4$

$17 = k$ $y = 17x$

b) Find x when y = 408

$y = 17x$ $408 = 17x$

$408/17 = 24$ $x = 24$

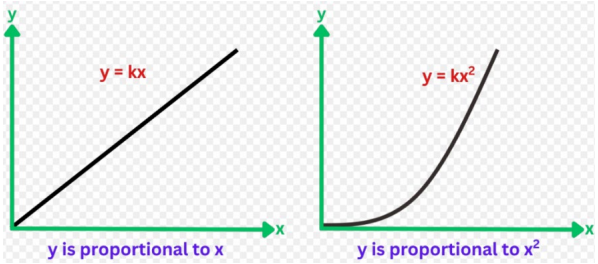
Direct Proportional Equations

Worded relationship	Relationship	Equation
y is directly proportional to x	$y \propto x$	$y = kx$
y is directly proportional to the square of x	$y \propto x^2$	$y = kx^2$
y is directly proportional to the square root of x	$y \propto \sqrt{x}$	$y = k\sqrt{x}$

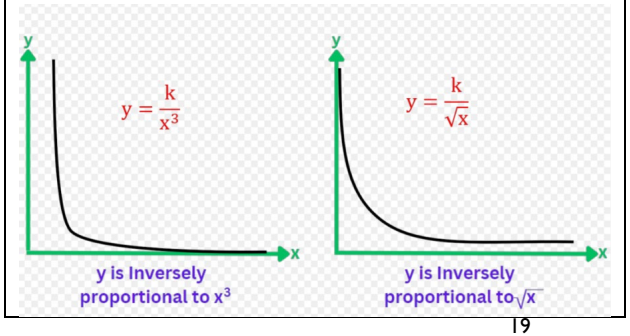
Indirect Proportional Equations

Worded relationship	Relationship	Equation
y is inversely proportional to x	$y \propto \frac{1}{x}$	$y = \frac{k}{x}$
y is inversely proportional to the square of x	$y \propto \frac{1}{x^2}$	$y = \frac{k}{x^2}$
y is inversely proportional to the square root of x	$y \propto \frac{1}{\sqrt{x}}$	$y = \frac{k}{\sqrt{x}}$

Direct Proportion Graphs



Indirect proportion Graphs



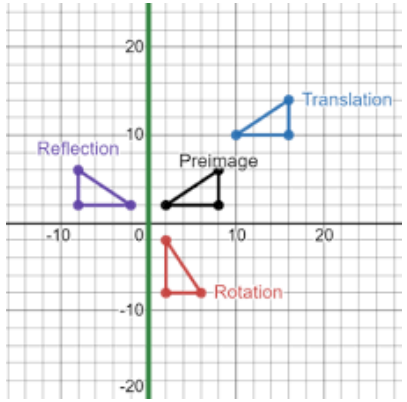
SUBJECT: Maths **YEAR: 10**

TOPIC: Transformations **SEMESTER: 2**

WORD REVOLUTION	
Translation	A change in the position of an object by movement along, up or diagonally on a coordinate grid.
Reflection	The image formed when a shape is reflected in a mirror line.
Rotation	Turning an object, through a given angle at a given point.
Vector	This describes how far a shape moves left or right and up or down.
Scale factor	The number by which all sides of an original shape are multiplied to create a larger (or smaller) shape.

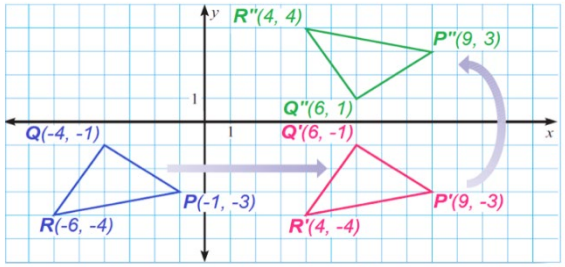
<u>Transformation</u>

Transformation is a change to a geometric 2D shape, such as a translation, rotation, reflection or enlargement. The enlargement can be positive or negative. The transformations can be individual or combined.

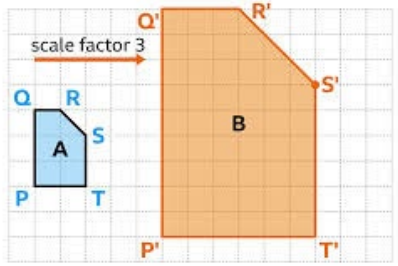


What will I study in this topic?	You will learn about combining the different ways in which a shape can be transformed. E.g. Translation, Rotation, Reflection and enlargement. <u>Investigate positive and negative enlargement of shapes.</u>
What will I be able to do by the end of this topic?	• Describing a combination of transformations where the first transformation is given. • Combining an enlargement and translation, combining a rotation and reflection and then describing the resultant product. • Enlarging a shape with a positive or a negative scale factor • Describing an enlargement with a positive or negative scale factor. • Enlarging a shape by a fractional scale factor.

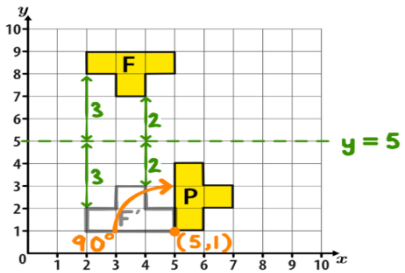
Translation and reflection



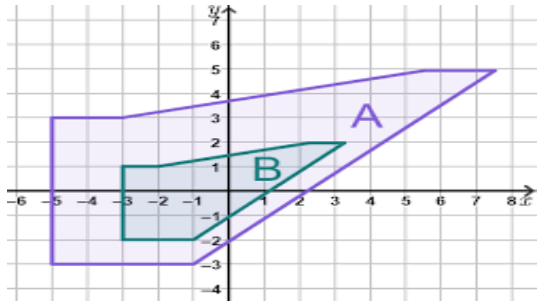
Enlargement by a positive scale factor



Translation and rotation



Enlargement by a negative scale factor



SUBJECT: Maths **YEAR: 10**

TOPIC: Rounding **SEMESTER: 2**

WORD REVOLUTION

Error Intervals	**Error intervals** are the limits of accuracy when a number has been rounded or truncated.
Index numbers/Indices	is a small number written above and to the right of a base number, also called a power or exponent. It shows how many times the base number is multiplied by itself.
Bounds	refer to the limits on the size or value of a quantity, specifically defined as upper and lower bounds.
Reccurring Decimals	is a decimal number only that consists of digits repeating after a fixed interval after the decimal.

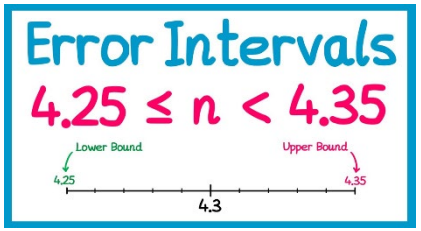
Laws of indices

- $a^m \times a^n = a^{m+n}$
- $a^m \div a^n = a^{m-n}$
- $(a^m)^n = a^{m \times n}$
- $a^0 = 1$
- $a^1 = a$
- $a^{-m} = \frac{1}{a^m}$

What will I study in this topic?	• Finding error intervals • Finding error intervals for truncated numbers • Index rules with positive indices • Index rules with negative indices • Simplifying expressions using index laws • Finding bounds for calculations • Converting fractions to recurring decimals • Converting recurring decimals to fractions
What will I be able to do by the end of this topic?	• Find error intervals for any values and truncated numbers • Know and apply the index laws/rules. • Find and use bounds for calculations • Covert between recurring decimals and fractions.

Error Intervals

If a value is rounded to 1dp and gives the answer 4.3, the error interval is shown here. The original number must be between 4.25 and 4.35



Bounds

We can write the range for this measurement as:

323.5 m ≤ height < 324.5 m

This value is called the **lower bound** …

… and this value is called the **upper bound**.

Recurring Decimals to Fractions

All recurring decimals can be written as fractions.

Eg Write $0.\dot{4}$ as a fraction ($0.\dot{4} = 0.44444\ldots\ldots$)

Let x = $0.\dot{4}$

So 10x = $4.\dot{4}$

Subtract: 9x = 4

and so $0.\dot{4} = \frac{4}{9}$

Recurring Decimals to Fractions

$0.\dot{1}\dot{8}$

$x = 0.181818\ldots$

$\downarrow \times 100 \downarrow$

$100x = 18.181818\ldots$

$- \quad x = 0.181818\ldots$

$99x = 18$

$x = \frac{18}{99} \xrightarrow{\div 9} \frac{2}{11}$ ($\div 9$ on both)

SUBJECT: Maths **YEAR:** 10

TOPIC: Expanding and Factorising Brackets **SEMESTER:** 2

WORD REVOLUTION

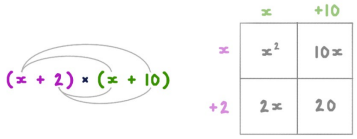
Expand	Multiply a bracket by a term or another bracket to produce an equivalent expression that does not have brackets.
Factorise	Write an equivalent expression that has a common factor multiplying a single bracket or two brackets. (Essentially the opposite of expanding)
Quadratic Expression	Any expression where the highest power of the variable is 2. In the form $ax^2 + bx + c$
Difference of two Squares	An expression that is one term squared minus another term squared which can be factorised. $a^2 - b^2 = (a + b)(a - b)$
Completing the Square (H)	Writing a quadratic expression in the form $(x + a)^2 + b$

What will I study in this topic?	Expand and factorise quadratic expressions into single or double brackets. Using the factorised form to solve a quadratic equation. Expand triple brackets, solve more complex quadratic equations. Complete the square and use this form to solve equations and find the turning point of a quadratic graph. (H)
What will I be able to do by the end of this topic?	• Expand double brackets • Factorise expressions of the form $x^2 + bx + c$ • Factorise using the difference of two squares • Factorise to solve equations of the form $x^2 + bx + c = 0$ • Expand triple brackets (H) • Complete the square (H) • Factorise expressions of the form $ax^2 + bx + c$ (H) • Find the turning point of a quadratic graph by completing the square (H)

Expanding Double Brackets

Multiply both terms in the first bracket by both terms in the second bracket. (**4 multiplications to do**) E.g.:

Expand and simplify $(x + 2)(x + 12)$

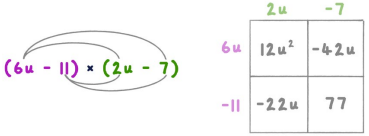


$= x \times x + x \times 10 + 2 \times x + 2 \times 10$

$= x^2 + 10x + 2x + 20$

$= x^2 + 12x + 20$

Expand and simplify $(6u - 11)(u - 7)$



$= 6u \times u + 6u \times -7 + -11 \times u + -11 \times -7$

$= 6u^2 + -42u + -11u + 77$

$= 6u^2 - 64u + 77$

Factorising double brackets (a=1)

In $x^2 + bx + c$ Find two numbers that multiply to make c and add to make b.

E.g. Factorise $x^2 + 2x - 15$

$x^2 + 2x - 15$

Factor pairs of -15

1 and -15	-1 and 15
3 and -5	-3 and 5

$-3 + 5 = 2$

$x^2 + 2x - 15 = (x - 3)(x + 5)$

Difference of two squares

Square root each term, then write using the result $a^2 - b^2 = (a + b)(a - b)$

E.g. Factorise $x^2 - 25$

$x^2 - 25 = x^2 - 5^2$

$= (x + 5)(x - 5)$

E.g. Factorise $36x^2 - 49y^2$

$36x^2 - 49y^2 = (6x)^2 - (7y)^2$

$= (6x + 7y)(6x - 7y)$

Factorising double brackets (a>1) (H)

In $ax^2 + bx + c$ Find two numbers that multiply to make ac and add to make b. Then split b into the two numbers and factorise each half separately.

E.g. Factorise $3x^2 - 14x + 8$

$3x^2 - 14x + 8$

$3 \times 8 = 24$

Factor pairs of 24

1 and 24	-1 and -24
2 and 12	-2 and -12
3 and 8	-3 and -8
4 and 6	-4 and -6

$-2 + -12 = -14$

$3x^2 - 14x + 8 = 3x^2 - 2x - 12x + 8$

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

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

Completing the square (H)

Where a=1, half b, write that in the squared bracket, subtract that value squared and then add c back on.

E.g. Write $x^2 + 14x + 11$ in the form $(x + a)^2 + b$

$x^2 + 14x + 11 = (x + a)^2 + b$

$a = 14 \div 2$

$= 7$

$(x + 7)^2 = x^2 + 14x + 49$

$(x + 7)^2 - 49 = x^2 + 14x$

$x^2 + 14x + 11 = (x + 7)^2 - 49 + 11$

$= (x + 7)^2 - 38$

SUBJECT: Maths **YEAR: 10**

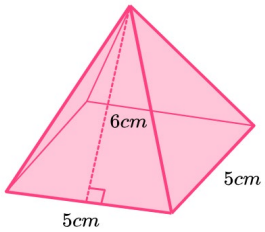
TOPIC: Geometry **SEMESTER: 2**

WORD REVOLUTION

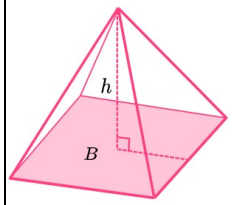
Pyramid	A **pyramid** is a 3-D shape made up of flat faces: a base (which is often a square or a triangle) and triangular faces that meet at a point called an apex.
Cone	A **cone** is a 3-D object with a circular base that tapers to a point (apex) that is directly above the centre of the base.
Frustum	A **frustum** is a shape that is left when you cut the top off a cone or a pyramid.

Surface area and volume of a pyramid

To find the surface area of a pyramid we need to find the area of each face and add them together.
For a square based pyramid, we add the area of the square base to the area of the four triangular faces.



Area of the base
$B = 5 \times 5 = 25$
Area of triangular faces
$A = \frac{1}{2} \times 6 \times 5 = 15$
Total surface area
$25 + (4 \times 15) = 85cm^2$

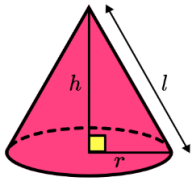


To find the volume of a pyramid, we use the formula: $\frac{1}{3}Bh$
Where:
B is the area of the base of the pyramid
h is the perpendicular height

You may need to use Pythagoras 'theorem to find the height of the triangular faces or the perpendicular height of the pyramid.

What will I study in this topic?	You will find the surface area of different pyramids by adding the areas of their faces. You will also use formulas to find the surface area of cones, spheres and frustums. You will also find volumes of these three-dimensional shapes.
What will I be able to do by the end of this topic?	• Find the surface area and volume of square and triangular based pyramids • Find the surface area and volume of a cone. • Find the surface area and volume of a sphere. • Apply your knowledge to find the surface area and volume of frustums and composite shapes.

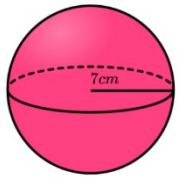
Volume and surface area of a cone



The formula to calculate the **volume** of a cone is:
$$V = \frac{1}{3}\pi r^2 h$$
The **surface area** of a cone is made up of two parts, a curved surface area and a circular base.
The formula for calculating the **curved surface area of a cone** is:
$$\text{Curved surface area} = \pi rl$$
Where, l is the slant height.
The formula for calculating the **area of a circle**:
$$\text{Area of circle} = \pi r^2$$
For the **total surface area**, we add the two parts together.
$$SA = \pi r^2 + \pi rl$$

Volume and surface area of a sphere

The **volume** of a sphere is the amount of space there is inside a sphere.

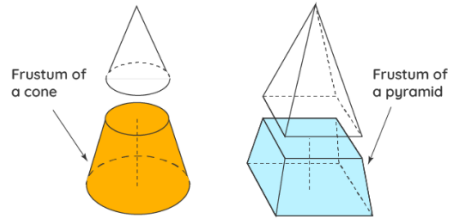


This sphere has a radius of 7 cm.

The formula for the volume of a sphere is:
$$V = \frac{4}{3}\pi r^3$$
$$= \frac{4}{3} \times \pi \times 7^3 = \frac{1372}{3}\pi$$
$$\approx 1440 \text{ cm}^3 (3sf)$$

The **surface area** of a sphere is the area which covers the outer surface of a sphere.
The formula for the surface area of a sphere is:
$$SA = 4\pi r^2$$
$$= 4 \times \pi \times 7^2 = 196\pi$$
$$\approx 616 \text{ cm}^2 (3sf)$$

Frustums



Volume and surface area of a hemisphere

A **hemisphere** is half a sphere.
The volume is just half the volume of the sphere.

The curved surface area is half that of the sphere, but we need to add the area of the circular base to find the total surface area.

SUBJECT: Science **YEAR:** 10

TOPIC: Ecology **SEMESTER:** 2

WORD REVOLUTION	
Biodiversity	The variety of different species of organisms on Earth, or within an ecosystem.
Quadrat	A square frame enclosing a known area. It is used to study the distribution of organisms.
Transect	A line which can be used to study the distribution of organisms across an area.
Community	The populations of different species living in a habitat.
Abiotic Factor	A non-living environmental factor.
Biotic Factor	A living environmental factor.
Ecosystem	The interaction of a community of living organisms with the abiotic parts of their environment.
Habitat	The place where an organism lives.
Population	The number of the same species living in an ecosystem.

What will I study in this topic?	We will look to revisit the topics of adaptations and variation in species that we covered in Year 9. We will then take an experimental look at how to measure the number of species in a particular habitat. This is known as the 'Sampling' required practical. Skills include calculating mean and area, and writing a method.
What will I be able to do by the end of this topic?	By the end of this unit, you will be able to: • Describe and explain how human activity impacts on the environment. • Describe how to use quadrats to estimate the population of a species. • Describe and explain how to carry out random and systematic sampling.

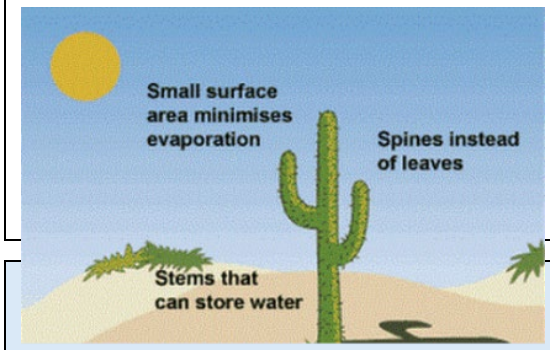
Y9 Recap

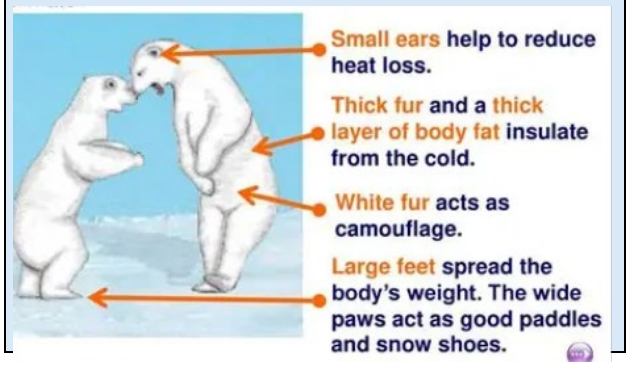
Abiotic Factors are the non-living factors of an environment. E.g. Moisture, light, temperature, pH.
Biotic Factors are the living factors of an environment. E.g. predators, competition, pathogens and availability of food.

Y9 Recap

Adaptations are specific features of an organism which enable them to survive in the conditions of their habitat.
Structural Adaptations- features of the organisms body e.g. colour for camouflage.
Behavioural Adaptations- how the organism behaves e.g. migration to a warmer climate during colder seasons.
Functional Adaptations- the ways the physiological processes work in the organism e.g. lower metabolism during hibernation to preserve energy stores.

Y9 Recap





SUBJECT: Science **YEAR: 10**

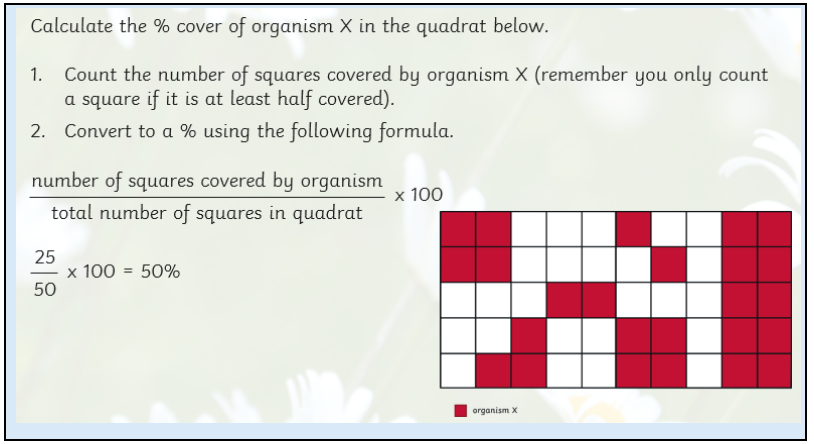
TOPIC: Ecology **SEMESTER: 2**

Key Questions:	What is an ecosystem? What is meant by a structural adaptation? What is a transect? Give three reasons why environmental factors in an area may change.
Curriculum Connections:	**Previous (Yr 9):** • Abiotic and biotic factors • Adaptations of a cactus, polar bear and camel. **Future:** • Environmental change • Water and the Carbon Cycle • Biodiversity and Waste Management • Deforestation and Land Use

Required Practical- Sampling

The distribution of an organism is affected by the environment and abiotic factors.
Quadrats can be used to measure the frequency of an organism in a given area.

1. Place a 1m^2 quadrat on the ground at a random point within the first sample area. E.g divide the area into a grid and use a random number generator to pick co-ordinates.
2. Count all the organisms in the quadrat.
3. Repeat this at least 10 times.
4. Work out the mean number of organisms per quadrat.
5. Multiply the mean number of organisms by the total area of the field. This will give you an estimated population of the organism.

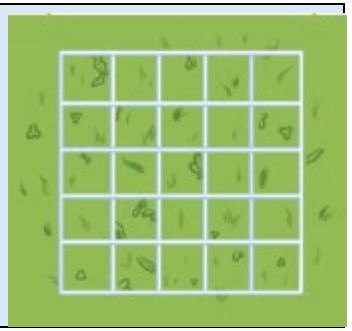


Required Practical- Transects

Transects are used to measure the change of distribution across an area. E.g. from the edge of a river.

1. Mark out a line in the area you want to study using a tape measure.
2. Collect data along the line (e.g. number of daisies)
3. You can do this by counting the number of organisms touching the line or by placing a quadrat at intervals along the line and count how many organisms are in the quadrat.

A quadrat



SUBJECT: Science **YEAR:** 10

TOPIC: Homeostasis and Response **SEMESTER:** 2

WORD REVOLUTION	
Diabetes	A condition that affects the body's ability to control its blood glucose level.
Gland	An organ that hormones are produced in and secreted from.
Glucagon	A hormone produced and secreted by the pancreas when blood glucose level is too low.
Glycogen	A molecule that acts as a store of glucose in liver and muscle cells.
Hormone	A chemical messenger which travels in the blood to activate cells.
Insulin	A hormone produced and secreted by the pancreas when blood glucose level is too high.
Optimum Level	A level of something (e.g. water, ions or glucose) that enables the body to work at its optimum.

What will I study in this topic?	We will look at how hormones affect body processes and compare the workings of hormones with nerve impulses covered in Y9. We will then focus on how the body regulates blood glucose levels. Finally, we will look at the symptoms and treatments of diabetes.
What will I be able to do by the end of this topic?	By the end of this unit, you will be able to: • Describe how hormones affect body processes. • Compare the function of nerves and hormones. • Describe the action of insulin and glucagon in response to blood glucose levels. • State the symptoms of diabetes and describe treatments.

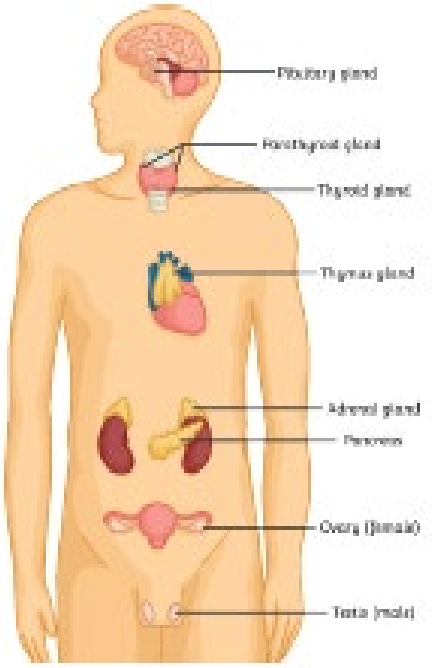
Hormones

Hormones are chemical messengers transported in the bloodstream to an effector where they can activate a response. They are produced and secreted from glands around the body which make up the endocrine system.

Hormones vs Neurons

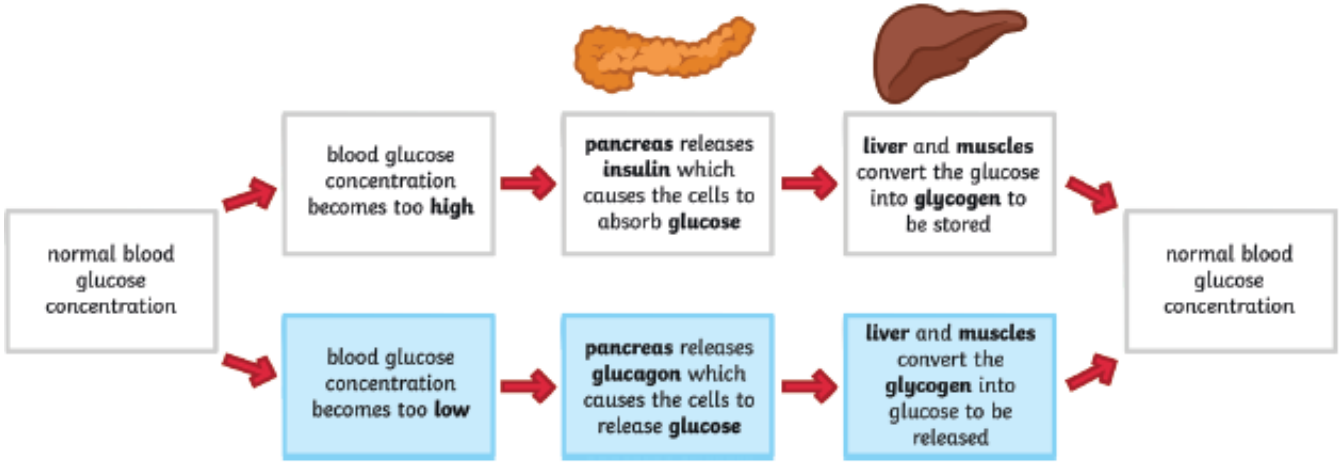
	neurons	hormones
speed	fast	slow
duration	short	long
target area	specific	general

The Endocrine System



Key Questions:	How do hormones travel to their target organs? Name five endocrine glands found in the male human body. What does insulin do to return blood glucose levels back to normal? What is type 2 diabetes?
Curriculum Connections:	**Previous (Yr 9):** • Nervous system • Function and adaptations of the neurone. **Future:** • Role of hormones in the Menstrual cycle

Control of Blood Glucose Levels



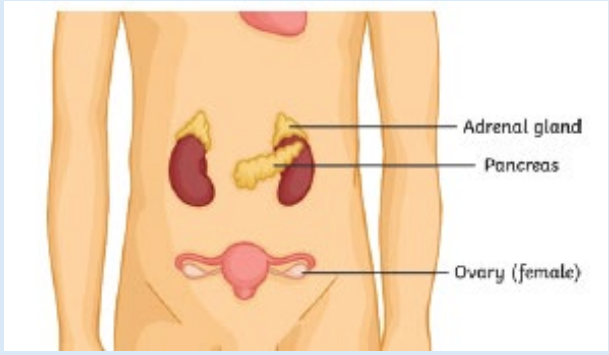
The pancreas is the organ and gland which monitors and regulates the blood glucose concentration.
Blood glucose increases when we eat.
Blood glucose decreases when we fast/sleep or complete exercise as glucose is used in respiration to release energy.

Diabetes

There are two types of diabetes: Type 1 and Type 2.

Type 1 is a disorder affecting the pancreas. The pancreas does not produce enough insulin so blood glucose levels become higher than normal. Type 1 diabetes is treated by insulin injections.

Type 2 is a disorder of effector cells which no longer respond to the hormones released from the pancreas. Type 2 diabetes can be managed through maintaining a carbohydrate-controlled diet and regular exercise.



SUBJECT: Science **YEAR:** 10

TOPIC: Inheritance, Variation and Evolution **SEMESTER:** 2

WORD REVOLUTION

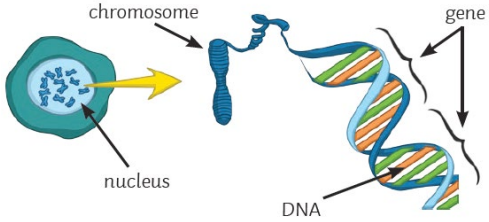
Allele	An alternative version of a gene.
Asexual Reproduction	Where organisms reproduce by mitosis to produce genetically identical offspring.
Chromosome	A long molecule of DNA found in the nucleus. Each chromosome carries many genes.
Dominant Allele	The allele for the characteristic that's shown by an organism if two different alleles are present for that characteristic.
Fertilisation	The fusion of male and female gametes during sexual reproduction.
Gamete	A sex cell, e.g. egg or sperm cell.
Heterozygous	Where an organism has two alleles for a particular gene that are different.
Homozygous	Where an organism has two alleles for a particular gene that are the same.
Meiosis	A type of cell division where a cell divides twice to produce four genetically different gametes.
Mitosis	A type of cell division where a cell reproduces itself by splitting to form two identical offspring.

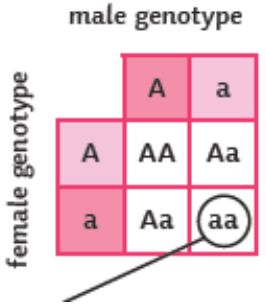
What will I study in this topic?	We will look at the processes of sexual and asexual reproduction and compare and contrast these processes. We will use genetic diagrams to identify how inherited disorders are passed on between generations and be able to complete punnett squares to calculate the probability of inheriting certain characteristics.
What will I be able to do by the end of this topic?	By the end of this unit, you will be able to: • Describe the processes of sexual and asexual reproduction. • Compare and contrast sexual and asexual reproduction. • Describe how sex is inherited. • Describe the advantages of sexual reproduction over asexual reproduction.

Probability

There are four possible combinations of gametes that offspring can inherit.
Punnett squares display the chance of inheriting a particular characteristic.

Location of DNA

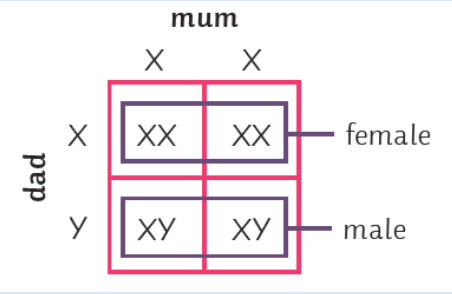




One of these four has the genotype aa- that's 25% or 0.25.

Sex Determination

Females carry two X chromosomes (XX)
Males carry one X and one Y chromosome (XY)



SUBJECT: Science **YEAR:** 10

TOPIC: Inheritance, Variation and Evolution **SEMESTER:** 2

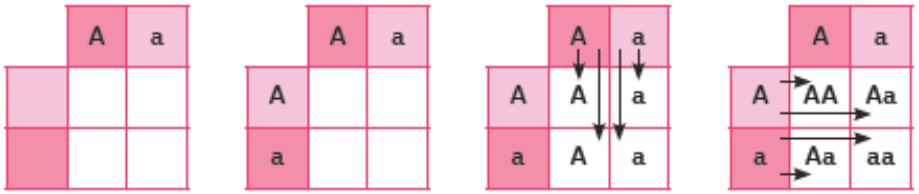
Key Questions:	Suggest why there is variation in the offspring of sexual reproduction. How many cell divisions take place in meiosis? Which type of reproduction produces offspring most quickly? What combination of chromosomes do human females have?
Curriculum Connections:	**Previous (Yr 9):** • Variation and adaptations in organisms • Natural selection • Selective Breeding **Future:** • Y11- Further revisiting of the topics studies in Y9 and Y10.

Mitosis and Meiosis

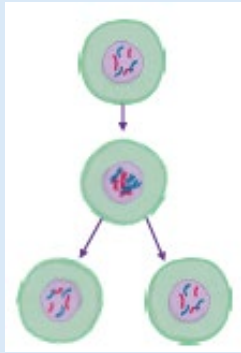
Mitosis	Meiosis
Produces two daughter cells.	Produces four daughter cells.
Daughter cells are genetically identical.	Daughter cells are not genetically identical.
The cell divides once.	The cell divides twice.
The chromosome number of the daughter cells is the same as the parent cells. In humans, this is 46 chromosomes.	The chromosome number is reduced by half. In humans, this is 23 chromosomes.
Used for growth and repair, and asexual reproduction.	Produces gametes for sexual reproduction.

How to complete a Punnett Square

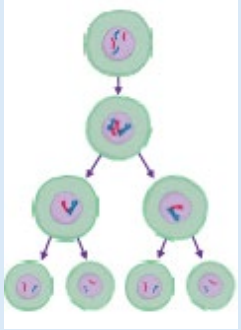
1. Write down the genotypes for the male and female
2. Put the alleles from the first parent into the boxes underneath.
3. Put the alleles from the second parent into the boxes to the right.



Mitosis



Meiosis



SUBJECT: Physics **YEAR: 10**

TOPIC: Paper 2: Forces **SEMESTER: 2**

WORD REVOLUTION

Magnetic Field	The region in which magnetic materials experience a force
Velocity	Speed and direction of an object
Distance	How far something has travelled
acceleration	The rate of change of velocity
Scalar	A quantity with magnitude and no direction
Vector	A quantity with magnitude and direction
Deceleration	A reduction in the rate of change of velocity
Weight	The force acting on an object due to gravity
Mass	The amount of 'stuff' in an object
Momentum	A property of a moving object, dependent on its mass and velocity.
Inertia	The tendency to continue in the same state of motion.
Refraction	The change in direction of a wave at a boundary.

What will I study in these topics?	Use forces to be able to describe and calculate the change in shape and motion of objects
What will I be able to do by the end of this topic?	• Newton's Laws of Motion • How work and energy transferred results from a force interacting with an object • Apply equations to calculate various quantities. • Use V-t graphs to calculate quantities

Newton's Laws of Motion.

Newton's 1st Law: An object will remain stationary or at a constant velocity unless acted upon by a resultant force.
Newton's 2nd Law: Resultant force is directly proportional to acceleration, F = m x a.
Newton's 3rd Law: When two objects interact, they exert an equal and opposite force on each other.

Acceleration

Acceleration is the rate of change of velocity.

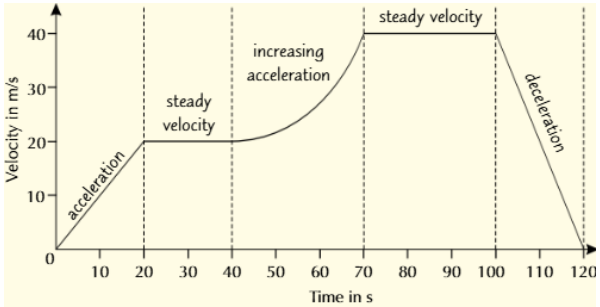
$$a = \frac{\Delta v}{t}$$

a = acceleration in m/s², v = velocity in m/s and t = time in s.
uniform acceleration is constant acceleration.

$$v^2 - u^2 = 2as$$

V = final velocity, u = initial velocity, s = distance (m) and a = uniform acceleration.

Velocity-time graphs



Terminal velocity – The maximum velocity an object reaches when resistive and gravitational forces balance out.

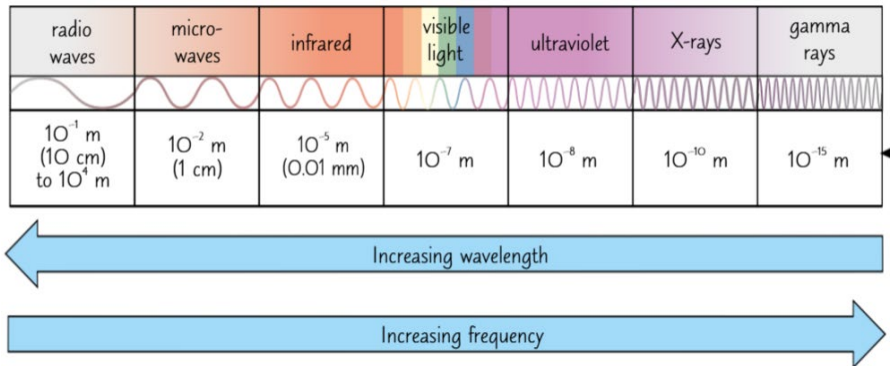
Work done – Energy transferred when a force moves an object through a distance.
W (J) = Force (N) x distance (m)

SUBJECT: Physics **YEAR: 10**

TOPICS: Paper 2: Waves and Magnetism **SEMESTER: 2**

What will I study in these topics?	The properties of waves and how this affects their uses. How electricity and magnetism are linked leading to new phenomena.
What will I be able to do by the end of this topic?	• Describe uses of electromagnetic waves • Describe how and why refraction happens • Apply the right and left hand rule to current and magnetic field interactions. • Describe how the motor effect works.

Electromagnetic Spectrum



Uses

Radio – TV and Radio

Microwaves – cooking and satellite communications.

Infrared – night vision, heating.

Visible – vision, fibre optics.

Ultraviolet – tanning, security pen.

X-Rays and Gamma Rays – medical imaging

Refraction:
When a wave crosses a boundary at an angle it changes direction.

Magnetism

Magnetic field – A region where magnetic materials experience a force.

Magnets are strongest at the poles (North and South).

Like poles repel each other (N and N, S and S).

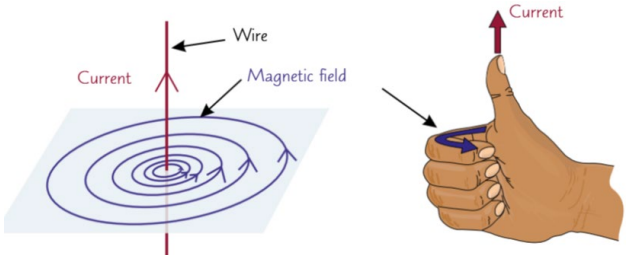
Opposite poles attract (N and S)

Magnetic Field lines go from N → S.

Current flows from positive to negative.

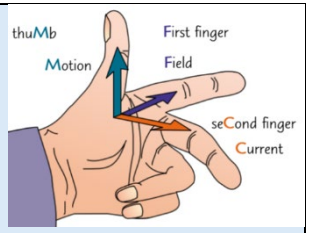
Right-Hand Rule

When a wire has a current flowing through it, it generates a magnetic field around it.



A solenoid is a coil of current carrying wire.

An electromagnet is a solenoid with an iron core.



Fleming's Left Hand Rule:
The force acting on a conductor in a magnetic field. First finger field. Second finger current. Thumb motion.

SUBJECT: Chemistry — YEAR: 10

TOPIC: Bonding & Quantitative Chemistry — SEMESTER: 2

WORD REVOLUTION

Relative Atomic Mass	The average mass of all of the isotopes of an element
Relative Formula Mass	The mass of a compound
Moles	The unit of measurement for amount of substance.
Avogadro's Constant	One mole of any substance contains 6.02×10^{23} atoms/molecules/ions
Law of Conservation of Mass	Atoms are not lost or made in a chemical reaction
Concentration	Number of particles per volume (normally per dm^3)
Limiting Reactant	The reactant that is used up first and determines the amount of product
Ionic Bonding	Transfer of electrons between metals and non-metals
Covalent Bonding	Sharing electrons between two non-metal atoms
Intermolecular Forces	Forces that are in-between molecules
Electrostatic Attraction	An attractive force between charged objects
Allotrope	Different forms of the same element
Formulae	A way of representing the composition of a substance using chemical symbols
Solubility	The ability of a solute to dissolve in a solvent to form a mixture

What will I study in this topic?	How the type of bonding influences the properties of substances Bonding & structure of carbon allotropes such as diamond and graphite How to balance chemical equations How to calculate amounts of substances and concentrations in reactions
What will I be able to do by the end of this topic?	Deduce ionic formulae State properties for ionic, simple covalent, large covalent and giant covalent compounds Explain why a substance is a solid/liquid/gas Explain the uses of diamond and graphite Calculate moles, concentration and masses using different equations Balance chemical equations

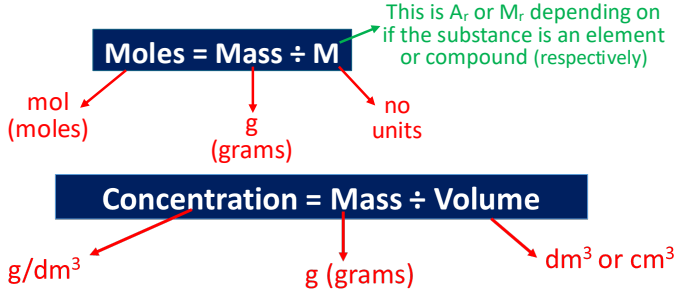
Properties of Ionic Compounds

High MP/BP	Due to strong electrostatic forces of attraction between oppositely charged ions
State at Room Temperature	Solid
Structure	Giant ionic lattice
Conducts electricity	Only when molten or in aqueous solutions

Giant Covalent Structures

Diamond	Each carbon forms 4 covalent bonds
	Does not conduct electricity
	High melting/ boiling point: Strong covalent bonds require a lot of energy to overcome
Graphite	Each carbon forms 3 covalent bonds
	Used as a lubricant → layers of hexagonal rings can slide
	Conducts electricity
	High melting/ boiling point: Strong covalent bonds require a lot of energy to overcome

Equations for calculating different quantities:



Common Formula of Ions you need to know:

Ion	Formula	Ion	Formula
Group 1	Li^+ Na^+ K^+	Transition metals	Cu^{2+} Fe^{3+}
Group 2	Mg^{2+} Ca^{2+}	Group 7	F^- Cl^- Br^-
Aluminium	Al^{3+}	Nitrate	NO_3^-
Ammonium	NH_4^+	Sulphate	SO_4^{2-}

SUBJECT: Chemistry **YEAR: 10**

TOPIC: Bonding & Quantitative Chemistry **SEMESTER: 2**

Key Questions:	Why can ionic compounds not conduct electricity when solid? Explain why water is a liquid at room temperature? Why is buckminsterfullerene useful for drug delivery? How is the mass of a product calculated from the mass of a reactant using moles?
Curriculum Connections:	Year 7 – Particles and Mixtures, Atoms and Compounds. Year 8 – Introduction to Chemical Reactions. Year 9 – Bonding & Structure, Quantitative Chemistry.

How to balance a chemical equation (1)

1	Divide the symbol equation where the arrow is.
2	List the type of atoms on each side: make sure they are in the same order on each side.
3	Count the number of each type of atom on each side.
4	If the numbers are the same, then it is balanced. If not place BIG numbers in front of the molecules. Then recount.

Tip: We don't use a big "1" in front of molecules. If there is no number, it means 1 molecule.

How to calculate the mass of a substance (2)

1	Highlight the compound you have information of and the compound you want to calculate.
2	Using the prompts (mass , M and moles) work out the moles for the known compound
3	Find out how many moles are in your unknown compound using ratio
4	Using mass = Mr x moles to calculate the mass of your unknown

Example of (1): Balance the equation

$$CH_4 + 4Cl_2 \longrightarrow CCl_4 + 4HCl$$

C = 1	C = 1
H = 4	H = 4
Cl = 8	Cl = 8

Explaining states of matter / melting or boiling point

Follow this sequence of thinking:

1. First element: look at the diagram before and after the arrow. Are electrons gained or lost?
2. How many?
3. Second element: look at the diagram before and after the arrow. Are electrons gained or lost?
4. How many?
5. Add "forming ions with full outer shells"

Describe what happens when a lithium atom reacts with a chlorine atom.

1. Lithium loses
2. 1 electron
3. Chlorine gains
4. 1 electron
5. Forming ions with full outer shells

"Lithium loses 1 electron, and chlorine gains 1 electron. Forming ions with full outer shells"

Example of (2): What mass of NaCl would be formed when 15.00g of NaOH reacts with HCl?

$$NaOH + HCl \rightarrow NaCl + H_2O$$

mass =	15.00 g	21.94 g
M_r =	40	58.5
moles =	0.375 mol	0.375 mol
ratio =	1	1

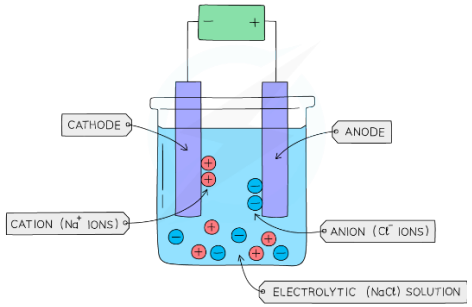
SUBJECT: Chemistry — YEAR: 10

TOPIC: Chemical Changes & Rates of Reaction — SEMESTER: 2

WORD REVOLUTION	
Reactivity	How easily a substance undergoes a chemical reaction
Electrolysis	Using electricity to break down an ionic compound
Anode	Positive electrode
Cathode	Negative electrode
Oxidation	Gaining oxygen or losing electrons
Reduction	Losing oxygen or gaining electrons
REDOX	A type of reaction involving both reduction and oxidation processes
Discharge	When ions lose or gain electrons to form their corresponding elements
Half Equation	A symbol equation that shows substances gaining or losing electrons
Aqueous	Dissolved in water
Activation Energy	Minimum energy needed for successful collisions between reactant particles
Rate of Reaction	How fast the reactants are changed into products.
Catalyst	Substances that lower activation energy in a reaction by providing an alternative energy pathway
Concentration	How many reacting particles (solute) per volume of solvent

What will I study in this topic?	The reactivity series of metals and how metals are extracted from ores based on their reactivity How electrolysis works Displacement reactions What is reduction and oxidation Collision theory and measuring rates of reaction
What will I be able to do by the end of this topic?	Use the reactivity series to make various reaction predictions Predict products of molten & aqueous electrolysis Describe the limitations of the electrolysis of aluminium oxide Write equations for displacement and redox reactions Describe & explain how changing conditions affects the rate of a reaction Calculate rates of reactions using graphs

Electrolysis



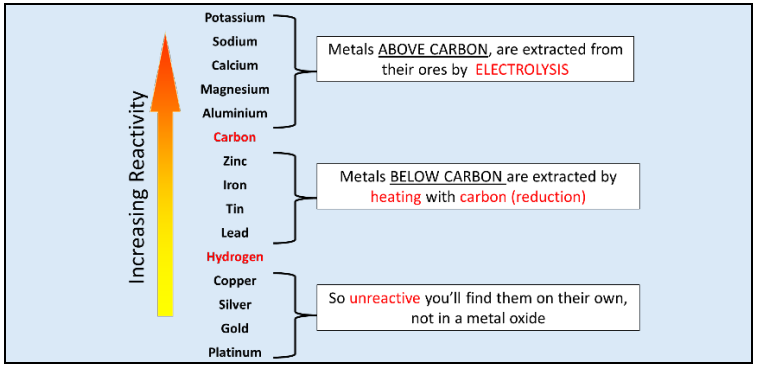
Predicting Products of Aqueous Electrolysis

THE RULES	
Negative electrode (Cathode)	*Positive electrode (Anode)*
Positive ions are attracted	Negative ions are attracted
Metals **less reactive** than hydrogen	**Halogen** (group 7 element)
Or **Hydrogen**	Or **Oxygen** (comes from OH^- ions)

Example: Sodium Chloride
4 ions present: Na^+, H^+, OH^-, Cl^-
Product at the cathode: Hydrogen as sodium too reactive
Product at the anode: Chlorine as it is a halogen

Electrolysis Principles

- Ionic compounds are melted (molten) or dissolved in water (aqueous) so their ions can freely move and carry a charge – called an **electrolyte** solution
- Opposite charges attract:
  - Positive ions go to the cathode
  - Negative ions go to the anode
- Ions are **discharged** at the electrodes forming elements



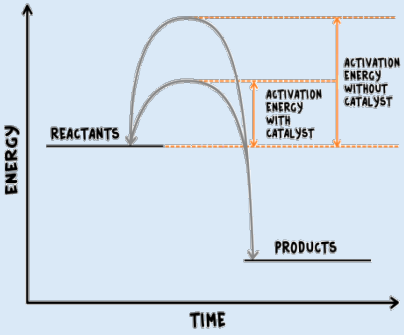
SUBJECT: Chemistry **YEAR: 10**

TOPIC: Chemical Changes & Rates of Reaction **SEMESTER: 2**

Key Questions:	Why is hydrogen produced at the cathode during electrolysis of aqueous sodium chloride? What is Redox? Describe the impact changes have on the rate of a reaction Describe a method for measuring the volume of gas when concentration is changed. Describe a method for measuring a change in turbidity of a solution when concentration is changed.
Curriculum Connections:	Year 7 – Particles and Mixtures. Year 8 – Metals & their Reactions, Energy in Chemical Reactions. Year 9 – Chemical changes

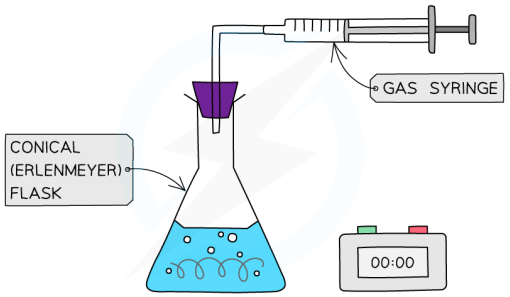
Factors Affecting Rates of Reaction

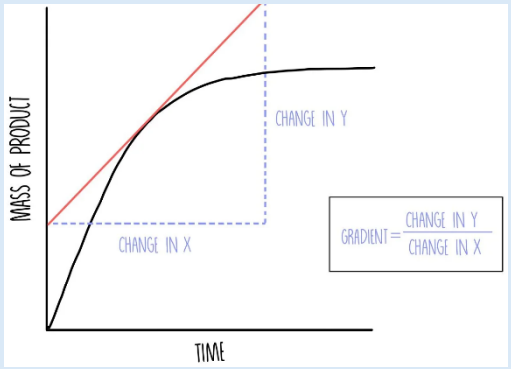
Concentration	At a higher concentration, there are more particles in the same amount of space. This causes an increase in the frequency of collisions, increasing the rate of reaction.
Temperature	At a higher temperature, particles have more kinetic energy. This means they move faster and are more likely to collide with other particles. When the particles collide, they do so with more energy, and so the number of successful collisions increases.
Surface Area	Breaking a reactant into smaller pieces will increase the surface are to volume ratio. This means for the same volume of solid the particles around it in the solution have more area to react with so there will be more frequency collisions. Increasing the frequency of collisions, increases the rate of reaction.
Pressure	At a higher pressure, the same number of particles are in a reduced space causing particles to be closer together. This causes an increase in the frequency of collisions, increasing the rate of reaction.
Catalyst	Catalysts increase the rate of reaction by providing an alternative energy pathway for the reaction that has a lower activation energy.



Required Practical: Measuring a Volume of Gas

1. Measure 50 cm^3 of 1 mol/dm^3 hydrochloric acid using a measuring cylinder. Add this to a conical flask
2. Measure out a 5 cm piece of magnesium ribbon, add this to the acid. Quickly attach an empty gas syringe to the flask.
3. Start the stopwatch
4. Take readings at 20 second intervals until the volume stops changing.
5. Record the results in a table and then use them to plot a graph
6. Repeat steps 1 - 6 using different concentrations of hydrochloric acid





The gradient is the rate of the reaction over that portion of the reaction

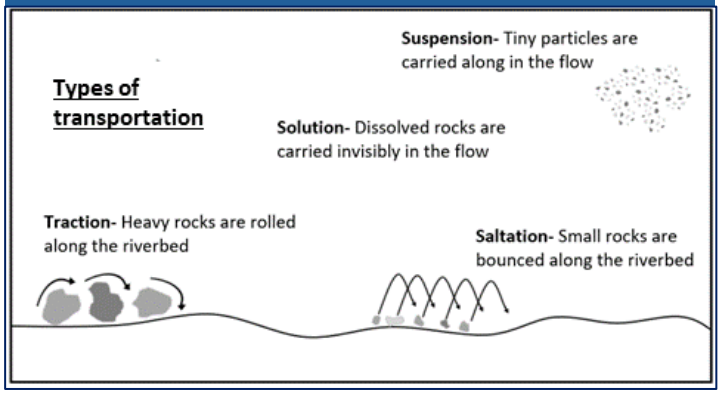
SUBJECT: GEOGRAPHY **YEAR: 10**

TOPIC: COASTAL PROCESSES **SEMESTER: 2**

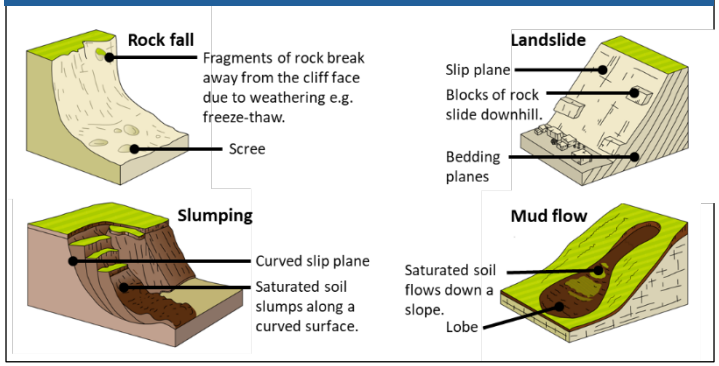
1. WORD REVOLUTION

Deposition	Occurs when material being transported by the sea is dropped due to the sea losing energy.
Erosion	The wearing away and removal of material by a moving force, such as a breaking wave.
Longshore drift	The zigzag movement of sediment along a shore caused by waves going up the beach at an oblique angle (swash) and returning at right angles (backwash).
Mass movement	The downhill movement of weathered material under the force of gravity.
Soft engineering	Managing erosion by working with natural processes to help restore beaches and coastal ecosystems.
Hard engineering	The use of concrete and large artificial structures to defend land against natural erosion processes.

2. TYPES OF TRANSPORTATION



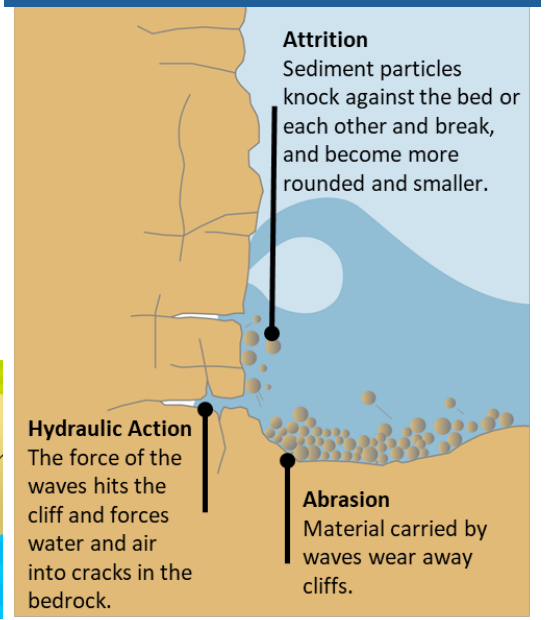
3. MASS MOVEMENT



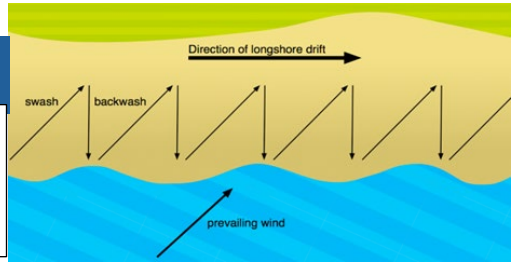
4. DEPOSITION

1. waves enter an area of shallow water;
2. waves enter a sheltered area, e.g. a cove or bay;
3. there is little wind;
4. a river or estuary flows into the sea, reducing wave energy; and
5. there is a good supply of material

5. EROSION



6. TRANSPORTATION



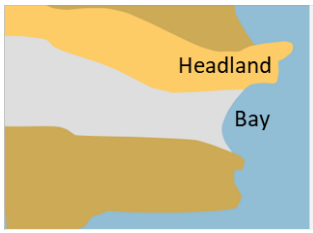
Longshore drift is the process of transportation at the coast. It happens because the wind blows waves up the beach at an angle but gravity brings the water back down the beach at a right angle.

SUBJECT: GEOGRAPHY — YEAR: 10

TOPIC: COASTAL PROCESSES — SEMESTER: 2

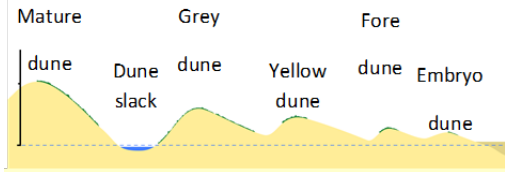
1. HEADLANDS AND BAYS

Headlands and bays are characteristic features of a discordant coastline where rocks of different hardness are exposed at the coast.



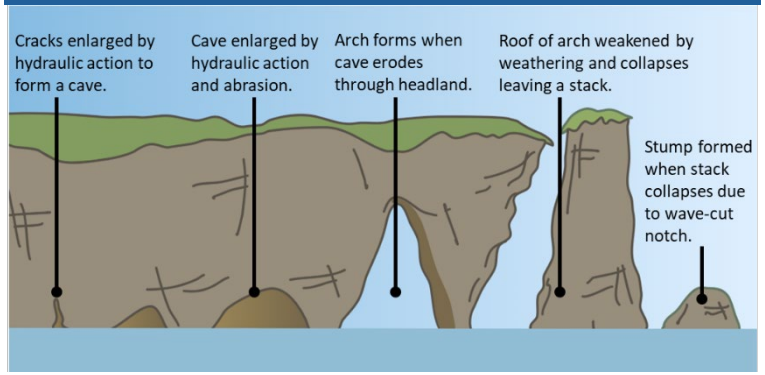
As weaker rock is eroded faster bays form, leaving more resistant headlands jutting out into the sea.

3. SAND DUNE FORMATION

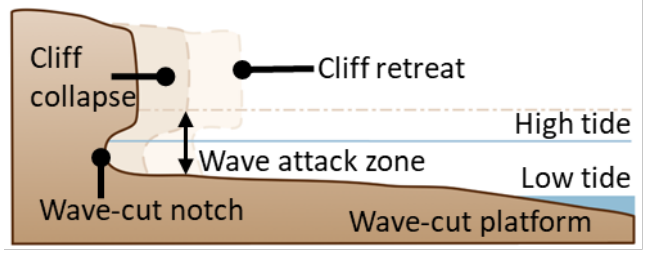


Sand dunes form at the back of sandy beaches. Sand is transported by the wind and gathers against an obstacle forming an embryo dune.

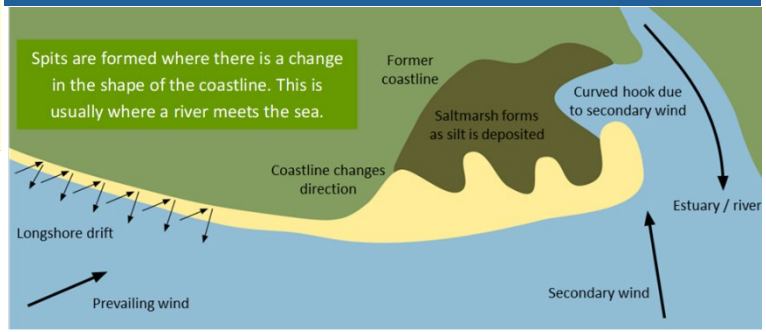
2. CAVE, ARCH, STACK, STUMP



4. WAVE-CUT PLATFORMS



5. SPIT FORMATION



6. COASTAL MANAGEMENT

Hard Engineering Defences		
Groynes	Wood barriers prevent longshore drift, so the beach can build up.	✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up or deflect the energy of the waves out to sea.	✓ Long life span ✓ Protects from flooding ✗ Expensive
Gabions or Rip Rap	Cages of rocks absorb the waves energy, protecting the cliff behind.	✓ Cheap ✓ Local material can be used . Will need replacing.
Soft Engineering Defences		
Beach Nourishment	Beaches built up with sand, causes waves to break protecting land	✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing.
Managed Retreat	Low value areas of the coast are left to flood & erode.	✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

7. OUR EXAMPLES

Features along a coastline – The Holderness Coast (Flamborough Head and Hornsea)

Coastal management – Groynes at Hornsea

SUBJECT: GEOGRAPHY — YEAR: 10

TOPIC: FIELDWORK - OVERVIEW — SEMESTER: 2

1. FIELDWORK PROCESS

Aim	Methodology	Data collection	Data presentation	Data analysis	Conclusion	Evaluation
A question or hypothesis	How you will going to collect data?	Getting out and collecting data	Show the data in a visual way	Explaining the data	Answer the question you strarted with	How could the study be improved?

2. WORD REVOLUTION

Primary data	Information that you collect yourself, e.g. tallies, measurements and photographs
Secondary data	Information that someone else has previously collected and made available e.g. on the internet
Quantitative data	Actual information that can be counted and used in fieldwork.
Qualitative data	Opinion-based information e.g. questionnaire.
Random sampling	Selecting a person or thing at random to measure or question. at random.
Systematic sampling	Collecting data in an ordered or regular way, e.g. every 5 metres or every fifth person.
Stratified sampling	Dividing sampling into groups, e.g. three sites from each section of coastline, or five people from each age range.
Mean	The total of all values that have been collected and then divide by the number of values.
Median	Achieved by writing out all of the numbers that have been collected in numerical order and find the middle number.
Mode	The most commonly appearing value within the data.

3. DATA COLLECTION

Method	What is it	Positive	Negative
Field sketches	Drawing key parts of a place and annotating them	Ideas and thoughts captured in the field. Links images with words	Can't easily go back and repeat so needs to be done there and then
Environmental surveys	Looking at an area using a set of criteria and applying a scale to them	Quick and easy to complete and gives lots of data to be graphed	Relies on opinion which vary from person to person
Measuring height & distance	Using tape measures/ rulers to gather numerical data on a feature	Give quantitative data that can be analysed later	Measurements are only as accurate as the people taking them

4. DATA PRESENTATION

Line graph	Used when data is linked together or continuous, often by time or distance e.g. showing how the speed of a river changes with distance downstream
Bar chart	When data collected is independent of each other, not continuous and therefore discrete e.g. the height of the beach at selected groynes
Pie chart	All pie charts represent a whole amount that equals 100% e.g. the proportion of people in the whole of Bradford in certain age brackets
Linking data to maps	Adding data onto a map locates the data to the exact point is was collected. This makes analysing the data more effective e.g. proportional circles to show the average size of a pebble on different parts of the beach

SUBJECT: GEOGRAPHY **YEAR: 10**

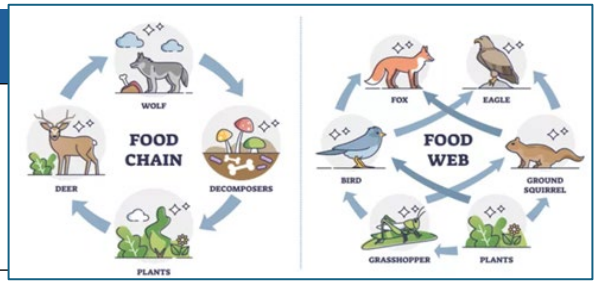
TOPIC: THE LIVING WORLD - RAINFORESTS **SEMESTER: 1**

1. WORD REVOLUTION

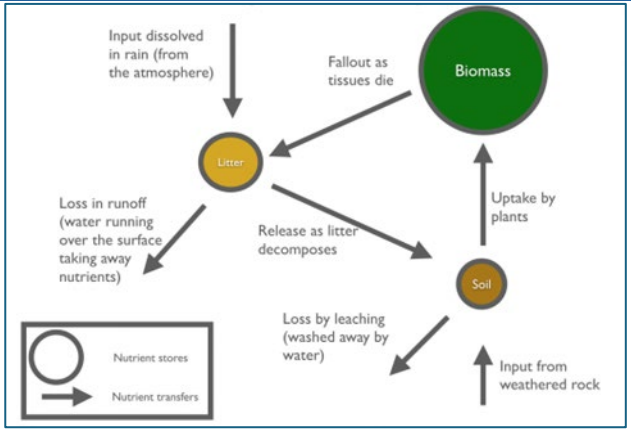
Abiotic	Relating to non-living things.
Biotic	Relating to living things.
Producer	An organism or plant that is able to absorb energy from the sun through
Consumer	Creature that eats animals and/or plant matter.
Decomposer	An organism such as a bacterium or fungus, that breaks down dead tissue, which is then recycled to the environment.
Ecosystem	A community of plants and animals that interact with each other and their physical environment.
Global ecosystem	Very large ecological areas on the earth's surface (or biomes), with fauna and flora (animals and plants)
Biodiversity	The variety of life in the world or a particular habitat.
Deforestation	The chopping down and removal of trees to clear an area of forest.
Ecotourism	Responsible travel to natural areas that conserves the environment, sustains the wellbeing of the local
Sustainability	Actions and forms of progress that meet the needs of the present without reducing the ability of future generations to meet their needs.

2. FOOD CHAINS AND FOOD WEBS

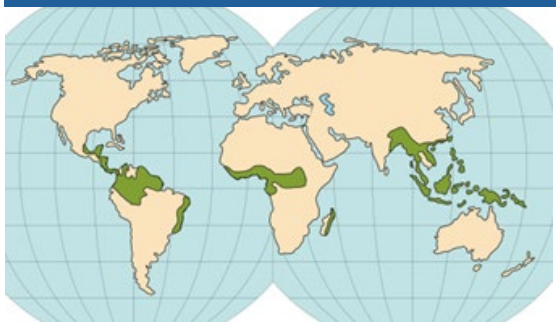
Simple food chains are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. Food webs however consists of a network of many food chains interconnected together.



3. THE NUTRIENT CYCLE



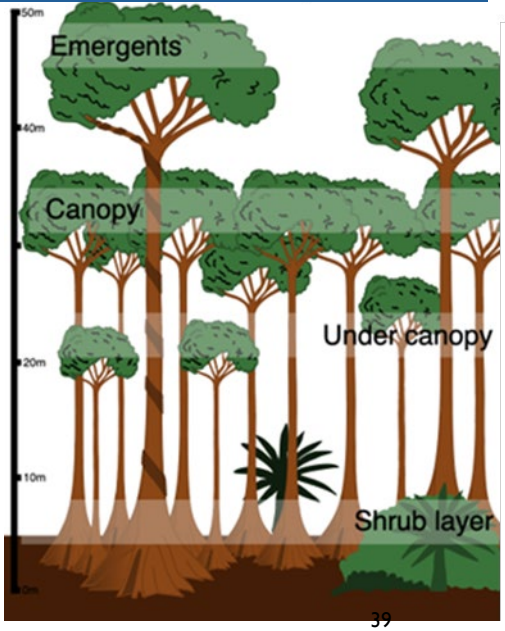
4. LOCATION OF TRFs



5. CLIMATE OF TRFs

Hot (between 27 and 28 degrees), wet (around 2000mm of rainfall) and humid all year round. This means that the growing season for plants is year round.

5. STRUCTURE OF TRFs



SUBJECT: GEOGRAPHY — YEAR: 10

TOPIC: THE LIVING WORLD — SEMESTER: 1

1. THE AMAZON RAINFOREST

5.5 million km², largest in the world, 40% of the world's remaining tropical rainforest.

2. CAUSES OF DEFORESTATION

Agriculture – Around 80% of deforestation caused by cattle ranching.

Logging – Hard wood (mahogany & teak) valued for furniture. Small trees pulped/charcoal.

Road building – Increased accessibility increases development e.g. Trans Amazon Highway

Mineral extraction – Gold, iron ore & bauxite. Mining 10K ha (1999) to 50K ha (2016) (e.g. Carajás)

Energy development – High rainfall creates ideal conditions for HEP e.g. Belo Monte, Brazil.

Settlement and population growth – Manaus expands (1.4 to 2M) for housing, roads and services.

3. IMPACTS OF DEFORESTATION

Economic Development

- Raw materials support processing industries and increase export value e.g. beef.
- Commercial farming and mining generate employment and tax income.
- HEP (e.g. Belo Monte Dam) = cheap energy.
- Loss of biodiversity reduces potential for ecotourism and new medicines.
- Long term loss - soil fertility and rivers polluted.

Social Impacts

- Education, health care and social conditions are improved from tax revenue.
- Decline in indigenous tribes e.g. Kayapo.

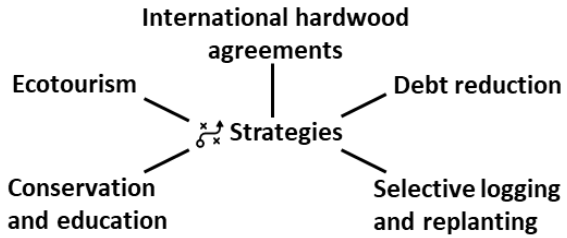
Environmental Impact

- Exposed land increases soil erosion
- Decline in biodiversity (approx. 137 species/day

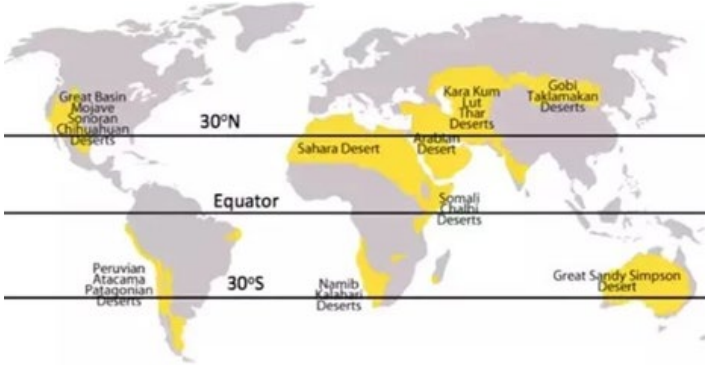
Climate Change

- Local environment becomes hotter and drier.
- Reduction in carbon sink due to deforestation.

4. SUSTAINABLE MANAGEMENT



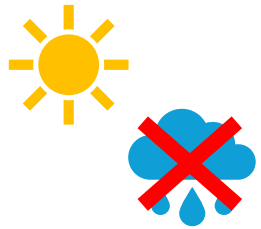
5. LOCATION OF HOT DESERTS



5. CLIMATE OF HOT DESERTS

Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm.

Heat – hot deserts rise over 40 degrees.



6. PLANT AND ANIMAL ADAPTATIONS

Cacti	Store water in their tissue and have spikes to stop animals eating them
Acacia trees	Short fat trunks act as a reservoir for water. They are fire resistant and have roots that go 50m into the ground to get water
Camels	Wide feet to spread weight over the sand.. They have slit-like nostrils and two rows of eyelashes to help keep out sand

SUBJECT: GEOGRAPHY — YEAR: 10

TOPIC: LIVING WORLD – HOT DESERTS — SEMESTER: 2

1. THE THAR DESERT – CASE STUDY

- Thar Desert is located on the border between India and Pakistan.
- Population growth in India, most populated country in the world in the next five years.

2. OPPORTUNITIES IN THE THAR DESERT

Tourism	Camel safaris over beautiful landscapes from cities like Jaisalmer, Pakistan & the winter desert festival attracts tens of thousands each year. This gives local people job opportunities
Farming	Large amounts of subsistence farming of crops and nomadic grazing. Some commercial farming has grown in recently with the development of irrigation channels. Crops include wheat, cotton, pulses and maize
Mineral extraction	Vast reserves of important minerals are extracted and used in India. These include gypsum & feldspar. Near Jaisalmer there are large volumes of limestone needed in the steel industry
Energy	A mixture of renewable energy sources like wind and solar energy are present alongside non-renewable options with large reserves of oil and coal both found in the desert. These create economic and social opportunities

3. CHALLENGES IN THE THAR DESERT

Extreme temperatures

Exceeding 50°C makes outside work hard. Extreme heat & high levels of evaporation is challenges to animals and plant life.

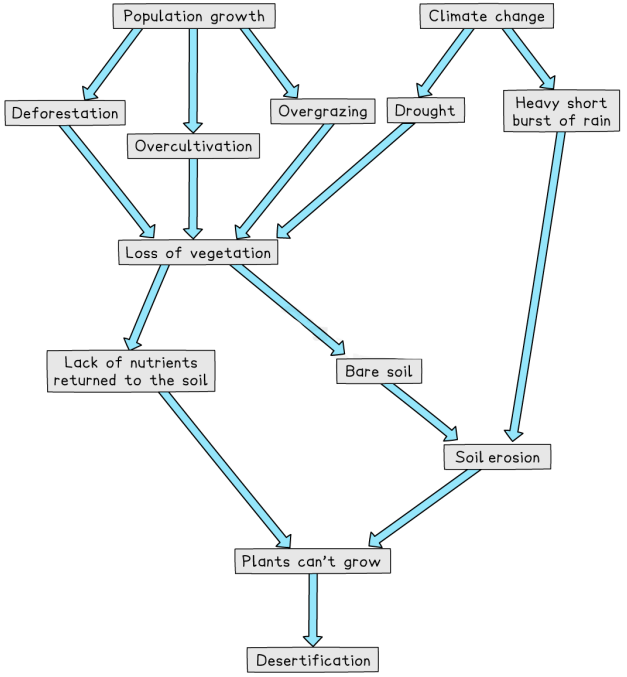
Water supply

A growing concern as population, farming and industry increase. Indira Gandhi Canal supplements occasional natural ponds and rivers.

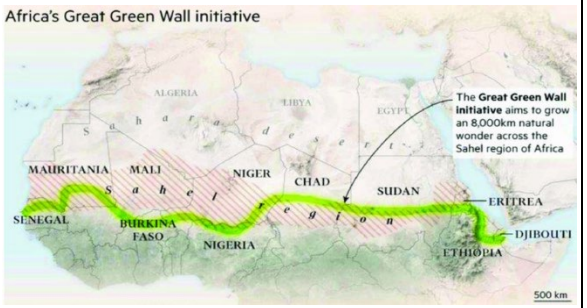
Inaccessibility

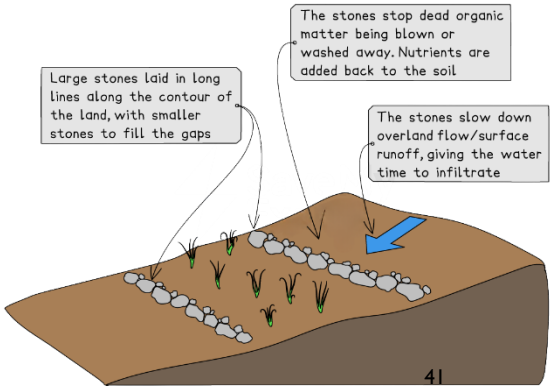
This is caused by a poor road network. The tarmac of existing roads melts in the heat and can be covered over by sand blown across them.

4. DESERTIFICATION



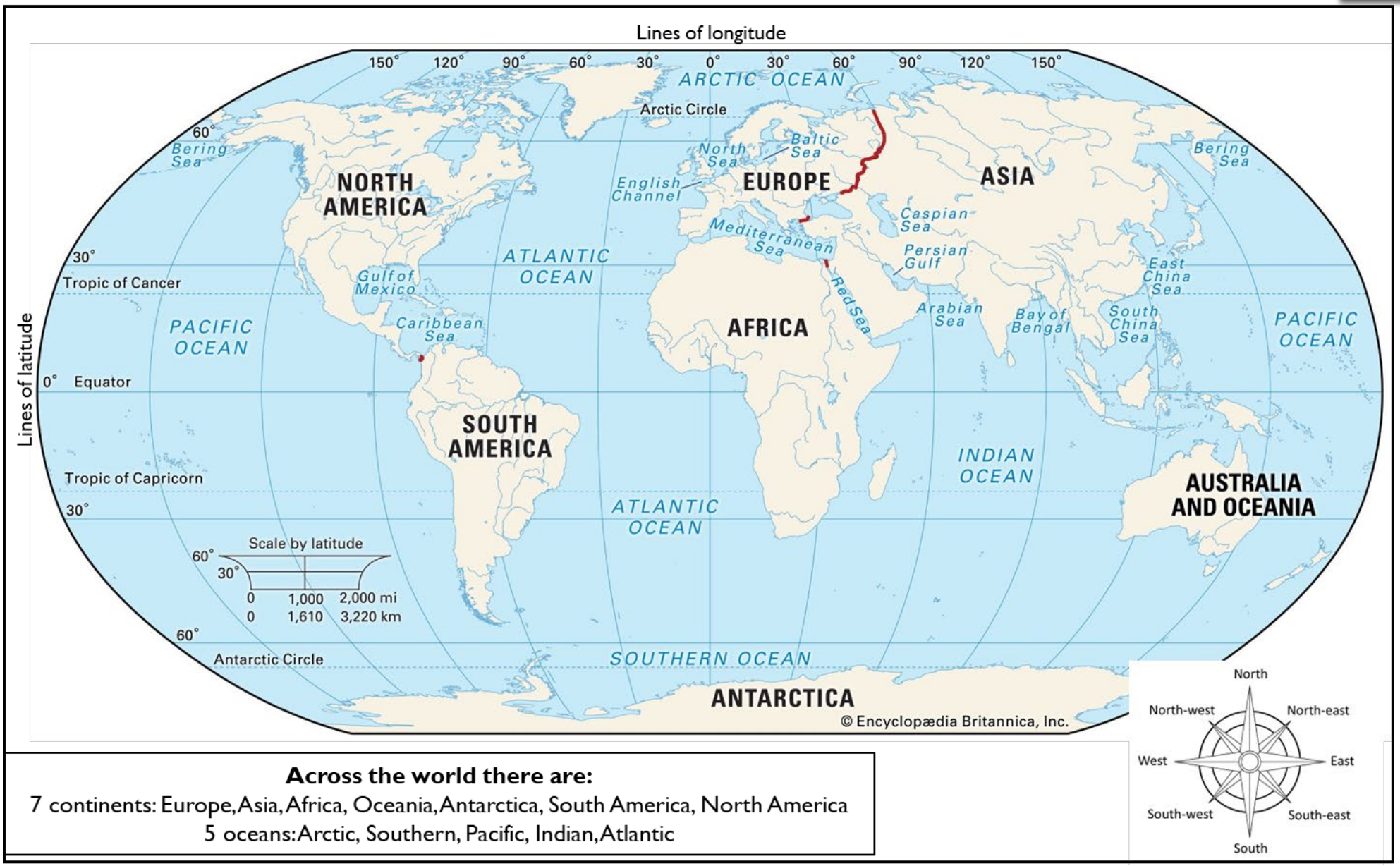
5. MANAGING DESERTIFCATION





SUBJECT: Geography **YEAR:** EDIT

TOPIC: Locational basics **SEMESTER:** I



Across the world there are:

7 continents: Europe, Asia, Africa, Oceania, Antarctica, South America, North America

5 oceans: Arctic, Southern, Pacific, Indian, Atlantic


BENTON PARK