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Autumn Term
2022-2023

Knowledge Organiser

Name: .....

Tutor Group: .....

Tutor & Room: .....

Contents

Macbeth by William Shakespeare (1606)

Key Vocab	
1.	**Prophecies** – predictions
2.	**Regicide** – killing a monarch (king or queen)
3.	**Great Chain of Being** – a system created by God which ranks every human and animal in the world
4.	**Supernatural** – a force that cannot be explained by human reason
5.	**Jacobean era** – the time period when the play was written and first performed (named after King James I)

When?		Key Idea and Theme	Key Quotes
Act 1	6.	Macbeth is a celebrated but violent war hero	*1.2.* ***Duncan****: "O valiant cousin! Worthy gentleman"* *1.2* ***Captain****: "unseamed him from the knave to th'chops"*
	7.	Duncan is the rightful king, chosen by God	*1.7.* ***Macbeth****: "his virtues will plead like angels"*
	8.	Banquo is an honourable man, who questions the prophecies	*1.3.* ***Banquo****: "What, can the devil speak true?"*
	9.	Supernatural is a powerful force; witches share prophecies	*1.3.* ***Witches*** *(to Macbeth): "All hail Thane of Cawdor, that shall be king hereafter"* *1.3.* ***Witches*** *(to Banquo): "Thou shall get king, though thou be none."*
	10.	Macbeth is in two minds about committing regicide as his ambition awakens	*1.3* ***Macbeth*** *(to witches): "Stay you imperfect speakers, tell me more."* *1.3* ***Macbeth****: "Why do you dress me in borrowed robes?"* *1.3.* ***Macbeth*** *(aside): "This supernatural soliciting cannot be good, cannot be ill"* *1.4* ***Macbeth*** *(aside): "Stars, hide your fires, let not light see my black and deep desires"*
	11.	Lady Macbeth is an ambitious, unusual Jacobean woman who encourages deception	*1.5* ***Lady Macbeth*** *(soliloquy): "Take my milk for gall"* *1.5* ***Lady Macbeth*** *(soliloquy): "Come, thick night, that my keen knife see not the wound it makes"* *1.5.* ***Lady Macbeth*** *(to Macbeth): "Look like the innocent flower, but be the serpent under't"* *1.7* ***Lady Macbeth*** *(to Macbeth): "When you durst do it, then you were a man."*
Act 2	12.	Macbeth is in two minds about committing regicide	*2.1* ***Macbeth*** *(soliloquy): "Is this a dagger I see before me? Come let me clutch me"*
	13.	The natural world is in chaos because the Great Chain of Being has been disturbed	*2.3* ***Lennox****: "The earth was feverous and did shake"* *2.4* ***Old Man****: "Tis said the horses ate each other"*
	14.	Macbeth is overwhelmed by guilt following committing regicide, compared to Lady Macbeth who is untroubled	*2.2* ***Macbeth*** *(soliloquy): "Will all great Neptune's Ocean wash this blood clean from my hand?"* *2.2* ***Lady Macbeth*** *(to Macbeth): "A little water clears us of this deed"* *2.2* ***Macbeth****: "I could not say 'Amen'"*
	15.	Duncan's sons suspect treason and deception, and flee	*2.2* ***Donalbain****: "There's daggers in men's smiles"*

Macbeth by William Shakespeare (1606)

When?		Key idea and theme	Key quotes
Act 3	16.	Macbeth is troubled by Banquo's knowledge of the **prophecies**.	3.1 ***Banquo*** *(soliloquy about Macbeth): "I fear thou playst most foully for it."* 3.1 ***Macbeth***: *"Our fears in Banquo stick deep."* 3.2 ***Macbeth***: *"O, full of scorpions is my mind, dear wife."*
	17.	Macbeth's guilt, madness and paranoia overwhelm him at the banquet.	3.4 ***Macbeth*** *(to ghost): "Never shake thy gory locks at me."*
	18.	Macbeth recognises that he cannot change his destructive fate.	3.4 ***Macbeth*** *(to Lady Macbeth): "I am in blood stepped in so far that returning were as tedious as go o'er."*
Act 4	19.	Macbeth's ambition and insecurities drive him to revisit the witches, for more **prophecies**.	4.1 ***The witches*** *(about Macbeth): "Something wicked this way comes."* 4.1 ***The prophecies***: *"Beware Macduff; none of woman born shall harm Macbeth; Macbeth will be safe until Birnam Wood comes to Dunsinane Hill."*
	20.	Macbeth becomes increasingly ruthless.	4.1 ***Macbeth*** *(aside, about Macduff): "Give to th'edge o'th'sword his wife, his babes, and all unfortunate souls."*
	21.	Scotland suffers as a result of Macbeth's unlawful kingship.	4.3 ***Macduff***: *"bleed, bleed poor country."*
Act 5	22.	Lady Macbeth is consumed by guilt and madness.	5.1 ***Gentle woman***: *"Lady Macbeth has light by her continually."* 5.1 ***Lady Macbeth*** *(sleepwalking, watched by doctor): "Out damned spot; Hell is murky."* 5.1 ***Lady Macbeth*** *(sleepwalking, watched by doctor): "Will these hands ne'er be clean?."*
	23.	Macbeth's arrogance blinds him to the approaching dangers of the English army, who know his kingship is unlawful.	5.2 ***Angus*** *(about Macbeth): "Now does he feel his title hang loose about him, like a giant's robe upon a dwarfish thief"* 5.3 ***Macbeth***: *"Bring me no more reports"*
	24.	Macbeth considers the pointlessness of life.	5.5 ***Macbeth*** *(about Lady Macbeth's death): "She should have died hereafter."* 5.5 ***Macbeth***: *"Life is a tale told by an idiot, full of sound and fury, signifying nothing."*
	25.	Macduff kills Macbeth, the rightful king Malcom takes the throne and order is restored in Scotland.	5.8 ***Macduff***: *"Macduff was from his mother's womb untimely ripped."* 5.9 ***King Malcom***: *"call home our exiled friends abroad that fled the snares of watchful tyranny."* 5.9 ***King Malcom***: *"dead butcher, and his fiend-like queen."*

The Strange Case of Dr Jekyll and Mr Hyde by Robert Louis Stevenson (1886)

Key Vocab	
1.	**Gothic genre** – fiction that typically contains: death and decay; the supernatural; the monstrous; suffering; isolated and mysterious settings
2.	**Victorian era (Fin de Siècle)** – the time period in which the novella was written: the end of the 19th Century
3.	**Duality** – when a person, place or idea has two contrasting sides
4.	**Alter-ego** – a person's alternative personality
5.	**Reputation** – how a person or place is viewed by others

When?		Key Idea and Theme	Key Quotes
Chapter 1: The Story of the Door	6.	Utterson is a loyal friend and a typical Victorian gentleman	*Utterson is described as "the last good influence in the lives of down-going men"*
	7.	Enfield and Utterson comment on the duality of the setting (London)	*"The shop fronts stood like rows of smiling saleswomen"* *The back of Jekyll's house is described as a "sinister block of building" which "showed no window"*
	8.	Enfield recounts Hyde's barbaric trampling of a child and Hyde's unusual response	*"trampled calmly over the child's body"* ***Enfield**: "it was hellish to see"* ***Enfield**: "like some damned Juggernaut"* *Hyde responds with "black sneering coolness"*
	9.	The theme of secrecy and reputation among gentlemen is introduced	*"Let us make a bargain never to refer to this again"*
Chapter 2: The Search for Mr Hyde	10.	Utterson's curiosity about Hyde grows as he benefits from Jekyll's will	*Utterson's "imagination was engaged, or rather enslaved"* *Utterson dreams that he is "haunted" by Hyde in London, that has become a "labyrinth"*
	11.	Dr Lanyon criticises Jekyll's approach to science, which is why they fell out	*"he began to go wrong, wrong in mind"* ***Lanyon**: "unscientific balderdash"*
	12.	Hyde - Jekyll's alter-ego is degenerate and animalistic when confronted by Utterson	*"snarled aloud into a savage laugh"* *"pale and dwarfish"*
Chapter 3: Dr Jekyll was Quite at Ease	13.	Two weeks later: Jekyll's appearance changes dramatically when Utterson challenges him about his friendship with Hyde	*Jekyll is a "well-made, smooth-faced man"* *"There came a blackness about his eyes"* ***Jekyll**: "The moment I choose, I can be rid of Mr Hyde"* *"This is a private matter, and I beg of you to let it sleep"*

The Strange Case of Dr Jekyll and Mr Hyde by Robert Louis Stevenson (1886)

When?		Key idea and theme	Key quotes
Chapter 4: The Carew Murder Case	14.	One year later: London is increasingly Gothic	*"fog rolled over the city"* *"reinvasion of darkness"* *"city in a nightmare"*
	15.	Hyde, representing evil, brutally murders an innocent gentleman with a cane that Utterson later recognises as Jekyll's	*Carew is an "aged, beautiful gentleman" with "innocent, old-world kindness"* *Hyde "clubbed him to death" with "ape-like fury"*
Chapter 5: The Incident of the Letter		Jekyll removes himself from society and becomes ill and guilty because of the actions of his monstrous alter-ego Hyde.	*"deadly sick"* ***Jekyll**: "O God, what a lesson I've had"*
	16	Utterson realises that Jekyll has pretended to be Hyde in a letter, saying he has disappeared.	*"Henry Jekyll forge for a murderer! And his blood ran cold in his veins"*
Chapter 6: The Remarkable Incident of Doctor Lanyon	17	Jekyll's health worsens and he shuts himself off from the world because he's losing control over when he turns into Hyde.	*"His face seemed to open and brighten"* *"confined himself"*
	18	Lanyon falls sick and dies after witnessing Hyde's transformation into Jekyll.	*"deep seated terror of the mind"*
Chapter 7: The Incident at the Window	19	Jekyll seems trapped in himself and behaves strangely when seen at the window.	*"disconsolate prisoner"* *"smile was struck out of his face"*
Chapter 8: The Last Night	20	Utterson hears from Poole about Jekyll's desperate and unusual behaviour whilst locked in the lab before breaking in.	***Poole**: "weeping like a woman or a lost soul"* *"masked thing like a monkey jumped whipped into the cabinet"* *"dismal screech of animal terror"*
Chapter 9: Dr Lanyon's Narrative	21	Lanyon's letter describes the terror of seeing Jekyll transform into Hyde.	*Lanyon describing Hyde - "his face become suddenly black, the features seemed to melt and alter"* *"my mind submerged in terror and my soul sickened at it"*
Chapter 10: Henry Jekyll's Full Statement of The Case	22	Jekyll describes his duality.	***Jekyll**: "man is not truly one but truly two"*
	23	Jekyll describes his gradual loss of control of his alter-ego Hyde who he created.	*At first Hyde makes Jekyll feel "younger, lighter, happier in body"* *Later Hyde began to "turn towards the monstrous"* *Jekyll unsuccessfully tries to repress Hyde – "my devil had long been caged, he came out roaring"; "the power of Hyde seems to have grown with the sickliness of Jekyll"*

English Language Paper 1

Q	Question	Mark	Look out for these things in the text that are specific to each question:	Must include in your answer:	Useful words/phrases to 'build' your answer
1.	List 4 things from this part of the source about…	**4**	You need to focus only on the line references given	• Short, precise answers • Focus on the key word in the question • Select quotations from the text • Inferences are not required	Copy quotes directly from the text for your answers
2.	How does the writer use language to describe …?	**8**	**Words and phrases** • Emotive verbs/adverbs/adjectives • Semantic field **Language features and techniques** • Imagery – metaphor; simile; personification • Sound patterns - repetition; onomatopoeia; alliteration **Sentence Forms** • Short sentence/list	**Thesis:** an overview of the writer's main ideas and how these are presented. **For each language paragraph:** **1) Point/idea that answers the question focus** with short, embedded quotations from text. **2) Identify** the language method used and explain why it has been used. **3) Analysis** - explore words from the quotation with a narrow focus to analyse how and why the language has been used. **4) Reinforce/challenge ideas** with more quotations from the text to support your point/main idea.	**Thesis:** *The writer presents…/characterises…/establishes…thorough the use of….throughout the extract.* **1)** ~~This makes the reader think/ feel…~~ *The writer conveys/demonstrates/illustrates the idea … The writer hints at/ reinforces/establishes* **2)** *The verb/adjective …. means …, which has associations/ connotations of…The metaphor/simile compares … to. … which is.. The alliteration creates a …sound, which imitates… /creates a tone of…The list of 3 creates …/reinforces…/The writer's use of repetition signifies…/reinforces the ideas about…* **3)** *The writer's use of the words….and…suggest…* *The writer uses words such as…to evoke…* *The writer's choice of words such as …seem to suggest…* **4)** *The writer later reinforces this idea when…* *The writer continues to reinforce/develop ideas about…when…* *The writer later challenges ideas about …by using…-*
3.	How has the writer structured the text to interest you as a reader?	**8**	**Structural feature** • (New) character/setting/event/mood/ atmosphere • Narrative voice/viewpoint • Juxtaposition – to highlight a contrast… • Climax – the most intense or exciting part of something… • Pivotal moment - a turning point to show a change in character or action… • Pathetic fallacy - when the weather reflects the mood of the character or atmosphere… • In medias res – beginning in the middle of the action… • Flashback – in past tense to describe a past memory or event… • Repetition across the text – to reinforce or develop an idea…	**Thesis:** give an overview of structural features used to present the writer's main idea. **For each language paragraph:** **1) Signpost/introduce structural feature:** character/setting/mood/narrator/ event). **2) Analyse:** Why the feature of structure is used and the impact it has for this text's specific purpose.	**Thesis:** *Initially, the writer focuses our attention on…in order to…As the extract progresses, this focus changes to…in order to show us…* *Finally, the writer contrasts this idea at the end of the extract by…* **1)** *Initially, the writer establishes….by focusing our attention on…* *As the extract progresses the writer presents us with a turning point / climax in the narrative to highlight/challenge/contrast/juxtapose…* *At the end of the extract, the writer zooms in to refocus our attention on…Towards the end of the extract the writer employs a flashback to show us…* **2)** *This sudden shift in focus allows us to understand…* *The writer's shift in tone from…to…reinforces the character's…* *The writer's reinforcement of…by revisiting…at the end of the extract suggests… The writer 's sudden contrast to….at the end of the extract makes us see that…*

English Language Paper 1

Q	Question	Mark	Look out for these things in the text that are specific to each question:	Must include in your answer:	Useful words/phrases to 'build' your answer
4.	"A student, having read this section of the text, said: "This part of the text shows ...." Look out for different sections of the quotation To what extent do you agree?	**20**	**1) Ideas about the character or event** • **What** is the character feeling? • **Why** is s/he feeling like this? • What is it about **his/her past background** that makes them feel like this? **2) Methods** a) Text level methods: Humour/Irony/Symbolism/ Characterisation/Dialogue/Setting b) Structural methods Juxtaposition/ contrast/ Pivotal moment c) Language methods (see Qu 2)	**Thesis:** an overview of the writer's main ideas and how these are presented in response to a given statement. **For each paragraph:** **1) Point/idea that responds to the statement focus** with short embedded quotations from text. **2) Identify** the language/structural method used and explain why it has been used – again link to the statement focus. **3) Analysis -** explore words from the quotation with a narrow focus to analyse how and why the language has been used. If you've identified a feature of structure then evaluate and explain why this has been used in light of the statement. **4) Reinforce/challenge ideas -** with more quotations from the text to support your point/main idea. Can you challenge the statement or is the same message being reinforced by the writer?	**Thesis:** *Arguably, the writer presents…* *To a certain extent, the writer shows us that…* **1)** ~~This makes the reader think/ feel…~~ *Initially, the writer conveys/demonstrates/illustrates the idea…when he describes……as….Towards the middle of the text, the writer hints at/ reinforces/establishes…* **2)** *The verb/adjective …. means …, which has associations/ connotations of…The metaphor/ simile compares … to. … which is..* *The alliteration creates a …sound, which imitates… /creates a tone of…The list of 3 creates …/reinforces…/The writer's use of repetition signifies…/reinforces the ideas about…* *The writer's use of the pivotal moment suggests…The turning point towards the middle of the extract could imply…The writer's focus on….suggests to us that…* **3)** *The writer's use of the words….and…suggest…* *The writer uses words such as…to evoke…* *The writer's choice of words such as …seem to suggest…* **4)** The writer later reinforces this idea when… The writer continues to reinforce/develop ideas about… when… The writer later challenges ideas about …by using…
5.	Write a description of …, as suggested by this picture Or Write a story/ description about…	**24 + 16**	**Suggested Examples of Writing Structure for Q5** 1. Drop 2. Zoom 3. Flash 4. Echo: Resolution? Twist? Cliff hanger? 1. In Medias Res 2. Establish background/voice 3. Description of setting 4. Climax/ Main event 5. Resolution? Twist? Cliff hanger? Cyclical narrative?	**Language Devices you must use:** **Imagery** • Metaphor/Simile – comparing something real to something imaginary… • Pathetic fallacy – when the weather reflects the character's mood or atmosphere… • Semantic field built up of adjectives, verbs and adverbs to reinforce an idea about a character or event… **Sound** • Alliteration – focuses the reader's attention on a section of the text to create a certain mood or rhythm… • Onomatopoeia – a sound associated with its name… • Repetition/anaphora to reinforce an idea about something or make it more prominent…	**Punctuation** • *Hyphen – '-'* • *Colon – ' : '* • *Semi-colon – ' ; '* **Sentences** • *Rhetorical question* • *Imperative* • *Exclamation* • *Patterns: Listing* • *Although/Despite…* • *Sentence starters: Adjective pairs/ Present participles*

English Language Paper 2

Q	Question	Mark	Look out for these things in the text that are specific to each question:	Must include in your answer:	Useful words/phrases to 'build' your answer
1.	Choose four statements below which are true	**4**	• Statements given are in chronological order	Shade in the four true statements	
2.	Use details from both sources to write a summary of what you understand about the different/ similar…. Look for the question focus	**8**	• Information you can pick out of the text that shows differences or similarities	**1)** An idea in your own words about the specific differences/similarities **2)** Evidence from both texts to support your ideas **3)** Inference of evidence • ~~You don't need to find methods~~ • ~~You don't need to write about the writers' feelings/attitudes~~ **4)** Summary of what both texts present at the end of the paragraph	**1)** *Both texts describe similar ideas about…* *Whilst Source A describes….Source B describes…* **2)** Source A refers to… When it describes… **3)** Which suggests/shows/demonstrates that… Which highlights that Which tells us that **2)** However/Similarly… In Source B the writer highlights… **3)** Which implies/demonstrates… **4)** Therefore, although/whereas Text A… Or Both texts…
3.	How does the writer use language to describe the …	**12**	**Words and phrases** • Emotive verbs/adverbs/adjectives • Semantic field • Language features and techniques • Imagery – metaphor; simile; personification • Sound patterns - repetition; onomatopoeia; alliteration **Sentence Forms** • Listing	**Thesis:** an overview of the writer's main ideas and how these are presented **For each language paragraph:** 1) Point/idea that answers the question focus with short embedded quotations from text. **2) Identify** the language method used and explain why it has been used. **3) Analysis** – explore words from the quotation with a narrow focus to analyse how and why the language has been used. **4) Reinforce/challenge ideas** with more quotations from the text to support your point/main idea.	**Thesis:** The writer presents…/characterises…/establishes…thorough the use of….throughout the extract. **1)** ~~This makes the reader think/ feel…~~ *The writer conveys/demonstrates/illustrates the idea* *The writer hints at/reinforces/establishes* **2)** The verb/adjective …. means …, which has associations/ connotations of… The metaphor/simile compares … to. … which is.. The alliteration creates a …sound, which imitates… /creates a tone of… The list of 3 creates …/reinforces…/ The writer's use of repetition signifies…/reinforces the ideas about… **3)** The writer's use of the words…,and…suggest… The writer uses words such as…to evoke… The writer's choice of words such as …seem to suggest… **4)** The writer later reinforces this idea when… The writer continues to reinforce/develop ideas about…when… The writer later challenges ideas about …by using…

English Language Paper 2

Q	Question	Mark	Look out for these things in the text that are specific to each question:	Must include in your answer:	Useful words/phrases to 'build' your answer
4.	Compare how the writers convey their different/similar perspectives and feelings about …	**16**	**1) Ideas -** inferences **Compare 'like with like' ideas** **2) Methods** **Text level methods** o Tone/register o Narrative Voice/Persona o story/anecdote o humour/irony o description/explanation o counter argument/lists o comparison/juxtaposition o expert/witness accounts **Sentence level methods** o List of three o Rhetorical question o Imperative o 1st/2nd person Direct Address o Facts/Statistics **Language methods** o Language choice o (see Question 3 list)	**Thesis:** a comparative overview of both writers' main ideas and the main way in which these are presented. **For each paragraph:** **1)** Point/idea that establishes the writers' attitudes with short embedded quotations from **both** sources. **2) Identify** the language or structural method used and explain why it has been used to show a specific attitude in both texts- the method in source A may be similar or different to the one in Source B. **3) Analysis** – explore words from any quotations with a narrow focus to analyse how and why the language has been used by the writers. **4) Reinforce/challenge ideas** with more quotations from the text to support your point/main idea. **5) Summarise attitudes** of both writers again at the end – based on the evidence you give in the main bit of your paragraph.	**Thesis:** *Source A is a [judgmental adjective] [type of text], whereas Source B is a [judgmental adjective] [type of text]. However, both view … as ….* **1)** ***Both*** *texts view/consider… as…* *The writers of both texts appear to view….as….* *Whilst the writer of Source A seems to feel…..about….the writer of Source B appears to think…through the use of…* **2)** *The writer uses …to [attitude verb/adjective]* *The idea that …* *Whereas in source B the writer uses juxtaposition highlight the contrast between…* **3)** *The writer's use of the words….and…suggest…* *The writer uses words such as…to evoke…* *The writer's choice of words such as …seem to sugges* *In comparison, the writer of Source B employs words such as …to suggest…* **4)** *The writer of Source A later reinforces this idea when…* *The writer of Source B continues to reinforce/develop ideas about…when…* **Negative Attitudes** / **Positive Attitudes** Questions / Sympathises Condemns / Celebrates Dismisses / Respects Criticizes / Values Dislikes / Mistrusts / Encourages Is angered by / Is inspired by Is unsympathetic to / Is interested *Therefore, whereas Source A…, Source B…* *although Source A…, Source B…* *both Source A and B describe…*
5.	[Statement of opinion] Write an article/ letter/speech/in which you explain/ argue your views on this statement	**24 + 16**	**Opening paragraph** ✓ Make your opinion about the topic clear by outlining your key opinion on the issue	**Ranking paragraph** ✓ Topic sentence ✓ Firstly… ✓ More worryingly … ✓ Most troublingly … ✓ Concluding sentence **Anecdote** ✓ Topic sentence ✓ Imperative. Let me tell you what happened to… ✓ Time References Only last week… ✓ Language Devices ✓ Concluding sentence	**Analogy** ✓ Topic sentence ✓ Declare comparison. We can think of … as being like… ✓ Description of other item ✓ Imperative Now compare this to Description of original item/idea **Future** ✓ Acknowledge that you understand another side to the argument ✓ Solutions to the issue/problem ✓ Ideas about how the issue will be addressed ✓ What the outcome should be

An Inspector Calls by J. B. Priestley (1945)

Context:
1. Set before WW1 (1912)
2. Society was rigid
3. Wealthy showed little empathy for poor
4. Workers had limited rights
5. National Strike 1912 – Dockers, miners, firemen
6. …but Unions were weak
7. Working class women were exploited

J.B. Priestley
8. Believed in socialism
9. Opposed to capitalism
10. Helped establish welfare state
11. Supported unions
12. Supported CND

Themes: Priestley wanted:
13. Class – to emphasise the suffering of the working classes
14. Society – a fairer, more cooperative society
15. Wealth/Poverty – to show the great gulf between the two
16. Responsibility – everyone in society to share this
17. Rights – unions, a welfare state and equality
18. Women – an end to exploitation

	Action	Act	Theme	Dramatic devices	Quotes
19.	The wealthy businessman, Arthur Birling is having an engagement party for his daughter, Sheila, who is engaged to Gerald Croft, an upper-class man whose father is a knight.	Act 1	Class & Society	Characterisation Setting Dramatic Irony Exposition	*"A fairly large suburban house belonging to a prosperous manufacturer"* *"You're just the kind of son-in-law I always wanted."* *"Crofts and Birlings… working together – for lower costs and higher prices"* *"Except for all last summer when you never came near me"* *"your father and I have been friendly rivals in business for some time now"* *"now I feel really engaged"* *"I'm talking as a hard-headed, practical man of business"*
20.	Birling's speeches relate to business and profit. Priestley uses dramatic irony to mock him.	Act 1	Wealth & poverty	Character development Subtle hints	*"The interests of capital – are properly protected."* *"…and unsinkable, absolutely unsinkable."*
21.	The Inspector arrives and tells them of the suicide of a young lady of around 23.	Act 1	Responsibility & Women	Character development Dramatic entrance Timing	*"Two hours ago, a young woman died in the infirmary…Burnt her inside out, of course."*

An Inspector Calls by J. B. Priestley (1945)

	Action	Act	Theme	Dramatic devices	Quotes
22.	Mr Birling sacked a girl from his factory for asking for a pay rise. He does not accept responsibility.	Act 1	Responsibility, Class, Women	Character development	*"Did you say 'why?'?"* *"it's my duty to keep labour costs down."*
23.	Sheila forced the manager at Millwards to dismiss a girl purely because she was jealous. She takes complete responsibility	Act 1	Responsibility & Class	Subtle hints	*"But these girls aren't cheap labour – they're people"* *"But she was very pretty and looked as if she could take care of herself. I couldn't be sorry for her"*
24.	Gerald had an affair with a working-class girl that he picked up at the Palace Bar. He appears to be shocked and deeply saddened by her death	Act 2	Responsibility & Class	Character development Timing Subtle hints Cliff-hanger	*"…women of the town"* *"…. But you must understand that a lot of young men…"*
25.	Mrs Birling, as chair of the Brumley Women's Organisation, refuses to help the girl, saying that she should go to the father of her unborn child. She refuses to accept any blame at all.	Act 2	Responsibility, Class, Women	Character development Dramatic Irony Cliff-hanger	*"…a trifle impertinent."* *"…Unlike the other three, I did nothing I'm ashamed of…"* *"Girls of that class…"* *"you have no power to make me change my mind"* *"She hands him back the ring"*
26.	Eric is revealed as the father of a girl's child. Inspector reveals that he forced himself upon the girl. Eric reveals that he stole money from his father's firm. He is appalled with himself.	Act 3	Responsibility, Women	Character development Timing Dramatic Irony Cliff-hanger	*"I was in that state when a chap easily turns nasty."* *"you're not the kind of father a chap could go to when he's in trouble"* *"Then, you killed her."*

An Inspector Calls by J. B. Priestley (1945)

	Action	Act	Theme	Dramatic devices	Quotes
27.	The Inspector's final speech reveals that he has come to teach the family to take responsibility for all members of society.	Act 3	Responsibility, Women	Character development Timing Dramatic exit Climactic speech	*"One Eva Smith has gone – but there are millions and millions and millions of Eva Smiths and John Smiths still left with us…We don't live alone. We are members of one body. We are responsible for each other. And I tell you that the time will soon come when, if men will not learn that lesson, then they well be taught it in fire and bloody and anguish."*
28.	The family's dysfunction is revealed after the Inspector leaves. The opening of the play is just a façade	Act 3	Responsibility, Class	Character development Setting	*"You're the one I blame for this."* *"What does it matter now whether they give you a knighthood or not?"*
29.	Gerald returns to reveal that their visitor was not a policeman. Birling discovers that no woman has committed suicide. Birling, his wife and Gerald are relieved. Sheila and Eric understand that they have still behaved immorally	Act 3	Class, Society	Dramatic entrance Character development	*"That man wasn't a police officer."* *"I suppose we're all nice people now."* *"Now look at the pair of them – the famous younger generation who know it all. And they can't even take a joke"*
30.	The family receive a phone call indicating that an Inspector is on his way.	Act 3	Responsibility	Climactic moment Curtain falls	*"I suppose we're all nice people now"* *"That was the police. A girl has just died – on her way to the Infirmary."*

Key Ideas:

31. Three Unities (Aristotle)
32. 7 Deadly Sins
33. Play as a vehicle for Playwright's views
34. Morality Play

Key Words:

35. Responsibility
36. Microcosm
37. Irony
38. Symbolism
39. Omnipotence
40. Socialism
41. Capitalism

Love and Relationships Poetry

Poems about family relationships

	Poem	Key Message	Key Quotations	Link to another poem
1	Before You Were Mine	The speaker looks at a photo of her mother and enviously imagines her life before the speaker was born; there is a mother-daughter role-reversal.	1. "Marilyn" 2. "my loud possessive yell" 3. "sparkle, waltz, laugh"	*Follower: both speakers admire, yet feel disconnected from, their parent.*
2	Follower	The speaker admiringly looks back at how he used to respect his father, but also how he made him feel inadequate; there is a father-son role-reversal.	1. "shoulders globed like a full sail" 2. "tripping, falling, yapping" 3. "he will not go away"	*Before You Were Mine: both speakers admire, yet feel disconnected from, their parent.*
3	Mother, any distance	The speaker's mother helps him as he moves out of home; he feels supported, excited yet anxious.	1. "acres of the walls/the prairies of the floors" 2. "Anchor. Kite." 3. "endless sky to fall or fly"	*Walking Away: both speakers reflect on the inevitable separation of parent and child as they grow older.*
4	Walking Away	The speaker learns a painful lesson that he must let his son go, in order for him to grow up.	1. "like a satellite wrenched from its orbit" 2. "set free into a wilderness" 3. "love is proved in the letting go"	*Mother, any distance: both speakers reflect on the inevitable separation of parent and child as they grow older.*
5	Climbing My Grandfather	The speaker wants to discover his grandfather and the process is challenging yet satisfying.	1. "Climbing has its dangers" 2. "warm ice" 3. "the slow pulse of his good heart"	*Eden Rock: both speakers have powerful yet painful memories of loved ones.*
6	Eden Rock	The speaker has a strong, precious yet painful memory of his parents.	1. "They are waiting for me" 2. "The same three plates" 3. "they beckon to me from the other bank"	*Climbing My Grandfather: both speakers have powerful yet painful memories of loved ones.*

Love and Relationships Poetry

Poems about loss, loneliness and suffering through relationships

	Poem	Key Message	Key Quotations	Link to another poem
7	When We Two Parted	The speaker has had an affair with someone that has ended painfully, leaving him feeling bitter, ashamed and completely isolated in his grief.	1. "silence and tears" 2. "Pale grew thy cheek and colder thy kiss" 3. "long, long shall I rue thee"	*Neutral Tones: both speakers have experienced a painful disconnection from their partner, that will haunt them for the rest of their lives.*
8	Porphyria's Lover	The speaker is a disturbed and lonely man, who realises that his lover will eventually leave him because she is of a higher status and so he decides to kill her to keep them together forever.	1. "the sullen wind […] did its worst to vex the lake" 2. "she was mine, mine fair" 3. "God has not said a word!"	*The Farmer's Bride: both speakers are frustrated by the fact that they cannot be with their lovers.*
9	The Farmer's Bride	The speaker and his wife are trapped in a loveless, imbalanced and isolating marriage, in a community where his wife is treated as less-than-human.	1. "chased her and turned the key upon her" 2. "Happy enough to chat and play with birds and rabbits" 3. "her eyes, her hair, her hair!"	*Porphyria's Lover: both speakers are frustrated by the fact that they cannot be with their lovers*
10	Neutral Tones	The speaker is haunted by the memory of the hopeless, painful winter's day that his relationship ended.	1. "a few leaves lay on the starving sod" 2. "grin of bitterness swept thereby" 3. "a pond edged with greyish leaves"	*When We Two Parted: both speakers have experienced a painful disconnection from their partner, that will haunt them for the rest of their lives.*

Love and Relationships Poetry

Poems about strong, deep connections between people

	Poem	Key Message	Key Quotations	Link to another poem
11	Letters From Yorkshire	Even though there is a distance between the speaker and her partner who live very different lives, they still maintain a strong bond.	1. "feeding words onto a blank screen" 2. "pouring air and light into an envelope" 3. "our souls tap out messages across the icy miles"	*Winter Swans: both speakers overcome distance between them and their loved one, by finding comfort in nature.*
12	I Think of Thee!	The speaker has such strong feelings for her husband that they overwhelm her completely; he is always on her mind.	1. "my thoughts are wild vines" 2. "Burst, shattered" 3. "Breathe a new air"	*Singh Song!: both speakers have all-consuming feelings of love for their partners.*
13	Winter Swans	The speaker feels disconnected from their partner at first, but they manage to find love again.	1. "the clouds had given their all" 2. "The swans tipping in unison" 3. "our hands had swum the distance between us"	*Letters From Yorkshire: both speakers overcome distance between them and their loved one, by finding comfort in nature.*
14	Singh Song!	The speaker and his wife have a rebellious, deeply personal and very strong love for each other, that goes against all the traditions of their culture.	1. "effing at my mum" 2. "di worst Indian shop" 3. "is priceless baby"	*I Think of Thee!: both speakers have all-consuming feelings of love for their partners.*
15	Love's Philosophy	The speaker tries to win a lover by convincing her that everything in the world naturally comes in a pair, so they should become a couple as well.	1. "nothing in the world is single" 2. "the mountains kiss high heaven" 3. "what are all these kissings worth, if thou kiss not me?"	*Singh Song!: both speakers are confident and joyful when discussing the love they have for their partner.*

Rearranging Formulae

Make x the subject	Get x on its own
2 lines annoy me	Get it onto 1 line
Successful elimination	With an inverse operation
If you do it to one side	Do it to the other to keep the balance

Make f the subject of the formula

$$\frac{2(f+g)}{h} = 3 - g$$

$\times h \qquad \times h$

$$2(f+g) = h(3-g)$$

$$2f + 2g = 3h - gh$$

$-2g \qquad -2g$

$$\frac{2f}{2} = \frac{3h - gh - 2g}{2}$$

$$f = \frac{3h - gh - 2g}{2}$$

Solving Quadratics

Quadratic Equations	Always make them equal to zero
And then?	It's always wise to factorise!
Successful elimination	With an inverse operation

$+12 \qquad +12$

$$x^2 - 7x + 12 = 0$$

2 numbers with a:
→ product = 12
→ sum = -7

$$(x-4)(x-3) = 0$$

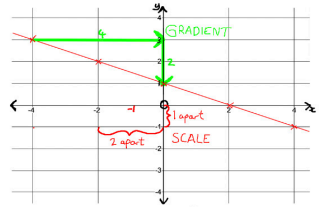
$x - 4 = 0 \qquad x - 3 = 0$

$+4 \quad +4 \qquad +3 \quad +3$

$x = 4 \qquad x = 3$

Linear Graphs (straight lines)

All graphs	Check the scale
Drawing graphs	Draw a table and plot the points
Straight line graphs	Y = mx + c
Gradient is	For 1 along, how much up or down
How do you find it?	Box method
Y-intercept	When x = 0
X-intercepts or roots	When y = 0
Equation of a line?	Gradient and point
Parallel lines	Have an equal gradient
Perpendicular lines	Negative reciprocal gradients



Draw the line $y = -\frac{1}{2}x + 1$

x	-4	-2	0	2	4
y	3	2	1	0	-1

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

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

$y = -\frac{1}{2}(0) + 1$

$y = 1$

So $C = 1$

Point D (12, -5) is on the line y_1

$(-5) = -\frac{1}{2}(12) + C$

$-5 = -6 + C$

$1 = C$

$(0) = -\frac{1}{2}(x) + 1$

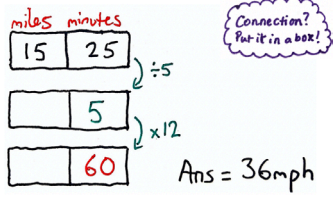
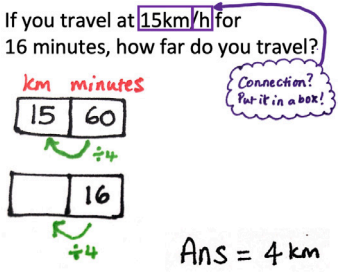
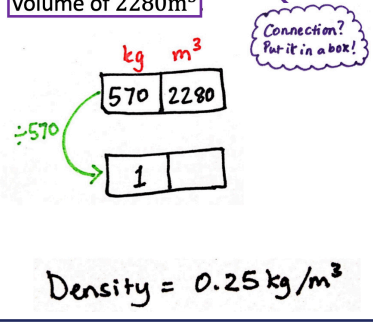
$-1 = -\frac{1}{2}x$

$2 = x$

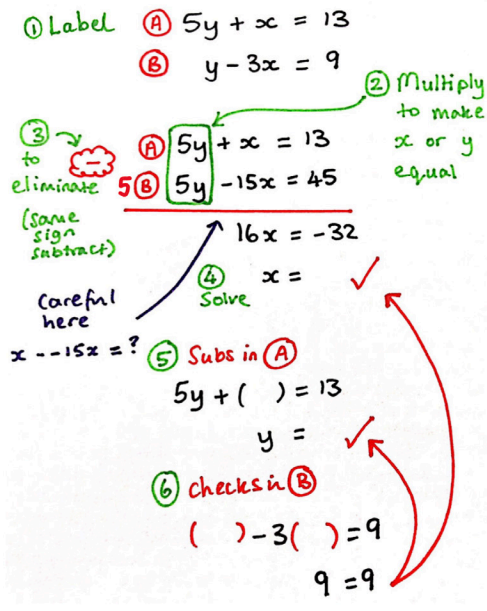
$m_y = -\frac{1}{2} \qquad m_{//} = -\frac{1}{2}$

$m_y = -\frac{1}{2} \qquad m_{\perp} = 2$

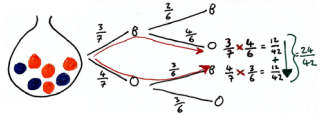
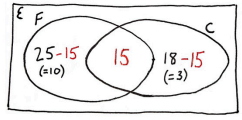
Compound Measures

Connection between 2 things	Box Method	Calculate average speed if you travel 15 miles in 25 minutes. 
Speed distance time	Box method miles minutes	If you travel at 15km/h for 16 minutes, how far do you travel? 
Density	Mass per 1 unit of volume	Calculate the density of an object that has a mass of 570kg and a volume of 2280m³ 

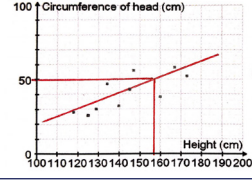
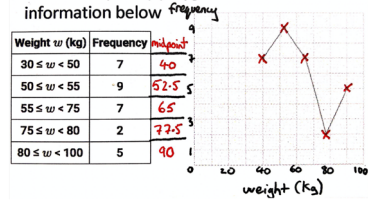
Simultaneous Equations

2 equations 2 unknowns	Simultaneous equations Same sign subtract	Solve $5y + x = 13$ $y - 3x = 9$ 
If you subs in A	Checks in B	
If you subs in B	Checks in A	

Probability

Probability	**Always adds up to 1**	Find x. Number rolled: 1 | 2 | 3 | 4 | 5 | 6 probability: 0.1 | 0.15 | 0.2 | 0.1 | x | 0.3 $0.1 + 0.15 + 0.2 + 0.1 + x + 0.3 = 1$
If two events have an equal chance	**Sample space to show the outcomes**	You toss two fair coins. What is the probability of both showing tails? H T H HH HT T TH TT $p(TT) = \frac{1}{4}$
Probability tree diagrams	**Across times, down add**	Calculate the probability of getting one of each colour. 
If you see 'and'?	**Times**	Evaluate the probability of rolling a 5 on a fair six-sided dice and getting heads from a fair coin toss. $p(5) = \frac{1}{6}$ $p(H) = \frac{1}{2}$ → $p(5 \text{ AND } H) = \frac{1}{6} \times \frac{1}{2}$
If you see 'or'?	**Add**	Evaluate the probability of getting an even number or a 3 on a fair six-sided dice. $p(\text{even}) = \frac{1}{2}$ $p(3) = \frac{1}{6}$ → $p(\text{even OR } 3) = \frac{1}{2} + \frac{1}{6}$
Venn Diagrams	**Start in the middle and work your way out**	25 people like football, 18 like cricket. a) How many in total if 15 like both?  Total = 10 + 15 + 3 =
And if we can't	**Call it x**	b) How many like both if 37 like either? Total = 25 − x + x + 18 − x 37 = 43 − x x =

Statistics

Mode	**Most**	Find the mode, median, mean and range of the following numbers: 8, 12, 4, -3, 1, 6, 1, 3 -3 1 1 3 4 6 8 12 mode = 1 median = $\frac{3+4}{2}$ =
Median	**Middle value (put them in order)**	
Mean	**Fair average**	mean = $\frac{-3+1+1+3+4+6+8+12}{8}$ =
Range	**Spread (biggest – smallest)**	range = 12 − (−3) =
Estimate the mean	**Midpoints**	The table shows road accidents reported in December. Estimate the mean number of accidents reported Accidents reported | Frequency (f) | midpoint (x) | fx 0 - 4 | 15 5 - 9 | 10 10 - 14 | 1 15 - 19 | 5 Ans = $\frac{\Sigma fx}{\Sigma f}$ Σf Σfx
And then?	$\frac{\Sigma fx}{\Sigma f}$	
Scatter graphs	**Line of best fit**	Estimate the height of someone with a head circumference of 50cm  Ans = 157cm
Frequency polygon **(frequency diagram)**	**Plot the midpoints & join them up**	Draw a frequency polygon to show the information below Weight w (kg) | Frequency | midpoint $30 \le w < 50$ | 7 | 40 $50 \le w < 55$ | 9 | 52.5 $55 \le w < 75$ | 7 | 65 $75 \le w < 80$ | 2 | 77.5 $80 \le w < 100$ | 5 | 90 

Algebraic Proportionality

Algebraic proportionality	General formula first
y is proportional to x	$y = kx$
y is inversely proportional to x	$y = k/x$
To find the k	Substitute the values

y = 32 when x = 4. Find y when x = 5, if...

a) y is proportional to x^2

$y \propto x^2$
$y = kx^2$
$(32) = k(4)^2$
$2 = k$
$y = 2x^2$
$y = 2(5)^2$
$=$

b) y is inversely proportional to x^2

$y \propto \frac{1}{x^2}$
$y = \frac{k}{x^2}$
$(32) = \frac{k}{(4)^2}$
$512 = k$
$y = \frac{512}{x^2}$
$y = \frac{512}{(5)^2}$
$=$

Recurring Decimals

Recurring decimals to fractions	Make the recurring parts match

Express $0.9\dot{2}\dot{6}$ as a fraction.

$x = 0.9262626...$
$1000x = 926.262626...$
$-\ 10x = 9.262626...$
$990x = 917$
$x =$

Compound Interest

Compound interest	$O \times M^T = F$
T stands for	Time

A bank pays 3% interest. How much will a deposit of £1500 be worth after 4 years?

$O \times M^T = F$

$O = 1500 \quad M = 1.03 \quad T = 4$

$1500 \times 1.03^4 =$

Right-angled Trigonometry

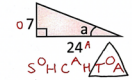
Right-angled triangle	Pythagoras or Trig
Side side side	Pythag, pythag, label the longest side
Side angle side	SOH CAH TOA Label the 2 sides Cover up the one you want And use the formula

Find the unknown values a and c

SSS

$SS^2 + SS^2 = LS^2$
$(c)^2 + (12)^2 = (13)^2$
$=$

SAS



SOH CAH TOA
$T = \frac{O}{A}$
$\tan(a) = \frac{(7)}{(24)}$
$a =$

Standard Form

Adding and subtracting (in standard form)	Make them ordinary numbers
Multiplying and dividing (in standard form)	Use index laws

Calculate $(7.5 \times 10^3) + (2.5 \times 10^4)$

$7.5 \times 10^3 \rightarrow 7500.$
$2.5 \times 10^4 \rightarrow 25000.$
$7500 + 25000 = 32500 = 3.25 \times 10^{\square}$

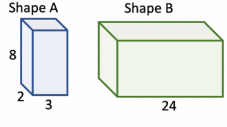
Calculate $(1 \times 10^3) \div (5 \times 10^5)$

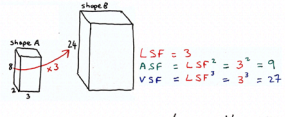
$\frac{1 \times 10^3}{5 \times 10^5} = \frac{1}{5} \times \frac{10^3}{10^5} = 0.2 \times 10^{-2}$
$= 2 \times 10^{-1} \times 10^{-2}$
$= 2 \times 10^{\square}$

Similar Shapes

2 shapes	Side by side
First find the	Length scale factor
Area scale factor	Length scale factor squared
Volume scale factor	Length scale factor cubed

Find the surface area and volume of shape B (all lengths in cm).





$\text{Surface area}_B = SA_A \times ASF$
$= SA_A \times 9$
$=$

$\text{volume}_B = V_A \times VSF$
$= V_A \times 27$
$=$

Rearranging Formulae

Make x the subject	Get x on its own
2 lines annoy me	Get it onto 1 line
Successful elimination	With an inverse operation
If you do it to 1 side	Do it to the other to keep the balance
x on both sides with brackets	Expand the brackets first
x on both sides	Get rid of the smallest x
Collect what we want on one side	Put the rest on the other
It's always wise	To factorise

Make f the subject of the formula in the formula below

$$\frac{2(f+g)}{h} = 3 - fg$$

$\times h \quad \times h$

$$2(f+g) = h(3-fg)$$

$$2f + 2g = 3h - fgh$$

$+fgh \quad +fgh$

$$2f + 2g + fgh = 3h$$

$-2g \quad -2g$

$$2f + fgh = 3h - 2g$$

$$\frac{f(2+gh)}{2+gh} = \frac{3h-2g}{2+gh}$$

$$f = \frac{3h-2g}{2+gh}$$

Compound Measures

Connection between 2 things	Box Method
Speed distance time	Box method miles minutes
Density	Mass per 1 unit of volume

Calculate average speed if you travel 15 miles in 25 minutes.

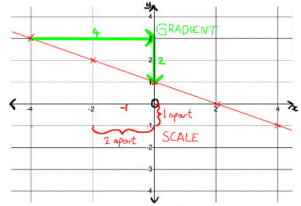
miles	minutes
15	25
	5
	60

$\div 5$, $\times 12$

Ans = 36mph

Linear Graphs (straight lines)

All graphs	Check the scale
Drawing graphs	Draw a table and plot the points
Straight line graphs	Y = mx + c
Gradient is	For 1 along, how much up or down
How do you find it?	Box Method
Y-intercept	When x = 0
X-intercepts or roots	When y = 0
Equation of a line?	Gradient and point
Parallel lines	Have an equal gradient
Perpendicular lines	Negative reciprocal gradients



Draw the line $y = -\frac{1}{2}x + 1$

x	-4	-2	0	2	4
y	3	2	1	0	-1

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

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

4 2 / 1 $\frac{1}{2}$ — 1 along, down $\frac{1}{2}$ $\therefore m = -\frac{1}{2}$

$y = -\frac{1}{2}(0) + 1$

$y = 1$

So $c = 1$

Point D (12, -5) is on the line y_1

$(-5) = -\frac{1}{2}(12) + c$

$-5 = -6 + c$

$1 = c$

$(0) = -\frac{1}{2}(x) + 1$

$-1 = -\frac{1}{2}x$

$2 = x$

$m_y = -\frac{1}{2} \quad m_{//} = -\frac{1}{2}$

$m_y = -\frac{1}{2} \quad m_{\perp} = 2$

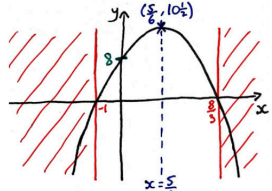
Simplifying Algebraic Fractions

It's always wise	To factorise	Simplify $\frac{4}{x^2-1} - \frac{2}{x^2+x}$
Adding/ subtracting fractions	Find the LCM	$= \frac{4}{(x+1)(x-1)} - \frac{2}{x(x+1)}$ $\times x \quad \times (x-1)$ $= \frac{4x}{x(x+1)(x-1)} - \frac{2(x-1)}{x(x+1)(x-1)}$ $= \frac{4x-2(x-1)}{x(x+1)(x-1)}$ $= \frac{4x-2x+2}{x(x+1)(x-1)}$ $= \frac{2x+2}{x(x+1)(x-1)}$
It's always wise	To factorise	$= \frac{2(x+1)}{x(x+1)(x-1)}$ $= \frac{2}{x(x-1)}$

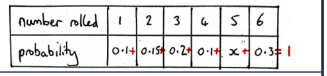
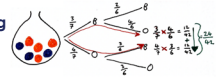
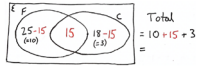
Simultaneous Equations

2 Equations 2 unknowns	Simultaneous equations	Solve A $6y+7x=47$, B $9y-8x=-22$ ① Label ② Multiply to make x or y equal ③ − to eliminate 3A $18y+21x=141$ 2B $18y-16x=-44$ $37x=185$ ④ Solve $x=$ ✓ ⑤ Subs in A $6y+7(\ )=47$ $y=$ ✓ ⑥ checks in B $9(\ )-8(\ )=-22$ $-22=-22$
If you subs in A	Checks in B	
If you subs in B	Checks in A	

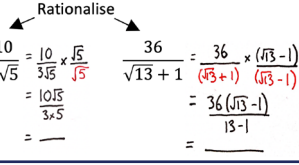
Solving Quadratics

Quadratic equations	Always make them equal to zero	Solve $3x^2+12x=6$ $-6 \quad -6$ $3x^2+12x-6=0$ $3(x^2+4x-2)=0$ $\div 3 \quad \div 3$ $x^2+4x-2=0$ ← Can't factorise $x^2+4x-2=0$ $(x+2)^2-4-2=0$ $(x+2)^2-6=0$ $+6 \quad +6$ $(x+2)^2=6$ $x+2=\pm\sqrt{6}$ $x=-2\pm\sqrt{6}$
What do we look for?	Common Factors	
And then?	It's always wise to factorise	
And if that fails?	Complete the square	
Quadratic inequalities	Draw the graph	Solve $-3x^2+5x+8\leq 0$ $-3 \rightarrow$ sad $-3x^2+5x+8=0$ $+3x^2 \quad -5x-8 \quad +3x^2-5x-8$ $0=3x^2-5x-8$ $0=(x+1)(3x-8)$ $x+1=0 \quad 3x-8=0$ $x=-1 \quad 3x=8$ $x=\frac{8}{3}$  $x\leq -1 \quad x\geq \frac{8}{3}$ when $x=0$ $y=-3(0)+5(0)+8$ $y=8$ Line of symmetry is midway between -1 and $\frac{8}{3}$ where $x=\frac{5}{6}$ when $x=\frac{5}{6}$ $y=-3(\frac{5}{6})+5(\frac{5}{6})+8$ $y=10\frac{1}{12}$ Turning point $=(\frac{5}{6}, 10\frac{1}{12})$
Is it happy or sad?	+x² happy -x² sad	
First step	Find the roots	
Second step	Draw the curve	
Third step	Find the y-intercept	
And if you need the turning point	Use symmetry and substitute	

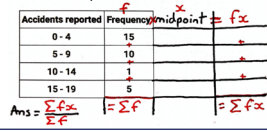
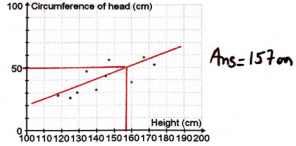
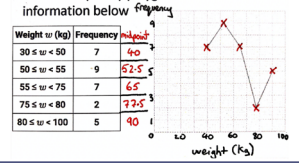
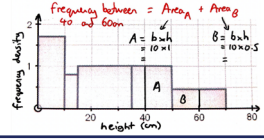
Probability

Probability	**Always adds up to 1**	Find x. 
If two events have an equal chance	**Sample space to show the outcomes**	You toss two fair coins. What is the probability of both showing tails? 
Probability tree diagrams	**Across times, down add**	Calculate the probability of getting one of each colour. 
If you see 'and'?	**Times**	Evaluate the probability of rolling a 5 on a fair six-sided dice and getting heads from a fair coin toss. $P(5)=\frac{1}{6}$ $P(H)=\frac{1}{2}$ $\longrightarrow P(5 \text{ AND } H)=\frac{1}{6}\times\frac{1}{2}$ =
If you see 'or'?	**Add**	Evaluate the probability of getting an even number or a 3 on a fair six-sided dice. $P(\text{even})=\frac{1}{2}$ $P(3)=\frac{1}{6}$ $\longrightarrow P(\text{even OR } 3)=\frac{1}{2}+\frac{1}{6}$ =
Venn Diagrams	**Start in the middle and work your way out.**	25 people like football, 18 like cricket. a) How many in total if 15 like both?  b) How many like both if 37 like either? 
And if we can't	**Call it x**	

Surds

Always make your life simple	**Simplify first up to 1**	Simplify $\sqrt{72}+\sqrt{98}$ = $\sqrt{36}\sqrt{2}+\sqrt{49}\sqrt{2}$ = $6\sqrt{2}+7\sqrt{2}$ =
Simplifying surds	**Highest square factor**	
Rationalise the denominator	**Irrational and rational?**	Rationalise 
Irrational only	**Times by a surd**	
Irrational and rational	**Difference of two squares**	

Statistics

Mode	**Most**	Find the mode, median, mean and range of the following numbers: 8, 12, 4, -3, 1, 6, 1, 3 -3 1 1 3 4 6 8 12 mode = 1 median = $\frac{3+4}{2}$ = mean = $\frac{-3+1+1+3+4+6+8+12}{8}$ = range = 12 − (−3) =
Median	**Middle value (put them in order)**	
Mean	**Fair average**	
Range	**Spread (biggest – smallest)**	
Estimate the mean	**Midpoints**	The table shows road accidents reported in December. Estimate the mean number of accidents reported 
And then?	$\frac{\Sigma fx}{\Sigma f}$	
Scatter graphs	**Line of best fit**	Estimate the height of someone with a head circumference of 50cm 
Frequency polygon **(frequency diagram)**	**Plot the midpoints & join them up**	Draw a frequency polygon to show the information below 
Histograms	**Frequency is area**	The histogram shows the heights of 65 animals. Estimate how many are between 40 and 60cm. 

Algebraic Proportionality

Algebraic proportionality	General formula first
y is proportional to x	$y = kx$
y is inversely proportional to x	$y = k/x$
To find the k	Substitute the values

y = 32 when x = 4. Find y when x = 5, if...

a) y is proportional to x^2

$y \propto x^2$

$y = kx^2$

$(32) = k(4)^2$

$2 = K$

$y = 2x^2$

$y = 2(5)^2$

$=$

b) y is inversely proportional to x^2

$y \propto \frac{1}{x^2}$

$y = \frac{K}{x^2}$

$(32) = \frac{K}{(4)^2}$

$512 = K$

$y = \frac{512}{x^2}$

$y = \frac{512}{(5)^2}$

$=$

Recurring Decimals

Recurring decimals to fractions	Make the recurring parts match

Express $0.926\dot{}$ as a fraction.

$x = 0.9262626\ldots$

$1000x = 926.262626\ldots$

$-\ 10x = 9.262626\ldots$

$990x = 915$

$x =$

Bounds

Max of A times B	Upper bound A times Upper bound B
Max of A plus B	Upper bound A plus Upper bound B
Max of A divided by B	Upper bound A divided by Lower bound B
Max of A minus B	Upper bound A minus Lower bound B

A = 4.6 (2sf) and B = 0.07 (1sf)

A: 4.5, 4.6, 4.7 — LB_A = 4.55, UB_A = 4.65

B: 0.06, 0.07, 0.08 — LB_B = 0.065, UB_B = 0.075

$(AB)_{max} = UB_A \times UB_B = 4.65 \times 0.075 =$

$(A+B)_{max} = UB_A + UB_B = 4.65 + 0.075 =$

$\left(\frac{A}{B}\right)_{max} = \frac{UB_A}{LB_B} = \frac{4.65}{0.065} =$

$(A-B)_{max} = UB_A - LB_B = 4.65 - 0.065 =$

Compound Interest

Compound interest	$O \times M^T = F$
T stands for	Time

A bank pays 3% interest. How much will a deposit of £1500 be worth after 4 years?

$O \times M^T = F$

$O = 1500 \quad M = 1.03 \quad T = 4$

$1500 \times 1.03^4 =$

Right-angled Trigonometry

Right-angled triangle	Pythagoras or Trig
Side side side	Pythag, pythag, label the longest side
Side angle side	SOH CAH TOA Label the 2 sides Cover up the one you want And use the formula

Find the unknown values a and c

SSS — longest side

13, c, 12

$SS^2 + SS^2 = LS^2$

$(c)^2 + (12)^2 = (13)^2$

$=$

SAS

7, a, 24°

SOH CAH TOA

$T = \frac{O}{A}$

$\tan(a) = \frac{(7)}{(24)}$

$a =$

Standard Form

Adding and subtracting (in standard form)	Make them ordinary numbers
Multiplying and dividing (in standard form)	Use index laws

Calculate $(7.5\times10^3) + (2.5\times10^4)$

7.5×10^3 → 7500.

2.5×10^4 → 25000.

7500 + 25000 = 32500 $= 3.25 \times 10^{\square}$

Calculate $(1\times10^3) \div (5\times10^5)$

$\frac{1\times10^3}{5\times10^5} = \frac{1}{5} \times \frac{10^3}{10^5} = 0.2 \times 10^{-2}$

$= 2\times10^{-1}\times10^{-2}$

$= 2\times10^{\square}$

Similar Shapes

2 shapes	Side by side
First find the	Length scale factor
Area scale factor	Length scale factor squared
Volume scale factor	Length scale factor cubed

Find the surface area and volume of shape B (all lengths in cm).

Shape A: 2, 3, 8

Shape B: 24

Shape A, Shape B, ×3, 24

LSF = 3

ASF = $LSF^2 = 3^2 = 9$

VSF = $LSF^3 = 3^3 = 27$

Surface area$_B$ = $SA_A \times ASF$ = $SA_A \times 9$ =

Volume$_B$ = $V_A \times VSF$ = $V_A \times 27$ =

Biology Unit 1: Organisation

1	**What is digestion of food and why is it important?**	Digestion breaks down large, complex food molecules into smaller ones that can be absorbed directly into the blood
2	**How do our teeth help us digest food?**	They break the food into smaller pieces, to increase the total surface area
3	**What are the functions of saliva in digestion?**	1. To moisten food to allow easier swallowing 2. To start chemical digestion of carbohydrates by enzymes
4	**What are the 7 main food groups?**	In any order: fats, proteins, carbohydrates, fibre, minerals, vitamins and water
5	**Which of the 7 main food groups are large polymer molecules?**	Fats, carbohydrates and proteins
6	**What is a polymer?**	A large molecule made up of repeating units of similar or identical small molecules
7	**How does stomach acid help digestion?**	1. It helps enzymes digest proteins 2. It provides an optimum pH for protease enzymes
8	**What is an enzyme?**	A biological catalyst - a protein that speeds up a reaction without being used up
9	**What is the order in which food passes through the digestive system?**	Mouth -> oesophagus -> stomach -> small intestine -> large intestine -> rectum -> anus
10	**What is the function of the small intestine?**	To absorb sugars, lipids, amino acids, vitamins and minerals from digested food
11	**How is the small intestine adapted to improve absorption of digested molecules**	Structures called villi increase the surface area for increased diffusion into the blood
12	**What is the function of the large intestine?**	To absorb water from the remains of food leaving waste behind
13	**What is bile and where is it made?**	A substance made in the liver that emulsifies fat and neutralises stomach acid
14	**Name where carbohydrase is made in the body**	Salivary glands, pancreas and small intestine
15	**What do carbohydrases break down and what is produced?**	Carbohydrates to simple sugars (e.g. amylase breaks down starch to glucose)
16	**Name where protease is made in the body**	Stomach, pancreas and small intestine
17	**What do proteases break down and what is produced?**	Proteins to amino acids
18	**Where is lipase made in the body?**	Pancreas and small intestine
19	**What do lipases break down and what is produced?**	Lipids (fats) to fatty acids and glycerol
20	**What are the products of digestion used for?**	To build new carbohydrates, lipids and proteins in cells, and for energy
21	**What is the test for protein in food?**	Add Biuret reagent to Sample of food. Reagent turns from blue to purple or violet
22	**What is the test for glucose (sugar) in food?**	Add Benedict's reagent to a sample of food and heat. Reagent turns from blue to orange/red
23	**What is the test for starch in food?**	Add iodine solution to a sample of food. Reagent turns from orange to blue/black
24	**What is the test for fats/lipids in food?**	Add ethanol or Sudan III to food and shake. Upper layer turns cloudy white (red if using Sudan III)
25	**What is the active site of an enzyme?**	Part of the surface which joins to a substrate and where the reaction happens
26	**What is a substrate?**	The molecule that is acted on by an enzyme (for example, being broken down)
27	**Why is the active site of an enzyme called 'complementary'?**	It fits the shape of the substrate perfectly (like a glove fits a hand-ish)
28	**Name two factors that can affect the shape of an enzyme's active site**	pH and (high) temperature
29	**What happens when an enzyme is denatured?**	Its active site changes shape permanently so the substrate can no longer fit

Biology Unit 1: Organisation

30	**In Biology, what do we mean by 'tissue'?**	A group of identical (or very similar) cells working together to do a particular job
31	**In Biology, what do we mean by 'organ'?**	A collection of different types of tissue that all work together to perform a specific function e.g. heart, lungs
32	**In Biology, what is an organ system?**	A group of organs that work together to perform a particular function
33	**Name the human organ systems**	Digestive system, nervous system, circulatory system, skeletal system, reproductive system, endocrine system
34	**Which system transports substances around the body?**	The circulatory system
35	**Name the two types of chambers in the heart and state their relative positions**	Upper chambers - Atria (singular: atrium) Lower chambers - Ventricles
36	**When the muscles in the atria contract, where does the blood go to?**	To the ventricles
37	**When the muscles in the ventricles contract, where does the blood go to?**	Out of the heart, either into the pulmonary artery or into the aorta
38	**What is the job of the heart valves?**	To prevent backflow of blood in the heart
39	**To where does blood flow after leaving the right hand side of the heart?**	The lungs
40	**To where does blood flow after leaving the left hand side of the heart?**	The rest of the body, except the lungs
41	**Which vessels carry blood away from and to the heart?**	Arteries away from and veins to the heart
42	**Which blood vessel takes blood back to the heart from the rest of the body?**	Vena cava
43	**Name the blood vessel by which blood leaves the heart to the lungs**	Pulmonary artery
44	**Name the blood vessel by which blood leaves the lungs to go back to the heart**	Pulmonary vein
45	**Which blood vessels have thick walls containing muscle tissue and elastic fibres?**	Arteries
46	**Which blood vessels have thinner walls and contain valves?**	Veins
47	**Name two key adaptations of capillaries**	Very thin wall (only one cell thick) to reduce distance diffusion must occur across, and very narrow also to reduce this distance
48	**Where is the "natural" pacemaker of the heart located?**	The right atrium
49	**What protects the lungs?**	The rib cage
50	**Which gases diffuse between the bloodstream and the lungs?**	Oxygen from the lungs to the blood, carbon dioxide from the blood to the lungs
51	**Name the structure which carries air from the nose and mouth to the lungs**	Trachea
52	**Name the two structures which branch off from the trachea**	Bronchi (singular: bronchus)
53	**Name the structure which branch off from the bronchi**	Bronchiole(s)
54	**What are the small gas exchange structures in the lungs called?**	Alveoli (singular: alveolus)
55	**Describe adaptations of alveoli to make them an efficient gas exchange surface**	Thin walls (one cell thick); Rich capillary network; Efficient movement of blood through capillaries; Folded inner surface; Alveoli contain mucus
56	**How does having thin walls improve diffusion in the alveoli?**	It decreases the distance that gases have to travel
57	**How does a rich capillary network around the alveoli improve diffusion of gases?**	It increases the size of the gas exchange surface
58	**How does the movement of blood in the capillaries surrounding the alveoli improve diffusion of gases?**	It maintains the concentration gradient between the alveoli and the blood
59	**How does the folded inner surface of the alveoli increase the diffusion of gases?**	It increases the surface area

Biology Unit 1: Organisation

60	**How does the mucus in the alveoli improve diffusion?**	It dissolves gases from the air for more efficient gas exchange
61	**What is the component of blood called that carries all of the blood cells in it?**	Plasma
62	**Which gas dissolves in blood plasma for transport from the organs to the lungs?**	Carbon dioxide
63	**What does blood transport from the small intestine to other organs?**	Soluble products of digestion
64	**What key gas do red blood cells transport?**	Oxygen
65	**What major organelle do red blood cells lack?**	A nucleus
66	**What do red blood cells contain that allows them to carry oxygen?**	Haemoglobin
67	**What do white blood cells do?**	Defend the body against microorganisms
68	**What do platelets do?**	Help clot the blood at wound sites
69	**What are the coronary arteries?**	Supply the heart muscle tissue with blood
70	**What occurs in coronary heart disease (CHD)?**	The coronary arteries become blocked with fatty deposits, narrowing them
71	**How can coronary heart disease cause heart attacks?**	Lack of blood to heart muscle cells means they can't release energy and contract
72	**How do stents treat coronary heart disease?**	Re-opens the blocked coronary artery, restoring blood flow
73	**How do statins treat coronary heart disease?**	Decreases blood concentration of cholesterol, reducing build-up of fatty deposits in the coronary arteries
74	**Why are faulty heart valves life-threatening?**	They allow back-flow of blood in the heart
75	**Name two types of replacement heart valves**	1. Mechanical 2. Biological (e.g. pigs or sheep)
76	**Describe a treatment used in the case of total heart failure**	Heart transplant

77	**Name a risk of surgical intervention in heart disease**	Infection
78	**When would an artificial heart be used?**	1. To allow the heart to rest and recover 2. To keep the patient alive ahead of a transplant
79	**Give examples of plant tissues**	Epidermal, palisade mesophyll, spongy mesophyll, xylem, phloem, meristem
80	**Name three plant organs**	Leaves, stems and roots
81	**What is the role of plant epidermal tissue?**	To cover and protect
82	**What is the role of the palisade mesophyll tissue in plants?**	This is where photosynthesis happens
83	**What is the role of the spongy mesophyll tissue in plants?**	This is where gas exchange occurs
84	**What is the role of xylem tissue in plants?**	Transport of water (and ions) from the roots
85	**What is the role of phloem tissue in plants?**	Transport of dissolved sugars (from the leaves)
86	**What is the role of meristem plant tissue?**	To divide into cells at the growing tips of shoots and roots
87	**What is transpiration?**	Movement of water from roots to leaves, then leaving the leaves via evaporation
88	**Name some factors which affect the rate of transpiration in plants.**	1. Temperature 2. Humidity 3. Air movement 4. Light intensity
89	**What is translocation?**	Movement of sugars from the leaves to the rest of the plant through phloem vessels
90	**Describe the adaptations of xylem tissue**	Hollow tubes strengthened by lignin
91	**Describe the adaptations of phloem tissue**	Elongated cells with pores in the end cell walls to aid movement of dissolved sugars
92	**What is the role of stomata?**	Openings through which water, oxygen and carbon dioxide move in and out of the leaf
93	**What do guard cells do?**	Control the opening and closing of stomata to control water loss and gas exchange in plants

Biology Unit 2: Infection and Response

1	**What is a communicable disease?**	A disease which can be passed on to others
2	**What are the four types of microorganisms that can cause disease?**	Bacteria, viruses, fungi, protists
3	**What are pathogens?**	Microorganisms that cause infectious disease
4	**Name four ways in which diseases caused by pathogens can be spread**	Through air, through water, direct contact (e.g. STDs), vectors
5	**Name four ways in which the spread of diseases can be reduced or prevented**	Hand-washing, safer sex practices, vaccination, eradication of vectors
6	**How do bacteria damage body cells?**	They release harmful molecules called toxins
7	**State the symptoms of the measles virus?**	Fever and a red skin rash
8	**How is the measles virus spread?**	Inhalation of droplets from sneezes and coughs
9	**What are symptoms of Salmonella infection?**	Fever, abdominal cramps, vomiting and diarrhoea
10	**How are Salmonella bacteria spread?**	Under-cooked/unhygienic food preparation
11	**How is the spread of Salmonella controlled in the UK?**	In the UK, chickens are vaccinated against Salmonella to control the spread
12	**What are the symptoms of a Gonorrhoea infection?**	Thick yellow or green discharge from the vagina or penis and pain on urination
13	**How are Gonorrhoea bacteria spread?**	Gonorrhoea is spread by sexual contact
14	**How can the spread of Gonorrhoea be reduced?**	Treatment with antibiotics or use of a barrier method of contraception e.g. condoms
15	**What are the symptoms of athlete's foot?**	Damaged skin and toe nails
16	**What microbe causes athlete's foot?**	A microscopic fungus
17	**How can the spread of athlete's foot be prevented?**	By treating the skin with anti-fungal chemicals and washing clothes regularly.
18	**What are the symptoms of malaria?**	Fever, shaking and liver damage
19	**Which kind of microbe causes malaria?**	A protist
20	**How is malaria spread?**	By mosquitoes
21	**How is the spread of malaria controlled?**	Eradication of vectors (e.g. mosquitoes); use of mosquito nets to avoid being bitten
22	**What are the early symptoms of HIV infection?**	HIV initially causes a flu-like illness
23	**How does HIV lead to AIDS?**	Disables the immune system so it can no longer deal with other infections or cancers
24	**How is HIV spread?**	Sexual contact or exchange of body fluids (e.g. blood) when drug users share needles
25	**Why is there a short delay between infection by a pathogen and feeling ill from the infection?**	Bacteria and viruses reproduce rapidly inside the body but not instantly
26	**Why might viruses cause more damage than bacteria?**	Viruses live and reproduce inside cells, causing cell damage
27	**In what way might bacteria cause damage to cells and tissues?**	Bacteria may produce poisons (toxins) that damage tissues and make us feel ill

Biology Unit 2: Infection and Response

28	**What is Tobacco Mosaic Virus and what type of organism does it affect?**	A widespread plant pathogen affecting many species of plants including tomatoes
29	**What are the symptoms of Tobacco Mosaic Virus?**	A distinctive 'mosaic' pattern of discolouration on the leaves which affects plant growth due to lack of photosynthesis
30	**What is rose black spot disease and how does it spread?**	A fungal disease where purple or black spots develop on leaves, which often turn yellow and drop early. It spreads by water or wind
31	**How does rose black spot fungus affect a plant?**	It affects the growth of the plant as photosynthesis is affected due to discolouration and destruction of the leaves
32	**How can rose black spot be treated?**	Using fungicides and/or removing and destroying the affected leaves
33	**What are the first line non-specific defence systems of the human body against pathogens?**	Skin, nose, trachea and bronchi, stomach
34	**What is the role of the immune system?**	If a pathogen enters the body the immune system tries to destroy the pathogen
35	**Name three ways in which white blood cells help to defend against pathogens**	Phagocytosis, antibody production, antitoxin production
36	**What is phagocytosis (fag-go-sy-toe-sis)?**	A white blood cell surrounds and engulfs a pathogen, then digests it and destroys it
37	**What are antibodies?**	Small proteins that attach to antigens on the outer surface of pathogens
38	**What are antitoxins?**	Small molecules that attach to toxin molecules and stop them being dangerous

39	**What are antigens?**	Small protein molecules on the outside of pathogen cells
40	**What does a vaccination contain?**	A small quantity of dead or inactive forms of a pathogen
41	**What is the purpose of vaccination programmes?**	To prevent illness in individuals and reduce spread of the pathogen in a population
42	**How does the contents of a vaccine prevent future infection?**	Stimulates white blood cells to produce antibodies. If the same pathogen re-enters the body white blood cells respond quickly to produce more of the correct antibodies, preventing infection
43	**What is 'herd immunity'?**	Where enough people in a population are immune so that the spread of disease stops
44	**What are the advantages of a mass vaccination programme?**	1. Protects individuals from a particular pathogen 2. Protects a population against epidemics 3. Reduces days off work and school 4. Reduces the costs to the NHS
45	**Why are children vaccinated against the measles virus?**	Measles is a serious illness that can be fatal if complications arise
46	**Which three diseases are prevented by the MMR vaccine?**	Measles, mumps and rubella
47	**What is an epidemic?**	The spread of an infectious disease throughout a community
48	**What are the disadvantages of a mass vaccination programme?**	1. Can be expensive 2. Some people could have an allergic response to the vaccine 3. May be against people's religious beliefs
49	**What is an antibiotic?**	A drug that kills bacteria (but not other types of pathogen)
50	**What are the current concerns around antibiotic treatment?**	The emergence of bacterial strains resistant to antibiotics means many antibiotics no longer work effectively

Biology Unit 2: Infection and Response

51	**How do antibiotics work?**	Preventing the bacterial cell wall from forming or preventing DNA from replicating
52	**What issues are there with the treatment for Gonorrhoea?**	Easily treated with the antibiotic penicillin until many resistant strains appeared
53	**What is the aim of antiretroviral drugs?**	To stop the virus replicating inside cells
54	**What are the issues with treating viral diseases?**	Antibiotics cannot kill viral pathogens. It is difficult to develop drugs that kill viruses without also damaging the body's tissues
55	**What are painkillers used for?**	Painkillers and other medicines are used to treat the symptoms of disease but do not kill pathogens
56	**Which drug was first made from plants called foxgloves?**	Digitalis (to treat heart disease)
57	**Which drug was first made from willow tree extracts?**	Aspirin (people used to chew on twigs from willow trees to relieve pain!)
58	**Where did we first discover penicillin?**	In a type of fungus (a mould)
59	**What are many modern drugs based on?**	Chemicals found in plants or microorganisms
60	**How are most drugs made now?**	By expert chemists in the pharmaceutical industry
61	**In terms of drugs, what does 'efficacy' mean?**	How well the drug works (treating or reducing the symptoms)
62	**In terms of drugs, what does 'dose' mean?**	A safe amount of drug that is also effective
63	**What do we mean by drug 'toxicity'?**	How dangerous a drug could be
64	**What are 'side effects'?**	Unwanted effects of a drug
65	**What the features of a good medicine?**	Effective, safe, and stable
66	**What is preclinical testing?**	Testing chemical in a laboratory using cells, tissues and live animals
67	**What happens in the first stage of clinical trials?**	Drugs are tested on healthy volunteers to see if the drug is safe
68	**What happens in the second stage of the clinical trial?**	Drugs are tested on healthy volunteers and patients to find the best dose
69	**What is a double-blind trial?**	Where neither the patient nor the doctor knows whether the drug or a placebo is being given to the patient
70	**What is a placebo?**	A tablet which looks like the real medicine but which contains no active drug
71	**Why are placebos used in drugs trials?**	To avoid bias

Biology Unit 2: Organisation

1	**What is the word equation for photosynthesis?**	Carbon dioxide + water -> glucose + oxygen (light above the arrow)
2	**What is the balanced chemical symbol equation for photosynthesis?**	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
3	**Which gas is a reactant in the photosynthesis reaction?**	Carbon dioxide
4	**Which gas is a product of the photosynthesis reaction?**	Oxygen
5	**What energy transfer occurs in photosynthesis?**	Light energy to chemical energy
6	**Where does photosynthesis occur in a plant or algal cell?**	Chloroplasts
7	**What is the name of the green pigment in chloroplasts?**	Chlorophyll
8	**What is the function of chlorophyll?**	Captures light energy
9	**Which leaf cells are specialised to do photosynthesis?**	Palisade cells (in the leaf)
10	**What are three major factors which affect the rate of photosynthesis?**	Temperature, light intensity, carbon dioxide concentration
11	**What is the relationship between light intensity and rate of photosynthesis?**	The higher the light intensity, the higher the rate of photosynthesis
12	**Which organic molecule is a product of photosynthesis?**	Glucose
13	**Which large carbohydrates molecules are made from glucose in plant cells?**	Starch and cellulose
14	**How do plant cells use glucose?**	Used for respiration, converted into insoluble starch for storage, used to produce fat or oil for storage, used to produce cellulose which strengthens the cell wall and/or used to produce amino acids for protein synthesis
15	**What else, other than glucose, do plants need to produce proteins?**	Nitrate ions
16	**Where are mineral ions absorbed from and through which plant organ?**	From the soil, through the roots
17	**What is the chemical test for starch in a plant's leaf?**	Boil the leaf in water, then use warm alcohol to remove the chlorophyll. Finally add iodine solution; starch produces a dark colour
18	**What is aerobic respiration?**	How energy is released from glucose with oxygen
19	**What is anaerobic respiration?**	How energy is released from glucose without oxygen
20	**Where does aerobic respiration happen in a eukaryotic cell?**	In the mitochondria

Biology Unit 2: Organisation

21	**Where does anaerobic respiration happen in any cell?**	In the cytoplasm
22	**What is the balanced chemical equation for aerobic respiration?**	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
23	**What is the word equation for anaerobic respiration in animal cells?**	Glucose -> lactic acid
24	**What is the word equation for anaerobic respiration in plant and yeast cells?**	Glucose -> ethanol + carbon dioxide
25	**Is more or less energy transferred in anaerobic respiration compared to aerobic respiration?**	Less, due to incomplete breakdown of glucose
26	**How have humans used anaerobic respiration in plant and yeast cells to make food and drink?**	Production of bread and alcoholic drinks
27	**Why does the heart rate increase during exercise?**	To supply more blood to muscle cells
28	**Which reactants for aerobic respiration does the blood contain?**	Glucose (in plasma) and oxygen (in red blood cells)
29	**Name three physical ways in which the human body reacts to an increased demand for energy**	Heart rate, breathing rate and breath volume all increase
30	**Which chemical is produced in respiring muscle cells if there is not enough oxygen?**	Lactic acid
31	**Which complex carbohydrate is stored in the muscle cells to provide chemical energy?**	Glycogen
32	**What is an oxygen debt?**	The amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells
33	**What does a build-up of lactic acid cause in muscles?**	Muscle fatigue
34	**What is produced when enzymes chemically break down carbohydrates?**	Simple sugar monomers
35	**What is produced when enzymes chemically break down lipids?**	Fatty acids and glycerol
36	**What is produced when enzymes chemically break down proteins?**	Amino acids
37	**What is "metabolism"?**	The sum of all the reactions in a cell or the body
38	**Where is lactic acid converted back into glucose?**	The liver
39	**How is lactic acid transported to the liver?**	In the blood

Chemistry Unit 3: Quantitative

1	**What is the conservation of mass?**	That atoms cannot be created or destroyed
2	**When a metal forms a metal oxide, why does the mass increase?**	Because oxygen atoms have been added
3	**When an acid reacts with a metal, why does the mass decrease?**	Because a gas is produced and escapes
4	**What is relative formula mass?**	The sum of the relative masses of each atom in a compound
5	**What are the four state symbols and what do they stand for?**	(s) solid (l) liquid (g) gas (aq) aqueous
6	**What symbol do we use for relative formula mass?**	Mr
7	**What is a mole?**	A number of particles
8	**What is Avogadro's number?**	6.022x10^23
9	**What formula relates moles, mass and Mr?**	Moles = mass/Mr
10	**What is a limiting reactant?**	A reactant that does not have enough mass to react with all the product
11	**What is the unit for concentration? (Double only)**	g/dm^3
12	**Which formula relates concentration, mass and volume?**	concentration = mass/volume
13	**If the amount of solute in a solution is increased, what happens to its concentration?**	Increases
14	**If the volume of water in a solution is increased, what happens to its concentration?**	Decreases

Chemistry Unit 4: Chemical Changes

1	**What is the reactivity series?**	A list of elements ordered by their reactivity
2	**How can metals be placed in order of their reactivity?**	Add the metals to water or acid and see which ones react the most (by how much fizzing there is)
3	**What is the name for a reaction where oxygen is removed from a compound?**	Reduction
4	**Explain why zinc can be extracted from zinc oxide with carbon but magnesium cannot be extracted from magnesium oxide with carbon**	Magnesium is more reactive than carbon, Zinc is less reactive than carbon, Carbon can therefore remove oxygen from zinc oxide but not magnesium oxide
5	**Explain why gold and silver can be found naturally in the Earth's crust**	They are very unreactive
6	**What process is used to extract metals more reactive than carbon?**	Electrolysis
7	**Define an ore**	A material containing enough metal in it for it to be economically worthwhile to extract the metal.
8	**Define oxidation in the context of loss and gain of electrons**	Oxidation is the loss of electrons
9	**Define reduction in the context of loss and gain of electrons**	Reduction is the gain of electrons
10	**Which of the substances below has been oxidized and which has been reduced? $Al^{3+} + Fe \rightarrow Fe^{3+} + Al$**	Aluminium has been reduced and iron has been oxidised
11	**Show two half equations for the reaction below: $Al^{3+} + Fe \rightarrow Fe^{3+} + Al$**	$Al^{3+} + 3e^- \rightarrow Al$, $Fe \rightarrow Fe^{3+} + 3e$-
12	**Define acid in terms of pH**	A substance with a pH of less than 7
13	**Define acids in terms of ions**	A substance which releases H^+ ions in solution
14	**State the three common acids and give their formulae**	Hydrochloric acid, HCl(aq), Sulphuric acid, H_2SO_4(aq), Nitric acid, HNO_3
15	**Which ions do the common acids form in solution?**	HCl forms H^+ and Cl^-, H_2SO_4 forms $2H^+$ and SO_4^{3-}, HNO_3 forms H^+ and NO_3^-
16	**What is a neutral solution?**	A solution with a pH of 7.
17	**How do you measure pH?**	With an indicator or pH probe.
18	**What is a base?**	A metal oxide, hydroxide or carbonate that will react with an acid. E.g. copper oxide
19	**What is an alkali?**	A soluble base. E.g. sodium hydroxide
20	**Which ions are always present in a solution of an alkali?**	OH^-

Chemistry Unit 4: Chemical Changes

21	**What is a salt?**	A compound formed when some or all of the hydrogen from an acid is replaced by a metal
22	**What type of salts are formed by the three main acids?**	Hydrochloric acid produces chlorides, sulphuric acid = sulphates, nitric acid = nitrates
23	**What is a neutralisation reaction?**	A reaction involving an acid that results in a neutral solution
24	**Which ions always react together in a neutralization reactions between acids and alkalis?**	H^+ and OH^-
25	**Write the equation showing the reaction between H+ and OH^- ions**	$H^+ + OH^- \rightarrow H_2O$
26	**Complete the equation: metal + acid →**	→ salt + hydrogen gas
27	**Complete the equation: metal hydroxide + acid →**	→ salt + water
28	**Complete the equation: metal oxide + acid →**	→ salt + water
29	**Complete the equation: metal carbonate + acid →**	→ salt + water + carbon dioxide
30	**How do you make a soluble salt from an acid?**	React the acid with a base.
31	**If a salt is in solution, how do you extract it as a solid?**	Allow the water to evaporate off (crystallisation)
32	**What is a strong acid?**	An acid which completely splits up into its ions in water. E.g. when HCl is in water all the HCl molecules split up into H^+ and Cl^-
33	**What is a weak acid?**	An acid which will have some molecules which do not split up into their ions when in water.
34	**What is the relationship between the strength of an acid and its pH?**	As an acid increases in strength the pH decreases.
35	**What is a concentrated acid?**	An acid where there are lots of acid particles in the water.
36	**What is a dilute acid?**	An acid where there are fewer acid particles in the water.
37	**How is pH measured?**	pH is related to the concentration of H^+ in a solution.
38	**Which ions are in NaCl**	Na^+ and Cl^-
39	**Which ions are in $CaCO_3$**	Ca^{2+} and CO_3^{2-}
40	**Which ions are in $Mg(OH)_2$**	Mg^{2+} and 2 ions of OH^-
41	**Which ions are in H_2SO_4**	2 ions of H^+ and one SO_4^{2-}
42	**Which ions are in NH_4OH**	NH_4^+ and OH^-

Chemistry Unit 4: Chemical Changes

43	**Which ions are in $(NH_4)_2O$**	2 ions of NH_4^+ and one O^{2-}
44	**What is the formula of calcium chloride?**	$CaCl_2$
45	**What is the formula of aluminium nitrate?**	$Al(NO_3)_3$
46	**What is the formula of iron (III) oxide?**	Fe_2O_3
47	**What is the formula of magnesium fluoride?**	MgF_2
48	**What is the formula of sodium sulphate?**	Na_2SO_4
49	**What is the formula of copper (I) oxide**	Cu_2O
50	**Is this process oxidation or reduction? $Al \rightarrow Al^{3+} + 3e^-$**	Oxidation
51	**Is this process oxidation or reduction? $Na^+ + e^- \rightarrow Na$**	Reduction
52	**Is this process oxidation or reduction? $F_2 + 2e^- \rightarrow 2F^-$**	Reduction
53	**Is this process oxidation or reduction? $Fe^{2+} \rightarrow Fe^{3+} + e^-$**	Oxidation
54	**Balance this ionic equation: $Ca + Na^+ \rightarrow Ca^{2+} + Na$**	$Ca + 2Na^+ \rightarrow Ca^{2+} + 2Na$
55	**Balance this ionic equation: $Mg^{2+} + Na \rightarrow Na^+ + Mg$**	$Mg^{2+} + 2Na \rightarrow 2Na^+ + Mg$
56	**Balance this ionic equation: $Al + Ca^{2+} \rightarrow Al^{3+} + Ca$**	$2Al + 3Ca^{2+} \rightarrow 2Al^{3+} + 3Ca$
57	**In this reaction, what has been oxidised and what has been reduced? $Mg^{2+} + 2Na \rightarrow 2Na^+ + Mg$**	Na has been oxidised, Mg^{2+} has been reduced
58	**In this reaction, what has been oxidised and what has been reduced? $2Al + 3Ca^{2+} \rightarrow 2Al^{3+} + 3Ca$**	Al has been oxidised, Ca^{2+} has been reduced
59	**In this reaction, what has been oxidised and what has been reduced? $K + Na^+ \rightarrow K^+ + Na$**	K has been oxidized, Na^+ has been reduced
60	**What is electrolysis?**	Using electricity to break down a substance
61	**What happens to an ionic substance when it is melted or dissolved in water?**	The ions become free to move around
62	**What is the name for the positive electrode?**	The anode
63	**What is the name for the negative anode?**	The cathode
64	**Are positive ions attracted to the anode or the cathode?**	Cathode

Chemistry Unit 4: Chemical Changes

65	**Are negative ions attracted to the anode or the cathode?**	Anode
66	**At which electrode would $Zn^{2+}(aq)$ turn into $Zn(s)$?**	Cathode (needs to gain electrons)
67	**At which electrode would $Cl^{-}(aq)$ turn into $Cl_2(g)$?**	Anode (needs to lose electrons)
68	**Balance the half equation: $Al^{3+} + e^{-} \rightarrow Al$**	$Al^{3+} + 3e^{-} \rightarrow Al$
69	**Balance the half equation: $Cl^{-} \rightarrow Cl_2 + e^{-}$**	$2Cl^{-} \rightarrow Cl_2 + 2e^{-}$
70	**Balance the half equation: $O^{2-} \rightarrow O_2 + e^{-}$**	$2O^{2-} \rightarrow O_2 + 4e^{-}$
71	**What will be the products for the electrolysis of molten iron bromide?**	Iron and bromine
72	**What will be the products for the electrolysis of molten zinc oxide?**	Zinc and oxygen
73	**What will be the products for the electrolysis of molten sodium chloride?**	Sodium and chlorine
74	**For the extraction of which metals is electrolysis needed?**	Ones more reactive than carbon, e.g. aluminium
75	**What are the two main disadvantages of using electrolysis to extract metals?**	Requires a large amount of energy to melt the compounds and to produce the necessary electricity
76	**Why is aluminium oxide mixed with cryolite when extracting aluminium?**	To lower the melting point
77	**What is produced at the anode and cathode in the electrolysis of aluminium oxide?**	Aluminium at the cathode and oxygen at the anode
78	**Why does the anode need to be replaced in the electrolysis of aluminium oxide?**	The anode wears away because the oxygen produced reacts with the carbon electrode to form carbon dioxide.
79	**What is produced at the cathode in the electrolysis of solutions?**	If the metal is less reactive than hydrogen, the metal is produced. If it is more reactive than hydrogen, hydrogen is produced.
80	**In the electrolysis of sodium chloride solution, what are the products?**	Chlorine gas and hydrogen gas
81	**Why is sodium not produced in the electrolysis of sodium chloride solution?**	It is more reactive than hydrogen so hydrogen is produced instead.
82	**What is produced at the anode in electrolysis of solutions?**	Either a halogen or oxygen (when there is no halogen present)

Chemistry Unit 5: Energy Changes

1	**State the law of conservation of energy.**	Energy cannot be created or destroyed, it can only transferred from one place to another.
2	**How does the law of conservation of energy apply to chemistry?**	In all chemical reactions, energy is either transferred to the surroundings or from the surroundings.
3	**What is an exothermic reaction?**	A reaction where energy is transferred to the surroundings.
4	**Give two examples of exothermic reactions.**	Combustion, respiration
5	**What happens to the temperature of the surroundings during an exothermic reaction?**	They increase. The thermometer is included in "the surroundings" so shows the temperature increasing.
6	**What is an endothermic reaction?**	A reaction where energy is transferred from the surroundings.
7	**Give two examples of endothermic reactions.**	Thermal decomposition reactions, citric acid and sodium hydrogencarbonate.
8	**What happens to the temperature of the surroundings during an endothermic reaction?**	They decrease. The thermometer is included in "the surroundings" so shows the temperature decreasing.
9	**State two uses of exothermic reactions**	Self-heating cans, hand warmers
10	**State two uses of endothermic reactions**	Some cooling sports injury packs
11	**What are reactants?**	The substances involved in a chemical reaction
12	**What are products?**	The substances formed when reactants have a chemical reaction
13	**What is a reaction profile?**	A diagram which shows whether the reactants have more or less energy than the products.
14	**If the reactants have more energy than the products, what kind of a reaction must have taken place?**	An exothermic one. The missing energy has been transferred to the surroundings.
15	**If the reactants have less energy than the products, what kind of a reaction must have taken place?**	An endothermic one. The extra energy has been take in by the surroundings.
16	**Is breaking bonds endothermic or exothermic?**	Endothermic.
17	**Is making bonds endothermic or exothermic?**	Exothermic.
18	**How do we work out the overall energy change of a reaction?**	Work out the difference between the energy needed to break all the bonds in the reactants and the energy released to form all the bonds in the products.

Physics Unit 2: Electricity

1	What does LDR stand for?	Light dependent resistor
2	What does LED stand for?	Light emitting diode
3	What is a battery?	Two or more cells together
4	How are ammeters connected?	In the loop/in series
5	How are voltmeters connected?	Across the component/in parallel
6	What are the 3 types of charge?	Positive, negative and neutral
7	What is the relative charge of an electron?	-1
8	What is the unit of charge?	coulomb or C
9	Why are certain materials electrical conductors?	They contain delocalised electrons
10	What do we call materials which are not electrical conductors?	Electrical insulators
11	What does the word rate mean?	Per second
12	Define current.	The rate of flow of charge
13	State the unit of current.	amps or A
14	What does 1 A mean?	1 coulomb per second
15	What component measures current?	Ammeter
16	Which particles are responsible for electricity in circuits?	Electrons
17	What are two common types of power supply?	Cells/batteries and mains
18	Define potential difference.	Energy transferred per unit of charge
19	The potential difference of a power supply is…	The energy the power supply transfers to each unit of charge
20	The potential difference across a component is…	The energy each unit of charge transfers to the component
21	What is voltage usually called?	Potential difference
22	State the unit of potential difference.	volts or V

23	What does 1 V mean?	1 joule per coulomb
24	What component measures potential difference?	Voltmeter
25	State the unit of resistance.	ohms or Ω
26	Which direction does conventional current flow?	Positive to negative
27	Which direction do electrons flow?	Negative to positive
28	State the equation linking current, charge and time using words.	Charge = Current x Time
29	What symbol is used instead of writing the word 'charge'?	Q
30	What symbol is used instead of writing the word 'current'?	I
31	What symbol is used instead of writing the word 'time'?	t
32	State the equation linking current, charge and time using symbols	Q = It
33	State the name AND the power of 10 for this prefix: T	Tera, 10 to the power of 12
34	State the name AND the power of 10 for this prefix: G	Giga, 10 to the power of 9
35	State the name AND the power of 10 for this prefix: M	Mega, 10 to the power of 6
36	State the name AND the power of 10 for this prefix: k	Kilo, 10 to the power of 3
37	State the name AND the power of 10 for this prefix: c	Centi, 10 to the power of -2
38	State the name AND the power of 10 for this prefix: m	Milli, 10 to the power of -3
39	State the name AND the power of 10 for this prefix: μ	Micro, 10 to the power of -6
40	State the name AND the power of 10 for this prefix: n	Nano, 10 to the power of -9

Physics Unit 2: Electricity

41	State the equation linking potential difference, charge and energy using words.	Energy = Charge x Potential Difference
42	What symbol is used instead of writing the words 'potential difference'?	V
43	What symbol is used instead of writing the word 'energy'?	E
44	State the equation linking potential difference, charge and energy using symbols.	E = QV
45	State the equation linking potential difference, current and resistance using words.	Potential Difference = Current x Resistance
46	What symbol is used instead of writing the word 'resistance'?	R
47	State the equation linking potential difference, resistance and current using symbols.	V = IR
48	How are resistance and current related when potential difference is constant?	Inversely proportional OR as resistance increases, current decreases
49	How are potential difference and current related when resistance is constant?	Directly proportional OR as potential difference increase, current increases
50	How do we check that 2 variables are directly proportional?	Divide the variables at least 3 times. Answer should be the same every time.
51	How do we check that 2 variables are inversely proportional?	Multiply the variables at least 3 times. Answer should be the same every time.
52	What is a variable resistor?	A component whose resistance can be changed
53	State the relationship between the length of a wire and its resistance	Directly proportional
54	What does directly proportional look like on a graph?	Straight line through the origin
55	When current passes through wires and components, what happens to them?	They heat up

56	How does the temperature of a wire affect its resistance?	As temperature increases, resistance increases
57	Why do we switch circuits off between readings?	So the wires don't heat up and increase resistance
58	When resistors are connected in series the total resistance is…	The sum of the resistances
59	When resistors are connected in parallel the total resistance is…	Less than the lowest resistance
60	Why is total resistance lower than the smallest resistance when resistors are connected in parallel?	More paths means more current. More current means less resistance.
61	What do we call graphs which show the relationship between current and potential difference for a component	I-V plots
62	Why are variable resistors used in circuits to measure the I-V characteristics of components?	To vary the current and potential difference of the component.
63	State the relationship between current and potential difference for an ohmic conductor.	Current is directly proportional to potential difference at constant temperature
64	State an example of an ohmic conductor.	A wire or a fixed resistor
65	Is a wire at a constant temperature an ohmic conductor?	Yes
66	Is a fixed resistor at a constant temperature an ohmic conductor?	Yes
67	Is a filament lamp an ohmic conductor?	No
68	Is a diode an ohmic conductor?	No
69	Why are wires and resistors ohmic conductors?	Their resistance stays constant as current changes
70	Why are filament lamps and diodes not ohmic conductors?	Their resistance changes as current changes
71	State another name for an ohmic conductor.	Linear

Physics Unit 2: Electricity

72	State another name for a non-ohmic conductor.	Non-linear
73	Why does the resistance of a filament lamp increase as current increases?	The temperature of the filament increases causing ions to vibrate more
74	How does the resistance of a filament lamp change as the potential difference across it increases?	Current increases so temperature increases so resistance increases
75	State the properties of a diode.	Current only flows through a diode in one direction.
76	Describe the resistance properties of a thermistor.	As temperature increases, resistance of thermistor decreases.
77	What happens to the resistance of a thermistor as it gets hotter?	Decreases
78	What happens to the resistance of a thermistor as it gets colder?	Increases
79	Describe the resistance properties of an LDR.	As light intensity increases, resistance of LDR decreases.
80	What happens to the resistance of an LDR as it gets brighter?	Decreases
81	What happens to the resistance of an LDR as it gets darker?	Increases
82	State an example of an application of a thermistor in a circuit.	A thermostat
83	State an example of an application of an LDR in a circuit.	Automatic lighting
84	In what type of circuit are all the components in one loop?	Series
85	In what type of circuit are the components in multiple loops?	Parallel
86	In a circuit, one component breaks and all the components stop working. What type of circuit is it?	Series
87	In a circuit, one component breaks and all the other components still work. What type of circuit is it?	Parallel
88	State the current rule for components connected in series.	Same current through each component
89	State the potential difference rule for components connected in series.	Potential difference of power supply is shared between the components
90	State the current rule for components connected in parallel.	The total current of the circuit is the sum of the currents through the components
91	State the potential difference rule for components connected in parallel.	The potential difference across each component is the same
92	When cells are connected together in series, how is the total potential difference calculated?	Add the potential differences of the cells together
93	What does dc stand for?	Direct current
94	What does ac stand for?	Alternating current
95	Describe direct current.	Current that is always in the same direction
96	Describe alternating current.	Current repeatedly reverses direction
97	Describe the potential difference of an ac supply	Continuously reverses polarity
98	What is the frequency of the domestic ac supply in the UK?	50 Hz
99	What does the word frequency mean in physics?	Number of cycles per second
100	State the unit of frequency.	hertz or Hz
101	What is the potential difference of the domestic ac supply in the UK?	230 V
102	Are batteries dc or ac?	dc
103	Is the mains supply dc or ac?	ac
104	What are the 3 wires in a three-core cable?	Live, neutral and earth

Physics Unit 2: Electricity

105	Which wire in a three-core cable is brown?	Live
106	Which wire in a three-core cable is blue?	Neutral
107	Which wire in a three-core cable has green and yellow stripes?	Earth
108	What colour is the live wire in a three-core cable?	Brown
109	What colour is the neutral wire in a three-core cable?	Blue
110	What colour is the earth wire in a three-core cable?	Green and yellow stripes
111	What surrounds the outside of wires in household electrical goods?	Electrical insulation
112	Which wire in a three-core cable carries the alternating potential difference from the supply?	Live
113	Which wire in a three-core cable completes the circuit?	Neutral
114	Which wire in a three-core cable is a safety wire to stop the appliance becoming live?	Earth
115	What is the potential difference between the live wire and earth?	230 V
116	What is the potential difference between the neutral wire and earth?	0 V
117	What is the potential of the earth wire?	0 V
118	Describe the role of a fuse in a circuit.	It melts and breaks the circuit if the current is above a certain value
119	Which wire in a three-core cable is the fuse connected to?	Live
120	State 2 risks of electricity.	Electrocution and fire
121	Why is it dangerous for the live wire to touch the neutral or earth wire?	Short circuit, low resistance, high current, fire
122	Why is it dangerous to touch a live wire, even when the circuit is off?	Electrocution
123	Define power.	Energy transferred per second
124	State the equation linking current, potential difference and power using words.	Power = Current x Potential Difference
125	What symbol is used instead of writing the word 'power'?	P
126	State the unit of power.	watts or W
127	State the equation linking current, potential difference and power using symbols.	P = IV
128	State the equation linking current, resistance and power using words.	Power = current2 x resistance
129	State the equation linking current, resistance and power using symbols.	P = I2R
130	What store of energy does an electric motor have?	Kinetic
131	State the equation linking time, energy and power using words.	Energy = Power x time

Physics Unit 2: Electricity

132	State the equation linking time, energy and power using symbols.	E = Pt
133	What is the name given to the system of cables and transformers linking power stations to consumers?	The National Grid
134	What are the two parts of The National Grid?	Cables and Transformers
135	What do step-up transformers do?	Increase the potential difference
136	What do step-down transformers do?	Decrease the potential difference
137	How do step-up transformers increase the efficiency of energy transfer in The National Grid?	Increasing potential difference decreases current, reducing energy loss due to heat
138	Which type of materials become electrically charged when rubbed against each other?	Insulators
139	Which particles move from one material to another to cause a build up of static charge?	Electrons
140	When electrons move from one material to another, which material builds up a positive charge?	The material which loses electrons
141	When electrons move from one material to another, which material builds up a negative charge?	The material which gains electrons
142	Describe the force when 2 positively charged objects are brought close together.	Repulsion OR they repel
143	Describe the force when 2 negatively charged objects are brought close together.	Repulsion OR they repel
144	Describe the force when a positively charged object is brought close to a negatively charged object.	Attraction OR they attract
145	Is the electrostatic force a contact or non-contact force?	Non-contact
146	Which force between surfaces is responsible for electrons transferring from one material to the other?	Friction
147	Why does friction between objects cause the objects to become charged?	Electrons transfer from one object to the other
148	What name is given to the region of space around a charged object?	Electric field
149	How does the strength of an electric field depend on the distance from the charged object?	The greater the distance from the charged object, the weaker the electric field
150	When an charged object is placed in an electric field, what does it experience?	A force
151	How does the size of the force between charged objects depend on their distance apart?	The greater the distance between the charged objects, the weaker the force
152	When drawing the electric field around a positively charged object, which way do the arrows point?	Away from the object
153	When drawing the electric field around a negatively charged object, which way do the arrows point?	Towards the object
154	When drawing the electric field around a charged object, what must you ensure?	(1) At least 4 arrows, (2) pointing in the right direction, (3) perpendicular to and (4) touching the surface
155	When the potential difference between a charged object and a neutral object is high enough, what can happen?	Sparking

Physics Unit 3: Particle Model of Matter

1	**In the particle model of matter, what are 'particles'?**	Atoms, molecules or ions
2	**What are the 3 states of matter?**	Solid, liquid and gas
3	**Describe the arrangement of particles in a solid.**	Closely packed, regular arrangement
4	**Describe the motion and kinetic energy of the particles in a solid.**	Vibrate about fixed positions, low kinetic energy
5	**Describe the forces between particles in a solid.**	Strong
6	**Describe the arrangement of particles in a liquid.**	Closely packed, not regular arrangement
7	**Describe the motion and kinetic energy of the particles in a liquid.**	Move around, higher kinetic energy than in a solid
8	**Describe the forces between particles in a liquid.**	Weaker than in a solid
9	**Describe the arrangement of particles in a gas.**	Far apart
10	**Describe the motion of the particles in a gas.**	Move freely and randomly with a range of speeds and directions
11	**Describe the kinetic energy of the particles in a gas.**	High
12	**Describe the forces between particles in a gas.**	Almost zero
13	**Which state of matter: Particles closely packed and vibrate on the spot.**	Solid
14	**Which state of matter: Particles close together and can move over each other.**	Liquid
15	**Which state of matter: Particles far apart and move freely.**	Gas
16	**When a force decreases the volume of a substance the substance has been …**	Compressed
17	**Which state(s) of matter can be compressed?**	Gas
18	**Why can gases be compressed?**	There is space between the particles
19	**Why can't liquids and solids be compressed?**	There isn't space between the particles
20	**Which state(s) of matter take the shape of their container?**	Liquid and gas
21	**Why do liquids and gases take the shape of their container?**	The particles can move around
22	**Why don't solids take the shape of their container?**	The particles can't move around
23	**Which state(s) of matter can flow?**	Liquid and gas
24	**Why can liquids and gases flow?**	The forces between particles are weak enough for the particles to move around
25	**Why can't solids flow?**	The forces between particles are too strong so the particles can't move around
26	**Which state of matter is usually the best conductor of heat and electricity?**	Solid
27	**Why are solids usually the best conductors of heat and electricity?**	The particles are closely packed
28	**When the volume of a substance increases due to an increase in temperature the substance has …**	Expanded
29	**Why do substances expand when heated?**	The particles gain kinetic energy and move further apart
30	**Name the state change: Solid to liquid.**	Melting
31	**Name the state change: Liquid to gas.**	Boiling
32	**Name the state change: Gas to liquid.**	Condensing
33	**Name the state change: Liquid to solid.**	Freezing
34	**Name the state change: Solid to gas.**	Sublimation
35	**Which state changes can occur when a substance is heated?**	Melting and boiling

Physics Unit 3: Particle Model of Matter

36	**Which state changes can occur when a substance is cooled?**	Condensing and freezing
37	**At what temperature do melting and freezing take place?**	The melting point
38	**Why do substances have different melting points?**	Different forces between particles
39	**At what temperature do melting and freezing take place for water?**	0°C
40	**At what temperature do boiling and condensing take place?**	The boiling point
41	**At what temperature do boiling and condensing take place for water?**	100°C
42	**What is conserved during changes of state?**	Mass
43	**Why is mass conserved during state changes?**	No particles are added or taken away
44	**Are changes of state reversible or irreversible?**	Reversible
45	**Are changes of state physical or chemical changes?**	Physical
46	**Why are changes of state physical changes?**	They are reversible and no new substance is made
47	**What is evaporation?**	The change from liquid to gas below the boiling point
48	**What name is given to the mass per unit volume of a material?**	Density
49	**Define density.**	Mass per unit volume
50	**What is volume?**	The amount of space an object fills
51	**State the unit of volume.**	m^3 or cubic metres
52	**Which state of matter is usually the most dense?**	Solid
53	**Which state of matter is usually the least dense?**	Gas

54	**Why are solids usually denser than liquids and gases?**	More particles per unit volume
55	**Why do substances usually get less dense when heated?**	The particles gain kinetic energy and move further apart
56	**What happens to the density of a gas when it is compressed?**	Increases
57	**What happens to the density of a substance when it is heated and expands**	Decreases
58	**What symbol is used instead of writing the word 'density'?**	ρ (the Greek letter rho)
59	**What symbol is used instead of writing the word 'mass'?**	m
60	**What symbol is used instead of writing the word 'volume'?**	V
61	**State the unit of mass.**	kg or kilogram
62	**State the unit of density.**	kg/m3 or kilogram per cubic metre
63	**State the equation linking density, mass and volume.**	Mass = density x volume
64	**State the equation linking density, mass and volume using symbols.**	$m = \rho V$
65	**How is density related to floating?**	Less dense substances float on more dense substances
66	**Why do hotter fluids rise above colder fluids?**	Hotter fluids are less dense than colder fluids
67	**What piece of equipment is used to measure mass?**	Mass balance
68	**What piece of equipment is used to measure the volume of a liquid?**	Measuring cylinder
69	**What piece of equipment is used to measure length?**	Ruler
70	**What piece of equipment allows length to be measured much more accurately than a ruler?**	Micrometer OR vernier callipers

Physics Unit 3: Particle Model of Matter

71	How is the volume of a cuboid found?	Length × width × height
72	How is the volume of an irregular solid found?	Displacement of water
73	How do you convert from g into kg?	÷ 1000
74	How do you convert from cm3 to m3?	÷ 1,000,000
75	In what case would an object absorb heat from the surroundings?	When the surroundings are hotter than the object.
76	In what case would an object lose heat to the surroundings?	When the surroundings are colder than the object.
77	When the kinetic energy of the particles in a substance increases, what happens to the substance?	Temperature increases
78	When the kinetic energy of the particles in a substance decreases, what happens to the substance?	Temperature decreases
79	What is a system?	A group of interacting parts
80	When particles move faster, their ..... energy increases.	Kinetic
81	When particles move further apart, their ..... energy increases.	Potential
82	What name is given to the total kinetic and potential energy of all the particles in a system?	Internal energy
83	Define internal energy.	The total kinetic and potential energy of all the particles in a system
84	When a substance is heated and increases in temperature without changing state its particles gain ..... energy.	Kinetic
85	When a substance is heated and changes state without changing temperature its particles gain ..... energy.	Potential
86	Which part of internal energy relates to changes of temperature?	Kinetic energy

87	Which part of internal energy relates to changes of state?	Potential energy
88	On a cooling or heating curve, what is happening in the sloping sections?	Change of temperature
89	On a cooling or heating curve, what is happening in the horizontal sections?	Change of state at constant temperature
90	What is room temperature approximately?	20°C
91	What piece of equipment is used to measure temperature?	Thermometer
92	When the temperature of a system is increased, what 3 things affect how much the temperature changes?	Mass, type of material and energy input
93	The energy needed to increase the temperature of 1 kg of a substance by 1°C is called the ...	Specific heat capacity
94	Define the specific heat capacity of a substance.	Amount of energy needed to increase the temperature of 1 kg of the substance by 1°C
95	State the unit of specific heat capacity.	joules per kilogram per degree Celsius OR J/kg°C
96	State the unit of energy.	joules OR J
97	State the unit of temperature.	degrees Celsius or °C
98	What symbol is used instead of writing the word 'energy'?	E
99	What symbol is used instead of writing the words 'specific heat capacity'?	c
100	What symbol is used instead of writing the word 'temperature'?	θ (the Greek letter theta)
101	What symbol is used instead of writing the word 'change'?	Δ (the Greek letter delta)
102	The amount of energy needed to change the state of 1 kg of the substance with no change in temperature is called the ...	Specific latent heat
103	Define the specific latent heat of fusion of a substance.	Amount of energy needed to melt 1 kg of the substance with no change in temperature

Physics Unit 3: Particle Model of Matter

104	**Define the specific latent heat of vaporisation of a substance.**	Amount of energy needed to boil 1 kg of the substance with no change in temperature
105	**State the unit of specific latent heat.**	joules per kilogram OR J/kg
106	**What symbol is used instead of writing the words 'specific latent heat'.**	L
107	**Latent heat of fusion relates to which state change?**	Solid to liquid OR melting
108	**Latent heat of vaporisation relates to which state change?**	Liquid to gas OR boiling
109	**Why does ice melt faster when placed on most metals than on most non-metals?**	Metals are better conductors of heat
110	**Why does ice melt faster when placed on a surface which is a better conductor of heat?**	Heat transfers to the ice faster
111	**The force exerted by particles in a gas colliding with each other and the walls of the container causes …**	Gas pressure
112	**What causes gas pressure?**	Collisions of particles
113	**In what 3 ways can gas pressure be increased?**	Smaller volume, higher temperature, more particles
114	**State the relationship between temperature and pressure (when volume is kept constant).**	Directly proportional
115	**Explain why increasing the temperature of a gas increases the gas pressure.**	Particles have more kinetic energy and move faster so collide more often with a greater force
116	**Explain why decreasing the temperature of a gas decreases the gas pressure.**	Particles have less kinetic energy and move slower so collide less often with a smaller force
117	**Complete this sentence: Decreasing the temperature of a gas ……. the gas pressure.**	Decreases
118	**Complete this sentence: Increasing the temperature of a gas ……. the gas pressure.**	Increases
119	**State the relationship between volume and gas pressure (when temperature is kept constant).**	Inversely proportional

120	**Explain why increasing the volume of a gas decreases the gas pressure.**	Particles are further apart so collide less often
121	**Explain why decreasing the volume of a gas increases the gas pressure.**	Particles are closer together so collide more often
122	**Complete this sentence: Decreasing the volume of a gas ……. the gas pressure.**	Increases
123	**Complete this sentence: Increasing the volume of a gas ……. the gas pressure.**	Decreases
124	**When the pressure inside a closed container is much bigger than the pressure outside the container, what can happen?**	Explosion
125	**When the pressure outside a closed container is much bigger than the pressure inside the container, what can happen?**	Implosion/collapse
126	**When the pressure outside an open container is bigger than the pressure inside, what happens?**	Air moves into the container
127	**When the pressure inside an open container is bigger than the pressure outside, what happens?**	Air moves out of the container
128	**What symbol is used instead of writing the word 'pressure'?**	p
129	**State the unit of pressure.**	pascals or Pa
130	**What is 'work' in physics?**	The energy transfer by a force
131	**When work is done on a gas what happens to the gas?**	Internal energy and temperature increases
132	**Why does the internal energy of the air in a tyre increase when the tyre is pumped up?**	Work is done on the air so the air's temperature increases
133	**How can gas turn to liquid without increasing temperature?**	Increasing pressure

Physics Unit 4: Atomic Structure

1	State the approximate radius of an atom.	1 x 10^{-10} m
2	Fill in the blank: The radius of the ..... is less than 1/10000 of the radius of the atom.	Nucleus
3	Approximately how many times smaller than the radius of an atom is the radius of a nucleus?	10,000
4	State the names of the 3 particles which make up atoms.	Protons, neutrons and electrons
5	Which particles are found in the nucleus of atoms?	Protons and neutrons
6	Which particles orbit the nucleus?	Electrons
7	Where are the protons and neutrons found in an atom?	Nucleus
8	Where are the electrons found in an atom?	Orbiting the nucleus
9	Where is most of the mass of an atom concentrated?	Nucleus
10	Where is the positive charge of an atom concentrated?	Nucleus
11	State the relative charge of a proton.	+1
12	State the relative charge of a neutron.	0
13	State the relative charge of an electron.	-1
14	State the relative mass of a proton.	1
15	State the relative mass of a neutron.	1
16	State the relative mass of an electron.	About 1/2000 (very small)
17	The electrons are arranged at different distances from the nucleus. What are these different distances called?	Energy levels
18	How can an electron move to a higher energy level (further from the nucleus)?	Electron absorbs electromagnetic radiation
19	How can an electron move to a lower energy level (closer to the nucleus)?	Electron emits electromagnetic radiation
20	What can happen to an electron when it absorbs electromagnetic radiation?	Moves to a higher energy level
21	What can happen to an electron when it emits electromagnetic radiation?	Moves to a lower energy level
22	If most of the mass of an atom is concentrated in the nucleus, what does this mean about the rest of the atom?	Mostly empty space
23	In an atom, the number of what particle is equal to the number of protons?	Electrons
24	Why do atoms have no overall electrical charge?	Equal number of protons and electrons
25	What word do we use when something has no overall electrical charge?	Neutral
26	State the overall charge of an atom.	0
27	All atoms of a particular element have the same number of which particle?	Protons
28	What is the number of protons in an atom of an element called?	Atomic number
29	What is the atomic number of an atom?	The number of protons (which is also the number of electrons)
30	What is the total number of protons and neutrons in an atom called?	Mass number
31	What is the mass number of an atom?	The total number of protons and neutrons
32	When representing an atom as a symbol, what does the smaller number represent?	The number of protons (which is also the number of electrons) OR the atomic number
34	When representing an atom as a symbol, what does the bigger number represent?	The total number of protons and neutrons OR the mass number
35	When atoms of the same element have different numbers of neutrons what are these atoms called?	Isotopes
36	What are isotopes?	Atoms of the same element with different numbers of neutrons
37	If atoms lose one or more outer electrons, what do they become?	Positive ions

Physics Unit 4: Atomic Structure

38	If atoms gain one or more outer electrons, what do they become?	Negative ions
39	What can lead to a scientific model being changed or replaced?	New experimental evidence
40	Before the discovery of the electron, what did people think atoms were?	Tiny indivisible spheres
41	Which model suggested that the atom is a ball of positive charge with negative electrons embedded within it?	Plum pudding model
42	Describe the plum pudding model of the atom.	Ball of positive charge with embedded negative electrons
43	Which experiment led to the nuclear model of the atom?	Alpha particle scattering experiment OR Rutherford's gold foil experiment
44	Which model suggests that the mass of the atom is concentrated in the centre in a positively charged nucleus?	Nuclear model
45	Describe the nuclear model of the atom.	Dense, positively charged nucleus surrounded by orbiting electrons.
46	Which model replaced the plum pudding model of the atom?	Nuclear model
47	Which model of the atom was proved wrong by the alpha scattering experiment?	Plum pudding model
48	What did Niels Bohr add to the nuclear model?	Orbiting electrons
49	Which scientist suggested that electrons orbit the nucleus at specific distances?	Bohr
50	What did James Chadwick discover about the atom?	Neutrons
51	Which scientist showed that neutrons exist?	Chadwick
52	How did the alpha scattering experiment show there is a dense, positively charged nucleus in the centre of the atom?	Some alpha particles rebounded at more than 90°

53	How did the alpha scattering experiment show that the atom is mostly empty space?	Most alpha particles went straight through
54	In the alpha scattering experiment, why are the alpha particles repelled from the nuclei?	Nuclei and alpha particles both have a positive charge and like charges repel
55	Describe radioactive decay.	Unstable nuclei emit radiation to become more stable
56	What name is given to the process where unstable nucleis emit radiation to become more stable?	Radioactive decay
57	How does an unstable nucleus become more stable?	Emitting radiation
58	What is a radioactive source?	The object which emits nuclear radiation
59	Complete the sentence: Radioactive decay is a ..... process.	Random
60	Define 'activity'.	Rate of nuclear decay
61	What word means 'the rate of nuclear decay'?	Activity
62	State the unit of activity.	becquerel OR Bq
63	What does 'becquerels/Bq' mean?	Number of decays per second
64	Define 'count rate'.	Number of decays recorded per second by a detector
65	What phrase means 'the number of decays per second recorded by a detector?'	Count-rate
66	Why is count rate always less than activity?	Only some of the radiation passes into the detector
67	State the name of a radioactive decay detector.	Geiger-Muller tube
68	What is an alpha particle?	2 protons and 2 neutrons
69	An alpha particle is the same as a nucleus of what element?	Helium
70	What is the difference between a helium atom and an alpha particle	Helium atom also has 2 electrons

Physics Unit 4: Atomic Structure

71	What is a beta particle?	A high speed electron
72	What happens in a nucleus when a beta particle is emitted?	Neutron turns into a proton
73	What is a gamma ray?	High energy electromagnetic radiation
74	Apart from alpha, beta and gamma, what else can be emitted from a nucleus as nuclear radiation?	A neutron
75	Which of alpha, beta and gamma is the most penetrating?	Gamma
76	Which of alpha, beta and gamma is the least penetrating?	Alpha
77	Which of alpha, beta and gamma is the most ionising?	Alpha
78	Which of alpha, beta and gamma is the least ionising?	Gamma
79	State the relationship between ionisation and penetration for nuclear radiation.	The more ionising, the less penetrating
80	State the range in air of alpha.	About 5 cm
81	State the range in air of beta.	About 1 m
82	State the range in air of gamma.	Unlimited
83	What can alpha be stopped by?	Paper
84	What can beta be stopped by?	Thin aluminium foil
85	What can gamma be stopped by?	Thick concrete or lead
86	Which type of radiation would be attracted to the positive side of an electric field?	Beta
87	Which type of radiation would be attracted to the negative side of an electric field?	Alpha
88	Which type of radiation would not be deflected by an electric field?	Gamma

89	When writing the symbol for an alpha particle what numbers go at the top and bottom?	Top = 4, Bottom = 2
90	When writing the symbol for an beta particle what numbers go at the top and bottom?	Top = 0, Bottom = -1
91	When an alpha particle is emitted from a nucleus, what happens to the atomic and mass number?	Atomic number decreases by 2; Mass number decreases by 4
92	When a beta particle is emitted from a nucleus, what happens to the atomic and mass number?	Atomic number increases by 1; Mass number doesn't change
93	When a gamma ray is emitted from a nucleus, what happens to the atomic and mass number?	No change
94	When radiation is emitted from an unstable nucleus, what is the resulting nucleus called?	Daughter nucleus
95	What name is given to the time it takes for half the number of nuclei in a sample to decay?	Half-life
96	What name is given to the time it takes for the activity of a sample to half?	Half-life
97	Define half-life.	The time it takes for the number of nuclei in a sample to half.
98	After 1 half-life, what fraction of the nuclei in a radioactive sample will remain?	1/2
99	After 2 half-lives, what fraction of the nuclei in a radioactive sample will remain?	1/4
100	After 3 half-lives, what fraction of the nuclei in a radioactive sample will remain?	1/8
101	After 4 half-lives, what fraction of the nuclei in a radioactive sample will remain?	1/16
102	After 5 half-lives, what fraction of the nuclei in a radioactive sample will remain?	1/32
103	What word is used for 'the unwanted presence of materials containing radioactive atoms on other materials'?	Contamination

Physics Unit 4: Atomic Structure

104	What word is used for 'the process of exposing an object to nuclear radiation'?	Irradiation
105	In which case does the object itself become radioactive? Contamination or irradiation?	Contamination
106	Why are irradiated things not themselves dangerous?	They do not become radioactive
107	State 3 safety precautions that should be taken when using radioactive sources.	Long tongs, use sources for minimum possible time, stand far away
108	What phrase means 'scientists checking the work of other scientists'?	Peer review
109	Which radiation type is most dangerous to humans if emitted inside the body and why?	Alpha because it is the most ionising
110	Why is ionising radiation dangerous to the human body?	Damages cells, mutation of DNA, increased risk of cancer
111	State two natural sources of background radiation.	Rocks; Food and drink; Cosmic rays from space; Radon gas
112	State two man-made sources of background radiation.	Nuclear power; Nuclear weapons testing; Medical
113	When using a detector to measure radiation from an object, what must you subtract from the reading?	Background count

114	How many mSv in a Sv?	1000
115	Why can radioactive materials with shorter half-lives be more dangerous?	High activity initially
116	Why can radioactive materials with shorter half-lives be less dangerous?	Activity drops to a safe level quickly
117	Which type of radiation is used in an ionisation smoke alarm?	Alpha
118	Why is alpha radiation used in ionisation smoke alarms?	Low penetration so blocked by smoke
119	Why are beta and gamma radiation not used in ionisation smoke alarms?	They would penetrate the smoke
120	Should the radiation source in an ionisation smoke alarm have a short or long half-life?	Long
121	Which type of radiation is used in thickness monitoring?	Beta
122	Why is beta radiation used in thickness monitoring?	The amount of beta that penetrates depends on thickness
123	Should the radiation source used in thickness monitoring have a short or long half-life?	Long
124	Which type of radiation is used to detect leaks in pipes?	Gamma
125	What should the approximate half-life of the radiation source used to detect leaks in pipes be?	Several days
126	Which type of radiation is used to sterilise sealed medical equipment?	Gamma
127	Which type of radiation is used in medical tracers?	Gamma
128	Why is a gamma source used for medical tracers?	Low ionisation means less damage to cells and high penetration so it can be detected outside the body

Physics Unit 4: Atomic Structure

129	What should the approximate half-life of the radiation source used in medical tracers be?	A few hours
130	Why should the half-life of the radiation source used in medical tracers be just a few hours?	Less irradiation of body so less damage to cells
131	What name is given to the splitting of a large and unstable nucleus?	Nuclear fission
132	Give an example of a large, unstable nucleus which can undergo nuclear fission.	Uranium or plutonium
133	What must the large, unstable nucleus first do before fission can occur?	Absorb a neutron
134	What happens during nuclear fission?	Large unstable nucleus splits into 2 smaller nuclei, 2 or 3 neutrons, gamma rays and energy
135	What store of energy do the fission products have?	Kinetic
136	Where does the energy released in nuclear fission come from?	Mass converts into energy
137	The neutrons released in nuclear fission can go on to cause further fission events. What is this called?	Chain reaction
138	In a nuclear reactor, which part absorbs neutrons to stop a chain reaction going out of control?	Control rods
139	In a nuclear reactor, which part slows down neutrons so they can be absorbed by large unstable nuclei?	Moderator
140	What causes the explosion caused by a nuclear weapon?	Uncontrolled chain reaction
141	State 2 advantages of using nuclear power to generate electricity.	No greenhouse gases, fuel has high energy density
142	State 2 environmental disadvantages of using nuclear power to generate electricity.	Toxic, radioactive waste which needs to be buried, risk of accidents like Chernobyl, non-renewable fuel
143	What name is given to the joining of two light nuclei (e.g. hydrogen) to form a heavier nucleus (e.g. helium)?	Nuclear fusion
144	Where does the energy released in nuclear fusion come from?	Mass converts into energy
145	What two conditions are needed for nuclear fusion to occur?	High temperature and pressure
146	Why are high temperature and pressure needed for nuclear fusion to occur?	To overcome electrostatic repulsion between nuclei
147	Why do nuclei repel each other?	Nuclei all have a positive charge and like charges repel
148	What advantages does fusion have over fission?	No radioactive waste, more energy per kg released, hydrogen is abundant

Separate Science Only

Further Quantitative		
1	**What is the yield of a chemical reaction?**	The amount of useful product
2	**What is the theoretical yield of a chemical reaction?**	The yield which you would expect to get in a reaction
3	**What is the percentage yield of a chemical reaction?**	The mount of actual product divided by the theoretical yield
4	**Why is the % yield almost never 100%?**	Reversible reaction, loss of product on separation, unexpected side reactions
5	**What is atom economy?**	The amount of starting material that ends up as useful product
6	**Why is atom economy important?**	Economic and sustainability reasons
7	**How is atom economy calculate?**	100 x Mr desired product/ Mr of all reactants
8	**What are the two units for concentration?**	g/dm^3 and mol/dm^3
9	**Which formula relates concentration, moles and volume?**	Concentration = moles/ volume
10	**What is the purpose of titration?**	Establish the concentration of an unknown solution
11	**Why are burettes used for some measurements and pipettes for others?**	Pipettes measure a fixed volume, burettes measure a variable volume
12	**What do the moles of gases and their volumes have in common?**	At the same temperature they occupy the same amount of volume
13	**What is the volume of one mole of any gas at room temperature and pressure?**	24dm^3

Chemical Cells		
1	**What is a chemical cell?**	A unit which contains chemicals which produce electricity through a reaction
2	**What are the main components of a chemical cell?**	An anode, a cathode and an electrolyte
3	**What is an electrolyte?**	A solution containing ions which allows current to flow.
4	**What does the potential difference of a cell depend on?**	The type of electrode and the electrolyte.
5	**What is a battery?**	Two or more cells connected in series
6	**What happens to the electrodes in a chemical cell?**	The more reactive metal depletes and the less reactive one increases in size.
7	**In non-rechargeable cells, why do the chemical reactions stop over time?**	One of the reactants becomes used up.
8	**How can certain cells be recharged?**	Applying an external electric current
9	**How does the reactivity of the metal electrodes affect the size of the potential difference?**	The greater the difference in reactivity, the greater the potential difference.
10	**What is a fuel cell?**	A cell which uses a fuel and oxygen (or air) to generate electricity.
11	**What are the products in a hydrogen fuel cell?**	Water
12	**State three advantages of hydrogen fuel cells**	Do not need to be recharged, no pollutants are produced, can be different sizes for different uses
13	**State three disadvantages of hydrogen fuel cells**	Hydrogen is highly flammable, hydrogen is sometimes produced through non-renewable means, hydrogen is difficult to store
14	**Complete the equation which occurs at the negative electrode of a hydrogen fuel cell $2H_2 + 4OH^- \rightarrow$**	$4H_2O + 4e^-$
15	**Complete the equation which occurs at the positive electrode of a hydrogen fuel cell $O_2 + 2H_2O \rightarrow$**	$4OH^-$
16	**Why can some cells not be recharged?**	Because the reaction is not reversible

The Changing Economic World

1. What is development?

Term	Definition
Development	The social and economic progress of a country.
Uneven development	Development takes place at different rates in different places.
Development gap	The difference in standards of living and wellbeing between the world's richest and poorest countries.
Quality of life	General wellbeing (includes health, happiness and social belonging).
Standard of living	Level of wealth and material goods available to people.
Economic development	Progress in an economy (a move from agriculture to industry).

Torr Quarry Case study

Torr Quarry is located in Somerset, it is the seventh largest limestone quarry in the UK. To make it more sustainable 200 acres of land were landscaped with trees and limestone was transported by rail rather than road reducing traffic in local villages.

200 acres of trees = carbon sink = reduce Co_2 in the atmosphere = reduced impact of climate change.
Rail rather than road = reduced air pollution = less lung diseases = less pressure on the NHS

2. How to measure development?

Term	Definition
GNI per capita	Gross National Income per person. The total value of goods and services produced in a country in a year, including overseas income divided by the size of the population.
Infant mortality rate	The number of deaths of infants under 1 year, per 1000 live births per year.
Life expectancy	The average age a person is expected to live.
People per doctor	The number of people who depend on a single doctor.
Generally, the higher the GNI the more improved the development indicator e.g. lower infant mortality due to more money invested in healthcare.	

3. How to reduce the development gap? (Tourism in Kenya)

+	Over 1.1 million are employed in tourism or connected industries → tertiary jobs are a higher wage than primary jobs → more disposable income to improve life. Tourism provides 12% of Kenya's GDP → more tax → leading to positive multiplier effect.
-	Some communities e.g. Maasai people are forced off their land → communities move onto poor quality land → less productive crop yields. Tourist vehicles damage the environment → animals lose their habitats and migrate/die → fewer tourists because the attraction is not as appealing.
Overall tourism benefits the country economically (although HICs still take a lot of the profits), but it must be sustainable so that all society and the environment are protected.	

4. Economic change in the UK

Primary	↓ due to mechanisation.
Secondary	↑ due to industrial revolution then ↓ due to deindustrialisation.
Tertiary	↑ due to wealth (↑ disposable income).
Quaternary	High-tech jobs including research and IT. ↑ due to government policies and increase in technology.

Why has our economy changed?

Deindustrialisation	The decline of a county's traditional manufacturing industry due to exhaustion of raw materials, loss of markets and competition from NEEs.
Government policies	A plan decided by a government to manage issues in a country.
Globalisation	The process which has created a more connected world, with increases in the movement of goods/people worldwide.

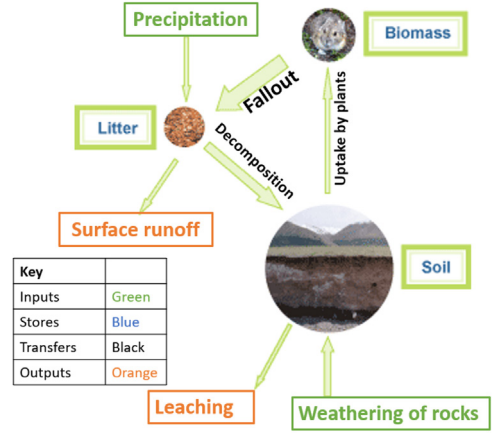
The Living World

1. Tropical rainforests

Characteristic	Definition
Climate	Consistently warm and wet (2,000mm rainfall per year and 28°C temperature).
Soil	Infertile as rain leaches nutrients. Some nutrients on the surface due to decomposition.
Structure (4 layers)	The difference in standards of living and wellbeing between the world's richest and poorest countries.
Biodiversity	Very high, but at risk due to deforestation. Over 50% of all species in the world.
Plants	Evergreen as there is a continual growing season. Tall trees and the dense canopy blocks light.
Nutrient cycle	This happens rapidly due to the hot and wet conditions.

3. Nutrient cycle

Nutrients occur naturally in the environment and are constantly recycled. Nutrients travel between three main stores.
Soil: Organic remains, clay and small rock particles.
Litter: Dead organic material.
Biomass: Plants/animals.



4. Strategies to reduce desertification (degradation of land)

Strategy	Explanation
Water and soil management	Drip irrigation, using a pipe with small holes that only releases small amount of water continuously for plants to grow, means that soil is not eroded away by lots of water being flooded in the land in one go.
Tree planting	The Great Green Wall is 7,600 km long and 15km wide. Tree roots hold soil together and add moisture to soil from transpiration. They reduce evaporation by providing shade.
Use of appropriate technology	Magic stones (low stone walls) reduce soil erosion.

2. Deforestation in the Amazon rainforest

Farming	Subsistence – growing food for yourself. Commercial farming (selling for profit) e.g. cattle ranching accounts for 75% of deforestation in the Amazon.
Logging	As quality of life for people increases there is a greater demand for higher quality furniture.
Road building	As countries like Brazil continue to rapidly economically develop, they must transport raw materials e.g. timber from the rainforest to the coast for exporting to factories or urban areas with factories.
Mineral extraction	Countries try to increase their income and gross domestic product (GDP). To do this they extract and export minerals to other countries.
Energy development	As the population and industry grows, more energy is required. The river provides energy by passing water through the pipes and turbine of a dam.
Population growth	Urban poor are encouraged to migrate to the countryside to ease overcrowding.

UK Physical Landscapes (Coasts)

1. Coastal processes

Process	Definition
Weathering	The breakdown of rock in situ e.g. mechanical (freeze thaw) and chemical (acid rain).
Mass movement	The downslope movement of material due to gravity e.g. rockfall, sliding and slumping.
Erosion	The wearing away of rock e.g. hydraulic action, abrasion, attrition and solution.
Deposition	The dropping of material due to a loss of energy.
Transportation	The movement of sediment e.g. longshore drift.

2. Erosional landforms at the coast

Headlands and bays	
1	Discordant coastlines have alternating bands of more resistant (chalk) and less resistant rock (clay).
2	The less resistant rock is eroded faster through abrasion, creating bays.
3	The more resistant rock erodes slower and is left jutting out to sea, forming a headland.
Cave, arch, stack	
1	Hydraulic power enlarges cracks in headland.
2	Over time they turn into a cave.
3	Back of cave is deepened by abrasion until it erodes through the headland > arch.
4	Weathering and erosion wear away at the arch until it eventually collapses (gravity).
5	A stack is formed.

3. Coastal management

Hard engineering
Man made structures built to control the sea. Reduces flooding and erosion.

Strategy	Explanation	Costs	Benefits
Sea walls	A hard wall made out of concrete that reflects waves back out to sea.	Expensive (£2000 per/m). Life span 75 years.	Prevents erosion/flooding. Often protects tourist resorts.
Rock armour	Boulders piled up along the coast. These erode rather than the coast.	Boulders can be moved by waves and need replacing.	Gaps allow water through, reducing wave energy. Cheap.
Gabions	Wire cages filled with rocks at the base of cliffs. Absorb wave energy.	Ugly to look at. £100 per/m. Metal corrodes over time.	Cheap and easy to build. Reduce erosion.
Groynes	Wooden fences at right angles to the coast, preventing sand moving by longshore drift = wider beach.	Starve beaches further along the coast = more erosion there. Life span only 25 years.	Stops longshore drift removing beaches. Fairly cheap.

Soft engineering
Schemes set up using a natural approach to managing the coast.

Strategy	Explanation	Costs	Benefits
Beach nourishment	Sand and shingle from elsewhere is added to beaches. Wider beaches stop erosion and flooding.	Needs redoing every 5 years. Sand has to be brought from elsewhere. Expensive.	Blends with existing beach. Larger beaches = tourists.
Dune regeneration	Creating or restoring sand dunes by nourishment or planting marram grass to stabilise the sand.	Protects only a small area. Areas zoned off from public which is unpopular.	Sand dunes create a barrier between the sea and land. Stabilisation is cheap.

Holderness Case study

Why does Holderness need to be protected?	What did they do to protect the coastline?
- Soft Boulder Clay = easily eroded. - B1242 road = links Hornsea and Mappleton = critical infrastructure. - Natural Gas Plant at Easington processes 25% of the UK's natural gas	1991 = 450 metres of coastline was protected by two rock groynes at Mappleton and rock armour (61,000 tonnes) = cost of £2m 1999 = 1km stretch near Easington was protected by rock armour at a cost of £6.6 million. Impacts = Mappleton and B1242 road protected & Great Cowden lost farmland and a caravan park

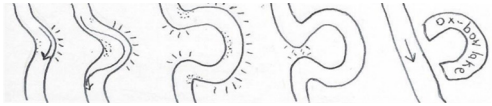
UK Physical Landscapes (Rivers)

1. The formation of meanders and oxbow lakes

These occur in the middle course of the river.

Meanders and oxbow lakes

Char.	A meander is a bend in the river. An oxbow lake is a semi-circular lake detached from the river.
Step 1	Erosion (mainly abrasion) happens on the outside of the river bend as velocity here is faster. This creates a river cliff.
Step 2	Deposition occurs on the inside of the bend (velocity slower) creating a slip off slope.
Step 3	The meander migrates over time (lateral erosion) creating a narrow neck.
Step 4	When the river floods, the water breaks through the narrow neck.
Step 5	The bend is cut off forming an ox bow lake.



2. What causes flooding?

Physical factors	Prolonged rainfall	Saturates the soil so no further water can infiltrate.
	Heavy rainfall	Water arrives too quickly to infiltrate > more surface runoff.
	Relief	Steep land means water reaches the river channel faster.
	Geology	Rocks like granite are impermeable.
Human factors	Urbanisation	More impermeable surfaces = more surface run off. Drains get water to river quickly > discharge.
	Deforestation	Trees intercept rainfall and soak up water. Cutting trees down means more water entering river.
	Agriculture	In winter, a lack of crops means more water enters river channel.

3. River management

Hard engineering (Man-made structures built to control the flow of rivers and reduce flooding)

Strategy	Explanation	Costs	Benefits
Channel straightening	Meanders are removed. Artificial channels make river straighter. Increases velocity.	May cause more flooding and erosion down steam.	Faster velocity means water leaves the area quickly reducing flood risk.
Flood relief channels	Channels built to divert water around built up areas, or to divert excess water which would flood.	Increased discharge where it re-joins the river so flooding may occur there.	Removes excess water from the river channel to reduce flooding.

Soft engineering (Schemes set up using knowledge of a river and its processes to reduce the effects of flooding)

Strategy	Explanation	Costs	Benefits
Flood plain zoning	Restrictions prevent building on parts of the flood plain likely to flood.	Not always possible to change existing land uses. Expansion of towns limited.	Flood risk reduced as less impermeable surfaces. Impacts reduced.
Tree planting	Planting seeds to grow into trees. Trees have roots in the soil as well as branches and leaves.	Less land is available for farming.	Discharge and flood risk are reduced because trees intercept the rainfall.

Oxford Flood Case Study

What factors put Oxford at risk?:

Confluence of the River Cherwell and Thames

It is an Urban Area.

July 2007:

- Flash flood which caused 250 homes to be evacuated and the A420 flooding for 100m.

What was done?

Excess bypass channel increased in size by excavating 400,000 m^3 of material to store increased discharge

Embankments built to make the river deeper increasing capacity.

20,000 trees planted to increase interception and reduce surface run off.

Impacts = Compulsory Purchase Order was issued to landowners forcing them to sell their land & People feel more confident about their land being protected.

Topic 1: Medicine In the Middle Ages C.1250-1500

Timeline		
1. Latin translations of Hippocrates' and Galen's works started to appear in Europe **11th century**	2. The Church banned members of the clergy from carrying out operations that involved cutting the patient **1215**	3. The Black Death arrived in England **1348**

Overview of health and disease in the Middle Ages	
4. Beliefs about causes of disease	a) God b) Misalignment of the planets c) Four Humours d) Miasma (bad air)
5. Methods of treating disease	a) Prayer, fasting and pilgrimage b) Bleeding and purging c) The Theory of Opposites d) Herbal remedies
6. Methods of preventing disease	a) Regular prayer and confession b) Following the Regimen Sanitatis c) Purifying the air
7. Main source of treatment	Female family members in the home
8. Who ran hospitals?	The Church

Key Words	
9. Astrology	The study of the planets and stars
10. Bleeding/ blood-letting	Taking blood out of the body to cure or prevent an illness
11. Miasma	Bad air believed to be filled with harmful fumes which could cause illness
12. Purging	Removing leftover food from the body
13. Regimen Sanitatis	A set of instructions for how to maintain good health
14. Self-flagellation	Whipping yourself to show God that you are sorry for your sins
15. Theory of the Four Humours	Belief that four liquids made up the body and had to be balanced to ensure good health

Key People	
16. Apothecary	A medical practitioner who mixed herbal remedies for physicians or directly for patients.
17. Barber surgeon	Barbers worked with sharp knives so also carried out medical procedures such as bleeding and smaller surgeries
18. Galen	A physician in the Roman Empire who liked and developed the ideas of Hippocrates
19. Hippocrates	An Ancient Greek physician who created the Theory of the Four Humours in the 5th century BC
20. Physician	Someone who practices medicine

Topic 2: Medicine In the Renaissance C.1500-C.1700

Timeline

1. Invention of the printing press **c.1440**	3. Publication of Vesalius's On the Fabric of the Human Body **1543**	5. The Royal Society met in London for the first time **1660**	7. Thomas Sydenham published Observationes Medicae **1676**

1536 2. Dissolution of the Monasteries in England	**1628** 4. William Harvey published his work on the circulation of the blood	**1665** 6. The Great Plague arrived in England

Overview of health and disease in the Renaissance

8. Beliefs about causes of disease	a) God b) Misalignment of the planets c) External factors d) Four Humours e) Miasma (bad air)
9. Methods of treating disease	a) Bleeding, purging and sweating b) Transference c) New herbal remedies d) Chemical cures
10. Methods of preventing disease	a) Cleanliness b) Purifying the air c) Avoiding external factors that people believed affected disease
11. Main source of treatment	Female family members in the home
12. Who ran hospitals?	Charities or local councils

Key Words

13. Anatomy	The study of the structure of the human body
14. Iatrochemistry	Looking for chemical cures for disease
15. Microscope	An instrument used to see objects too small to see with the naked eye
16. Printing press	A machine that allowed many copies of the same text or picture to be printed
17. Quarantine	A method of isolating people who are infected with a disease
18. Secular	Not religious or spiritual
19. Transference	A new theory of treatment that a disease could be transferred to something else

Key People

20. Andreas Vesalius	An Italian doctor and lecturer in surgery, who proved through dissection that Galen's work on anatomy was wrong
21. The Royal Society	An organisation which aimed to carry out experiments to further scientific understanding, and encourage the sharing of scientific knowledge
22. Thomas Sydenham	A well-respected doctor in London, who laid the foundations for a more scientific approach to medicine by encouraging careful observation of symptoms
23. William Harvey	An English doctor who discovered how blood circulates around the body

Topic 3: Medicine In the Industrial Period 1700-1900

Timeline

1. Edward Jenner discovered the smallpox vaccine **1796**	3. Jenner's smallpox vaccination was made compulsory in Britain **1852**	5. Florence Nightingale travelled to Crimea to treat wounded soldiers **1854**	7. Joseph Lister used carbolic acid as an antiseptic in surgery **1865**	9. The government passed the Public Health Act **1875**

1847 2. James Simpson discovered the effects of chloroform as an anaesthetic	**1854** 4. John Snow discovered that contaminated drinking water causes cholera	**1861** 6. Louis Pasteur published the Germ Theory of Disease	**1871** 8. The government fined people who did not vaccinate their children against smallpox

Overview of health and disease in the C18th and C19th

10. Beliefs about causes of disease	a) Miasma b) Theory of spontaneous generation c) Germ Theory (from 1861)
11. Methods of treating disease	a) Home remedies b) Patent remedies c) Surgeryd) Hospital care
12. Methods of preventing disease	a) Vaccination b) Government action
13. Main source of treatment	A lot of people, especially the rich, still chose to be treated at home
14. Who ran hospitals?	Charities or local people. Some local governments built hospitals for the poor.

Key Words

15. Anaesthetic	A drug given to patients to make them unconscious before and during surgery
16. Aseptic surgery	Surgery where the operating theatre has been made free of bacteria
17. Antiseptics	Chemicals used to destroy bacteria and to prevent infection
18. Germ	A type of bacteria (or microbe) that causes disease
19. Vaccination	Injecting a killed or weakened microbe into the body to develop resistance against a disease

Key People

20. Edward Jenner	Developed the smallpox vaccination
21. Florence Nightingale	Improved nurses' training and hospital care
22. James Simpson	Discovered that chloroform was an effective anaesthetic
23. John Snow	Discovered that contaminated water caused cholera
24. Joseph Lister	Theorised that germs caused infection
25. Louis Pasteur	Developed the Germ Theory of Disease
26. Robert Koch	Discovered that different germs cause different diseases

Topic 4: Modern Medicine,1900-Present

Timeline

1. Salvarsan 606, the first 'magic bullet' was discovered **1909**	3. Florey and Chain developed penicillin into a usable treatment **1941**	5. NHS was launched by government → free medical care to all **1948**	7. The Clean Air Act was passed to reduce air pollution **1956**	9. The government made it illegal to smoke in enclosed workplaces **July 2007**

1928 2. Alexander Fleming discovered that penicillin killed harmful bacteria	**1942** 4. The government launched a national vaccination campaign against diphtheria	**1953** 6. Watson and Crick discovered the structure of DNA and how it passed on information	**1990-2003** 8. Scientists worked on the Human Genome Project, identifying the purpose of each gene

Overview of health and disease in modern Britain

10. Beliefs about the causes of disease	a) Germ Theory b) Genetic factors c) Lifestyle choices
11. Methods of treating disease	a) Chemical cures b) Antibiotics c) Advanced surgery d) High-tech methods
12. Methods of preventing disease	a) Mass vaccinations b) Government laws and campaigns
13. Main source of treatment	The NHS (through GPs or hospitals)
14. Who ran hospitals?	From 1948, the government ran hospitals through the NHS

Key Words

15. Antibiotic	Drugs made from bacteria that kill other bacteria, and so cure an infection
16. DNA	Carries genetic information
17. Gene	Part of a cell, made up of DNA, that determines how bodies look and work
18. Human genome	The complete set of DNA containing all the information to build a human
19. 'Magic bullets'	Chemical cures that attack the microbes in the body causing disease
20. X-Ray	Rays that penetrate the human body, so we can see inside it

Key People

21. Alexander Fleming	A British doctor who discovered that penicillin killed harmful bacteria
22. Howard Florey and Ernst Chain	Scientists who developed penicillin into a usable treatment
23. James Watson and Francis Crick	Scientists working in Cambridge, who discovered the structure of DNA
24. Paul Ehrlich	A German scientist who tested chemical compounds to find a cure for syphilis.
25. Rosalind Franklin	An English chemist, who was the first person to take x-ray photographs of DNA

Topic 1: The Development of the Civil Rights Movement, 1954-60

Timeline			
1. Brown v. Topeka case **1954**	3. Beginning of the Montgomery Bus Boy **December 1955**	5. Southern Christian Leadership Conference (SCLC) formed by Martin Luther King Jr **January 1957**	7. Civil Rights Act passed **September 1957**
August 1955 2. Emmett Till murdered	**1956** 4. Bus Boycott successful, segregation on buses ended	**September 1957** 6. Little Rock High School	

Key People	
8. Martin Luther King Jr	An American Baptist minister and activist who became a key leader in the civil rights movement from 1954-68
9. President Dwight Eisenhower	US President from 1953 to 1961
10. Rosa Parks	A civil rights activist who became a nationally recognised symbol of strength
11. Thurgood Marshall	A civil rights advocate and later US Supreme Court Justice

Key Words	
12. Congress	The US equivalent of parliament, split into two parts – the Senate and the House of Representatives
13. Jim Crow Laws	State and local laws, enacted from 1876-1965, that enforced racial segregation in Southern USA
14. Ku Klux Klan	Racial supremacy group, based in the South, who used violence against black Americans
15. Lynching	Punishing a person without legal process or authority, often with brutality
16. Non-violent direct action	Rejecting violence in favour of peaceful tactics as a means of gaining political objectives
17. Sharecroppers	A type of farming in which families rent small plots of land from a landowner in return for a portion of their crop
18. Supreme Court	The highest federal court of the USA

Topic 2: Protest, Progress and Radicalism 1960-75

Timeline

1. Greensboro sit-in	3. Anniston bomb attack	5. James Meredith case began	7. Birmingham march	9. Mississippi murders	11. Assassination of Malcolm X	13. Kerner Report published	15. Protest at the Mexico Olympics
February 1960	**May 1961**	**June 1962**	**August 1963**	**June 1964**	**February 1965**	**February 1968**	**October 1968**

May 1961	**April 1962**	**June 1963**	**June 1964**	**July 1964**	**August 1965**	**April 1968**
2. First Freedom Ride	4. Voter Education Project set up	6. Medgar Evers shot	8. Freedom Summer	10. Civil Rights Act passed	12. Voting Rights Act passed	14. Assassination of Martin Luther King Jr

Key People

16. James Farmer	Civil rights leader, National Director of CORE and organiser of the 1961 Freedom Rides
17. James Meredith	Became the first black American student at the University of Mississippi
18. John Carlos	Bronze medal winner in the 1968 Olympic Games, who saluted during the medal ceremony to show black unity
19. Tommie Smith	Gold medal winner in the 1968 Olympic Games, who saluted during the medal ceremony to show black unity

Key Words

20. Communist	Someone who promotes a classless society where power is shared and private ownership is abolished
21. Executive order	A directive issued by the President of the USA that manages operations of the federal government and has the force of law
22. Federalise	To put under the direct control and authority of a federal government
23. Freedom Riders	Civil rights activists who rode interstate buses into the Southern states in 1961 to challenge segregated bus terminals
24. Freedom Schools	Temporary, alternative free schools for black Americans which aimed to encourage them to become more politically active
25. 'Great Society'	A series of programmes with a focus on ending poverty and racial injustice, which were set up on the initiative of President Johnson
26. Nation of Islam	They believed in separatism from white society, pride in their heritage and armed self-defence
27. Separatism	Keeping races apart

Topic 3: US Involvement In the Vietnam War, 1954-75

Timeline

1. The defeat of the French at Dien Bien Phu **1954**	3. Ho Chi Minh set up the Vietcong to oppose Diem **1960**	5. Diem overthrown **1963**	7. Beginning of 'Operation Rolling Thunder' **1965**	9. Introduction of Vietnamisation **1969**	11. The bombing of North Vietnam **1972**

1955 2. Diem elected president of South Vietnam	**1962** 4. The introduction of the Strategic Hamlet policy	**1964** 6. The Gulf of Tonkin incident	**1968** 8. The Tet Offensive and My Lai massacre	**1970-71** 10. Attacks on Cambodia and Laos

Key People

12. General William Westmoreland	United States Army general, who commanded US forces during the Vietnam War from 1964 to 1968
13. Ho Chi Minh	Joint founder of the Vietminh and President of North Vietnam from 1954 until his death
14. John F Kennedy	US President from 1961 until his assassination in 1963
15. Lyndon B Johnson	President Kennedy's vice-president, who succeeded him as President of the USA from 1963 to 1969
16. Ngo Dinh Diem	Leader of South Vietnam from 1955 until his assassination in 1963
17. Richard Nixon	US President from 1969 until his resignation in 1974

Key Words

18. Ambush	A surprise attack
19. ARVN	The army of the Republic of South Vietnam
20. Booby trap	A device that is intended to kill, harm or surprise a person
21. Ceasefire	A temporary stoppage of a war
22. Cold War	An ideological conflict from 1945 between the USA and the Soviet Union
23. Containment	Prevention of communism spreading to non-communist nations
24. Guerrilla campaign	Fighting in small groups against conventional forces
25. Gulf of Tonkin	A body of water located off the coast of Northern Vietnam and southern China
26. Napalm	A highly flammable sticky jelly used in incendiary bombs
27. Strategic Hamlet Programme	US attempt to win over the peasants by moving them into new villages in areas under the control of the South Vietnamese army
28. Vietcong	Communist-led guerrilla army and political movement
29. Vietminh	A nationalist movement set up in 1941 originally to fight for Vietnamese independence from French rule
30. Vietnamisation	Nixon's policy to train and equip the South Vietnamese soldiers to take the place of US troops

Topic 4: Reactions To, and the End of, US Involvement In Vietnam, 1964-75

Timeline

1. Johnson decided not to stand for re-election as President.	3. Nixon began secret peace talks with North Vietnam	5. Nixon visited China	7. Ceasefire was agreed. Paris Peace Agreement was signed	9. North Vietnamese captured Saigon. A year later, Vietnam was reunited
1968	**1969**	**1972**	**January 1973**	**April 1975**

1968	**1970**	**1972**	**March 1975**
2. The My Lai Massacre	4. The Kent State University shootings	6. The October Agreement was reached with North Vietnam	8. After breaking the ceasefire in December 1974, the North Vietnamese won a key victory

Key People	
10. Henry Kissinger	US National Security Advisor and later Secretary of State
11. Mao Zedong	Founding father of the People's Republic of China from 1949
12. Walter Cronkite	Respected TV journalist from CBS News who reported from Vietnam

Key Words	
13. Draft	US name for conscription, which made military service compulsory for men over the age of 18
14. Détente	A period in the 1970s when Cold War relations between the USA and the USSR appeared to be more relaxed
15. Red Scare	Term used in the USA involving promotion of a widespread fear of Communism
16. Sovereignty	The authority of a state to govern itself

GCSE Art

The four assessment objectives for both components (Unit 1 and Unit 2)

1. I will develop ideas through investigations, demonstrating critical understanding of sources.
2. I will refine my work by exploring ideas, selecting, and experimenting with appropriate media, materials, techniques and processes.
3. I will record ideas, observations, and insights relevant to intentions as work progresses.
4. I will present a personal and meaningful response that realises intentions and demonstrates understanding of visual language.

Timeline and Deadlines

September ⟷ **Easter** ⟷ **Summer** ⟷ **Christmas**

Project 1 – Unit 1 – Angles | **Project 2 – Unit 1 – Identity**

January ⟷ **March** | **June** | **August**

External Set Task – Unit 2 Chosen Theme From Exam Paper | **Public Exams in Main Hall** | **Results Day**

AQA Assessment Objective CHECKLIST

A01 Develop	• I have researched **a wide range** of artists, craftsmen and designers • I have worked **IN THE STYLE** of the artists using my own photographs • I have written about the artist and how they have informed and influenced my practice
A02 Refine	• I have experimented with **a wide range of relevant** media and techniques • All my work has been **well refined** • I have pushed my ideas to their **full limitations** to show the process and development of my ideas
A03 Record	• I have **drawn from observation** using a range of different media • I have worked from my **own photographs** • I have used **annotation to explain the development** of my research and ideas

AO1: How do I research artists?

You will be given a list of artists whose style of work suit the chosen theme: You will need to introduce them with dates, places, what kind of work they are known for, how relevant their work is to your project. You MUST include at least 2 images of the artist's work and point out the key features.

AO2: What kinds of media, materials, techniques and processes can I use?

You will need to show a wide variety of different media. Drawing, painting, sewing, printing etc – but only if the artist's work you are researching requires that kind of response.

AO3: How do I record my ideas?

Drawing and written annotation are more important because it shows you have observed closely and noted key features that link with the theme.

Key words to learn for GCSE art annotation:

SPACE:	positive; negative; open; closed; deep; foreground; composition; position; perspective
COLOUR:	primary; secondary; tertiary; bright; bold; radiant; dull; vivid; contrasting; monochrome; harmonious; analogous; complimentary; tints; tones; warm; cool
SHAPE:	regular; irregular; circle; triangle; square; angular; asymmetrical; bent; bulbous; chunky
FORM:	3-Dimentional; model; construct; mould;
VALUE:	tone; graduation; dark; light; mid; bright; faded; smooth;
TEXTURE:	smooth; rough; course; bumpy; spiky; silky; broken; serrated;
LINE:	fluent; free; controlled; powerful; geometric; angular; thick; thin; horizontal; vertical; overlapping; inferred; continuous

What you need to do to achieve the best grades:

1. Present your work as neatly as possible – clean lines, clear presentation, and beautiful lettering.
2. Draw as much as possible – to show you have clearly observed the artist's work.
3. Write about what you intend to do – and reflect on what you have already done.
4. Be as independent as you can – by researching other artists beside those that have been suggested.
5. Take photographs of images that are relevant to the project theme.
6. Meet all the deadlines set – if you fall behind, it is difficult to catch up on missing work.

GCSE Art

GCSE ART Annotation

Shape, form, space	Tone	Pattern and Texture	Line	Colour
Closed	Bright	Repeated	Fluent	Bright
Open	Dark	Uniform	Free	Bold
Distorted	Faded	Geometric	Rough	Primary
Flat	Smooth	Random	Controlled	Secondary
Organic	Harsh	Symmetrical	Powerful	Tertiary
Deep	Contrasting	Soft	Strong	Radiant
Positive	Intense	Irregular	Geometric	Dull
Negative	Sombre	Coarse	Angular	Vivid
Foreground	Grey	Bold	Light	Contrasting
Background	Strong	Uneven	Delicate	Deep
Composition	Powerful	Bumpy	Flowing	Monochrome
Curvaceous	Feint	Rough	Simple	Harmonious
Elongated	Light	Smooth	Thick	Complementary
Large	Medium	Uneven	Thin	Natural
Small	Dark	Spiky	Horizontal	Earthy
2D	Dramatic	Broken	Broken	Subtle
3D	Large	Furry	Interrupted	Pale
	Small	Fine	Rounded	Cool
		Flat	Overlapping	Warm
		Grid	Faint	Saturated
				Luminous
				Strong

Basic, simple, solid, loud, quiet, bright, realistic, stylised, observed, busy, vibrant, strange, interesting, balanced, lively, negative, recognisable, abstract, tactile, meaningful, symbolic, depressing, unique, emotive, hidden, textural, dynamic, disturbed, sophisticated, puzzling, optimistic, powerful, intentional, conceded, subtle.

Example

I have created this piece using watercolours, coloured pencil and oil pastel. I have learnt how to blend the watercolours to show different tones and add texture. The piece shows strong shapes and vivid colours. I have added coloured pencils to show some areas in more detail and focus. The artist Georgia O'Keeffe has inspired my piece. In her work she uses bright, bold colours to show close up views of flowers with a range of dark to light tones. I aim to now further develop my piece by using other materials. I could do this by experimenting with block prints on watercolour backgrounds or possibly try painting onto fabric and then stitch into to show more detail.

REMEMBER to check your…
Spellings, Grammar and Punctuation

Sentence Starter Help
Try thinking of our own too

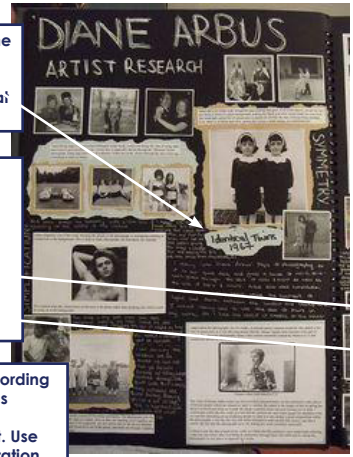
- In this piece I have…
- The materials I have used are…
- The technique I have used is…
- Through working in this way I have learnt how to…
- I have shown… in the style of…
- This piece could develop further by including…
- The artist… has influenced my designs because…
- To develop this piece further I could…
- I think using… worked really well because…
- I am particularly pleased with… and I now aim to…

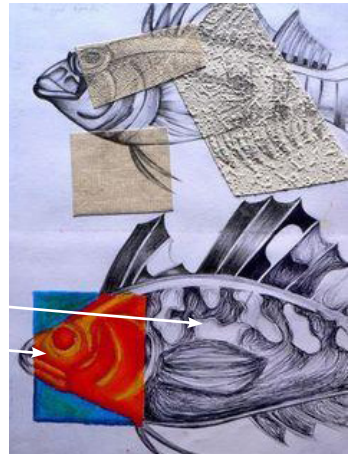
AO1: Look at the way this artist's work has been presented. What do you notice?

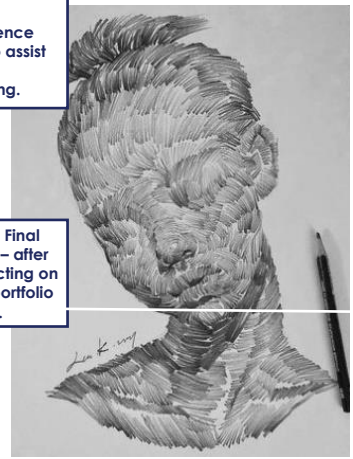
AO2: Look at the way this study has been constructed. A variety of materials have been explored for greater impact.

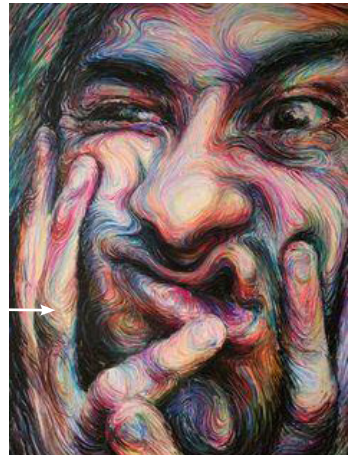
AO3: Recording your ideas are very important. Use the annotation guide and sentence starters to assist you with your writing.

AO4: Final idea – after reflecting on the portfolio work.









Core knowledge

Key Terms	
1. Automation	The use of machinery to complete manufacturing tasks.
2. Crowdfunding	Raising money from large numbers of people.
3. Cooperatives	Businesses owned, governed and self-managed by its workers.
4. Non-Renewable	Resources that will eventually run out (cannot be replaced).
5. Renewable	Resources that can be replaced/regrown (will not run out).
6. Technology Push	New technologies or materials that lead to designers using these to design new products.
7. Market Pull	Products made/improved in response to customer needs.
8. Flexible Manufacturing Systems	A system in which production is organised into cells of machines performing different tasks.
9. Just in Time Manufacturing	Ensuring materials and components are ordered to arrive at the product assembly point just in time for production.
10. Lean Manufacturing	Production focusing on reduction of waste to minimise costs and maximise efficiency.
11. Photochromic	Changes colour in relation to light levels.
12. Thermochromic	Changes colour in relation to heat.
13. Shape-memory alloys	Can be bent/deformed and returns to original shape when heated.
14. Glass-Reinforced Plastic	A lightweight, chemical and heat resistant and waterproof composite material.
15. Carbon Fibre Reinforced Plastic	A carbon fibre mesh set with adhesive which has an extremely high strength-to-weight ratio.
16. Kevlar	Woven fabric with excellent impact resistance.
17. Gore-Tex	Waterproof and breathable textile.
18. Microfibres	Very fine synthetic textile which is breathable and durable.
19. Conductive Fabrics	A textile that allows a small electrical current to pass through them.

Key Terms	
20. First Class Lever	A lever that has the fulcrum in the middle.
21. Second Class Lever	A lever that has the load in the middle.
22. Third Class Lever	A lever that has the force in the middle.
23. Linear Motion	Movement in a straight line.
24. Reciprocating Motion	Movement backwards and forwards in a straight line.
25. Rotary Motion	Movement around a circle.
26. Oscillating Motion	Movement swinging from side to side.
27. Physical Properties	Traits/characteristics that a material has before it is used.
28. Fusibility	Ability to be heated and joined to another material.
29. Electrical conductivity	Ability to conduct electricity.
30. Thermal conductivity	Ability to conduct heat.
31. Resistance to Moisture	Ability to prevent liquid and moisture from permeating the surface.
32. Absorbency	Ability to soak up and retain liquid, heat or light.
33. Mechanical or Working Properties	How a material behaves when it is manipulated.
34. Strength	Ability to withstand a constant force without breaking.
35. Hardness	Ability to withstand scratching, cutting and abrasion.
36. Density	How solid a material is.
37. Toughness	Ability to withstand impact from a dynamic force.
38. Malleability	Ability to be bent or shaped easily.
39. Ductility	Ability to be drawn or pulled into a length or wire without breaking.
40. Elasticity	Ability to be stretched and return to its original shape.

Specialist Material

Specialist Material - Tools and Materials

	**41. Marking Gauge**	Used to make a parallel line to an edge.
	**42. Planes**	Used to create a smooth surface by slicing away thin shavings of waste wood.
	**43. Chisels**	Used to produce a variety of wood joints.
	**44. Tenon Saw**	Used to cut accurate and straight lines in wood.
	**45. Coping Saw**	Used to cut curved lines in wood. Can be used to cut fine and intricate cuts.

Specialist Material (timber)

46. Air Seasoning	A natural method of reducing the moisture content of wood by letting air flow around it in a controlled way.
47. Kiln Seasoning	A quick method of reducing the moisture content of wood. A kiln is filled with steam and then gradually reduced which slowly dries out the wood.

48. Timber Conversion


Baulk Cut


Through and Through


Tangential Cut


Quarter Cut

49. Wood Finishes


Stains (enhances/ changes colour)


Preservatives (Repels water/ moisture and insects)


Varnish (clear finish and adds protection)


Oils (enhances the wood's natural oils)

Material Categories

50. Timber and Board	51. Metals	52. Plastics	53. Textiles	54. Paper and Board
Hardwoods Oak, ash, mahogany. **Softwoods** Larch, pine, spruce. **Manufactured Boards** MDF (medium density fibreboard), plywood, chipboard.	**Ferrous Metals** Low-carbon steel (mild steel), high-carbon steel (tool steel), cast iron. **Non-Ferrous Metals** Aluminium, copper, silver/gold. **Alloys** Brass, bronze, stainless steel.	**Thermoforming Polymers** Acrylic (PMMA), high-impact polystyrene (HIPS), polypropylene (PP). **Thermosetting Polymers** Epoxy resin, urea formaldehyde, melamine formaldehyde.	**Natural Fibres** Cotton, wool, silk. **Synthetic Fibres** Polyester, polyamide, elastane. **Blended Textiles** Polycotton.	**Papers** Bleed proof paper, layout paper, tracing paper. **Boards** Corrugated cardboard, foam core board, duplex board.

Blood Brothers by Willy Russell (1982)

Genre – Musical and Tragedy (Elements of Comedy)		
Question areas	Proxemics; Semiotics; Context - social/cultural/historical; Props; Character traits (movement/voice); Set design; Lighting; Costume; Staging; Performance exam. Actor; Director; Designer.	**Key pages**
Key words	1. **Proxemics -** space/distance between actors 2. **Semiotics -** everything on stage that conveys or symbolises a message or meaning to the audience 3. **Social/cultural/historical: the play's context –** the play was written in the 1980s. The play is set in Liverpool during the 1960s to the 1980s. It is a play that explores the injustice of class divide between middle class (rich) and working class (poor) 4. **Props -** objects on stage (e.g. bible; locket; toy gun; gun; £50 note; mop/tea towel; new shoes; shopping bags from expensive shops; dictionary etc) 5. **Character traits/Aspects of character -** persona; what the character is like and their background. Status in life. A character might change during the plot 6. **Characterisation -** the act of changing voice, body language, movement, gesture etc when in role. The actor must use their skills to portray a character consistently throughout their performance 7. **Movement -** gesture; gait; pace; posture; facial expression; body language; stance; eye contact; quality of movement; level (exaggerated) 8. **Voice -** pace and rhythm; pause; tone; volume; accent; emphasis; quality; resonance (exaggerated) 9. **Set design -** style; colour; position; stage furniture; stage flats; wings; cyclorama; backdrop: legs; ground row; tabs; borders; levels; symbolism; location - the set should represent the context of the play 10. **Lighting -** automated or moving heads; flood light; follow spot; Fresnel; gel; lighting desk; Parcan; practical; profile spot; rigging; strobe; ultraviolet; spotlight; side lights; up light; down light; warm wash; cold wash; flood light; fade-up; fade-down; cross fade (speed of fades can be slow, middle pace, fast) gobo; blackout 11. **Costume -** period costumes; culture; colour; fabric; style; condition; symbolism; element; item (e.g. shirt; hat; shawl; cane; umbrella); movement 12. **Staging -** the process of selecting, designing, adapting to, or modifying the performance space for a play. This includes stagecraft elements as well as the structure of the stage and its components 13. **Performance space -** thrust; in the round; traverse; proscenium arch; end on; apron; black box; promenade; site specific 14. **Sound design -** sound effects; diegetic or non-diegetic; live or recorded; sourcing; underscoring; mixing; amplification; direction; pre-set; transitions; volume	
Key Themes and scenes	15. **Theme - Social class** this issue is explored in the police scene when the police officer treats Mrs J differently from Mr Lyons. The Dole-ites scene highlights the differences between Edward - in this scene he comes back from university for the Christmas holiday and wants to have fun. In contrast Mickey has been given his cards (been made redundant), is married to Linda and they have a baby on the way	47-48 90-93
	16. **Theme - Nurture Vs Nature** this issue is explored in Act 1 the Blood Brothers scene when the boys are 7 years old, it highlights how similar that are to each other at this age and they become firm friends. During the play the brothers take different paths, and we see them become completely different people from each other and they are no longer close. In final scene - the gap between them is stark and Mickey is bitter about the differences in the life that he has led in comparison to Edward's. He says 'Well, how come you got everything... an' I got nothin'	27-31 104
	17. **Theme - Superstition** this issue is explored in Act 1 the shoes on the table scene when Mrs J starts working for Mrs L – Mrs Johnstone panics when Mrs Lyons puts the new shoes on the table highlighting her superstitious nature. Mrs Lyons uses Mrs Johnstone's superstitious nature to control her and stop her revealing the truth	9-15 22-23

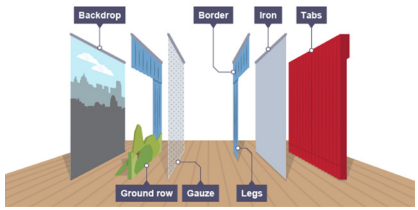
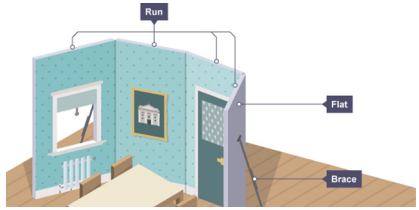
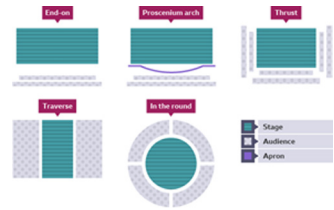
Blood Brothers by Willy Russell (1982)

Key Character – Characterisation - Examples of Movement and Voice		
Working Class Characters:	**18. Mrs Johnstone**	Working class (**voice** - Liverpudlian/scouse working class **accent. Posture** - hunched shoulders to show that she is downtrodden). At 25 years old she has 7 children; suggests she is a maternal character (**proxemics** - always very close to Mickey and Edward, smiling **facial expression** and soft **tone of voice**). Caring, impulsive, makes rash decisions (**voice pace** – quick, saying certain lines quickly and sudden **movements** for example when telling Mrs Lyons in Act 1 to take one of the babies). Generous and values people over money (Open **body language/posture** and enthusiastic **tone of voice**). Uneducated and does not value education. Superstitious. Lively. She is poor and trapped by poverty
	19. Mickey Johnstone	Working Class (**voice** - Liverpudlian/scouse working class **accent**). Friendly, excitable boy in Act 1. Looks up to his older brother Sammy (**movement - pace** fast movements with lots of jumping. **Voice - pace** saying all his lines as quickly as possible). He is energetic, bright and witty, but not very well educated. He likes Edward's generosity and, in turn, enjoys being able to show him new things. Edward gives Mickey a chance to shine and be a leader and escape the oppression he feels from his brother, school and general poverty. Shy about his emotions (**eye line** looking down when Linda says she loves him. **Gesture** - fidgeting with his top) Becomes withdrawn after becoming unemployed in Act 2. Later he is influenced by Sammy to commit a crime and goes to prison where he becomes dependent on antidepressants
	20. Linda	Working Class (**voice** - Liverpudlian/scouse working class **accent**). Kind and compassionate character. Loves Mickey and comes to Mickey's aid both when he is suspended from school and when he is mocked by the other children (**proxemics** - always very close to Mickey, smiling **facial expression** and soft **tone of voice**). Feisty and humorous. Strong-willed. Her lack of education and money allows her no real chance of happiness once Mickey becomes a depressed drug addict. As a last resort, she asks Edward for help before having an affair with him. Her betrayal of Mickey suggests that she is in some ways untrustworthy; but this is also her only chance to escape from the circumstances that have trapped her
	21. Sammy Johnstone	Working Class (**voice** - Liverpudlian/scouse working class **accent**). He is an aggressive and threatening character. From the start of the play he is shown to enjoy making fun of others, especially Mickey. He is presented as anti-social and criminal, threatening a bus conductor with a knife and killing a filling station worker. As an adult he has no job or money
	22. Minor characters	Catalogue man, finance man and milkman, these are created for various dramatic purposes. They either lack sympathy or are unfair and two-faced when dealing with others
Middle Class Characters:	**23. Mrs Lyons**	Upper/Middle class (**Accent** - received pronunciation). A lonely housewife, finds it difficult to be affectionate towards others. Wealthy, self-centred, an over-protective mother, who is always anxious. Suspicions in later scenes due to loneliness. She becomes unreasonable and is possibly mad when she attacks Mrs Johnstone (**Movement - Pace** sudden moves toward Mrs J. **Voice** – **Pitch** high and harsh **tone**)
	24. Edward	Friendly, generous character (**Facial expression** – smiling and calm **tone**). Naively offers him sweets in an attempt to impress Mickey. He joins in with Mickey and Linda's games and unselfishly tries to get Mickey to express his love for Linda. Raised in a middle-class home and is educated at a private school (**Accent** - received pronunciation). Feels restricted as a child/teenager. An impulsive character. Act 2 - He seems to lack compassion and does not sympathise with Mickey's plight as he doesn't understand. Instead, he tells Mickey to use his dole money to live like a 'Bohemian' (Carefree **tone of voice** and open **body language/posture**)
	25. Mr Lyons	Upper/Middle class (**Accent** - received pronunciation). He is a wealthy businessman who spends long periods of time away from his family. He is the managing director of the factory where Mickey worked before Mickey was made redundant. He is a distant figure to his wife and son, preferring not to get involved in their affairs (professional **tone of voice** even when talking to his family. **Gait** stiff and controlled). Instead he provides money and homes in wealthy areas as well as expensive schooling for Edward. He sends Mickey a heartless redundancy letter
	26. Minor characters	Policeman, judge, teacher. These characters are created for various dramatic purposes. They either lack sympathy or are unfair and two-faced when dealing with others.
Neutral character	**27. Narrator**	Russell creates a 'character' of the narrator, who acts like the Greek 'Chorus' from ancient tragedy whose role is to explain some of the key action on stage. The narrator also involves the audience by asking them directly to judge what they see (**eye line** look directly at the audience and into the eyes of characters he wants them to judge). He helps to make sure that the audience stay a little 'detached' from the events of the play (cold **tone of voice** and controlled **movement**). He also helps them remember that this is a 'story'. He reveals that the brothers die at the very start of the play and from then on constantly reminds the audience of the twins' fate. He presents the themes of fate, destiny and superstition throughout the play, but at the end he asks the audience to consider if it was social forces rather than 'fate' that caused the tragedy

Blood Brothers by Willy Russell (1982)

Key Relationships	**28. Mickey and Edward (Eddie)**	Enthusiastic friends at the start. Want to be friends with each other. Do not understand why they cannot be friends, they do not react to the barriers of class and background. There is a change in their relationship when Eddie goes off to university; Mickey loses his job and after Mickey comes out of prison
	29. Mickey and Linda	Mickey's best friend, she always protects him when he is picked on. There is a change in their relationship when Mickey goes to prison and he becomes addicted to drugs
	30. Linda and Edward (Eddie)	Eddie and Linda are friends as children. There is a change in their relationship when she asks him to get Mickey a job and a house
	31. Mrs Johnstone and Mickey	As a mother she loves him completely and blames herself for Mickey's life choices
	32. Mrs Johnstone and Edward (Eddie)	Mrs Johnstone loves Edward and feels guilty about her child growing up never knowing that he is her child. She watches him become successful. Edward likes Mrs Johnstone and it is clear they have a bond even though they are from completely different worlds
	33. Mrs Lyons and Edward (Eddie)	Mrs Lyons loves Edward but is constantly torn apart with the guilt she feels. They do not have an honest relationship as she is keeping a secret that could cost her Edward's love

Design key words

34. Themes/ symbols	The set design can also communicate abstract concepts, such as themes and symbols. As an example, a design could include a large, dead tree to suggest the themes of death in the play	
35. Style	Set design is also important in supporting the style of the production. For example, a play in a naturalistic style would aim to create the impression of reality through realistic-looking props and set items. A play performed in a minimalistic style would use just a few, simple props to represent a setting, such as a large, suspended window frame to suggest the performer is standing inside a grand manor house	
36. Colour	Colour can be used within set design to symbolise various ideas on stage. For example, the set designer for this play could include dull greys and a monochromatic palette (single colour) this could enhance the sad atmosphere and dark themes in the play	
37. Condition	The condition of a design can reveal important information about the setting or a character's circumstances. For example, shabby, ragged and decaying piles of rubbish might suggest that the area is run down and a waste ground	
38. Levels	A set designer can vary levels using a rostra, ramps and/or steps. Blocks, staging units, scaffolding and planks can be used to create levels. Levels are often used in productions to portray a character's status, power or situation	
40. Position	Where you put the items of set on the stage. Use the correct language - upstage, downstage, centre stage, stage left, stage right, upstage centre or left or right, downstage centre or left or right	
41. Stage furniture	Items of set that can be moved on stage but are not props	  
42. Location	The set can tell the audience where and when the scene takes place	
43. Symbolism	Items that represent a message on stage	

Component 1: Devising and Evaluating

Key question areas	Artistic vision – your intention; social/cultural/historical context; genre and style, aspects of the character; actors' movement and voice; staging; set design, structure
Key words	1. **Context/social/cultural/historical:** Date – Place - Issue 2. **Character traits/Aspects of character -** persona; what the character is like and their background; their status in life (remember a character might change during the plot) 3. **Set design -** style; colour; position; stage furniture; stage flats; wings; cyclorama; backdrop: legs; ground row; tabs; borders; levels; symbolism; location. The set should represent the context of the play 4. **Lighting -** flood light; follow spot; gel; strobe; ultraviolet; spotlight; side lights; up light; down light; warm wash; cold wash; flood light; fade-up; fade-down; cross fade (speed of fades can be slow, middle pace, fast pace); gobo; blackout 5. **Costume -** period costumes; cultural costumes; colour; fabric; style; condition; symbolism; element; item (e.g. shirt; hat; shawl; cane; umbrella) 6. **Staging -** the process of sg, designing, adapting to, or modifying the performance space for a play. This includes stagecraft elements as well as the structure of the stage and its components 7. **Performance space -** thrust; in the round; traverse; end on; proscenium arch; black box; white blank canvas; promenade; site specific 8. **Sound design -** sound effects; live or recorded; underscoring; direction; transitions; volume

Performance Spaces Defined	
9. Proscenium Arch	Audience looks at the stage from the same direction as each other. The picture frame through which the audience sees the play - the "fourth wall"
10. End on	Audience looks at the stage from the same direction as each other. Similar to Proscenium Arch
11. Black box	Flexible studio like D1 & D2. Audience & actors are in same room, surrounded by black tabs (curtains)
12. Thrust	Stage projects into the auditorium so that the audience is seated on three sides of the extended piece
13. Traverse	The audience is on either side of the acting area like a fashion show
14. In the round	The acting area is surrounded on all sides by seating. Often a number of entrances through the seating. Special consideration needs to be given to onstage furniture and scenery as audience sightlines can easily be blocked
15. Promenade	The audience moves around the performance space and sees the play at a variety of different locations
16. Site Specific	A piece of performance which has been designed to work only in a particular non-theatre space

Component 1: Devising and Evaluating

Key genre/styles and practitioners – your play may be categorised using multiple genre types and various styles	
17. Naturalism – Stanislavski	Attempts to hold up a mirror to real life. To give the illusion of characters as actual people in real-life situations using everyday language
18. Epic Theatre – Brecht	Episodic scenes, a lack of tension, breaking the theatrical illusion through devices such as direct address, use of songs, projections and narration
19. Physical Theatre - Frantic Assembly	Incorporates dance elements into a dramatic theatre performance and symbolic movement
20. Rudolph Laban	Laban's Eight Efforts help actors to come up with new ways to move as a character
21. Theatre of Cruelty	Artaud thought that theatre should provoke a primal, emotional response from the audience. Various techniques are used to evoke a real reaction such as harsh lighting, complete darkness, disorientating sounds
22. Metatheatre	Comedy and tragedy, at the same time, where the audience can laugh at the protagonist while feeling empathetic simultaneously
23. Forum Theatre	Actors or audience members can stop a performance, often a short scene in which a character was being oppressed in some way. The audience can suggest different actions for the actors to carry out on stage in an attempt to change the outcome of what they were seeing
24. Comedy	There is a happy ending. Intention: amusing and entertaining the audience
25. Melodrama	Exaggerated plot and/or characters in order to appeal to the emotions
26. Realism	Intentionally presents the audience with an accurate depiction of the real world, rather than a stylised interpretation
27. Stylised	Emphasising and often exaggerating elements of the design or characteristics of a role
28. Theatre in Education (T.I.E)	The use of theatrical techniques to educate, covering social issues or topics on the school's syllabus

Key areas for devising	
29. The semiotics of drama	The signs and symbols you choose to put on stage for your audience to "read" - Nothing on stage is an accident - Lighting, sound, props, costume The actor is also a sign – the way you use your voice and movement is a sign for the audience
30. Social, cultural, historical contexts	When and where your play is set and performed / What real-life events and/or issues influence your performance / DATE-PLACE-ISSUE
31. Structure	You should constantly evaluate the structure and create tension graphs to reflect the changes you make along the way **Linear** - when scenes run in a chronological order from beginning to end. Naturalistic. Builds tension to a natural climax **Episodic** - the action unfolds as a series of episodes all connected but usually out of chronological sequence. Most scenes are of equal significance. Scenes can jump about in time and place and do not necessarily build to a natural climax as a result

Ensemble Music

A. Genres

1.	**Chamber Music**	The Baroque Era	Sonata, Trio Sonata	**1.** Basso Continuo **2.** Figured Bass	**3.** Ornaments **4.** Terraced dynamics	**5.** Complex contrapuntal/polyphonic textures **6.** Harpsichord	
		The Classical Era	String Quartet	String quartet movements **1.** Fast, usually in sonata form **2.** Slow, often in ABA or Theme & Variation form **3.** Moderate dance movement, e.g. minuet & trio **4.** Fast, either in sonata form or rondo form		**5.** Sonata form **6.** Arpeggios **7.** Alberti bass **8.** Scalic patterns **9.** Sequences **10.** Canon **11.** Accidentals	**12.** Piano invented **13.** Pedal notes **14.** Regular phrases **15.** Functional harmony **16.** Tutti **17.** Cadenza
		The Romantic Era	String Quartet Piano Quintet	**1.** Extended harmony **2.** Chromaticism **3.** Frequent Modulation **4.** Complex textures	**5.** Contrasting timbres **6.** Virtuoso performers **7.** Leitmotif	**8.** Lyricism **9.** Expression **10.** Expanded orchestra	
2.	**Musical Theatre**	**1.** Libretto **2.** Lyrics numbers/finales **3.** Through-composed		**4.** 32-bar song form **5.** Word-painting **6.** Ballad	**7.** 'Ensemble' numbers/choruses **8.** Opening **9.** Recitative		
3.	**Jazz and Blues**	Jazz trio Rhythm section	**1.** Blues scale **2.** 'Blue' notes **3.** Improvisation **4.** Melisma **5.** Scat singing	**6.** Call and response **7.** 12-bar blues **8.** Simple quadruple time **9.** Syncopation **10.** Swung rhythms	**11.** Brass mutes used **12.** Walking bass **13.** Extended chords **14.** Standard **15.** Head	**16.** Chorus **17.** Break **18.** Back-ups **19.** Kicks **20.** Licks	**21.** Turnaround **22.** Lead sheet **23.** Shout chorus **24.** Front line

B. Textures

4.	**Monophonic**	Single melodic line for an instrumental or vocal soloist, with no accompaniment, or when parts are in unison	9.	**Layered**	When more parts are added (layered) on top of each other, producing a richer texture
5.	**Homophonic**	One main melody is heard with a harmonic accompaniment of chords (or perhaps broken chords)	10.	**Melody and Accompaniment**	When the tune is the main focus of interest and is accompanied by another part
6.	**Polyphonic**	A number of melodic lines heard independently of each other. Imitation and counterpoint are devices used in this texture	11.	**Canon**	Device where the melody is repeated exactly in another part while the initial melody continues
7.	**Unison**	When two or more musical parts sound the same (pitches) at the same time	12.	**Round**	Type of canon where different voices sing exactly the same melody, beginning at different times
8.	**Chordal**	When the parts move together producing a series or progression of chords	13.	**Countermelody**	A new melody that is played at the same time as a previous melody

C. Ensembles

14.	**Basso Continuo**	Keyboard (harpsichord/organ) + Bassline (cello/bassoon/bass gamba)	**1.** Provides the harmonic and rhythmic accompaniment in Baroque music **2.** Uses figured bass to indicate the chords						
15.	**Sonatas**	Sonata – small instrumental piece, Trio Sonata – 2 instruments + basso continuo	**1.** A small instrumental piece **2.** Sonata da chiesa is Italian for 'church sonata' and had four movements					**3.** George Frideric Handel	
16.	**String Quartet**	Violin 1, Violin 2, Viola, Cello	**1.** Varied musical textures used		**2.** Joseph Haydn				
17.	**Jazz/Blues trio**	Piano/Guitar, Double Bass, Drum kit	**1.** Walking bass **2.** The groove	**3.** The beat **4.** Chordal accompaniment		**5.** Lead sheet **6.** Fills	**7.** Stop chords **8.** Dave Brubeck Quartet		**9.** Bill Evans Trio
18.	**Rhythm Section**	Drum Kit, Piano and/or guitar, Double Bass							
19.	**Vocal Ensembles**	Duet, Trio, SATB choir, Backing Vocals	**1.** A cappella **2.** Ballad	**3.** Chest voice **4.** Choral music	**5.** Chorale **6.** Colla voce	**7.** Declamatory writing **8.** Falsetto		**9.** Head voice **10.** Recitative	**11.** Phrase

Film Music

A. Terminology

1.	**Diegetic**	Music contained in the action
2.	**Non-diegetic**	Background music
3.	**Fanfares**	Short musical flourish based on notes of a chord, using dotted rhythms and played by brass instruments
4.	**Theme**	Short musical phrase that is used and repeated
5.	**Leitmotif**	Short musical theme linked with a character, object, place or idea
6.	**Mickey-Mousing**	When the music is precisely synchronised with events on screen
7.	**Minimalism**	Musical ideas are based on small cells which are repeated and evolve gradually
8.	**Layering**	Building up musical ideas
9.	**Ostinato**	Repeated melodic, rhythmic or harmonic musical pattern
10.	**Riff**	Repeated musical phrase
11.	**Click track**	Metronome heard by musicians through headphones as they record
12.	**Cues**	The parts of the film that require music
13.	**Syncing/ sync point**	A precise moment where the timing of the music needs to fit with the action

B. Tempo, Rhythm & Metre

14.	**Allegro/Vivace**	Fast/ lively
15.	**Moderato/ Andante**	Moderate pace / at a walking pace
16.	**Adagio/Lento**	Slow
17.	**Accelerando**	Getting faster
18.	**Ritardando/ Rallentando**	Getting slower
19.	**Pause**	A rest in the music
20.	**Rubato**	Not sticking strictly to time
21.	**Dotted rhythms**	
22.	**Syncopation**	Music that is off beat
23.	**Augmentation**	Note values are replaced with longer ones
24.	**Diminution**	Note values are replaced with shorter ones
25.	**Cross rhythms/ Polyrhythms**	Different rhythms are played simultaneously

C. Tonality

26.	**Atonality**	When there is no sense of home key
27.	**Polytonality**	Two or more keys at the same time
28.	**Bitonality**	Two keys at the same time
29.	**Modes**	Scales system that existed before major/ minor

D. Dynamics

30.	**Piano**	Quiet
31.	**Forte**	Loud
32.	**Crescendo**	Getting louder
33.	**Diminuendo**	Getting quieter

E. Instrumentation

34.	**Instrumentation**	The instruments playing
35.	**Low pitched instruments**	Representing dark and sombre atmospheres, large and slow-moving
36.	**Orchestration**	The arrangement of the instruments
37.	**Historical instruments**	Suggest a time period/ the idea of the past
38.	**National instruments**	Suggest a country (e.g. bagpipes)
39.	**Loud Brass**	Triumphant, war, royalty
40.	**Quiet Brass**	Sinister
41.	**Solo instrument**	Loneliness/isolation
42.	**Strings**	Emotion, passion, grief
43.	**Glissando**	A slide between two pitches
44.	**Very high pitch**	Creates suspense
45.	**Very low pitch**	Creates sense of danger
46.	**Lots of percussion**	Fast action sequence/ dramatic
47.	**Tremolo strings**	Tension, fear, drama
48.	**Glockenspiel**	Magic, fairy tales
49.	**Timpani**	Large orchestral drums
50.	**Timbre**	The 'sound quality' or 'tonal colour' of a particular instrument or voice

F. Harmony

51.	**Diatonic**	All the notes in the chords are in the key (also called 'consonant' harmony)
52.	**Chromatic**	Chords that use notes not in the key
53.	**Arpeggio**	Each note of a chord played separately

Musical Forms and Devices

A. The Western Classical Tradition

1.	**The Baroque Era**	1600-1750	**1.** Ornaments **2.** Terraced dynamics **3.** Different types of texture (homophonic and polyphonic)	**4.** Major/minor key system **5.** Small orchestras **6.** Use of harpsichord, basso continuo and figured bass	**7.** Binary, ternary, rondeau
2.	**The Classical Era**	1750-1810	**1.** Balanced phrases **2.** Functional harmony **3.** Alberti bass	**4.** Larger orchestra **5.** Frequent use of homophony **6.** Contrasts in dynamics and mood	**7.** Minuet and trio form, variations, rondo, sonata, ternary
3.	**The Romantic Era**	1810-1910	**1.** Lyrical melodies and themes **2.** Leitmotifs **3.** More expressive	**4.** Chromaticism **5.** Unexpected key changes **6.** Even larger orchestra	**7.** Developments in form: music often linked to other art forms

B. Musical Forms

4.	**Binary**	A, B	Two contrasting sections: both are usually repeated	Bach: March in D major
5.	**Ternary**	A, B, A	Three sections: the outer two are the same, the middle one contrasts	Mozart: Lacrymosa
6.	**Rondo**	A, B, A, C, A	The opening section keeps returning, with contrasting sections in between	Purcell: Rondaeu
7.	**Variation**	T, V1, V2, V3	A theme is followed by sections in which it is developed in imaginative ways	Mozart: Ah, vous dirai-je, Maman'
8.	**Strophic**	A, A, A	Same music repeated in every section	Brahms: 'Weigenlied'
9.	**Minuet and Trio**	M, T, M	Both use binary form. The trio is like a second minuet but contrasting in some way	Haydn: Minuet-Trio (Symphony 94)

C. Musical Devices

10.	**Repetition**	The exact repeat of a musical idea or phrase, without variation	19.	**Pedal**	A held or repeated note against which changing harmonies are heard
11.	**Contrast**	A change in the musical content. Often achieved through dynamics, key, tempo or instruments	20.	**Canon**	When a melody is repeated in another part while the initial melody is still being played
12.	**Anacrusis**	A note or notes which are played before the first strong beat	21.	**Conjunct**	When the melody moves by steps (next-door notes)
13.	**Imitation**	When a musical idea is copied in another part. This can be used in polyphony	22.	**Disjunct**	When the melody leaps between notes that are not next to each other
14.	**Sequence**	The repetition of a melodic phrase, but at a higher or lower pitch	23.	**Broken Chord/ Arpeggio**	When the notes of a chord are separated and played in succession, either up or down
15.	**Ostinato**	A musical pattern which is repeated many times. Known as a riff in modern music	24.	**Alberti bass**	A type of broken chord accompaniment, which was common in the Classical period
16.	**Syncopation**	Same as 'off beat'. When accented notes are played on the weaker beats of the bar	25.	**Motifs**	A short melodic or rhythmic idea that has a distinctive character
17.	**Dotted rhythms**	A dot after a note increases its value by half again. This gives a 'jagged' effect to the rhythm	26.	**Chord Progressions**	A series of chords related to each other in a particular key
18.	**Drone**	A repeated note or notes held throughout a passage of music	27.	**Modulation**	The process of changing key
			28.	**Regular phrases**	The balanced parts of a melody

Pop Music

A. Structure		
1.	**32-bar song form**	32 bars long, presents two ideas (A and B)
2.	**Strophic**	Intro – Verse 1 – Verse 2 – Verse 3 – Verse 4 – etc. – Outro
3.	**12 bar blues**	12 bars arranged in harmony: I – I – I – I – IV – IV – I – I – V – IV – I – I
4.	**Verse-chorus form**	Intro-Verse-Chorus-Verse-Chorus-Outro
5.	**Riffs**	Repeated musical pattern
6.	**Middle 8 / Bridge**	Contrasting section towards the end of a song
7.	**Instrumental Break**	Instrumental section during a song
8.	**Fill**	Short instrumental passage between two vocal phrases

B. Melody		
9.	**Range**	The span of notes the vocalist covers
10.	**Blue notes**	Flattened 3rd, 5th or 7th
11.	**Hooks**	Catchy melody which returns during a song
12.	**Diatonic**	All the notes are in the piece's key
13.	**Chromatic**	Melody includes notes that aren't in the piece's key
14.	**Melismatic**	More than one note per syllable
15.	**Syllabic**	One note per syllable
16.	**Conjunct**	Melody moves by step
17.	**Disjunct**	Melody includes large leaps

C. Instrumentation		
18.	**Rhythm Guitar**	Ordinary electric guitar which supports the rhythm by strumming the chords
19.	**Lead Guitar**	Electric guitar that plays the melody / harmonises with vocals / has a solo
20.	**Bass Guitar**	Usually has four strings and provides the low notes (the bass line)
21.	**Drum Kit**	3-5 drums, some cymbals and a high hat
22.	**Keyboards**	Electric pianos, synthesisers, Hammond organs
23.	**Lead and Backing vocals**	Main soloist and other voices which join to support the main singer / provide harmonies / countermelodies
24.	**Falsetto**	A vocal technique used by male singers to reach notes outside of their range

Pop Music

D. Techniques		
25.	**Looping**	Repeating a part of the music
26.	**Sampling**	Taking a sample of one sound recording and using it in another song
27.	**Panning**	A studio technique for adjusting sound levels between the left and right speakers
28.	**Phasing**	An electronic delay effect
29.	**Balance**	Relative of volume of the individual performers in a group
30.	**Remixing**	Changing a piece through electronic manipulation
31.	**Delay**	Electronically produced repeated, decaying echo
32.	**Reverb**	Effect which creates a sense of depth
33.	**Distortion/ Overdrive**	Both refer to ways of increasing the gain of amplified instruments, producing a growly/fuzzy tone
34.	**Wah-wah**	Pedal that mimics sound of human voice
35.	**Auto Tune**	Alters the pitch in recorded vocals

E. Harmony		
36.	**Notes of the triad**	Root, Third, Fifth
37.	**Primary Chords**	Tonic, Subdominant, Dominant. Sometimes these are written in Roman Numerals (I, IV, V)
38.	**Secondary Chords**	Chords borrowed from another key
39.	**Chord Progression**	The order of chords in a song, changes for different sections
40.	**Cadences**	Perfect (V-I), Plagal (IV-I), Imperfect (?-V), Interrupted (V-?)
41.	**Harmonic Rhythm**	The rate at which the chords change in a song

F. Tempo, Rhythm & Metre		
42.	**Syncopation**	The off-beats are emphasized
43.	**Driving rhythms**	Rhythms which drive the music forward

G. Genres		
44.	**Pop**	A general term covering the many different styles and genres of music around since the late 18th Century that are considered to be part of modern everyday culture
45.	**Rock**	A general term that covers many different genres of music which have developed since rock and roll in the 1950s. There have been many stylistic changes in this period
46.	**Fusion**	When musical styles are combined together to make something new
47.	**Bhangra**	A fusion of Indian and Western music, combined to make a new style

Core knowledge

Computer Systems

A computer system has both hardware and software.

Keyword	Definition
Hardware	The physical components that make up a device or computer system.
Software	The programs that give instructions to the hardware to make it perform the desired task.

Software Classification

Keyword	Definition
Application Software	A program designed to perform a specific task that the user interacts directly with (e.g. spreadsheets, web browser and word processor, disk defragmentation).
System Software	A program concerned with the running of the computer. Its purpose is the control the computer hardware and manage the application software. (e.g. operating system, antivirus, backup tools, firewall)
Operating System (OS)	The most important piece of system software. The OS handles management of the processor, memory, input/output devices, applications, and security.
Functions of the operating system	
Application management	Manages installation of an application and control access of data and devices to the application
Processor management	Allows multiple applications to be run simultaneously by manages the processing time between applications and CPU cores. Multitasking refers to this.
Memory management	Moves files and programs in and out of memory.
Security	Controls user's access to files and data. Provides security updates.
Input/Output devices	Allows users to send and receive data from input/output devices.

Cloud Computing

Cloud storage	Can store data and files on a server elsewhere that can be accessed via the internet.	
Cloud applications	Using applications over the internet.	
Cloud file management	Accessing, syncing, backing up, and sharing files over the internet	
	Advantages	**Disadvantages**
Cloud Computing	• Only pay for storage that you use • Data and files available from anywhere in the world where there is an internet connection • Data automatically backed up	• Need a reliable network connection • Files are hosted elsewhere so a security concern • The most recent versions of software is often not available • Transfer of data over the internet will slow down performance.
Local Storage	• Files can be accessed even when there is no internet connection • More secure as files to not need to be transferred over the network and the user has more control	• Users need to organise their backup solutions • Not so easy to share documents • Can only access the files locally

Memory

Keyword	Definition
Volatile memory	Main memory. When the computer is turned off the contents of volatile memory is lost.
Non-volatile memory	Secondary storage. When the computer is turned off the contents of non-volatile memory is kept.
ROM	Read Only Memory. Data can only be read from the device, and the memory cannot be edited or deleted. Stores the start-up instructions on a computer.
RAM	When applications are executed, they are loaded into RAM first. RAM is volatile.

Core knowledge

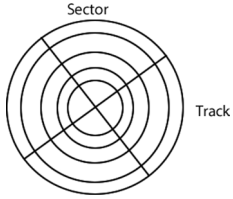
Embedded Systems

Keyword	Definition
Embedded system	A computer system that is designed for a specific function.
General-purpose computer	A computer system that can carry out many tasks.
Embedded systems examples	Home appliances like a dishwasher, fridge, microwave, oven, air conditioning.

Secondary Storage

Magnetic Hard Disk

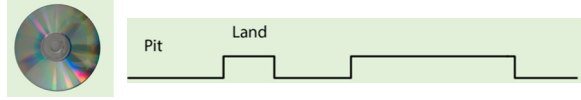
- Tracks on the disk platters contain tiny magnets, each holding 1 bit of data.
- The polarity (negative or positive) of the magnets determines whether the bits are 0 or 1.
- The write head modifies the polarity of the magnet as appropriate.
- The read head identifies whether each magnet is negative or positive.
- The tracks are laid out as a series of concentric rings.



Advantages	Disadvantages
• Cheap form of storage • Can store large amounts of data	• Less reliable because it contains moving parts that can break • Electromagnetic surge can corrupt the data held • Slow speed of read/write access

Optical Disks

- Tracks on the disk contain pits and lands.
- The track is a spiral.
- A laser is emitted, and the laser light is reflected when it hits the lands, but is scattered when it hits the pits.
- Depending on whether the light is scattered light is encoded as a binary value of 0 and reflected light is encoded as a 1.
- The sensor is able to detect light reflected, but not scattered.
- Example: Blu-Ray (25 Gb) DVD (4.7 Gb), CD (700 Mb).



Advantages	Disadvantages
• Can transfer easily between computers • Cheap for low amounts of data storage	• Can scratch easily • Not much storage compared with other methods.

Solid state Drive

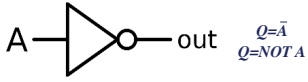
- Use millions of switches called floating gate transistors on microchips to store data.
- Electrons are stored in gates and this is encoded as 0 when there is an electron present and encoded a 1 when there is no electron present.
- The electros remain trapped even when there is no flow of electricity.
- Contain no moving parts and are therefore more robust that optical and magnetic storage.

Advantages	Disadvantages
• Much faster than other means of storage • More reliable than other means if you are only reading data • Quiet	• More expensive per volume of storage • Reliability might be an issue if you write a lot of data to it

Core knowledge

Boolean Logic

NOT gate - The output is the opposite of the input

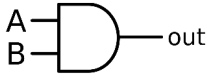


$Q=\bar{A}$
$Q=NOT\ A$

NOT truth table

Input	Output
0	1
1	0

AND gate - has two inputs and will have a true output if the two inputs are true otherwise the output will be false



$Q=A.B$
$Q=A\ AND\ B$

AND truth table

Input - A	Input - B	Output
0	0	0
1	0	0
0	1	0
1	1	1

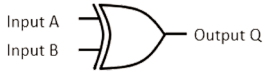
OR gate - has two inputs and will have a true output if either or both the inputs are true

$Q=A+B$
$Q=A\ OR\ B$

AND truth table

Input - A	Input - B	Output
0	0	0
1	0	1
0	1	1
1	1	1

XOR gate - has two inputs and will have a true output if either the inputs are true but not both



$Q=A \oplus B$
$Q=A\ XOR\ B$

AND truth table

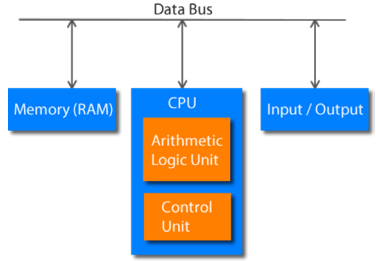
Input - A	Input - B	Output
0	0	0
1	0	1
0	1	1
1	1	0

Boolean Expression Operators

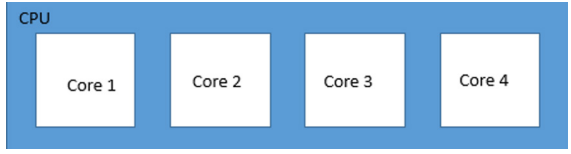
Operator		Example	
AND	.	Q = A AND B	Q = A . B
OR	+	Q = A OR B	Q = A + B
NOT	¯	Q = NOT A	Q = A
XOR	⊕	Q = A XOR B	Q = A ⊕ B

System Architecture

Keyword	Definition
CPU/ Processor	Fetches instructions from memory, decodes them, and executes them to perform a task
Von Neumann architecture	The stored program concept, where program instructions and the data to be processed can be stored in the same memory.
Bus	Wires through which data and instructions are transferred between computer components
Clock	Keeps all the CPU components synchronised
ALU	Arithmetic logic unit. Where basic arithmetic and logical operations take place
Control unit	Controls the FDE cycle.
Registers	A very small amount of memory that store instructions and data during FDE cycle. Volatile.
Cache	A larger piece of memory that can store data and instructions that are likely to be reused. Also volatile



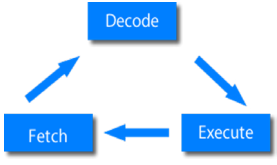
Factors affecting CPU performance	
Clock speed	The number of cycles that a processor carries out per second. Each cycle of the CPU allows a single action (instruction) to be carried out. The greater the clock speed, the greater the number of operations and the faster the computer will run.
Number of processor cores	Nowadays most CPUs have multiple cores. Having multiple cores allows instructions to be carried out concurrently (at the same time), whereas a single core will only allow carry out instructions in serial (one at a time).
Latency	Delay in transfer of data between components
Cache size	Controls user's access to files and data. Provides security updates.
Input/Output devices	The bigger the cache the greater the volume of data and instructions that can be stored thereby reducing latency and improving performance of the CPU.



Core knowledge

FDE cycle

1. Instructions are loaded into memory
2. Processor fetches the instruction from the main memory
3. Instruction is decoded so the CPU knows what to do with the instruction
4. Processor then executes the instruction
5. Result of the instruction can be stored in memory
6. Next instruction is then fetched from main memory and the cycle repeats itself.



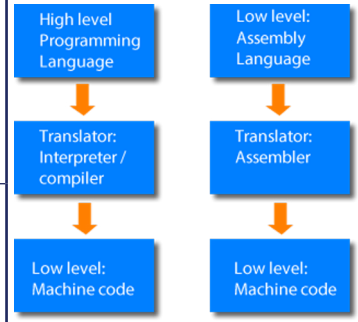
Classification of Programming Languages

Keyword	Definition
High level languages	Closer to human language and is therefore easier to understand. A translator is used to convert the instructions into code that the computer understand.
Low level languages	Refer to machine code and assembly language. Is close to the language understood by the computer. However, it is difficult for humans to understand.
Machine code	Expressed in binary values 0 and 1. This is the language that computers understand. All programming languages need to be translated into machine code. Machine code is specific to a processor.
Assembly language	Provides basic computer instructions for programs to run. There is a one to one relationship between machine code and assembly code instructions. One assembly language instruction maps to one machine code instruction,
ALU	Arithmetic logic unit. Where basic arithmetic and logical operations take place
Control unit	Controls the FDE cycle.
Registers	A very small amount of memory that store instructions and data during FDE cycle. Volatile.
Cache	A larger piece of memory that can store data and instructions that are likely to be reused. Also volatile

Low level languages versus high level languages

	Advantages	Disadvantages
Low level	Produce code that is faster and better optimised than high level languages. Appropriate for developing new operating systems, embedded systems and hardware device drivers	Difficult to understand and modify Assembly code is written for a specific processor architecture, and so is not portable to other computer architectures
High level	High level programming languages allow code to be written that is more portable. Thus code can be run on different of the types of computer system with different processor architecture. Easier to understand Easier to modify	Needs a translator Runs slower because of the layers of abstraction and there is inefficiency in translator.

Program translators	
Translator	Allow programs to be translated into machine code so then programs can be run on a computer.
Interpreter	Converts high level languages into machine code one instruction at a time on-the-fly while the program is running. Each instruction is converted to machine code once the previous instruction has been executed.
Compiler	A program that converts high level languages into machine code before the program is run. A compiler saves the machine code, so the source code is no longer needed. A compiler allows a program to be run faster than interpreted code.
Assembler	Converts assembly language instructions into machine code.



Core knowledge

Computer Networks

Keyword	Definition
Network	A set of computers that are connected to one another.
PAN	Personal Area Network. Set up around an individual person, usually using Bluetooth.
LAN	Local Area Network. Covers a relatively small geographical area typically extends over the range of a single organisation such as a university campus, school site. LANs are usually managed by a single organisation.
WAN	Wide Area Network. Made up of many local area networks and covers a much wider geographical area. The internet is the ultimate WAN. It is a network of networks with billions of interconnected devices.

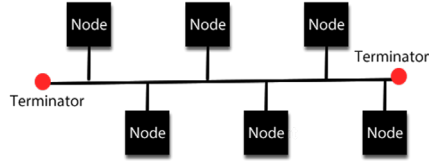
Advantages of a network	Disadvantages of a network
✓ Share resources, such as software applications, files and hardware (e.g. printers). ✓ Allows communication (e.g. email) and can transfer files easily. ✓ Easier network management (e.g. can backup data onto a central file server; updates can be sent to all computers; users on a network can login to any computer)	× Greater security risk as computers can be hacked if they are connected to the internet. × Worms can spread from one computer to another × A problem with any shared resource, (e.g. file server goes down) can impact the whole network.

Network Topology

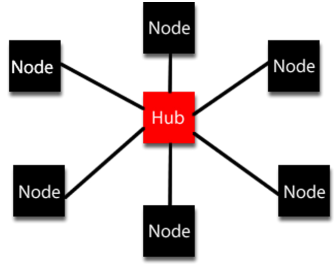
Network Topology	Describes how a set of computers are arranged within a network.
Bus Topology	All devices including clients, servers, printers and so on are connected to a cable called a bus/backbone cable. All communication is via the shared bus. At either ends of the bus is a terminator.
Star Topology	All devices including clients, servers, printers and so on are connected to a central hub or switch. All communication is via the hub.

	Advantages	Disadvantages
Bus topology	✓ Easy and cheap to install and does not require much cable ✓ Easy to add more computers	× If the main cable fails then then the whole network fails. × Less secure as data are broadcast to all devices on the network. × Can be slow as there are collisions between data along the shared bus. × Will get slower as more computers are added.
Star topology	✓ Greater security as data is only sent to the intended recipient. ✓ If any of the connections fail only a single node will be affected. ✓ Fewer collisions between data packets	× If the central hub fails, then every computer on the network is affected. × Expensive as extra cable and hardware (hubs) are needed.

Bus topology diagram



Star topology diagram



Core knowledge

Wired and Wireless

Wired Network	Use cables to communicate, like copper or fibre optic cables.
Wireless Network	Use radio waves communicate (e.g. Wi-Fi).

	Advantages	Disadvantages
Wired	• Allows more control, security, and reliability. • Can restrict who has access to the network. • Wired methods have greater speeds than wireless methods.	• Cables can be difficult to maintain in big organisations. • Having many cables can get expensive. • Worse for the environment. • Less portability
Wireless	• Can use computer anywhere and not constrained by cables. • Not as much hardware needed.	• Security is a much more difficult challenge. • Slower than wired methods • Signal can be interfered with by obstacles and other electronic devices.

Copper cables use electrical signals to transmit data. Three main types:

Coaxial cable	The signal loses strength over long distances
Unshielded twisted pair	A pair of copper cables are twisted together and allows data to be transmitted over longer distances
Shielded twisted pair	Shielding around the twisted cables means the signal is less susceptible to interference.

Fibre Optic cables are glass or plastic and use pulses of light to transmit data

	Advantages	Disadvantages
Copper cables	• Cheaper than fibre optic • Reliable because a telephone is powered from the copper cable and does not rely on a separate electrical power supply	• Slow • Low capacity • Can only be used over short distances • Interference can occur
Fibre Optic cables	• Higher bandwidth than copper so can transmit more data • Less attenuation (degrading) of the signal so fibre optic is more suitable over long distances • Less "cross talk" interference between fibres compared with copper so the quality of the signal is better	• Expensive • Difficult to install

Network Security and Protocols

Why do we need network security?

- ✓ To prevent unauthorised access to a network.
- ✓ To protect our data e.g. to prevent sensitive data being stolen
- ✓ Prevent cyberattacks

Methods of Network Security

Keyword	Definition
Authentication	Allows us to confirm the identity of an individual.
Encryption	The message is garbled so if it gets intercepted during transmission it will be almost impossible for anyone without the key to read the original message.
Firewall	Prevents incoming packets containing malware getting into the network.
MAC address filtering	A MAC (Media Access Control) address is a unique identifier for any device that is connected to a network. Each network interface card has a unique MAC address that is a 12-digit hexadecimal code. Specific devices can be blocked from accessing a network.

Core knowledge

Network Protocols

Keyword	Definition
Network protocol	A set of rules that allow computers to communicate and exchange information over a network. There are many types of protocols depending on the application.
HTTP	Hyper Text Transfer Protocol. The protocol used for the World Wide Web. Used for accessing web pages.
HTTPS	Secure version of HTTP. The data is encrypted during transfer. Used for e-commerce and online banking.
FTP	File Transfer Protocol. Used to download or upload large files from a server to a client.
Ethernet	Not a single protocol but a collection of related protocols. LANs most commonly use ethernet.
Wi-Fi	A collection of protocols that use radio waves to transmit data between devices. Wi-Fi is a trademark and WLAN (Wireless LAN) is the generic term.
SMTP	Simple Mail Transfer Protocol. Sends emails from the user onto the email server.
IMAP	Internet Message Access Protocol. Retrieves the email from the email server to the client (user) and allows access from anywhere on any device because the email remains on the server.
TCP	When files are sent over the internet, they are broken up into small chunks called packets. When they arrive at the destination computer they are reassembled back into the original format.
UDP	Used as an alternative to TCP. It is used in video conferencing and online gaming when speed is necessary as huge volumes of data are transferred in real time. It improves speed by not checking for lost packets, so they do not get re-sent.
IP	Internet Protocol. A set of rules that govern the transmission of data across the internet.

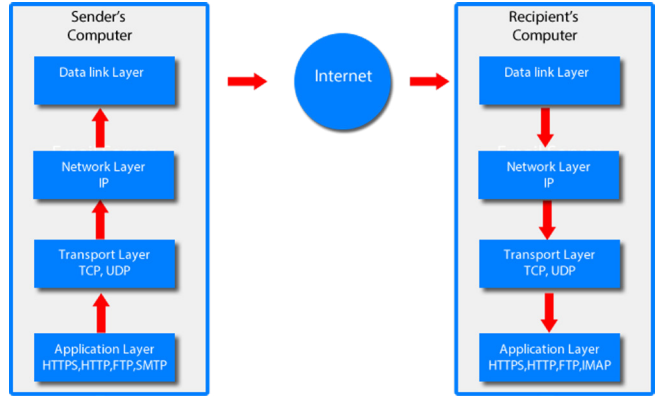
TCP/IP

The TCP and IP protocol work closely together and are referred to as TCP/IP. The TCP/IP model consists of four layers that pass data between each layer.

Application layer	Contains protocols related to the application such as HTTP, HTTPS for web browsers, FTP for file transfer and SMTP and IMAP for email.
Transport layer	Establishes the end to end connection. It splits the data into packets and passes the data onto the network layer. On the recipient's computer the transport layer reassembles the packets into the original form. TCP and UDP are the main protocols used in this layer.
Network layer	Adds the source and destination IP address and route the packets over the network. At the destination the network layer strips out the IP addresses. The IP operates on this layer. Can also be called the Internet layer.
Link layer	Has a network card and deals with the physical connection and adds the physical addresses (MAC address) of the hardware to the packets that it receives from the network layer.

Use the following mnemonic to remember the 4 layers:

- All (Application)
- Turtles (Transport)
- Need (Network/Internet)
- Love (Link)



Core knowledge

Data Representation

Number bases

Denary	Base 10. Means that we have 10 possible values (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) in each place value (1s, 10s, 100s..)
Binary	Base 2. Means we have 2 values, 0 and 1. Computers store data and instructions in binary.
Hexadecimal	Base 16. To make up the 16 values we use the ten denary numbers in addition to 6 letters (A, B, C, D, E, F).

Binary

To calculate the maximum value for a given number of bits we use 2n-1 where n is the number of bits. For example for 4 bits we have 24-1 which is 15.

Bits	Max value binary	Max value denary
1	1_2	1_{10}
2	11_2	3_{10}
3	111_2	7_{10}
4	1111_2	15_{10}
5	11111_2	31_{10}
6	111111_2	63_{10}
7	1111111_2	127_{10}
8	11111111_2	255_{10}

Denary	Hex.	Binary
0_{10}	0_{16}	0000_2
1_{10}	1_{16}	0001_2
2_{10}	2_{16}	0010_2
3_{10}	3_{16}	0011_2
4_{10}	4_{16}	0100_2
5_{10}	5_{16}	0101_2
6_{10}	6_{16}	0110_2
7_{10}	7_{16}	0111_2

Denary	Hex.	Binary
8_{10}	8_{16}	1000_2
9_{10}	9_{16}	1001_2
10_{10}	A_{16}	1010_2
11_{10}	B_{16}	1011_2
12_{10}	C_{16}	1100_2
13_{10}	D_{16}	1101_2
14_{10}	E_{16}	1110_2
15_{10}	F_{16}	1111_2

Hexadecimal advantages:

- Easier to read than binary for programmer
- Fewer characters per value so easier to write for programmers

Hexadecimal is not understood by a computer! It must always be translated to binary for it to understand

Core knowledge

Converting Between Number Bases

Denary to binary conversion

1. Create a grid:

128	64	32	16	8	4	2	1

2. Add a 1 to the corresponding cell if number contributes to target number and 0 to all the other cells

Worked example: convert 24_{10} to binary.

128	64	32	16	8	4	2	1
0	0	0	1	1	0	0	0

$16_{10} + 8_{10} = 24_{10}$
The binary value is $\underline{11000}_2$ (we can ignore the preceding zeros)

Binary to denary conversion

Worked example: Convert 01011001_2 to denary

1. Create the grid:

128	64	32	16	8	4	2	1
0	1	0	1	1	0	0	1

2. Add up the cells that have a corresponding value of 1:
$64 + 16_{10} + 8_{10} + 1 = \underline{89}_{10}$

Hexadecimal to denary conversion

1) Convert the two hex values separately to denary value
2) Multiply the first value by 16
3) Add the second value

Worked example: Covert $A3_{16}$ to denary
$A_{16} = 10_{10}$
$3_{16} = 3_{10}$
$(10_{10} \times 16_{10}) + 3_{10} = \underline{163}_{10}$

Denary to hexadecimal conversion

1) Integer divide the denary number by 16
2) Take the modulus 16 of the denary number
3) Convert the two numbers to the corresponding hex values.

Worked example: Convert 189_{10} to hex
$189_{10} / 16_{10} = 11_{10}$ remainder 15_{10}
$11_{10} = B_{16}$
$15_{10} = F_{16}$
$189_{10} = \underline{BF}_{16}$

Hexadecimal to binary conversion

1. Find the corresponding 4-bit binary number for the two numbers
2. Concatenate the two binary values to give the final binary value

Example: convert $C3_{16}$ to binary
$C_{16} = 12_{10} = 1100_2$
$3_{16} = 3_{10} = 0011_2$
$\underline{11000011}_2$

Binary to hexadecimal conversion

1. Split the binary number into groups of 4 bits: $1110_2\ 1010_2$
2. Find the corresponding Hex value for each of the 4-bit groups

Worked example: Convert 11101010_2 to hexadecimal
$1110_2 \mid 1010_2$
$1110_2 = 14_{10} = E_{16}$
$1010_2 = 10_{10} = A_{16}$
$\underline{EA}_{16}$

Core knowledge

Units of Information

A bit is the fundamental unit of binary numbers. A bit is a binary digit that can be either 0 or 1.

1 byte = 8 bits
1 nibble = 4 bits

Unit	Symbol	Number of bytes
Kilobyte	KB	103 (1000)
Megabyte	MB	106 (1 million)
Gigabyte	GB	109 (1 billion)
Terabyte	TB	1012 (1 trillion)

Character Encoding

Character coding schemes allows text to be represented in the computer. One such coding scheme is ASCII. ASCII uses 7 bits to represent each character which means that a total of 128 characters can be represented.

Lower case letters	26
Upper case letters	26
Numbers	10
Symbols (e.g. comma, colon)	33
Control characters	33

ASCII encoded values for some characters

A	1000001_2	65_{10}
B	1000010_2	66_{10}
a	1100001_2	97_{10}
b	1100010_2	98_{10}
"0"	0110000_2	48_{10}
"1"	0110001_2	49_{10}

- ASCII has a limited character set (7 bits, 128 characters), but Unicode has 16 bits and allows many more (65K) characters.
- Unicode provides a unique character for different languages and different platforms.
- It allows us to represent different alphabets for instance Greek, Mandarin, Japanese, Emojis etc.
- Unicode and ASCII are the same up to 127.

Binary Addition

Binary addition rules

$0_2 + 0_2 = 0_2$
$0_2 + 1_2 = 1_2$
$1_2 + 0_2 = 1_2$
$1_2 + 1_2 = 10_2$ (carry 1)
$1_2 + 1_2 + 1_2 = 11_2$ (carry 1)

Example

$$\begin{array}{rl} & 10101001_2 \\ & 00001001_2 \\ + & 00010101_2 \\ \hline & 11000111_2 \\ \text{carry} & \ 111 \quad\ 1 \end{array}$$

Binary Shift

The binary shift operator is used to perform multiplication and division of numbers by powers of 2

multiply/divide	x 16	x 8	x 4	x 2	/ 2	/ 4	/ 8
shift	<<4	<<3	<<2	<<1	>>1	>>2	>>3

Example: Apply shift operator to 1101_2 (13_{10})

Shift	Result	Denary
<<1	11010_2	$13_{10} \times 2_{10} = 26_{10}$
<<2	110100_2	$13_{10} \times 4_{10} = 52_{10}$
>>1	110	$13_{10} / 2_{10} = 6_{10}$

Note that odd numbers are rounded down to the nearest integer when the right shift operator is applied.

Core knowledge

Sound

Sample - Measure of the analogue signal at a given point in time

Sample rate - number of samples taken per second and is measured in Hertz.

Sample resolution - number of bits used to represent each sample

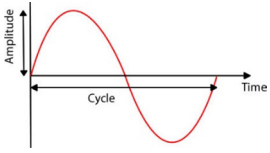
The size of sound files can be calculated using:

Size of file *= length (seconds) x sample rate x sampling resolution*

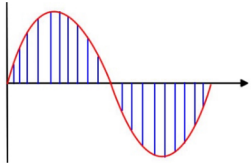
For sound to be stored digitally on a computer it needs to be converted from its continuous analogue form into a discrete binary values. The steps are:

1. Microphone detects the sound wave and converts it into an electrical (analogue) signal
2. The analogue signal is sampled at regular intervals
3. The samples are approximated to the nearest integer (quantised)
4. Each integer is encoded in binary with a fixed number of bits

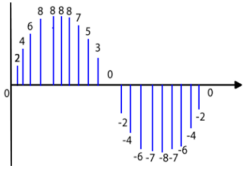
Original analogue signal regular intervals



Sample signal at



Integer values give to each sample



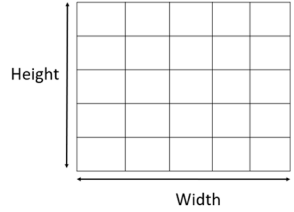
Encode as binary

0 2 4 6 8 8 8 8 7 5 3 0 ->
00000 00010 00100 01000
01000 01000 01000 00111
00101 00011 …

Images

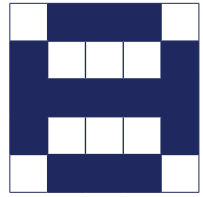
Bitmap images are made up from tiny dots called pixels. Each pixel will have a colour associated with it. An image can then be constructed from many of pixels which will have different colours arranged in rows and columns.

Resolution = width (pixels) x height (pixels)



Colour depth is the number of bits used to represent each pixel in an image. If we have a black and white image it has two colours. Each pixel can be represented by a single pixel because a bit value of 0 is black and 1 is white.

Image and corresponding binary encoding



01111010001111111000101110

To represent more colours we can use more bits. For instance if we have 2-bits per pixel we can represent 4 colours because we know have 4 binary code combinations (00, 01, 10, 11) where each code represents a different colour

Calculating the size of a bitmap image

File size (bits) = width (pixels) x height (pixels) x colour depth (bits)

File size in bytes = (width x height x colour depth) / 8

Core knowledge

Data Compression

The purpose of data compression is to make the files smaller which means that:

- Less time / less bandwidth to transfer data
- Take up less space on the disk

Given that there are 7 bits per ASCII character, the uncompressed size of an ASCII phrase is:

Size = number of characters (including spaces) x 7

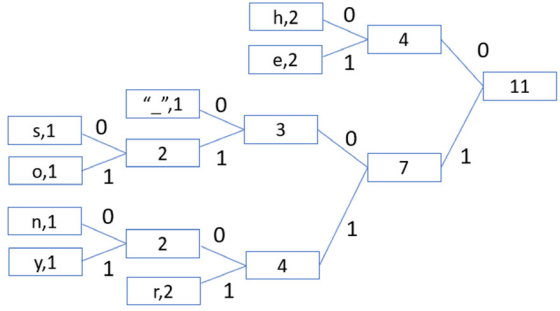
Run Length Encoding (RLE) is a compression method where sequences of the same values are stored in pairs of the value and the number of those values. For instance, the sequence:
0 0 0 1 1 0 1 1 1 1 0 1 1 1 1
Would be represented as:
3 0 2 1 1 0 4 1 1 0 4 1

Huffman coding is a form of compression that allows us to use fewer bits for higher frequency data. More common letters are represented using fewer bits than less common letters. For instance, "a" and "e", which occur in many words would be represented with fewer bit than "z" which occurs rarely.
This allows for much more effective compression than RLE.

Worked Example: How much smaller is the phrase 'henry horse' encoded using Huffman encoding compared with its uncompressed size.

Calculate the uncompressed size
In the phrase henry horse there are 11 characters (including the space). Therefore the uncompressed size is 11 x 7 = 77 bits

Here is the Huffman tree for the phrase:



Letter	encoding
e	01
h	00
r	111
<space>	100
o	1011
s	1000
n	1100
y	1101

Encode message
00 01 1100 111 1101 100 00 1011 111 1000 01 = 33 bits

Therefore, by using compression we have reduced the size from 77 bits to 33 bits a saving of 44 bits.

Christianity: Beliefs and Teachings (Unit 2)

Topics covered:

1. Nature of God
2. Evil and Suffering
3. The Trinity
4. Creation
5. The Incarnation
6. The Crucifixion
7. The Resurrection
8. The Ascension
9. Life After Death
10. Heaven and Hell
11. Sin and Salvation
12. Jesus and Salvation
13. Atonement

1. Nature of God

What do Christians believe about God?

- ✓ Immanent (present in Earth and involved with humanity)
- ✓ Transcendent (outside life and beyond understanding)
- ✓ Omnipotent (all-powerful)
- ✓ Omnibenevolent (all-loving and all-good)
- ✓ Merciful (compassionate and forgiving)
- ✓ Just (fair and judges humans' actions)

'God so loved the world that he gave his one and only Son'. John 3:16
'Nothing is impossible with God'. Luke 1:37

2. The problem of evil and suffering

- ✓ **Why is this a problem?** Many question why a loving God would allow people to suffer rather than prevent it.
- ✓ **What do Christians believe?** Christians believe God treats all people fairly and is incapable of making the wrong judgement.
- ✓ **How does this influence Christians?** Christians are therefore sure that they can trust God even when things appear to be going wrong.

3. The Trinity

- ✓ What is it? The concept of the trinity is that there are three 'persons' all of which are God.
- ✓ God is made up of three persons, not three separate people.
- ✓ God is not a physical being.
- ✓ Think of the three persons as non-physical elements.
- ✓ The trinity describes the following:

There is only one God

Each person of the Trinity is fully God

The persons of the trinity are not the same

The Father

- ✓ The first person of the trinity is the Father.
- ✓ God the Father is believed to be the creator of earth and all living things on it.
- ✓ As the creator, he acts as a good father would towards his children.
- ✓ He is believed to be omnipotent, omnibenevolent and omniscient.

The Son

- ✓ The second person of the trinity is referred to as the Son of God.
- ✓ The Son became incarnate on Earth through Jesus.
- ✓ Christians believe Jesus was both fully human whilst on earth but also fully God as well.

The Holy Spirit

- ✓ The third person of the trinity is the Holy Spirit.
- ✓ Christians believe when Jesus left the Earth, God sent the Holy Spirit.
- ✓ The Holy Spirit is there to influence, guide and sustain the Earth and all life on it.
- ✓ The Holy Spirit is believed to be the unseen power of God at work in the world.

Keywords

Omnipotent – All-powerful

Omnibenevolent – All-loving

Omniscient – All-knowing

Original sin – The belief that all humans are born with sin because Adam & Eve disobeyed God in the Garden of Eden

The Holy Trinity – The belief that there is one God made of three different persons – The Father, The Son and The Holy Spirit

Incarnation – God made flesh. Christians believe that Jesus is God

Genesis – The chapter in the Old Testament that tells the creation story

Crucifixion – Death by being nailed to a cross

Blasphemy – The sin of being disrespectful towards God

Miracle – An event science cannot explain

Repent – To ask forgiveness after committing a sin

Resurrection – To rise from the dead

Ascension – The belief that Jesus went to heaven in full physical form

Atonement – The belief that Jesus' death paid for everyone's sin

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4. Creation

Genesis:

- ✓ Christians believe God created the earth and all living things.
- ✓ Genesis chapter 1 tells us the story of creation.
- ✓ The story gives an account of how the universe was created, how the earth was made fit for life and finally how God created life including humans.
- ✓ It is believed to have happened in six days after which God rested.
- ✓ For Christians the most important part of the story is the fact that everything was created 'good.'

'In the beginning, God created the heavens and the earth'. Genesis 1:1

Literal interpretation of creation:

- ✓ They believe it is literally true.
- ✓ Everything that is in the story is the word of God and happened exactly as it is told.
- ✓ God created the world in seven days exactly as described in the story.
- ✓ Evidence of science and fossils is false and should be ignored.

God inspired interpretation of creation:

- ✓ They believe that the account contains the truth but is not literally true.
- ✓ The world was created by God but the story was not dictated by God therefore may have some errors.
- ✓ God did create the world and all that is in it but may not have created it in seven days as described.

Inspired by the world and a sense of God interpretation of creation:

- ✓ They believe that the story should not be taken as truth but is to show that God created the world and the Bible is to show them the message that God has to send us.
- ✓ In the case of creation, it is to show that we were created by a loving God who created us all and created a world for us to live in.

The Word:

'In the beginning was the Word, and the Word was with God, and the Word was God. He was with God in the beginning. Through him all things were made; without him nothing was made that has been made'. John 1:1-3

- ✓ Experts have debated this teaching for years and specifically the identity of the Word.
- ✓ Most agree the Word refers to God the Son who entered in history through Jesus.
- ✓ This shows that all three persons of the trinity were present in creation.
- ✓ Therefore, the trinity has existed since the beginning.
- ✓ This passage shows that the three persons are not part of a chain with the Son replacing the Father and so on, they have been present since the beginning.

Christianity: Beliefs and Teachings (Unit 2)

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5. The Incarnation

- ✓ **What is it?** Incarnation means becoming flesh, taking a human form. It refers to the act of when God became human in the form of Jesus.
- ✓ **What do Christians believe?** Christians believe that Jesus was both fully human and fully God during his time on earth.
- ✓ **Evidence for this:** The gospels of Matthew and Luke explain clearly that Mary did not conceive Jesus sexually, but rather that it was an immaculate conception.
- ✓ It is a fundamental Christian belief that through the incarnation, God showed himself as a human being for around 30 years.
- ✓ Christians refer to Jesus as Christ, which is translated into a Hebrew word which means Messiah.
- ✓ Christians believe that Jesus is the Messiah, sent to save God's people.
- ✓ When Jesus was baptised, a voice from Heaven was heard and said **'You are my Son' Mark 1:11**.
- ✓ On another occasion Peter referred to Jesus as 'Christ'.

'This is how the birth of Jesus the Messiah came about: His mother Mary was pledged to be married to Joseph, but before they came together, she was found to be pregnant through the Holy Spirit'. Matthew 1:18

'You may believe that Jesus is the Messiah, the Son of God, and that by believing you may have life in his name'. Mark 14:61b-62a

6. The Crucifixion

- ✓ Jesus was sentenced to death by crucifixion (where criminals are nailed to a cross and lifted).
- ✓ Christians believe that even though Jesus was the Son of God, it does not mean he was spared the pain and horror of his death.
- ✓ Jesus forgave those who crucified him because they did not realise the significance of what was happening.
- ✓ The crucifixion gives Christians confidence that if they accept Jesus' sacrifice, sin can no longer destroy their lives as God forgives those who faithfully ask for it.
- ✓ It helps them to understand that suffering is a part of life, just as it was for Jesus, and God understands what the sufferer is going through.

'Jesus called out with a loud voice, 'Father, into your hands I commit my spirit.' When he had said this, he breathed his last'. Luke 23:46

- ✓ Once Jesus had died a man called Joseph asked for the body so it could be buried.
- ✓ Due to it being the Sabbath day there was insufficient time to bury it properly, so Joseph laid the body of Jesus in a tomb and rolled a large stone to block the entrance.

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7. The Resurrection

- ✓ According to accounts Jesus was placed in the tomb late on Friday afternoon.
- ✓ How long Jesus remained in the tomb was unclear because when some of Jesus' followers went on Sunday after Shabbat they found the tomb empty.
- ✓ All accounts make it clear that Jesus' body was nowhere to be found.
- ✓ Each story mentions the women meeting men (who may have been angels) who told them that Jesus had risen and to spread the message.
- ✓ The belief that Jesus rose from the dead is called the resurrection and is a key teaching of Christianity.
- ✓ For the next few days or weeks Jesus appeared to several people.
- ✓ He told each of them he had risen from the dead as he had predicted when he was alive.
- ✓ The story spread quickly and there were several different witnesses that said he had risen.
- ✓ Christians believe the resurrection shows the power of good over evil.
- ✓ They believe by accepting Jesus they can also be resurrected in some way.
- ✓ They have no need to fear death.
- ✓ It assures them that God will forgive their sins if they follow the teachings of Christianity.
- ✓ Without the resurrection there wouldn't be a Christian faith.

8. The Ascension

- ✓ The ascension is a matter of interpretation.
- ✓ If Jesus had the power to be able to rise from the dead, it is possible that the same power meant he could leave the Earth physically and return to heaven.
- ✓ After meeting his disciples and asking them to carry on his good work, Jesus left them for the last time and ascended to heaven.

'While he was blessing them, he left them and was taken up into heaven'. Luke 24:51

9. Life After Death

- ✓ Christians believe humans receive eternal life as a gift from God, and so a belief in the afterlife is dependent on a belief in God.
- ✓ The afterlife either begins upon death or at the Day of Judgement when Jesus will return to judge the living and the dead.

Judgement:

- ✓ Christians believe it is God who judges the fate of those who die.
- ✓ He will take into account the life of the person and the extent to which they have tried to get close to him.
- ✓ Jesus makes it clear that in serving others, they are serving him.
- ✓ Christians believe that simply treating other people well and in accordance with Christian morality is not enough to guarantee a good afterlife.
- ✓ They believe that Jesus is the Son of God and in order to gain a good afterlife you have to have faith in him and following his teaching.

'And the life everlasting'. The Apostles Creed

'I am the way and the truth and the life. No one comes to the Father except through me'. John 14:6

Christianity: Beliefs and Teachings (Unit 2)

Topics covered:

1. Nature of God
2. Evil and Suffering
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10. Heaven and Hell

Heaven:

- ✓ Traditional paintings show it as beyond the clouds and where God sits on a huge throne watching the Earth.
- ✓ It is seen as a place of peace, joy and freedom from pain.
- ✓ Whether it is spiritual or physical is unclear.
- ✓ Some Christians believe that only those who believe in Jesus will be allowed into heaven.
- ✓ Other Christians believe that heaven is reserved for Christians and followers of other faiths who have lived good lives.
- ✓ Other Christians believe that heaven is for those who call themselves Christian regardless of how they have lived their life. Simply being baptised guarantees you a place.
- ✓ All Christians believe that God will forgive sins and this will enable people to approach God's presence.

Hell:

- ✓ Often seen as the opposite of heaven.
- ✓ Christians understand it to be a state of existence without God.
- ✓ It is often depicted as a place of eternal suffering, terror, fire and torture ruled by the devil.
- ✓ It leaves a difficult question as to, if heaven is reserved for Christians, where do non-Christians go.
- ✓ Many believe that all those who try to follow God will be accepted by him and not be sent to hell.

The parable of the sheep and the goats indicates heaven is a reward for both faith and good actions – only one is insufficient.

11. Sin and Salvation

Origins of Sin:

- ✓ Sin is any thought or action which separates humans from God.
- ✓ Christians believe that all humans commit sins as nobody is perfect. It is impossible not to sin.
- ✓ Some Christians believe in the idea of original sin. This is the idea that humans are born with an inbuilt tendency to do wrong.
- ✓ The idea is introduced in the story of Adam and Eve where they ate the forbidden fruit and were banished from the Garden of Eden.
- ✓ Christians believe that God gave humans free will in order to choose how to live their lives, but it doesn't mean that they can do whatever they want.
- ✓ Christians believe that the Christian teachings give them guidance on how they should use their free will.

The Ten Commandments. E.g. 'Thou shall not kill' and 'Honour thy mother and father'. Exodus 20:1-19

Salvation:

- ✓ Salvation means to be saved from sin and the consequences of it.
- ✓ Salvation enables humans to get close to God again and be granted eternal life with God.
- ✓ Christians believe there are two main ways to get salvation:
  - **Salvation through good works** – the Old Testament makes it clear that a person achieves salvation through faith in God and by obeying God's law e.g. the Ten Commandments.
  - **Salvation through grace** – salvation is given by God through faith in Jesus and his teachings. It is not earned or deserved but a gift for the faithful.
- ✓ Whilst salvation through works is the most widely believed type of salvation, many Christians believe it is possible to achieve salvation through grace alone as there is evidence of it in the Bible.

Christianity: Beliefs and Teachings (Unit 2)

Topics covered:

1. Nature of God	4. Creation	7. The Resurrection	10. Heaven and Hell	13. Atonement
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12. Jesus and Salvation

- ✓ Christians believe that Jesus' death makes up for original sin and so can bring people back to God.
- ✓ Jesus knew that his death was necessary to restore the relationship between God and humans and make salvation available to all people.
- ✓ Christians believe through Jesus' death and resurrection; humans can receive forgiveness for sin.
- ✓ The fact that Jesus rose from the dead shows that God accepted Jesus' sacrifice and atonement, which means Jesus restored the relationship between God and humans.
- ✓ Jesus made salvation possible because God will now forgive anybody who asks in faith.

'For the wages of sin is death, but the gift of God is eternal life in Christ Jesus our Lord'. Romans 6:23

13. Atonement

- ✓ Atonement removes the effect of sin and allows people to restore their relationship with God. This is possible because of Jesus.
- ✓ God is holy and therefore does not overlook sin. The penalty of sin must be paid, and Christians believe it was paid through Jesus.

'He is the atoning sacrifice for our sins, and not only for ours but also for the sins of the whole world'. 1 John 2:1-2

Islam: Beliefs and Teachings (Unit 1)

Topics covered:

1. The Oneness of God (Tawhid)
2. Nature of Allah
3. Angels
4. Life After Death
5. Prophethood
6. Predestination
7. Muhammad
8. Holy Books
9. Sunni and Shi'a
10. Imamate

1. The Oneness of God

- ✓ One of the most important beliefs for Muslims is Tawhid (the belief that there is only one God).
- ✓ This belief is repeated daily in the Shahadah (one of the five pillars).
- ✓ A Muslim's most important duty is to declare faith in one God.
- ✓ God is unique. No one can picture God which is why there aren't any pictures or statues of Him in Islam.
- ✓ God is the only creator and controller of everything.
- ✓ Muslims believe they should accept whatever happens as the will of God (supremacy of God's will).

'Say, He is God the One, God the eternal'. Quran 112:1-4

'Misfortunes can only happen with God's permission'. Quran 64:11

2. Nature of Allah

Muslims believe God is:

- ✓ Immanent (present in Earth and involved with humanity)
- ✓ Transcendent (outside life and beyond understanding)
- ✓ Omnipotent (all-powerful)
- ✓ Beneficent (all-loving and all-good)
- ✓ Merciful (compassionate and forgiving)
- ✓ Just (fair and judges humans' actions)

'There is no God but Him, the Creator of all things'. Qur'an 6:102

'He is with you wherever you are'. Qur'an 57:4

3. Angels

Muslims believe angels bring the words of God to the prophets. They have no free will and are made from elements of light. Their roles are:

- ✓ Messengers, guardians of people, recording actions of humans, an angel of death, purifying hearts, bring natural disasters

'Each person has angels before him and behind'. Qur'an 13:11

Jibril:

- ✓ Archangel, relayed the Qur'an to Muhammad, guided Muhammad through his entire life

Mika'il:

- ✓ Archangel, angel of mercy, responsible for sending rain, thunder and lightning

Islam: Beliefs and Teachings (Unit 1)

Topics covered:

1. The Oneness of God (Tawhid)
2. Nature of Allah
3. Angels
4. Life After Death
5. Prophethood
6. Predestination
7. Muhammad
8. Holy Books
9. Sunni and Shi'a
10. Imamate

4. Life After Death

For Muslims death isn't the end but the start of a new stage of life called Akhirah.

- ✓ After death you lie in the grave waiting for The Day of Judegment; this is called Barzakh.
- ✓ Angels are sent to question them about their life. If they are good and honest they will be rewarded; if they are bad and untruthful they will be punished.

The Day of Judgement

When God's purpose for the world has been fulfilled He will destroy it.

- ✓ The world will be transformed into a new world.
- ✓ Everyone who has ever lived will be resurrected and judged by God.
- ✓ If people are given the book of deeds in their right hands they will go to heaven, if it is in their left they will go to hell.

Heaven and Hell

Heaven:

Described as the gardens of happiness

It is a reward for faith and good deeds

'A reward for what they used to do'. Quran 56:24

Hell:

Described as a place of fire and great torment

Punishment for those who reject God and do evil

'They will dwell amid scorching wind and scalding water in the shadow of black smoke, neither cool nor refreshing'. Quran 56:42-44

5. Prophethood

God has chosen people to bring the message of Islam to the people. These chosen people are called prophets.

- ✓ They are important because they provide communication between God and humans.
- ✓ In order for humans to live how God wants it is necessary for instructions to be delivered through prophets.
- ✓ Around 124,000 prophets, of which 25 are named in the Qur'an.
- ✓ They are important role models as they were good people who lived according to God's will.

Every community is sent a messenger'. Quran 10:47

Adam:

- ✓ First man on earth and first prophet of Islam.
- ✓ Father of the human race so treated with great respect. God created Hawwa (Eve) to stop Adam being lonely. They were told not to eat from the tree in the middle of the garden but they did, and so sin entered the world. Adam is important as God gave him understanding which he passed on through his descendants. God revealed to him the foods they can eat, how to repent for wrongdoing and how to bury the dead.

'He taught Adam the names [of things]'. Quran 2:31

Ibrahim:

- ✓ Fulfilled all the tests and commands God gave him. Was promised to be the father of all nations. Demanded people to stop idol worship. Was supposed to be burnt alive but survived (miracle) so people began to follow God.
- ✓ Re-built the Ka'aba after it was destroyed. Important as he stopped idol worship, gave the message of one God and rebuilt the Ka'aba

'God took Abraham as a friend'. Qur'an 4:125

Islam: Beliefs and Teachings (Unit 1)

Topics covered:

1. The Oneness of God (Tawhid)
2. Nature of Allah
3. Angels
4. Life After Death
5. Prophethood
6. Predestination
7. Muhammad
8. Holy Books
9. Sunni and Shi'a
10. Imamate

6. Predestination

Sunni:

- ✓ Believe God has already determined everything that will happen in the universe.
- ✓ Linked to Sunni belief of the supremacy of God's will. Doesn't mean that people have no choice about how they behave.

'Only what God has decreed will happen to us'. Qur'an 9:51

Shi'a:

- ✓ Believe that God knows everything that is going to happen, but does not decide what is going to happen.
- ✓ Shi'a Muslims do not see conflict between supremacy of God's will and human freedom to act freely and make choices, as God knows what you will choose but does not choose for you.

'God does not change the condition of a people [for the worse] unless they change what is in themselves'. Qur'an 13:11

7. Muhammad

- ✓ Muhammad received the final revelation of Islam from God.
- ✓ Known as the last and greatest prophet.
- ✓ Religious from an early age and would go into the mountains to a cave to pray and meditate.
- ✓ In 610CE on Mount Hira he received his first revelation from God through the angel Jibril.
- ✓ For more than 20 years received further revelations, which were combined together to make the Qur'an.
- ✓ 3 years after the first revelation, he began preaching the words he received and continued to do it for the rest of his life.
- ✓ He challenged the people of Makkah to give up their sinful ways (cheating, drinking, gambling and idol worshipping).
- ✓ Was persecuted by the leaders of Makkah and so fled from the city in 622CE. This is known as the **Hijrah (departure)** and marks the beginning of the **Ummah (worldwide community)**.
- ✓ Before the departure Muhammad was taken on an amazing experience where Jibril took him to Jerusalem. Muhammad was carried on a horse like creature with wings. From Jerusalem he ascended to heaven and saw signs of God and spoke to prophets such a Isa. This is where he was told to pray 5 times a day. This journey is known as the **Night Journey**.

'Muhammad is not the father of any one of you men; he is God's Messenger and the seal of prophets: God knows everything'. Qur'an 33:40

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8. Holy Books

The Quran:

- ✓ The Qur'an is the direct word of God, which was revealed to Muhammad over a period of around 22 years.
- ✓ Contains the foundation of every believer's faith.
- ✓ Is most sacred of all the holy books. Is infallible (without error and non-changing). Contains a mixture of historical accounts and advice on how to follow God. There are 114 surahs (chapters) in total.
- ✓ Those who can recite the Qur'an from memory are given the title 'Hafiz'.

'This is the Scripture in which there is no doubt, containing guidance for those who are mindful of God'. Qur'an 2:2

- ✓ Other holy books have been revealed by God. Some Muslims believe these books have been lost, whilst others believe they can be found in the Bible, although the original text has been corrupted so does not have the same authority as the Qur'an.

The Torah (Tawrat):

- ✓ Given to Moses (Musa). Mentioned 18 times in the Qur'an. Essentially the first five books of the Bible but additions and subtractions have been made.

The Psalms (Zabur):

- ✓ Revealed to David. Mentioned 3 times in the Qur'an. Similar to the Psalms in the Bible.

The Gospel (Injil):

- ✓ Revealed to Jesus (Isa). Mentioned 12 times in the Qur'an. It is thought to have been lost but some of its message is still found in the Bible.

Scrolls of Ibrahim:

- ✓ One of the earliest scriptures of Islam, revealed to Ibrahim. Referred to in the Qur'an. No longer exist as they have been lost.

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9. Sunni and Shi'a Islam

Sunni:

- ✓ When Muhammad died the majority of Muslims thought that only the Qur'an and Sunnah had the authority to guide the beliefs and behaviour of Muslims.
- ✓ They elected Caliphs to act on behalf of God and Muhammad. They do not make the laws; they just enforce them. These Muslims became known as Sunni (meaning followers of the Sunnah).

Shi'a:

- ✓ Another group believed that Muhammad named his cousin Ali as his successor.
- ✓ Ali and his supporters thought that the true leader had to be a descendent of Muhammad and chosen by God.
- ✓ Ali's claims to be leader were ignored by many Muslims. Over time a split developed between those who followed Ali (the Shi'as) and the Sunnis. Shi'as have their own interpretations of the Law and only accept sayings of Muhammad which have been passed down through Ali or his followers.

Six Articles of Faith in Sunni Islam:

- ✓ There is only one God Allah.
- ✓ Angels communicate the message of God to humans.
- ✓ The Qur'an is the most important writing and the highest authority in Islam.
- ✓ Muhammad is the most important prophet of God.
- ✓ The Day of Judgement is when all humanity will be judged by God and sent to paradise or hell.
- ✓ The supremacy of God's will means that God already knows but also makes happen everything that occurs in the world and in human lives.

The Five Roots of 'Usul ad-Din' in Shi'a Islam:

- ✓ Tawhid means that God is one.
- ✓ Prophethood means accepting that Muhammad is God's last prophet.
- ✓ God is just and wise and cannot do wrong. He holds humans accountable for their actions.
- ✓ The Imamate means accepting that twelve Imams are the leader of Islam and guard the truth of the religion without error.
- ✓ After death you will be resurrected and judged by God.

10. The Imamate

- ✓ When Muhammad died it wasn't clear who should succeed him.
- ✓ Muslims split in to two groups **Sunni and Shi'a**.
- ✓ **Sunni's** elected Abu Bakr as their first Caliph (leader, teacher).
- ✓ **Shi'a** believe that Muhammad named his cousin Ali as his successor so he became the first Imam.
- ✓ For Shi'as it was important that Ali took control because they believe that Muhammad appointed him under divine instruction and leadership should follow in the family line.
- ✓ When Ali died his son became the Imam. Each Imam that followed was the son of the previous Imam.
- ✓ The **Twelver Branch of Shi'a Islam** believe that there have been twelve Imams in total. The last one they believe has been kept alive by God and is hidden somewhere on earth who will return to bring peace, justice and equality.
- ✓ The **Twelvers** believe that the Imams not only rule but are able to interpret the Qur'an and Shari'ah Law without fault.
- ✓ They believe that the receiving of God's law was through Muhammad but guiding people comes through the Imams.
- ✓ **The Imamate** is the name given to the appointment of the Imams and is important because people need divine guidance to know how to live correctly.

Religion and Life

Topics covered:

1. Origins of the universe
2. Value of the world
3. Use of resources
4. Pollution
5. Use of animals
6. Origins of human life
7. Abortion
8. Euthanasia
9. Death and afterlife

Remember: If a question is asking you for the **similarities** it means **two things the same.** If it says **contrasting** it is asking you to say **both for and against**

1. The origins of the universe

Christianity:

- ✓ The universe was designed and created by God.
- ✓ They believe God created the world out of nothing, 'ex-nihilo'.
- ✓ The Genesis creation story gives an account of how God created the universe.
- ✓ Christians have differing opinions on whether the creation story actually happened (see Christianity knowledge sheet and creation.)

'In the beginning God created the heavens and the earth'. Genesis 1

Islam:

- ✓ Muslims also believe the world was created by God in six days.
- ✓ Most Muslims understand the original text of six days to mean six phases, or periods of time.
- ✓ Unlike the Bible, the Qur'an does not specify exactly what took place during each period.
- ✓ The Qur'an does not mention a day of rest.

'Your Lord is God, who created the heavens and earth in six Days, then established Himself on the throne'. Qur'an 7:54

Science:

- ✓ The Big Bang Theory is the leading scientific explanation for how the universe began.
- ✓ It suggests that all matter was compressed into a small hot mass. A massive expansion of space took place and the condensed matter was flung in different directions. It has been expanding ever since creating the universe.

2. The value of the world

- ✓ The world is complex and fascinating. When you look at the world you have to wonder how it was all made.

Stewardship:

- ✓ For **Christians** they believe God has given the privilege of living on the earth but with the responsibility of looking after it.
- ✓ The special responsibility to care for and protect the planet it called stewardship.
- ✓ As stewards of the Earth Christians believe people have been appointed by God to respect and manage the world. In return we can use it in a sustainable way for our survival.
- ✓ In **Islam** stewardship is known as khalifah. Muslims believe that God gave humans the responsibility of looking after the planet.
- ✓ People should protect the environment. On the Day of Judgement humans will be answerable to God concerning how well they have fulfilled this role.

'It is He who has made you successors on the earth'. Qur'an 6:165

Dominion:

- ✓ In **Christianity** some believe that humans were given the power and authority to rule over the world. This is called dominion.
- ✓ A minority of Christians believe that people can do what they like with the earth and everything in it because humans are in charge.

'Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground'. Genesis 1:28

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3. The use and abuse of resources

- ✓ Worldwide over 90 million barrels of oil are used a day.
- ✓ The problem of deforestation is a serious one. Around 7.3 million hectares of forest are lost each year.
- ✓ Many other non-renewable resources are being used up very quickly, and once they are gone the world will have to adapt drastically in order to live without them.

Renewable resources:

- ✓ Scientists are developing alternatives to non-renewable resources.
- ✓ While renewable resources (wind, wave power, and sunlight), can theoretically give us unlimited energy, in practice there are currently lots of problems with them, which is why conserving energy is important to people.

Christianity:

- ✓ Christians believe they should avoid waste, conserve energy and reduce the demand for natural resources.
- ✓ They believe they can do things like; walking, cycling and public transport instead of using cars, use products which don't have a lot of packaging, turn off lights which aren't being used and reusing bags when shopping, can all help to save natural resources and conserve energy.

Muslims:

- ✓ In the Hadith, Muslims are advised to only take what is necessary from the world.
- ✓ Each Muslim has a responsibility to help look after the environment and not overuse the world's resources.

'Do not seek from it more than what you need'. Hadith.

4. Pollution

- ✓ Pollution puts the health of humans, animals and plants at risk.
- ✓ There are many types of pollution which include: air pollution,
  land pollution and water pollution.

Christianity:

- ✓ Christians believe the world is on loan to humans who have a duty to care for it.
- ✓ The **parable of the talents (Matthew 25)** warns that God will judge how responsible people have been.
- ✓ Polluting the world is not good stewardship, as God's creation is being abused.
- ✓ Pollution also harms people, so it is not **'loving one's neighbour'** or considering future generations.
- ✓ Christians believe they must help to protect the natural world from being harmed by pollution.

'The earth is the LORD'S, and everything in it'. Psalm 24:1

Islam:

- ✓ Muslims believe that the environment should be nurtured, valued and restored to what God intended it to be.
- ✓ Irresponsible behaviour that leads to pollution is seen as unacceptable.
- ✓ In cases where the consequences are fatal, particularly to human life, pollution is haram (forbidden) in Islam.

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5. The Use and Abuse of Animals:

Muslims beliefs about animals:

- ✓ Muslims believe God made all living creatures and they all worship him in their own way.
- ✓ Each animal is valuable to God, has rights and should be treated with respect and compassion.
- ✓ Islam teaches that animals have been made for the benefit of humans but they are not to be used and abused.
- ✓ They must not be beaten unnecessarily nor used to fight each other for human entertainment.
- ✓ All animal cruelty is to be avoided and factory farming is haram (forbidden).
- ✓ Muhammad is seen as a role model in the way he treated animals. There is a story where he cut off a part of his cloak rather than disturb a sleeping cat.
- ✓ He also told a man to return a bird's eggs when he saw the distress of the mother bird.

'All the creatures that crawl on the earth and those that fly with their wings are communities like yourselves'. Qur'an 6:38

Christian beliefs about animals:

- ✓ Christians believe animals were created by God for humans to use and care for.
- ✓ Many believe God values animals but that humans are more important because they were created in God's image and have souls.
- ✓ The Bible teaches that animals are to be treated kindly, but we have permission from God to use them as food.

'Everything that lives and moves about will be food for you'. Genesis 9:3

'The righteous care for the needs of their animals'. Proverbs 12:10

Muslim beliefs on animal experimentation:

- ✓ In Islam causing harm to an animal, doing anything that may harm an animal's life, body or genetic order is not allowed.
- ✓ Causing them stress and forcing them to do a job beyond their power is not allowed either.
- ✓ If such actions were to protect and preserve human life, such as the development of medicines, an exception may be allowed, as long as the animal is treated humanely and with care.
- ✓ All suffering must be kept to an absolute minimum.
- ✓ For example, forcing an animal to smoke to find the effects of smoking is not allowed.
- ✓ Testing cosmetics on animals is also seen as wrong.

Christian beliefs on animal experimentation:

- ✓ In modern societies Christians generally support limited animal testing.
- ✓ Christians believe that all human life is sacred, using animals to develop new drugs may benefit millions of people and save many lives.
- ✓ They believe animals can be used as long as there is no other way to safely develop medicines and it is carried out as caringly as possible.
- ✓ Testing cosmetics on animals was banned in the UK in 1998, and most Christians support the ban.

Muslim beliefs on the use of animals for meat:

- ✓ Muslims are allowed to eat meat which has been killed according to Shari'ah law.
- ✓ For food to be permissible, it must have been farmed and killed according to Muslim teaching.
- ✓ The Qur'an expressly forbids the eating of pig meat and it is also haram to eat any animal which has not been ritually slaughtered or has died in the wild.
- ✓ To provide food is an example of a just cause but hunting for entertainment and pleasure is not.

'Whoever kills a sparrow or anything bigger than that without a just cause, God will hold him accountable on the Day of Judgement'. Hadith

Christian beliefs on the use of animals for meat:

- ✓ Christians have the choice whether to eat meat or not.
- ✓ They should also be sensitive to the beliefs of others about what they wish to eat.
- ✓ Most Christians eat meat. Those who decide not to, usually do so because they are against killing animals, as they believe that animals should not be harmed.
- ✓ Others object to the animal cruelty which can occur in large factory farms.

'The one who eats everything must not treat with contempt the one who does not, and the one who does not eat everything must not judge the one who does, for God has accepted them'. Romans 14:3

Religion and Life

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6. Origins of human life

Science:

- ✓ Charles Darwin came up with the theory of evolution. He suggested that creatures appeared in the sea, which over a long period of time, evolved into other species.
- ✓ Some became able to survive on land as well as in the sea. Some then developed the ability to fly. This is called evolution.
- ✓ According to the theory of evolution, humans evolved over millions of years from other animals on land.
- ✓ Scientists have discovered bones from several extinct species, which they claim as possible ancestors of the human race.

Christianity:

- ✓ Fundamentalist Christians believe that the origin of human life was exactly as recorded in Genesis, with God creating each species separately.
- ✓ Whilst some accept adaptation in species, they do not believe there is enough evidence to prove that creatures evolve.
- ✓ Some Christians believe in God as the creator, but also accept the theory of evolution.
- ✓ They believe the Bible is concerned with 'why' it happened, rather than the 'how'.
- ✓ Some Christians say it happened because God designed and crated the beginning of life and set everything in motion to develop over the course of history.
- ✓ They believe that evolution is the way God designed life to advance and evolve.

So God created mankind in his own image, in the image of God he created them; male and female he created them'. Genesis 1:27

Islam:

- ✓ Muslims believe that after God made the universe, he made the first human being called Adam.
- ✓ Muslims believe the whole of the human race is descended from Adam and Hawwa (Eve).
- ✓ Some Muslims reject the idea of evolution altogether, and believe that God formed all the different species. Others accept all forms of evolution except where it applies to humans.

'You [humans] were lifeless and He gave you life'. Qur'an 2:28

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7. Abortion

- ✓ Abortion is the removal of a foetus from the mother's womb.
- ✓ This can happen naturally through miscarriage, but abortion usually refers to the medical procedure of deliberately ending the pregnancy.
- ✓ Before 1967 abortion was illegal in the UK. Abortion is currently allowed up to the 24th week of a pregnancy, in a licenced clinic if two doctors agree.

Christianity:

- ✓ Christians believe in the sanctity of life. God has given each person a purpose in life therefore abortion is wrong.
- ✓ Many Christians believe that life starts at conception, abortion therefore is wrong as you are killing a life. The only time it may be acceptable is to save the mother's life.
- ✓ Others oppose abortion but believe it is acceptable in some circumstances such as the result of rape or if the child would be severely disabled.
- ✓ Some say it is the 'lesser of two evils' and the kindest thing to do, for example if the quality of life for the baby is near non-existent.

'Before I formed you in the womb I knew you, before you were born I set you apart'. Jeremiah 1:5

'As God's chosen people, holy and dearly loved, clothe yourselves with compassion, kindness, gentleness and patience'. Colossians 3:12

Islam:

- ✓ For Muslims they are taught to value life. The Qur'an does not explicitly refer to abortion.
- ✓ It is generally forbidden, but should be allowed in particular circumstances, such as if the mother's life is at risk.
- ✓ Some believe it should be allowed if the foetus will be born with either physical or mental disabilities or if conception was a result of rape.
- ✓ The abortion should be carried out as early as possible and definitely before ensoulment (somewhere between 40-120 days of pregnancy).
- ✓ In Islam, having an abortion after ensoulment is seen as taking a life.

'Do not kill your children for fear of poverty – We shall provide for them and for you – killing them is a great sin'. Qur'an 17:31

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8. Euthanasia

- ✓ Euthanasia means 'good death'. The intention is to end the life of someone who is in pain or has poor quality of life due to a serious illness but they can't take their own life.
- ✓ There are three types of euthanasia; voluntary – where a person asks a doctor to end their life for them; non-voluntary – where a person is too ill to request to die, but a doctor will end it because it's in their best interests; and involuntary – where a person is able to consent, but does not and their life is ended anyway.
- ✓ All forms of euthanasia are currently illegal in the UK and treated as murder or manslaughter.

Christianity:

- ✓ Many believe taking a life is interfering with God's plan. They think it is comparable to murder and open to abuse.
- ✓ Most believe it goes against the sanctity of life, and only God has the right to take life away.
- ✓ Some Christians do support euthanasia and believe that it should be used if it is the most loving thing to do.
- ✓ They believe God has given people free will so they should be able to choose when to end their lives.

'Thou shall not kill'. Exodus.
'Blessed are the merciful'. Matthew 5:7

Islam:

- ✓ Muslims believe in the sanctity of life. They believe all life is a gift from God and therefore should be valued and looked after.
- ✓ No person has the right to take life away, only God decides when it will be ended.
- ✓ No one knows the plan for the person who is suffering, there may be a reason for it.
- ✓ Euthanasia is forbidden in Islam and is considered a sin against God, the community and the individual.
- ✓ To end a life prematurely is going against God, because it is interfering with God's plan.

'Do not take life, which God has made sacred, except by right'. Quran 17:33
'No soul may die except with God's permission at a predestined time'. Qur'an 3:145

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9. Death and the Afterlife

Christianity:

- ✓ Christians believe humans receive eternal life as a gift from God, and so a belief in the afterlife is dependent on a belief in God.
- ✓ The afterlife either begins upon death or at the **Day of Judgement** when Jesus will return to judge the living and the dead.

Judgement:

- ✓ Christians believe it is God who judges the fate of those who die.
- ✓ He will take into account the life of the person and the extent to which they have tried to get close to him.
- ✓ Jesus makes it clear that in serving others, they are serving him.
- ✓ Christians believe that simply treating other people well and in accordance with Christian morality is not enough to guarantee a good afterlife.
- ✓ They believe that Jesus is the Son of God and in order to gain a good afterlife you have to have faith in him and following his teaching.

'And the life everlasting'. The Apostles Creed
'I am the way and the truth and the life. No one comes to the Father except through me'. John 14:6

Heaven:

- ✓ Traditional paintings show it as beyond the clouds and where God sits on a huge throne watching the earth.
- ✓ It is seen as a place of peace, joy and freedom from pain. Whether it is spiritual or physical is unclear.

Hell:

- ✓ Often seen as the opposite of heaven.
- ✓ Christians understand it to be a state of existence without God.
- ✓ It is often depicted as a place of eternal suffering, terror, fire and torture ruled by the devil.
- ✓ It leaves a difficult question as to, if heaven is reserved for Christians, where do non-Christians go?
- ✓ Many believe that all those who try to follow God will be accepted by him and not be sent to hell.

The parable of the sheep and the goats indicates heaven is a reward for both faith and good actions – only one is insufficient. Islam:

Islam:

- ✓ For Muslims death isn't the end but the start of a new stage of life called Akhirah. After death you lie in the grave waiting for The Day of Judgement; this is called Barzakh.
- ✓ Angels are sent to question them about their life.
- ✓ If they are good and honest they will be rewarded; if they are bad and untruthful they will be punished.

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- ✓ When God's purpose for the world has been fulfilled He will destroy it.
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- ✓ Everyone who has ever lived will be resurrected and judged by God.
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'They will dwell amid scorching wind and scalding water in the shadow of black smoke, neither cool nor refreshing'. Quran 56:42-4

Component 1 Human Lifespan Development

Learning Aim A: Understand human growth and development across life stages and the factors that affect it

Key Questions: How do people grow and develop throughout their lives? How can factors such as lifestyle choices, relationships affect this? Understanding these processes is essential knowledge and understanding for health and social care practitioners.

A1 Growth and development across life stages

Lifestages

1. Infancy (0 – 2 years)
2. Early childhood (3 – 8 years)
3. Adolescence (9 – 18 years)
4. Early adulthood (19 – 45 years)
5. Middle adulthood (46 – 65 years)
6. Later adulthood (65+ years)

Holistic Development

1. Physical development – Physical growth and physiological change
2. Intellectual development – Developing thinking and language skills and common activities that promote learning and development
3. Emotional development – Developing feelings about self and other
4. Social development – Forming relationships

A2 Factors affecting growth and development

1. Physical factors

a) Genetic inheritance
b) Diet and lifestyle choices
c) Experience of illness and disease
d) Appearance

2. Economic factors

a) Income/wealth
b) Material possessions

3. Social, Cultural and emotional factors

a) Educational experiences
b) Culture, e.g. community involvement, religion, gender
c) Influence of role models
d) Influence of social isolation
e) Personal relationship with friends and family

Learning Aim B: Investigate how individuals deal with life events

B1 Different types of life events

1. Physical events

a) Accident/injury
b) Ill health

2. Relationship changes

a) Entering a relationship
b) Marriage
c) Divorce
d) Parenthood
e) Bereavement

3. Life circumstances

a) Moving house, school, or job
b) Exclusion from education
c) Redundancy
d) Imprisonment
e) Retirement

B2 Coping with change caused by life events

1. How individuals adapt to these changes

2. Sources of support

a) Family, friends, partners
b) Professional carers and services
c) Community groups, voluntary and faith-based organisations

3. Types of support

a) Emotional
b) Information and advice
c) Practical help, e.g. financial assistance, childcare, transport

Component 2 Services and Values

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

Learning Aim B: Demonstrate care values and review own practice

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

A1 Health and social care services

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

A2 Barriers to accessing services

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

B1 Care values

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

B2 Reviewing own application of care values

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

1: Identity and Culture - Me, my family and friends

Parle-moi de ta famille – tell me about your family	J'ai une grande / petite famille – I have a big / small family Je vis dans une famille monoparentale – I live in a single-parent family
	Nous sommes trois dans ma famille – there are three of us in our family
	J'ai deux frères et une soeur – I have two brothers and one sister
	Je suis fils unique / Je suis fille unique (f) – I am an only child
	Mes parents sont divorcés, j'habite avec ma mère et mon beau-père – My parents are divorced, I live with my mother and my step-father
	J'ai…Il / elle a les yeux bleus / verts / marron et les cheveux blonds / noirs / bruns / roux – I have…he / she has blue / green / brown eyes and blonde / black / brown / red hair
	Je m'entends bien avec mon frère / mes frères / ma soeur / mes soeurs / mon père / ma mère / mes parents – I get on well with…
	Je ne m'entends pas bien avec / Je m'entends mal avec mes frères / soeurs / parents – I don't get on well with my brothers / sisters / parents
	Je me dispute avec / je me fâche contre – I argue with / I get angry with…
	Mon frère est sympa / mes frères sont sympas – my brother is nice / my brothers are nice
	Ma soeur est généreuse / mes seours sont généreuses – my sister is generous / my sisters are generous
	Il (elle) m'énerve / ils (elles) m'énervent – he (she) / they get on my nerves
Décris ton/ ta meilleur(e) ami(e) - describe your best friend	Nous nous disputons rarement – we rarely argue (with each other)
	Ma meilleure amie est intelligente, compréhensive et vraiment sympa – my best friend (f) is intelligent understanding and really nice
	Mon meilleur ami est drôle, compréhensif mais des fois un peu egoïste – my best friend (m) is funny, understanding but sometimes a bit selfish

Tu veux te marier et avoir des enfants? – do you want to marry and have children?	Ma partenaire idéale est / serait gentille (f) / Mon partenaire idéal est / serait gentil (m) - my ideal partner is/would be kind
	Je vais me marier / Je me marierai car le marriage est tès important pour moi - I am going to get married / will marry as marriage is very important to me
	Je ne veux pas me marier car cinquante pour cent des mariages finissent en divorce – I don't want to marry as 50% of marriages end in divorce
	Je ne vais pas me marier avant l'âge de trente ans – I'm not going to marry before I'm 30
	J'espère avoir deux enfants – I hope to have 2 children Je ne veux pas d'enfants – I don't want children

ma famille	my family
mon père / mon beau-père	my father / my step father
ma mère / ma belle-mère	my mother / my step mother
mes parents / mes grand-parents	my parents / my grandparents
mon grand-père	my grandpa
ma grand-mère	my grandma
mon frère / mon demi-frère	my brother / my half or step brother
ma soeur / ma demi-soeur	my sister / my half or step sister
ma tante / mon oncle	my auntie / my uncle
mon cousin (m) / ma cousine (f)	my cousin
mes cousin(e)s	my cousins
un (mon) chien / un (mon) chat	a (my) dog / a (my) cat

Je le / la / les trouve … I find he / she (is) / they (are)	**sympa(s) / agréable(s)**	nice
	adorable(s) / mignon(ne)(s)	adorable / cute
	amusant(e)(s) / drôle(s)	funny
	intelligent(e)(s)	intelligent
	compréhensif(s) / -ive(s)	understanding
	créatif (-ive)(s)	creative
	travailleur(s) / euse(s)	hard-working
	timide(s)	shy
	gentil(le)(s)	kind
	généreux / -euse(s)	generous
	egoïst(e)(s)	selfish
	casse-pieds / agaçant(e)(s)	a pain in the neck
	jaloux / jalouse(s)	jealous
	méchant(e)(s)	mean
	strict(e)(s) / sévère(s)	strict
	paresseux / paresseuse (s)	lazy
	désagréable (s)	unpleasant

1: Identity and Culture - Technology in everyday life

Comment utilises-tu / utilisez-vous la technologie? – how do you use technology?	J'ai un portable / une tablette / un ordinateur – I have a phone / tablet (or laptop) / a computer
	J'envoie des textos / des mails – I send texts / emails
	Je lis / poste des messages – I read / post messages
	Je tchatte avec mes copains / copines – I chat with friends
	Je reste en contact avec mes amis et ma famille – I stay in contact with my friends and family
	Je regarde des films en streaming – I stream films
	Je prends des photos / réalise des vidéos – I take photos / make videos
	Je regarde / partage des photo et vidéos (sur YouTube, Instagram…) – I watch / share photos and videos (on…)
	Je télècharche des films et de la musique – I download films and music
	Je joue aux jeux vidéo en ligne avec mes amis – I play video games online with my friends
On peut… you can	envoyer / tchatter / rester en contact / regarder / prendre des photos / réaliser des vidéos / partager des liens vers / commenter / télècharger / jouer – send / chat online / stay in contact / watch / take photos / make videos / share / share links for / comment on / download / play
J'aime / Je préfère… I like to / prefer	
Je n'aime pas… I don't like to…	

parce que…	c'est plus facile / plus vite / pratique – it is easier / quicker / handy (practical)
	c'est divertissant / amusant / marrant / drôle / rigolo – it's fun / funny
	c'est créatif / ça me donne de l'inspiration - it's creative / it gives me inspiration
	c'est la meilleure façon de / c'est important de… rester en contact – it's the best way to / it's important to… stay in contact
	c'est une grande partie de ma vie quotidienne – it's a big part of my daily life
	J'ai peur d'être manipulé(e) / de passer trop de temps sur mon portable – I'm afraid of being manipulated / of spending too much time on my phone
	J'ai peur de perdre mes données / que mes données soient volées / partager trop d'infos personnelles – I'm afraid of losing my data / of my data being stolen / of sharing too much personal information
	les portables / les trolls sont gênants - phones / trolls are annoying

tous les jours	every day
souvent	often
deux heures par jour	two hours a day
quelquefois	sometimes
rarement	rarely
Je ne (partage) jamais	I never (share)
Je passe des heures sur…	I spend hours on…
une demande d'amitié	a friend request
valider la demande d'amitié	to accept the friend request
ajouter à mes amis	add friend
taguer	to tag
une notification	an alert
les médias sociaux	social media

le réseau	the network
en ligne	on line
un smartphone / portable	(smart)phone
une tablette	a tablet / laptop
un ordinateur	a computer
l'agenda	calendar
l'application	app
le GPS	GPS
un site / une page web	a website / page
ma page perso / mon profil	my profile page
des messages	messages
des posts	posts
des liens	links
un like / j'ai liké…	a like / I liked…

Je l'utilise pour… I use it in order to…	faire des recherches / googler / faire mes devoirs – do research / google / do my homework
	organiser des sorties et des rendez-vous / me faire de nouveaux amis – organise outings and meet-ups / make new friends
Hier, je l'ai utilisé pour… yesterday I used it to…	lire ou écouter les actualités – read or listen to the news
	trouver un resto / des emplois / de l'inspiration – find a restaurant / jobs / inspiration
	faire une réservation / des réservations pour des vacances – make a reservation / book a holiday
	garder le contact / trouver de nouveaux contacts – keep in contact / find new contacts
	tchatter / partager des photos / partager des infos… sur Snapchat, TikTok, Twitter, Facebook, Instagram… – chat online / share photos / share information…on Snapchat, TikTok, Twitter, Facebook, Instagram

1: Identity and Culture - Free Time Activities

Que fais-tu pendant ton temps libre? / Que faites-vous pendant votre temps libre? – how do you spend your free time?	Je fais du sport / J'écoute de la musique / Je chante / Je lis – I do sport / I listen to music / I sing / I read
	Je fais du jogging / de l'athlétisme / du judo / du yoga – I jog / do athletics / judo / yoga
	Je joue de la guitare / du piano – I play guitar / piano
	Je regarde la télé / des films / des vidéo – I watch tv / films / videos
	Je joue aux jeux vidéo, des fois en ligne avec mes amis – I play video games sometimes online with my friends
	Après avoir fait mes devoirs j'aime jouer / lire / faire… – after having done my homework I like to play / read / do…

Qu'est-ce que tu vas / vous allez faire le weekend prochain? **Je vais / on va / nous allons… – I'm going to / we're going to…**	au bowling / à la piscine / chez mon ami(e) / au musée / au resto / au centre sportif / aller au centre commercial / au parc / au cinéma - the bowling alley / swimming pool / my friend's house / the museum / restaurant / the sport centre / the shopping centre / the park / the cinema
	rester chez moi / écouter de la musique / jouer de la guitar / jouer du piano / chanter – stay home / listen to music / play guitar / play piano / sing
	regarder un film / voir un match de foot / jouer aux jeux vidéo / lire un roman / faire de la cuisine – watch a movie / see a football match / play video games / read a novel / cook
	acheter des vêtements / des gadgets / une tenue de sport / de l'équipement sportif – to buy clothes / gadgets / sports wear / sports gear
	jouer au foot / basket / au tennis / au rugby – play football / basketball / tennis / rugby
	faire de la natation / du bowling / du skate / de l'équitation / du vélo – go swimming / bowling / skateboarding / horse-riding / cycling

Qu'est-ce que tu as fait le weekend dernier? – what did you do last weekend?	Le samedi dernier je suis sorti(e) avec mes amis – last Saturday I went out with my friends
	Je suis allé(e) / on est allés au parc… – I / we went to the park
	J'a regardé un film / j'ai lu un livre / j'ai joué … – I watched a film / read a book / played
	J'ai fait mes tâches / j'ai fait de la cuisine – I did my chores / I did some cooking

Quel est le dernier film que tu as vu? / Quel est le dernier film que vous avez vu? - What's the latest film you saw?	Le weekend dernier je suis allé(e) au cinéma, j'ai vu /regardé … – Last weekend I went to the cinema, I saw/watched…
	J'ai vu un film d'horreur / d'action / de science-fiction / d'arts martiaux / romantique / comique / à suspense – I saw a horror film / an action film / a sci-fi film / a martial arts film / a romantic film / a funny film / a thriller
	J'ai regardé […] en streaming / sur Netflix / sur YouTube – I streamed […] / I watched […] on Netflix / on YouTube
	Je l'ai adoré parce que c'était drôle / passionant / triste / émouvant / éducatif – I loved it because it was funny / exciting / sad / moving / educational

Quel est le dernier livre que tu as lu? (informal) / Quel est le dernier livre que vous avez lu? - What's the latest book you read?
J'ai lu un roman d'aventure / un roman de guerre / un roman historique / une (auto)biographie / la littérature non-romanesque - I read an adventure novel / a war novel / a historical novel / an (auto)biography / non-fiction

Quel type de musique aimes-tu? / aimez-vous? – What music do you like?
J'aime le rock / le pop / le classique / le rap / le hip-hop / le reggae – I like rock / pop / classical / rap / hip-hop / reggae

Quel type d'émissions aimes-tu? / aimez-vous? – What TV progs do you like?
J'aime les comédies [f] / les émissions musicales [f] / les séries de drame / les émissions policières / les émissions de télé-réalité [f] / les émissions de sport [f] / les dessins animés [m] / les jeux télévisés [m] / les documentaires [m] – I like comedies / music progs / drama series / detective progs / tv reality shows / sport progs / animés / game shows / documentaries cependant / part contre je n'aime pas….parce que… – however / on the other hand I don't like….because…

1: Identity and Culture - Customs and Festivals

Quelle est votre fête préférée? – what is your favourite festival / custom / celebration?

Je préfère // Ma célébration / fête préférée, c'est - I prefer // My favourite celebration / festival is…	Noël / Pâques / Aïd al-Fitr / La Saint-Valentin / Mardi Gras / Hanoukka / le Saint-Sylvestre (Le Jour de l'An) / mon anniversaire – Christmas / Easter / Eid al-Fitr / Valentine's day / Mardi Gras / Hanukkha / New Year's Eve / my birthday	**parce que**	j'ai les cadeaux / j'adore le chocolat / on ne travaille pas / on se déguise / on mange / on offre… c'est une fête réligieuse / historique/ romantique // il y a des feux d'artifices – I have presents / I love chocolate / you don't go to work / you wear costumes / you eat / you give gifts… it's a religious / historical / romantic festival // there are fireworks

Où es-tu allé(e) / Où êtes-vous allé(e)(s) pour célébrer / fêter…?	Where did you go to celebrate…?
Qu'est-ce que tu as / vous avez mangé et bu?	What did you eat and drink?
C'étail comment?	How was it?

Je suis / On est allé(e)(s) - I / we went **manger – to eat**	dans un restaurant chinois / indien / au fast food / dans un café – to a Chinese / Indian / fast food restaurant / café avec ma famille / mes amis – with my family / friends
C'était – it was **Il y avait – there was**	très bon / délicieux – very good / delicious trop salé / trop cuit / trop froid - too salty / over cooked / too cold un insecte dans la salade / trop de monde – an insect in the salad / too many people
Je suis / On est allé(e)(s) à / en[…] - to… **chez […]**	avec mes parents / copains - with my parents / mates pour Noël / Aïd al-Fitr… - for Christmas…
J'ai / On a … vu / regardé / eu / fait / mangé / écouté – I / we… saw / watched / had / made / ate / listened to	un défilé / un feu d'artifice / le père Noël / des cadeaux / beaucoup de bons plats / des chocolats / de la musique – a parade / a firework display / Santa / presents / a lot of good food / chocolates / music

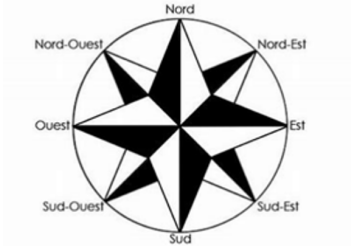
à l'église	to church
à la mosquée	to the mosque
à la synagogue	to the synagogue

J'ai aimé / adoré - I liked **regarder – looking at** **faire – making** **donner – giving** **recevoir – receiving**	le défilé / la fête / les feux d'artifice / les chocolats / les gâteaux / les cadeaux – the parade / fireworks / chocolates / cakes / presents

2: Local, national, international and global areas of interest - Home, town, neighbourhood and region

Où habites-tu / Où habitez-vous? – where do you live?	J'habite à Barnet, Londres dans le sud-est de l'Angleterre - I live in Barnet, London in the south east of England J'habitais… - I used to live…
Qu'est-ce qu'on peut faire dans ta / votre région – what can you do in your neighbourhood?	J'habite avec ma famille dans un appartement / une maison jumelle / une maison mitoyenne – we live in London in an apartment / semi-detatched house / terraced house
	Il y a / On a trois chambres – there are / we have three bedrooms
	Dans ma chambre il y a – in my bedroom there is / there are Par contre je n'ai pas de / il n'y a pas de – however, I don't have / there isn't / aren't any…
	La chambre de mon frère est plus petite / grande que la mienne – my brother's bedroom is smaller / bigger than mine
	Il y a / Il n'y a pas beaucoup à faire dans ma région – there is / there isn't a lot to do in my area
	Il y a un centre commercial / une gare / un parc / un centre sportif / un cinéma / des magasins / des restaurants et cafés – there is a shopping centre / a station / a sports centre / a cinema / there are shops / restaurants and cafés
	Il y avait plus de / moins de – there used to be more… / less…
	On peut / On pouvait s'amuser au centre ville – you can / you used to be able to enjoy yourself in the town centre
On peut / On pouvait – you can / you used to be able to …	sortir avec des amis / voir un film / manger dans un bon restaurant / jouer au foot dans le parc / fair du shopping – go out with friends / see a film / eat in a good restaurant / play football in the park / go shopping
Où amerais-tu / aimeriez-vous habiter à l'avenir? – where would you like to live in the future?	J'aimerais habiter un appartement de luxe / une grande maison / un château / sur un bateau – I would love to live in a luxury apartment / a big house / a castle / on a boat

Pourquoi?	parce que je rêve d'une vie calme / passionante // je voudrais avoir une grande famille / je tiens à mon indépendance // j'adore la mer / la campagne – because I dream of a calm / exciting life // I would like to have a big family / I value [my independence] / I love the sea / the countryside



une cuisine	a kitchen
une salle à manger	a dining room
un salon	a living room
une salle de bains	a bathroom
une chambre	a bedroom

le canapé	sofa
un fauteuil	an armchair
le lit	bed
le bureau	desk
les rideaux (m)	curtains
l'armoire (f)	wardrobe
la commode	chest of drawers
la bibliothèque	bookcase
la chaise (en bois)	(wooden) chair
la table	table
la fenêtre	window
l'étagère (f)	shelf

the adjectives that come **before** the noun	
une bonne région	a good area
une mauvaise région	a bad area
une belle maison	a beautiful house
une vieille / ancienne maison	an old house
une nouvelle maison	a new house
une grande maison	a big house
une petite maison	a small house

2: Local, national, international and global areas of interest - Social issues

Que fais-tu / faites-vous pour aider dans ta région ? – what do you do to help your area?	Je suis bénévole pour l'Armé du Salut depuis deux ans – I've been at volunteer at the Salvation Army for 2 years
	Je distribue de la soupe et du pain aux gens qui n'ont pas assez d'argent pour acheter à manger – I give out soup and bread to people who don't have enough money to buy food
	J'accompagne le camion-soupe dans les rue de ma ville – I go with the soup van around my town
	Je fais des carton alimentaires – I make up food parcels
	Je donne de l'argent aux associations caritatives – I give money to charity
	J'aide la collection de l'argent – I help raise money
	Je donne des vêtements aux magasins caritatifs – I give clothes to charity shops
À l'avenir, qu'est-ce que tu voudrais / vous voudriez faire pour aider? – in the future what would you like to do to help?	Je visite les personnes âgées dans ma communauté – I visit the elderly in my community
	Je voudrais faire du travail bénévole – I would like to do charity work
	J'aimerais aider les gens / les enfants / les animaux – I would like to help people / children / animals
	Je voudrais voyager autour du monde en travaillant pour des associations internationales – I would like to travel the world working for international charities

tous les weekends	every weekend
deux / trois fois par semaine	twice / three times a week
lundi et mercredi matin	Monday and Wednesday morning
depuis un an / trois mois	(since) for a year / three months

masculine: bon / mauvais / beau / vieux / ancien / nouveau / grand / petit
plural (m): bons / mauvais / beaux / vieux / anciens / nouveaux / grands / petits

C'est une association caritative – it's a charity	qui s'appelle / appelée – called	Médecins Sans Frontières Les Resto du Coeur…
qui veut aider les malades – which wants to help sick people qui combat / organise des campagnes contre / lutte contre la faim et la pauvreté – which combats / organises campaigns against / fights against hunger and poverty		
Elle a été fondée / Elle a été crée – it was founded / created	en 1971 – in 1971 dans les années quatre-vingts – in the '80s	par des médecins – by doctors par un comédien – by an actor
Son objectif principal est d'aider – its main objective is to help	les malades même dans les zones de guerre – the sick even in war zones	
	les pauvres / les sans-abri / les sans-emploi / les faims – the poor / the homeless / the unemployed / the hungry	
Elle veut donner des médicaments / des vêtements / de la nourriture / un abri – It wants to give medicine / clothing / food / shelter		
Parles-moi de ton regime – tell me about your diet		
J'ai un régime [assez / très] sain / équilibré / malsain – I have a [fairly / very] healthy / balanced / unhealthy diet		

normalement - normally généralement - generally	je mange / je prends – I eat / have	des fruits et des légumes – fruit and vegetables des produits laitiers – dairy de la viande – meat du poisson – fish		tous les jours - every day assez régulièment - quite regularly de temps en temps - from time to time rarement - rarely
aussi / en plus - also souvent – often	j'évite de – I avoid j'essaie de ne pas - I try not to	manger – eat boire – drink	de la viande – meat de(s) sucreries – sweet things de(s) boissons sucrées – sugary drinks de(s) matières grasses – fatty foods	parce que je suis végétarien(ne) – because I'm vegetarian car ça peut mener à l'obésité – because it can lead to obesity parce que c'est dangereux pour le cœur – because it's dangerous for your heart car c'est mauvais pour les dents – because it's bad for your teeth

Je dois – I must Je devrais – I should J'ai besoin de – I need to Il faut – it is necessary to	manger – eat boire – drink	trois repas par jour – three meals a day beaucoup d'eau – a lot of water le petit déjeuner – breakfast		pour rester en bonne santé - to stay healthy pour être en forme - to stay in shape
	faire - do	de l'exercice - exercise du sport - sport	de temps en temps – from time to time regulièrement – regularly au moins trois fois par semaine – at least three times a week	
	dormir - sleep	huit heures par nuit – eight hours a night		

2: Local, national, international and global areas of interest - Global issues

Que fais-tu pour aider l'environnement? – what do you do to help the environment?	J'utilise les transports en commun – I use public transport
	J'économise l'eau et l'électricité – I economise water and electricity
	Je prends une douche au lieu d'un bain – I take a shower instead of a bath
	Je recycle le plastique – I recycle plastic
	Pour aider l'enivronnement il faut réduire la pollution – to help the environment you must reduce pollution
	On doit recycler plus – we must recycle more
Quelles sont les plus grands problèmes de l'environnement ? – what are the biggest problems of the environment?	Les problèmes graves de l'environnement sont la circulation / les déchets - the most serious environmental problems are traffic/waste
	Ce que m'inquiète c'est le réchauffement/la pollution – what worries me is global warming/pollution
	Si on protège les forêts on peut sauver les animaux – if we protect forests we can save animals

le verre	glass
le papier	paper
le plastique	plastic
les boîtes	tin
le carton	cardboard
le métal	metal
les déchets alimentaires	food waste

les SDF	the homeless
la pauvrété	poverty
le logement	accomodation
le sac de couchage	sleeping bag
le trottoir	the pavement
une pièce de monnaie	a coin
un emploi	a job

Est-ce qu'il y a beaucoup de chômage dans ta région? - is there a lot of unemployment in your region?	Il y a beaucoup de chômage car il n'y a pas assez d'emplois – there's lots of unemployment as there aren't enough jobs
Qu'est-ce qu'il faut faire pour combattre le chômage? – what must we do to fight against unemployment?	Pour combattre le chômage il faut créer plus d'emplois – to fight against unemployment we must create more jobs
Il y a beaucoup de personnes sans logement dans ta ville? – are there lots of homeless people in your town?	Il y a beaucoup de personnes sans domicile car il n'y a pas assez de logements – there are lots of homeless people because there aren't enough houses
Qu'est-ce qu'il faut faire pour aider les personnes sans logement? – what must we do to help the homeless?	Pour aider les gens sans logement on peut donner de l'argent à une association caritative – to help the homeless we can give money to a charity

2: Local, national, international and global areas of interest - Travel and tourism

Que fais-tu en vacances normalement? - what do you normally do on holiday?	J'aime aller en Espagne car il fait chaud – I like going to Spain because it's hot
	Normalement je vais en vacances en Italie parce que la nourriture est délicieuse – normally I go on holiday in Italy because the food is delicious
	D'habitude je voyage en avion car c'est plus rapide - usually I travel by plane because it's faster
	J'adore bronzer sur la plage parce que c'est relaxant – I love sunbathing on the beach because it's relaxing
	Je préfère loger dans un hôtel parce que c'est plus confortable – I prefer staying in a hotel beacuase it's more comfortable
Qu'est-ce que tu as fait pendant les vacances l'année dernière? – What did you do on your holiday last year?	J'ai visité beaucoup de monuments historiques – I visited lots of historic sites
	J'ai passé deux semaines au bord de la mer avec ma famille – I spent two weeks by the sea with my family
	C'était très intéressant – it was very interesting
Quelles sont tes vacances de rêve? - what's your dream holiday?	Je voudrais aller aux États-unis pour faire du shopping – I would like to go to the United States to go shopping
	Je voudrais aller avec ma famille car ils paient tout – I would like to go with my family because they pay for everything

en voiture	by car
en avion	by plane
en train	by train
en car	by coach
en bateau	by boat
à velo	by bike
à pied	on foot

un château	a castle
un appartement	an apartment
un hôtel	a hotel
un chambre d'hôte	a bed and breakfast
un camping	a campsite
une auberge de jeunesse	a youth hostel
au bord de la mer	by the sea
à la montage	in the mountains
à la campagne	in the countryside
en ville	in town

Relaciones Con Familia y Amigos – Relationships with Family and Friends

¿Cómo es tu familia? – what is your family like?

En mi familia hay **In my family, there is/are**	mi my	padre madre hermano/a abuelo/a tío/a primo/a	father mother brother/sister grandfather/grandmother uncle/aunt m/f cousin
Tengo **I have**	mis My (for plural nouns)	padres abuelos hermanos primos	parents grandparents siblings cousins

Tengo	I have	los ojos verdes/azules/grises/marrones green/blue/grey/brown eyes
Tiene	s/he has	el pelo rubio/castaño/negro/pelirrojo blond/brown/dark/ginger hair
Tenemos	we have	
Tienen	they have	el pelo corto/largo/liso/ondulado/rizado short/long/straight/wavy/frizzy hair

Soy	I am	un poco	a bit
Es	s/he is	bastante	quite
Sería	I / s/he would be	muy	very
		demasiado	too

Adjective agreement rule

Adj end	Masc sing	Masc plur	Fem sing	Fem plur
- O	- O	- OS	- A	- AS
- A	- A	- AS	- A	- AS
- R	- R	- RES	- RA	- RAS
- L	- L	- LES	- L	- LES
- Z	- Z	- CES	- Z	- CES
- E	- E	- ES	- E	- ES

divertido	fun
travieso	silly
generoso	generous
cariñoso	caring
abierto	open
serio	serious
honrado	honest
perezoso	lazy
orgulloso	proud
egoísta	selfish
optimista	optimistic
feliz	happy
hablador	talkative
trabajador	hard-working
amable	nice/kind
triste	sad
alegre	happy

¿Cómo te llevas con familia? – How do you get on with your family?

Ahora Now Normalmente Normally Por lo general In general	me llevo bien I get on well me llevo mal I get on badly me peleo I fight/argue	con with + family member	porque es because s/he is	+ personality adjective
En el pasado In the past Hace X años X years ago El año pasado Last year	me llevaba bien/mal I used to get on well me llevaba mal I used to get on badly me peleaba I used to argue/fight		porque era because s/he was	

Relaciones y planes para el futuro – Relationships and plans for the future

Mi novia ideal **Mi novio ideal**	My ideal gif My ideal bf	sería – would be	+ personality adjectives
		Tendría - would have	+ physical description
		viviría - would live	en un piso/ una casa lujoso/a in a luxurious flat/ house
Mi pareja ideal	Mi ideal partner	estudiaría - would study	a la universidad/ ciencias/ idiomas/ comercio at university/ science/ languages/ business
		le gustaría - would like	viajar/ leer/ ver películas (to) trave / read/ watch movies

Creo/pienso que I believe/think that	me gustaría I would like	casarme - to get married enamorarme – to fall in love
En el futuro In the future		tener una familia - to have a family
Cuando sea mayor When I am older	me encantaría I would love	tener hijos – to have children encontrar el amor de mi vida to meet the love of my life
Cuando tenga 20 años When I am 20	quisiera I would love (=wish)	vivir con mi novio/a to live with my boyfriend/girlfriend
Después de mis estudios After my studies		vivir juntos to live together

1: La tecnología

¿Cómo usas la tecnología? – How do you use technology?

Uso I use	Instagram Whatsapp Skype	para in order to	descargar música pasar el tiempo compartir fotos colgar fotos contactar con mi familia conocer a gente nueva subir y ver videos chatear en línea mandar mensajes estar en contacto navegar por Internet	download music pass the time share photos post photos get in touch with my family know new people upload and watch video chat online send messages keep in touch surf the net
	mi móvil my mobile			
	mi tableta my tablet			
	mi portátil my laptop			

¿Cuáles son las ventajas/los peligrosos? – What are the advantages/dangers?

Es possible It is possible to	hacer los deberes ser útil para los deberes aprender mucho buscar muchísima información hacer amigos hablar con el extranjero ser bueno para el comercio jugar a los video-juegos comprar en línea	do your homework be useful for homework learn a lot find a ton of information make friends talk with foreigners be good for trade play videogames buy online
Se puede One/you can	ser peligroso hablar con desconocidos sufrir del acoso en línea tener efectos negativos en los estudios	be dangerous talking to strangers suffer from online bullying have a negative effect on studies

¿Qué piensas del Internet – What do you think of the Internet?

Lo bueno The good thing Lo mejor The best thing	es que is that	no) es it is (not)	un poco bastante muy demasiado	adictivo amplio/a cómodo/a divertido/a interactivo necesario/a peligroso/a práctico/a rápido/a fácil de usar popular útil gratis	addictive extensive convenient fun interactive necessary dangerous practical quick easy to use popular useful free
Lo malo The bad thing Lo peor The worst thing		puede ser it can be			

Lo único malo es que The only bad thing is that Lo negative es que The negative thing is that	soy adicto/a a…	I am addicted to…
	es adicto/a a…	s/he is addicted to…
	estoy enganchado/a … enganchado/a …	I am hooked on…
	está enganchado/a…	s/he is hooked on…
	es una perdida de tiempo	it is a waste of time

The perfect

to say what you have just done

Use the present tense of the verb ***haber*** + **past participle**.

(yo)	**he**	escuch**ado**
(tú)	**has**	beb**ido**
(él/ella/usted)	**ha**	compart**ido**

To form the past participle, remove the ***–ar***, ***–er*** or ***–ir*** from the infinitive and add:

–ado (***–ar*** verbs)
–ido (***–er*** / ***–ir*** verbs)

Some past participles are irregular, including:

hacer (to do / make) → ***hecho***
ver (to see / watch) → ***visto***

The present continuous

to say what you are doing at the moment

	estar (to be)	**present participle**
(yo)	estoy	
(tú)	estás	mir**ando**
(él/ella/usted)	está	beb**iendo**
(nosotros/as)	estamos	escrib**iendo**
(vosotros/as)	estáis	
(ellos/ellas/ustedes)	están	

To form the present participle, take the infinitive, remove the ***–ar***, ***–er*** or ***–ir*** and add the endings: ***–ando***, ***–iendo***, ***–iendo***.

Estoy buscando *canciones.* — **I am looking** for songs.
Está jugando *al fútbol.* — **He/She is playing** football.

Irregular present participles include: *leer* → ***leyendo***, *dormir* → ***durmiendo***

1: Las actividades del tiempo libre

¿Qué haces en tu tiempo libre? – What do you do during your free time?

Normalmente Normally Por lo general In general	me gusta I like me encanta I love me apasiona I am passionate about me interesa en I am interested in prefiero I prefer suelo I usually (+infinitive)	tocar la guitarra/el piano to play the guitar/piano cantar en un coro to sing in a choir practicar un deporte to practise a sport bailar/dar un paseo to dance/go for a walk descansar/escuchar música to rest/listen to music ver la televisión to watch tv leer una novela/una revista to read a book/a magazine ir al cine/un concierto to go to the cinema/ a concert salir a comer to go out to eat
En el futuro In the future El fin de semana próximo Next weekend	voy a - I am going to pienso - I am thinking of intento - I plan to quiero - I want me gustaría - I would like	

¿Qué ves en la tele o en el cine? – What do you watch on TV or at the cinema?

Me gusta Me encanta Normalmente Normally Por lo general In general	el telediario - the news	porque es because it is	adictivo/a/os/as addictive educativo/a/os/as educational estupendo/a/os/as brilliant tonto/a/os/as silly informativo/a/os/as informative emocionante(s) exciting interesante(s) interesting
Me gustan I like Me encantan I love Me interesan I am interested in	los dibujos animados - cartoons los documentales - documentaries los concursos - game shows los realitys - reality tv programmes los programas de música/ deportes - music/sports programmes	porque son because they are	
	las noticias - the news las comedias - comedies las telenovelas - soap operas las películas de amor/acción/ ciencia ficción - love/action/ science fiction films		

¿Qué deporte haces? – What sport do you do?

Jugaba - I used to play Juego - I play Jugaré - I will play	al fútbol al baloncesto al balonmano al hockey/tenis	football basketball handball hockey/tennis	porque because era - it was es - it is será - it will be +adjective
Iba - I used to go Voy - I go Iré - I will go	al polideportivo al gimnasio a la piscina de paseo	to the sports centre to the gymnasium to the swimming pool for a walk	
Hacía - I used to do Hago - I do Haré - I will do	gimnasia/ escalada atletismo/ciclismo equitación natación	gymnastics/rock-climbing athletics/cycling horse-riding swimming	

¿Qué comes y bebes? – What do you eat and drink?

Comí Como Voy a comer Comeré	I ate I eat I am going to eat I will eat	arroz / pan pollo / pescado	rice / bread chicken / fish
		carne / ensalada pasta / pizza	meat / salad pasta / pizza
		caramelos/pasteles huevos	sweets / cakes eggs
		galletas verduras	biscuits vegetables
Bebí Bebo Voy a beber Beberé	I drank I drink I am going to drink I will drink	agua / vino	water / wine
		té / café zumo de naranja	tea / coffee orange juice
		limonada cerveza	lemonade beer

Porque Because Ya que As/since	(no) es it is (not) (no) son they are (not)	sano/a/o/as rico/a/o/as delicioso/a/o/as sabroso/a/o/as grasiento/a/o/as asqueroso/a/o/as dulce(s) picante(s)	healthy tasty/rich delicious tasty greasy/fatty disgusting sweet spicy

Las Fiestas Y Las Tradiciones – Festivals and Traditions

Hablando de las fiestas – Talking about festivals

El Día de los muertos	se celebra is celebrated	el primero de noviembre	en Mexíco
Las Fallas		durante el mes de marzo	en Valencia
La Tomatina		el último día de agosto	en Buñol
San Fermín		del 6 al 14 de julio	en Pamplona
La Feria de Abril		en abril	en Sevilla
La Semana Santa		durante Pascua	en Valladolid

Durante esta fiesta During this festival	se llevan trajes de colores	colourful costumes are worn
	se queman figuras de madera	wooden figures are burnt
	se lanzan huevos/tomates	eggs/tomatoes are thrown
	se construyen hogueras	bonfires are built
	se disparan fuegos artificiales	fireworks are set off
	se celebran los santos	saints are celebrated
	se ven batallas y desfiles	battles and processions are seen
	se come comida típica	typical food is eaten
	se decoran las tumbas	tombs are decorated

Ir a una fiesta – Going to a festival

En mi opinión In my opinión				emocionante	exciting
				interesante	interesting
		era	used to be	peligroso	dangerous
Pienso que I think that				raro/extraño	strange
		fue	was	impresionante	impressive
	assistir a + festival			guay	cool
Creo que I believe that		es	is	tonto	stupid/silly
				hermoso	beautiful
	attending + festival	sería	would be	entretenido	entertaining
Desde mi punto de vista From my point of view				único	unique
		será	will be	fascinante	fascinating
				increíble	amazing
				estupendo	marvellous

¿Cómo se celebra Navidad? – How is Christmas celebrated?

Durante Navidad During Christmas	la gente people	come uvas a medianoche	eat grapes at midnight
		canta villancicos	sing carols
	la familia the family	va a la iglesia	go to church
		prepara platos típicos	prepare typical dishes
	Visitamos familia y amigos		We visit family and friends
	Llevamos ropa especial		We wear special clothes
	Decoramos la casa		We decorate the house
	Decoramos el árbol de Navidad		We decorate the Christmas tree
	Pasamos tiempo con la familia		We spend time with the family
	Comemos comida deliciosa		We eat delicious food
	Bebimos champán		We drink Champagne
	Recibimos regalos		We receive presents

¿Qué hiciste durante las vacaciones de Navidad?

The preterite tense

Use the **preterite tense** to talk about completed actions in the past.

visit**ar** (to visit)	beb**er** (to drink)	sal**ir** (to leave / to go out)	**irregular verbs** **ir** (to go) **ser** (to be)
visit**é**	beb**í**	sal**í**	**fui**
visit**aste**	beb**iste**	sal**iste**	**fuiste**
visit**ó**	beb**ió**	sal**ió**	**fue**
visit**amos**	beb**imos**	sal**imos**	**fuimos**
visit**asteis**	beb**isteis**	sal**isteis**	**fuisteis**
visit**aron**	beb**ieron**	sal**ieron**	**fueron**

Other irregular verbs in the preterite include:

tener (e.g. ***tuve*** – I had), ***hacer*** (e.g. ***hice*** – I did / made) and ***ver*** (e.g. ***vi*** – I saw / watched).

Some verbs have a spelling change in the 'I' form only:

jugar → *jugué* *llegar* → *llegué* *sacar* → *saqué*

2: Current And Future – La Vida Escolar - Life At School

Las reglas – the rules	Tenemos que hacer una hora de deberes cada noche - we have to do an hour of homework per evening
	Hay que prestar atención en clase - we have to pay attention in lessons
	No se debe olvidar el boligrafo - we shouldn't forget our pens
	Se debe llevar uniforme - we must wear a uniform
	Se puede llevar maquillaje - we can wear make-up
	Los móviles están prohibidos - mobile phones are forbidden
Los problemas – problems	No comprendo/ No entiendo - I don't understand
	Siempre tengo demasiados deberes - I always have too much homework
	Mis notas son malos - my grades are bad
Décris- moi ton école – Describe your school	Las aulas son modernas - the classrooms are modern
	No me gusta la comida en el comedor - I don't like the food in the canteen
	Hay 1100 alumnos en mi instituto - there are 1,100 students in my school
	Hay un campo de deporte - there is a big sports field

un blázer	a blazer
los zapatos	shoes
una falda	a skirt
un jersey	a jumper
una camisa	a shirt
unos pantalones	trousers
una corbata	a tie

estoy de acuerdo	I agree
tienes razón	you're right
no estoy de acuerdo	I disagree
es mentira	it's false
es verdad	it's true

¿Qué opinas de la vida escolar en Inglaterra? – What do you think of school life in England?	En mi opinion – in my opinion Pienso que – I think that Según… – According to…	El día escolar es demasiado largo/corto – the school day is too long/short
		El día escolar empieza demasiado temprano – the school day begins too early
		Las reglas son muy estrictas – the rules are very strict
		Hay demasiada presión – there is too much pressure
		El uniforme es una buena/mala idea – uniform is a good/bad idea
		Los profesores son severos/simpáticos – the teachers are strict/nice

2: Current and Future

2: Current and future – la educación después de los 16 años - education post-16	
¿Qué planes tienes para el año que viene? – What plans do you have for next year?	Quiero continuar con mis estudios – I want to continue my studies
	Me gustaría hacer un aprendizaje – I would like to do an apprenticeship
Tengo la intención de - I intend Podría - I could Quisiera - I would like Tengo ganas de - I feel like	estudiar- to study buscar trabajo – to find a job hacer un aprendizaje - to do an apprenticeship ir a la universidad - to go to university
¿Cuales son tus puntos fuertes/flacos? – What are your strong/weak points?	Soy bueno/a / malo/a en ciencias – I am good at/bad at science
	Creo que soy trabajador/a – I think I am hardworking
¿Cuál empleo te interesa? Which career are you interested in?	Me gustaría ser contable/profesor – I'd like to be an accountant/a teacher
	Me gustaría trabajar en un banco – I'd like to work in a bank
¿Te gustaría continuar a estudiar? Would you like to continue studying?	Quiero hacer mi bachillerato y voy a estudiar las lenguas – I want to pass my A levels and I'm going to study languages
	No quiero continuar a estudiar porque estoy harto de los examenes – I don't want to continue studying because I'm fed up of exams

2: Current and future – jobs, career choices and ambitions									
¿Qué te gustaría hacer en el futuro ? – What would you like to do in the future?		Me gustaría trabajar – I'd like to work Quiero trabajar – I want to work Tengo ganas de trabajar – I wish to work			como médico – as a doctor en un despacho – in an office al extranjero – abroad con los niños – with children				
¿Porque quieres hacer esto trabajo? – Why do you want to do this job?		Escogé el trabajo porque paga bien – I chose this career because it pays well							
		Una ventaja de ser camarero es trabajar con mucha gente – an advantage of being a waiter is working with many people							
¿Que profesión no te interesa y por que? – Which career doesn't interest you and why?		No quiero ser policía porque es demasiado peligroso – I don't want to be a police officer because it's too dangerous							
		Una desventaja de ser músico es el riesgo del paro – One disadvantage of becoming a musician is the risk of unemployment							
Háblame de ti mismo – Tell me about yourself		Soy una persona… - I'm a person who is... Creo que soy – I think I am			organizado/a – organised generoso/a – generous simpático/a – kind un poco impaciente – a bit impatient bastante perezoso – quite lazy				
		En cinco años me gustaría – In five years time I would like to			ser jefe – become a boss tener mi propia empresa – have my own business trabajar al extranjero – work abroad				
policía - police officer	panadero/a - baker	peluquero/a - hairdresser	granjero/a - farmer	cartero/a - postman/woman	electricista - electrician	cantante - singer	albañil - bricklayer	ingeniero/a - engineer	
profesor/ profesora - teacher	veterinario/a - vet	médico/a - doctor	abogado/a - lawyer	camarero/a - waiter/waitress	dependiente/ dependienta - sales assistant	enfermero/a - nurse	plomero/a - plumber		

GCSE PE

1A	**What is a joint?**
	• A place where two or more bones meet
1B	**What is cartilage?**
	• Tissue which covers the end of bones providing a smooth, friction-free surface
1C	**What is a synovial fluid?**
	• A substance produced by the synovial membrane to lubricate the joint
1D	**What are ligaments?**
	• Attaches bone to bone
1E	**What are tendons?**
	• Attaches muscle to bone
1F	**What are bursae?**
	• Fluid-filled bag which helps to reduce friction at a joint
1G	**Define flexion.**
	• A decrease in the angle at a joint
1H	**Define extension.**
	• An increase in the angle at a joint
1I	**Define abduction.**
	• Movement away from the midline of the body
1J	**Define adduction.**
	• Movement towards the midline of the body
1K	**Define rotation.**
	• Turning the limb along its long axis
1L	**Define circumduction.**
	• Movement in a circular motion
1M	**Define plantar flexion.**
	• Movement where the toes are pointed down towards the ground

1N	**Define dorsi flexion.**
	• Movement where the toes are pointed up towards the knee
2A	**What are alveoli?**
	• Tiny air sacs in the lungs which allow for rapid gaseous exchange
2B	**Define tidal volume.**
	• The volume of air breathed in (or out) during a normal breath at rest
2C	**Define expiratory reserve volume.**
	• The volume of air which can be exhaled after normal tidal expiration
2D	**Define inspiratory reserve volume.**
	• The volume of air which can be inhaled after normal tidal inspiration
2E	**Define residual volume.**
	• The volume of air that remains in the lungs after maximal expiration
2F	**Define vasoconstriction.**
	• A tightening of the blood vessels
2G	**Define vasodilation.**
	• A widening of the blood vessels
2H	**What are the two phases of the cardiac cycle?**
	• Diastole and systole
2I	**Define diastole.**
	• Where cardiac muscle relaxes allowing the heart to fill with blood
2J	**What are veins?**
	• Blood vessels which transport blood towards the heart
2K	**What are arteries?**
	• Blood vessels which transport blood away from the heart
2L	**What are capillaries?**
	• Tiny blood vessels which allow gaseous exchange to occur

GCSE PE

3A	**Define aerobic.**
	• In the presence of oxygen
3B	**Define anaerobic.**
	• In the absence of oxygen
3C	**What is lactic acid?**
	• Waste product produced during anaerobic exercise
3D	**Define oxygen debt.**
	• Temporary shortage of oxygen in the body due to strenuous exercise
3E	**Define EPOC.**
	• Excess Post Exercise Oxygen Consumption
3F	**Define DOMS.**
	• Delayed Onset of Muscle Soreness
3G	**Define hypertrophy.**
	• Increased size of muscles/heart due to long-term exercise
3H	**Define bradycardia.**
	• Lowered resting heart rate due to long-term exercise
3I	**What is a cool down?**
	• Recovery method involving light aerobic work and a sequence of stretches
3J	**What is an ice bath?**
	• Recovery method where the body is immersed in cold water to speed up recovery
3K	**What is a sports massage?**
	• Recovery method where pressure is applied through rubbing and kneading to areas of tension
3L	**What is an adapted diet?**
	• Recovery method where additional nutrients and fluids are taken on to support recovery

4A	**Summarise the arrangement of lever systems**
	• 1, 2, 3 – F, R, E
4B	**Identify where a 1st class lever can be found.**
	• Elbow and head/neck
4C	**Identify where a 2nd class lever can be found.**
	• Ankle
4D	**Identify where a 3rd class lever can be found.**
	• Elbow (movement below head height)
4E	**Define mechanical advantage.**
	• The benefit of a lever system
4F	**How is mechanical advantage calculated?**
	• Effort arm ÷ resistance arm
4G	**Summarise the combination of planes and axes.**
	• S-T / F-S / T-L
4H	**Which plane and axis are involved in forwards/backwards movement?**
	• Sagittal plane, transverse axis
4I	**Which plane and axis are involved in sideways movement?**
	• Frontal plane, sagittal axis
4J	**Which plane and axis are involved in rotational movement?**
	• Transverse plane, longitudinal axis
4K	**Define isotonic.**
	• Contraction involving change in muscle length causing movement
4L	**Define isometric.**
	• Contraction involving no change in muscle length causing no movement
4M	**Identify the two types of isotonic contraction.**
	• Concentric (shortening) and eccentric (lengthening)

GCSE PE

5A	**Define health.** • A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity
5B	**Define fitness.** • The ability to meet/cope with the demands of the environment
5C	**Define agility.** • The ability to move and change direction quickly whilst maintaining control
5D	**Define balance.** • Maintaining the centre of mass over a base of support
5E	**Define cardiovascular endurance.** • The ability of the heart and lungs to supply oxygen to the working muscles
5F	**Define coordination.** • The ability to use two or more parts of the body together smoothly and efficiently
5G	**Define flexibility.** • The range of movement possible at a joint
5H	**Define muscular endurance.** • The ability of a muscle or muscle group to repeat contractions without fatigue
5I	**Define power.** • Strength x speed
5J	**Define reaction time.** • The time taken to initiate response to a stimulus
5K	**Define speed.** • The maximum rate at which you can perform a movement or cover a distance
5L	**Define maximal strength.** • The largest force possible in a single contraction

5M	**Define static strength.** • The maximum force applied to an immovable object
6A	**Identify the test for agility.** • Illinois agility test
6B	**Identify the test for balance.** • Stork stand test
6C	**Identify the test for cardiovascular endurance.** • Multi-stage fitness test
6D	**Identify the test for coordination.** • Wall toss test
6E	**Identify the test for flexibility.** • Sit and reach test
6F	**Identify the test for muscular endurance.** • Sit-up bleep test
6G	**Identify the test for power.** • Vertical jump test
6H	**Identify the test for reaction time.** • Ruler drop test
6I	**Identify the test for maximal strength.** • 1 rep max test
6J	**Identify the test for speed.** • 30m sprint test
6K	**Identify three reasons for completing fitness testing.** • Identify strengths and weaknesses • Inform training requirements • Set goals • Monitor improvement
6L	**Identify three limitations of fitness testing.** • Tests are not sport specific • Tests do not replicate competitive conditions • Test results lack reliability • Tests may be invalid

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6M	**What is quantitative data?**
	• Measurement based on facts/statistics
6N	**What is qualitative data?**
	• Measurement based on opinion
7A	**What are the five principles of training?**
	• Specificity • Progression • Overload • Reversibility • Tedium
7B	**What are the four principles of overload?**
	• Frequency • Intensity • Time • Type
8A	**What is circuit training?**
	• A series of exercises performed one after the other with a rest in between • Used to improve muscular endurance
8B	**Identify two advantages of circuit training.**
	• Easily adjusted to suit different sports • Easily adjusted to suit ability
8C	**Identify two disadvantages of circuit training.**
	• May require specialist equipment • Difficult to gauge work/rest ratio at the start
8D	**What is continuous training?**
	• Exercise for an extended period of time without rest • Also known as 'steady state' training • Used to improve cardiovascular endurance
8E	**Identify two advantages of continuous training.**
	• No equipment required • Can be completed anywhere
8F	**Identify two disadvantages of continuous training.**
	• It can be tedious/boring • It can be time-consuming
8G	**What is fartlek training?**
	• Training which involves repeated changes to intensity and terrain • Also known as 'speed-play' • Used to improve cardiovascular endurance
8H	**Identify two advantages of fartlek training.**
	• Replicates changing intensity of games • More interesting than continuous training
8I	**Identify two disadvantages of fartlek training.**
	• Difficult to gauge work/rest ratio at the start • Complex to make required adjustments
8J	**What is interval training?**
	• Training which involves periods of work and rest • Used to improve speed
8K	**What is HIIT?**
	• High Intensity Interval Training
8L	**Identify two advantages of interval training.**
	• Burns body fat quickly • Can be completed quickly
8M	**Identify two disadvantages of interval training.**
	• Requires high level of motivation • Extreme work can lead to injury
8N	**What is plyometric training?**
	• Training which involves explosive movements such as jumping, hopping and bounding • Used to improve power
8O	**Identify two advantages of plyometric training.**
	• Develops explosive movement • Adds variety and 'fun' to training

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8P	**Identify two disadvantages of plyometric training.** • Requires knowledge of safe techniques • Requires expensive equipment
8Q	**What is weight training?** • Training which involves using free weights or resistance machines • Used to improve strength, power and muscular endurance
8R	**Identify two advantages of weight training.** • Used to improve different fitness components • Can be used to recover from injury
8S	**Identify two disadvantages of weight training.** • Requires knowledge of safe techniques • Requires expensive equipment
8T	**Identify key features of muscular endurance training.** • Lifting >70% of 1 rep max • Approx. 3 sets of 4-8 reps
8U	**Identify key features of muscular endurance training.** • Lifting <70% of 1 rep max • Approx. 3 sets of 12-15 reps
8V	**What is static stretching?** • Stretching to the limit and holding the stretch isometrically • Used to improve flexibility
8W	**Identify two advantages of static stretching.** • Relatively safe • Can be completed by anyone
8X	**Identify two disadvantages of static stretching.** • Can be time consuming to stretch whole body • Over stretching can cause injury
8Y	**What is altitude training?** • Training high above sea level (>2,000m) • Used to improve cardiovascular endurance

9A	**Identify three safety principles to follow during fitness training.** • Complete suitable warm-up and cool-down • Wear suitable clothing/footwear • Maintain hydration levels • Use correct techniques
9B	**Identify the three training seasons.** • Pre-season (preparation) • Peak-season (competition) • Post-season (transition)
9C	**Identify the key purpose of pre-season.** • Improve general/aerobic fitness
9D	**Identify the key purpose of peak-season.** • Maintain fitness levels
9E	**Identify the key purpose of post-season.** • Rest and recovery
9F	**Identify key parts of a warm-up.** • Gradual pulse raiser • Stretches • Skill-based activity • Mental preparation
9G	**Identify three benefits of a warm-up.** • Increased body temperature • Increased range of movement • Psychological preparation • Reduce risk of injury
9H	**Identify key parts of a cool-down.** • Light aerobic exercise • Stretches
9I	**Identify three benefits of a cool-down.** • Maintain elevated heart rate / breathing rate • Removal of lactic acid • Prevents DOMS

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1A	**Identify three user groups who may participate in sport.** • Ethnic minorities • Retired people / over 50s • Single parents • Children/teenagers • Disabled • Unemployed
1B	**Identify three barriers to participation in sport.** • Lack of time • Family commitments • Lack of disposable income • Lack of suitable facilities/equipment • Lack of role models • Limited provision of suitable activities • Lack of awareness • Impact of stereotypes
1C	**Identify three solutions to barriers to participation in sport.** • Improved promotion/range of activities • Initiatives to target key groups • Improved access (e.g. ramps and lifts) • Using alternative equipment • Reduction on costs • Specialist coaching • Use of role models
1D	**Identify three factors which can influence the popularity of sport in the UK.** • Level of participation • Provision • Media coverage • Level of success for both teams and individuals • Role models • Acceptability

1E	**Identify three sports which are increasing in popularity in the UK.** • Walking • Yoga • Zumba • Fitness training • Football
1F	**Identify two sports which are becoming less popular in the UK.** • Swimming • Cycling
1G	**Identify three new/emerging sports in the UK.** • Ultimate Frisbee • Footgolf • Triathlon • American Football • Lacrosse • Korfball • Handball
2A	**Identify three different values which can be promoted through sport.** • Team spirit • Fair play • Citizenship • Tolerance and respect • Inclusion • National pride • Excellence
2B	**Identify three key elements of the Olympic and Paralympic movement** • The creed • The symbol • The Olympic and Paralympic values

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2C	**Identify three of the Olympic/Paralympic values.** • Respect • Excellence • Friendship • Courage • Determination • Inspiration • Equality
2D	**Identify three initiatives which promote values through sport.** • FIFA's 'Football for Hope' campaign • ECB's 'Chance to Shine' programme • Sport Relief
2E	**Identify three reasons why it is important for sports performers to demonstrate good behaviour.** • To ensure the game is played fairly • To promote the values of the sport • To ensure the safety of participants • To demonstrate good sportsmanship • To avoid gamesmanship (e.g. time wasting)
2F	**Identify three reasons why it is important for spectators to demonstrate good behaviour.** • To ensure suitable playing atmosphere • To help combat social issues (e.g. racism)
2G	**What are PEDs?** • Performance Enhancing Drugs
2H	**Identify two reasons why athletes may use PEDs.** • Pressure to succeed as an individual • Pressure to succeed as a nation
2I	**Identify three reasons why athletes should not use PEDs.** • Long term ill health • Consequences when found guilty • Unfair advantage

2J	**Identify the full name for the group known as 'WADA'.** • World Anti-Doping Agency
2K	**What is the 'whereabouts rule'?** • Athletes are required to select one hour per day, seven days a week to be available for no-notice drugs tests
2L	**Identify three different testing methods used by WADA.** • Blood sample collection • Urine sample collection • Hair sample collection • Nail sample collection
2M	**Identify the main sanction used by WADA.** • Specifics
2N	**Identify three examples of elite performers who have used performance enhancing drugs.** • Dwain Chambers • Lance Armstrong • Marion Jones • Ben Johnson
2O	**Identify one impact drug taking can have on the reputation of sport.** • Mistrust of results/events due to repeated scandals
3A	**Identify three different features of major sporting events.** • The regularity • Range of countries involved • Level of investment
3B	**Identify an example of a 'one off' event.** • The Olympics
3C	**Identify an example of a 'regular' event.** • The Champions League final
3D	**Identify an example of a 'regular and recurring' event.** • The World Tennis Finals

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3E	**Identify the three key areas related to the legacy of a major sporting event.** • Sporting • Social • Economic
3F	**Identify three potential benefits of hosting major sporting events.** • Increased tourism • Commercial benefits • Increased participation in some sports • Improved infrastructure/facilities • Increased status of the country • Improved morale of the country
3G	**Identify three potential drawbacks of hosting major sporting events.** • Expensive to bid for/host the event • Facilities may not be used after the event • Poor reputation if event is disorganised • Financial benefits may not be spread evenly across the country
4A	**What is an NGB?** • National Governing Body
4B	**Identify three different areas of focus for NGBs.** • Promotion • Development • Infrastructure • Policies and initiatives • Funding • Support
4C	**Identify three ways NGBs promote their sport.** • Promoting participation • Increasing the popularity of the sport • Exposure in the media

4D	**Identify three ways NGBs develop their sport.** • Elite training and development • Coaching awards • Training of officials
4E	**Identify three ways NGBs improve infrastructure in their sport.** • Organise competitions and tournaments • Organise rule-making and disciplinary procedures • Providing a national directive and vision • Providing guidance, support and insurance • Assist with facility developments
4F	**Identify three ways NGBs organise policies and initiatives in their sport.** • Organise anti-doping policies • Promoting etiquette and fair play • Community programmes • Provide information and guidance on safeguarding
4G	**Identify three ways NGBs distribute funding in their sport.** • Grants • Government initiatives • Lottery funding • Private investment and donations • Merchandising Fundraising events
4H	**Identify two ways NGBs offer support in their sport.** • Providing technical advice • Providing location/contact details for local club

Notes

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