

YEAR 10

Knowledge
ORGANISER

2026 - 27
SEMESTER 1



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, Miss Fox, Mr Sykes. If you are unable to speak to any member of staff, please contact: studentsupport@bentonpark.mlt.co.uk



MY YEAR LEADER
Miss Charlton



MY KEY STAGE LEADER
Miss Dobby



MY SLT LINK
Mrs Howard

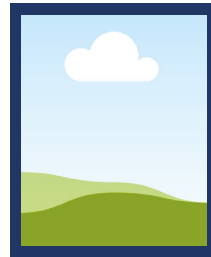
OTHER YEAR LEADERS



Year 9 – Miss Bannister



Year 8 – Miss Downing



Year 7 – Miss Bond



Year 11 – Mrs Sykes



**Designated
Safeguarding Lead /
Assistant Headteacher**
Mrs Howard



**KS4 Safeguarding
Officer**
Mrs Kelly



**SENCo /
Assistant Headteacher**
Mr Hayes



Key Stage 3 Leader
Mrs Collins

MY *Attendance* RECORD

ATTENDANCE %

Year so far:

Attendance Targets:

DATE	WEEKLY %	YEAR TO DATE %
Week 1		
Week 2		
Week 3		
Week 4		
Week 5		
Week 6		
Week 7		
Week 8		
Week 9		
Week 10		
Week 11		
Week 12		
Week 13		
Week 14		
Week 15		
Week 16		
Week 17		
Week 18		
Week 19		

STUDENT *Loyalty* CARD

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

**COLLECT A STAMP EACH TIME YOU ATTEND A LUNCH AND AFTER SCHOOL
EXTRA-CURRICULAR ACTIVITY. WHEN YOU'VE REACHED 10, 20, 30 AND 40
STAMPS YOU WILL RECEIVE A REWARD!**

SUBJECT: English

YEAR: 10



TOPIC: 'An Inspector Calls'

SEMESTER: I

WORD REVOLUTION

Capitalism	An economic and political system in which a country's trade and industry are controlled by private owners for profit.
Socialism	Socialism is a way to organize a society. It deals mostly with the economy, or the part of a society that creates wealth. The goal of socialism is to spread wealth more evenly and to treat all people fairly.
Hierarchy	In society or an organisation, hierarchy is a system in which people are organised according to status or rank.
Dramatic irony	A literary device where the audience know more than the character(s) on stage.
Class	Social classes are hierarchal groupings in society
Morality play	A play which depicts a conflict between good and evil in humans.
False ending	A device used in drama which tricks the audience into thinking that the work has ended before it continues.
Stage directions	Instructions in a play which guide the actors on how to speak, where to stand, when to enter / exit etc and lighting, sound effects and overall mood.
Patriarchy	A system of society or government in which men are in control and women are largely excluded.
Responsibility	Being accountable or to blame for something / having a duty to deal with someone or something
Inequality	A lack of equality or fair treatment in society.
Well-made play	A dramatic genre from 19 th Century theatre which has a tight plot structure and a climactic resolution.

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)

SOCIETY AND ATTITUDES

- Social Justice
- Inequality: class and gender
- Oppression and hierarchy
- Social and collective responsibility
- Capitalism and socialism
- Post-war England

PEOPLE & RELATIONSHIPS

- Guilt
- Power Struggles
- Generational divide
- Parents and children

FORM, STRUCTURE & LANGUAGE

- Morality Play
- Dramatic Irony
- False Ending
- Stage directions
- Static and dynamic characters



SUBJECT: English Literature Paper 2

YEAR: 10

TOPIC: 'An Inspector Calls'

SEMESTER: I



Key Questions:	- To what extent is each character responsible for Eva Smith's death? - Does Priestley suggest that personal morality should outweigh social status or wealth? - How does the play challenge the idea of individual versus collective responsibility? - How does Priestley portray the divide between the upper and working classes? - What role does class play in the treatment of Eva Smith by each character? - Is social mobility presented as possible or futile in the world of the play?
Curriculum Connections:	- A Christmas Carol (Y7) – social responsibility / moral message and writers' intention - Jane Eyre (Y8) - social commentary on class, women, education - Protest Poetry (Y9) – literature with a political message - Animal Farm (Y9) - political allegory / moral message

Characters in the play

Mr Arthur Birling	Proud, self-assured and staunchly capitalist.
Mrs Sybil Birling	Cold, snobbish and dismissive of those beneath her social class.
Eric Birling	Arthur and Sybil's son; immature and reckless.
Sheila Birling	Arthur and Sybil's daughter; initially naïve and self-absorbed.
Gerald Croft	Charming but morally compromised. Sheila's fiancée.
Inspector Goole	Priestley's mouthpiece for social justice. Challenges each character.
Eva Smith / Daisy Renton	Unseen victim. Her story is pieced together through confessions.
Edna	Female character; the Birling family maid.



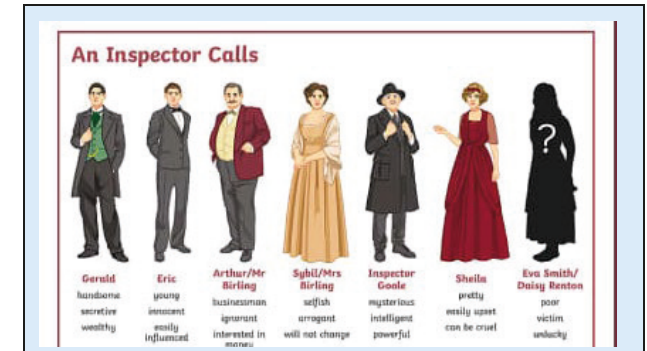
Brief summary of the play

Overview

J.B. Priestley's *An Inspector Calls* is a gripping drama set in 1912, centred around the upper class Birling family. As they celebrate the engagement of Sheila Birling and Gerald Croft, their evening is interrupted by the arrival of Inspector Goole, who is investigating the tragic death of a young woman, Eva Smith.

Plot

The Inspector methodically questions each member of the family about the death of Eva, revealing how their actions may have impacted the woman's life. As the interrogation unfolds, tensions rise and long-held assumptions begin to unravel.



SUBJECT: English Literature Paper 2

YEAR: 10

SEMESTER: I



AN INSPECTOR CALLS – KEY CONTEXT

Historical

Set in 1912: Just before World War I, during the Edwardian era — a time of stark class divisions and social inequality.

Written in 1945: Right after World War II, when Britain was reckoning with the need for social reform and collective responsibility.

Titanic Reference: Mr. Birling's claim that the Titanic is "unsinkable" is dramatic irony — Priestley uses it to highlight the arrogance and misplaced confidence of the upper class

Social

Class Divide: The play critiques the rigid class system. The wealthy Birlings are contrasted with Eva Smith, a working-class woman who suffers due to their actions.

Gender Roles: Women in 1912 had limited rights and were often economically dependent on men. Eva's vulnerability reflects this, and Priestley subtly supports the growing suffragette movement.

Youth vs. Age: The younger generation (Sheila and Eric) show moral growth, while the older (Mr. and Mrs. Birling) cling to outdated values — symbolizing hope for a more progressive future

Political - The play was written and first staged in 1945, after the end of the Second World War. The Labour Party had just won power, advocating for welfare reforms. Priestley's play aligns with this shift toward a more equitable society. Priestley, a committed socialist, uses the Inspector to challenge capitalist ideals. The Inspector's message — "We are members of one body" — promotes social responsibility and collective ethics

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.
Dialogue	Exchanges between characters that drive plot and reveal relationships.
Tension	Building suspense and emotional intensity.
Symbolic Props	Objects with deeper meaning (e.g., scientific instruments, the journal).
Lighting	Used to create mood, shift scenes, or focus attention.



In 1912, women were not allowed to vote. The Suffragette movement campaigned for this reform.

In 1912, Titanic sank, even though it was apparently 'unsinkable'. 1500 people died.

KEY THEMES IN THE PLAY

Social responsibility	Priestley urges his audience to care for others, especially those less fortunate. Each character is forced to confront their role in Eva's death.
Class and social hierarchy	Eva's story is designed to expose the cruelty of the class system that favours the wealthy.
Generational conflict	Priestley uses the divide to suggest that hope lies within the younger generation.
Capitalism vs socialism	The tension between these two ideologies plays out in each interrogation.
Gender & power	The play critiques the patriarchy and its attitudes and exploitation of women.



SUBJECT: English Literature
Paper 2

TOPIC: 'An Inspector Calls'

YEAR: 10

SEMESTER: I



How will I be assessed?

Formative assessment: Sample marking feedback on Arthur Birling in Act One.

Ensure that you have clear understanding of this character and the techniques that Priestley uses to create him. Learn key quotations and explain what these suggest. Link this to the messages that Priestley wanted to share with his audience about capitalists and capitalist attitudes.

Summative assessment: Individually marked essay on how Sheila changes throughout the play.

Ensure that you are clear on how Sheila changes over the course of the three acts in the play. Learn key quotations from the whole of the play that show these changes. Link these to the messages that Priestley wanted to share about women, the younger generation and the working classes..

Dramatic methods in the play

- **Dramatic structure of the play**
 - Three-Act Play: Follows a tight structure with rising tension and climactic revelations.
 - Cyclical Ending: The play ends with another inspector's arrival, suggesting the characters may be doomed to repeat their mistakes — or get a second chance.
 - Cliffhangers: Each act ends on a suspenseful note.
- **Dramatic irony and foreshadowing**
- **Symbolism and props** – the photograph and the doorbell.
- **Contrasts and juxtaposition** – Sheila/Birling, moral authority/Birlings arrogance
- **Genre Blending** – Crime thriller / morality play / well-made play

Key Quotations

- Mr Arthur Birling – “A man has to mind his own business and look after his own.”
- Mrs Sybil Birling - “I did nothing I’m ashamed of.”
- Eric Birling - “You killed her — and the child she’d have had too — my child — your own grandchild.”
- Sheila Birling - “But these girls aren’t cheap labour – they’re people.”
- Gerald Croft - “I didn’t feel about her as she felt about me.”
- Inspector Goole - “We are members of one body. We are responsible for one another.”

SENTENCE STARTERS FOR ESSAY WRITING

Priestley presents the character as ...

Priestley wanted to stress to his audience that...

As seen in Act One, the character is...

The character changes over the course of the play; at the beginning they are...

The theme of [social responsibility/class/gender] is demonstrated using...

Priestley presents a juxtaposition between these two characters to show...

EVIDENCE AND ANALYSIS SENTENCE STARTERS

This is shown when the character says....

The characters consistent use of declarative sentences shows that

The use of [dramatic irony/emotive language/stage direction] here creates the impression that....

The use of the word “...” suggests that ...

This is a powerful moment in the play because it reveals that ...

Further Reading and Other Resources

[An Inspector Calls - GCSE English Literature - BBC Bitesize](#)

[GCSE English Literature podcasts - An Inspector Calls - BBC Bitesize](#)

[AQA English Revision - An Inspector Calls](#)

There are two film versions of *An Inspector Calls* which we also use in school; a version from 1954 and one from 2018. You can access both of these on Digital Theatre Plus.

Username: student.bentonpark Password: gentle@4683

Recall Questions

1. What is the name of the young woman whose death Inspector Goole is investigating?
2. Which two characters are engaged at the beginning of the play?
3. When is the play set and when was it first staged?
4. Which character claims that the Titanic is ‘unsinkable’ and what does this reveal about them?
5. Which are the characters that show growth and change over the play?
6. What does Gerald admit to during the Inspector’s questioning?
7. For which ideology is Inspector Goole a mouthpiece?
8. Which ideology does Arthur Birling represent?
9. What was Eric’s involvement with Eva Smith?
10. What dramatic device is used when the Inspector arrives, after Birling speaks about self-reliance?

SUBJECT: English Language Paper 1

YEAR: 10

TOPIC: Narrative & Descriptive Writing

SEMESTER: I



WORD REVOLUTION

narrative	Telling a story
point of view	The perspective from which the story is narrated.
First person	First person – from one person's point of view – 'I' or 'we'.
third person	Third person - Telling a story from an outside perspective – 'he', 'she' or 'they'.
tense	The time the story is told in (past, present, or future).
structure	How a story is organised (e.g. beginning, middle, end).
setting	Where and when a story takes place.
characterisation	How characters are described and developed.
metaphor	A comparison saying one thing is another (e.g. "Time is a thief").
personification	Giving human qualities to non-human things (e.g. "The sun smiled").
atmosphere	The mood or feeling created in the story.
imagery	Descriptive language that creates a vivid picture or appeals to the senses.

Exam Task

AQA Language Paper 1, Section B Question 5

Task: Write to describe or narrate based on a visual prompt.

Marks: 40 marks (24 for content, 16 for technical accuracy)

Timing: Use 5–10 minutes to plan ideas and structure. Then spend 30–35 minutes writing.

Assessment objectives

AO5 – Communication and organisation

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 – Technical Accuracy

Students must use a range of vocabulary and sentence structures for clarity, purpose and effect, with accurate spelling and punctuation.

Descriptive Techniques

simile
metaphor
personification
sensory description
pathetic fallacy
alliteration
onomatopoeia
emotive language
dramatic verbs

Five Sentence Openers

1. Start with an adverb

Example: *Silently, the figure moved through the mist, leaving no trace behind.*

2. Start with a prepositional phrase

Example: *In the heart of the abandoned city, the wind whispered through shattered windows.*

3. Start with a simile or metaphor

Example: *Like a predator stalking its prey, the storm crept across the horizon.*

4. Start with a subordinate clause

Example: *Although her hands trembled, she reached for the door handle and turned it slowly.*

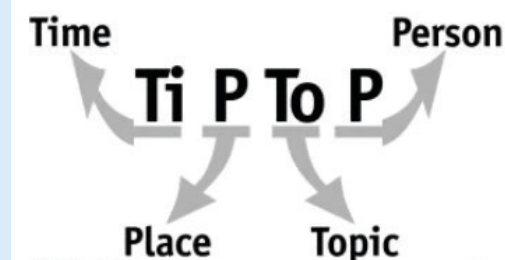
5. Start with dialogue or a quotation

Example: *"Don't move," he hissed, eyes fixed on the forest floor.*

Sentence Structures

Simple	An independent clause.	The wind howled.
Compound	Two independent clauses joined by a conjunction	The wind howled, and the trees bent under its force.
Complex	One independent clause + one or more subordinate clauses.	Although the wind howled, the candle flame stood firm.
Minor	Used for effect.	Silence. / Too late.
Exclamatory	Express a strong emotion.	What a view!
Interrogative	Asks a question.	What was moving?
Declarative	States a fact or opinion.	The sky was painted gold.

How to have TiPToP paragraphing skills



SUBJECT: English Language Paper I

YEAR: 10

TOPIC: Narrative / Descriptive Writing

SEMESTER: I



Narrative point of view	First person perspective: written as if the narrator is a character observing or taking part in the story. Second person perspective: written as if the narrator is talking directly to the reader (you / your) Third person perspective: written as if the narrator is talking about the characters and events, but not necessarily a character in the story Omniscient narrator: a narrator who is god-like, able to move from place to place and character to character, realigning the reader to any perspective they wish to share.
Tense	Narratives can be written in either past tense (when the action happened in the past) or in present tense (as if it is happening now). Past tense – ‘She crept down the hallway, heart pounding, as the floorboards groaned beneath her feet.’ Present tense – ‘She creeps down the hallway, heart pounding, as the floorboards groan beneath her feet.’ You can choose to write in either past or present tense, but you MUST stick to the same tense throughout!

Synonyms

dark	dim, gloomy, shadowy, murky, dusky, cloudy, dingy
scary	frightening, terrifying, daunting, alarming, chilling, threatening, intimidating, petrifying
old	ancient, aged, decrepit, dilapidated, elderly, worn, vintage, antique, historic
bright	shiny, radiant, vivid, brilliant, luminous, incandescent, dazzling, effulgent
fast	quick, rapid, speedy, swift, brisk, fleet, expeditious
slow	laborious, tedious, ponderous, painful, deliberate, unhurried
big	massive, vast, gargantuan, immense, titanic, monumental
weird	unconventional, eccentric, peculiar, anomalous, aberrant, bizarre
nice	Enjoyable, pleasant, agreeable, delightful, gratifying, acceptable, diverting, admirable
funny	Humorous, comedic, amusing, entertaining, hysterical, uproarious, riotous, jocular

Model response

A single bulb flickered above the stairwell, casting jagged shadows that danced like ghosts on the peeling walls. The air was thick with damp and something else—something metallic. Blood? She hesitated, her breath shallow, ears straining for movement. Nothing. Just the hum of silence, too perfect to trust. Her hand trembled as it gripped the railing, cold and slick beneath her fingers. Each step creaked like a warning. Behind her, the door she'd entered creaked shut on its own. She spun. Empty. But the scent was stronger now. Closer. Something was down there. And it was waiting.

What descriptive techniques have been used here? How could it be improved?

Starting your Creative Writing

Create an atmosphere

- The sky bled shades of amber and violet as...
- A hush fell over the landscape, broken only by...
- Nestled between the hills, the village slumbered beneath...

Sensory starters

- The scent of the rain clung to the air like...
- Each step crunched against the frostbitten earth...

Emotional or character focused

- Her heart thudded like a drum, echoing the silence around her...
- He stood motionless; eyes fixed on the horizon.

Time and place anchors

- It was just past midnight when the first tremor was felt.
- Long before the sun rose, the streets were alive with...

Creative writing structure Descriptive writing

FIRST OF ALL..... Decide on the mood/tone of your piece of writing. Will it be eerie/chaotic/calm/busy/peaceful/joyful? Imagery.

Paragraph 1 – Establish the mood/tone. Describe how you feel and how the setting feels. Use sensory imagery here.

Paragraph 2 – ‘Zoom in’ on a person / a family / a situation / an item / object and describe it. How does it add to the mood/tone? Can you use a simile, or personify the item or object?

Paragraph 3 – Keep this one super short....snippet of speech? A sudden or random sound? A feeling?

Paragraph 4 – ‘Zoom out’ and describe what is going on around you. Focus on the senses, what you see and hear and *experience*.

Paragraph 5 – A final reflective moment. Thoughts/feelings? Link back to the start.

SUBJECT: ENGLISH LITERATURE
PAPER 2
TOPIC: POWER & CONFLICT
POETRY

YEAR: 10

SEMESTER: 1



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 comparison

When poems have similarities:

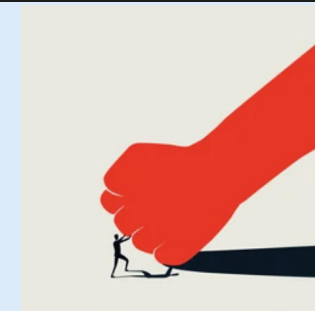
Similarly... Both poems convey / address...
 Both poets explore / present... This idea is also explored in... In a similar way, ... Likewise, ...

When poems have differences:

Although... Whereas... Whilst... In contrast, ...
 Conversely, ... On the other hand, ...
 On the contrary, ...
 Unlike...

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...



How could this image relate to each poem?

SUBJECT: English Literature
Paper 2

TOPIC: London

YEAR: 10

SEMESTER: I



Summary:	William Blake's poem <i>London</i> presents a bleak and powerful critique of the social and political conditions in 18th-century London. The speaker walks through the city and observes widespread suffering, oppression, and moral decay. He hears the cries of children, the despair of soldiers, and the sorrow of the poor, all confined by "mind-forged manacles" — symbolic of societal and psychological oppression. Blake condemns institutions like the Church and monarchy for their role in sustaining injustice. The poem ends with an image of a diseased and corrupted society, highlighting the loss of innocence and the destructive impact of industrialization and authority.
Context:	William Blake wrote <i>London</i> in the late 18th century, during a time of major social, political, and economic upheaval. The Industrial Revolution was transforming cities, leading to poverty, child labour, and poor living conditions. Blake, a Romantic poet and radical thinker, was deeply critical of the established institutions of power — including the Church, the monarchy, and government — which he believed contributed to widespread suffering. Influenced by the French Revolution, Blake used <i>London</i> to expose corruption and social inequality.

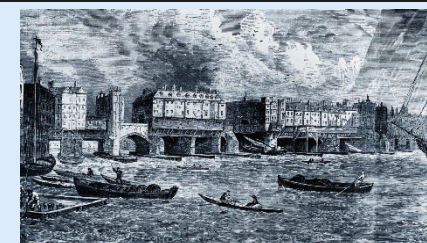
Poetic devices used in the poem

Repetition	"In every cry of every Man, / In every Infants cry of fear, / In every voice..."
Imagery	"And the hapless Soldier's sigh / Runs in blood down Palace walls."
Alliteration	"mind-forged manacles"
Metaphor	"mind-forged manacles"
Symbolism	"Chimney-sweeper's cry"
Juxtaposition	"Marriage hearse"
Anaphora	"In every cry... / In every Infants cry... / In every voice..."
Enjambment	"How the Chimney-sweeper's cry / Every black'ning Church appalls;"

Key messages from the poem

The overall message of William Blake's *London* is a powerful critique of the social, political, and spiritual oppression present in 18th-century society. Blake highlights the widespread suffering of the poor, the corruption of institutions like the Church and monarchy, and the emotional and mental imprisonment of individuals through "mind-forged manacles." He exposes how industrialization and rigid social systems strip people of freedom, innocence, and hope.

The poem suggests that this suffering is not natural, but man-made, caused by those in power. Ultimately, *London* conveys a message of deep injustice and the destructive impact of a society lacking compassion and freedom.



"I wander thro' each charter'd street,
Near where the charter'd Thames does flow"



"How the Chimney-sweepers cry"

SUBJECT: English Literature
Paper 2

TOPIC: Ozymandias

YEAR: 10

SEMESTER: I



Summary:	<i>Ozymandias</i> by Percy Bysshe Shelley is a sonnet that explores the impermanence of power and the inevitable decay of all human achievements. The poem describes a traveller's account of a ruined statue in the desert. The statue's grand scale and inscription — boasting of the king's greatness — lie in stark contrast to the desolate surroundings. Once a powerful ruler, Ozymandias is now forgotten, his empire reduced to dust. Shelley uses irony and vivid imagery to highlight the futility of arrogance and the passage of time, suggesting that even the mightiest rulers cannot escape the ravages of history and nature.
Context:	Percy Bysshe Shelley wrote <i>Ozymandias</i> in 1817, during the Romantic era, a period that emphasised emotion, nature, and the critique of political power. The poem was inspired by the recent arrival of fragments of a statue of Pharaoh Ramesses II in Britain, symbolizing the collapse of once-great empires. Shelley, a radical thinker, used the poem to criticise tyranny, arrogance, and the belief in human permanence. Through the image of a ruined statue in a vast desert, he illustrates how time erodes even the most powerful legacies. The poem serves as a warning against pride and the illusion of eternal power.

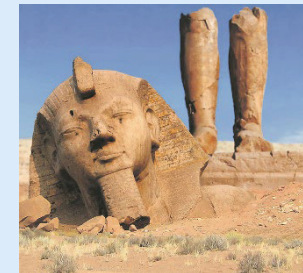
Poetic Devices used in *Ozymandias*

Irony	'Look on my Works, ye Mighty, and despair!'
Imagery	'Two vast and trunkless legs of stone / Stand in the desert.'
Alliteration	'boundless and bare / The lone and level sands stretch far away.'
Oxymoron	'colossal wreck'
Personification	'The hand that mocked them and the heart that fed.'
Metaphor	The statue itself is a metaphor for human ambition and the temporary nature of power.
Symbolism	The <i>ruined statue</i> symbolizes the decay of human power and legacy.
Caesura	'Nothing beside remains. Round the decay...'

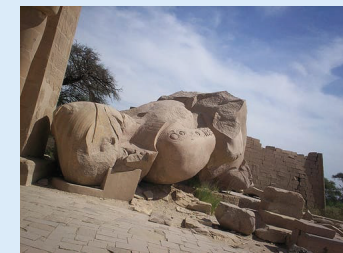
Message of the poem

The central message of *Ozymandias* is that human power and achievements are temporary, no matter how grand or seemingly immortal they may appear. Shelley illustrates this through the image of a ruined statue in a vast, empty desert — once a monument to a powerful king, now a broken remnant surrounded by nothing. The poem serves as a warning against pride, arrogance, and the illusion of permanence, especially in rulers and empires. It suggests that time, nature, and history will eventually erase all human accomplishments, leaving only fragments behind.

Ultimately, *Ozymandias* reminds us of the **fragility of human legacy**.



"Two vast and trunkless legs of stone"



"Look on my works, ye Mighty, and despair!"

**SUBJECT: ENGLISH LITERATURE
PAPER 2**

YEAR: 10

TOPIC: MY LAST DUCHESS

SEMESTER: 1



Summary	The poem is a dramatic monologue spoken by a Duke who is showing a visitor a portrait of his late wife, the Duchess. As he talks, he reveals more about his personality and his attitudes towards the duchess. • The Duke describes the Duchess as being too friendly and easily pleased, smiling at everyone and everything. • He was jealous and felt she didn't appreciate him and his status enough. • He hints that he gave commands to have the duchess killed. • The Duke is now arranging a new marriage, and the poem ends with him showing off another piece of art in his collection.
Context	Patriarchal Society: The poem reflects how women were often seen as possessions, with little power or voice. The Duke's attitude shows how men sought control women's lives—and even their deaths. Inspired by Real Events: The Duke in the poem is based on Alfonso II, Duke of Ferrara, who married a young woman from a powerful family. She died mysteriously, and he later arranged another marriage. Many of Browning's poems deal with power dynamics, especially in relationships. Browning often draws attention to how people in authority can misuse their power, but he leaves it to the reader to draw their own conclusions.

POETIC DEVICES

It's a dramatic monologue , revealing the Duke's character through his own words.
The poem is written in iambic pentameter and rhyming couplets , but also uses enjambment . This creates a natural conversational tone (which could be said to conceal a rigid, formal structure).
The language used is very sophisticated and formal, reflecting the duke's high status.
The repetition of 'I' and 'my' reflect the duke's egotistical nature.
The curtain covering the portrait symbolises the duke's need for control over the duchess.
Browning creates a very positive and innocent image of the duchess.

KEY QUOTES

'That's my last duchess...'

'None puts by the curtain I have drawn for you but I.'

'She liked whate'er she looked on...'

'my gift of a nine-hundred-years- old name...'

'I choose never to stoop'

'I gave commands; Then all smiles stopped...'

'Notice Neptune, though, Taming a seahorse...'

IDEAS & MESSAGES

Abuse of patriarchal and societal power. The duke is powerful because of his gender and his wealth. In contrast, the duchess has no voice in the poem and is powerless against her husband.
Pride – the duke is too proud to explain the problem to his wife, choosing 'never to stoop.' It shows the pride and arrogance that often comes with great power.
Objectification – the duchess is treated like a possession by the duke, reflecting historical attitudes to women and marriage. Browning could be criticising these traditional attitudes in the poem.
Violence – although not explicitly stated in the poem, the duke ultimately uses physical violence to silence the duchess. His high status means he can command others to kill her rather than doing it himself.



How does the curtain show the duke's power?

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.
eg. Compare how writers present ideas about powerful people in ‘Ozymandias’ and one other poem (30 marks)

Exemplar paragraph

In Ozymandias, Shelley presents power as something that is ultimately temporary and hollow. The inscription “Look on my Works, ye Mighty, and despair!” shows Ozymandias’s arrogance and belief in his own greatness. However, the ruined statue and the “boundless and bare” desert around it highlight how his power has faded over time. Similarly, in My Last Duchess, Browning explores the theme of control and dominance through the Duke’s possessive attitude. The Duke’s pride is shown in how he describes his wife as a piece of art—“I call that piece a wonder”—suggesting he values ownership over genuine connection. His calm tone when revealing he “gave commands” that led to her death shows how he abuses his power without remorse. Both poets use irony to show how powerful figures are often self-obsessed and cruel, and how their power is either challenged or lost.

What makes it successful?

- 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

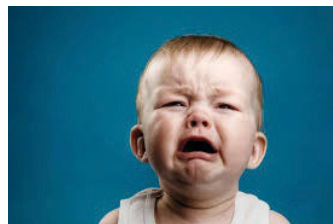
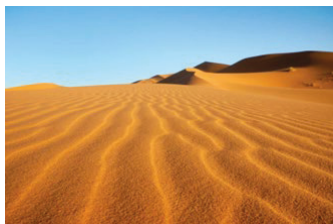
- Abuse of power by people of high status.
- Oppression of those without power.
- Human power as temporary and limited.
- Social structures reinforcing power or lack of power.
- Cruelty or violence as a means of control.

Useful phrases for big ideas / messages

- Shelley draws attention to...
- Browning could be saying that...
- Blake encourages the reader to consider...
- One of the key messages in the poem is...
- Through the depiction of ... Shelley criticises...

Picture Quiz

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



Recall Questions

1. What social issues does Blake address in ‘London’?
2. Who or what does Blake see as being to blame for these problems?
3. Give two techniques used in ‘London’. How are they effective?
4. What poetic movement was Shelley a part of? What were they interested in?
5. What is the phrase ‘colossal wreck’ an example of? What ideas does it convey?
6. What messages about power are conveyed in ‘Ozymandias’?
7. What is significant about the title of ‘My Last Duchess’?
8. What impression does Browning create of the duke’s character?
9. What style is ‘My Last Duchess’ written in? How does this suit the duke?
10. How is the duke in My Last Duchess similar or different to Ozymandias?

SUBJECT: English Literature
Paper 2
TOPIC: Power and Conflict
Poetry

YEAR: 10

SEMESTER: I



SUBJECT: Maths

YEAR: 10



TOPIC: Percentages

SEMESTER: I

WORD REVOLUTION

Percentage	Per-cent means "out of one hundred". A percentage is part of an amount.
Interest	When extra money is given to you when you invest, or money you pay if you borrow.
Compound Interest	Where interest is earned not only on your deposit but also on the accumulated interest
Exponential Form	When a number is multiplied by itself multiple times, it can be written more simply in exponential form
Percentage Decay	Is a process where the amount decreases by a consistent percentage over a given period of time

Compound Interest

Calculate the interest on £40 when the compound interest is 5% over 3 years.

- Year 1: $£40 \times 1.05 = £42$
- Year 2: $£42 \times 1.05 = £44.10$
- Year 3: $£44.10 \times 1.05 = £46.31$

This calculation can also be written as

$$40 \times 1.05 \times 1.05 \times 1.05 = 46.31$$

Which can be written as

$$40 \times 1.05^3 = 46.31$$

What will I study in this topic?

You will recap percentage increase and decrease and use the percentage multiplier. You will learn about compound interest, and percentage growth and decay.

What will I be able to do by the end of this topic?

- Calculating a total when given the interest and the amount of time
- Calculate the starting value, when the total and rate of interest is known
- Use a percentage growth formula across a range of real-life situations
- Use a percentage decay formula across a range of real-life situations

Increasing and Decreasing by a Percentage

Increase £360 by 27%

When using a calculator, you can simply multiply by the multiplier (add the decimal equivalent to one)

$$£360 \times 1.27 = £457.20$$

Decrease £360 by 27%

When using a calculator, you can simply multiply by the multiplier (subtract the decimal equivalent from one)

$$£360 \times 0.73 = £262.80$$

Compound Interest Formula

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Working backwards

What interest rate do you need to turn \$1,000 into \$5,000 in 20 years?

$$\begin{aligned} r &= (\$5,000 / \$1,000)^{1/20} - 1 \\ &= (5)^{0.05} - 1 \\ &= 1.0838 - 1 \\ &= 0.0838 \end{aligned}$$

0.0838 as a percentage is **8.38%**

Percentage Decay – Car Depreciation

A new car is worth £20,000, it depreciates at 8% per year, how much is it worth after 5 years?

The multiplier is $100\% - 8\% = 92\% = 0.92$

$$\text{Value is } 20,000 \times 0.92^5 = 13,181.63$$

So, the value of the car is now £13,181.63.

SUBJECT: Maths

YEAR: 10



TOPIC: Statistical Diagrams

SEMESTER: I

WORD REVOLUTION

Frequency	The count of how many times a specific event or data value occurs
Range	The difference between the highest and lowest value
Median	The middle value in an ordered dataset
Mean	The sum of a set of numbers divided by the total count of numbers in that set
Class width	The difference between the upper and lower boundaries of a class interval

Key Terms

Discrete data: countable data that can be categorised e.g. shoe size, eye colour

Continuous data: data that is measured and can take any value e.g. height, time, temperature

Qualitative data: text-based data that describes something e.g. colours, race

Quantitative data: numerical data e.g. age, height, temperature

What will I study in this topic?

You will learn how to collect, interpret, represent and compare data sets. You will learn the difference between types of data and use a variety of diagrams for representation.

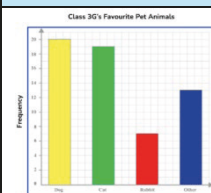
What will I be able to do by the end of this topic?

You will be able to draw and interpret

- Frequency tables
- Bar Charts
- Frequency Polygons
- Cumulative Frequency Graphs (H)
- Histograms (H)
- Stem and Leaf Diagrams
- Box plots (H)

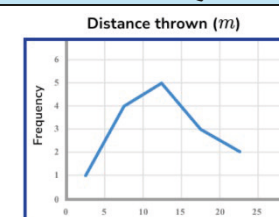
You will be able to use a range of techniques including comparing mean, median, mode and measures of spread.

BAR CHART



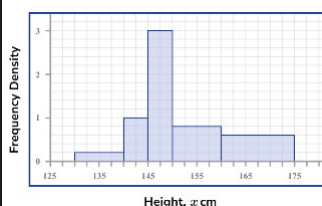
Representation of a data set by using bars. The larger height of the bar, the higher the value for the individual category.

FREQUENCY POLYGON



A graph that shows the frequencies of grouped data. It is a diagram that plots the midpoints of the class intervals against the frequencies joined with straight lines.

HISTOGRAM



A histogram is like a bar chart but is used to display qualitative continuous data. The area of each

bar represents the frequency of values in that class interval.

Freq. Density = freq./ class width

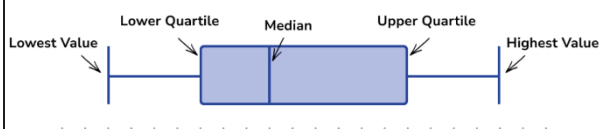
STEM AND LEAF

Key : 2 0 means 20	
Stem	Leaf
0	1 4
1	3 6 6 7
2	0 2 5
3	6 7 7 7 8
4	0 1 3

forms the leaf.

A method of organising numerical data based on the place value of the numbers. Each number is split into two parts. The first digits form the stem. The last digit

BOX PLOT



A box plot is a diagram showing the following 5

pieces information for a set of data. **Lowest value, lower quartile, median, upper quartile, highest value.**

SUBJECT: Maths

YEAR: 10



TOPIC: Algebra

SEMESTER: I

WORD REVOLUTION

Simultaneous	Occurring, operating or done at the same time
Equation	Contains an equals sign. This can be solved to find the unknown value
Formula	(Plural Formulae) – A mathematical rule or relationship including unknown values
Rearrange	Move things around. In this context, make an unknown the subject of the formula

What will I study in this topic?

You will learn how to solve a pair of simultaneous equations using both the elimination and substitution method. You will link this to the graphs of the equations. You will also learn how to rearrange a formula to make an unknown the subject of the formula.

What will I be able to do by the end of this topic?

- Find a pair of values that satisfy two equations at the same time (simultaneously).
- Recognise that this solution can be seen from the graphs of both equations – the solutions are the coordinates of the point where both graphs meet one another.
- Change a formula around so that a different variable is on the left hand side of the equals sign.

Rearranging Formulae

REARRANGE THIS

$$x = \frac{y + 2}{6} \rightarrow y = ?$$

To rearrange a formula means to change the subject so that a different unknown appears left of the equals sign.

In the example above we need to rearrange it so that y is the subject. You do this in the same way you solve equations. So here, first multiply both sides by 6 to give $6x = y + 2$. Then subtract 2 from both sides and swap things around the equals sign to leave you with:

$$y = 6x - 2$$

Simultaneous Equations

You will be asked to solve a pair of simultaneous equations. This means you need to find a value of x and a value of y that make both equations correct at the same time.

$$\begin{aligned} 3x + y &= 7 \\ 2x + y &= 6 \end{aligned}$$

Here, $x = 0$ and $y = 7$ works in the first equation but not the second.

Correct solutions: $x = 1$ $y = 4$

Elimination Method

$$\begin{aligned} 3x + 8y &= 23 \\ x + 2y &= 7 \quad \times 3 \\ \hline 3x + 6y &= 21 \end{aligned}$$

This is when you have to ensure that the numbers in front of one unknown are the same. Then you can add or subtract the remaining equations to find the solutions.

Substitution Method

This is when you swap an unknown in one equations with information from the other. Here if we swap y with $x + 2$ in the first equation we are left with:

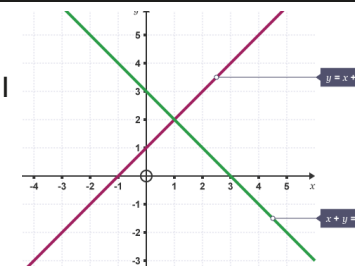
$$\begin{aligned} 2x + y &= 14 \\ y &= x + 2 \end{aligned}$$

$$2x + x + 2 = 14$$

This is an equation we can now solve to find x once we have collected like terms.

Solving Graphically

In the diagram we can see the graphs of $y = x + 1$ and $x + y = 3$. The solution to solving these simultaneously is where the graphs meet.



Solutions: $x = 1$, $y = 2$

SUBJECT: Maths

YEAR: 10



TOPIC: Geometry

SEMESTER: I

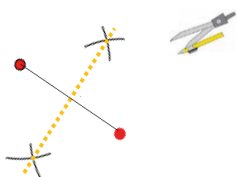
WORD REVOLUTION

Opposite	The side opposite the marked angle.
Adjacent	The side next to both the right angle and the marked angle.
Hypotenuse	The side which is opposite the right angle.
Trigonometric functions (sine, cosine, tangent)	Ratios of two sides of a right-angled triangle containing the angle.
Locus (Loci - plural)	A locus is a set of points that satisfy a given set of conditions.

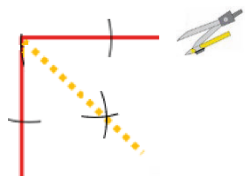
Loci

We can draw loci such as:

Locus equidistant from two points
(Perpendicular Bisector)



Locus equidistant from two lines
(Angle Bisector)



Locus equidistant from a straight line



The ends of the line
are fixed points

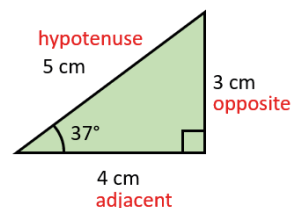
What will I study in this topic?

You will learn how to find missing angles and side lengths of a right-angled triangle using trigonometry. You will also learn the exact values for the trigonometric ratios. In addition, you will learn how to use compasses and a ruler to construct a locus that satisfies multiple conditions.

What will I be able to do by the end of this topic?

- Identify trigonometric ratios sine, cosine and tangent
- Find unknown sides in right-angled triangles
- Find unknown angles in right-angled triangles
- Use the exact values of trigonometric ratios
- Solve problems involving angles of elevation and depression
- Construct loci

Sides



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin 37 = \frac{3}{5}$$

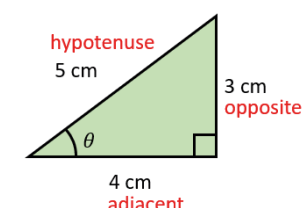
$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\cos 37 = \frac{4}{5}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$\tan 37 = \frac{3}{4}$$

Angles



$$\sin \theta = \frac{3}{5}$$

$$\theta = \sin^{-1} \frac{3}{5}$$

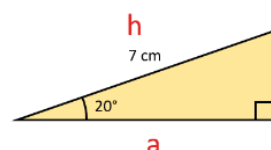
$$\cos \theta = \frac{4}{5}$$

$$\theta = \cos^{-1} \frac{4}{5}$$

$$\tan \theta = \frac{3}{4}$$

$$\theta = \tan^{-1} \frac{3}{4}$$

Example

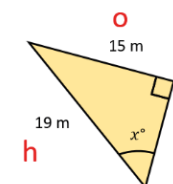


$$\sin 20 = \frac{x}{7}$$

$$x = 7 \sin 20$$

$$x = 2.4 \text{ cm (1dp)}$$

Example



$$\sin x = \frac{15}{19}$$

$$x = \sin^{-1} \frac{15}{19}$$

$$x = 52.1^\circ \text{ (1dp)}$$

SUBJECT: Maths

YEAR: 10

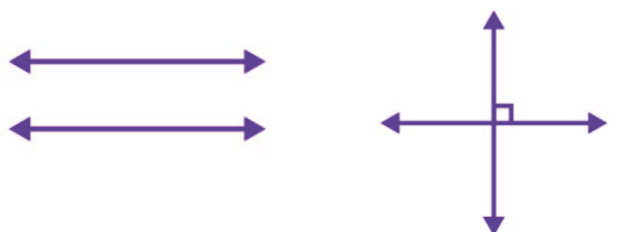


TOPIC: Graphs

SEMESTER: I

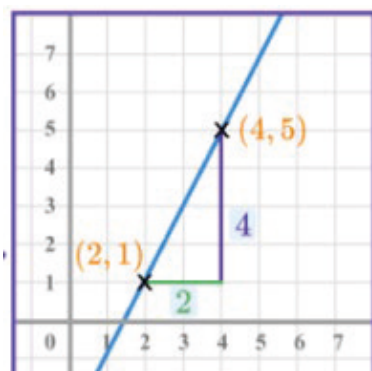
WORD REVOLUTION

Parallel	Two lines that are equal distance from each other and never meet.
Perpendicular	Perpendicular lines will always cross at right angles, 90° .
Gradient	The gradient refers to the measure of the steepness or slope of a line.
Intercept	Is a point on the axis, through which the slope of the line passes.
Substitute	Is the process of replacing variables in an expression or equation.



Parallel lines

Perpendicular



What will I study in this topic?

You will study how to find equations of parallel and perpendicular lines (higher only). You will apply prior learning and work out the gradients of a line from the equation of a parallel line, where the graphs are shown. Where the graphs are not shown, you will be able to identify from the equation if the lines are parallel or not parallel. You will further explore real-life graphs, find their equations and sketch graphs of water flows.

What will I be able to do by the end of this topic?

- Read the gradients from a pair of plotted lines and determine if they are parallel.
- Work out the gradient and the y-intercept of a line from the equation of a parallel line, with a negative gradient and where graphs are not shown.
- Find the equation of a straight line from its gradient and a point, then use and find equations of real-life graphs.
- Find the equation of a straight line from two points on the line.
- Find equations of parallel and perpendicular lines.
- Plot real-life graphs and sketch graphs of water flows.

Finding the Gradient of a line

To calculate the gradient (known as 'm') of a straight line through two coordinates (x_1, y_1) and (x_2, y_2) :

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

For example on left:

$$m = \frac{5 - 1}{4 - 2} = \frac{4}{2} = 2$$

It can be helpful to think about this formula as: **"Change in y divided by change in x" or as rise over run**.

Finding the y-intercept

The y-intercept is a point on the y-axis, through which the slope of the line passes. This is represented as 'c' when we write the equation for a line, $y = mx + c$.

Graphically you can use the y-coordinate at which point the slope intersects the y-axis.

$$y = mx + c$$

$y =$ m $x +$ c

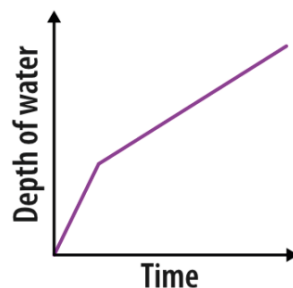
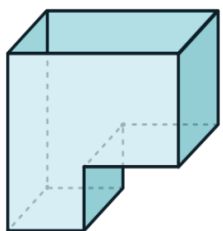
gradient y-intercept

The gradient tells you how steep the line is. For every 1 across, you travel ... up/down.

The y-intercept tells you where the line crosses the y axis.

Sketch Graphs of Water Flow

You will be using mathematical concepts of rates of change and depicting how water levels change over time in containers. You will be able to sketch depth-time graphs to represent water filling a container, where the steepness of the line indicates how fast the water level is rising. Water is poured into the container below at a constant rate, you will need to sketch a graph to show the depth of water over time.



Finding the equation of a line

The general equation of a straight line is: $y = mx + c$, the gradient is denoted by the letter m , and the y-intercept denoted as 'c'.

You will be asked to find the equation of a line with gradient 3, passing through (4, 1).

Answer:

Start with writing the equation, we know the gradient is $m=3$.

$$y = 3x + c$$

Substitute $x = 4$ and $y=1$ into equation to get:

$$1 = (3 \times 4) + c$$

$$1 = 12 + c$$

Now solve to find c.

Subtract 12 on both sides to find value of 'c':

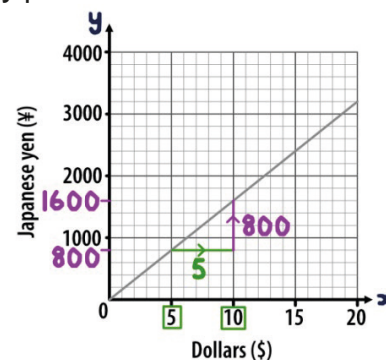
$$-11 = c$$

Re-write equation:

$$y = 3x - 11$$

Real-life Example:

Using this exchange rate, how much is \$100 in Japanese Yen?



First find the gradient, this tells us how many Yen per \$.

$$\text{gradient} = \frac{\text{change in } y}{\text{change in } x} = \frac{800}{5} = 160$$

From this we can write the equations and solve: $y = 160x$ and when $x = 100$, $y = 16000$

Equations of Parallel Lines/ Perpendicular Lines

Parallel lines have the same gradient.

To find the equation of a **parallel line**, find the gradient then substitute a coordinate on the line into $y = mx + c$.

Example workout if the following lines are parallel or not, $y = 2x + 1$ and $y = 2x - 2$

The above lines are parallel as they have the same gradient of 2.

Perpendicular Lines (Higher)

Two lines will be perpendicular if the products of their gradients is -1. You must first find the gradient of the line and use this to find the equation.

Example: Find the equation of a line that is perpendicular to $y = 2x + 1$.

To find the perpendicular gradient, find the number which will multiply by 2 to give -1. This is the negative reciprocal which is $-\frac{1}{2}$.

This gives:

$$y = -\frac{1}{2}x + c$$

Examples of lines that will be perpendicular to $y = 2x + 1$:

$$y = -\frac{1}{2}x + 5 \text{ or } y = -\frac{1}{2}x + 2$$

SUBJECT: Maths

YEAR: 10



TOPIC: Set Notation

SEMESTER: I

WORD REVOLUTION

Set	A Set is a collection of things, usually numbers.
Independent	Where the outcome of one event does not affect the outcome of the other event.
Dependent	Where the outcome of one event depends upon what has happened before.
Union	Is represented by $\cup$ set notation, it includes all the elements of both sets.
Intersection	Is represented by $\cap$ set notation it includes the common elements of both sets.

What will I study in this topic?

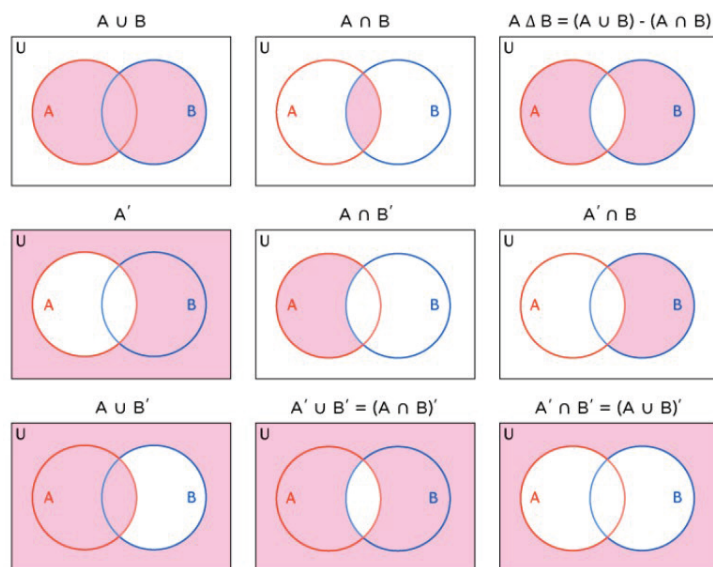
You will learn how to calculate probabilities using different types of diagrams (Venn diagrams and tree diagrams)

What will I be able to do by the end of this topic?

- Describing/shading/finding the probability regions and calculating probability in a Venn diagram using the union and intersection
- Working out the intersection/union/complement of two sets defined by conditions within a given universal set
- Describing/finding an element belonging to the intersection of a set and the complement of a set
- Drawing a Venn diagram given the universal set and the intersection and union of two sets
- Completing and finding independent or dependent probabilities using Tree Diagrams

Sets and Venn Diagrams

MATH MONKS



Tree Diagrams

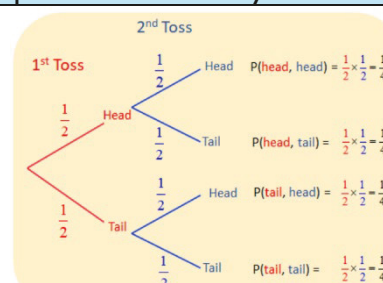
A **probability tree diagram** is a visual tool used to calculate the probabilities of different outcomes in a sequence of events. It helps in organizing and visualizing the possible outcomes and their associated probabilities, making it easier to perform calculations.

Key Elements of Tree Diagrams

Branches: Each branch represents a possible outcome of an event. The probability of each outcome is written on the branch.
Outcomes: The outcomes are written at the end of the branches.
Multiplication and Addition: To calculate the overall probabilities, multiply the probabilities along the branches and add the probabilities down the columns.

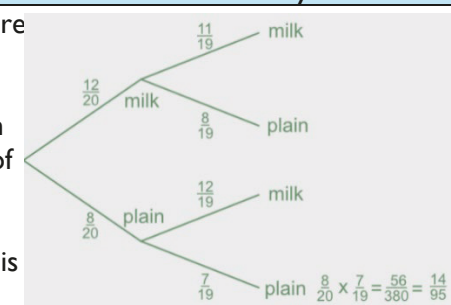
Independent Probability

Here, the 2nd outcome does not depend on the result of the first. Probabilities usually stay the same.



Conditional Probability

This is where the 2nd outcome depends on the result of the first. The 2nd probability is Different.



SUBJECT: Science

YEAR: 10

TOPIC: Variation, Inheritance and Evolution

SEMESTER: I



WORD REVOLUTION

DNA	Deoxyribonucleic acid. The molecule in cells that stores genetic information.
Variation	The differences that exist between individuals.
Natural Selection	The process by which species evolve.
Selective Breeding	When humans artificially select the plants or animals that are going to breed, so that the genes for particular characteristics remain in the population.
Fossil	The remains of an organism from many years ago, which is found in rock.
Binomial System	The system used in classification for naming organisms using a two-part Latin
Extinction	When no living individuals of a species remain.
Mutation	A random change in an organism's DNA.
Species	A group of similar organisms that can reproduce to give fertile offspring.
Classification	Organising living organisms into groups based on their characteristics.

What will I study in this topic?

You will study how fossils give humans evidence for evolution. We will look in detail at the stages of Darwin's theory of natural selection and how genetic and environmental factors affect how organisms compete in their environment. We will study how organisms are related and how Scientists classify organisms through the system of classification. Finally, we will look at how humans selectively breed animals and plants in the farming industry.

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 stages of natural selection.
- Describe how genetic and environmental factors affect variation.
- Describe the ways in which fossils are formed.
- Use pedigree charts to classify organisms.

Variation

Variation may be due to differences in-

- The genes that have been inherited.
- The conditions in which they have developed.
- A combination of genes and the environment.

Classification

Linnaeus classified living things into kingdom, phylum, class, order, family, genus and species. Organisms are named by the binomial system of genus and species.

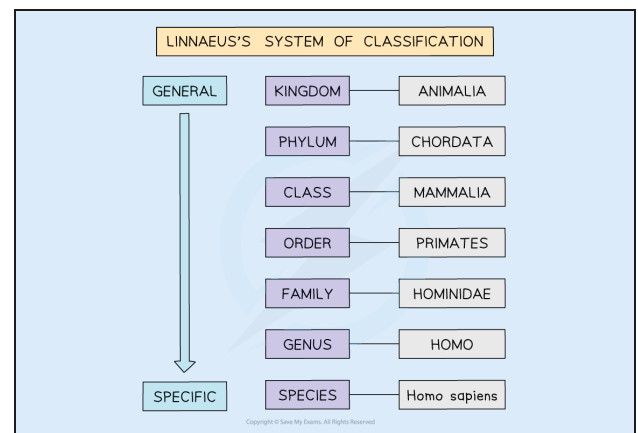
Due to evidence from chemical analysis, there is now a 'three-domain system' developed by Carl Woese.

Fossils

Fossils could be

- The actual remains of an organism that has not decayed.
- Mineralised forms of the harder parts of an organism (e.g. bones)
- Traces of organisms such as footprints or burrows.

Fossils help us to understand how much or little organisms have changed as life developed on Earth.



SUBJECT: Science

YEAR: 10

TOPIC: Variation, Inheritance and Evolution

SEMESTER: I



Key Questions:	How do mutations in our DNA cause variation? Describe the stages of Darwin's theory of Natural Selection. Describe how humans selectively breed animals. Describe how fossils give us evidence for evolution.	
Curriculum Connections:	Previous (Yr 8): • Continuous and discontinuous variation in humans • Stages of natural selection. • Extinction and preserving species.	Future: • Resistant bacteria- how bacteria become resistant to antibiotics. • Genetic engineering- using technology to produce desired cells. • Using punnett squares to calculate the probability of inheriting genes.

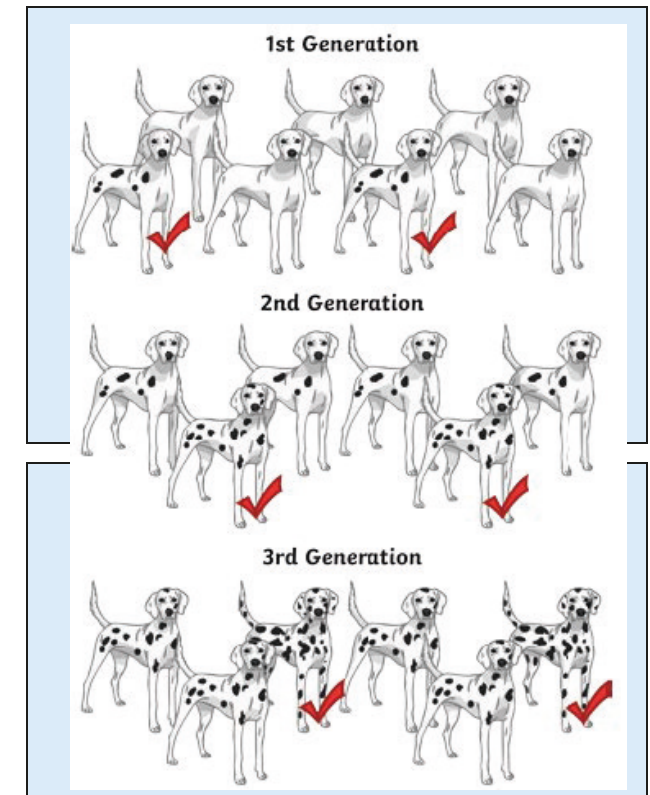
Natural Selection

Charles Darwin developed the theory of natural selection. All species of living things have evolved from simple life forms by natural selection.

1. There is variation in the population due to genetic mutations.
2. Organisms compete for food, mates and territory in order to survive.
3. The organisms who are better adapted to the environment (due to genetic and environmental variation) will survive. The others will die.
4. The surviving organisms reproduce and pass on their successful genes to the next generation.

Selective Breeding

1. Choose parents who have the desired characteristic.
2. Select the best offspring and breed these to make the next generation.
3. These offspring are then bred again and again, over many generations, until a desired result is achieved.



SUBJECT: Science

TOPIC: Ecology

YEAR: 10

SEMESTER: I



WORD REVOLUTION

Abiotic Factor	A non-living factor of the environment.
Biotic Factor	A living factor of the environment.
Community	The populations of different species living in a habitat.
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.
Consumer	An organism that eats another organism.
Producer	An organism (usually a plant) that can produce its own food through photosynthesis. Starts off the food chain.
Predator	An animal that eats another animal.
Prey	An animal that gets eaten by another animal.

What will I study in this topic?

You will study how to interpret food webs, suggest how changes in the environment can lead to changes in the population of an organism. We will look at how plants and animals are adapted to suit their environment and explain the conflicting pressures on maintaining biodiversity.

What will I be able to do by the end of this topic?

By the end of this unit, you will be able to:

- Explain how adaptations in plants and animals increase their chances of survival.
- Describe how a change in the environment can affect the food chain.
- Explain how biotic and abiotic factors affect the organism's survival.

Abiotic and Biotic Factors

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.

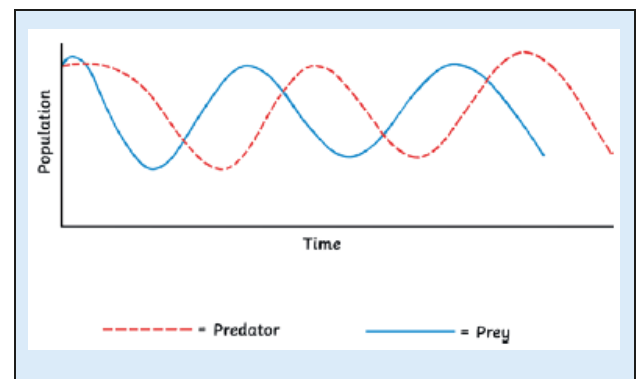
Predator/Prey Cycles

Populations of predator and prey increase and decrease in cycles. The size of the predator population depends on the size of the prey population and vice versa. Overall, there is a stable community.

Food Chains

The source of all energy in a food chain is the Sun. It is made useful by plants through photosynthesis where glucose is produced. When an organism is consumed, some of the energy is lost.

Remember: the arrow in a food chain indicates the direction of the flow of energy.



SUBJECT: Science

TOPIC: Ecology

YEAR: 10

SEMESTER: I



Key Questions:	How do biotic and abiotic factors affect where organisms live? Can you identify the producer, consumers, predators and prey in a food chain? How are organisms such as the polar bear, camel and cactus adapted to survive?	
Curriculum Connections:	Previous (Yr 7): • Revisit food chains and webs. • Revisit adaptations of plants and animals	Future: • How humans are changing environments of organisms through global warming, deforestation and land use. • Maintaining ecosystems and biodiversity.

Adaptations

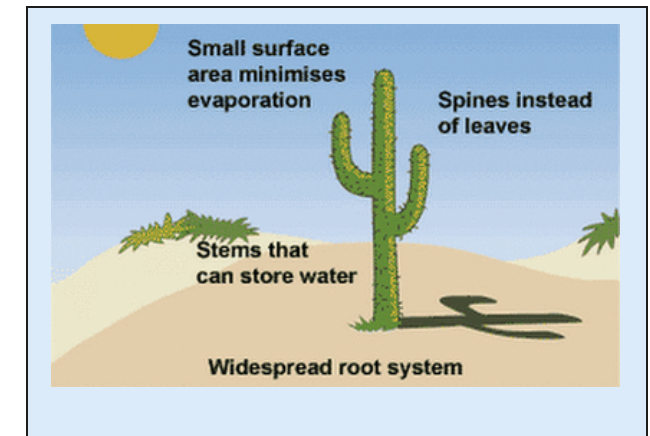
Adaptations are specific features of an organism which enable them to survive in the conditions of their habitat.

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.

A plant or animal will not physically change to adapt to its environment during its lifetime. Instead there is natural variation where some features will favour the organisms chance of survival.



Competition

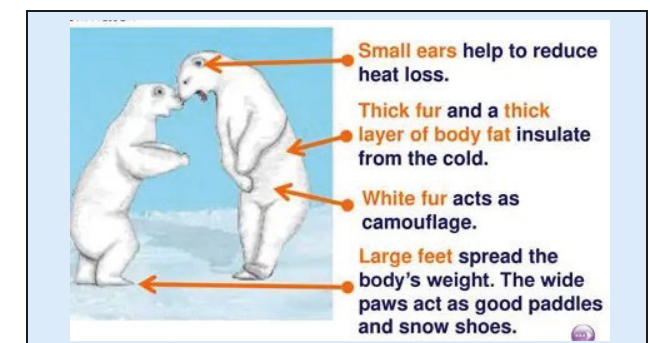
Species will compete with one another and within their own species to survive and reproduce.

Mutualism occurs when both species benefit from a relationship.

Parasitism occurs when a parasite only benefits from living on the host.

Animals compete for resources such as food, water and shelter. They may also compete within their own species for mates.

Plants compete for resources including light, water, space and minerals. All resources are needed for photosynthesis so the plants can make their own food.



SUBJECT: Biology

YEAR: 10



TOPIC: Cell Biology

SEMESTER: I

WORD REVOLUTION

Diffusion	The movement of particles from an area of higher concentration to an area of lower concentration.
Osmosis	The movement of water molecules from an area of higher concentration to an area of lower concentration via a partially permeable membrane .
Active Transport	The movement of particles from an area of lower concentration to an area of higher concentration. This requires energy .
Mitochondria	Where respiration takes place, this releases energy for the cell to use.
Partially Permeable Membrane	A membrane with tiny holes in it, which lets smaller molecules through but not larger ones.
Alveoli	Tiny air sacs in the lungs where gas exchange occurs.
Villi	Tiny finger-like structures in the small intestine that increase the surface area for the absorption of food.
Stomata	Holes in the leaves which allow for gas exchange.
Gills	The gas exchange surface in fish.

What will I study in this topic?

How diffusion, osmosis and active transport work.

Compare each process and apply the theory to the lungs, small intestine, leaves and fish.

Osmosis Required Practical- identify the variables, carry out the practical using a method and evaluate the results.

What will I be able to do by the end of this topic?

Describe when diffusion, osmosis and active transport take place.

Carry out the osmosis required practical- explain why the mass of the potato changed.

Identify the variables in the practical.

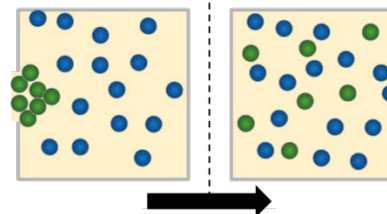
Describe how to reduce the effect of errors in the practical.

Calculate surface area:vol ratio.

Describe how exchange surfaces are adapted to efficiently exchange substances.

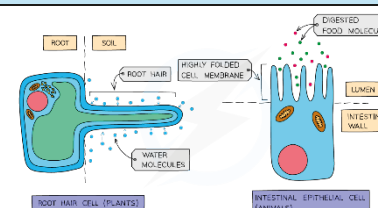
Diffusion:

Diffusion is simple. It's just the gradual movement of particles from places where there are lots of them to places where there are fewer.



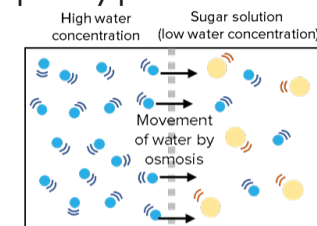
Active Transport

Sometimes substances need to be absorbed against a concentration gradient, i.e. from a lower to a higher concentration.



Osmosis:

Learn this definition- 'Osmosis is the movement of water molecules from an area of higher concentration to an area of lower concentration via a partially permeable membrane.'



Diffusion

Substances move from a **high** to a **low** concentration down a concentration gradient.

x No energy required

oxygen food water

Osmosis

Water moves from a **high** to a **low** concentration across a **semipermeable membrane** & down a concentration gradient.

x No energy required

Active transport

Substances move from a **low** to a **high** concentration **against** a concentration gradient.

✓ Energy required

Mineral ions

Glucose

Photosynthesis



SUBJECT: Biology

TOPIC: Cell Biology

YEAR: 10

SEMESTER: I



Key Questions:	What are the differences between diffusion, osmosis and active transport? Why does the potato chip gain or lose mass during the osmosis required practical? How are the alveoli, villi, leaf and fish gills adapted for gas exchange?
Curriculum Connections:	Past: Year 7 – Describe the structure of plant and animal cells.. Year 8 - Compare the differences in animal and plant cells. Year 9 – State the differences between eukaryotes and prokaryotes.

Osmosis Required Practical

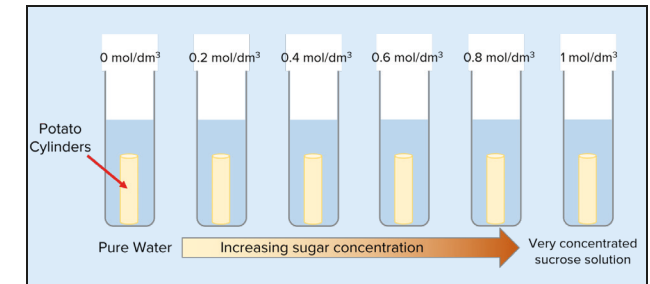
Dependent variable- mass of potato.

Independent variable- concentration of sugar solution.

Control variables- volume of solution, temperature, time in solution.

If water has moved into the potato the mass will increase. The potato has a lower concentration of water than the solution.

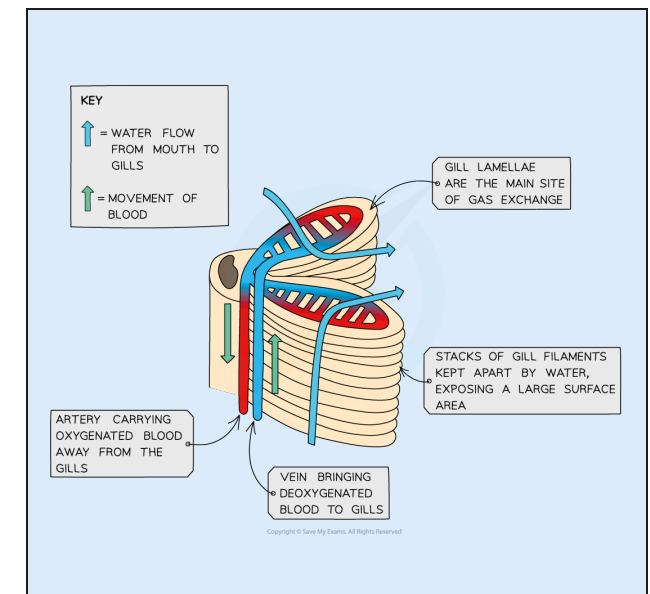
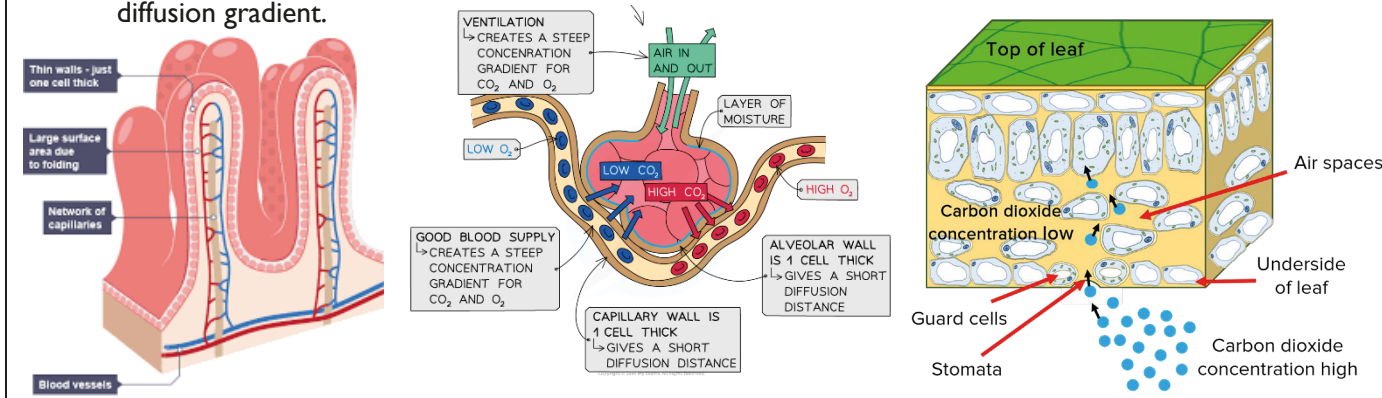
If water has moved out of the potato the mass will decrease. The potato has a higher concentration of water than the solution.



Exchanging Substances

Exchange surfaces are adapted to maximise effectiveness:

- They have a thin membrane, so substances have a short distance to diffuse.
- They have a large surface area, so lots of substances can diffuse at once.
- In animals, they are surrounded by lots of capillaries, to exchange substances quickly and maintain the diffusion gradient.



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 1 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?

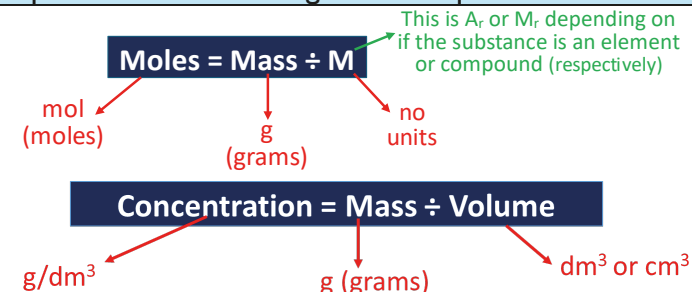
Deduce ionic formulae
 State properties for ionic, simple covalent, large covalent and giant covalent compounds
 Explain why a substance is a solid/liquid/gas
 Explain the uses of diamond and graphite
 Calculate moles, concentration and masses using different equations
 Balance chemical equations

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 $\rightarrow$ 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

TOPIC: Bonding & Quantitative Chemistry

YEAR: 10

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)	How to calculate the mass of a substance (2)																
<table><tr><td>1</td><td>Divide the symbol equation where the arrow is.</td></tr><tr><td>2</td><td>List the type of atoms on each side: make sure they are in the same order on each side.</td></tr><tr><td>3</td><td>Count the number of each type of atom on each side.</td></tr><tr><td>4</td><td>If the numbers are the same, then it is balanced. If not place BIG numbers in front of the molecules. Then recount.</td></tr></table> <i>Tip: We don't use a big "1" in front of molecules. If there is no number, it means 1 molecule.</i>	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.	<table><tr><td>1</td><td>Highlight the compound you have information of and the compound you want to calculate.</td></tr><tr><td>2</td><td>Using the prompts (mass, M and moles) work out the moles for the known compound</td></tr><tr><td>3</td><td>Find out how many moles are in your unknown compound using ratio</td></tr><tr><td>4</td><td>Using mass = M x moles to calculate the mass of your unknown</td></tr></table>	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 = M x moles to calculate the mass of your unknown
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Example of (1): Balance the equation



C = 1
H = 4
Cl = 28

C = 1
H = 14
Cl = 58

Explaining states of matter / melting or boiling point

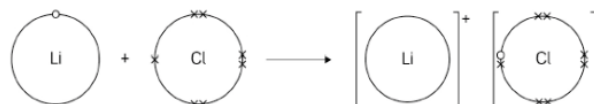
Follow this sequence of thinking:

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"

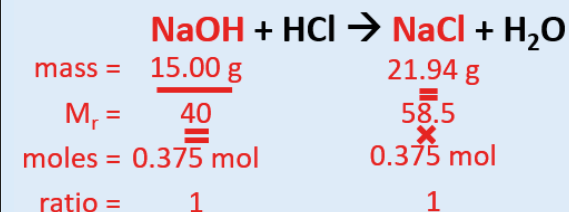
Describe what happens when a lithium atom reacts with a chlorine atom.

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?



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

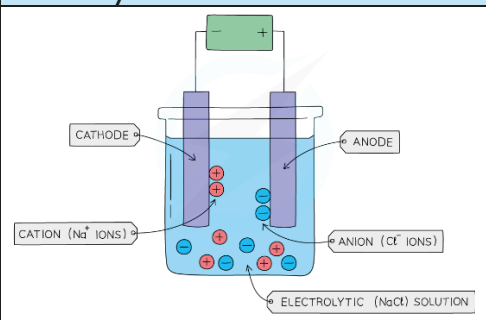
What will I study in this topic?

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



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

Predicting Products of Aqueous Electrolysis

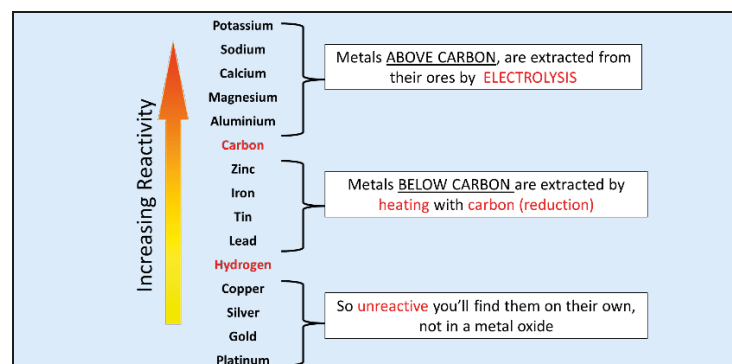
THE RULES	
Negative electrode (Cathode)	Positive electrode (Anode)
Positive ions are attracted	Negative ions are attracted
Metals less reactive than hydrogen	Halogen (group 7 element)
Or Hydrogen	Or Oxygen (comes from OH ⁻ ions)

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



SUBJECT: Chemistry

YEAR: 10

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

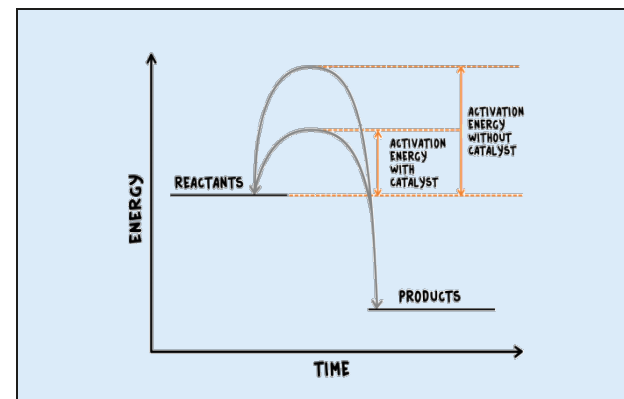
SEMESTER: 2



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.
Curriculum Connections:	Describe a method for measuring a change in turbidity of a solution when concentration is changed.
	Year 7 – Particles and Mixtures. Year 8 – Metals & their Reactions, Energy in Chemical Reactions . Year 9 – Chemical changes

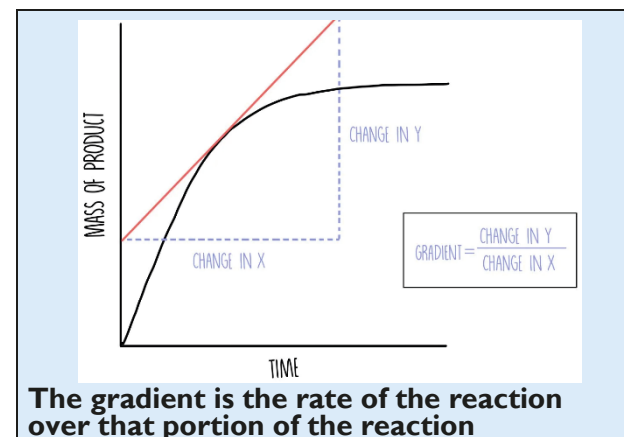
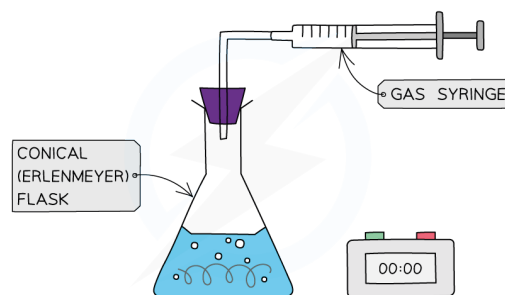
Factors Affecting Rates of Reaction

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 area 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 cm³ of 1 mol/dm³ 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: Physics

YEAR: 10



TOPIC: Paper 1 Topics

SEMESTER: I

WORD REVOLUTION

Conservation of energy	Energy cannot be created or destroyed. It can only be transferred from one store to another.
Renewable	A way of producing energy that will not run out
Non-renewable	A way of producing energy that will eventually run out (finite)
Kinetic Energy	Movement energy
Thermal Energy	Energy related to an object's temperature – the stored kinetic energy of its particles
Elastic Potential Energy	Energy stored in a stretched object
Gravitational Potential Energy	Energy store due to its position/height
Specific heat capacity	The energy needed to raise 1 kg of an object by 1 degree
Specific latent heat	The energy needed to change the state of 1 kg of a substance (melt or boil)
Evaporation	Liquid to Gas
Condensation	Gas to Liquid
Sublimation	Solid to Gas
Arrangement	How the particles are positioned

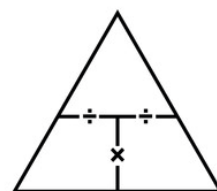
What will I study in these topics?

The mathematical equations to calculate different energy types
How to convert units (if necessary)
The energy requirements to heat different materials

What will I be able to do by the end of this topic?

Calculate....
Kinetic energy
Elastic potential energy
Gravitational potential energy
Specific heat capacity
Specific latent heat

Using a formula triangle:



Start with a blank triangle.
Put in your times and divide
Look at the equation sheet
If the values are times together, they both go at the bottom

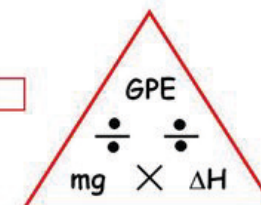
If they are divided the top value goes at the top and the bottom at the bottom – easy!
Whatever you want to work out, cover it up.

Calculating Gravitational potential energy:

$$\text{GPE} = \text{Weight} \times \text{Change in height}$$

(Joules) (newtons) (metres)

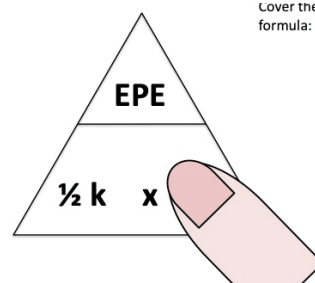
(Remember: Weight = mg)



Elastic potential energy:

$$E_e = \frac{1}{2} k e^2$$

Cover the e^2 in the triangle to give the formula:

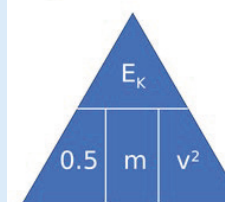


So $e^2 = \frac{\text{EPE}}{\frac{1}{2} k}$

Just square root to get e

$$e = \sqrt{\frac{\text{EPE}}{\frac{1}{2} k}}$$

Kinetic energy = 0.5 x mass x velocity squared
 $E_k = \frac{1}{2} m v^2$



Kinetic energy – Joules (J)

Mass – kilograms (kg)

Velocity – metres per second (m/s)

SUBJECT: Physics

YEAR: 10

TOPIC: Paper 1 Topics

SEMESTER: I



Key Questions:	Can you choose the right equation to use to answer the question? Can you rearrange an equation? Can you change units to make them useful?
Curriculum Connections:	Past: Year 7 energy stores. Year 8 density calculations. Year 8 Chemistry of atoms. Year 9 Chemistry of atomic model. Year 9 Energy stores and transfer.

Converting units:

Converting units is on both higher and foundation tier exams. Although you are given the equation sheet, you're not given the correct units. This means you must be able to spot if the units need to be converted. Remembering these standard units is important:

Time = seconds

Energy = joules

Power = Watts

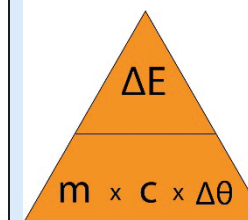
Mass = kg

Height = meters

Speed/velocity = m/s

Question	Working	Answer
150 000 J into kJ	150 000/1000	150 kJ
15kW into watts	15 x 1000	15 000 W
16MW into watts	16 x 1 000 000	16 000 000 W
150 J into kJ	150/1000	0.15 kJ
700J into MJ	700/1000 000	0.0007 MJ
12 000kW into W	12 000 x 1000	12 000 000 W
0.65MJ into joules	0.65 x 1 000 000	650 000 J

$$\begin{array}{ccccccc} \text{Change in thermal} & = & \text{Mass, } m & \times & \text{specific heat} & \times & \text{temperature} \\ \text{energy, } \Delta E & & & & \text{capacity, } c & & \text{change, } \Delta\theta \\ \text{(Joules, J)} & & \text{(kg)} & & \text{(J/kg}^\circ\text{C)} & & \text{(}^\circ\text{C)} \end{array}$$



$$\Delta E = m \times c \times \Delta\theta$$

$$m = \frac{\Delta E}{c \times \Delta\theta} \quad \Delta\theta = \frac{\Delta E}{m \times c}$$

$$c = \frac{\Delta E}{m \times \Delta\theta}$$

Specific heat capacity and specific latent heat:

Changing the *internal energy* of a material will cause it to change temperature or change state:

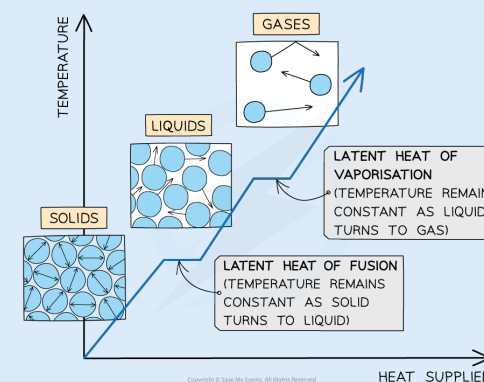
- the energy required for a particular change in temperature is given by the *specific heat capacity*.
- the energy required for a particular change in state is given by the *specific latent heat*.

As there are two boundaries, solid/liquid and liquid/gas, each material has two specific latent heats:

- latent heat of fusion - the amount of energy needed to *melt* or *freeze* the material at its melting point.
- latent heat of vaporisation - the amount of energy needed to *boil* or *condense* the material at its boiling point.

The amount of *thermal energy* stored or released as the temperature of a system changes can be calculated using the equation:

Change in thermal energy = Mass $\times$ Specific latent heat



SUBJECT: Geography

TOPIC: Urban issues (global)

YEAR: 10

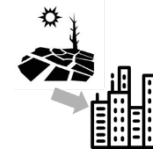
SEMESTER: I



1. Word Revolution

Birth rates	Number of births per 1000/ year
Death rate	Number of deaths per 1000/ year
Natural change	Difference between birth & death rate (can be increase or decrease)
Urbanisation	An increase in the proportion of people living in towns and cities
Migration	The movement of people from one place to another to live
Push factor	A reason why people leave a place
Pull factor	Something attracting people to an area to live
Mega city	City with a population of over 10 million people.
Squatter settlement	Poorly constructed, illegal area of a city built by people. Often called favelas or slums .
Informal sector	A job without a formal contract or employer. No taxes paid or sick leave.

2. Urbanisation



Rural to urban migration

Push: Poorly paid primary jobs in the countryside, lack of access to services.

Pull: Secondary and tertiary jobs, access to hospitals and education.



Natural increase

High birth rate: younger people migrate to cities

Lower death rate: access to clean water and hospitals

Rapid urbanisation in NEEs

3. Importance of Rio de Janeiro



The population in Rio is 13.5 million.
In 1950, it was 3 million.

Regional	Transport hub (2 airports)
	Provides schools, hospitals and 5 universities
National	A major port – main exports are coffee, sugar and iron ore
	Produces 5% of Brazil's GDP
International	Cultural capital of Brazil with over 50 museums
	Hosted the 2016 Olympics and 2014 World Cup
	Famous landmarks like Christ the Redeemer

4. Opportunities in Rio de Janeiro

Literacy rate is 97% , compared to 93% across the whole of Brazil (S)
5 universities , e.g. Federal University of Rio de Janeiro (S)
Access to free healthcare – 3 public hospitals (S)
96% of Rio has access to the main water supply (S)
Offshore oil discovery = jobs in oil extraction and refining (Ec)
Jobs in the tourism sector (Ec)
Santa Cruz steelworks employs 8000 people (Ec)

5. Challenges and solutions in Rio de Janeiro

Social challenges

- 23% live in slums, or 'favelas'
- Murder rate is 20 per 1000
- 25% of the poorest children don't attend school regularly.

Economic challenges

- 3.5 million work in informal jobs
- Unemployment rate is around 15%

Environmental challenges

- 50 tonnes of industrial waste dumped in Guanabara Bay daily
- Most congested city in South America
- Less than 2% of waste recycled

Urban planning: Favela Bairro Project

- Focus on **upgrading** favelas.
- Improved access to **fresh water and sanitation**, and **paved roads**.
- **Cable car** from Alemao to Ipanema.
- **However** – maintenance challenging

SUBJECT: Geography

TOPIC: Rivers

YEAR: 10

SEMESTER: I



1. WORD REVOLUTION

Drainage basin	Area of land drained by a river
Source	Start of the river, normally in mountainous areas
Mouth	End of a river, where it enters a sea or lake
Tributary	A smaller river that joins the main river
Discharge	The amount of water in a river at one time
Flood	When water spills out of the river channel
Hydrograph	A graph which shows the discharge of a river, related to rainfall
Hard engineering	Building artificial structures to try to stop natural processes
Soft engineering	Using nature to reduce the impact of flooding and erosion

2. EROSION

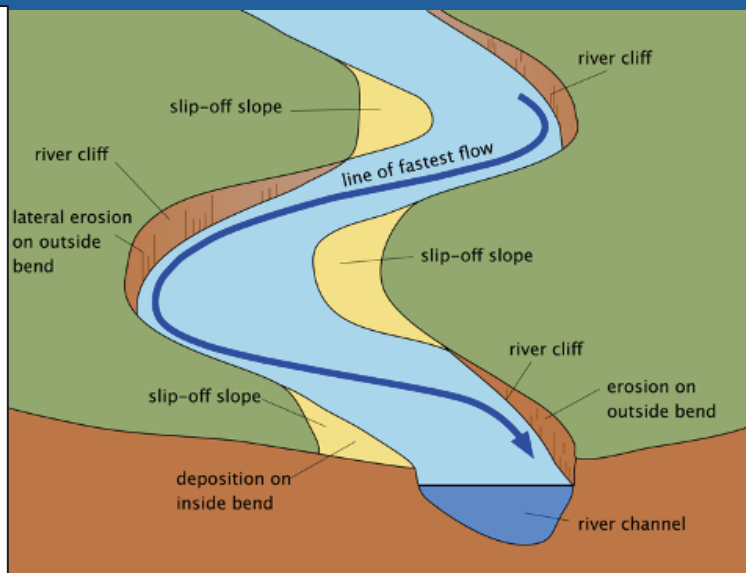
Hydraulic action	Sheer force of the water exploding cracks in the river channel
Abrasion	Rocks scraping against the river channel
Attrition	Rocks hitting each other and getting smaller, smoother, and more rounded
Solution (corrosion)	River water dissolving certain types of rock

3. RIVER CHANGES from SOURCE to MOUTH

	Upper course	Middle course	Lower course
Long profile	Waterfalls Interlocking spurs	Meander Oxbow-lake	Floodplains Levees Estuary
Cross profile	Steep, V-shaped valley Vertical erosion	Widening valley Lateral erosion	Open, flat valley Deposition

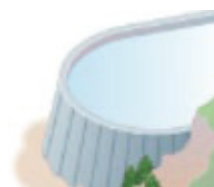
4. MEANDERS

In shallower water there is **increased friction**. This **slows water down** as it **loses energy**. This causes **deposition** to occur.



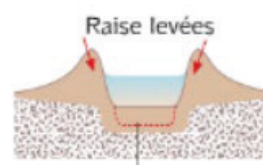
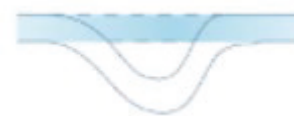
5. MANAGING RIVER PROCESSES

Hard engineering



Build Dams & reservoirs: Hold back flood water, even out river flow

Straighten: Water leaves area quickly



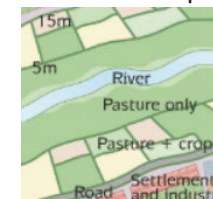
Embankments: Make the channel bigger, less flooding

Soft engineering



Flood warning: Give people time to prepare in advance of floods

Afforestation (plant trees): Less water reaches the river as trees soak it up



Zonation: Keep houses & business away from rivers, use these for crops & parks

SUBJECT: Geography

TOPIC: Urban issues (UK)

YEAR: 10

SEMESTER: I



1. WORD REVOLUTION

Deprivation	An individual or an area lacking essentials
Ethnicity	Belonging to a social group that has common cultural traditions
Brownfield site	Land that has been used, abandoned and now awaits some new
Greenfield site	Land, often in a rural or on the edge of an urban area that has not yet been built on
Rural urban	A zone of transition between the built-up area and the countryside
Urban sprawl	The unplanned growth of urban areas into the countryside.
Regeneration	Long term improvement of a run down or derelict area
Sustainability	Meeting the needs of today without having a negative impact on the future
Urban greening	Increasing and preserving green space such as public parks and gardens in urban areas

3. LONDON OPPORTUNITIES AND CHALLENGES

Opportunities	Challenges
Ethnic diversity: Most ethnically diverse city in the UK. Areas like Chinatown and the Notting Hill Carnival	Deprivation: Unemployment in Kensington and Chelsea is 3.9% , compared to 9.4% in Newham,
Employment: Constant job growth since 1994. High skilled financial sector jobs .	Housing: 100,000 new people each year, but only 20,000 houses . Half of the homeless population in the UK is in London. Newham – housing is old tower blocks
Leisure: Natural History Museum, West End shows, Buckingham Palace, the London Eye	Education: Children in Kensington and Chelsea 4 times more likely to go to university .
Urban greening: Almost 1 tree per person . Green spaces make up 47% of the city's area.	Health: 8 years difference in life expectancy between Kensington and Chelsea and London.
Integrated transport: All public transport are linked together. New Elizabeth Line from suburbs to central London	Pollution: Air pollution worse than other European cities. Nitrous dioxide (NO2). Over 4000 die prematurely.

2. LONDON IMPORTANCE



Population: 9.1 million.

National	International
Capital city Largest city in the UK - Produces 23% of the UK's GDP 1/3 of all higher education	- Financial centre – the City, and Canary Wharf - Headquarters of TNCs - UK's 2 busiest airports – Gatwick and Heathrow

4. REGENERATION AND SUSTAINABILITY

Regeneration of **Newham, Stratford** in **East London** as part of the **2012 Olympics**.

Regeneration features	Sustainable Living in East Village
- Cleaned soil from chemical waste - Cleaned River Lea - Largest new park in London (100 hectares) International Quarter – 25,000 jobs Here East media centre – 5000 people However.... Increase in house prices, local people protests - gentrification	2800 homes in East Village (10,000 total by 2030). 40% affordable - New school Green roofs 35 independent shops, cafes and bars 50% less water used 30% less energy – burning biomass

SUBJECT: Geography

YEAR: 10



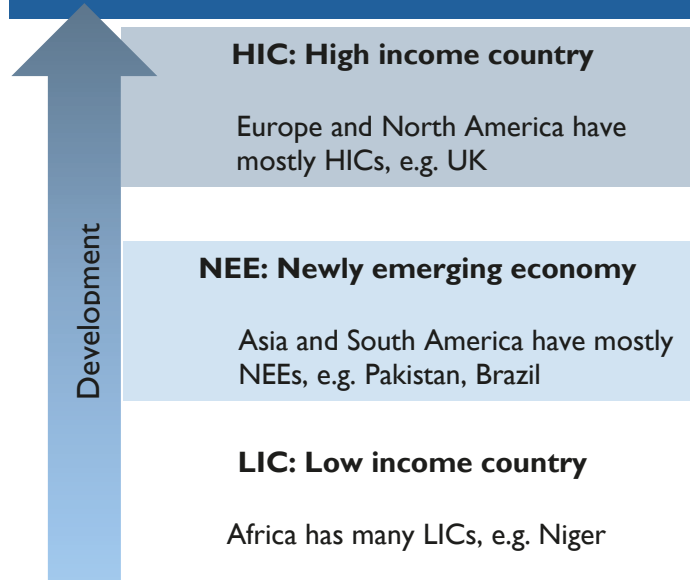
TOPIC: Geography basics

SEMESTER: I

1. WORD REVOLUTION

Development	Process of a country or area improving
Life expectancy	Average age people live to in an area.
Literacy rate	Amount of people who can read and write in an area
Erosion	Wearing away of rock
Weathering	Weakening of rock where it is
Weather	Day to day changes in the atmosphere
Climate	Long term average weather conditions

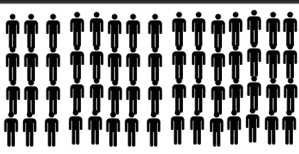
2. DEVELOPMENT AROUND THE WORLD



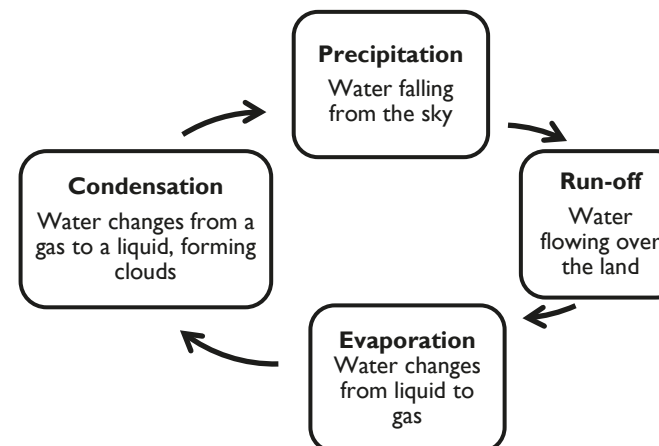
3. JOB TYPES

Tertiary jobs 	Providing a service, e.g. doctor, shop assistant, taxi driver
Secondary jobs 	Making raw materials into a product, e.g. in a factory
Primary jobs 	Extracting raw materials from nature, e.g. farmer, fisher, miner

3. RURAL and URBAN AREAS

Rural	Urban
Countryside E.g. Yorkshire Dales	City or town E.g. Leeds
Sparsely populated: not many people in a certain area.	Densely populated: lots of people in a certain area
	

4. THE WATER CYCLE



5. WEATHERING

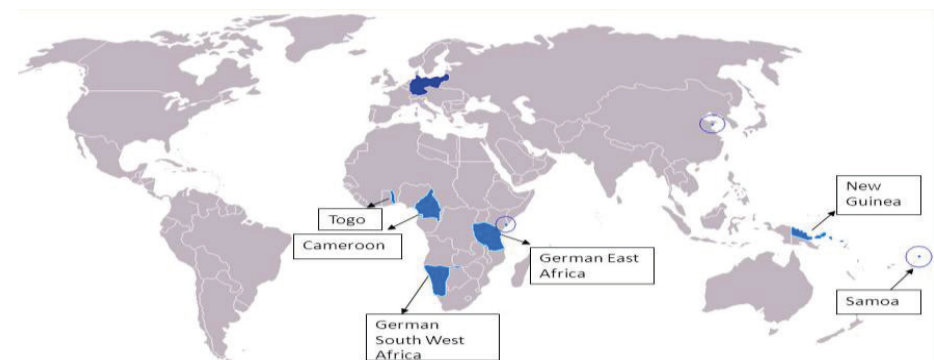
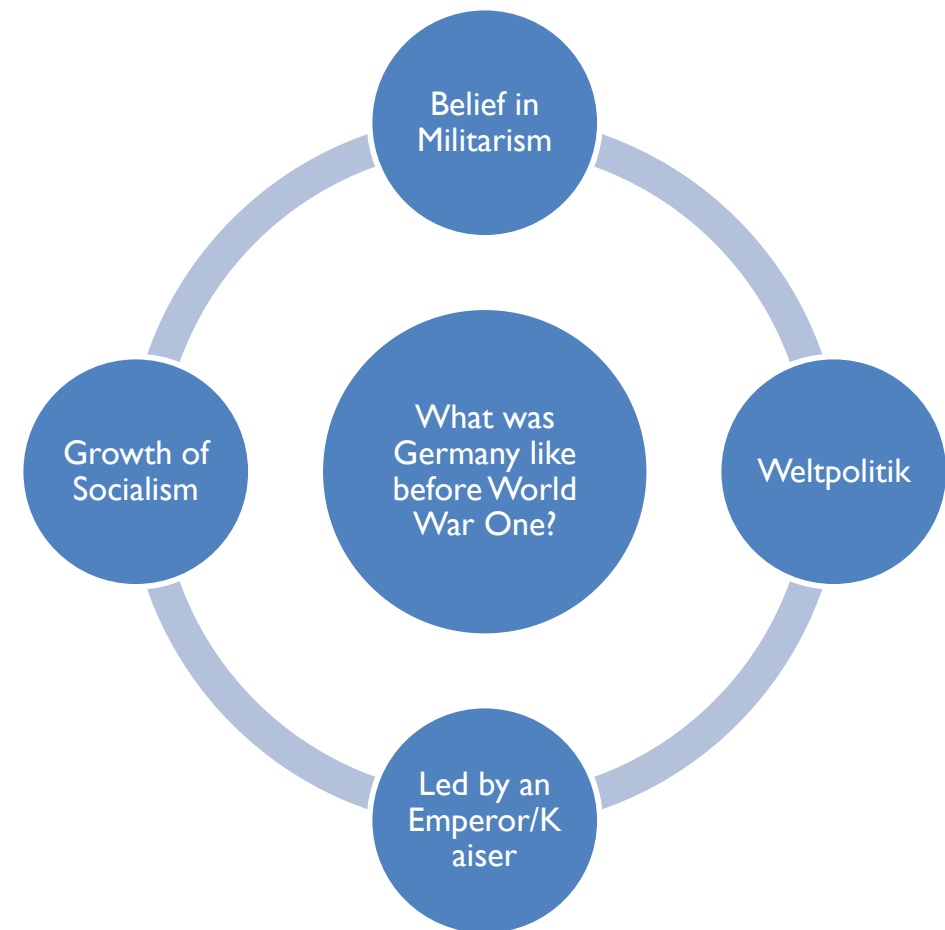
Biological: tree roots grow into rock, animals burrow into rock

Chemical: slightly acidic rainwater dissolves certain types of rock (e.g. limestone)

Freeze-thaw: water freezes and melts inside rock, expanding cracks

Word Revolution	
Authoritarianism	The belief that people should do as they were told and not question his authority
Nationalism	Usually a right-wing belief that a country should have a strong decisive leader, that prioritises the strength of the nation above individual rights and freedoms
Militarism	The belief that a country should maintain a strong military and be prepared to aggressively defend their national interests
Socialism	Left-wing belief that workers should be treated well and that the government should make laws to protect workers' rights
Weltpolitik	Kaiser Wilhelm's 'world policy', desire to expand Germany's influence around the world
Empire	When one country controls territory in other places, and rules over other countries. Wilhelm wanted his 'Place in the Sun'.

Key people	
Kaiser Wilhelm II	Kaiser (King) of Germany 1888-1918. Militaristic and wanted a strong nation to compete on a global stage. Felt that Germany should be traditional and respect his authority. However, he faced problems from the rise of socialism and trade unions within Germany.



Medieval period					Renaissance		Industrial Period		Modern Period
1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1750	1750-1800	1800-1900	1900-present

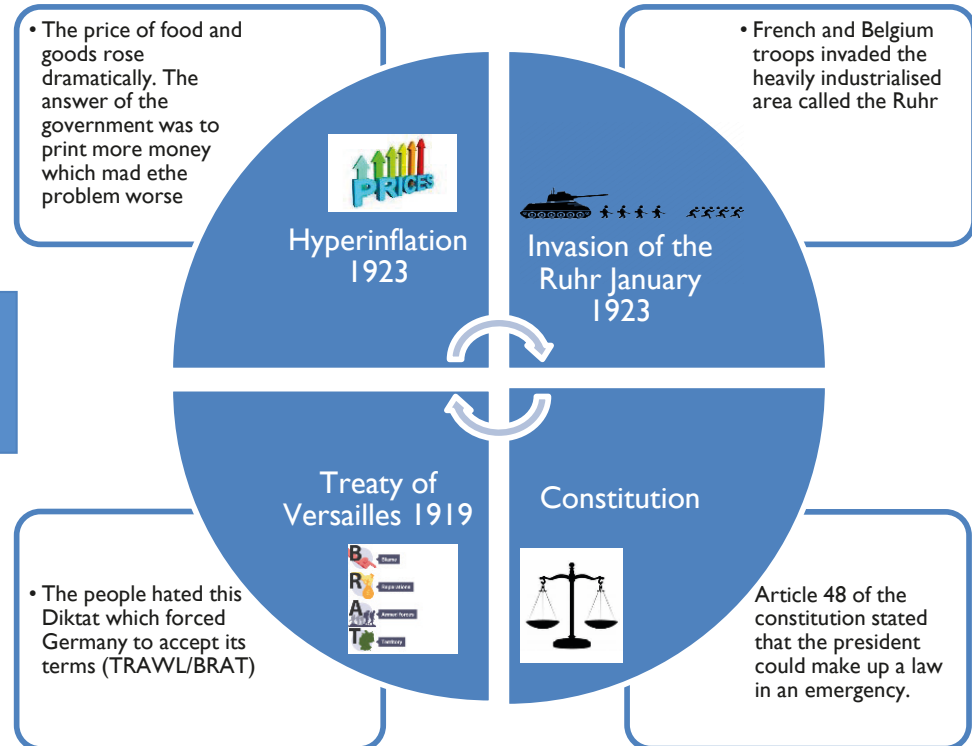
SUBJECT: History
TOPIC: Weimar Germany

YEAR: 10
SEMESTER: I



Word Revolution	
Constitution	Agreement about how a country should be run
Reichstag	German parliament
Proportional Representation	Voting system where the number of votes equals the number of seats in the Reichstag
Coalition	When two or more parties unite together to form of government based on compromise
Article 48	Allows the President to bypass the Reichstag
Putsch	German word for 'uprising' or rebellion
Hyperinflation	Money loses value and becomes worthless
Golden Age	Huge explosion in German culture, music, art
Key people	
Gustav Stresemann	As Chancellor but also Foreign Minister he introduced the Dawes act, the Young Plan and the Rentenmark. He also made a number of International Relations agreements such as joining the League of Nations in 1926

Germany's problems 1919-1923



Germany's recovery 1924-1929



Medieval period					Renaissance		Industrial Period		Modern Period
1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1750	1750-1800	1800-1900	1900-present

SUBJECT: History
TOPIC: Rise of Hitler

YEAR: 10
SEMESTER: I

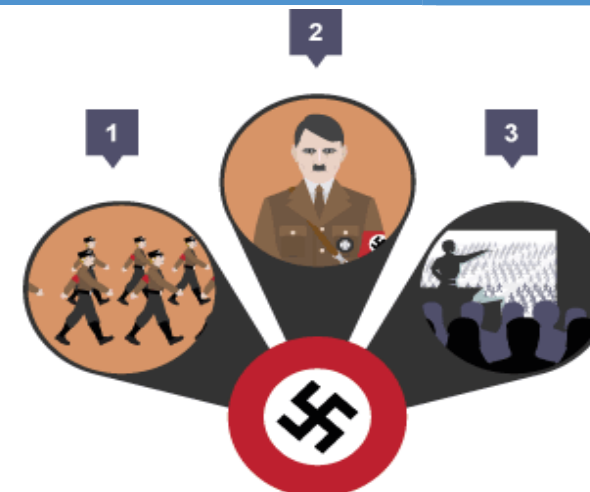


Word Revolution

Propaganda	Attempts to make people think a certain way
Sturmabteilung (SA)	'Brownshirts', paramilitary Nazi thugs
Schutzstaffel (SS)	'Blackshirts', Hitler's private bodyguard
Mein Kampf	Hitler's autobiography, explained his views
Enabling Act	Hitler could make laws without the Reichstag
Gleichschaltung	'Nazification', making Germany loyal to Nazis
Gestapo	Secret police, 'knock in the night' kidnapped anyone suspected of opposing the Nazis

Hitler becomes Chancellor

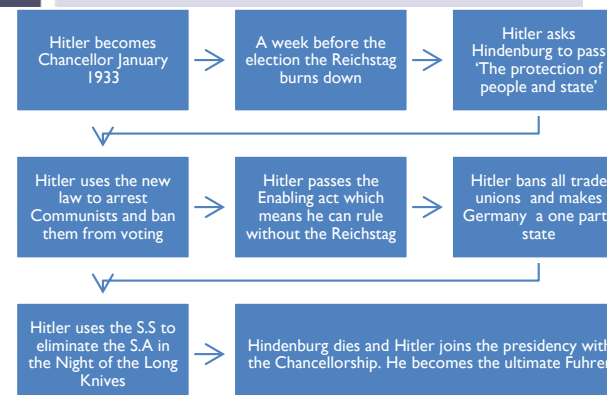
Hitler turns Germany into a Dictatorship



1 Role of the SA

2 Appeal of Hitler

3 Propaganda



Key people	
Adolf Hitler	Leader of Nazi Party who rose to total power using legal and brutal methods
Ernst Rohm	Leader of the SA (Brownshirts)
Joseph Goebbels	Nazi head of propaganda during 1920s and 1930s

Medieval period					Renaissance		Industrial Period		Modern Period
1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1750	1750-1800	1800-1900	1900-present

SUBJECT: History

TOPIC: Hitler controls Germany

YEAR: 10

SEMESTER: I

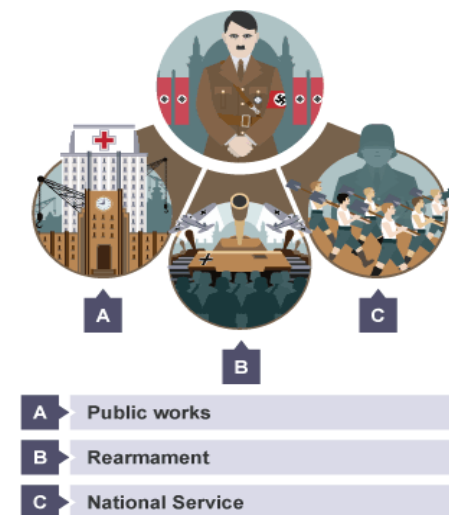
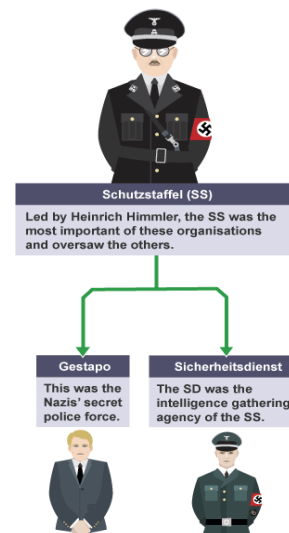
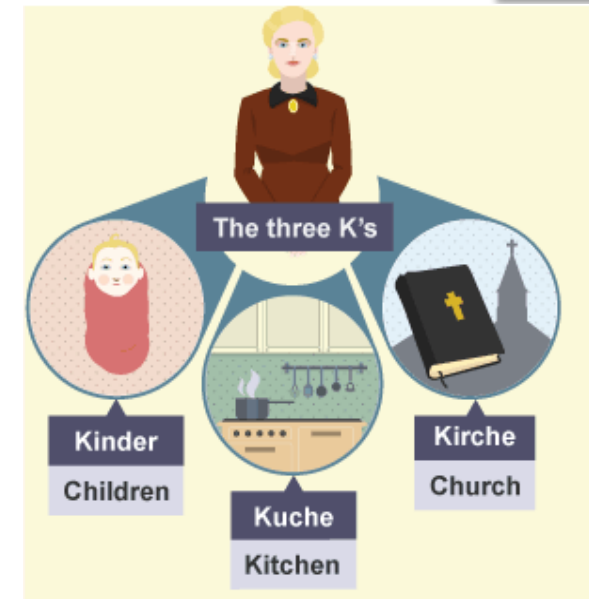
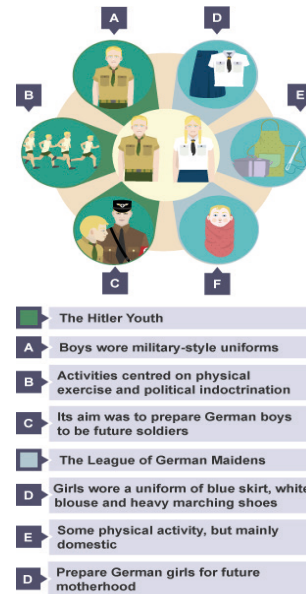


Word Revolution

German Labour Front (DAF)	Set up to replace Trade Unions
Strength Through Joy	Offers cheap deals on holidays for workers
Beauty of Labour	Improvements to working conditions
Concordat	In July 1933 the Pope agreed to stay out of political matters if the Nazis did not interfere with Catholic affairs
Kinder, Kuche, Kirche	Children, Kitchen, Church. This summed up the Nazi ideal of womanhood
Hitler Youth	The Nazi's youth club to indoctrinate (brainwash) young people.
Rearmament	Building up the armed forces during the 1930s

Key people

Hjalmar Schacht	Nazi minister for the Economy tasked with making Germany into an autarky. Sacked in 1936.
Herman Goering	Replaced Schacht as minister for the Economy in 1936. He came up with 'Four Year Plan' to get Germany ready for war by 1940.



Medieval period					Renaissance		Industrial Period		Modern Period
1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1750	1750-1800	1800-1900	1900-present

SUBJECT: GCSE Business

TOPICS: 1.1 – 1.3

YEAR: 10

SEMESTER: 1



WORD REVOLUTION

Enterprise	An organisation involved in business activity
Entrepreneur	A person who starts a business, takes risks and makes decisions
Obsolete	When something is no longer useful (eg: typewriter)
Market research	Research which is done to understand customer needs/wants
Qualitative data	Data that is based on thoughts, feelings and opinions
Quantitative data	Data which is based on numbers
Convenience	Refers to something being easy to do or access, saving time & effort.
Segment	A part into which something is divided.
Aim	A long term goal.
Objective	A short term goal or step necessary to reach an aim.
Revenue	The money made from sales of goods and services.
Cost	The money a business pays/spends of things like rent and supplies.
Price	The amount a business charges a customer.
Profit	The money that is left over after all costs have been paid.

What will I study in these topics?

During Semester 1, you will learn how and why businesses start and how businesses can add value to materials, products and services. You will also learn about how businesses decide what to sell and where to sell it by looking at different types of market research and how the mix of product, price, place and promotion need to work together effectively in order for a business to be successful. As well as this you will be introduced to various financial elements of businesses and how businesses can manage their finances to ensure success.

What will I be able to do by the end of this topic?

By the end of this semester you will have a good understanding of how businesses start and you will be developing the skills necessary to apply that knowledge to the context of small and start up businesses. You will have an understanding of the 3, 6, 9 and 12 mark questions you will be required to answer in the GCSE exams.

1.1 Enterprise and Entrepreneurship

The first unit you study this semester includes examining how and why businesses start and where ideas come from to start a business. Whilst some businesses start because of an original idea, many also start because the entrepreneur has a different motivation, for example the desire to work for themselves.

1.2 Spotting a business opportunity

This unit focuses on how businesses understand what customers want and what they do to target their products and services effectively. You will learn about different types of market research and how businesses segment their markets to ensure they are reaching the right customer, in the right place, at the right time.

1.3 Putting a business idea into practice

This is where we start to look at the aims/objectives of businesses and how many organisations manage their finances. You will learn about how to calculate revenue, costs and profit and the difference between fixed and variable costs – crucial to understanding and making decisions about improving business performance.

**You are the business leaders of the future:
be kind, be resilient,
take responsibility.**

SUBJECT: GCSE Business

YEAR: 10

TOPIC: 1.1-1.2

SEMESTER: 1



Key Questions:	1. How and why do businesses start? 2. What are the methods used by businesses to add value? 3. How does a business decide who to sell to and where to sell their products? 4. What sort of financial management tools do businesses need to make sure they are managing their finances properly? 5. Where do businesses get money/finance from in order to start/grow. 6. What sort of aims do businesses have? (It's not always about making lots of money!)
Curriculum Connections:	These units provide the first steps in understanding how businesses start and are managed: 1.1: What you learn here helps you to understand the motivation of entrepreneurs which connects to the first part of learning in year 11 which is called Business Growth where you will learn about methods of growth. 1.2: This is connected to deeper learning about the 4 P's (product, price, place and promotion) in year 11. 1.3: This unit directly relates to some more complex financial decision making calculations you will learn in year 11.

1.1 Enterprise and entrepreneurship: essential knowledge

Why new business ideas come about:

- changes in technology
- changes in what consumers want
- products and services becoming obsolete.

How new business ideas come about: • original ideas • adapting existing products/services/ideas.

The impact of risk and reward on business activity:

- risk: business failure, financial loss, lack of security
- reward: business success, profit, independence.

The role of business enterprise and the purpose of business activity:

- produce goods or services
- meet customer needs
- add value: convenience, branding, quality, design, USP.

The role of entrepreneurship:

- an entrepreneur: organises resources, makes business decisions, takes risks.

What is a brand?

A brand is not **just** a logo! A brand is a name, term, design, symbol, or any other feature that identifies one seller's goods or services as distinct from those of other sellers. Think about a brand you know about or have bought – what was your experience like? That experience all forms part of the brand, along with the product itself.

1.2 Spotting a business opportunity: essential knowledge

Customer needs: • what customer needs are: price, quality, choice, convenience

Purpose of market research: • identify customer needs • identify gaps in the market • reduce risk • to inform business decisions.

Methods: • primary research • secondary research

Data in market research: • qualitative and quantitative data • the role of social media • importance of reliability

Using market segmentation to target customers: • identifying market segments: location, demographics, lifestyle, income, age • market mapping to identify a gap in the market and competition.

Understanding the competitive environment: • strengths and weaknesses of competitors based on: price, quality, location, product range and customer service • the impact of competition on business decision making.

Is market research important?

Yes - because it helps businesses make informed decisions, reduces the risk of failure, identifies opportunities, and helps their understanding of customer needs. By gathering and analysing accurate data about customers and competitors, businesses can develop products and services that meet demand, set appropriate prices, and increase their chances of success.



1.3 Putting a business idea into practice

This unit focuses on the financial elements of starting and running a business. Good financial decision making is at the heart of successful businesses, so what sorts of things do businesses need to consider?

Key questions you'll be able to answer at the end of this unit include:

- Where can I find the money to start my business?
- If I want to grow my business after a few years, what sources of finance are available to me?
- How will I know how much revenue I need to make to cover all of the costs of running my business?
- How can I make sure there's enough cash in the bank to pay my staff, suppliers and other costs each month?
- How can I estimate how much money it will cost to run my business?
- Is my business idea profitable?
- Why do businesses have different aims and objectives?

1.3 Essential knowledge

Business aims and business objectives when starting up: • financial aims and objectives: survival, profit, sales, market share, financial security • non-financial aims and objectives: social objectives, personal satisfaction, challenge, independence and control.

The concept and calculation of: • revenue • fixed and variable costs • total costs • profit and loss • interest • break even level of output • margin of safety.

Interpretation of break even diagrams: • the impact of changes in revenue and costs • break even level of output • margin of safety • profit and loss.

Key calculations:

- **Revenue** = price x quantity sold
- **Total variable cost** = variable cost per unit x quantity made/sold
- **Total cost** = fixed cost + variable cost
- **Profit** = revenue – cost
- **Net cash flow** = inflows-outflows
- **Opening balance:** money in the bank at the start of the month
- **Closing balance** = opening balance – net cash flow

1.3 Essential knowledge

The importance of cash to business: • to pay suppliers, overheads and employees • to prevent business failure (insolvency) • the difference between cash and profit.

Calculation and interpretation of cash-flow forecasts: • cash inflows • cash outflows • net cash flow • opening and closing balances.

Sources of finance for a start-up or established small business: • short-term sources: overdraft and trade credit • long-term sources: personal savings, venture capital, share capital, loans, retained profit and crowd funding.

Break even, explanation and calculation:

Break-even is the point at which revenue and total costs are the same.

The **break-even level of output** informs a business of how many products it needs to sell to reach the **break-even point (BEP)**.

➤ **Break-even** = $\text{fixed costs} \div (\text{selling price} - \text{variable costs})$

The **margin of safety** is the amount sales can fall before the *break-even point (BEP)* is reached and the business makes no profit.

➤ **Margin of safety** = $\text{actual sales} - \text{break-even sales}$

SUBJECT: GCSE Business

YEAR: 10

TOPIC: 1.1-1.3

SEMESTER: I



How will I be assessed?

End of unit assessments: At the end of each unit there will be a GCSE style end of unit assessment, which you will be expected to revise for to make sure you do the best you can do! This also helps your teacher to see whether there have been any gaps in learning, or if we need to review a topic area with your class. At the end of Year 10 you will sit a full GCSE Business paper 1, covering everything you have learned over the year. In class, your teacher will be continually assessing your work through looking at your books, asking you questions and reviewing your green pen work.

Responding to exam questions:

In business we use a paragraph structure which is designed to help you score the best marks. 3 mark questions need one paragraph, 6 mark questions need 2 paragraphs and 9 mark questions require 3 paragraphs (there is a particular technique to getting the 9 mark questions right, listen out when you're doing these!).

Example question: **Explain one advantage of adding value to a business. (3 marks)**

P (Point): An advantage to a business of adding value is that it can charge higher prices for its products.

B (Because): This is **because** the business has enhanced the product by adapting it to make it more valuable to the customer.

L (Leading to): This will **lead to** the business receiving more revenue for each product it sells.

T (Therefore): **Therefore** if the business can keep costs to a reasonable level, it will receive more profit per product sold.

Green pen in Business

You must have a green pen with you every lesson.

This is because your teachers will be providing feedback on tasks so that you can improve your work and develop your understanding.

We also want you to fully understand where/how marks are awarded when we do practice questions, so we'll be asking you to annotate and improve these regularly

Homework

Homework will be set on Educake each week.

Make sure you can log on to Educake, using your school Microsoft 365 account and look out for your weekly homework.

Homework in Business is designed to help you recall key information, which will be really important when it comes to assessments and your final exams.

Where to find out more



BBC Bitesize: Edexcel GCSE Business

This includes quizzes, videos and useful information for the whole of the GCSE Business specification – give it a try!

Recall Questions

1. State two reasons entrepreneurs start businesses.
2. State two ways that new business ideas come about.
3. State two risks and two rewards of starting a business.
4. State three reasons businesses exist.
5. State the four methods of adding value.
6. State the four key customer needs.
7. State two types of primary market research.
8. State two types of secondary market research.
9. State four methods of market segmentation.
10. Explain two things you might use a market map for?
11. Write down the calculations for revenues, costs and profit.
12. Create a break even chart, showing the break even point and the margin of safety.

SUBJECT: Cambridge National Sports Studies

YEAR: 10

TOPIC: Increasing awareness of outdoor and adventurous activities

SEMESTER: I



WORD REVOLUTION

Outdoor Activity	Leisure, recreation or sport activity undertaken in a natural, rural space, that can be done as an individual or part of a group
National Sports Centre	Provide facilities and expertise in outdoor activities
Voluntary Organisations	Provide services to people under the age of 18
Local Providers	Offer activity centres available to schools, groups and families offering qualified instructors, a range of activities and accommodation
Terrain	A stretch of land, especially with regard to its physical features
National Governing Body	Independent organisation that manages a specific sport
Holme Pierrepont	National Water Sports Centre near Nottingham
Plas y Brenin	UK's national mountain centre; located in North Wales
Tollymore National Outdoor	Northern Ireland's National Centre for Mountaineering and Canoeing

What will I study in this topic?

Split into 4 topic areas, R187 focuses on outdoor activities, and what provisions are available throughout the UK. Assigned 3 different outdoor activities, you'll research provisions locally and nationally, what equipment, clothing and technology is required to participate in those activities, along with the various terrains they can take part on. Practically you will participate in at least 1 of the set activities, followed by evaluating your own performance and the benefits OAA has on the peoples physical, social and mental well-being.

What will I be able to do by the end of this topic?

By the end of this topic, you will have knowledge of where you can access outdoor activities, have the confidence to participate in them, knowing what equipment, clothing and technology is required in order to participate and/or compete in them. You will be able to evaluate your own performance, recognising where your strengths and weaknesses are, allowing you to improve overall performance levels and increase enjoyment.

R187 Outdoor activities

Abseiling
Paragliding
Orienteering

R187 OAA Benefits

Physical benefits

- Improve fitness
- Exposure to sunlight

Mental benefits

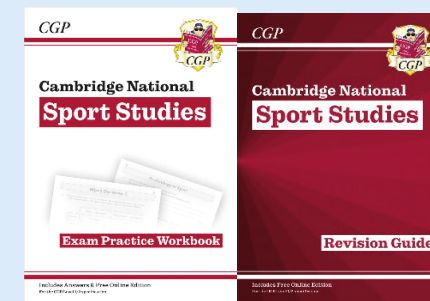
- Positive risk-taking
- Improve self confidence and self-esteem
- Time away from devices

Social benefits

- Meeting people
- Develop social skills

R187 – Mark bands

2*	34
d2	30
m2	26
p2	22
d1	18
m1	14
p1	10
U	0



SUBJECT: Cambridge National Sports Studies

YEAR: 10

TOPIC: Increasing awareness of outdoor and adventurous activities

SEMESTER: I

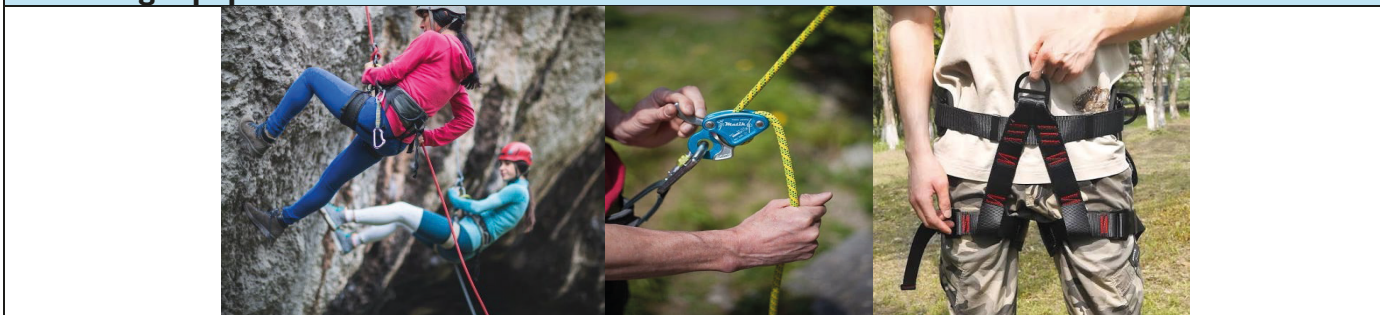


Key Questions:	What are the benefits of participating in OAAs? What are some of the potential risks associated with OAAs, and how can these risks be managed? Where do you currently get information about sports and activities? What are the three national sports centres? What practical barriers might prevent you from participating in more OAAs?
Curriculum Connections:	Geography: physical geography – different terrains. Human geography – provision of OAA in the UK. English language: report writing, communication skills (participating in OAA within a group) PE: skill development

Orienteering equipment



Abseiling equipment



SUBJECT: Computer Science

YEAR: 10

TOPIC: Paper I content

SEMESTER: I



WORD REVOLUTION

CPU (Central Processing Unit)	The part of the computer that processes instructions; often called
ALU (Arithmetic Logic Unit)	Performs arithmetic and logical operations within the CPU.
Control Unit	Directs the flow of data and instructions within the CPU.
Register	Small, fast memory location within the CPU used to store data
Cache	High-speed memory located close to the CPU to store frequently used
RAM (Random Access Memory)	Volatile memory used to store data and programs currently in use.
ROM (Read-Only Memory)	Non-volatile memory that stores permanent instructions, like the
Secondary Storage	Non-volatile storage used for long-term data storage (e.g., HDD, SSD).
Binary	A number system using only 0s and 1s; used by computers to represent
Network	A group of connected devices that can communicate and share
LAN (Local Area Network)	A network that covers a small geographical area, like a school or
WAN (Wide Area Network)	A network that covers a large geographical area, like the internet.
Protocol	A set of rules governing data transmission (e.g., TCP/IP, HTTP).
IP Address	A unique identifier assigned to each device on a network.

What will I study in this topic?

- In this topic, you will build your understanding of how computer systems function and communicate. You'll explore key components like the CPU, memory, and storage, and learn how data is represented using binary and character sets. You'll examine how networks operate, including protocols, IP addresses, and security features such as encryption and firewalls.
- You'll also study how software interacts with hardware through operating systems and utilities, and consider the ethical, legal, and environmental effects of technology.

What will I be able to do by the end of this topic?

In this topic, you'll strengthen your understanding of how computer systems work and communicate. You'll explore components like the CPU, memory, and storage, and learn how data is represented using binary and character sets. You'll examine how networks function, including protocols, IP addresses, and security features such as encryption and firewalls. You'll also study how software interacts with hardware through operating systems and utilities, and consider the ethical, legal, and environmental impact of technology.

What is a "Network"?

A network is a group of connected devices that share data and resources. Networks allow computers to communicate, access the internet, and use shared hardware like printers.

A **LAN** (Local Area Network) connects devices in a small area, such as a home or school.

A **WAN** (Wide Area Network) spans a larger area, like the internet, linking multiple LANs together across cities or countries.

My email address: _____@bentonpark.net

My computer log in: _____

My computer Password: _____

My EduCake user name: _____

EduCake password: _____

How do computers use binary and characters?

Computers use **binary** (base 2) because their hardware is built from millions of tiny switches that are either on or off—perfect for representing two states. All data, including numbers, text, images, and sound, is stored and processed using binary. **Hexadecimal** is a base-16 number system used to simplify long binary numbers. It's easier for humans to read and write, especially when dealing with memory addresses or colour codes, even though it represents the same values as binary.

Binary shifts are operations that move binary digits left or right. Shifting left multiplies the value by powers of two, while shifting right divides it—useful for fast calculations.

To represent text, computers use **character sets**. **ASCII** maps common characters to binary codes, while **Unicode** extends this to include symbols from many languages and scripts. These systems allow computers to store and display readable text across different platforms and languages.

SUBJECT: Computer Science

YEAR: 10

TOPIC: Paper 1 content

SEMESTER: I



Key Questions:	1. How do the components of a computer system work together to process and store data? 2. Why do computers use binary, and how does hexadecimal help us work with binary more easily? 3. What's the difference between a LAN and a WAN, and how do networks keep data secure? 4. How do operating systems and utility software help manage computer hardware and data? 5. What are the ethical, legal, and environmental issues we need to consider when using technology?
Curriculum Connections:	This unit builds on digital literacy and systems knowledge introduced in Key Stage 3, where students explored hardware, software, and basic data representation. It deepens their understanding of how computers store, process, and transmit data, and introduces key concepts like binary, networks, and system software in greater detail. These topics form the foundation for later GCSE units, including cybersecurity, algorithms, and data structures. They also prepare students for A Level Computer Science, where they will study advanced system architecture, networking protocols, and low-level data handling. Understanding how these units connect helps students see how digital systems work as a whole.

Ethical, legal, cultural and environmental

As technology becomes more central to our lives, it's vital to understand its wider impact.

Ethical issues involve questions about right and wrong—such as how personal data is used or whether AI should replace human jobs.

Legal issues relate to laws like the **Data Protection Act** and **Computer Misuse Act**, which protect users and prevent cybercrime.

Cultural issues explore how technology affects different societies, including the digital divide and changes in how we communicate and learn.

Environmental issues focus on the impact of device production, energy use, and e-waste. Efficient coding and recycling help reduce this impact.

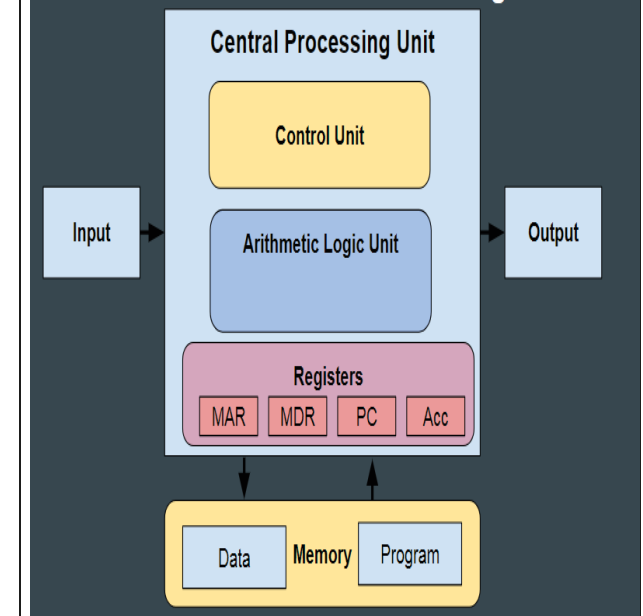
Threats to our computers and networks

Computers and networks face a range of threats that can compromise data, disrupt services, or damage systems.

Common **threats** include **malware** (like viruses, worms, and trojans), which can corrupt files or steal information. **Phishing** tricks users into revealing sensitive data, while **denial-of-service (DoS) attacks** overwhelm systems to make them unusable. These threats often exploit **vulnerabilities**—weaknesses in software, hardware, or user behaviour. Examples include outdated software, poor password practices, or unsecured networks. Hackers can use these gaps to gain unauthorised access or install malicious code. To reduce risk, organisations use **firewalls**, **encryption**, **anti-virus software**, and regular updates. Educating users about safe practices is also essential.

Understanding threats and vulnerabilities helps students recognise how digital systems can be attacked and how to protect them. This knowledge is vital for future topics like cybersecurity and ethical hacking, and supports responsible use of technology.

Von Neumann Architecture Diagram



SUBJECT: Computer Science

YEAR: 10

TOPIC: Paper I content

SEMESTER: I



Number systems: Conversion

Conversion Type	Method of Doing This	Worked Example
Denary to Binary	Divide the number by 2, record the remainder, repeat with the quotient until the quotient is 0. The binary number is the remainders read in reverse.	Example: 13 → 1101
Binary to Denary	Multiply each bit by 2 raised to the power of its position (starting from 0 on the right), and sum the results.	Example: 1101 → $1*2^3 + 1*2^2 + 0*2^1 + 1*2^0 = 8 + 4 + 0 + 1 = 13$
Binary to Hex	Split the binary number into groups of 4 bits (from the right). Convert each group to its hex equivalent.	Example: 11010111 → 1101 0111 → D7
Hex to Binary	Convert each hex digit to its 4-bit binary equivalent.	Example: 2F → 0010 1111
Hex to Denary	Multiply each hex digit by 16 raised to the power of its position (starting from 0 on the right), and sum the results.	Example: 2F → $(2*16^1) + (15*16^0) = 32 + 15 = 47$
Denary to Hex	Divide the number by 16, record the remainder, repeat with the quotient until the quotient is 0. The hex number is the remainders read in reverse.	Example: 47 → 2F

Understanding data storage

Bit	The smallest piece of data – just a 1 or a 0.
Nibble	4 bits. It's called a "nibble" because it's half a byte – like a small bite!
Byte	8 bits. Enough to store one letter or symbol.
Kilobyte (KB)	1024 bytes. Not 1000, because computers use binary (base 2), and 1024 is 2^{10} .
Megabyte (MB)	1024 KB. Used for storing photos, songs, or small apps.
Gigabyte (GB)	1024 MB. Common for USB sticks, phones, and games.
Terabyte (TB)	1024 GB. Used for large hard drives and cloud storage.

Why should I care about binary or hex?

Computers use **base 2 (binary)** because they are made of millions of tiny switches that can only be **on** or **off**—just like binary digits, which are only **1** or **0**. This makes binary the simplest and most reliable way for computers to store and process data. **Hexadecimal (base 16)** is used because it's a **shorter, more human-friendly way** to write long binary numbers. One hex digit represents four binary digits, so it's easier to read, write, and debug code—especially when working with colours, memory addresses, or machine code.

Mnemonic	op code	Description
ADD	1xx	Add
SUB	2xx	Subtract
STO	3xx	Store
LDA	5xx	Load
BR	6xx	Branch
BRZ	7xx	Branch on zero
BRP	8xx	Branch on positive
IN	901	Input
OUT	902	Output
HLT	000	Halt or Stop
DAT		Data storage location



SUBJECT: Design & Technology

YEAR: 10



TOPIC: Food Preparation & Nutrition

SEMESTER: I

WORD REVOLUTION FOR FOOD, NUTRITION & HEALTH UNIT

Balanced Diet	Eating the correct amounts of different foods so your body gets all the nutrients it needs to stay healthy.
Malnutrition	A condition caused by eating too little, too much, or not getting the right balance of nutrients, which can affect a person's health and wellbeing.
Macronutrients	Nutrients the body needs in large amounts, such as carbohydrates, protein and fats. They provide energy and help the body grow and repair.
Micronutrients	Nutrients the body needs in small amounts, such as vitamins and minerals. They help keep the body healthy and working properly.
Dietary Reference Values (DRVs)	Recommended amounts of nutrients and energy people should have each day to stay healthy.
Energy Balance	The relationship between the energy you eat (calories) and the energy you use through activity and normal body functions. If these are balanced, your weight stays stable.

WORD REVOLUTION FOR FOOD SCIENCE UNIT

Gelatinisation	The process where starch thickens a liquid when it is heated, such as when making a white sauce.
Coagulation	When proteins, such as those in eggs, change from liquid to solid when heated.
Dextrinisation	The browning of starch when it is heated, giving foods like toast or pastry their golden colour and flavour.
Caramelisation	When sugar is heated until it turns brown, creating a sweeter flavour and darker colour.
Denaturation	When proteins change their structure because of heat, acid or whisking. This is the first stage before coagulation.
Shortening	The process where fat coats flour to stop gluten developing, creating a crumbly texture in pastry and biscuits.

What will I study in this topic?

- ✓ You will develop your practical food preparation and cooking skills.
- ✓ You will learn about nutrition and healthy eating.
- ✓ You will make a variety of dishes, with a focus on savoury recipes.
- ✓ You will learn how to adapt meals to meet different users' needs.
- ✓ You will explore a range of food-related issues, including obesity, diabetes, and vegetarianism.
- ✓ You will understand the difference between micronutrients and macronutrients.
- ✓ You will learn about the importance and benefits of including both micronutrients and macronutrients in a balanced diet.

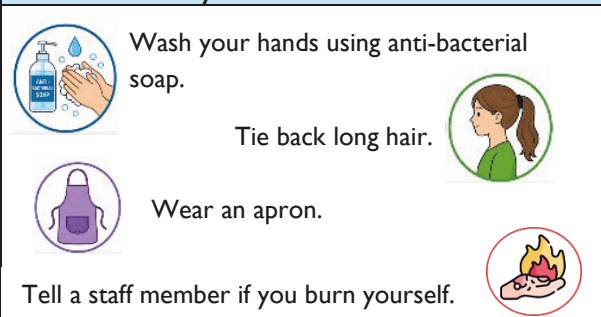
What will I be able to do by the end of this topic?

- Demonstrate practical food preparation and cooking skills by making a range of savoury dishes.
- Explain the principles of healthy eating, including the role of micronutrients and macronutrients.
- Adapt meals to meet the dietary needs of different individuals.
- Apply my knowledge of nutrition to plan and prepare healthy, balanced meals.

Key Tools:



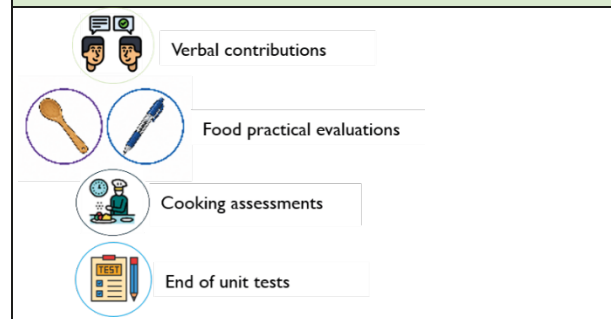
Health & Safety



Curriculum links

The AQA GCSE Food Preparation & Nutrition course has strong links across the curriculum. In **Science**, students learn about nutrition, digestion, food safety and the science of cooking. In **Health & Social Care**, they explore how diet affects health and wellbeing at different life stages. The course also develops **Design & Technology** skills through planning, designing, making and evaluating food products. **Geography** links include food provenance, sustainability and global food production, while **Mathematics** is used for weighing, measuring, costing and nutritional calculations. **English** skills are developed through research, analysing information, evaluating practical work and communicating ideas clearly. It also links to **PE**, as students learn how nutrition, hydration and energy balance support physical activity, fitness and sports performance.

How will I be assessed?



SUBJECT: Design & Technology

TOPIC: Food Preparation & Nutrition

YEAR: 10

SEMESTER: I



Top tips for Y10 Food Preparation & Nutrition

- ✓ Buy a revision guide.
- ✓ Be on time to every lesson. The practical lessons are only 55 minutes- the time will fly by!
- ✓ Always bring your ingredients. If there is a problem, please see your Food teacher before the lesson so we can help you.
- ✓ Work as a team! You can help your table members whether it is a theory lesson or a practical.
- ✓ Ensure you have all equipment. This is essential for the evaluations you have to complete or the design tasks.
- ✓ Read through each recipe carefully. Make sure you understand the steps before you begin, you can always ask your teacher to go through them with you!
- ✓ Stick to the time call outs- your teacher will give you helpful reminders of where you should be at certain times. Try to stay on track!
- ✓ Clean up after yourself. The food rooms are used by lots of different year groups. Ensure it is hygienic and clean for the next class.

Topics (units) of this GCSE

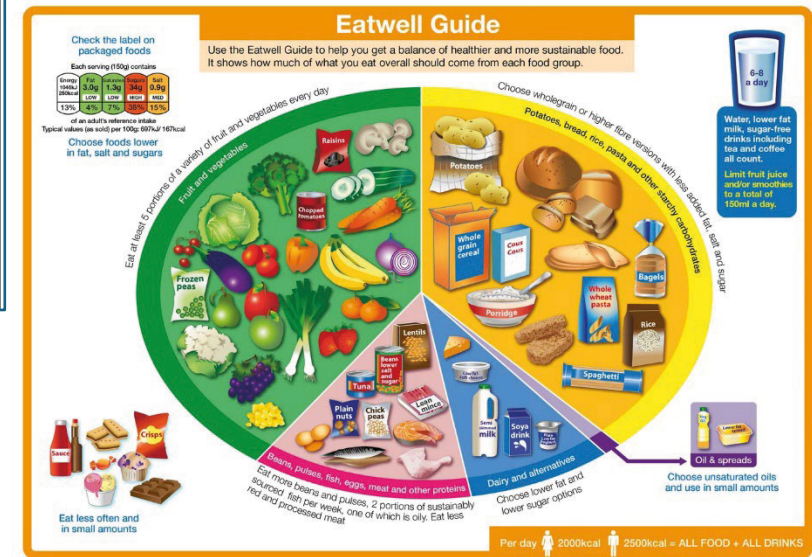


Semester 1 will include:

1. Food, Nutrition & Health
2. Food science

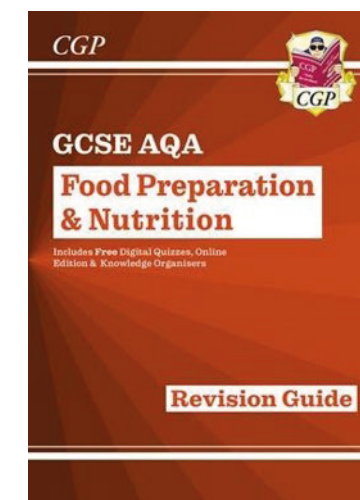
Heat transference

Conduction 	Heat moves through solids by particle vibration. The hob heats the pan; the pan heats the food.	Examples include: • Frying • Baking • Roasting
Convection 	Heat moves through liquids or gases. Hot particles rise, cool particles sink, forming convection currents.	Examples include: • Boiling • Steaming
Radiation 	Heat travels as waves directly from the heat source to the food — no contact needed.	Examples include: • Grilling • Microwaving



Know your food adjectives- think, speak and write like a chef!

Appetising	Creamy	Sweet	Savoury	Tangy
Soft	Spicy	Moist	Chewy	Smooth
Crispy	Rich	Zesty	Fluffy	Buttery
Bland	Wet	Dry	Delicious	Crunchy



Make sure you buy this revision guide. It is vital for this GCSE and includes all the information you will need for this two year course.

SUBJECT: Design & Technology

YEAR: 10



TOPIC: Product Design and Textiles

SEMESTER: I

WORD REVOLUTION

Function	The purpose of a product or how well a product fulfils its purpose
Sustainability	Designing and making products in a way that meets current needs without compromising the ability of future generations to meet their needs.
Density	The mass of a material within a given volume; how heavy a material is for its size.
Toughness	A material's ability to absorb impact and resist breaking or cracking.
Hardness	A material's resistance to scratching, wear, indentation, or abrasion.
Conductivity	The ability of a material to allow heat or electricity to pass through it.
Ductility	The ability of a material to be stretched or drawn into a wire without breaking.
Torque	A turning force that causes an object to rotate around a pivot or axis.
Composite	A material made from two or more different materials combined to improve performance.
Smart Material	A material that changes its properties in response to an external stimulus such as heat, light, or pressure.
Automation	The use of machines, computers, or technology to carry out tasks with little or no human intervention.
Ecological Footprint	A measure of the impact a person, product, or organisation has on the environment through resource use and waste production.

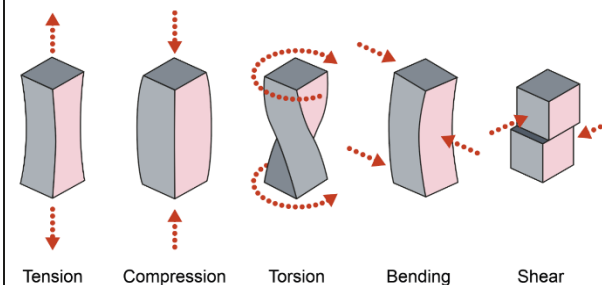
What will I study in this topic?

- Iterative design and designing for a client
- Names and classifications of a range of different materials. This will include textiles, timber, metal and polymers
- Mechanical and physical properties of materials.
- Developments in new materials, such as smart materials

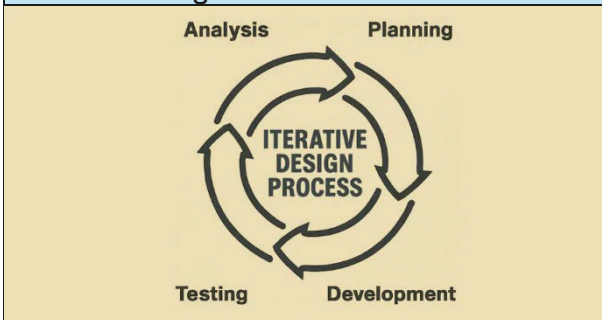
What will I be able to do by the end of this topic?

- Develop design ideas using the iterative approach
- Explain how specific materials are classified, giving reasons
- Select suitable materials with regard for their properties
- Suggest how smart and modern materials can enhance products

Types of force:



Iterative Design



Curriculum Connections:

You'll practice iterative design which will help you develop innovative ideas as part of your NEA next year.

Theory lessons will provide you with a breadth of knowledge across a wide range of material areas. Next semester we will look in more depth at your chosen specialist material area.

You will also gain an understanding of why specific materials are suited to given applications. You'll learn to consider both mechanical and physical properties.

How will I be assessed?

- Worksheets in lessons and design tasks
- Practical outcomes
- End of semester 1 exam

SUBJECT: Design & Technology

YEAR: 10

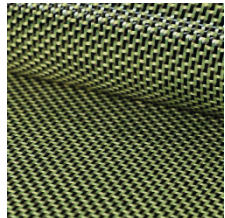
TOPIC: Product Design and Textiles

SEMESTER: I



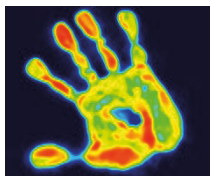
<u>Ferrous Metals</u> Contain iron	Low carbon steel High carbon steel Cast Iron	<u>Alloys</u> Mixture of 2 or more different metals	Stainless steel Brass Bronze Nitinol (SMA)	<u>Softwoods</u> From a coniferous tree	Pine Cedar Spruce	<u>Thermoforming plastics</u> Melt when heated	Acrylic PVC PET PP HDPE LDPE	<u>Natural fabrics</u> Derived from plants or animals	Wool Silk Cotton Linen
<u>Non-ferrous metals</u> Don't contain iron	Zinc Aluminium Tin Copper Lead Gold Silver	<u>Hardwoods</u> From a deciduous tree	Oak Birch Beech Ash Teak	<u>Manmade boards</u> Manmade from wood and resins	Plywood MDF Chipboard Sterling board	<u>Thermosetting plastics</u> Will not melt when heated	UF MF Epoxy Resin Polyester Resin	<u>Synthetic Fabrics</u> Man made, usually from oil	Nylon Polyester Acrylic Elastane

Technical Textiles: Kevlar



- Kevlar has an extremely high tensile strength. This means it can resist very high tensile (stretching) forces.
- Kevlar is woven into a fabric. A little like a football net, but tighter.
- The Kevlar fabric is then layered for increased strength.
- When an object hits the fabric, the force stretches it, exerting a tensile load. Kevlar can resist this due to its high tensile strength.
- It's a little bit like a ball hitting a football net. The force is spread across the fibres. This is how body armour such as bullet proof vests are made.

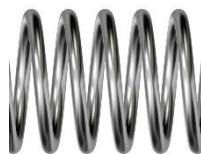
Smart Materials



Thermochromic pigment
Changes colour with heat



Photochromic pigment
Changes colour with light



Shape Memory Alloy (Nitinol)
Changes shape with heat or electricity



Piezoelectric material
Applying electricity causes movement. Applying movement produces electricity

Key Factors when selecting materials

(Product Design & Textiles)

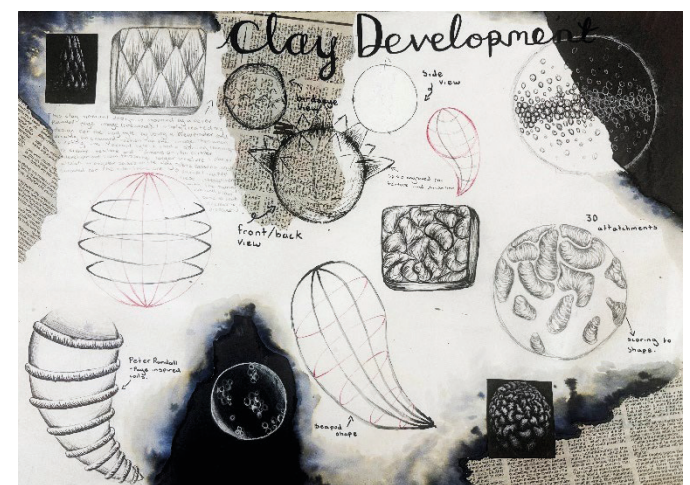
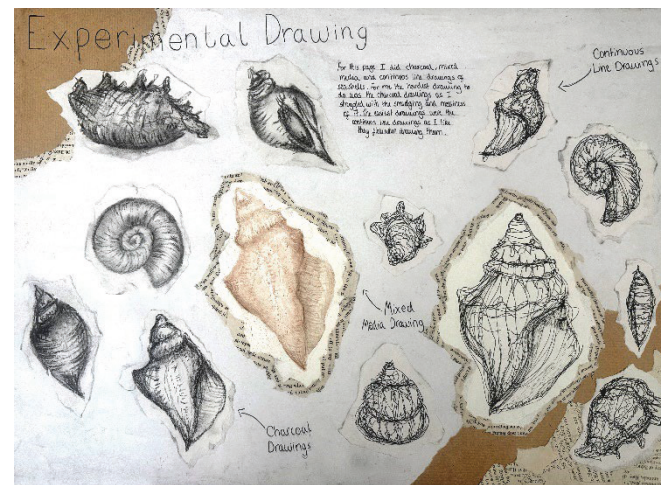
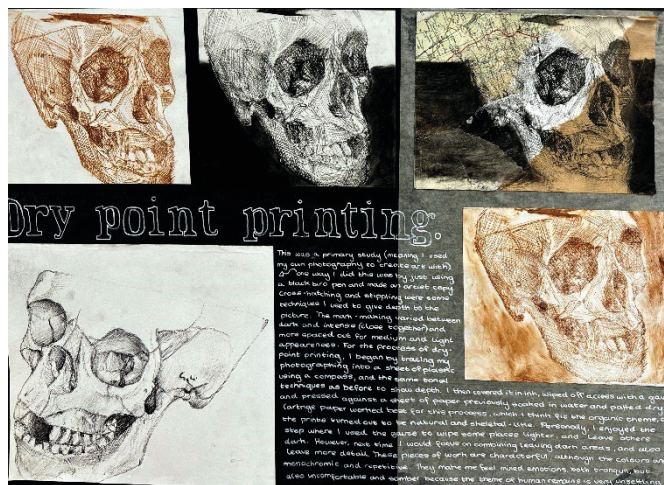
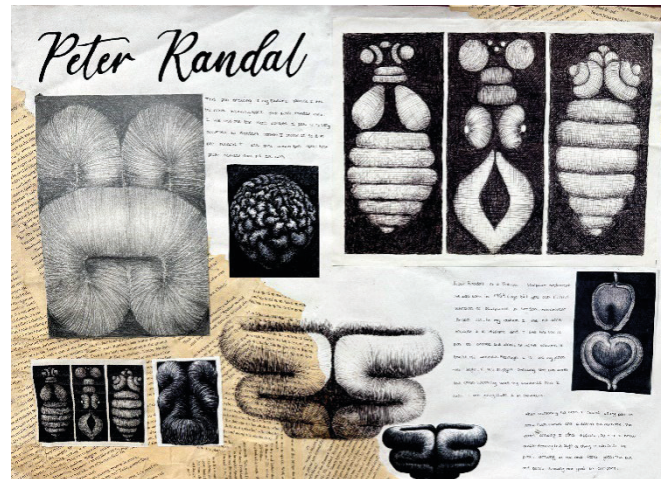
- Function
- Aesthetics
- Ergonomics
- Cost
- Environmental impact
- Manufacturing processes
- User needs and safety
- Durability
- Availability & supply
- Ethical considerations

SUBJECT: Art & Design

TOPIC: Natural Forms Minor Project

YEAR: 10

SEMESTER: I



NATURAL FORMS MINOR PROJECT - GRADE 9 EXAMPLES AND GENERAL GUIDANCE

- Introduce the artist using a clear page title (e.g. Karl Blossfeldt or Development).
- Include at least 2+ images of the artist's work (Ensure at least one is A5 in size as most of the page should be dominated by artwork and images, not writing).
- Include an informative biography covering relevant information (one paragraph is sufficient).
- Discuss WHAT the artist makes, discuss WHY they make it and discuss HOW they make it.
- You must include your own opinions on their work and link them closely to your project.
- Discuss how their art might impact your intentions (what artwork you will create).
- Carefully consider your layout using diagonal compositional rules.
- Copy a section of at least one of their artworks (use the same/or similar medium to the artist where possible to show that you are linking to their practical processes/techniques).
- Include a piece of further information or insight on the artist such as - newspaper cuttings, book pages, exhibition leaflets or quotes. This demonstrates the depth of your research and that you are scrutinizing the context of their work.

SUBJECT: Art & Design

TOPIC: Natural Forms Minor Project

YEAR: 10

SEMESTER: I



A01

EXPLORE DEVELOP ANALYSE

Develop ideas through investigations, demonstrating critical understanding of sources.

AQA GCSE ART AND DESIGN

Assessment Objective 1 is about developing and refining ideas from an initial starting point through to a final outcome. This process involves using mood boards, mind maps, sketches, and studies, while exploring the work of artists, designers, and craftspeople relevant to your theme.

It's important to go beyond simply collecting facts. You should analyse the work you research and think critically about how it connects to your own ideas, then use this understanding to shape your creative decisions in a personal and meaningful way.

A03

RECORD OBSERVE ANNOTATE

Record ideas, observations and insights relevant to intentions as work progresses

AQA GCSE ART AND DESIGN

Assessment Objective 3 is about recording your ideas, observations, and insights in visual, written, or other forms. You should work from a variety of experiences and sources, as each one can inspire different directions for your project. Reflect regularly on your progress, considering what you've achieved and what you plan to do next.

Your understanding and intentions should be clear in how you use materials and techniques, and in how your ideas develop. Show that you've thought carefully about your choices and how they relate to your theme.

Make sure to reflect on your creative process, including your selection of media and contextual sources. Demonstrate your understanding of formal elements in both your own work and that of others, and consider how your ideas could be developed further in response to the set theme or brief.

A02

REFINE EXPERIMENT SELECT

Refine work by exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes

AQA GCSE ART AND DESIGN

Assessment Objective 2 is about refining your ideas by experimenting with materials, techniques, and processes. Your choices should be informed by your understanding of how artists and designers use different materials. Through hands-on exploration, you'll discover what works best for your intentions and develop your technical skills. You don't need to use every method you try, but your final piece should clearly link to your practical studies. It's important to show evidence of experimentation, so present your samples and tests clearly in your sketchbook, journal, or on mounted sheets.

Make sure to explain your creative decisions. Show how and why you selected certain materials or techniques, and use annotations to highlight connections between your work and the artists you've studied.

A04

PRESENT PERSONAL MEANINGFUL

Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language

AQA GCSE ART AND DESIGN

Assessment Objective 4 is about presenting a personal, informed, and meaningful response from your initial research to your final piece. You need to show a clear understanding of the theme and how artists, designers, or craftspeople work, using this knowledge to shape your own creative outcomes.

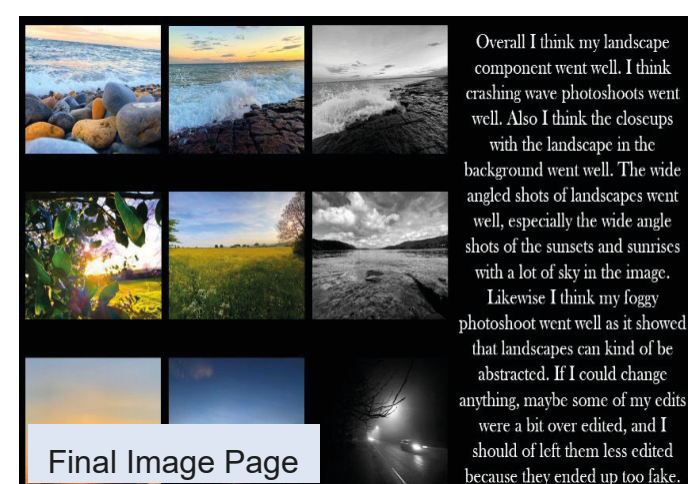
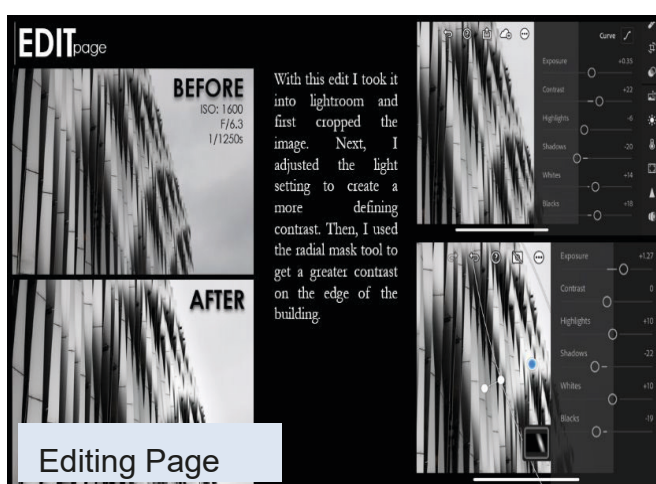
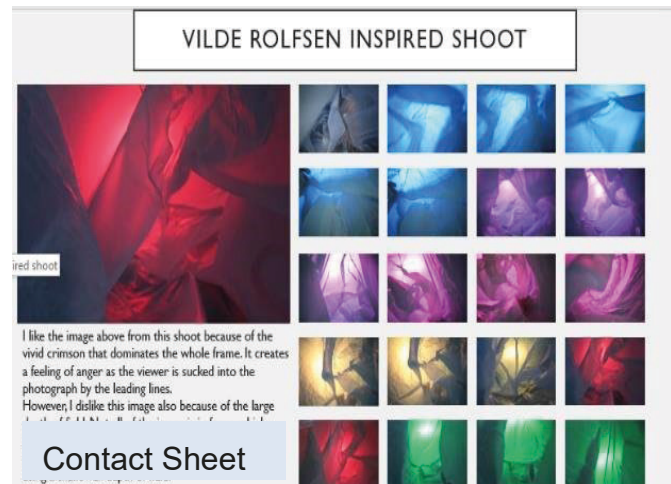
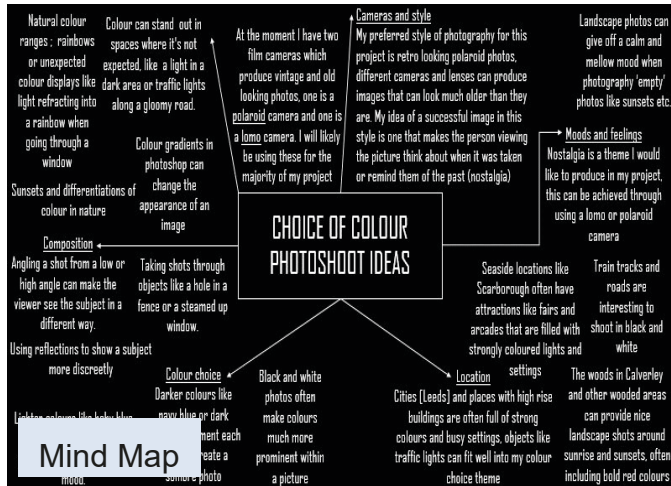
Your response should reflect thoughtful choices in source material and media, with clear connections between your work and the contextual sources you've explored. Record your ideas as they develop, showing how they lead to your final piece.

Organise your project so that the journey from your starting point to your final outcome is clear. Your work should demonstrate how your ideas have evolved and how you've applied your understanding of art and design throughout the process.

SUBJECT: Photography

TOPIC: Distortion: Altered Realities

YEAR: 10
SEMESTER: I



WHAT IS PHOTOGRAPHY AND DISTORTION PROJECT - GRADE 9 EXAMPLES AND GENERAL GUIDANCE

- Introduce the artist using a clear page title (e.g. Karl Blossfeldt or Development.)
- Include at least 5+ images of the artist's work Include an informative biography covering relevant information (one paragraph is sufficient.)
- Discuss WHAT the artist makes, discuss WHY they make it and discuss HOW they make it.
- You must include your own opinions on their work and link them closely to your project.
- Discuss how their Photography might impact your intentions (what photo shoots you will create.)
- Each photoshoot requires you to provide evidence in your portfolio. This should be in the form a contact sheet and an editing page.
- Contact sheets need to contain all images of the shoot in a grid form, an evaluation of the shoot and a title.
- Editing pages should contain a title, before and after images, screenshots of the editing process and an evaluation of the process.

SUBJECT: Photography

TOPIC: Distortion: Altered Realities

YEAR: 10

SEMESTER: I



A01

EXPLORE DEVELOP ANALYSE

Develop ideas through investigations, demonstrating critical understanding of sources.

AQA GCSE ART AND DESIGN

Assessment Objective 1 is about developing and refining ideas from an initial starting point through to a final photographic outcome. This process involves creating digital mood boards, mind maps, test shots, and experimental shoots, while exploring the work of photographers and relevant visual artists connected to your theme.

It's important to go beyond simply collecting images or information. You should analyse the photographers you research, considering their use of composition, lighting, camera settings, and subject matter, and think critically about how this links to your own ideas. You should then use this understanding to inform and develop your own shoots, shaping your creative decisions in a personal and meaningful way.

A03

RECORD OBSERVE ANNOTATE

Record ideas, observations and insights relevant to intentions as work progresses

AQA GCSE ART AND DESIGN

Assessment Objective 3 is about recording your ideas, observations, and insights through photographs, annotations, and digital presentations. You should work from a variety of sources, including your own shoots and image-based research, as each can inspire different directions for your project.

Your understanding and intentions should be clear in how you use camera techniques, composition, lighting, and editing, and in how your ideas develop. Show that you've thought carefully about your choices and how they relate to your theme.

Make sure to reflect on your photographic process, including your shoots, selection, and editing, as well as your choice of contextual sources. Demonstrate your understanding of formal elements in both your own work and that of others.

A02

REFINE EXPERIMENT SELECT

Refine work by exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes

AQA GCSE ART AND DESIGN

Assessment Objective 2 is about refining your ideas by experimenting with photographic techniques and processes. Your choices should be informed by your understanding of how photographers use camera settings, lighting, and composition. Through practical shoots and digital experimentation, you'll discover what works best for your intentions and develop your technical skills. You don't need to use every technique you try, but your final images should clearly link to your practical work. It's important to show evidence of experimentation, so present your test shots and edits clearly in your PowerPoint.

Make sure to explain your creative decisions. Show how and why you selected certain techniques or approaches, and use annotations to highlight connections between your work and the photographers you've studied.

A04

PRESENT PERSONAL MEANINGFUL

Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language

AQA GCSE ART AND DESIGN

Assessment Objective 4 is about presenting a personal, informed, and meaningful photographic response from your initial research to your final images. You need to show a clear understanding of the theme and how photographers work, using this knowledge to shape your own outcomes.

Your response should reflect thoughtful choices in subject matter, techniques, and editing, with clear connections between your work and the photographers you've explored. Record your ideas as they develop, showing how they lead to your final images.

Organise your PowerPoint so that the journey from your starting point to your final outcome is clear. Your choices should demonstrate how you've applied your understanding of photography throughout the process.

