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**Autumn Term**  
**2021-2022**



# Knowledge Organiser

Name: .....

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Shakespeare (1606)	<b>34.</b>	Science - Physics Unit 4: Atomic Structure	<b>64.</b>	Design Technology - Specialist Materials
Alley (1818)	<b>35-38.</b>	French - 1: Identity and Culture	<b>65-66.</b>	Drama - Blood Brothers by Willy Russell (1982)
l	<b>39-42.</b>	French - 2: Local, national, international and global areas of interest	<b>67.</b>	Drama - Component 1: Devising and Evaluating
Priestley (1945)	<b>43-46.</b>	Spanish - 1: Relaciones con familia y amigos, La tecnología, Las fiestas	<b>68-69.</b>	HSC - Component 1 - Human Lifespan Development
ulae,	<b>47-48.</b>	Spanish - 2: Current and future	<b>70.</b>	Music - Ensemble Music
ng Quadratics	<b>49.</b>	Geography - The Changing Economic World	<b>71.</b>	Music - Film Music
ures,	<b>50.</b>	Geography - The Living World	<b>72.</b>	Music - Musical Forms and Devices
s	<b>51.</b>	Geography - UK Physical Landscapes (Coasts)	<b>73.</b>	Music - Pop Music
onality,	<b>52.</b>	Geography - UK Physical Landscapes (Rivers)	<b>74-75.</b>	PE - Part 1
interest,	<b>53.</b>	History - Topic 1: Medicine In The Middle Ages C.1250-1500, Topic 2: Medicine In The Renaissance C.1500-C.1700	<b>76-77.</b>	PE - Part 2
ard Form,	<b>54.</b>	History - Topic 3: Medicine In The Industrial Period 1700-1900, Topic 4: Modern Medicine, 1900-Present	<b>79-81.</b>	PE - Cambridge National Sports Studies
g Formulae,	<b>55.</b>	History - Topic 1: The Development Of The Civil Rights Movement, 1954-60, Topic 2: Protest, Progress And Radicalism 1960-75	<b>82-87.</b>	RE - Christianity beliefs and teachings
phs (straight	<b>56.</b>	History - Topic 3: Us Involvement In The Vietnam War, 1954-75, Topic 4: Reactions To, And The End Of, Us Involvement In Vietnam, 1964-75	<b>88-93.</b>	RE - Islam beliefs and teachings
Algebraic	<b>57.</b>	Art - The four assessment objectives for both components (Unit 1 and Unit 2)	<b>94-100.</b>	RE - Religion and Life
Solving	<b>58.</b>	Art - What you need to do to achieve the best grades	<b>101-104.</b>	Business - Business in the real world
Surds,	<b>59.</b>	Computing - 1.1 Systems Architecture	<b>105-109.</b>	Business - Marketing
onality,	<b>60.</b>	Computing - 1.2 Memory and 1.3 Storage	<b>110.</b>	Business - Finance for business formulae list
Compound Interest,	<b>61.</b>	Computing - 1.4 Wired and Wireless Networks		
ard Form,	<b>62.</b>	Computing - 1.5 Network Topologies, Protocols and Layers		
tion	<b>63.</b>	Design Technology - Core knowledge		
and Response				
ng & Structure				
tion				
ical Changes				
odel				

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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

# Macbeth by William Shakespeare (1606)

English  
1 of 11

## Key Terms:

1.	<b>Prophecies</b> – Predictions.	
2.	<b>Regicide</b> – Killing a monarch (king or queen).	
3.	<b>Great Chain of Being</b> – A system created by God which ranks every human and animal in the world.	
4.	<b>Supernatural</b> – A force that cannot be explained by human reason.	
5.	<b>Jacobean era</b> – 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. <b>Macbeth</b> is a celebrated but <b>violent</b> war hero.	1.2 Duncan: "O valiant cousin! Worthy gentleman!" 1.2 Captain: "unseamed him from the nave to th'chops."
	7. <b>Duncan</b> as the <b>rightful king</b> , chosen by God.	1.7 Macbeth: "his virtues will plead like angels."
	8. <b>Banquo</b> as an <b>honourable man</b> , who questions the <b>prophecies</b> .	1.3. Banquo: "What, can the devil speak true?"
	9. <b>Supernatural</b> as a powerful force; <b>witches</b> share <b>prophecies</b> .	1.3 Witches (to Macbeth): "All hail Thane of Cawdor, that shall be king hereafter." 1.3 Witches (to Banquo): "Thou shalt get king, though thou be none."
	10. <b>Macbeth</b> is in two minds about committing <b>regicide</b> as his <b>ambition</b> awakens.	1.3 Macbeth (to witches): "Stay you imperfect speakers, tell me more." 1.3 Macbeth: "Why do you dress me in borrowed clothes?" 1.3 Macbeth (aside): "This supernatural soliciting cannot be good, cannot be ill." 1.7 Macbeth (soliloquy): "Bloody instructions return to plague th'inventor." 1.4 Macbeth (aside): "Stars, hide your fires, let not light see my black and deep desires."
	11. <b>Lady Macbeth</b> is an <b>ambitious</b> , unusual <b>Jacobean</b> woman who encourages <b>deception</b> .	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. <b>Macbeth</b> is in two minds about committing <b>regicide</b> .	2.1 Macbeth (soliloquy): "Is this a dagger I see before me? Come let me clutch thee."
	13. <b>Macbeth</b> is overwhelmed by <b>guilt</b> following committing <b>regicide</b> , compared to <b>Lady Macbeth</b> who is <b>untroubled</b> .	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.'"
	14. The <b>natural world</b> is in <b>chaos</b> because the <b>Great Chain of Being</b> has been disturbed.	2.3 "The earth was feverous and did shake." 2.4 "Tis said they (Duncan's horses) eat each other."
	15. <b>Duncan's sons</b> suspect <b>treason</b> and <b>deception</b> , and flee.	2.3 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 Malcolm takes the throne and order is restored in Scotland.	5.8 Macduff: "Macduff was from his mother's womb untimely ripped." 5.9 King Malcolm: "call home our exiled friends abroad that fled the snares of watchful tyranny." 5.9 King Malcolm: "dead butcher, and his fiend-like queen."

## Frankenstein by Mary Shelley (1818)

### Key Vocab:

1.	<b>Romanticism</b> – Romantics believed in the power and beauty of nature.	
2.	<b>Gothic fiction</b> – Includes supernatural and sublime ideas.	
3.	<b>Enlightenment/Industrial age</b> – Romanticism was a reaction to these.	
4.	<b>Nature Vs Nurture, Passion over Reason</b> – Key romantic ideas.	
When?	Key idea and theme	Key quotes
Prologue. Walton's letters to his sister. His passion is to reach the North Pole.	5. Letter 1 – <b>Captain Robert Walton</b> writes to his sister Margaret to tell her he is ready for his journey. He is <b>passionate about the natural world</b> he will encounter, and excited about gaining <b>new knowledge to benefit all</b> .	Walton: 'My daydreams become more fervent and vivid.' 'I shall satiate my ardent curiosity with the sight of a part of the world never before visited.'
	6. Letter 2 – <b>Walton</b> is lonely and <b>feels nobody understands him</b> .	Walton: 'I desire the company of a man who could sympathise with me.'
	7. Letter 3 – <b>Walton</b> writes that he expects his <b>ambition</b> to be fulfilled.	Walton: 'What can stop the determined heart and resolved will of man?'
	8. Letter 4 – Trapped in the ice he sees a <b>mysterious stranger</b> , then meets <b>Victor Frankenstein</b> who explains how <b>his ambitions led to his downfall</b> .	Frankenstein: 'Do you share my madness? Have you drunk of the intoxicating draught? Hear me... and you will dash the cup from your lips.'
Chapters 1-4. Victor's early life & family, his early interest in science and arrival at University.	9. Ch. 1 – <b>Victor</b> describes <b>his perfect childhood</b> , and how he developed a powerful love for his adopted cousin Elizabeth.	Frankenstein: 'My parents seemed to draw inexhaustible stores of affection from a mine of love to bestow.' Frankenstein: 'Elizabeth was mine –to protect, love and cherish.'
	10. Ch. 2 – <b>Victor</b> develops his <b>love for Science</b> and learning, inspired by obscure scientists like Paracelsus and Cornelius Agrippa.	Frankenstein: 'I studied the wild fancies of these writers with delight.'
	11. Ch. 3 – <b>Victor's mother dies</b> . He goes to Ingolstadt to study. He dislikes <b>Kremppe</b> , but admires <b>Professor Waldman</b> , who shares his <b>passion</b> .	Frankenstein: 'I will pioneer a new way, explore unknown powers and unfold to the world the deepest mysteries of creation.'
	12. Ch. 4 – <b>Victor</b> spends two years ignoring his family to <b>research the secret of life</b> . Sometimes he stays up all night and spends time in graveyards and charnel houses.	Frankenstein: 'My application ... became so eager that the stars often disappeared in the light of the morning.'

## Frankenstein by Mary Shelley (1818)

When?		Key idea and theme	Key quotes
Chapters 5-10. Victor's creation comes to life, and he must deal with the consequences.	13.	Ch. 5 – <b>The creature</b> awakens. <b>Victor</b> realises that he has driven himself to the brink of destruction chasing an impossible dream. He becomes very ill and is nursed back to health by <b>Henry Clerval</b> .	Frankenstein: 'Now that I had finished the beauty of the dream vanished and breathless horror and disgust filled my heart.'
	14.	Ch.7 – <b>Victor</b> receives a letter telling him that his brother has been killed. He makes his way back to Geneva. During a <b>violent and impressive storm</b> , he sees <b>the creature</b> and realises that he is responsible for William's death.	Frankenstein: 'I discovered my lovely boy stretched on the grass livid and motionless.' Frankenstein: 'Vivid flashes illuminating the lake making it appear like a vast sheet of fire.' Frankenstein: The deformity of its aspect... it was the filthy demon.'
	15.	Ch. 8 – <b>Justine</b> is sentenced to death for William's murder. <b>Victor</b> knows that the creature is the murderer and feels <b>terrible guilt</b> .	Frankenstein: 'Torn by remorse, horror and despair, I beheld those I loved spend vain sorrow upon the first hapless victims to my unhallowed arts.'
	16.	Ch. 9 – Blaming himself, and <b>enraged</b> by the deaths of William and Justine, <b>Victor</b> goes into the mountains to seek <b>revenge</b> on the creature.	Frankenstein: 'I wished to see him again that I might... avenge the deaths of William and Justine.' Frankenstein: 'I listened with the extremist agony. I... was the true murderer.'
	17.	Ch. 10 – <b>Victor and the creature</b> confront each other in the Alps. Victor is furious but he does begin to feel <b>sympathy</b> when the creature describes how he has been <b>mistreated by humanity</b> .	Creature: 'I ought to be thy Adam, but I am rather the fallen angel.' Creature: 'I was benevolent and good; misery made me a fiend.' Frankenstein: 'For the first time I felt the duties of a creator towards his creature'.
	18.	Ch. 11 – <b>The creature</b> describes how at first, he was completely unaware of his surroundings. As his journey progressed, he realised that <b>mankind was always going to treat him as an outsider</b> . He found a shelter next to a family dwelling.	Creature: 'I was a poor, helpless, miserable wretch.' Creature: 'I sat down and wept.' Creature: 'Here then I retreated and lay down happy to have found a shelter, however miserable, from the [...] barbarity of man.'
Chapters 11-16. The creature begins to tell Victor his story. He describes the events of his life since Victor abandoned him - these include William's murder.	19.	Ch 12 – <b>The creature</b> considers how he might be <b>rejected</b> further by humanity.	Creature: 'I imagined they would be disgusted until by my gentle demeanour, I should win... their love.'
	20.	Ch 15 – <b>The creature</b> learns to read and reflects on the nature of his <b>isolation</b> . The creature learns about Frankenstein through the journal and becomes <b>enraged</b> . He introduces himself to the cottagers who react with violence, to the creature's dismay.	Creature: 'My person was hideous and my stature gigantic. What did this mean? Who was I? What was I? Whence did I come?'. Creature: 'Satan had his companions, fellow devils, to admire and encourage him but I am solitary and abhorred.' Creature: 'I could have torn him limb from limb as the lion rends the antelope.'
	21.	Ch 16 – <b>The creature, spurned by all humanity</b> , goes to Geneva to seek <b>revenge</b> . He encounters William, Victor's brother, and describes how he killed him.	Creature: 'Cursed, cursed creator. Why did I live?' Creature: 'My daily vows rose for revenge.' Creature: 'I gazed on my victim and my heart swelled with exultation and hellish triumph.'

## Frankenstein by Mary Shelley (1818)

When?		Key idea and theme	Key quotes
<p>Chapters 17 – 24. The creature asks Victor to make him a companion. Victor initially agrees but then changes his mind; enraged, the creature kills Elizabeth. Victor dies after telling Walton his story. Walton abandons his own plans.</p>	22.	Ch 17 – Victor initially refuses because he is worried about the consequences but feels sympathy for the creature and fear over what might happen if he refuses. He agrees to create a companion for the creature, who tells Victor he will be watching.	<p><i>Creature: 'If I cannot inspire love I will cause fear.'</i></p> <p><i>Frankenstein: 'I concluded that the justice due to him and my fellow creatures demanded that I should comply with his request.'</i></p>
	23.	Ch 20 – Victor is overcome with horror at what he is doing and destroys the companion in front of the creature. The creature swears revenge.	<p><i>Frankenstein: 'The wretch saw me destroy the creature on whose future existence he depended for happiness ...'</i></p> <p><i>Creature: 'Beware, for I am fearless and therefore powerful... I shall be with you on your wedding night.'</i></p>
	24.	Ch 21 – To his horror, Victor learns Clerval has been murdered.	<i>Frankenstein: 'the agonies I endured... I was carried out in strong convulsions.'</i>
	25.	Ch 23 – The creature murders Elizabeth on her wedding night; Victor vows revenge.	<p><i>Frankenstein: 'A grin was on the face of the monster.'</i></p> <p><i>Frankenstein: 'My rage is unspeakable...'</i></p>
	26.	Ch 24 – Victor spends the rest of his life chasing the creature. He completes his story to an amazed Walton and then dies. Walton finds the creature crying over Victor's death. The creature tells Walton that he will now kill himself. Walton realises the danger of unchecked ambition and turns his crew home.	<p><i>Frankenstein: 'I was cursed by some devil and carried about [...] an eternal hell.'</i></p> <p><i>Frankenstein: 'I must pursue and destroy the being to whom I gave existence'</i></p> <p><i>Creature: 'You hate me; but your abhorrence cannot equal that with which I regard myself.'</i></p> <p><i>Creature: 'I shall die. I shall no longer feel the agonies which now consume me.'</i></p>

## English Language Paper 1 – Knowledge Organiser

Q	Question	Mark	Look out for these things in the text that are specific to each question:	Must include in your answer:	Must include in your answer:
1.	List 4 things from this part of the source about...	4	You need to focus only on the line references given	<ul style="list-style-type: none"> <li>Short, precise answers</li> <li>Focus on the key word in the question</li> <li>Select quotations from the text</li> <li>Inferences are not required</li> </ul>	Copy quotes directly from the text for your answers
2.	How does the writer use language to describe ...?	8	<b>Words and phrases</b> <ul style="list-style-type: none"> <li>Emotive verbs/adverbs/ adjectives</li> <li>Semantic field</li> </ul> <b>Language features and techniques</b> <ul style="list-style-type: none"> <li>Imagery – metaphor; simile; personification</li> <li>Sound patterns - repetition; onomatopoeia; alliteration</li> </ul> <b>Sentence Forms</b> <ul style="list-style-type: none"> <li>Short sentence/ list</li> </ul>	<b>Thesis:</b> <i>an overview of the writer's main ideas and how these are presented.</i>  <b>For each language paragraph:</b> <b>1) Point/idea that answers the question focus</b> with short, embedded quotations from text.  <b>2) Identify</b> the language method used and explain why it has been used.  <b>3) Analysis</b> - explore words from the quotation with a narrow focus to analyse how and why the language has been used.  <b>4) Reinforce/challenge ideas</b> with more quotations from the text to support your point/main idea.	<b>Thesis:</b> <i>The writer presents.../characterises.../establishes...thorough the use of....throughout the extract.</i>  <b>1) This makes the reader think/ feel...</b> <i>The writer conveys/ demonstrates/ illustrates the idea ... The writer hints at/ reinforces/ establishes</i>  <b>2) The verb/adjective ... means ... which has associations/ connotations of...<i>The metaphor/ simile compares ... to ... which is.</i>  <i>The alliteration creates a ...sound, which imitates... /creates a tone of...</i><i>The list of 3 creates .../reinforces...</i><i>The writer's use of repetition signifies.../reinforces the ideas about...</i>   <b>3) The writer's use of the words....and...suggest...</b>  <i>The writer uses words such as...to evoke...</i>  <i>The writer's choice of words such as ...seem to suggest...</i>   <b>4) The writer later reinforces this idea when...</b>  <i>The writer continues to reinforce/develop ideas about...when...</i>  <i>The writer later challenges ideas about ...by using...</i> </b>
3.	How has the writer structured the text to interest you as a reader?	8	<b>Structural feature</b> <ul style="list-style-type: none"> <li>(New) character/setting/ event/ mood/ atmosphere</li> <li>Narrative voice/viewpoint</li> <li>Juxtaposition – to highlight a contrast...</li> <li>Climax – the most intense or exciting part of something...</li> <li>Pivotal moment - a turning point to show a change in character or action...</li> <li>Pathetic fallacy - when the weather reflects the mood of the character or atmosphere...</li> <li>In medias res – beginning in the middle of the action...</li> <li>Flashback – in past tense to describe a past memory or event...</li> <li>Repetition across the text – to reinforce or develop an idea...</li> </ul>	<b>Thesis:</b> <i>give an overview of structural features used to present the writer's main idea.</i>  <b>For each language paragraph:</b> <b>1) Signpost/introduce structural feature:</b> <i>character/ setting/ mood/ narrator/ event).</i>  <b>2) Analyse:</b> <i>Why the feature of structure is used and the impact it has for this text's specific purpose.</i>	<b>Thesis:</b> <i>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...</i>  <b>1) Initially, the writer establishes....by focusing our attention on...</b> <i>As the extract progresses the writer presents us with a turning point / climax in the narrative to highlight/challenge/contrast/juxtapose...</i> <i>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...</i>  <b>2) This sudden shift in focus allows us to understand...</b> <i>The writer's shift in tone from...to...reinforces the character's...</i> <i>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...</i>



# English Language Paper 1 – Knowledge Organiser

Q	Question	Mark	Look out for these things in the text that are specific to each question:	Must include in your answer:	Must include in your answer:
4.	<p>"A student, having read this section of the text, said: "This part of the text shows ...."</p> <div>Look out for different sections of the quotation</div> <p>To what extent do you agree?</p>	20	<p><b>1) Ideas about the character or event</b></p> <ul style="list-style-type: none"> <li>What is the character feeling?</li> <li>Why is s/he feeling like this?</li> <li>What is it about <b>his/her past background</b> that makes them feel like this?</li> </ul> <p><b>2) Methods</b></p> <p>a) <u>Text level methods</u>: Humour/ Irony/ Symbolism/ Characterisation/ Dialogue/ Setting</p> <p>b) <u>Structural methods</u> Juxtaposition/ contrast/ Pivotal moment</p> <p>c) <u>Language methods</u> (see Qu 2)</p>	<p><b>Thesis:</b> <i>an overview of the writer's main ideas and how these are presented in response to a given statement.</i></p> <p><b>For each paragraph:</b></p> <p><b>1) Point/idea that responds to the statement focus</b> with short embedded quotations from text.</p> <p><b>2) Identify</b> the language/structural method used and explain why it has been used – again link to the statement focus.</p> <p><b>3) Analysis</b> - 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.</p> <p><b>4) Reinforce/challenge ideas</b> - 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?</p>	<p><b>Thesis:</b> <i>Arguably, the writer presents... To a certain extent, the writer shows us that...</i></p> <p><b>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...</b></p> <p><b>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...</b></p> <p><b>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...</b></p> <p><b>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...</b></p>
5.	<p>Write a description of ..., as suggested by this picture</p> <p>Or</p> <p>Write a story/ description about...</p>	24 + 16	<p><b>Suggested Examples of Writing Structure for Q5</b></p> <ol style="list-style-type: none"> <li>Drop</li> <li>Zoom</li> <li>Flash</li> <li>Echo: Resolution? Twist? Cliff hanger?</li> </ol> <ol style="list-style-type: none"> <li>In Medias Res</li> <li>Establish background/voice</li> <li>Description of setting</li> <li>Climax/ Main event</li> <li>Resolution? Twist? Cliff hanger? Cyclical narrative?</li> </ol>	<p><b>Language Devices you must use:</b></p> <p><b>Imagery</b></p> <ul style="list-style-type: none"> <li>Metaphor/Simile – comparing something real to something imaginary...</li> <li>Pathetic fallacy – when the weather reflects the character's mood or atmosphere...</li> <li>Semantic field built up of adjectives, verbs and adverbs to reinforce an idea about a character or event...</li> </ul> <p><b>Sound</b></p> <ul style="list-style-type: none"> <li>Alliteration – focuses the reader's attention on a section of the text to create a certain mood or rhythm...</li> <li>Onomatopoeia – a sound associated with its name...</li> <li>Repetition/anaphora to reinforce an idea about something or make it more prominent...</li> </ul>	<p><b>Punctuation</b></p> <ul style="list-style-type: none"> <li>Hyphen – '-'</li> <li>Colon – ':'</li> <li>Semi-colon – ';' ;</li> </ul> <p><b>Sentences</b></p> <ul style="list-style-type: none"> <li>Rhetorical question</li> <li>Imperative</li> <li>Exclamation</li> <li>Patterns: Listing</li> <li>Although/ Despite...</li> <li>Sentence starters: Adjective pairs/ Present participles</li> </ul>

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

Context			J.B. Priestley	Themes - Priestley wanted:
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			8. Believed in socialism 9. Opposed to capitalism 10. Helped establish welfare state 11. Supported unions 12. Supported CND	13. <b>Class</b> – to emphasise the suffering of the working classes 14. <b>Society</b> – a fairer, more cooperative society 15. <b>Wealth/Poverty</b> – to show the great gulf between the two 16. <b>Responsibility</b> – everyone in society to share this 17. <b>Rights</b> – unions, a welfare state and equality 18. <b>Women</b> – an end to exploitation
Action	Act	Theme	Dramatic devices	Quotes
19. The wealthy businessman, <b>Arthur Birling</b> is having an engagement party for his daughter, <b>Sheila</b> , who is engaged to <b>Gerald Croft</b> , an upper <b>class</b> man whose father is a knight.	Act 1	Class, Society	Characterisation Setting Dramatic Irony Exposition	"You're just the kind of son-in-law I always wanted." "Crofts and Birlings...working together – for lower costs and higher prices"
20. <b>Birling's</b> speeches relate to <b>business and profit</b> . 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. <b>The Inspector</b> 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."
22. <b>Mr Birling</b> sacked a girl from his factory for asking for a pay rise. He does not accept <b>responsibility</b> .	Act 1	Responsibility, Class, Women	Character development Subtle hints	"Did you say 'why'?" "it's my duty to keep labour costs down."
23. <b>Sheila</b> forced the manager at Millwards to dismiss a girl purely because she was <b>jealous</b> . She takes complete <b>responsibility</b> .	Act 1	Responsibility, Class	Character development	"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. <b>Gerald</b> had an affair with a <b>working class</b> 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..."

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Action	Act	Theme	Dramatic devices	Quotes
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..."
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."
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, Class	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 will be taught it in fire and blood and anguish."
28. The family's dysfunction is revealed after the Inspector leaves. The opening of the play is just a façade.	Act 3	Class, Society	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	Responsibility	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	"That was the police. A girl has just died – on her way to the Infirmary."
<b>Key Ideas:</b>  31. Three Unities (Aristotle) 32. 7 Deadly Sins 33. Play as a vehicle for Playwright's views 34. Morality Play			<b>Key Words:</b>  35. Responsibility 36. Microcosm 37. Irony 38. Symbolism 39. Omnipotence 40. Socialism 41. Capitalism	

## Poetry

### Poems about family relationships

Poems about family relationships	Poem		Key Message	Key Quotations	Link to another poem
	1.	<b>Before You Were Mine</b>	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.	<b>Follower</b>	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.	<b>Mother, any distance</b>	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.	<b>Walking Away</b>	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.	<b>Climbing My Grandfather</b>	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.	<b>Eden Rock</b>	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.

### Poems about loss, loneliness and suffering through relationships

	7.	<b>When We Two Parted</b>	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.	<b>Porphyria's Lover</b>	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.	<b>The Farmer's Bride</b>	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.	<b>Neutral Tones</b>	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.

## Poetry

## Poems about strong, deep connections between people

Poems about strong, deep connections between people	Poem	Key Message	Key Quotations	Link to another poem
	11. <b>Letters From Yorkshire</b>	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. <b>I Think of Thee!</b>	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. <b>Winter Swans</b>	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. <b>Singh Song!</b>	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. <b>Love's Philosophy</b>	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	<p>Make f the subject of the formula</p> $\frac{2(f+g)}{h} = 3 - g$ <p><math>\times h</math> <math>\times h</math></p> $2(f+g) = h(3-g)$ $2f + 2g = 3h - gh$ <p><math>-2g</math> <math>-2g</math></p> $\frac{2f}{2} = \frac{3h - gh - 2g}{2}$ $f = \frac{3h - gh - 2g}{2}$
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	

## Solving Quadratics

Quadratic Equations	Always make them equal to zero	<p>Solve <math>x^2 - 7x = -12</math></p> <p><math>+12</math> <math>+12</math></p> $x^2 - 7x + 12 = 0$ <p>2 numbers with a: → product = 12 → sum = -7</p> $(x-4)(x-3) = 0$ $x-4=0 \quad x-3=0$ <p><math>+4</math> <math>+4</math> <math>+3</math> <math>+3</math></p> $x=4 \quad x=3$
And then?	It's always wise to factorise!	
Successful elimination	With an inverse operation	

## 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 $x = 0$
What if we can't find it?	Substitute a point on the line
X-intercepts or roots	When $y = 0$
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

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

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

$\Rightarrow \begin{array}{|c|c|} \hline 1 & 2 \\ \hline \end{array}$ 
  
 $\downarrow \downarrow$ 
  
 $\Rightarrow \begin{array}{|c|c|} \hline 1 & \frac{1}{2} \\ \hline \end{array}$ 
  
 $\therefore m = -\frac{1}{2}$

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

$$y = 1$$

$$\text{So } C = 1$$

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

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

$$-5 = -6 + C$$

$$1 = C$$

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

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

$$2 = x$$

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

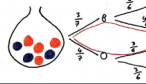
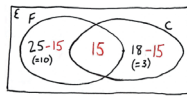
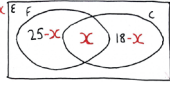
$$m_{\perp} = -\frac{1}{2}$$

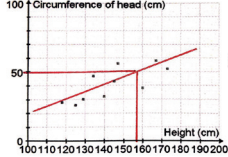
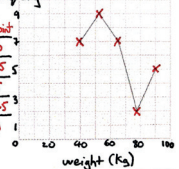
$$m_y = -\frac{1}{2}$$

$$m_{\perp} = 2$$

Compound Measures								
Compound measures	Box Method	<p>Calculate average speed if you travel <u>15 miles</u> in 25 minutes.</p> <p>miles minutes</p> <table border="1"> <tr> <td>15</td> <td>25</td> </tr> </table> <p><math>\div 5</math></p> <table border="1"> <tr> <td></td> <td>5</td> </tr> </table> <p><math>\times 12</math></p> <table border="1"> <tr> <td></td> <td>60</td> </tr> </table> <p>Ans = 36mph</p> <p>Connection? Put it in a box!</p>	15	25		5		60
15	25							
	5							
	60							
Speed distance time	Box method miles minutes	<p>If you travel at <u>15km/h</u> for 16 minutes, how far do you travel?</p> <p>km minutes</p> <table border="1"> <tr> <td>15</td> <td>60</td> </tr> </table> <p><math>\div 4</math></p> <table border="1"> <tr> <td></td> <td>16</td> </tr> </table> <p><math>\times 4</math></p> <p>Ans = 4 km</p> <p>Connection? Put it in a box!</p>	15	60		16		
15	60							
	16							
Density mass volume	Box method kg m <sup>3</sup>	<p>Calculate the density of an object that has a <u>mass of 570kg</u> and a <u>volume of 2280m<sup>3</sup></u></p> <p>kg m<sup>3</sup></p> <table border="1"> <tr> <td>570</td> <td>2280</td> </tr> </table> <p><math>\div 570</math></p> <table border="1"> <tr> <td>1</td> <td></td> </tr> </table> <p>Density = 0.25 kg/m<sup>3</sup></p> <p>Connection? Put it in a box!</p>	570	2280	1			
570	2280							
1								

Simultaneous Equations		
2 equations 2 unknowns	Simultaneous equations Same sign subtract	<p>Solve <math>5y + x = 13</math> <math>y - 3x = 9</math></p> <p>① Label</p> <p>④ <math>5y + x = 13</math> ⑤ <math>y - 3x = 9</math></p> <p>② Multiply to make x or y equal</p> <p>③ to eliminate (same sign subtract)</p> <p>④ <math>5y + x = 13</math> ⑤ <math>5y - 15x = 45</math></p> <p>⑤ <math>16x = -32</math> ④ <math>x = -2</math></p> <p>careful here</p> <p>⑤ <math>x - 15x = ?</math></p> <p>⑤ Subs in ④</p> <p><math>5y + (-2) = 13</math> <math>y = 3</math></p> <p>⑥ checks in ⑤</p> <p><math>(3) - 3(-2) = 9</math> <math>9 = 9</math></p>
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. <table border="1"> <tr> <td>number rolled</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>probability</td> <td>0.14</td> <td>0.15</td> <td>0.2</td> <td>0.14</td> <td>x</td> <td>0.3</td> </tr> </table>	number rolled	1	2	3	4	5	6	probability	0.14	0.15	0.2	0.14	x	0.3
number rolled	1	2	3	4	5	6										
probability	0.14	0.15	0.2	0.14	x	0.3										
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? <div style="display: flex; align-items: center; justify-content: center;"> <table border="1" style="margin-right: 20px;"> <tr><td></td><td>H</td><td>T</td></tr> <tr><td>H</td><td>HH</td><td>HT</td></tr> <tr><td>T</td><td>TH</td><td>TT</td></tr> </table> <math>p(TT) = \frac{1}{4}</math> </div>		H	T	H	HH	HT	T	TH	TT					
	H	T														
H	HH	HT														
T	TH	TT														
And if they don't?	Probability tree, 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. $p(5) = \frac{1}{6} \quad p(H) = \frac{1}{2} \rightarrow p(5 \text{ AND } H) = \frac{1}{6} \times \frac{1}{2}$														
If you see 'or'?	Add	Evaluate the probability of getting an even number or a 3 on a fair six-sided dice. $p(\text{even}) = \frac{1}{2} \quad p(3) = \frac{1}{6} \rightarrow p(\text{even OR } 3) = \frac{1}{2} + \frac{1}{6}$														
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? 														
And if we can't	Call it x	b) How many like both if 37 like either? $\text{Total} = 25 - x + x + 18 - x = 43 - x$ $37 = 43 - x$ $x = 6$ 														

Statistics																	
Mode	Most	Find the mode, median, mean and range of the following numbers: 8, 12, 4, -3, 1, 6, 1, 3															
Median	Middle value (put them in order)	$-3 \quad 1 \quad 1 \quad 3 \quad 4 \quad 6 \quad 8 \quad 12$ mode = 1 median = $\frac{3+4}{2}$															
Mean	Fair average	$\text{mean} = \frac{-3+1+1+3+4+6+8+12}{8}$															
Range	Spread (biggest - smallest)	$\text{range} = 12 - (-3)$															
Estimate the mean	Midpoints	The table shows road accidents reported in December. Estimate the mean number of accidents reported <table border="1"> <thead> <tr> <th>Accidents reported</th> <th>Frequency</th> <th>midpoint = fx</th> </tr> </thead> <tbody> <tr> <td>0 - 4</td> <td>15</td> <td></td> </tr> <tr> <td>5 - 9</td> <td>10</td> <td></td> </tr> <tr> <td>10 - 14</td> <td>1</td> <td></td> </tr> <tr> <td>15 - 19</td> <td>5</td> <td></td> </tr> </tbody> </table> $\text{Ans} = \frac{\sum fx}{\sum f} = \frac{\sum fx}{\sum f} = \frac{\sum fx}{\sum f}$	Accidents reported	Frequency	midpoint = fx	0 - 4	15		5 - 9	10		10 - 14	1		15 - 19	5	
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15 - 19	5																
And then?																	
Scatter graphs	Line of best fit	Estimate the height of someone with a head circumference of 50cm  $\text{Ans} = 157 \text{ cm}$															
Frequency polygon (frequency diagram)	Plot the midpoints & join them up	Draw a frequency polygon to show the information below <table border="1"> <thead> <tr> <th>Weight w (kg)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>30 ≤ w &lt; 50</td> <td>7</td> </tr> <tr> <td>50 ≤ w &lt; 55</td> <td>9</td> </tr> <tr> <td>55 ≤ w &lt; 75</td> <td>7</td> </tr> <tr> <td>75 ≤ w &lt; 80</td> <td>2</td> </tr> <tr> <td>80 ≤ w &lt; 100</td> <td>5</td> </tr> </tbody> </table> 	Weight w (kg)	Frequency	30 ≤ w < 50	7	50 ≤ w < 55	9	55 ≤ w < 75	7	75 ≤ w < 80	2	80 ≤ w < 100	5			
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Algebraic Proportionality		
Algebraic proportionality	General formula first	$y = 32$ when $x = 4$ . Find $y$ when $x = 5$ , if...
Proportional	$y \propto x$	<p>a) <math>y</math> is proportional to <math>x^2</math></p> $y \propto x^2$ $y = Kx^2$ $(32) = K(4)^2$ $32 = 16K$ $2 = K$ $y = 2x^2$ $y = 2(5)^2$ $y = 50$
Inversely proportional	$y \propto \frac{1}{x}$	<p>b) <math>y</math> is inversely proportional to <math>x^2</math></p> $y \propto \frac{1}{x^2}$ $y = \frac{K}{x^2}$ $(32) = \frac{K}{(4)^2}$ $32 = \frac{K}{16}$ $512 = K$ $y = \frac{512}{x^2}$ $y = \frac{512}{(5)^2}$ $y = 20.48$
To find the k	Substitute the values	

Recurring Decimals		
Recurring decimals to fractions	Make the recurring parts match	Express $0.92\dot{6}$ as a fraction.
		$x = 0.9262626...$ $1000x = 926.262626...$ $- 10x = 9.262626...$ $990x = 915$ $x = \frac{915}{990} = \frac{61}{66}$

Compound Interest		
Compound interest	$O \times M^T = F$	A bank pays 3% interest. How much will a deposit of £1500 be worth after 4 years?
T stands for	Time	$O \times M^T = F$ $1500 \times 1.03^4 = F$

Right-angled Trigonometry		
Right-angled triangle	Pythagoras or Trig	Find the unknown values $a$ and $c$
Side side side	Pythag, pythag, label the longest side	<p>SSS: <math>13^2 + 12^2 = c^2</math>  <math>169 + 144 = c^2</math>  <math>313 = c^2</math>  <math>c = \sqrt{313} \approx 17.7</math></p> <p>SAS: <math>12^2 + 13^2 = c^2</math>  <math>144 + 169 = c^2</math>  <math>313 = c^2</math>  <math>c = \sqrt{313} \approx 17.7</math></p>
Side angle side	SOH CAH TOA Label the 2 sides Cover up the one you want And use the formula	<p>SOH: <math>\sin A = \frac{12}{c}</math>  <math>\sin 70^\circ = \frac{12}{c}</math>  <math>c = \frac{12}{\sin 70^\circ} \approx 12.7</math></p> <p>CAH: <math>\cos A = \frac{13}{c}</math>  <math>\cos 70^\circ = \frac{13}{c}</math>  <math>c = \frac{13}{\cos 70^\circ} \approx 38.5</math></p> <p>TOA: <math>\tan A = \frac{12}{13}</math>  <math>\tan 70^\circ = \frac{12}{13}</math>  <math>13 \tan 70^\circ = 12</math>  <math>13 \times 2.747 = 12</math>  <math>35.71 = 12</math>  <math>23.51 = 12</math>  <math>11.75 = 12</math>  <math>5.87 = 12</math>  <math>2.93 = 12</math>  <math>1.46 = 12</math>  <math>0.73 = 12</math>  <math>0.36 = 12</math>  <math>0.18 = 12</math>  <math>0.09 = 12</math>  <math>0.045 = 12</math>  <math>0.0225 = 12</math>  <math>0.01125 = 12</math>  <math>0.005625 = 12</math>  <math>0.0028125 = 12</math>  <math>0.00140625 = 12</math>  <math>0.000703125 = 12</math>  <math>0.0003515625 = 12</math>  <math>0.00017578125 = 12</math>  <math>8.7890625 \times 10^{-5} = 12</math>  <math>4.39453125 \times 10^{-5} = 12</math>  <math>2.197265625 \times 10^{-5} = 12</math>  <math>1.0986328125 \times 10^{-5} = 12</math>  <math>5.4931640625 \times 10^{-6} = 12</math>  <math>2.74658203125 \times 10^{-6} = 12</math>  <math>1.373291015625 \times 10^{-6} = 12</math>  <math>6.866455078125 \times 10^{-7} = 12</math>  <math>3.4332275390625 \times 10^{-7} = 12</math>  <math>1.71661376953125 \times 10^{-7} = 12</math>  <math>8.58306884765625 \times 10^{-8} = 12</math>  <math>4.291534423828125 \times 10^{-8} = 12</math>  <math>2.1457672119140625 \times 10^{-8} = 12</math>  <math>1.0728836059570312 \times 10^{-8} = 12</math>  <math>5.364418029785156 \times 10^{-9} = 12</math>  <math>2.682209014892578 \times 10^{-9} = 12</math>  <math>1.341104507446289 \times 10^{-9} = 12</math>  <math>6.705522537231445 \times 10^{-10} = 12</math>  <math>3.352761268615722 \times 10^{-10} = 12</math>  <math>1.676380634307861 \times 10^{-10} = 12</math>  <math>8.381903171539305 \times 10^{-11} = 12</math>  <math>4.190951585769652 \times 10^{-11} = 12</math>  <math>2.095475792884826 \times 10^{-11} = 12</math>  <math>1.047737896442413 \times 10^{-11} = 12</math>  <math>5.238689482212065 \times 10^{-12} = 12</math>  <math>2.619344741106032 \times 10^{-12} = 12</math>  <math>1.309672370553016 \times 10^{-12} = 12</math>  <math>6.54836185276508 \times 10^{-13} = 12</math>  <math>3.27418092638254 \times 10^{-13} = 12</math>  <math>1.63709046319127 \times 10^{-13} = 12</math>  <math>8.18545231595635 \times 10^{-14} = 12</math>  <math>4.092726157978175 \times 10^{-14} = 12</math>  <math>2.046363078989087 \times 10^{-14} = 12</math>  <math>1.023181539494543 \times 10^{-14} = 12</math>  <math>5.115907697472715 \times 10^{-15} = 12</math>  <math>2.557953848736357 \times 10^{-15} = 12</math>  <math>1.278976924368179 \times 10^{-15} = 12</math>  <math>6.394884621840895 \times 10^{-16} = 12</math>  <math>3.197442310920447 \times 10^{-16} = 12</math>  <math>1.598721155460223 \times 10^{-16} = 12</math>  <math>7.993605777301115 \times 10^{-17} = 12</math>  <math>3.996802888650557 \times 10^{-17} = 12</math>  <math>1.998401444325279 \times 10^{-17} = 12</math>  <math>9.992007221626395 \times 10^{-18} = 12</math>  <math>4.996003610813197 \times 10^{-18} = 12</math>  <math>2.498001805406599 \times 10^{-18} = 12</math>  <math>1.249000902703299 \times 10^{-18} = 12</math>  <math>6.245004513516495 \times 10^{-19} = 12</math>  <math>3.122502256758247 \times 10^{-19} = 12</math>  <math>1.561251128379124 \times 10^{-19} = 12</math>  <math>7.80625564189562 \times 10^{-20} = 12</math>  <math>3.90312782094781 \times 10^{-20} = 12</math>  <math>1.951563910473905 \times 10^{-20} = 12</math>  <math>9.757819552369525 \times 10^{-21} = 12</math>  <math>4.878909776184762 \times 10^{-21} = 12</math>  <math>2.439454888092381 \times 10^{-21} = 12</math>  <math>1.2197274440461905 \times 10^{-21} = 12</math>  <math>6.098637220230952 \times 10^{-22} = 12</math>  <math>3.049318610115476 \times 10^{-22} = 12</math>  <math>1.524659305057738 \times 10^{-22} = 12</math>  <math>7.62329652528869 \times 10^{-23} = 12</math>  <math>3.811648262644345 \times 10^{-23} = 12</math>  <math>1.905824131322172 \times 10^{-23} = 12</math>  <math>9.52912065661086 \times 10^{-24} = 12</math>  <math>4.76456032830543 \times 10^{-24} = 12</math>  <math>2.382280164152715 \times 10^{-24} = 12</math>  <math>1.191140082076357 \times 10^{-24} = 12</math>  <math>5.955700410381785 \times 10^{-25} = 12</math>  <math>2.977850205190892 \times 10^{-25} = 12</math>  <math>1.488925102595446 \times 10^{-25} = 12</math>  <math>7.44462551297723 \times 10^{-26} = 12</math>  <math>3.722312756488615 \times 10^{-26} = 12</math>  <math>1.861156378244307 \times 10^{-26} = 12</math>  <math>9.305781891221535 \times 10^{-27} = 12</math>  <math>4.652890945610767 \times 10^{-27} = 12</math>  <math>2.326445472805383 \times 10^{-27} = 12</math>  <math>1.163222736402691 \times 10^{-27} = 12</math>  <math>5.816113682013455 \times 10^{-28} = 12</math>  <math>2.908056841006727 \times 10^{-28} = 12</math>  <math>1.454028420503364 \times 10^{-28} = 12</math>  <math>7.27014210251682 \times 10^{-29} = 12</math>  <math>3.63507105125841 \times 10^{-29} = 12</math>  <math>1.817535525629205 \times 10^{-29} = 12</math>  <math>9.087677628146025 \times 10^{-30} = 12</math>  <math>4.543838814073012 \times 10^{-30} = 12</math>  <math>2.271919407036506 \times 10^{-30} = 12</math>  <math>1.135959703518253 \times 10^{-30} = 12</math>  <math>5.679798517591265 \times 10^{-31} = 12</math>  <math>2.839899258795632 \times 10^{-31} = 12</math>  <math>1.419949629397816 \times 10^{-31} = 12</math>  <math>7.09974814698908 \times 10^{-32} = 12</math>  <math>3.54987407349454 \times 10^{-32} = 12</math>  <math>1.77493703674727 \times 10^{-32} = 12</math>  <math>8.87468518373635 \times 10^{-33} = 12</math>  <math>4.437342591868175 \times 10^{-33} = 12</math>  <math>2.218671295934087 \times 10^{-33} = 12</math>  <math>1.109335647967043 \times 10^{-33} = 12</math>  <math>5.546678239835215 \times 10^{-34} = 12</math>  <math>2.773339119917607 \times 10^{-34} = 12</math>  <math>1.386669559958803 \times 10^{-34} = 12</math>  <math>6.933347799794015 \times 10^{-35} = 12</math>  <math>3.466673899897007 \times 10^{-35} = 12</math>  <math>1.733336949948504 \times 10^{-35} = 12</math>  <math>8.66668474974252 \times 10^{-36} = 12</math>  <math>4.33334237487126 \times 10^{-36} = 12</math>  <math>2.16667118743563 \times 10^{-36} = 12</math>  <math>1.083335593717815 \times 10^{-36} = 12</math>  <math>5.416677968589075 \times 10^{-37} = 12</math>  <math>2.708338984294537 \times 10^{-37} = 12</math>  <math>1.354169492147269 \times 10^{-37} = 12</math>  <math>6.770847460736345 \times 10^{-38} = 12</math>  <math>3.385423730368172 \times 10^{-38} = 12</math>  <math>1.692711865184086 \times 10^{-38} = 12</math>  <math>8.46355932592043 \times 10^{-39} = 12</math>  <math>4.231779662960215 \times 10^{-39} = 12</math>  <math>2.115889831480107 \times 10^{-39} = 12</math>  <math>1.057944915740053 \times 10^{-39} = 12</math>  <math>5.289724578700265 \times 10^{-40} = 12</math>  <math>2.644862289350132 \times 10^{-40} = 12</math>  <math>1.322431144675066 \times 10^{-40} = 12</math>  <math>6.61215572337533 \times 10^{-41} = 12</math>  <math>3.306077861687665 \times 10^{-41} = 12</math>  <math>1.653038930843832 \times 10^{-41} = 12</math>  <math>8.26519465421916 \times 10^{-42} = 12</math>  <math>4.13259732710958 \times 10^{-42} = 12</math>  <math>2.06629866355479 \times 10^{-42} = 12</math>  <math>1.033149331777395 \times 10^{-42} = 12</math>  <math>5.165746658886975 \times 10^{-43} = 12</math>  <math>2.582873329443487 \times 10^{-43} = 12</math>  <math>1.291436664721743 \times 10^{-43} = 12</math>  <math>6.457183323608715 \times 10^{-44} = 12</math>  <math>3.228591661804357 \times 10^{-44} = 12</math>  <math>1.614295830902179 \times 10^{-44} = 12</math>  <math>8.071479154510895 \times 10^{-45} = 12</math>  <math>4.035739577255447 \times 10^{-45} = 12</math>  <math>2.017869788627723 \times 10^{-45} = 12</math>  <math>1.008934894313861 \times 10^{-45} = 12</math>  <math>5.044674471569305 \times 10^{-46} = 12</math>  <math>2.522337235784652 \times 10^{-46} = 12</math>  <math>1.261168617892326 \times 10^{-46} = 12</math>  <math>6.30584308946163 \times 10^{-47} = 12</math>  <math>3.152921544730815 \times 10^{-47} = 12</math>  <math>1.576460772365407 \times 10^{-47} = 12</math>  <math>7.882303861827035 \times 10^{-48} = 12</math>  <math>3.941151930913517 \times 10^{-48} = 12</math>  <math>1.970575965456759 \times 10^{-48} = 12</math>  <math>9.852879827283795 \times 10^{-49} = 12</math>  <math>4.926439913641897 \times 10^{-49} = 12</math>  <math>2.463219956820948 \times 10^{-49} = 12</math>  <math>1.231609978410474 \times 10^{-49} = 12</math>  <math>6.15804989205237 \times 10^{-50} = 12</math>  <math>3.079024946026185 \times 10^{-50} = 12</math>  <math>1.539512473013092 \times 10^{-50} = 12</math>  <math>7.69756236506546 \times 10^{-51} = 12</math>  <math>3.84878118253273 \times 10^{-51} = 12</math>  <math>1.924390591266365 \times 10^{-51} = 12</math>  <math>9.621952956331825 \times 10^{-52} = 12</math>  <math>4.810976478165912 \times 10^{-52} = 12</math>  <math>2.405488239082956 \times 10^{-52} = 12</math>  <math>1.202744119541478 \times 10^{-52} = 12</math>  <math>6.01372059770739 \times 10^{-53} = 12</math>  <math>3.006860298853695 \times 10^{-53} = 12</math>  <math>1.503430149426847 \times 10^{-53} = 12</math>  <math>7.517150747134235 \times 10^{-54} = 12</math>  <math>3.758575373567117 \times 10^{-54} = 12</math>  <math>1.879287686783559 \times 10^{-54} = 12</math>  <math>9.396438433917795 \times 10^{-55} = 12</math>  <math>4.698219216958897 \times 10^{-55} = 12</math>  <math>2.349109608479448 \times 10^{-55} = 12</math>  <math>1.174554804239724 \times 10^{-55} = 12</math>  <math>5.87277402119862 \times 10^{-56} = 12</math>  <math>2.93638701059931 \times 10^{-56} = 12</math>  <math>1.468193505299655 \times 10^{-56} = 12</math>  <math>7.340967526498275 \times 10^{-57} = 12</math>  <math>3.670483763249137 \times 10^{-57} = 12</math>  <math>1.835241881624569 \times 10^{-57} = 12</math>  <math>9.176209408122845 \times 10^{-58} = 12</math>  <math>4.588104704061422 \times 10^{-58} = 12</math>  <math>2.294052352030711 \times 10^{-58} = 12</math>  <math>1.147026176015355 \times 10^{-58} = 12</math>  <math>5.735130880076775 \times 10^{-59} = 12</math>  <math>2.867565440038387 \times 10^{-59} = 12</math>  <math>1.433782720019194 \times 10^{-59} = 12</math>  <math>7.16891360009597 \times 10^{-60} = 12</math>  <math>3.584456800047985 \times 10^{-60} = 12</math>  <math>1.792228400023992 \times 10^{-60} = 12</math>  <math>8.96114200011996 \times 10^{-61} = 12</math>  <math>4.48057100005998 \times 10^{-61} = 12</math>  <math>2.24028550002999 \times 10^{-61} = 12</math>  <math>1.120142750014995 \times 10^{-61} = 12</math>  <math>5.600713750072475 \times 10^{-62} = 12</math>  <math>2.800356875036237 \times 10^{-62} = 12</math>  <math>1.400178437518119 \times 10^{-62} = 12</math>  <math>7.000892187590595 \times 10^{-63} = 12</math>  <math>3.500446093795297 \times 10^{-63} = 12</math>  <math>1.750223046897649 \times 10^{-63} = 12</math>  <math>8.751115234488245 \times 10^{-64} = 12</math>  <math>4.375557617244122 \times 10^{-64} = 12</math>  <math>2.187778808622061 \times 10^{-64} = 12</math>  <math>1.0938894043110305 \times 10^{-64} = 12</math>  <math>5.469447021555152 \times 10^{-65} = 12</math>  <math>2.734723510777576 \times 10^{-65} = 12</math>  <math>1.367361755388788 \times 10^{-65} = 12</math>  <math>6.83680877694394 \times 10^{-66} = 12</math>  <math>3.41840438847197 \times 10^{-66} = 12</math>  <math>1.709202194235985 \times 10^{-66} = 12</math>  <math>8.546010971179925 \times 10^{-67} = 12</math>  <math>4.273005485589962 \times 10^{-67} = 12</math>  <math>2.136502742794981 \times 10^{-67} = 12</math>  <math>1.0682513713974905 \times 10^{-67} = 12</math>  <math>5.341256856987452 \times 10^{-68} = 12</math>  <math>2.670628428493726 \times 10^{-68} = 12</math>  <math>1.335314214246863 \times 10^{-68} = 12</math>  <math>6.676571071234315 \times 10^{-69} = 12</math>  <math>3.338285535617157 \times 10^{-69} = 12</math>  <math>1.669142767808579 \times 10^{-69} = 12</math>  <math>8.345713839042895 \times 10^{-70} = 12</math>  <math>4.172856919521447 \times 10^{-70} = 12</math>  <math>2.086428459760723 \times 10^{-70} = 12</math>  <math>1.043214229880361 \times 10^{-70} = 12</math>  <math>5.216071149401805 \times 10^{-71} = 12</math>  <math>2.608035574700902 \times 10^{-71} = 12</math>  <math>1.304017787350451 \times 10^{-71} = 12</math>  <math>6.520088936752255 \times 10^{-72} = 12</math>  <math>3.260044468376127 \times 10^{-72} = 12</math>  <math>1.630022234188064 \times 10^{-72} = 12</math>  <math>8.15011117094032 \times 10^{-73} = 12</math>  <math>4.07505558547016 \times 10^{-73} = 12</math>  <math>2.03752779273508 \times 10^{-73} = 12</math>  <math>1.01876389636754 \times 10^{-73} = 12</math>  <math>5.0938194818377 \times 10^{-74} = 12</math>  <math>2.54690974091885 \times 10^{-74} = 12</math>  <math>1.273454870459425 \times 10^{-74} = 12</math>  <math>6.367274352297125 \times 10^{-75} = 12</math>  <math>3.183637176148562 \times 10^{-75} = 12</math>  <math>1.591818588074281 \times 10^{-75} = 12</math>  <math>7.959092940371405 \times 10^{-76} = 12</math>  <math>3.979546470185702 \times 10^{-76} = 12</math>  <math>1.989773235092851 \times 10^{-76} = 12</math>  <math>9.948866175464255 \times 10^{-77} = 12</math>  <math>4.974433087732127 \times 10^{-77} = 12</math>  <math>2.487216543866064 \times 10^{-77} = 12</math>  <math>1.243608271933032 \times 10^{-77} = 12</math>  <math>6.21804135966516 \times 10^{-78} = 12</math>  <math>3.10902067983258 \times 10^{-78} = 12</math>  <math>1.55451033991629 \times 10^{-78} = 12</math>  <math>7.77255169958145 \times 10^{-79} = 12</math>  <math>3.886275849790725 \times 10^{-79} = 12</math>  <math>1.943137924895362 \times 10^{-79} = 12</math>  <math>9.71568962447681 \times 10^{-80} = 12</math>  <math>4.857844812238405 \times 10^{-80} = 12</math>  <math>2.428922406119202 \times 10^{-80} = 12</math>  <math>1.214461203059601 \times 10^{-80} = 12</math>  <math>6.072306015298005 \times 10^{-81} = 12</math>  <math>3.036153007649002 \times 10^{-81} = 12</math>  <math>1.518076503824501 \times 10^{-81} = 12</math>  <math>7.590382519122505 \times 10^{-82} = 12</math>  <math>3.795191259561252 \times 10^{-82} = 12</math>  <math>1.897595629780626 \times 10^{-82} = 12</math>  <math>9.48797814890313 \times 10^{-83} = 12</math>  <math>4.743989074451565 \times 10^{-83} = 12</math>  <math>2.371994537225782 \times 10^{-83} = 12</math>  <math>1.185997268612891 \times 10^{-83} = 12</math>  <math>5.929986343064455 \times 10^{-84} = 12</math>  <math>2.964993171532227 \times 10^{-84} = 12</math>  <math>1.482496585766114 \times 10^{-84} = 12</math>  <math>7.4124829288</math></p>

## Rearranging Formulae

Make x the subject	Get x on its own	<p>Make f the subject of the formula in the formula below</p> $\frac{2(f+g)}{h} = 3 - fg$ <p style="text-align: center;">xh      xh</p> $2(f+g) = h(3-fg)$ $2f + 2g = 3h - fgh$ <p style="text-align: center;">+fgh      +fgh</p> $2f + 2g + fgh = 3h$ <p style="text-align: center;">-2g      -2g</p> $2f + fgh = 3h - 2g$ $\frac{f(2+gh)}{2+gh} = \frac{3h-2g}{2+gh}$ $f = \frac{3h-2g}{2+gh}$
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	
Xs and brackets on both sides	Expand and simplify	
Xs 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	
Why this time?	Get the x on its own	

## Compound Measures

Compound measures	Box Method	Calculate average speed if you travel <u>15 miles in 25 minutes.</u>						
Speed distance time	Box method miles minutes	<div>miles minutes</div> <table border="1"><tr><td>15</td><td>25</td></tr></table> <div><math>\div 5</math></div> <table border="1"><tr><td></td><td>5</td></tr></table> <div><math>\times 12</math></div> <table border="1"><tr><td></td><td>60</td></tr></table> <div>Ans = 36mph</div>	15	25		5		60
15	25							
	5							
	60							
Density mass volume	Box method kilograms m <sup>3</sup>							

## 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 $x = 0$
What if we can't find it?	Substitute a point on the line
X-intercepts or roots	When $y = 0$
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

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

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

Box Method:  $\begin{array}{|c|c|} \hline 4 & 2 \\ \hline 1 & \frac{1}{2} \\ \hline \end{array}$  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  $y_1$

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

$-5 = -6 + C$

$1 = C$

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

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

$2 = x$

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

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

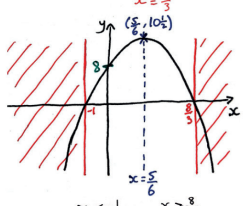
## Simplifying Algebraic Fractions

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

## Simultaneous Equations

2 Equations 2 unknowns	Simultaneous equations	<p>Solve (A) <math>6y + 7x = 47</math> (1) Label</p> <p>(B) <math>9y - 8x = -22</math> (2) Multiply to make x or y equal</p> <p>(3) <math>3(A) \quad 18y + 21x = 141</math>  <math>2(B) \quad 18y - 16x = -44</math>  <math>\quad \quad \quad 37x = 185</math>          (4) Solve <math>x = 5</math></p> <p>(5) Subs in (A)  <math>6y + 7(5) = 47</math>  <math>6y = 47 - 35</math>  <math>6y = 12</math>  <math>y = 2</math></p> <p>(6) checks in (B)  <math>9(2) - 8(5) = -22</math>  <math>18 - 40 = -22</math>  <math>-22 = -22</math></p>
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	<p>Solve <math>3x^2 + 12x = 6</math></p> $3x^2 + 12x - 6 = 0$ $3(x^2 + 4x - 2) = 0$ $x^2 + 4x - 2 = 0 \leftarrow \text{Can't factorise}$ $(x+2)^2 - 4 - 2 = 0$ $(x+2)^2 - 6 = 0$ $(x+2)^2 = 6$ $x+2 = \pm\sqrt{6}$ $x = -2 \pm \sqrt{6}$
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	<p>Solve <math>-3x^2 + 5x + 8 \leq 0</math></p> $-3x^2 + 5x + 8 = 0$ $3x^2 - 5x - 8 = 0$ $0 = (x+1)(3x-8)$ $x+1 = 0 \quad 3x-8 = 0$ $x = -1 \quad 3x = 8$ $x = \frac{8}{3}$
Is it happy or sad?	Coefficient of $x^2$	
First step	Find the roots	 <p>when <math>x = 0</math>  <math>y = -3(0) + 5(0) + 8</math>  <math>y = 8</math></p> <p>Line of symmetry is midway between <math>-1</math> and <math>\frac{8}{3}</math> where <math>x = \frac{5}{6}</math></p> <p>when <math>x = \frac{5}{6}</math>  <math>y = -3(\frac{5}{6})^2 + 5(\frac{5}{6}) + 8</math>  <math>y = 10\frac{1}{6}</math>          Turning point = <math>(\frac{5}{6}, 10\frac{1}{6})</math></p>
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. <table border="1"> <tr> <td>number rolled</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>probability</td> <td>0.14</td> <td>0.15</td> <td>0.2</td> <td>0.14</td> <td>x</td> <td>0.3</td> </tr> </table>	number rolled	1	2	3	4	5	6	probability	0.14	0.15	0.2	0.14	x	0.3
number rolled	1	2	3	4	5	6										
probability	0.14	0.15	0.2	0.14	x	0.3										
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? <table border="1"> <tr> <td></td> <td>H</td> <td>T</td> </tr> <tr> <td>H</td> <td>HH</td> <td>HT</td> </tr> <tr> <td>T</td> <td>TH</td> <td>TT</td> </tr> </table> $p(TT) = \frac{1}{4}$		H	T	H	HH	HT	T	TH	TT					
	H	T														
H	HH	HT														
T	TH	TT														
And if they don't?	Probability tree, 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. $p(5) = \frac{1}{6} \quad p(H) = \frac{1}{2} \rightarrow p(5 \text{ AND } H) = \frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$														
If you see 'or'?	Add	Evaluate the probability of getting an even number or a 3 on a fair six-sided dice. $p(\text{even}) = \frac{1}{2} \quad p(3) = \frac{1}{6} \rightarrow p(\text{even OR } 3) = \frac{1}{2} + \frac{1}{6} = \frac{2}{3}$														
Venn Diagrams	Start in the middle and work your way out.	25 people like football, 18 like cricket. <p>a) How many in total if 15 like both?</p>														
And if we can't	Call it x	b) How many like both if 37 like either? $\begin{aligned} \text{Total} &= 25 - x + 18 - x = 43 - x \\ 37 &= 43 - x \\ x &= 6 \end{aligned}$														

## Surds

Always make your life simple	Simplify first up to 1	Simplify $\sqrt{72} + \sqrt{98}$ $= \sqrt{36} \sqrt{2} + \sqrt{49} \sqrt{2}$ $= 6\sqrt{2} + 7\sqrt{2}$ $= 13\sqrt{2}$
Simplifying surds	Highest square factor	
Rationalise the denominator	Irrational and rational?	Rationalise $\frac{10}{3\sqrt{5}} = \frac{10 \times \sqrt{5}}{3\sqrt{5} \times \sqrt{5}} = \frac{10\sqrt{5}}{15} = \frac{2\sqrt{5}}{3}$ $\frac{36}{\sqrt{13} + 1} = \frac{36 \times (\sqrt{13} - 1)}{(\sqrt{13} + 1)(\sqrt{13} - 1)} = \frac{36(\sqrt{13} - 1)}{13 - 1} = \frac{36(\sqrt{13} - 1)}{12} = 3(\sqrt{13} - 1)$
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 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?	$\frac{\sum fx}{\sum f}$	<table border="1"> <thead> <tr> <th>Accidents reported</th> <th>Frequency</th> <th>midpoint</th> <th><math>f \times x</math></th> </tr> </thead> <tbody> <tr> <td>0-4</td> <td>15</td> <td>2</td> <td>30</td> </tr> <tr> <td>5-9</td> <td>10</td> <td>7</td> <td>70</td> </tr> <tr> <td>10-14</td> <td>1</td> <td>12</td> <td>12</td> </tr> <tr> <td>15-19</td> <td>5</td> <td>17</td> <td>85</td> </tr> <tr> <td><b>Total</b></td> <td><b>31</b></td> <td></td> <td><b>197</b></td> </tr> </tbody> </table> <p>Ans = <math>\frac{\sum fx}{\sum f} = \frac{197}{31} \approx 6.35</math></p>	Accidents reported	Frequency	midpoint	$f \times x$	0-4	15	2	30	5-9	10	7	70	10-14	1	12	12	15-19	5	17	85	<b>Total</b>	<b>31</b>		<b>197</b>
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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 <table border="1"> <thead> <tr> <th>Weight (kg)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>30 ≤ w &lt; 50</td> <td>7</td> </tr> <tr> <td>50 ≤ w &lt; 55</td> <td>9</td> </tr> <tr> <td>55 ≤ w &lt; 75</td> <td>7</td> </tr> <tr> <td>75 ≤ w &lt; 80</td> <td>2</td> </tr> <tr> <td>80 ≤ w &lt; 100</td> <td>5</td> </tr> </tbody> </table>	Weight (kg)	Frequency	30 ≤ w < 50	7	50 ≤ w < 55	9	55 ≤ w < 75	7	75 ≤ w < 80	2	80 ≤ w < 100	5												
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80 ≤ w < 100	5																									
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	$y = 32$ when $x = 4$ . Find $y$ when $x = 5$ , if...
Proportional	$y \propto x$	a) $y$ is proportional to $x^2$ $y \propto x^2$ $y = kx^2$ $32 = k(4)^2$ $32 = 16k$ $k = 2$ $y = 2x^2$ $y = 2(5)^2$ $y = 50$
Inversely proportional	$y \propto \frac{1}{x}$	b) $y$ is inversely proportional to $x^2$ $y \propto \frac{1}{x^2}$ $y = \frac{k}{x^2}$ $32 = \frac{k}{(4)^2}$ $32 = \frac{k}{16}$ $k = 512$ $y = \frac{512}{x^2}$ $y = \frac{512}{(5)^2}$ $y = \frac{512}{25}$ $y = 20.48$
To find the k	Substitute the values	

## Recurring Decimals

Recurring decimals to fractions	Make the recurring parts match	Express $0.9\dot{2}6$ as a fraction.
		$x = 0.9262626...$ $1000x = 926.262626...$ $- 10x = 9.262626...$ $990x = 915$ $x = \frac{915}{990}$ $x = \frac{61}{66}$

## Bounds

Max of A times B	Upper bound of A Upper bound of B	$A = 4.6$ (2sf) and $B = 0.07$ (1sf) $A: \begin{array}{c} 4.5 \\ 4.55 \\ 4.6 \\ 4.65 \end{array}$ $B: \begin{array}{c} 0.065 \\ 0.0675 \\ 0.07 \\ 0.0725 \end{array}$
Max of A plus B	Upper bound of A Upper bound of B	$(A+B)_{max} = U_{A_{max}} + U_{B_{max}} = 4.65 + 0.0725 = 4.7225$
Max of A divided by B	Upper bound of A Lower bound of B	$(\frac{A}{B})_{max} = \frac{U_{A_{max}}}{L_{B_{min}}} = \frac{4.65}{0.065} = 71.538$
Max of A minus B	Upper bound of A Lower bound of B	$(A-B)_{max} = U_{A_{max}} - L_{B_{min}} = 4.65 - 0.065 = 4.585$

## Compound Interest

Compound interest	$O \times M^T = F$	A bank pays 3% interest. How much will a deposit of £1500 be worth after 4 years? $O \times M^T = F$ $1500 \times 1.03^4 = 1689.72$
T stands for	Time	

## Right-angled Trigonometry

Right-angled triangle	Pythagoras or Trig	Find the unknown values a and c
Side side side	Pythag, pythag, label the longest side	SSS: $13^2 + 12^2 = c^2$ $169 + 144 = c^2$ $313 = c^2$ $c = \sqrt{313} = 17.7$
Side angle side	SOH CAH TOA Label the 2 sides Cover up the one you want And use the formula	SAS: $\frac{12}{\sin 74^\circ} = \frac{a}{\sin 58^\circ}$ $a = \frac{12 \sin 58^\circ}{\sin 74^\circ} = 10.2$ $\frac{12}{\sin 74^\circ} = \frac{c}{\sin 48^\circ}$ $c = \frac{12 \sin 48^\circ}{\sin 74^\circ} = 9.8$

## Standard Form

Adding and subtracting (in standard form)	Make them ordinary numbers	Calculate $(7.5 \times 10^3) + (2.5 \times 10^4)$ $7500 + 25000 = 32500 = 3.25 \times 10^4$
Multiplying and dividing (in standard form)	Use index laws	Calculate $(1 \times 10^3) \div (5 \times 10^5)$ $\frac{1 \times 10^3}{5 \times 10^5} = \frac{1}{5} \times \frac{10^3}{10^5} = 0.2 \times 10^{-2} = 2 \times 10^{-3}$

## Similar Shapes

2 shapes	Side by side	Find the surface area and volume of shape B (all lengths in cm). Shape A: $2 \times 3 \times 8$ Shape B: $24 \times 36 \times 48$
First thing	Length scale factor	$LSF = \frac{24}{2} = 12$
Area scale factor	Length scale factor squared	$ASF = LSF^2 = 12^2 = 144$
Volume scale factor	Length scale factor cubed	$VSF = LSF^3 = 12^3 = 1728$

## 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	19	What do lipases break down and what is produced?	Lipids (fats) to fatty acids and glycerol
2	How do our teeth help us digest food?	They break the food into smaller pieces, to increase the total surface area	20	What are the products of digestion used for?	To build new carbohydrates, lipids and proteins in cells, and for energy
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	21	What is the test for protein in food?	Add Biuret reagent to sample of food. Reagent turns from blue to purple or violet
4	What are the 7 main food groups?	In any order: fats, proteins, carbohydrates, fibre, minerals, vitamins and water	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
5	Which of the 7 main food groups are large polymer molecules?	Fats, carbohydrates and proteins	23	What is the test for starch in food?	Add iodine solution to a sample of food. Reagent turns from orange to blue/black
6	What is a polymer?	A large molecule made up of repeating units of similar or identical small molecules	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)
7	How does stomach acid help digestion?	1. It helps enzymes digest proteins 2. It provides an optimum pH for protease enzymes	25	What is the active site of an enzyme?	Part of the surface which joins to a substrate and where the reaction happens
8	What is an enzyme?	A biological catalyst - a protein that speeds up a reaction without being used up	26	What is a substrate?	The molecule that is acted on by an enzyme (for example, being broken down)
9	What is the order in which food passes through the digestive system?	Mouth -> oesophagus -> stomach -> small intestine -> large intestine -> rectum -> anus	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)
10	What is the function of the small intestine?	To absorb sugars, lipids, amino acids, vitamins and minerals from digested food	28	Name two factors that can affect the shape of an enzyme's active site	pH and (high) temperature
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	29	What happens when an enzyme is denatured?	Its active site changes shape permanently so the substrate can no longer fit
12	What is the function of the large intestine?	To absorb water from the remains of food leaving waste behind	30	In Biology, what do we mean by 'tissue'?	A group of identical (or very similar) cells working together to do a particular job
13	What is bile and where is it made?	A substance made in the liver that emulsifies fat and neutralises stomach acid	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
14	Name where carbohydrase is made in the body	Salivary glands, pancreas and small intestine	32	In Biology, what is an organ system?	A group of organs that work together to perform a particular function
15	What do carbohydrases break down and what is produced?	Carbohydrates to simple sugars (e.g. amylase breaks down starch to glucose)	33	Name the human organ systems	Digestive system, nervous system, circulatory system, skeletal system, reproductive system, endocrine system
16	Name where protease is made in the body	Stomach, pancreas and small intestine	34	Which system transports substances around the body?	The circulatory system
17	What do proteases break down and what is produced?	Proteins to amino acids	35	Name the two types of chambers in the heart and state their relative positions	Upper chambers - Atria (singular: atrium) Lower chambers - Ventricles
18	Where is lipase made in the body?	Pancreas and small intestine			

## Biology Unit 1: Organisation

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
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

## Biology Unit 1: Organisation

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 plant



## Biology Unit 2: Infection and Response

94	What is a communicable disease?	A disease which can be passed on to others	113	How is malaria spread?	By mosquitoes
95	What are the four types of microorganisms that can cause disease?	Bacteria, viruses, fungi, protists	114	How is the spread of malaria controlled?	Eradication of vectors (e.g. mosquitoes); use of mosquito nets to avoid being bitten
96	What are pathogens?	Microorganisms that cause infectious disease	115	What are the early symptoms of HIV infection?	HIV initially causes a flu-like illness
97	Name four ways in which diseases caused by pathogens can be spread	Through air, through water, direct contact (e.g. STDs), vectors	116	How does HIV lead to AIDS?	Disables the immune system so it can no longer deal with other infections or cancers
98	Name four ways in which the spread of diseases can be reduced or prevented	Hand-washing, safer sex practices, vaccination, eradication of vectors	117	How is HIV spread?	Sexual contact or exchange of body fluids (e.g. blood) when drug users share needles
99	How do bacteria damage body cells?	They release harmful molecules called toxins	118	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
100	State the symptoms of the measles virus?	Fever and a red skin rash	119	Why might viruses cause more damage than bacteria?	Viruses live and reproduce inside cells, causing cell damage
101	How is the measles virus spread?	Inhalation of droplets from sneezes and coughs	120	In what way might bacteria cause damage to cells and tissues?	Bacteria may produce poisons (toxins) that damage tissues and make us feel ill
102	What are symptoms of Salmonella infection?	Fever, abdominal cramps, vomiting and diarrhoea	121	What is Tobacco Mosaic Virus and what type of organism does it affect?	A widespread plant pathogen affecting many species of plants including tomatoes
103	How are Salmonella bacteria spread?	Under-cooked/unhygienic food preparation	122	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
104	How is the spread of Salmonella controlled in the UK?	In the UK, chickens are vaccinated against Salmonella to control the spread	123	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
105	What are the symptoms of a Gonorrhoea infection?	Thick yellow or green discharge from the vagina or penis and pain on urination	124	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
106	How are Gonorrhoea bacteria spread?	Gonorrhoea is spread by sexual contact	125	How can rose black spot be treated?	Using fungicides and/or removing and destroying the affected leaves
107	How can the spread of Gonorrhoea be reduced?	Treatment with antibiotics or use of a barrier method of contraception e.g. condoms	126	What are the first line non-specific defence systems of the human body against pathogens?	Skin, nose, trachea and bronchi, stomach
108	What are the symptoms of athlete's foot?	Damaged skin and toe nails	127	What is the role of the immune system?	If a pathogen enters the body the immune system tries to destroy the pathogen
109	What microbe causes athlete's foot?	A microscopic fungus			
110	How can the spread of athlete's foot be prevented?	By treating the skin with anti-fungal chemicals and washing clothes regularly.			
111	What are the symptoms of malaria?	Fever, shaking and liver damage			
112	Which kind of microbe causes malaria?	A protist			

## Biology Unit 2: Infection and Response

128	Name three ways in which white blood cells help to defend against pathogens	Phagocytosis, antibody production, antitoxin production	138	Why are children vaccinated against the measles virus?	Measles is a serious illness that can be fatal if complications arise
129	What is phagocytosis (fag-go-sy-toe-sis)?	A white blood cell surrounds and engulfs a pathogen, then digests it and destroys it	139	Which three diseases are prevented by the MMR vaccine?	Measles, mumps and rubella
130	What are antibodies?	Small proteins that attach to antigens on the outer surface of pathogens	140	What is an epidemic?	The spread of an infectious disease throughout a community
131	What are antitoxins?	Small molecules that attach to toxin molecules and stop them being dangerous	141	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
132	What are antigens?	Small protein molecules on the outside of pathogen cells	142	What is an antibiotic?	A drug that kills bacteria (but not other types of pathogen)
133	What does a vaccination contain?	A small quantity of dead or inactive forms of a pathogen	143	What are the current concerns around antibiotic treatment?	The emergence of bacterial strains resistant to antibiotics means many antibiotics no longer work effectively
134	What is the purpose of vaccination programmes?	To prevent illness in individuals and reduce spread of the pathogen in a population	144	How do antibiotics work?	Preventing the bacterial cell wall from forming or preventing DNA from replicating
135	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	145	What issues are there with the treatment for Gonorrhoea?	Easily treated with the antibiotic penicillin until many resistant strains appeared
136	What is 'herd immunity'?	Where enough people in a population are immune so that the spread of disease stops	146	What is the aim of antiretroviral drugs?	To stop the virus replicating inside cells
137	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	147	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
			148	What are painkillers used for?	Painkillers and other medicines are used to treat the symptoms of disease but do not kill pathogens

## Biology Unit 2: Infection and Response

149	Which drug was first made from plants called foxgloves?	Digitalis (to treat heart disease)
150	Which drug was first made from willow tree extracts?	Aspirin (people used to chew on twigs from willow trees to relieve pain!)
151	Where did we first discover penicillin?	In a type of fungus (a mould)
152	What are many modern drugs based on?	Chemicals found in plants or microorganisms
153	How are most drugs made now?	By expert chemists in the pharmaceutical industry
154	In terms of drugs, what does 'efficacy' mean?	How well the drug works (treating or reducing the symptoms)
155	In terms of drugs, what does 'dose' mean?	A safe amount of drug that is also effective
156	What do we mean by drug 'toxicity'?	How dangerous a drug could be
157	What are 'side effects'?	Unwanted effects of a drug

158	What the features of a good medicine?	Effective, safe, and stable
159	What is preclinical testing?	Testing chemical in a laboratory using cells, tissues and live animals
160	What happens in the first stage of clinical trials?	Drugs are tested on healthy volunteers to see if the drug is safe
161	What happens in the second stage of the clinical trial?	Drugs are tested on healthy volunteers and patients to find the best dose
162	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
163	What is a placebo?	A tablet which looks like the real medicine but which contains no active drug
164	Why are placebos used in drugs trials?	To avoid bias

## Chemistry Unit 1: Bonding & Structure

1	What charge do electrons have?	-1	15	Explain in terms of electrons what occurs when magnesium bonds with chlorine	One electron is transferred from Mg to two different Cl atoms
2	What charge does a lithium ion have?	1+ (Li loses its one outer shell electron)	16	Explain in terms of electrons what occurs when sodium bonds with oxygen	Two electrons transferred to an oxygen atom from two different sodium atoms
3	What charge does beryllium have?	2+ (Be loses its two outer shell electrons)	17	Why do sodium ions and chlorine ions bond ionically?	Oppositely charged ions are attracted to each other by strong electrostatic forces
4	What charge does an ion of barium have?	2+ (group 2 – Ba loses its 2 outer shell electrons)	18	Why don't sulphur ions and oxygen ions form ionic bonds with each other?	Both ions are negatively charged so they repel
5	What charge does an ion of fluorine (fluoride ion) have?	1- (group 7 - 7 electrons in the outer shell, needs to gain one more)	19	What is the name for a substance made of billions of oppositely charged ions joined together?	Giant ionic lattice
6	If an atom gains electrons, what charge will it have?	Negative	20	Define giant ionic lattice	A huge 3D network of ions
7	If an atom loses electrons, what charge will it have?	Positive (they have lost negative charges!)	21	Describe the melting points of ionic substances	High
8	What charge does an ion of oxygen (oxide ion) have?	2- (6 electrons in outer shell, needs two more)	22	Will NaCl(s) conduct electricity?	No – ions can't move
9	What charge does an ion of selenium have?	2- (group 6 - 6 electrons in outer shell, and needs to gain two)	23	Will NaCl (aq) conduct electricity?	Yes (aq stands for aqueous which means it is dissolved in water – ions can move)
10	Explain in terms of electrons what occurs when lithium bonds with chlorine	One electron transferred from lithium to chlorine (Li becomes positive ion, chlorine becomes negative chloride ion)	24	Will NaCl (l) conduct electricity?	Yes – ions can move
11	Why do atoms transfer electrons in ionic bonding?	To become more stable by gaining full outer shells	25	What does molten mean?	In liquid form
12	Explain in terms of electrons what occurs when lithium bonds with fluorine	One electron is transferred from lithium to fluorine	26	What does soluble mean?	The substance dissolves in water
13	Explain in terms of electrons what occurs when magnesium bonds with oxygen	Two electrons are transferred from magnesium to oxygen	27	What does insoluble mean?	The substance does not dissolve in water
14	Explain in terms of electrons what occurs when beryllium bonds with oxygen	Two electrons are transferred from beryllium to oxygen	28	Magnesium carbonate is insoluble. What do you need to do for it to conduct electricity?	Melt it

## Chemistry Unit 1: Bonding & Structure

29	Explain why chlorine and fluorine bond covalently	They are both non-metals	40	Describe the structure of simple covalent molecules	Strong covalent bonds between atoms, weak forces holding the molecules together (weak intermolecular forces)
30	What happens to electrons in ionic bonding?	They are transferred (from metal atoms to non-metal atoms)	41	What are intermolecular forces?	Weak forces between molecules which hold them together
31	What happens to electrons in covalent bonding?	They are shared between the atoms	42	Explain why methane has a low melting point	It is a simple molecular substance, with weak intermolecular forces that do not need much energy to overcome
32	What is the name given to the structure of diamond, graphite and silicon dioxide?	Giant covalent	43	What is a polymer?	A large number (many thousands) of small molecules joined together in a chain to form a large molecule
33	Explain why diamond has a high melting point	It is a giant structure – strong (covalent) bonds throughout	44	Describe the structure of metals	Positive metal ions arranged in layers with delocalised electrons moving between them
34	Explain why graphite conducts electricity	Delocalised electrons between the layers can move through the graphite	45	Explain why metals can conduct electricity	Delocalised electrons are free to carry charge throughout the structure
35	Explain why graphite can act as a lubricant	Weak forces between the layers allow them to slide easily over each other	46	Explain why pure metals are softer than alloys	Regular layers of identical metal atoms are able to slide over each other
36	What is graphene?	A single layer of graphite	47	What is an alloy?	A mixture of two or more elements, at least one of which is a metal
37	What is a fullerene?	A substance made of carbon atoms arranged to form a cage	48	Give reasons for alloying a metal	To make it harder or less reactive
38	What type of substances are methane and water?	Simple molecular (or simple molecules)	49	Explain why alloys are usually harder than pure metals	Different sized atoms disturb the regular layers and prevent them from sliding over each other easily
39	What is a molecule?	A group of atoms (two or more) chemically bonded together			

## Physics Unit 1: Electricity

1	How does current behave in a series circuit?	The current is the same at any point and through any component in a series circuit	15	Through which wire does current flow out of an appliance?	Through the neutral wire
2	How does potential difference (p.d.) behave in a series circuit?	The p.d. drops across each component, such that total voltage of the power supply is shared between all the components	16	Which wire is a safety feature of appliances with metal casings?	The earth wire
3	State the rule for resistance in a series circuit	The more resistors added, the greater the total resistance, such that: $RT=R1+R2+...$ etc.	17	What should be the potential difference between the neutral and earth wires in the mains supply?	0 V
4	State the rule for current in a parallel circuit	The total current drawn from the supply equals the sum of the currents through each branch	18	What is an electric current?	A flow of electric charge (usually electrons)
5	How does potential difference (p.d.) behave in a parallel circuit?	The potential difference across each branch in the circuit is the same.	19	Define potential difference between two points in a circuit	The work done when a coulomb of charge passes between the points
6	State the rule for resistance in a parallel circuit	Adding resistors in parallel decreases the total resistance (to less than that of the smallest resistor)	20	What does a potential difference between two points in a circuit cause?	Charge to flow between the two points
7	What colour is the live wire in a three-core cable?	Brown	21	What is resistance?	A property of a material or component which opposes the flow of electric charge
8	What colour is the neutral wire in a three-core cable?	Blue	22	Which particles can carry charge in electric circuits?	Charged particles which are mobile - (mobile) electrons or (mobile) ions
9	What colour is the earth wire in a three-core cable?	Green and yellow	23	What is a series circuit?	A circuit where there is only one route for charge to flow
10	What is direct current (d.c.)?	Current which always flows in the same direction in a circuit	24	What is a parallel circuit?	A circuit where there is more than one route for charge to flow along
11	What is alternating current (a.c.)?	Current (and therefore voltage) which reverses its direction constantly	25	State the equation which links charge flow, current and time	$Q=It$
12	What is mains voltage in the UK?	230V a.c.	26	State the equation which links current, potential difference and resistance	$V=IR$
13	What is the frequency of UK mains alternating current?	50Hz (the current changes direction and back again 50 times every second)	27	State the equation which links current, potential difference and power	$P=IV$
14	Through which wire does current flow into an appliance?	Through the live wire	28	State the equation which links current, power and resistance	$P=I^2R$

## Physics Unit 1: Electricity

29	State the equation which links energy transferred, power and time	$E=Pt$	39	Describe the I-V characteristic of a diode	The current only flows through the diode in one direction, there is a very high resistance in the reverse direction
30	State the equation which links charge flow, energy transferred and potential difference	$E=QV$	40	Give an example of alternating current	Mains electricity
31	What is the unit of charge?	coulomb (C)	41	Give an example of direct current	A cell or battery
32	What is the unit of current?	amp (A)	42	What is the National Grid?	A network of cables and transformers that supply mains electricity throughout the UK
33	What is the unit of potential difference?	volt (V)	43	Are power stations part of the National Grid?	No
34	What is the unit of resistance?	ohm ( $\Omega$ )	44	What does a step-up transformer do?	Increases output p.d.
35	What is the unit of power?	watt (W)	45	What does a step-down transformer do?	Decreases output p.d.
36	Describe the I-V characteristics of a resistor	Current and potential difference are directly proportional, resistance is constant	46	Why are transformers used in the National Grid?	To reduce power losses in cables by increasing efficiency (high voltages allow lower currents to be used so that less heat is lost)
37	Describe the I-V characteristics of a filament lamp	Resistance is not constant, it increases as p.d. increases			
38	Explain why resistance increases with increasing p.d. in a filament lamp	Increasing p.d. increases current, which in turn increases the temperature, causing ions to vibrate and increasing the frequency of collisions between electrons flowing through the filament			

## Biology Unit 2: Organisation

1	What is the word equation for photosynthesis?	Carbon dioxide + water -> glucose + oxygen (light above the arrow)	21	Where does anaerobic respiration happen in any cell?	In the cytoplasm
2	What is the balanced chemical symbol equation for photosynthesis?	$6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$	22	What is the balanced chemical equation for aerobic respiration?	$\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$
3	Which gas is a reactant in the photosynthesis reaction?	Carbon dioxide	23	What is the word equation for anaerobic respiration in animal cells?	Glucose -> lactic acid
4	Which gas is a product of the photosynthesis reaction?	Oxygen	24	What is the word equation for anaerobic respiration in plant and yeast cells?	Glucose -> ethanol + carbon dioxide
5	What energy transfer occurs in photosynthesis?	Light energy to chemical energy	25	Is more or less energy transferred in anaerobic respiration compared to aerobic respiration?	Less, due to incomplete breakdown of glucose
6	Where does photosynthesis occur in a plant or algal cell?	Chloroplasts	26	How have humans used anaerobic respiration in plant and yeast cells to make food and drink?	Production of bread and alcoholic drinks
7	What is the name of the green pigment in chloroplasts?	Chlorophyll	27	Why does the heart rate increase during exercise?	To supply more blood to muscle cells
8	What is the function of chlorophyll?	Captures light energy	28	Which reactants for aerobic respiration does the blood contain?	Glucose (in plasma) and oxygen (in red blood cells)
9	Which leaf cells are specialised to do photosynthesis?	Palisade cells (in the leaf)	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
10	What are three major factors which affect the rate of photosynthesis?	Temperature, light intensity, carbon dioxide concentration	30	Which chemical is produced in respiring muscle cells if there is not enough oxygen?	Lactic acid
11	What is the relationship between light intensity and rate of photosynthesis?	The higher the light intensity, the higher the rate of photosynthesis	31	Which complex carbohydrate is stored in the muscle cells to provide chemical energy?	Glycogen
12	Which organic molecule is a product of photosynthesis?	Glucose	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
13	Which large carbohydrates molecules are made from glucose in plant cells?	Starch and cellulose	33	What does a build-up of lactic acid cause in muscles?	Muscle fatigue
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	34	What is produced when enzymes chemically break down carbohydrates?	Simple sugar monomers
15	What else, other than glucose, do plants need to produce proteins?	Nitrate ions	35	What is produced when enzymes chemically break down lipids?	Fatty acids and glycerol
16	Where are mineral ions absorbed from and through which plant organ?	From the soil, through the roots	36	What is produced when enzymes chemically break down proteins?	Amino acids
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	37	What is "metabolism"?	The sum of all the reactions in a cell or the body
18	What is aerobic respiration?	How energy is released from glucose with oxygen	38	Where is lactic acid converted back into glucose?	The liver
19	What is anaerobic respiration?	How energy is released from glucose without oxygen	39	How is lactic acid transported to the liver?	In the blood
20	Where does aerobic respiration happen in a eukaryotic cell?	In the mitochondria			



## Chemistry Unit 4: Chemical Changes

1	What is the reactivity series?	A list of elements ordered by their reactivity	21	What is a salt?	A compound formed when some or all of the hydrogen from an acid is replaced by a metal. E.g. $\text{CuSO}_4$ , copper sulphate, where copper has replaced H from $\text{H}_2\text{SO}_4$
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)	22	What type of salts are formed by the three main acids?	Hydrochloric acid produces chlorides, sulphuric acid produces sulphates, nitric acid produces nitrates
3	What is the name for a reaction where oxygen is removed from a compound?	Reduction	23	What is a neutralisation reaction?	A reaction involving an acid that results in a neutral solution
4	Explain why gold and silver can be found naturally in the Earth's crust	It is very unreactive	24	Which ions always react together in neutralisation reactions between acids and alkalis?	$\text{H}^+$ and $\text{OH}^-$
5	What process is used to extract metals more reactive than carbon?	Electrolysis	25	Write the equation showing the reaction between $\text{H}^+$ and $\text{OH}^-$ ions	$\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$
6	What is an ore?	A material containing enough metal in it for it to be economically worthwhile to extract the metal	26	metal + acid $\rightarrow$	$\rightarrow$ salt + hydrogen gas
7	What is a displacement reaction?	A reaction in which a more reactive element takes the place of a less reactive element in one of its compounds or in solution	27	metal hydroxide + acid $\rightarrow$	$\rightarrow$ salt + water
8	What is oxidation in the context of loss and gain of electrons?	Oxidation is the loss of electrons	28	metal oxide + acid $\rightarrow$	$\rightarrow$ salt + water
9	What is reduction in the context of loss and gain of electrons?	Reduction is the gain of electrons	29	metal carbonate + acid $\rightarrow$	$\rightarrow$ salt + water + carbon dioxide
10	Which of the substances below has been oxidized and which has been reduced? $\text{Al}^{3+} + \text{Fe} \rightarrow \text{Fe}^{3+} + \text{Al}$	Aluminium has been reduced and iron has been oxidised	30	How do you make a soluble salt from an acid?	React the acid with a base. E.g. to make copper sulphate react copper oxide with sulphuric acid
11	Define acid in terms of pH	A substance with a pH of less than 7	31	If a salt is in solution, how do you extract it as a solid?	Allow the water to evaporate off and it will leave the salt behind as a solid.
12	Define acids in terms of ions	A substance which releases $\text{H}^+$ ions in solution	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 $\text{H}^+$ and $\text{Cl}^-$
13	What does (aq) stand for?	Aqueous: when something is dissolved in water. E.g. $\text{NaCl(aq)}$ is salt water	33	What is a weak acid?	An acid which will have some molecules which do not split up into their ions. E.g. in ethanoic acid only some of the molecules will have split up into the ethanoate ion and $\text{H}^+$ ions
14	State the three common acids and give their formulae	Hydrochloric acid, $\text{HCl(aq)}$ , Sulphuric acid, $\text{H}_2\text{SO}_4\text{(aq)}$ , Nitric acid, $\text{HNO}_3^-$	34	What is the relationship between the strength of an acid and its pH?	As an acid increases in strength the pH decreases
15	Which ions do the common acids form in solution?	HCl forms $\text{H}^+$ and $\text{Cl}^-$ , $\text{H}_2\text{SO}_4$ forms $2\text{H}^+$ and $\text{SO}_4^{2-}$ , $\text{HNO}_3$ forms $\text{H}^+$ and $\text{NO}_3^-$	35	What is a concentrated acid?	An acid where there are lots of acid particles in the water
16	What is a neutral solution?	A solution with a pH of 7. Water is an example			
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?	$\text{OH}^-$			

## Chemistry Unit 4: Chemical Changes

36	What is a dilute acid?	An acid where there are fewer acid particles in the water	57	Do positive ions move to the anode or the cathode?	Cathode
37	How is pH measured?	pH is related to the concentration of $H^+$ in a solution	58	Do negative ions move to the anode or the cathode?	Anode
38	Which ions are in NaCl?	$Na^+$ and $Cl^-$	59	At which electrode would $Zn^{2+}(aq)$ turn into $Zn(s)$ ?	Cathode (needs to gain electrons)
39	Which ions are in $CaCO_3$ ?	$Ca^{2+}$ and $CO_3^{2-}$	60	At which electrode would $Cl^-(aq)$ turn into $Cl_2(g)$ ?	Anode (needs to lose electrons)
40	Which ions are in $Mg(OH)_2$ ?	$Mg^{2+}$ and 2 ions of $OH^-$	61	What will be the products for the electrolysis of molten iron bromide?	Iron and bromine
41	Which ions are in $H_2SO_4$ ?	2 ions of $H^+$ and one $SO_4^{2-}$	62	What will be the products for the electrolysis of molten zinc oxide?	Zinc and oxygen
42	Which ions are in $NH_4OH$ ?	$NH_4^+$ and $OH^-$	63	For the extraction of which metals is electrolysis needed?	Ones more reactive than carbon, e.g. aluminium
43	Which ions are in $(NH_4)_2O$ ?	2 ions of $NH_4^+$ and one $O^{2-}$	64	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
44	What is the formula of calcium chloride?	$CaCl_2$	65	Why is aluminium oxide mixed with cryolite when extracting aluminium?	To lower the melting point
45	What is the formula of aluminium nitrate?	$Al(NO_3)_3$	66	What is produced at the anode and cathode in the electrolysis of aluminium oxide?	Aluminium at the cathode and oxygen at the anode
46	What is the formula of iron (III) oxide?	$Fe_2O_3$	67	Why does the anode need to be replaced in the electrolysis of aluminium oxide?	The oxygen reacts with the carbon electrode to produce carbon dioxide
47	What is the formula of magnesium fluoride?	$MgF_2$	68	In the electrolysis of sodium chloride solution, what are the products?	Chlorine gas and hydrogen gas
48	What is the formula of sodium sulphate?	$Na_2SO_4$	69	Why is sodium not produced in the electrolysis of sodium chloride solution?	It is more reactive than hydrogen, so hydrogen is produced instead
49	What is the formula of copper (I) oxide?	$Cu_2O$	70	What is produced at the anode in electrolysis of solutions?	Either a halogen or oxygen (when there is no halogen present)
50	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	71	For a given liquid, predict the products at each electrode	Pure metal at cathode, non-metal at anode
51	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			
52	In this reaction, what has been oxidised and what has been reduced? $K + Na^+ \rightarrow K^+ + Na$	K has been oxidised, $Na^+$ has been reduced			
53	What is electrolysis?	Using electricity to break down a substance			
54	What happens to an ionic substance when it is melted or dissolved in water?	The ions become free to move around			
55	What is the name for the positive electrode?	The anode			
56	What is the name for the negative anode?	The cathode			

## Physics Unit 3: Particle Model

1	What do we mean by "particle"?	An atom or molecule
2	Describe the particle arrangement in a solid	Particles have a regular arrangement, have a fixed position, touch each other and small spaces
3	Describe the particle arrangement in a liquid	Particles touch each other but have no fixed position and slide past each other. Some small spaces
4	Describe the particle arrangement in a gas	Particles are separated and move freely. Large spaces
5	What formula relates density, mass and volume?	Density = Mass / volume
6	Define "physical change"	A change in which intermolecular forces are overcome or enabled but no chemical bonds are broken or made
7	Give a particle explanation for melting	Particles are given enough energy (through heating) to overcome the intermolecular forces that hold them in a fixed position
8	Give a particle explanation for freezing	Particles lose kinetic energy and move more slowly, reducing spaces between particles and allowing intermolecular forces to hold particles together
9	What is condensing?	When a gas cools to form a liquid
10	What is boiling?	When a liquid is heated to form a gas
11	What is evaporation?	When a liquid slowly forms a gas due to kinetic energy of individual particles at the surface
12	What is sublimation?	When a solid turns straight to a gas or a gas turns straight to a solid
13	Define internal energy of an object	The total kinetic and potential energy of the particles in an object
14	Define "specific heat capacity"	The amount of energy needed to raise the temperature of 1kg by 1 degree C
15	Define "latent heat"	The energy needed to change state "up"
16	Describe the relationship between gas temperature and pressure at constant volume	The higher the temperature the higher the pressure
17	What is "potential energy of particles"?	Energy particles have because they've had work done on them
18	What is "kinetic energy of particles"?	Energy particles have because they are moving
19	What does "to do work on particles" mean?	To move them further apart against their intermolecular attraction
20	How would you find the specific heat capacity of a material?	Find its mass, time how long it takes to raise temp of sample, find energy as power X time, then use shc formula (given)
21	How would you calculate the density of a cuboid?	Volume = length X base X height. Find mass using a mass balance, then use density = mass / volume
22	How would you find the density of an irregular object?	Volume = displaced water into a measuring cylinder. Find mass using mass balance, then use density = mass/volume

## Physics Unit 4: Atomic Structure

1	What is an atom?	The smallest piece of an element that still has the properties of that element. A building-block of matter
2	What is a sub-atomic particle?	A particle that makes up the atom: a proton, neutron or electron
3	What is the atomic nucleus?	The central part of the atom
4	What is a proton?	A subatomic particle with mass = +1 and charge = +1
5	What is a neutron?	A subatomic particle with mass = +1 and charge = 0
6	What is an electron?	A subatomic particle with mass = 0 and charge = -1
7	Which sub-atomic particles are in the nucleus?	Protons and neutrons
8	Which sub-atomic particles orbit the nucleus?	Electrons
9	What is radioactive decay?	When an unstable nucleus gives out alpha or beta radiation, often accompanied by gamma radiation
10	Define "half-life"	The time taken for the number of radioactive nuclei/ decay events to decrease by half
11	What is an alpha particle made of?	A helium nucleus: two protons and two neutrons
12	What is a beta particle?	A fast-moving electron
13	What is gamma radiation?	An electromagnetic wave from the nucleus
14	Name the four types of nuclear radiation	Alpha particle, beta particle, gamma ray, neutron
15	What is "contamination?"	When radioactive material gets on an object
16	What is "irradiation"?	When an object is exposed to radiation
17	State the charge on an alpha particle	+2
18	State the charge on a beta particle	-1
19	Which is the most penetrating radioactive emission?	Gamma
20	Which is the least penetrating radioactive emission?	Alpha
21	List the 3 types of nuclear radiation in order of ionisation power, starting with the most ionising	Alpha, beta, gamma
22	What does mass number tell you?	Total number of protons + neutrons
23	What does atomic number tell you?	Number of protons
24	What is an "isotope"?	Same element, same number of protons, different number of neutrons
25	What was the "plum pudding" model of the atom?	Negative charges spaced in a positive dough
26	What is the "nuclear" model of the atom?	Positive central nucleus surrounded by negative electrons- most of atom is empty space
27	How does beta decay occur?	A neutron in the nucleus decays to make a proton and an electron. The electron exits the nucleus as a beta particle and the proton stays in the nucleus

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

<b>Parle-moi de ta famille</b> – 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'énervé / ils (elles) m'énervent – he (she) / they get on my nerves
<b>Décris ton/ ta meilleur(e) ami(e)</b> - 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 égoïste – my best friend (m) is funny, understanding but sometimes a bit selfish

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

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

<b>Tu veux te marier et avoir des enfants? – do you want to marry and have children?</b>	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 mariage est très 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

## 1: Identity and Culture - Technology in everyday life

<b>Comment utilises-tu / utilisez-vous la technologie? – how do you use technology?</b>	J'ai un portable / une tablette / un ordinateur – I have a phone / tablet (or laptop) / a computer	<b>tous les jours</b>	every day	<b>le réseau</b>	the network
	J'envoie des textos / des mails – I send texts / emails	<b>souvent</b>	often	<b>en ligne</b>	on line
	Je lis / poste des messages – I read / post messages	<b>deux heures par jour</b>	two hours a day	<b>un smartphone / portable</b>	(smart)phone
	Je chatte avec mes copains / copines – I chat with friends	<b>quelquefois</b>	sometimes	<b>une tablette</b>	a tablet / laptop
	Je reste en contact avec mes amis et ma famille – I stay in contact with my friends and family	<b>rarement</b>	rarely	<b>un ordinateur</b>	a computer
	Je regarde des films en streaming – I stream films	<b>Je ne (partage) jamais</b>	I never (share)	<b>l'agenda</b>	calendar
	Je prends des photos / réalise des vidéos – I take photos / make videos	<b>Je passe des heures sur...</b>	I spend hours on...	<b>l'application</b>	app
	Je regarde / partage des photo et vidéos (sur YouTube, Instagram...) – I watch / share photos and videos (on...)	<b>une demande d'amitié</b>	a friend request	<b>le GPS</b>	GPS
	Je télécharge des films et de la musique – I download films and music	<b>valider la demande d'amitié</b>	to accept the friend request	<b>un site / une page web</b>	a website / page
	Je joue aux jeux vidéo en ligne avec mes amis – I play video games online with my friends	<b>ajouter à mes amis</b>	add friend	<b>ma page perso / mon profil</b>	my profile page
<b>On peut... you can</b>	envoyer / chatter / rester en contact / regarder / prendre des photos / réaliser des vidéos / partager des liens vers / commenter / télécharger / jouer – send / chat online / stay in contact / watch / take photos / make videos / share / share links for / comment on / download / play	<b>taguer</b>	to tag	<b>des messages</b>	messages
<b>J'aime / Je préfère... I like to / prefer</b>		<b>une notification</b>	an alert	<b>des posts</b>	posts
<b>Je n'aime pas... I don't like to...</b>		<b>les médias sociaux</b>	social media	<b>des liens</b>	links
<b>parce que...</b>	c'est plus facile / plus vite / pratique – it is easier / quicker / handy (practical)	<b>Je l'utilise pour... I use it in order to...</b>  <b>Hier, je l'ai utilisé pour... yesterday I used it to...</b>		<b>un like / j'ai liké...</b>	a like / I liked...
	c'est divertissant / amusant / marrant / drôle / rigolo – it fun / funny			faire des recherches / googler / faire mes devoirs – do research / google / do my homework	
	c'est créatif / ça me donne de l'inspiration - it's creative / it gives me inspiration			organiser des sorties et des rendez-vous / me faire de nouveaux amis – organise outings and meet-ups / make new friends	
	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			lire ou écouter les actualités – read or listen to the news	
	c'est une grande partie de ma vie quotidienne – it's a big part of my daily life			trouver un resto / des emplois / de l'inspiration – find a restaurant / jobs / inspiration	
	J'ai peur d'être manipulé(e) / de passer trop de temps sur mon portable			faire une réservation / des réservations pour des vacances – make a reservation / book a holiday	
	– I'm afraid of being manipulated / of spending too much time on my phone			garder le contact / trouver de nouveaux contacts – keep in contact / find new contacts	
	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			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	
	les portables / les trolls sont gênants - phones / trolls are annoying				

# 1: Identity and Culture - Free-time activities

<b>Que fais-tu pendant ton temps libre? / Que faites-vous pendant votre temps libre? – how do you spend your free time?</b>	Je fais du sport / J'écoute de la musique / Je chante / Je lis – I do sport / I listen to music / I sing / I read	<b>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?</b>	Le weekend dernier je suis allé(e) au cinéma, j'ai vu / regardé ... – Last weekend I went to the cinema, I saw / watched...
	Je fais du jogging / de l'athlétisme / du judo / du yoga – I jog / do athletics / judo / yoga		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
	Je joue de la guitare / du piano – I play guitar / piano		J'ai regardé [...] en streaming / sur Netflix / sur YouTube – I streamed [...] / I watched [...] on Netflix / on YouTube
	Je regarde la télé / des films / des vidéo – I watch tv / films / videos		Je l'ai adoré parce que c'était drôle / passionnant / triste / émouvant / éducatif – I loved it because it was funny / exciting / sad / moving / educational
	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...		

<b>Qu'est-ce que tu vas / vous allez faire le weekend prochain?</b>  <b>Je vais / on va / nous allons... – I'm going to / we're going to...</b>	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	<b>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?</b>	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
	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		

<b>Qu'est-ce que tu as fait le weekend dernier? – what did you do last weekend?</b>	Le samedi dernier je suis sorti(e) avec mes amis – last Saturday I went out with my friends	<b>Quel type de musique aimes-tu? / aimez-vous? – What music do you like?</b>	J'aime le rock / le pop / le classique / le rap / le hip-hop / le reggae – I like rock / pop / classical / rap / hip-hop / reggae
	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		

		<b>Quel type d'émissions aimes-tu? / aimez-vous? – What TV progs do you like?</b>	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?

<b>Je préfère // Ma célébration / fête préférée, c'est</b> <b>- I prefer // My favourite celebration / festival is...</b>	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 / Hanukkah / New Year's Eve / my birthday	<b>parce que</b>	j'ai les cadeaux / j'adore le chocolat / on ne travaille pas / on se déguise / on mange / on offre... c'est une fête religieuse / 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
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<b>Où es-tu allé(e) / Où êtes-vous allé(e)s pour célébrer / fêter...?</b>	Where did you go to celebrate...?
<b>Qu'est-ce que tu as / vous avez mangé et bu?</b>	What did you eat and drink?
<b>C'était comment?</b>	How was it?

<b>à l'église</b>	to church
<b>à la mosquée</b>	to the mosque
<b>à la synagogue</b>	to the synagogue

<b>Je suis / On est allé(e)s - I / we went manger – to eat</b>	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
<b>C'était – it was</b> <b>Il y avait – there was</b>	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
<b>Je suis / On est allé(e)s à / en[...] - to... chez [...]</b>	avec mes parents / copains - with my parents / mates pour Noël / Aïd al-Fitr... - for Christmas...
<b>J'ai / On a ... vu / regardé / eu / fait / mangé / écouté</b> <b>- I / we... saw / watched / had / made / ate / listened to</b>	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

<b>J'ai aimé / adoré - I liked regarder – looking at faire – making donner – giving recevoir – receiving</b>	le défilé / la fête / les feux d'artifice / les chocolats / les gâteaux / les cadeaux – the parade / fireworks / chocolates / cakes / presents
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## 2: Local, national, international and global areas of interest - Home, town, neighbourhood and region

<b>Où habites-tu / Où habitez-vous? – where do you live?</b>  <b>Qu'est-ce qu'on peut faire dans ta / votre région – what can you do in your neighbourhood?</b>	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...
	J'habite avec ma famille dans un appartement / une maison jumelle / une maison mitoyenne – we live in London in an apartment / semi-detached 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...
<b>On peut / On pouvait – you can / you used to be able to ...</b>	sortir avec des amis / voir un film / manger dans un bon restaurant / jouer au foot dans le parc / faire du shopping – go out with friends / see a film / eat in a good restaurant / play football in the park / go shopping
<b>Où aimerais-tu / aimeriez-vous habiter à l'avenir? – where would you like to live in the future?</b>	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

<b>Pourquoi?</b>	parce que je rêve d'une vie calme / passionnante // 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
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<b>une cuisine</b>	a kitchen
<b>une salle à manger</b>	a dining room
<b>un salon</b>	a living room
<b>une salle de bains</b>	a bathroom
<b>une chambre</b>	a bedroom

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

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

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

<b>Que fais-tu / faites-vous pour aider dans ta région ? – what do you do to help your area?</b>	Je suis bénévole pour l'Armée du Salut depuis deux ans – I've been at volunteer at the Salvation Army for 2 years	C'est une association caritative – it's a charity		qui s'appelle / appelée – called	Médecins Sans Frontières Les Resto du Cœur...	
	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	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				
	J'accompagne le camion-soupe dans les rue de ma ville – I go with the soup van around my town	Elle a été fondée / Elle a été créée – 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		
	Je fais des carton alimentaires – I make up food parcels	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			
	Je donne de l'argent aux associations caritatives – I give money to charity		les pauvres / les sans-abri / les sans-emploi / les faims – the poor / the homeless / the unemployed / the hungry			
	J'aide la collection de l'argent – I help raise money	Elle veut donner des médicaments / des vêtements / de la nourriture / un abri – It wants to give medicine / clothing / food / shelter				
	Je donne des vêtements aux magasins caritatifs – I give clothes to charity shops	Parles-moi de ton regime – tell me about your diet				
	Je visite les personnes âgées dans ma communauté – I visit the elderly in my community	J'ai un régime [assez / très] sain / équilibré / malsain – I have a [fairly / very] healthy / balanced / unhealthy diet				
<b>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?</b>	Je voudrais faire du travail bénévole – I would like to do charity work	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 régulièrement – quite regularly de temps en temps – from time to time rarement – rarely	
	J'aimerais aider les gens / les enfants / les animaux – I would like to help people / children / animals	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 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						
		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 régulièrement – 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

<b>Que fais-tu pour aider l'environnement? – what do you do to help the environment?</b>	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'environnement il faut réduire la pollution – to help the environment you must reduce pollution
	On doit recycler plus – we must recycle more
<b>Quelles sont les plus grands problèmes de l'environnement? – what are the biggest problems of the environment?</b>	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

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

<b>les SDF</b>	the homeless
<b>la pauvreté</b>	poverty
<b>le logement</b>	accommodation
<b>le sac de couchage</b>	sleeping bag
<b>le trottoir</b>	the pavement
<b>une pièce de monnaie</b>	a coin
<b>un emploi</b>	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

<b>Que fais-tu en vacances normalement? - what do you normally do on holiday?</b>	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 because it's more comfortable
<b>Qu'est-ce que tu as fait pendant les vacances l'année dernière? – What did you do on your holiday last year?</b>	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
<b>Quelles sont tes vacances de rêve? - what's your dream holiday?</b>	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

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

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

# 1: Relaciones con familia y amigos

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

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

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

<b>Soy</b> <b>Es</b> <b>Sería</b>	I am s/he is I / s/he would be	un poco a bit bastante quite muy very demasiado too	divertido fun travieso silly generoso generous cariñoso caring abierto open serio serious honrado honest perezoso lazy orgullosa proud egoísta selfish optimista optimistic feliz happy hablador talkative trabajador hard-working amable nice/kind triste sad alegre happy
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### 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

## ¿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	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	+ family member	porque era because s/he was	

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

<b>Mis padres</b>	Están enamorados Are in love Están casados Are married Están separados Are separated Están divorciados Are divorced	Quando era joven When I was young Hace X años – X years ago
	Se casaron Got married Se separaron Separated Se divorciaron Got divorced	

Creo/pienso que I believe/think that En el futuro In the future Cuando sea mayor When I am older Cuando tenga 20 años When I am 20 Después de mis estudios After my studies	me gustaría I would like me encantaría I would love quisiera I would love (=wish)	casarme - to get married enamorarme - to fall in love tener una familia - to have a family tener hijos - to have children encontrar el amor de mi vida to meet the love of my life vivir con mi novio/a to live with my boyfriend/girlfriend vivir juntos to live together
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## 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	download music pass the time share photos post photos get in touch with my family
	mi móvil my mobile		conocer a gente nueva subir y ver videos chatear en línea	know new people upload and watch video chat online
	mi tableta my tablet		mandar mensajes estar en contacto navegar por Internet	send messages keep in touch surf the net
	mi portátil my laptop			

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

Es posible 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 hw be useful for hw 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

### ¿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	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	bastante  muy  demasiado		

Lo único malo es que The only bad thing is that	soy adicto/a a...	I am addicted to...
	es adicto/a a...	s/he is addicted to...
Lo negativo es que The negative thing is that	estoy enganchado/a ... enganchado/a ...	I am hooked on...
	está enganchado/a...	s/he is hooked on...
	es una pérdida 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	escuchado
(tú)	has	bebido
(él/ella/usted)	ha	compartido

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	
(él/ella/usted)	está	mirando
(nosotros/as)	estamos	bebiendo
(vosotros/as)	estáis	escribiendo
(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 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 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 realities - reality tv programmes los programas de música/deportes - music/sports programmes las noticias - the news las comedias - comedies las telenovelas - soap operas las películas de amor/acción/ciencia ficción - love/action/science fiction films	porque son because they are	

## ¿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 carne / ensalada pasta / pizza caramelos/ pasteles huevos galletas Verduras	rice / bread chicken / fish meat / salad pasta / pizza sweets / cakes eggs biscuits vegetables
Bebí Bebo Voy a beber Beberé	I drank I drink I am going to drink I will drink	agua / vino té / café zumo de naranja limonada cerveza	water / wine tea / coffee orange juice 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

## 1: Las fiestas

### Hablando de las fiestas – talking about festivals

El Día de los muertos	se celebra is celebrated	el primero de noviembre	en México
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 se queman figuras de madera se lanzan huevos/tomates se construyen hogueras se disparan fuegos artificiales se celebran los santos se ven batallas y desfiles se come comida típica se decoran las tumbas	colourful costumes are worn wooden figures are burnt eggs/tomatoes are thrown bonfires are built fireworks are set off saints are celebrated battles and processions are seen typical food is eaten tombs are decorated
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### ¿Cómo se celebra Navidad? – how is Christmas celebrated?

Durante Navidad During Christmas	la gente people la familia the family	come uvas a medianoche canta villancicos va a la iglesia prepara platos típicos	eat grapes at midnight sing carols go to church prepare typical dishes
	visitamos familia y amigos llevamos ropa especial decoramos la casa decoramos el árbol de Navidad  pasamos tiempo con la familia  comemos comida deliciosa bebimos champán recibimos regalos		we visit family and friends we wear special clothes we decorate the house we decorate the Christmas tree we spend time with the family we eat delicious food we drink champagne we receive presents

### Ir a una fiesta – going to a festival

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

### ¿Qué hiciste durante las vacaciones de Navidad?

#### The preterite tense

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

visitar (to visit)	beber (to drink)	salir (to leave / to go out)	irregular verbs ir (to go) ser (to be)
visité	bebí	salí	fui
visitaste	bebiste	saliste	fuiste
visitó	bebió	salíó	fue
visitamos	bebimos	salimos	fuimos
visitasteis	bebisteis	salisteis	fuisteis
visitaron	bebieron	salieron	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

<b>Las reglas – the rules</b>	Tenemos que hacer una hora de deberes cada noche - we have to do an hour of homework per evening	<b>un blázer</b>	a blazer
	Hay que prestar atención en clase - we have to pay attention in lessons	<b>los zapatos</b>	shoes
	No se debe olvidar el bolígrafo - we shouldn't forget our pens	<b>una falda</b>	a skirt
	Se debe llevar uniforme - we must wear a uniform	<b>un jersey</b>	a jumper
	Se puede llevar maquillaje - we can wear make-up	<b>una camisa</b>	a shirt
	Los móviles están prohibidos - mobile phones are forbidden	<b>unos pantalones</b>	trousers
<b>Los problemas – problems</b>	No comprendo/ No entiendo - I don't understand	<b>una corbata</b>	a tie
	Siempre tengo demasiados deberes - I always have too much homework		
	Mis notas son malos - my grades are bad		
<b>Décris- moi ton école – Describe your school</b>	Las aulas son modernas - the classrooms are modern	<b>estoy de acuerdo</b>	I agree
	No me gusta la comida en el comedor - I don't like the food in the canteen	<b> tienes razón</b>	you're right
	Hay 1100 alumnos en mi instituto - there are 1,100 students in my school	<b>no estoy de acuerdo</b>	I disagree
	Hay un campo de deporte - there is a big sports field	<b>es mentira</b>	it's false
		<b>es verdad</b>	it's true

<b>¿Qué opinas de la vida escolar en Inglaterra? – What do you think of school life in England?</b>	En mi opinión – 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 – 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 exámenes – 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			
policia - 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	

# The Changing Economic World

## 1. What is development?

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

## 5. Example of modern industry being sustainable

<b>Google</b>	London Landscraper started 2018.
<b>686 bikes spaces, 4 car spaces</b>	Encourages cycling to work. < congestion/CO2 emissions.
<b>Solar panels</b>	Reduces fossil fuel consumption.

## 2. How to measure development?

Term	Definition
<b>GNI per capita</b>	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.
<b>Infant mortality rate</b>	The number of deaths of infants under 1 year, per 1000 live births per year.
<b>Life expectancy</b>	The average age a person is expected to live.
<b>People per doctor</b>	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 → less 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

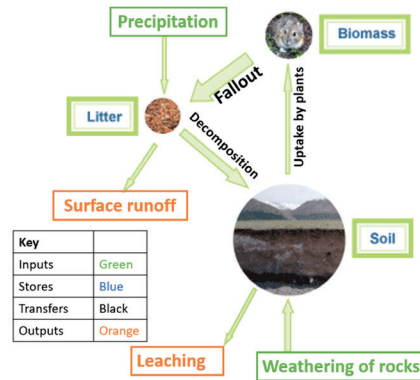
<b>Primary</b>	↓ due to mechanisation.
<b>Secondary</b>	↑ due to industrial revolution then ↓ due to deindustrialisation.
<b>Tertiary</b>	↑ due to wealth (↑ disposable income).
<b>Quaternary</b>	High-tech jobs including research and IT. ↑ due to government policies and increase in technology.

## Why has our economy changed?

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

### 1. Tropical rainforests

Characteristic	Definition
<b>Climate</b>	Consistently warm and wet (2,000mm rainfall per year and 28°C temperature).
<b>Soil</b>	Infertile as rain leaches nutrients. Some nutrients on the surface due to decomposition.
<b>Structure (4 layers)</b>	The difference in standards of living and wellbeing between the world's richest and poorest countries.
<b>Biodiversity</b>	Very high, but at risk due to deforestation. Over 50% of all species in the world.
<b>Plants</b>	Evergreen as there is a continual growing season. Tall trees and the dense canopy blocks light.
<b>Nutrient cycle</b>	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
<b>Water and soil management</b>	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.
<b>Tree planting</b>	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.
<b>Use of appropriate technology</b>	Magic stones (low stone walls) reduce soil erosion.

### 2. Deforestation in the Amazon rainforest

<b>Farming</b>	Subsistence – growing food for yourself. Commercial farming (selling for profit) e.g. cattle ranching accounts for 75% of deforestation in the Amazon.
<b>Logging</b>	As quality of life for people increases there is a greater demand for higher quality furniture.
<b>Road building</b>	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.
<b>Mineral extraction</b>	Countries try to increase their income and gross domestic product (GDP). To do this they extract and export minerals to other countries.
<b>Energy development</b>	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.
<b>Population growth</b>	Urban poor are encouraged to migrate to the countryside to ease overcrowding.

# UK Physical Landscapes (Coasts)

## 1. Coastal processes

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

## 2. Erosional landforms at the coast

### Headlands and bays

- Discordant coastlines have alternating bands of more resistant (chalk) and less resistant rock (clay).
- The less resistant rock is eroded faster through abrasion, creating bays.
- The more resistant rock erodes slower and is left jutting out to sea, forming a headland.

### Cave, arch, stack

- Hydraulic power enlarges cracks in headland.
- Over time they turn into a cave.
- Back of cave is deepened by abrasion until it erodes through the headland > arch.
- Weathering and erosion wear away at the arch until it eventually collapses (gravity).
- 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
<b>Sea walls</b>	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.
<b>Rock armour</b>	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.
<b>Gabions</b>	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.
<b>Groynes</b>	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
<b>Beach nourishment</b>	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.
<b>Dune regeneration</b>	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.

## UK Physical Landscapes (Rivers)

### 1. The formation of meanders and oxbow lakes

These occur in the middle course of the river.

#### Meanders and ox bow lakes

- Char.** A meander is a bend in the river. An ox bow 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.



### 3. River management

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

Strategy	Explanation	Costs	Benefits
<b>Channel straightening</b>	Meanders are removed. Artificial channels make river straighter. Increases velocity.	May cause more flooding and erosion down stream.	Faster velocity means water leaves the area quickly reducing flood risk.
<b>Flood relief channels</b>	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
<b>Flood plain zoning</b>	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.
<b>Tree planting</b>	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.

### 2. What causes flooding?

<b>Physical factors</b>	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.
<b>Human factors</b>	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.

## 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 <b>11th century</b>	2. The Church banned members of the clergy from carrying out operations that involved cutting the patient <b>1215</b>	3. The Black Death arrived in England <b>1348</b>
Overview of health and disease in the Middle Ages		Key people
<b>4. Beliefs about causes of disease</b> a) God   b) Misalignment of the planets c) Four Humours   d) Miasma (bad air)	<b>9. Astrology</b> The study of the planets and stars	<b>16. Apothecary</b> A medical practitioner who mixed herbal remedies for physicians or directly for patients.
<b>5. Methods of treating disease</b> a) Prayer, fasting and pilgrimage b) Bleeding and purging c) The Theory of Opposites d) Herbal remedies	<b>10. Bleeding/blood-letting</b> Taking blood out of the body to cure or prevent an illness	<b>17. Barber surgeon</b> Barbers worked with sharp knives so also carried out medical procedures such as bleeding and smaller surgeries
<b>6. Methods of preventing disease</b> a) Regular prayer and confession b) Following the Regimen Sanitatis c) Purifying the air	<b>11. Miasma</b> Bad air believed to be filled with harmful fumes which could cause illness	<b>18. Galen</b> A physician in the Roman Empire who liked and developed the ideas of Hippocrates
<b>7. Main source of treatment</b> Female family members in the home	<b>12. Purging</b> Removing leftover food from the body	<b>19. Hippocrates</b> An Ancient Greek physician who created the Theory of the Four Humours in the 5th century BC
<b>8. Who ran hospitals?</b> The Church	<b>13. Regimen Sanitatis</b> A set of instructions for how to maintain good health	<b>20. Physician</b> Someone who practices medicine
<b>14. Self-flagellation</b> Whipping yourself to show God that you are sorry for your sins	<b>15. Theory of the Four Humours</b> Belief that four liquids made up the body and had to be balanced to ensure good health	

## TOPIC 2: MEDICINE IN THE RENAISSANCE c.1500-c.1700

Timeline			
1. Invention of the printing press <b>c.1440</b>	3. Publication of Vesalius's On the Fabric of the Human Body <b>1543</b>	5. The Royal Society met in London for the first time <b>1660</b>	7. Thomas Sydenham published Observations Medicae <b>1676</b>
<b>1536</b> 2. Dissolution of the Monasteries in England	<b>1628</b> 4. William Harvey published his work on the circulation of the blood	<b>1665</b> 6. The Great Plague arrived in England	
Overview of health and disease in the Renaissance		Key people	
<b>8. Beliefs about causes of disease</b> a) God   b) Misalignment of the planets c) External factors   d) Four Humours e) Miasma (bad air)	<b>13. Anatomy</b> The study of the structure of the human body	<b>20. Andreas Vesalius</b> An Italian doctor and lecturer in surgery, who proved through dissection that Galen's work on anatomy was wrong	
<b>9. Methods of treating disease</b> a) Bleeding, purging and sweating b) transference c) New herbal remedies d) Chemical cures	<b>14. Iatrochemistry</b> Looking for chemical cures for disease	<b>21. The Royal Society</b> An organisation which aimed to carry out experiments to further scientific understanding, and encourage the sharing of scientific knowledge	
<b>10. Methods of preventing disease</b> a) Cleanliness   b) Purifying the air c) Avoiding external factors that people believed affected disease	<b>15. Microscope</b> An instrument used to see objects too small to see with the naked eye	<b>22. Thomas Sydenham</b> A well-respected doctor in London, who laid the foundations for a more scientific approach to medicine by encouraging careful observation of symptoms	
<b>11. Main source of treatment</b> Female family members in the home	<b>16. Printing press</b> A machine that allowed many copies of the same text or picture to be printed	<b>23. William Harvey</b> An English doctor who discovered how blood circulates around the body	
<b>12. Who ran hospitals?</b> Charities or local councils	<b>17. Quarantine</b> A method of isolating people who are infected with a disease		
	<b>18. Secular</b> Not religious or spiritual		
	<b>19. Transference</b> A new theory of treatment that a disease could be transferred to something else		

Timeline				
1. Edward Jenner discovered the smallpox vaccine <b>1796</b>	3. Jenner's smallpox vaccination was made compulsory in Britain <b>1852</b>	5. Florence Nightingale travelled to Crimea to treat wounded soldiers <b>1854</b>	7. Joseph Lister used carbolic acid as an antiseptic in surgery <b>1865</b>	9. The government passed the Public Health Act <b>1875</b>
<b>1847</b> 2. James Simpson discovered the effects of chloroform as an anaesthetic	<b>1854</b> 4. John Snow discovered that contaminated drinking water causes cholera	<b>1861</b> 6. Louis Pasteur published the Germ Theory of disease	<b>1871</b> 8. The government fined people who did not vaccinate their children against smallpox	

Overview of health and disease in the C18th and C19th	Key words	Key people
<b>10. Beliefs about causes of disease</b> a) Miasma b) Theory of spontaneous generation c) Germ theory (from 1861) <b>11. Methods of treating disease</b> a) Home remedies b) Patent remedies c) Surgery d) Hospital care <b>12. Methods of preventing disease</b> a) Vaccination b) Government action <b>13. Main source of treatment</b> A lot of people, especially the rich, still chose to be treated at home <b>14. Who ran hospitals?</b> Charities or local people. Some local governments built hospitals for the poor.	<b>15. Anaesthetic</b> A drug given to patients to make them unconscious before and during surgery <b>16. Aseptic surgery</b> Surgery where the operating theatre has been made free of bacteria <b>17. Antiseptics</b> Chemicals used to destroy bacteria and to prevent infection <b>18. Germ</b> A type of bacteria (or microbe) that causes disease <b>19. Vaccination</b> Injecting a killed or weakened microbe into the body to develop resistance against a disease	<b>20. Edward Jenner</b> Developed the smallpox vaccination <b>21. Florence Nightingale</b> Improved nurses' training and hospital care <b>22. James Simpson</b> Discovered that chloroform was an effective anaesthetic <b>23. John Snow</b> Discovered that contaminated water caused cholera <b>24. Joseph Lister</b> Theorised that germs caused infection <b>25. Louis Pasteur</b> Developed the Germ theory of disease <b>26. Robert Koch</b> Discovered that different germs cause different diseases

### TOPIC 4: MODERN MEDICINE, 1900-PRESENT

Timeline				
1. Salvarsan 606, the first 'magic bullet' was discovered <b>1909</b>	3. Florey and Chain developed penicillin into a usable treatment <b>1941</b>	5. NHS was launched by government → free medical care to all <b>1948</b>	7. The Clean Air Act was passed to reduce air pollution <b>1956</b>	9. The government made it illegal to smoke in enclosed workplaces <b>July 2007</b>
<b>1928</b> 2. Alexander Fleming discovered that penicillin killed harmful bacteria	<b>1942</b> 4. The government launched a national vaccination campaign against diphtheria	<b>1953</b> 6. Watson and Crick discovered the structure of DNA and how it passed on information	<b>1990-2003</b> 8. Scientists worked on the Human Genome Project, identifying the purpose of each gene	

Overview of health and disease in modern Britain	Key words	Key people
<b>10. Beliefs about the causes of disease</b> a) Germ Theory b) Genetic factors c) Lifestyle choices <b>11. Methods of treating disease</b> a) Chemical cures b) Antibiotics c) Advanced surgery d) High-tech methods <b>12. Methods of preventing disease</b> a) Mass vaccinations b) Government laws and campaigns <b>13. Main source of treatment</b> The NHS (through GPs or hospitals) <b>14. Who ran hospitals?</b> From 1948, the government ran hospitals through the NHS	<b>15. Antibiotic</b> Drugs made from bacteria that kill other bacteria, and so cure an infection <b>16. DNA</b> Carries genetic information <b>17. Gene</b> Part of a cell, made up of DNA, that determines how bodies look and work <b>18. Human genome</b> The complete set of DNA containing all the information to build a human <b>19. 'Magic bullets'</b> Chemical cures that attack the microbes in the body causing disease <b>20. X-Ray</b> Rays that penetrate the human body, so we can see inside it	<b>21. Alexander Fleming</b> A British doctor who discovered that penicillin killed harmful bacteria <b>22. Howard Florey and Ernst Chain</b> Scientists who developed penicillin into a usable treatment <b>23. James Watson and Francis Crick</b> Scientists working in Cambridge, who discovered the structure of DNA <b>24. Paul Ehrlich</b> A German scientist who tested chemical compounds to find a cure for syphilis. <b>25. Rosalind Franklin</b> 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

**History**  
3 of 4

Timeline			
1. Brown v. Topeka case <b>1954</b>	3. Beginning of the Montgomery Bus Boycott <b>December 1955</b>	5. Southern Christian Leadership Conference (SCLC) formed by Martin Luther King <b>January 1957</b>	7. Civil Rights Act passed <b>September 1957</b>
<b>August 1955</b> 2. Emmett Till murdered	<b>1956</b> 4. Bus Boycott successful, segregation on buses ended	<b>September 1957</b> 6. Little Rock High School	
Key people		Key words	
<b>8. Martin Luther King Jr</b>	An American Baptist minister and activist who became a key leader in the civil rights movement from 1954-68	<b>12. Congress</b>	The US equivalent of parliament, split into two parts – the Senate and the House of Representatives
<b>9. President Dwight Eisenhower</b>	US President from 1953 to 1961	<b>13. Jim Crow Laws</b>	State and local laws, enacted from 1876-1965, that enforced racial segregation in the Southern USA
<b>10. Rosa Parks</b>	A civil rights activist who became a nationally recognised symbol of strength	<b>14. Ku Klux Klan</b>	Racial supremacy group, based in the South, who used violence against black Americans
<b>11. Thurgood Marshall</b>	A civil rights advocate and later US Supreme Court justice	<b>15. Lynching</b>	Punishing a person without legal process or authority, often with brutality
		<b>16. Non-violent direct action</b>	Rejecting violence in favour of peaceful tactics as a means of gaining political objectives
		<b>17. Sharecroppers</b>	A type of farming in which families rent small plots of land from a landowner in return for a portion of their crop
		<b>18. Supreme court</b>	The highest federal court of the USA

## TOPIC 2: PROTEST, PROGRESS AND RADICALISM 1960-75

Timeline							
1. Greensboro sit-in February 1960	3. Anniston bomb attack May 1961	5. James Meredith case began June 1962	7. Birmingham march August 1963	9. Mississippi murders June 1964	11. Assassination of Malcolm X February 1965	13. Kerner Report published February 1968	15. Protest at the Mexico Olympics October 1968
May 1961 2. First Freedom Ride	April 1962 4. Voter Education Project set up	June 1963 6. Medgar Evers shot	June 1964 8. Freedom Summer	July 1964 10. Civil Rights Act passed	August 1965 12. Voting Rights Act passed	April 1968 14. Assassination of Martin Luther King	
Key people			Key words				
16. James Farmer	Civil rights leader, National Director of CORE and organiser of the 1961 Freedom Rides		20. Communist	Someone who promotes a classless society where power is shared and private ownership is abolished		24. Freedom Schools	Temporary, alternative free schools for black Americans which aimed to encourage them to become more politically active
17. James Meredith	Became the first black American student at the University of Mississippi		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		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
18. John Carlos	Bronze medal winner in the 1968 Olympic Games, who saluted during the medal ceremony to show black unity		22. Federalise	To put under the direct control and authority of a federal government		26. Nation of Islam	They believed in separatism from white society, pride in their heritage and armed self-defence
19. Tommie Smith	Gold medal winner in the 1968 Olympic Games, who saluted during the medal ceremony to show black unity		23. Freedom Riders	Civil rights activists who rode interstate buses into the Southern states in 1961 to challenge segregated bus terminals		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 <b>1954</b>	3. Ho Chi Minh set up the Vietcong to oppose Diem <b>1960</b>	5. Diem overthrown <b>1963</b>	7. Beginning of 'Operation Rolling Thunder' <b>1965</b>	9. Introduction of Vietnamisation <b>1969</b>	11. The bombing of North Vietnam <b>1972</b>
<b>1955</b> 2. Diem elected president of South Vietnam	<b>1962</b> 4. The introduction of the Strategic Hamlet policy	<b>1964</b> 6. The Gulf of Tonkin incident		<b>1968</b> 8. The Tet Offensive and My Lai massacre	<b>1970-71</b> 10. Attacks on Cambodia and Laos

Key people		Key words	
<b>12. General William Westmoreland</b>	United States Army general, who commanded US forces during the Vietnam War from 1964 to 1968	<b>18. Ambush</b>	A surprise attack
<b>13. Ho Chi Minh</b>	Joint founder of the Vietminh and President of North Vietnam from 1954 until his death	<b>19. ARVN</b>	The army of the Republic of South Vietnam
<b>14. John F Kennedy</b>	US President from 1961 until his assassination in 1963	<b>20. Booby trap</b>	A device that is intended to kill, harm or surprise a person
<b>15. Lyndon B Johnson</b>	President Kennedy's vice-president, who succeeded him as President of the USA from 1963 to 1969	<b>21. Ceasefire</b>	A temporary stoppage of a war
<b>16. Ngo Dinh Diem</b>	Leader of South Vietnam from 1955 until his assassination in 1963	<b>22. Cold War</b>	An ideological conflict from 1945 between the USA and the Soviet Union
<b>17. Richard Nixon</b>	US President from 1969 until his resignation in 1974	<b>23. Containment</b>	Prevention of communism spreading to non-communist nations
		<b>24. Guerrilla campaign</b>	Fighting in small groups against conventional forces
		<b>25. Gulf of Tonkin</b>	A body of water located off the coast of Northern Vietnam and southern China
		<b>26. Napalm</b>	A highly flammable sticky jelly used in incendiary bombs
		<b>27. Strategic Hamlet Programme</b>	US attempt to win over the peasants by moving them into new villages in areas under the control of the South Vietnamese army
		<b>28. Vietcong</b>	Communist-led guerrilla army and political movement
		<b>29. Vietminh</b>	A nationalist movement set up in 1941 originally to fight for Vietnamese independence from French rule
		<b>30. Vietnamisation</b>	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

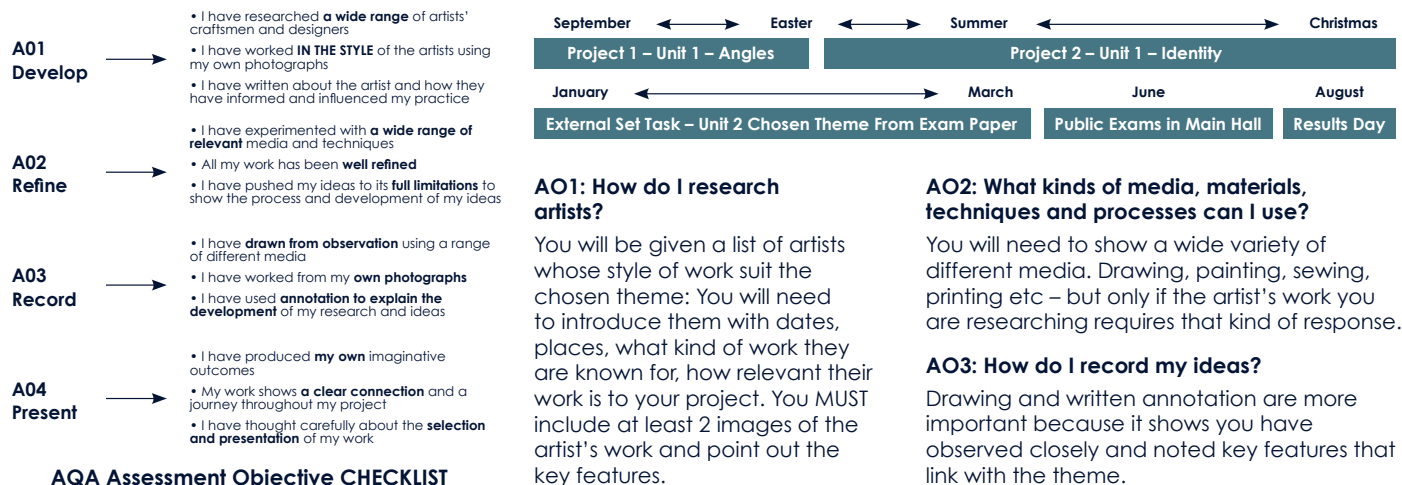
Timeline				
1. Johnson decided not to stand for re-election as President. <b>1968</b>	3. Nixon began secret peace talks with North Vietnam <b>1969</b>	5. Nixon visited China <b>1972</b>	7. Ceasefire was agreed. Paris Peace Agreement was signed <b>January 1973</b>	9. North Vietnamese captured Saigon. A year later, Vietnam was reunited <b>April 1975</b>
<b>1968</b> 2. The My Lai Massacre	<b>1970</b> 4. The Kent State University shootings	<b>1972</b> 6. The October Agreement was reached with North Vietnam	<b>March 1975</b> 8. After breaking the ceasefire in December 1974, the North Vietnamese won a key victory	

Key people		Key words	
<b>10. Henry Kissinger</b>	US National Security Advisor and later Secretary of State	<b>13. Draft</b>	US name for conscription, which made military service compulsory for men over the age of 18
<b>11. Mao Zedong</b>	Founding father of the People's Republic of China from 1949	<b>14. Détente</b>	A period in the 1970s when Cold War relations between the USA and the USSR appeared to be more relaxed
<b>12. Walter Cronkite</b>	Respected TV journalist from CBS News who reported from Vietnam	<b>15. Red Scare</b>	Term used in the USA involving promotion of a widespread fear of Communism
		<b>16. Sovereignty</b>	The authority of a state to govern itself

## 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



## Key words to learn for GCSE art annotation:

<b>SPACE:</b>	positive; negative; open; closed; deep; foreground; composition; position; perspective
<b>COLOUR:</b>	primary; secondary; tertiary; bright; bold; radiant; dull; vivid; contrasting; monochrome; harmonious; analogous; complimentary; tints; tones; warm; cool
<b>SHAPE:</b>	regular; irregular; circle; triangle; square; angular; asymmetrical; bent; bulbous; chunky
<b>FORM:</b>	3D imentional; model; construct; mould;
<b>VALUE:</b>	tone; graduation; dark; light; mid; bright; faded; smooth;
<b>TEXTURE:</b>	smooth; rough; course; bumpy; spiky; silky; broken; serrated;
<b>LINE:</b>	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 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	Fine	Interrupted	Pale
	Small	Grid	Rounded	Cool
			Overlapping	Warm
			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

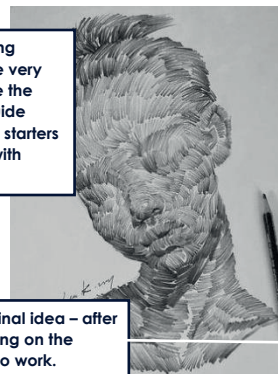
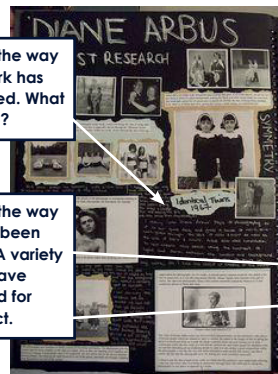
- In this piece I have...
- The materials I have used are...
- The technique I have used is...
- Through working in this way I have learnt how to...
- I have shown... in the style of...
- This piece could develop further by including...
- The artist... has influenced my designs because...
- To develop 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.



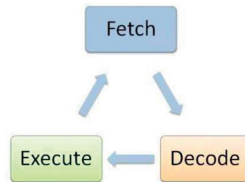
## Systems Architecture

### Key Concepts

- Computer systems take data (input), process it and then output it.
- Embedded systems** are computers built in to other devices like washing machines. They are dedicated to a single task so they are efficient.
- Clock speed:** The number of instructions a processor can carry out per/second. Higher clock speed = faster CPU.
- Number of **Cores:** The more cores a CPU has the more instructions it can carry out at once (multitasking). More cores = faster processing.
- Cache size:** A larger cache gives the CPU faster access to more data.

### Fetch - Decode - Execute Cycle

CPU **fetches** instruction from the RAM (copies memory address to MAR, copies instruction to MDR & adds 1 to PC). CU **decodes** the instruction from the MDR. Instruction is **executed** by the CU. The next instruction is fetched and the cycle repeats.



### Exam Questions

- Explain how cache size, cores and clock speed affect the performance of the CPU.
- Define what is meant by an embedded system.
- What is the purpose of the ALU?
- Explain the role of the CPU registers (MAR and MDR).
- Explain how the fetch decode execute cycle works.

### The Central Processing Unit (CPU)

**Control Unit (CU):** Executes instructions and controls the flow of data in the CPU.

**Program counter:** Holds the memory address for the instruction of each cycle.

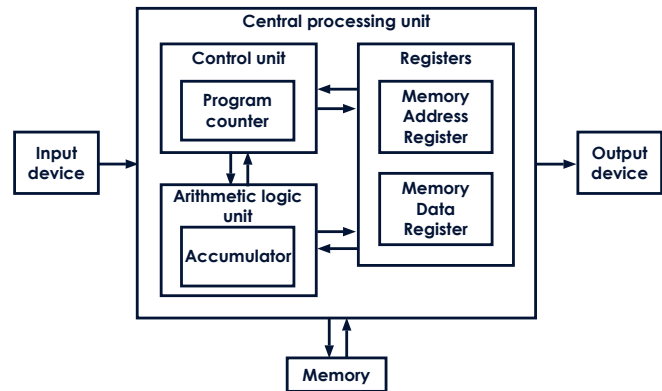
**Arithmetic Logic Unit (ALU):** Does all of the calculations and logic operations.

**Accumulator:** Holds the result of any calculations in the ALU.

**Cache:** Very fast memory that stores regularly used data so that the CPU can access it quickly.

**MAR (Memory Address Register):** Holds the address about to be used by the CPU.

**MDR (Memory Data Register):** Holds the actual data or instruction being processed by the CPU.



## 1.2 Memory and 1.3 Storage

### Random Access Memory (RAM)

- RAM is the computer's main memory that holds the data, programs and files while they are being used.
- RAM is volatile (power off = the data is lost).
- The CPU will fetch instructions from the RAM in the fetch - decode - execute cycle.
- When the RAM is full the computer uses VIRTUAL MEMORY. It uses the secondary storage as temporary RAM so that the computer can continue running (but slowly).

### Read Only Memory (ROM)

- The ROM is on a chip build into the motherboard.
- It contains the BIOS (boot up sequence for the computer).
- ROM is non-volatile (data still stored after power is off).

### Types of Storage

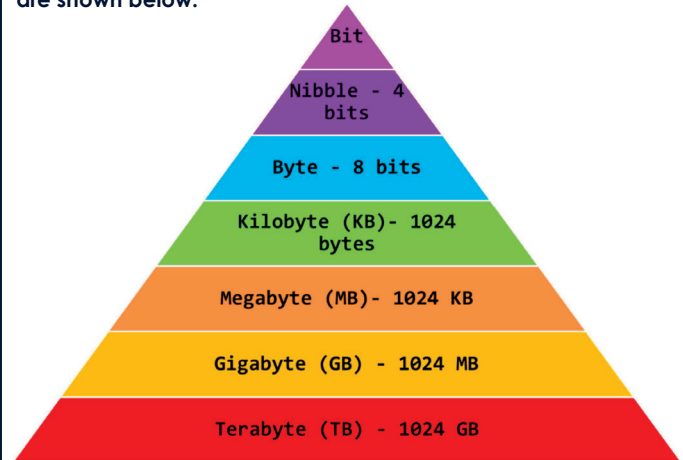
- Secondary Storage: where all data including the programs are stored when they are not being used.

Storage	Key Information
Hard Disk Drive (HDD)	Magnetic, has moving parts, large capacity, lower cost than SSD
Solid State Drive (SSD)	Flash memory, no moving parts, more robust than HDD, faster and more expensive than HDD
Flash memory	e.g. USB memory sticks, memory cards.
Optical Storage	e.g. CDs, DVDs. Cheap, portable and fairly robust.
Magnetic tape	Used for archive storage (backups). Very large capacity, low cost, slow.

Storage device comparison factors: speed, cost, durability, robustness, capacity and portability.

### Storage Capacity

Some storage methods such as a HDD or SSD have a large capacity (they can store lots of data). Other devices such as CDs and SD cards have smaller capacity. Measurements of capacity are shown below:



1000 instead of 1024 could be used when doing your conversion calculations, because you will not be allowed a calculator in your exam.

### Exam Questions

1. Explain how the RAM works with the CPU in the fetch - decode - execute cycle.
2. Explain the difference between volatile and non-volatile memory, giving an example of each.
3. Tom is buying a new laptop, he is not sure whether to get a magnetic HDD or SSD. Discuss the benefits and drawbacks of each.

## 1.4 Wired and Wireless Networks

### Key Terms

A network is where devices have been connected together so that they can share data and resources. Networks can be wired (Ethernet) or wireless (Wi-Fi).

<b>Local Area Network (LAN)</b>	Cover a small geographical area such as an office. Use their own infrastructure.
<b>Wide Area Network (WAN)</b>	WANs connect LANs together over a large geographical area and make use of infrastructure from telecommunications companies.
<b>Bandwidth</b>	The amount of data that can pass between network devices per second.
<b>Server</b>	A device that provides services for other devices (e.g. file server or print server).
<b>Client</b>	A computer or workstation that receives information from a central server.
<b>Peer to peer Network</b>	All of the computers in the network are equal. They connect directly to each other.
<b>Standalone computers</b>	A computer not connected to a network.

### Network Hardware

**Network Interface Controller (NIC):** Built in hardware that allows a device to connect to a network.

**Switches:** Connect devices on a LAN.

**Router:** Transmits the data (packets) between the networks (eg: the internet and your LAN).

**Wireless Access Point (WAP):** A switch that allows devices to connect wirelessly.

**Cables:** The cables in a network can be twisted pair cables, coaxial cables or fibre optic cables.

### Network Performance

These factors can impact on network performance:

**Bandwidth:** The more bandwidth, the more data that can be transferred at a time.

**Number of Users:** Having a lot of people using a network means lots of data is being transmitted which can slow it down.

**Transmission Media:** Wired connections are faster than wireless. Fibre optic cables are faster than copper cables.

**Wireless Factors:** Wireless can be affected by walls distance, signal quality and interference from other devices.

**Topology:** The layout of a network can impact on its performance.

### Virtual Networks

A virtual network is part of a LAN or WAN where only certain devices can "see" and communicate with each other usually connected remotely.

### Exam Questions

1. Give 3 items of hardware needed for a network
2. Explain the difference between a peer-to-peer network and a client server network.
3. The school's network has become very slow. Explain two different reasons why this might be.
4. Evaluate the benefits of using a wired connection rather than a wireless one.



## 1.5 Network Topologies, Protocols and Layers

### Network Topologies

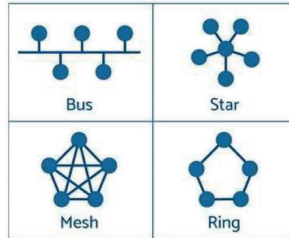
**A topology is the layout of a network.**

**Bus:** Slow network due to data collisions on the single backbone cable.

**Star:** If the central switch fails, the whole network fails. If one device fails, the network is fine.

**Ring:** Data moves in one direction which prevents collisions. Only one device can send data at once.

**Mesh:** Each device is connected to every other device so they can send data the fastest route. There is no single point where network can fail. Require lots of wire.



### Protocols

Protocols are the rules for how devices communicate and transmit data across a network.

Every device has a **MAC address** so that it can be identified on a network. E.g.: 98-IC-B3-09-85-15

**IP addresses** are used when sending data between networks. They can be static (permanent) or dynamic (different each time the device connects).

**TCP/IP:** Used to send data between networks in packets.

**Transmission Control Protocol (TCP):** Splits the data into packets and re-assembles. Checks data is sent correctly.

**Internet Protocol (IP):** Does the packet switching.

**Hyper Text Transfer Protocol (HTTP):** for accessing websites.

**HTTPS:** The secure version of HTTP.

**File Transfer Protocol (FTP):** Moves files between devices.

**Post Office Protocol (POP3):** Retrieves emails from server. Once you download the email the server copy is deleted.

**Internet Message Access Protocol (IMAP):** Retrieves email from server. Email is kept on server, you see a copy.

**Simple Mail Transfer Protocol (SMTP):** Sends emails.

### Layers

Network protocols are divided into layers so that protocols with similar functions are grouped together.

<b>Layer 4: Application</b>	<ul style="list-style-type: none"> <li>• Turn data into applications or websites</li> <li>• HTTP, FTP, SMTP</li> </ul>
<b>Layer 3: Transport</b>	<ul style="list-style-type: none"> <li>• Control the flow of data</li> <li>• TCP</li> </ul>
<b>Layer 2: Network</b>	<ul style="list-style-type: none"> <li>• Direct data packets between networks</li> <li>• IP</li> </ul>
<b>Layer 1: Data Link</b>	<ul style="list-style-type: none"> <li>• Sending data over a physical network</li> <li>• Ethernet</li> </ul>

### Packet Switching

- Data is split into packets and numbered in order.
- Each packet is sent the fastest route across the internet by the routers. This means packets can take different routes and arrive out of order.
- The packet numbers are used to put them in order.
- If packets are missing a timeout message is sent.
- Once all have arrived a receipt confirmation is sent to the device that sent them.

### Exam Questions

1. Explain why protocols are used.
2. Describe how packet switching works.
3. Evaluate the benefits and drawbacks of a mesh.
4. Draw topologies for bus, ring and star networks.
5. Explain the difference between HTTP and HTTPS.
6. Explain the difference between POP3 and IMAP.








## Core knowledge









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

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

## Specialist Material - Tools and Materials

	Image	Name	Use
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.
Timber Conversion		
48	   	<p>Baulk Cut      Through and Through      Tangential Cut      Quarter Cut</p>
Wood Finishes		
49	   	<p>Stains (enhances/changes colour)      Preservatives (Repels water/moisture and insects)      Varnish (clear finish and adds protection)      Oils (enhances the wood's natural oils)</p>

## Material categories

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

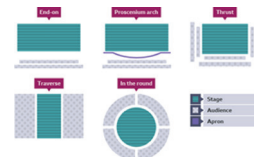
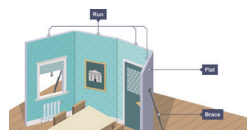
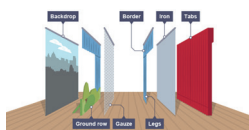
# Blood Brothers by Willy Russell (1982)

## 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. <b>Proxemics</b> - space/distance between actors 2. <b>Semiotics</b> - everything on stage that conveys or symbolises a message or meaning to the audience 3. <b>Social/cultural/historical: the play's context</b> – 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. <b>Props</b> - 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. <b>Character traits/Aspects of character</b> - persona; what the character is like and their background. Status in life. A character might change during the plot 6. <b>Characterisation</b> - 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. <b>Movement</b> - gesture; gait; pace; posture; facial expression; body language; stance; eye contact; quality of movement; level (exaggerated) 8. <b>Voice</b> - pace and rhythm; pause; tone; volume; accent; emphasis; quality; resonance (exaggerated) 9. <b>Set design</b> - 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. <b>Lighting</b> - 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. <b>Costume</b> - period costumes; culture; colour; fabric; style; condition; symbolism; element; item (e.g. shirt; hat; shawl; cane; umbrella); movement 12. <b>Staging</b> - 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. <b>Performance space</b> - thrust; in the round; traverse; proscenium arch; end on; apron; black box; promenade; site specific 14. <b>Sound design</b> - sound effects; diegetic or non-diegetic; live or recorded; sourcing; underscoring; mixing; amplification; direction; pre-set; transitions; volume		
	Key Themes and scenes	15. <b>Theme - Social class</b> 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. <b>Theme - Nurture Vs Nature</b> 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. <b>Theme - Superstition</b> 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
	<b>Key character – Characterisation - examples of movement and voice</b>		
	Working Class Characters:	18. Mrs Johnstone	Working class ( <b>voice</b> - Liverpoolian/scouse working class <b>accent</b> . <b>Posture</b> - hunched shoulders to show that she is downtrodden). At 25 years old she has 7 children; suggests she is a maternal character ( <b>proxemics</b> - always very close to Mickey and Edward, smiling <b>facial expression</b> and soft <b>tone of voice</b> ). Caring, impulsive, makes rash decisions ( <b>voice pace</b> – quick, saying certain lines quickly and sudden <b>movements</b> for example when telling Mrs Lyons in Act 1 to take one of the babies). Generous and values people over money (Open <b>body language/posture</b> and enthusiastic <b>tone of voice</b> ). Uneducated and does not value education. Superstitious. Lively. She is poor and trapped by poverty
		19. Mickey Johnstone	Working Class ( <b>voice</b> - Liverpoolian/scouse working class <b>accent</b> ). Friendly, excitable boy in Act 1. Looks up to his older brother Sammy ( <b>movement</b> - <b>pace</b> fast movements with lots of jumping. <b>Voice</b> - <b>pace</b> 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 ( <b>eye line</b> looking down when Linda says she loves him). <b>Gesture</b> - 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 ( <b>voice</b> - Liverpoolian/scouse working class <b>accent</b> ). 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 ( <b>proxemics</b> - always very close to Mickey, smiling <b>facial expression</b> and soft <b>tone of voice</b> ). 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 ( <b>voice</b> - Liverpoolian/scouse working class <b>accent</b> ). 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

## Blood Brothers by Willy Russell (1982)

Middle Class Characters:	23. Mrs Lyons	Upper/Middle class ( <b>Accent</b> - 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 ( <b>Movement</b> - <b>Pace</b> sudden moves toward Mrs J. Voice – <b>Pitch</b> high and harsh <b>tone</b> )
	24. Edward	Friendly, generous character ( <b>Facial expression</b> – smiling and calm <b>tone</b> ). 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 ( <b>Accent</b> - 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 <b>tone of voice</b> and open <b>body language/posture</b> )
	25. Mr Lyons	Upper/Middle class ( <b>Accent</b> - 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 <b>tone of voice</b> even when talking to his family. <b>Gait</b> 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 ( <b>eye line</b> 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 <b>tone of voice</b> and controlled <b>movement</b> ). 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
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 grow 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

**Drama**  
3 of 3

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	<ol style="list-style-type: none"> <li><b>Context/social/cultural/historical:</b> Date – Place - Issue</li> <li><b>Character traits/Aspects of character</b> - persona; what the character is like and their background; their status in life (remember a character might change during the plot)</li> <li><b>Set design</b> - 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</li> <li><b>Lighting</b> - 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</li> <li><b>Costume</b> - period costumes; cultural costumes; colour; fabric; style; condition; symbolism; element; item (e.g. shirt; hat; shawl; cane; umbrella)</li> <li><b>Staging</b> - 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</li> <li><b>Performance space</b> - thrust; in the round; traverse; end on; proscenium arch; black box; white blank canvas; promenade; site-specific</li> <li><b>Sound design</b> - sound effects; live or recorded; underscoring; direction; transitions; volume</li> </ol>
<b>Performance spaces defined</b>	
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
<b>Key genre/styles and practitioners – your play may be categorised using multiple genre types and various styles</b>	
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
<b>Key areas for devising</b>	
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 <b>Linear</b> - when scenes run in a chronological order from beginning to end. Naturalistic. Builds tension to a natural climax <b>Episodic</b> - 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

## Component 1 - Human Lifespan Development

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

**Coursework title: Understanding how life affects our growth and development**

### Key Questions:

*What are the life stages within the human lifespan? What are the age ranges for each life stage? What is holistic development? How do individuals grow and develop physically, intellectually, emotionally and socially? What factors can positively and negatively impact on growth and development?*

### A1 Growth and development across life stages

A1. Life stages and age ranges	A2. Holistic Development	A21. Physical factors	A22. Economic factors
<ul style="list-style-type: none"> <li><b>Infancy</b> (0 – 2 years)</li> <li><b>Early childhood</b> (3 – 8 years)</li> <li><b>Adolescence</b> (9 – 18 years)</li> <li><b>Early adulthood</b> (19 – 45 years)</li> <li><b>Middle adulthood</b> (46 – 65 years)</li> <li><b>Later adulthood</b> (65+ years)</li> </ul>	<ul style="list-style-type: none"> <li><b>Physical</b> development – Physical growth and physiological change</li> <li><b>Intellectual</b> development – Developing thinking and language skill and common activities that promote learning and development</li> <li><b>Emotional</b> development – Developing feelings about self and other</li> <li><b>Social</b> development – Forming relationships</li> </ul>	<ul style="list-style-type: none"> <li>a) Genetic inheritance</li> <li>b) Diet and lifestyle choices</li> <li>c) Experience of illness and disease</li> <li>d) Appearance</li> </ul>	<ul style="list-style-type: none"> <li>a) Income/ wealth</li> <li>b) Material possessions</li> </ul>
<b>A23. Social, Cultural and emotional factors</b> <ul style="list-style-type: none"> <li>a) Educational experiences</li> <li>b) Culture, e.g. community involvement, religion, gender</li> <li>c) Influence of role models</li> <li>d) Influence of social isolation</li> <li>e) Personal relationship with friends and family</li> </ul>			

### Key Terms

<b>1. Life stages</b>	Distinct phases of life that each person passes through.	<b>2. Characteristics</b>	Distinct phases of life that each person passes through.
<b>3. Growth</b>	The increase in body size such as height and weight.	<b>4. Classification</b>	The grouping of similar things into a category.
<b>5. Development</b>	The gaining of new skills and abilities, such as riding a bike.	<b>6. Gross motor skills</b>	The skills acquired to control and coordinate large muscles – legs, arms and torso.
<b>7. Fine motor skills</b>	The skills acquired to control and coordinate small muscles – fingers, hands and toes.	<b>8. Lifestyle</b>	The choices made that affect health and development such as diet and exercise.
<b>9. Menopause</b>	The ceasing (stopping) of menstruation (periods).	<b>10. Bonding and attachment</b>	The emotional ties an individual forms with others.
<b>11. Contentment</b>	The emotional state when an individual feels happy in their environment and with the way that they are being cared for.	<b>12. Self-esteem</b>	How good or how bad an individual feels about themselves and how much they value their abilities.
<b>13. Low self-esteem</b>	When an individual does not feel good about him/her/oneself for any reason.	<b>14. Genetic inheritance</b>	The genes a person inherits from their parents.
<b>15. Gender role</b>	The role and responsibilities determined by a person's gender.	<b>16. Role model</b>	Someone a person admires and strives to be like.

## Learning Aim B: Investigate how individuals deal with life events

### Coursework title: Coping with Life

#### Key Questions:

What are life events? What are expected and unexpected life events? What are the impacts on individuals physically, intellectually, emotionally, and socially of experiencing a life event? How can support help individuals to cope with the change caused by life events?

#### B1 Different types of life event

##### B1. Physical events

- a) Accident/ injury
- b) Ill health

##### B2. Relationship changes

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

##### B3. 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 and how individuals adapt to these changes

##### B21. Sources of support

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

##### B22. Types of support

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

#### Key Terms

<b>17. Life events</b>	These are expected or unexpected events that can affect development.	<b>18. Expected</b>	The belief that something is likely to happen.
<b>19. Unexpected</b>	Not thought of as likely to happen.	<b>20. Bereavement</b>	The process of coming to terms with the death of someone close.
<b>21. Physical events</b>	Those that make changes to your body, physical health or mobility.	<b>22. Relationship changes</b>	The impact on informal and intimate relationships.
<b>23. Life circumstances</b>	These are the impacts on day-to-day life and the choices you make.	<b>24. Adapt</b>	To adjust to new conditions or circumstances.
<b>25. Respite care</b>	Care that involves temporary care of an individual with ill health to provide relief for their carers (usually parent/s, partners, family members).	<b>26. Professional</b>	Describes a member of a profession who is trained and skilled in their area of work.

## Ensemble Music

A. Genres				
1.	<b>Chamber Music</b>	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
		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.	<b>Musical Theatre</b>	1. Libretto 2. Lyrics 3. Through-composed 4. 32-bar song form 5. Word-painting 6. Ballad 7. 'Ensemble' numbers/choruses 8. Opening numbers/finales 9. Recitative		
3.	<b>Jazz and Blues</b>	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.	<b>Monophonic</b>	Single melodic line for an instrumental or vocal soloist, with no accompaniment, or when parts are in unison	9.	<b>Layered</b> When more parts are added (layered) on top of each other, producing a richer texture
5.	<b>Homophonic</b>	One main melody is heard with a harmonic accompaniment of chords (or perhaps broken chords)	10.	<b>Melody and Accompaniment</b> When the tune is the main focus of interest and is accompanied by another part
6.	<b>Polyphonic</b>	A number of melodic lines heard independently of each other. Imitation and counterpoint are devices used in this texture	11.	<b>Canon</b> Device where the melody is repeated exactly in another part while the initial melody continues
7.	<b>Unison</b>	When two or more musical parts sound the same pitches at the same time	12.	<b>Round</b> Type of canon where different voices sing exactly the same melody, beginning at different times
8.	<b>Chordal</b>	When the parts move together producing a series or progression of chords	13.	<b>Counter melody</b> A new melody that is played at the same time as a previous melody


C. Ensembles				
14.	<b>Basso Continuo</b>	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.	<b>Sonatas</b>	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.	<b>String Quartet</b>	Violin 1, Violin 2, Viola, Cello	1. Varied musical textures used 2. Joseph Haydn	
17.	<b>Jazz/Blues trio</b>	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.	<b>Rhythm Section</b>	Drum Kit, Piano and/or guitar, Double Bass		
19.	<b>Vocal Ensembles</b>	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	



## A. Terminology

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

## B. Tempo, Rhythm & Metre

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

## C. Tonality

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

## D. Dynamics

30.	<b>Piano</b>	Quiet
31.	<b>Forte</b>	Loud
32.	<b>Crescendo</b>	Getting louder
33.	<b>Diminuendo</b>	Getting quieter

## E. Instrumentation

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

## F. Harmony

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

## Musical Forms and Devices

### A. The Western Classical Tradition

1.	<b>The Baroque Era</b>	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.	<b>The Classical Era</b>	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.	<b>The Romantic Era</b>	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.	<b>Binary</b>	A, B	Two contrasting sections: both are usually repeated	Bach: March in D major
5.	<b>Ternary</b>	Ternary	Three sections: the outer two are the same, the middle one contrasts	Mozart: Lacrymosa
6.	<b>Rondo</b>	A, B, A, C, A	The opening section keeps returning, with contrasting sections in between	Purcell: Rondaue
7.	<b>Variation</b>	I, V1, V2, V3	A theme is followed by sections in which it is developed in imaginative ways	Mozart: Ah, vous dirai-je, Maman'
8.	<b>Strophic</b>	A, A, A	Same music repeated in every section	Brahms: 'Weigenlied'
9.	<b>Minuet and Trio</b>	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.	<b>Repetition</b>	The exact repeat of a musical idea or phrase, without variation	19.	<b>Pedal</b>	A held or repeated note against which changing harmonies are heard
11.	<b>Contrast</b>	A change in the musical content. Often achieved through dynamics, key, tempo or instruments	20.	<b>Canon</b>	When a melody is repeated in another part while the initial melody is still being played
12.	<b>Anacrusis</b>	A note or notes which are played before the first strong beat	21.	<b>Conjunct</b>	When the melody moves by steps (next-door notes)
13.	<b>Imitation</b>	When a musical idea is copied in another part. This can be used in polyphony	22.	<b>Disjunct</b>	When the melody leaps between notes that are not next to each other
14.	<b>Sequence</b>	The repetition of a melodic phrase, but at a higher or lower pitch	23.	<b>Broken Chord/Arpeggio</b>	When the notes of a chord are separated and played in succession, either up or down
15.	<b>Ostinato</b>	A musical pattern which is repeated many times. Known as a riff in modern music	24.	<b>Alberti bass</b>	A type of broken chord accompaniment, which was common in the Classical period
16.	<b>Syncopation</b>	Same as 'off beat'. When accented notes are played on the weaker beats of the bar	25.	<b>Motifs</b>	A short melodic or rhythmic idea that has a distinctive character
17.	<b>Dotted rhythms</b>	A dot after a note increases its value by half again. This gives a 'jagged' effect to the rhythm	26.	<b>Chord Progressions</b>	A series of chords related to each other in a particular key
18.	<b>Drone</b>	A repeated note or notes held throughout a passage of music	27.	<b>Modulation</b>	The process of changing key
			28.	<b>Regular phrases</b>	The balanced parts of a melody

## A. Structure

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

## B. Melody

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

## C. Instrumentation

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

## D. Techniques

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

## E. Harmony

36.	<b>Notes of the triad</b>	Root, Third, Fifth
37.	<b>Primary Chords</b>	Tonic, Subdominant, Dominant. Sometimes these are written in Roman Numerals (I, IV, V)
38.	<b>Secondary Chords</b>	Chords borrowed from another key
39.	<b>Chord Progression</b>	The order of chords in a song, changes for different sections
40.	<b>Cadences</b>	Perfect (V-I), Plagal (IV-I), Imperfect (2-V), Interrupted (V-2)
41.	<b>Harmonic Rhythm</b>	The rate at which the chords change in a song

## F. Tempo, Rhythm & Metre

42.	<b>Syncopation</b>	The off-beats are emphasized
43.	<b>Driving rhythms</b>	Rhythms which drive the music forward

## G. Genres

44.	<b>Pop</b>	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.	<b>Rock</b>	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.	<b>Fusion</b>	When musical styles are combined together to make something new
47.	<b>Bhangra</b>	A fusion of Indian and Western music, combined to make a new style

## PE Part 1

1A	<b>What is a joint?</b> <ul style="list-style-type: none"><li>A place where two or more bones meet</li></ul>	1N	<b>Define dorsi flexion.</b> <ul style="list-style-type: none"><li>Movement where the toes are pointed up towards the knee</li></ul>
1B	<b>What is cartilage?</b> <ul style="list-style-type: none"><li>Tissue which covers the end of bones providing a smooth, friction-free surface</li></ul>	2A	<b>What are alveoli?</b> <ul style="list-style-type: none"><li>Tiny air sacs in the lungs which allow for rapid gaseous exchange</li></ul>
1C	<b>What is a synovial fluid?</b> <ul style="list-style-type: none"><li>A substance produced by the synovial membrane to lubricate the joint</li></ul>	2B	<b>Define tidal volume.</b> <ul style="list-style-type: none"><li>The volume of air breathed in (or out) during a normal breath at rest</li></ul>
1D	<b>What are ligaments?</b> <ul style="list-style-type: none"><li>Attaches bone to bone</li></ul>	2C	<b>Define expiratory reserve volume.</b> <ul style="list-style-type: none"><li>The volume of air which can be exhaled after normal tidal expiration</li></ul>
1E	<b>What are tendons?</b> <ul style="list-style-type: none"><li>Attaches muscle to bone</li></ul>	2D	<b>Define inspiratory reserve volume.</b> <ul style="list-style-type: none"><li>The volume of air which can be inhaled after normal tidal inspiration</li></ul>
1F	<b>What are bursae?</b> <ul style="list-style-type: none"><li>Fluid-filled bag which helps to reduce friction at a joint</li></ul>	2E	<b>Define residual volume.</b> <ul style="list-style-type: none"><li>The volume of air that remains in the lungs after maximal expiration</li></ul>
1G	<b>Define flexion.</b> <ul style="list-style-type: none"><li>A decrease in the angle at a joint</li></ul>	2F	<b>Define vasoconstriction.</b> <ul style="list-style-type: none"><li>A tightening of the blood vessels</li></ul>
1H	<b>Define extension.</b> <ul style="list-style-type: none"><li>An increase in the angle at a joint</li></ul>	2G	<b>Define vasodilation.</b> <ul style="list-style-type: none"><li>A widening of the blood vessels</li></ul>
1I	<b>Define abduction.</b> <ul style="list-style-type: none"><li>Movement away from the midline of the body</li></ul>	2H	<b>What are the two phases of the cardiac cycle?</b> <ul style="list-style-type: none"><li>Diastole and systole</li></ul>
1J	<b>Define adduction.</b> <ul style="list-style-type: none"><li>Movement towards the midline of the body</li></ul>	2I	<b>Define diastole.</b> <ul style="list-style-type: none"><li>Where cardiac muscle relaxes allowing the heart to fill with blood</li></ul>
1K	<b>Define rotation.</b> <ul style="list-style-type: none"><li>Turning the limb along its long axis</li></ul>	2J	<b>What are veins?</b> <ul style="list-style-type: none"><li>Blood vessels which transport blood towards the heart</li></ul>
1L	<b>Define circumduction.</b> <ul style="list-style-type: none"><li>Movement in a circular motion</li></ul>	2K	<b>What are arteries?</b> <ul style="list-style-type: none"><li>Blood vessels which transport blood away from the heart</li></ul>
1M	<b>Define plantar flexion.</b> <ul style="list-style-type: none"><li>Movement where the toes are pointed down towards the ground</li></ul>	2L	<b>What are capillaries?</b> <ul style="list-style-type: none"><li>Tiny blood vessels which allow gaseous exchange to occur</li></ul>

## PE Part 1

3A	<b>Define aerobic.</b> <ul style="list-style-type: none"><li>In the presence of oxygen</li></ul>
3B	<b>Define anaerobic.</b> <ul style="list-style-type: none"><li>In the absence of oxygen</li></ul>
3C	<b>What is lactic acid?</b> <ul style="list-style-type: none"><li>Waste product produced during anaerobic exercise</li></ul>
3D	<b>Define oxygen debt.</b> <ul style="list-style-type: none"><li>Temporary shortage of oxygen in the body due to strenuous exercise</li></ul>
3E	<b>Define EPOC.</b> <ul style="list-style-type: none"><li>Excess Post Exercise Oxygen Consumption</li></ul>
3F	<b>Define DOMS.</b> <ul style="list-style-type: none"><li>Delayed Onset of Muscle Soreness</li></ul>
3G	<b>Define hypertrophy.</b> <ul style="list-style-type: none"><li>Increased size of muscles/heart due to long-term exercise</li></ul>
3H	<b>Define bradycardia.</b> <ul style="list-style-type: none"><li>Lowered resting heart rate due to long-term exercise</li></ul>
3I	<b>What is a cool down?</b> <ul style="list-style-type: none"><li>Recovery method involving light aerobic work and a sequence of stretches</li></ul>
3J	<b>What is an ice bath?</b> <ul style="list-style-type: none"><li>Recovery method where the body is immersed in cold water to speed up recovery</li></ul>
3K	<b>What is a sports massage?</b> <ul style="list-style-type: none"><li>Recovery method where pressure is applied through rubbing and kneading to areas of tension</li></ul>
3L	<b>What is an adapted diet?</b> <ul style="list-style-type: none"><li>Recovery method where additional nutrients and fluids are taken on to support recovery</li></ul>

4A	<b>Summarise the arrangement of lever systems</b> <ul style="list-style-type: none"><li>1, 2, 3 – F, R, E</li></ul>
4B	<b>Identify where a 1st class lever can be found.</b> <ul style="list-style-type: none"><li>Elbow and head/neck</li></ul>
4C	<b>Identify where a 2nd class lever can be found.</b> <ul style="list-style-type: none"><li>Ankle</li></ul>
4D	<b>Identify where a 3rd class lever can be found.</b> <ul style="list-style-type: none"><li>Elbow (movement below head height)</li></ul>
4E	<b>Define mechanical advantage.</b> <ul style="list-style-type: none"><li>The benefit of a lever system</li></ul>
4F	<b>How is mechanical advantage calculated?</b> <ul style="list-style-type: none"><li>Effort arm ÷ resistance arm</li></ul>
4G	<b>Summarise the combination of planes and axes.</b> <ul style="list-style-type: none"><li>S-T / F-S / T-L</li></ul>
4H	<b>Which plane and axis are involved in forwards/backwards movement?</b> <ul style="list-style-type: none"><li>Sagittal plane, transverse axis</li></ul>
4I	<b>Which plane and axis are involved in sideways movement?</b> <ul style="list-style-type: none"><li>Frontal plane, sagittal axis</li></ul>
4J	<b>Which plane and axis are involved in rotational movement?</b> <ul style="list-style-type: none"><li>Transverse plane, longitudinal axis</li></ul>
4K	<b>Define isotonic.</b> <ul style="list-style-type: none"><li>Contraction involving change in muscle length causing movement</li></ul>
4L	<b>Define isometric.</b> <ul style="list-style-type: none"><li>Contraction involving no change in muscle length causing no movement</li></ul>
4M	<b>Identify the two types of isotonic contraction.</b> <ul style="list-style-type: none"><li>Concentric (shortening) and eccentric (lengthening)</li></ul>

## PE Part 2

5A	<b>Define health.</b> <ul style="list-style-type: none"><li>A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity</li></ul>
5B	<b>Define fitness.</b> <ul style="list-style-type: none"><li>The ability to meet/cope with the demands of the environment</li></ul>
5C	<b>Define agility.</b> <ul style="list-style-type: none"><li>The ability to move and change direction quickly whilst maintaining control</li></ul>
5D	<b>Define balance.</b> <ul style="list-style-type: none"><li>Maintaining the centre of mass over a base of support</li></ul>
5E	<b>Define cardiovascular endurance.</b> <ul style="list-style-type: none"><li>The ability of the heart and lungs to supply oxygen to the working muscles</li></ul>
5F	<b>Define coordination.</b> <ul style="list-style-type: none"><li>The ability to use two or more parts of the body together smoothly and efficiently</li></ul>
5G	<b>Define flexibility.</b> <ul style="list-style-type: none"><li>The range of movement possible at a joint</li></ul>
5H	<b>Define muscular endurance.</b> <ul style="list-style-type: none"><li>The ability of a muscle or muscle group to repeat contractions without fatigue</li></ul>
5I	<b>Define power.</b> <ul style="list-style-type: none"><li>Strength x speed</li></ul>
5J	<b>Define reaction time.</b> <ul style="list-style-type: none"><li>The time taken to initiate response to a stimulus</li></ul>
5K	<b>Define speed.</b> <ul style="list-style-type: none"><li>The maximum rate at which you can perform a movement or cover a distance</li></ul>
5L	<b>Define maximal strength.</b> <ul style="list-style-type: none"><li>The largest force possible in a single contraction</li></ul>

5M	<b>Define static strength.</b> <ul style="list-style-type: none"><li>The maximum force applied to an immovable object</li></ul>
6A	<b>Identify the test for agility.</b> <ul style="list-style-type: none"><li>Illinois agility test</li></ul>
6B	<b>Identify the test for balance.</b> <ul style="list-style-type: none"><li>Stork stand test</li></ul>
6C	<b>Identify the test for cardiovascular endurance.</b> <ul style="list-style-type: none"><li>Multi-stage fitness test</li></ul>
6D	<b>Identify the test for coordination.</b> <ul style="list-style-type: none"><li>Wall toss test</li></ul>
6E	<b>Identify the test for flexibility.</b> <ul style="list-style-type: none"><li>Sit and reach test</li></ul>
6F	<b>Identify the test for muscular endurance.</b> <ul style="list-style-type: none"><li>Sit-up bleep test</li></ul>
6G	<b>Identify the test for power.</b> <ul style="list-style-type: none"><li>Vertical jump test</li></ul>
6H	<b>Identify the test for reaction time.</b> <ul style="list-style-type: none"><li>Ruler drop test</li></ul>
6I	<b>Identify the test for maximal strength.</b> <ul style="list-style-type: none"><li>1 rep max test</li></ul>
6J	<b>Identify the test for speed.</b> <ul style="list-style-type: none"><li>30m sprint test</li></ul>
6K	<b>Identify three reasons for completing fitness testing.</b> <ul style="list-style-type: none"><li>Identify strengths and weaknesses</li><li>Inform training requirements</li><li>Set goals</li><li>Monitor improvement</li></ul>
6L	<b>Identify three limitations of fitness testing.</b> <ul style="list-style-type: none"><li>Tests are not sport specific</li><li>Tests do not replicate competitive conditions</li><li>Test results lack reliability</li><li>Tests may be invalid</li></ul>

## PE Part 2

6M	<b>What is quantitative data?</b> <ul style="list-style-type: none"> <li>Measurement based on facts/statistics</li> </ul>	8F	<b>Identify two disadvantages of continuous training.</b> <ul style="list-style-type: none"> <li>It can be tedious/boring</li> <li>It can be time-consuming</li> </ul>
6N	<b>What is qualitative data?</b> <ul style="list-style-type: none"> <li>Measurement based on opinion</li> </ul>	8G	<b>What is fartlek training?</b> <ul style="list-style-type: none"> <li>Training which involves repeated changes to intensity and terrain</li> <li>Also known as 'speed-play'</li> <li>Used to improve cardiovascular endurance</li> </ul>
7A	<b>What are the five principles of training?</b> <ul style="list-style-type: none"> <li>Specificity</li> <li>Progression</li> <li>Overload</li> <li>Reversibility</li> <li>Tedium</li> </ul>	8H	<b>Identify two advantages of fartlek training.</b> <ul style="list-style-type: none"> <li>Replicates changing intensity of games</li> <li>More interesting than continuous training</li> </ul>
7B	<b>What are the four principles of overload?</b> <ul style="list-style-type: none"> <li>Frequency</li> <li>Intensity</li> <li>Time</li> <li>Type</li> </ul>	8I	<b>Identify two disadvantages of fartlek training.</b> <ul style="list-style-type: none"> <li>Difficult to gauge work/rest ratio at the start</li> <li>Complex to make required adjustments</li> </ul>
8A	<b>What is circuit training?</b> <ul style="list-style-type: none"> <li>A series of exercises performed one after the other with a rest in between</li> <li>Used to improve muscular endurance</li> </ul>	8J	<b>What is interval training?</b> <ul style="list-style-type: none"> <li>Training which involves periods of work and rest</li> <li>Used to improve speed</li> </ul>
8B	<b>Identify two advantages of circuit training.</b> <ul style="list-style-type: none"> <li>Exercises chosen can be simple or complex</li> <li>Easily adjusted to suit ability</li> </ul>	8K	<b>What is HIIT?</b> <ul style="list-style-type: none"> <li>High Intensity Interval Training</li> </ul>
8C	<b>Identify two disadvantages of circuit training.</b> <ul style="list-style-type: none"> <li>May require specialist equipment</li> <li>Difficult to gauge work/rest ratio at the start</li> </ul>	8L	<b>Identify two advantages of interval training.</b> <ul style="list-style-type: none"> <li>Burns body fat quickly</li> <li>Can be completed quickly</li> </ul>
8D	<b>What is continuous training?</b> <ul style="list-style-type: none"> <li>Exercise for an extended period of time without rest</li> <li>Also known as 'steady state' training</li> <li>Used to improve cardiovascular endurance</li> </ul>	8M	<b>Identify two disadvantages of interval training.</b> <ul style="list-style-type: none"> <li>Requires high level of motivation</li> <li>Extreme work can lead to injury</li> </ul>
8E	<b>Identify two advantages of continuous training.</b> <ul style="list-style-type: none"> <li>No equipment required</li> <li>Can be completed anywhere</li> </ul>	8N	<b>What is plyometric training?</b> <ul style="list-style-type: none"> <li>Training which involves explosive movements such as jumping, hopping and bounding</li> <li>Used to improve power</li> </ul>
		8O	<b>Identify two advantages of plyometric training.</b> <ul style="list-style-type: none"> <li>Develops explosive movement</li> <li>Adds variety and 'fun' to training</li> </ul>

## PE Part 2

8P	<b>Identify two disadvantages of plyometric training.</b>	<ul style="list-style-type: none"> <li>Requires knowledge of safe techniques</li> <li>Requires expensive equipment</li> </ul>	9A	<b>Identify three safety principles to follow during fitness training.</b>	<ul style="list-style-type: none"> <li>Complete suitable warm-up and cool-down</li> <li>Wear suitable clothing/footwear</li> <li>Maintain hydration levels</li> <li>Use correct techniques</li> </ul>
8Q	<b>What is weight training?</b>	<ul style="list-style-type: none"> <li>Training which involves using free weights or resistance machines</li> <li>Used to improve strength, power and muscular endurance</li> </ul>	9B	<b>Identify the three training seasons.</b>	<ul style="list-style-type: none"> <li>Pre-season (preparation)</li> <li>Peak-season (competition)</li> <li>Post-season (transition)</li> </ul>
8R	<b>Identify two advantages of weight training.</b>	<ul style="list-style-type: none"> <li>Used to improve different fitness components</li> <li>Can be used to recover from injury</li> </ul>	9C	<b>Identify the key purpose of pre-season.</b>	<ul style="list-style-type: none"> <li>Improve general/aerobic fitness</li> </ul>
8S	<b>Identify two disadvantages of weight training.</b>	<ul style="list-style-type: none"> <li>Requires knowledge of safe techniques</li> <li>Requires expensive equipment</li> </ul>	9D	<b>Identify the key purpose of peak-season.</b>	<ul style="list-style-type: none"> <li>Maintain fitness levels</li> </ul>
8T	<b>Identify key features of muscular endurance training.</b>	<ul style="list-style-type: none"> <li>Lifting &gt;70% of 1 rep max</li> <li>Approx. 3 sets of 4-8 reps</li> </ul>	9E	<b>Identify the key purpose of post-season.</b>	<ul style="list-style-type: none"> <li>Rest and recovery</li> </ul>
8U	<b>Identify key features of muscular endurance training.</b>	<ul style="list-style-type: none"> <li>Lifting &lt;70% of 1 rep max</li> <li>Approx. 3 sets of 12-15 reps</li> </ul>	9F	<b>Identify key parts of a warm-up.</b>	<ul style="list-style-type: none"> <li>Gradual pulse raiser</li> <li>Stretches</li> <li>Skill based activity</li> <li>Mental preparation</li> </ul>
8V	<b>What is static stretching?</b>	<ul style="list-style-type: none"> <li>Stretching to the limit and holding the stretch isometrically</li> <li>Used to improve flexibility</li> </ul>	9G	<b>Identify three benefits of a warm-up.</b>	<ul style="list-style-type: none"> <li>Increased body temperature</li> <li>Increased range of movement</li> <li>Psychological preparation</li> <li>Reduce risk of injury</li> </ul>
8W	<b>Identify two advantages of static stretching.</b>	<ul style="list-style-type: none"> <li>Relatively safe</li> <li>Can be completed by anyone</li> </ul>	9H	<b>Identify key parts of a cool-down.</b>	<ul style="list-style-type: none"> <li>Light aerobic exercise</li> <li>Stretches</li> </ul>
8X	<b>Identify two disadvantages of static stretching.</b>	<ul style="list-style-type: none"> <li>Can be time consuming to stretch whole body</li> <li>Over stretching can cause injury</li> </ul>	9I	<b>Identify three benefits of a cool-down.</b>	<ul style="list-style-type: none"> <li>Maintain elevated heart rate/breathing rate</li> <li>Removal of lactic acid</li> <li>Prevents DOMS</li> </ul>
8Y	<b>What is altitude training?</b>	<ul style="list-style-type: none"> <li>Training high above sea level (&gt;2,000m)</li> <li>Used to improve cardiovascular endurance</li> </ul>			



## Cambridge National Sports Studies

1A	<b>Identify three user groups who may participate in sport.</b> <ul style="list-style-type: none"> <li>• Ethnic minorities</li> <li>• Retired people/over 50s</li> <li>• Single parents</li> <li>• Children/teenagers</li> <li>• Disabled</li> <li>• Unemployed</li> </ul>	1E	<b>Identify three sports which are increasing in popularity in the UK.</b> <ul style="list-style-type: none"> <li>• Walking</li> <li>• Yoga</li> <li>• Zumba</li> <li>• Fitness training</li> <li>• Football</li> </ul>
1B	<b>Identify three barriers to participation in sport.</b> <ul style="list-style-type: none"> <li>• Lack of time</li> <li>• Family commitments</li> <li>• Lack of disposable income</li> <li>• Lack of suitable facilities/equipment</li> <li>• Lack of role models</li> <li>• Limited provision of suitable activities</li> <li>• Lack of awareness</li> <li>• Impact of stereotypes</li> </ul>	1F	<b>Identify two sports which are becoming less popular in the UK.</b> <ul style="list-style-type: none"> <li>• Swimming</li> <li>• Cycling</li> </ul>
1C	<b>Identify three solutions to barriers to participation in sport.</b> <ul style="list-style-type: none"> <li>• Improved promotion/range of activities</li> <li>• Initiatives to target key groups</li> <li>• Improved access (e.g. ramps and lifts)</li> <li>• Using alternative equipment</li> <li>• Reduction on costs</li> <li>• Specialist coaching</li> <li>• Use of role models</li> </ul>	1G	<b>Identify three new/emerging sports in the UK.</b> <ul style="list-style-type: none"> <li>• Ultimate Frisbee</li> <li>• Footgolf</li> <li>• Triathlon</li> <li>• American Football</li> <li>• Lacrosse</li> <li>• Korfball</li> <li>• Handball</li> </ul>
1D	<b>Identify three factors which can influence the popularity of sport in the UK.</b> <ul style="list-style-type: none"> <li>• Level of participation</li> <li>• Provision</li> <li>• Media coverage</li> <li>• Level of success for both teams and individuals</li> <li>• Role models</li> <li>• Acceptability</li> </ul>	2A	<b>Identify three different values which can be promoted through sport.</b> <ul style="list-style-type: none"> <li>• Team spirit</li> <li>• Fair play</li> <li>• Citizenship</li> <li>• Tolerance and respect</li> <li>• Inclusion</li> <li>• National pride</li> <li>• Excellence</li> </ul>
		2B	<b>Identify three key elements of the Olympic and Paralympic movement</b> <ul style="list-style-type: none"> <li>• The creed</li> <li>• The symbol</li> <li>• The Olympic and Paralympic values</li> </ul>

## Cambridge National Sports Studies

2C	<b>Identify three of the Olympic/Paralympic values.</b>
	<ul style="list-style-type: none"> <li>• Respect</li> <li>• Excellence</li> <li>• Friendship</li> <li>• Courage</li> <li>• Determination</li> <li>• Inspiration</li> <li>• Equality</li> </ul>
2D	<b>Identify three initiatives which promote values through sport.</b>
	<ul style="list-style-type: none"> <li>• FIFA's 'Football for Hope' campaign</li> <li>• ECB's 'Chance to Shine' programme</li> <li>• Sport Relief</li> </ul>
2E	<b>Identify three reasons why it is important for sports performers to demonstrate good behaviour.</b>
	<ul style="list-style-type: none"> <li>• To ensure the game is played fairly</li> <li>• To promote the values of the sport</li> <li>• To ensure the safety of participants</li> <li>• To demonstrate good sportsmanship</li> <li>• To avoid gamesmanship (e.g. time wasting)</li> </ul>
2F	<b>Identify three reasons why it is important for spectators to demonstrate good behaviour.</b>
	<ul style="list-style-type: none"> <li>• To ensure suitable playing atmosphere</li> <li>• To help combat social issues (e.g. racism)</li> </ul>
2G	<b>What are PEDs?</b>
	<ul style="list-style-type: none"> <li>• Performance Enhancing Drugs</li> </ul>
2H	<b>Identify two reasons why athletes may use PEDs.</b>
	<ul style="list-style-type: none"> <li>• Pressure to succeed as an individual</li> <li>• Pressure to succeed as a nation</li> </ul>
2I	<b>Identify three reasons why athletes should not use PEDs.</b>
	<ul style="list-style-type: none"> <li>• Long term ill health</li> <li>• Consequences when found guilty</li> <li>• Unfair advantage</li> </ul>
2J	<b>Identify the full name for the group known as 'WADA'.</b>
	<ul style="list-style-type: none"> <li>• World Anti-Doping Agency</li> </ul>
2K	<b>What is the 'whereabouts rule'?</b>
	<ul style="list-style-type: none"> <li>• Athletes are required to select one hour per day, seven days a week to be available for no-notice drugs tests</li> </ul>
2L	<b>Identify three different testing methods used by WADA.</b>
	<ul style="list-style-type: none"> <li>• Blood sample collection</li> <li>• Urine sample collection</li> <li>• Hair sample collection</li> <li>• Nail sample collection</li> </ul>
2M	<b>Identify the main sanction used by WADA.</b>
	<ul style="list-style-type: none"> <li>• Sanctions</li> </ul>
2N	<b>Identify three examples of elite performers who have used performance enhancing drugs.</b>
	<ul style="list-style-type: none"> <li>• Dwain Chambers</li> <li>• Lance Armstrong</li> <li>• Marion Jones</li> <li>• Ben Johnson</li> </ul>
2O	<b>Identify one impact drug taking can have on the reputation of sport.</b>
	<ul style="list-style-type: none"> <li>• Mistrust of results/events due to repeated scandals</li> </ul>
3A	<b>Identify three different features of major sporting events.</b>
	<ul style="list-style-type: none"> <li>• The regularity</li> <li>• Range of countries involved</li> <li>• Level of investment</li> </ul>
3B	<b>Identify an example of a 'one off' event.</b>
	<ul style="list-style-type: none"> <li>• The Olympics</li> </ul>
3C	<b>Identify an example of a 'regular' event.</b>
	<ul style="list-style-type: none"> <li>• The Champions League final</li> </ul>
3D	<b>Identify an example of a 'regular and recurring' event.</b>
	<ul style="list-style-type: none"> <li>• The World Tennis Finals</li> </ul>

## Cambridge National Sports Studies

3E	<b>Identify the three key areas related to the legacy of a major sporting event.</b> <ul style="list-style-type: none"> <li>• Sporting</li> <li>• Social</li> <li>• Economic</li> </ul>	4D	<b>Identify three ways NGBs develop their sport.</b> <ul style="list-style-type: none"> <li>• Elite training and development</li> <li>• Coaching awards</li> <li>• Training of officials</li> </ul>
3F	<b>Identify three potential benefits of hosting major sporting events.</b> <ul style="list-style-type: none"> <li>• Increased tourism</li> <li>• Commercial benefits</li> <li>• Increased participation in some sports</li> <li>• Improved infrastructure/facilities</li> <li>• Increased status of the country</li> <li>• Improved morale of the country</li> </ul>	4E	<b>Identify three ways NGBs improve infrastructure in their sport.</b> <ul style="list-style-type: none"> <li>• Organise competitions and tournaments</li> <li>• Organise rule-making and disciplinary procedures</li> <li>• Providing a national directive and vision</li> <li>• Providing guidance, support and insurance</li> <li>• Assist with facility developments</li> </ul>
3G	<b>Identify three potential drawbacks of hosting major sporting events.</b> <ul style="list-style-type: none"> <li>• Expensive to bid for/host the event</li> <li>• Facilities may not be used after the event</li> <li>• Poor reputation if event is disorganised</li> <li>• Financial benefits may not be spread evenly across the country</li> </ul>	4F	<b>Identify three ways NGBs organise policies and initiatives in their sport.</b> <ul style="list-style-type: none"> <li>• Organise anti-doping policies</li> <li>• Promoting etiquette and fair play</li> <li>• Community programmes</li> <li>• Provide information and guidance on safeguarding</li> </ul>
4A	<b>What is an NGB?</b> <ul style="list-style-type: none"> <li>• National Governing Body</li> </ul>		
4B	<b>Identify three different areas of focus for NGBs.</b> <ul style="list-style-type: none"> <li>• Promotion</li> <li>• Development</li> <li>• Infrastructure</li> <li>• Policies and initiatives</li> <li>• Funding</li> <li>• Support</li> </ul>	4G	<b>Identify three ways NGBs distribute funding in their sport.</b> <ul style="list-style-type: none"> <li>• Grants</li> <li>• Government initiatives</li> <li>• Lottery funding</li> <li>• Private investment and donations</li> <li>• Merchandising Fund raising events</li> </ul>
4C	<b>Identify three ways NGBs promote their sport.</b> <ul style="list-style-type: none"> <li>• Promoting participation</li> <li>• Increasing the popularity of the sport</li> <li>• Exposure in the media</li> </ul>	4H	<b>Identify two ways NGBs offer support in their sport.</b> <ul style="list-style-type: none"> <li>• Providing technical advice</li> <li>• Providing location/contact details for local club</li> </ul>

## 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

### 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

### 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.

## Christianity beliefs and teachings (Unit 2)

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8. The Ascension
9. Life after death
10. Heaven and Hell
11. Sin and Salvation

12. Jesus and Salvation
13. Atonement

### 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)

### 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

### 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 resurrection 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**

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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.



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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, purify 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)

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### 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 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.

### 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**

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### 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 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, 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 Gods and spoke to prophets such as 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**

## Islam beliefs and teachings (Unit 1)

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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).

#### 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.

#### 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.

#### 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.

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### 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 **Twelver's** 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**



## Religion and Life

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**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**

### 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 Hadiith, 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'. Hadiith.**

### 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.

## Religion and Life

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**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**

### 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 carefully 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

### 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**

### 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 created 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 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**

## Religion and Life

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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 chose 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**

## Religion and Life

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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**

## Religion and Life

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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:

- ✓ 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.

### 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 56:42-4

## Business - Unit 3.1 Business in the real world

### 3.1.1 The purpose and nature of businesses

	Key concepts	Key words	Test yourself:
1.	The purpose of business	<b>Goods, service, customer, consumer</b>	a. What are the reasons for starting a business? b. What is the difference between a good and a service? c. Outline the characteristics of an entrepreneur. d. Outline the objectives of an entrepreneur. e. Explain why a business needs all factors of production. f. Define opportunity cost. g. Define the 3 sectors and give examples of business that operate in each one. h. Explain two significant impacts that changes in the environment and technology might have on a business.
2.	Enterprise and entrepreneurship	<b>Entrepreneur, enterprise, entrepreneurship, innovative, characteristics</b>	
3.	Factors of production	<b>Resources, land, labour, capital, enterprise</b>	
4.	Opportunity Cost	<b>Interest</b>	
5.	Business sectors	<b>Primary, secondary, tertiary sectors</b>	
6.	The business environment	<b>Technological, economic, legal, environmental, interest rates, inflation</b>	

### 3.1.2 Business Ownership

	Key concepts	Advantages	Disadvantages	Test yourself:
7.	<b>Sole trader</b>	Quick to set up You make all the decisions You keep all the profits	Can be stressful <b>Business has unlimited liability</b>	a. Describe a typical business that could be a sole trader or partnership. b. Outline the key differences between a PLC and an Ltd. c. Explain and compare limited and unlimited liability. d. How would the objectives of a not-for-profit organisation differ to an Ltd? e. Evaluate why a business should change ownership. f. Evaluate which legal structure would be most appropriate for a specific business. g. Analyse the benefits and drawbacks of each legal structure, including reference to management and control, sources of finance, liability, and distribution of profits.
8.	<b>Partnerships</b>	Share workload More sources of finance Share skills	Unlimited liability Share the profits <b>May disagree with partners</b>	
9.	<b>Private Limited companies (Ltd)</b>	<b>Limited liability</b> Opportunity for additional investment Can keep control by keeping the majority of the shares	Cannot sell on shares on the stock market, only to friends and family Profit likely to be shared through <b>dividends</b>	
10.	<b>Public Limited companies (PLC)</b>	Limited liability Can sell shares on the <b>Stock Market</b>	Share price controlled by the market Can be at risk of a hostile <b>takeover</b>	
11.	<b>Not-for-profit organisations</b>	Opportunity to increase income/impact by publicising 'charity' status	Scrutiny by the Charity Commission	

Key term	Definition
12. <b>Unlimited liability</b>	Means that personal possessions of the owners of a business are at risk if there are any problems. There is no limit to the amount of money the owners may pay out.
13. <b>Limited liability</b>	The owners are not responsible for the debts of the business. The limit of their liability for the business' debts is the same amount they invested.

## Business - Unit 3.1 Business in the real world

### 3.1.3 Setting business aims and objectives

	The role of objectives in business	Definition	Test yourself:
14.	Customer satisfaction	Whether customers are pleased with the goods/service they receive; whether they would purchase again.	a. Outline 5 common aims and objectives for a business. b. Why does the size of the business impact on the objectives set? c. Explain a way, other than profit, that a business can be successful. d. Evaluate whether growth is always a good thing.
15.	Profit maximisation	Ability to make maximum profit with low operating expenses.	
16.	Increase market share	The percentage of sales in a particular market recorded by a business.	
17.	Growth	When a business sells increased quantities of its products.	
18.	Survival	The capacity of a business to stay in business.	
19.	Shareholder value	The value that a shareholder can get for the money invested in a business.	
20.	Social and ethical objectives	Setting environmental and sustainability targets and being honest.	

### 3.1.4 Stakeholders

Stakeholders are individuals and organisations that are affected by, and affect, the activities of a business.			Test yourself:
21.	Internal – those within the business	Owners/shareholders, employees	a. Outline 5 common aims and objectives for a business. b. Why does the size of the business impact on the objectives set? c. Explain a way, other than profit, that a business can be successful. d. Evaluate whether growth is always a good thing.
22.	External – those outside of the business	Competitors, local community, the Government	
23.	Connected – those linked in some way	Suppliers, customers, creditors (those who the business owes money to)	
24.	Stakeholder objectives	Maximising pay for workers, minimising environmental impact, high dividend payments for owners	



## Business - Unit 3.1 Business in the real world

### 3.1.5 Business Location

	Factors that influence location	Why?	Test yourself:
25.	Proximity to market	A business will want to know where its customers are located and ensure they can reach them easily and will lower costs.	a. Explain the benefits and drawbacks of a business being located on the high street. b. Why might a new start-up business be located at home? c. Why might a growing business struggle to retain its employees if it moves location? d. Evaluate the best choice of location for a supermarket in the UK with reference to recent changes in consumer buying habits.
26.	Availability of raw materials	Some businesses rely on raw materials, for example, a wine business will want to be near the grape vines that it uses to produce wine.	
27.	Labour	The availability of the potential workforce needs to be considered. Do they have the right skills? Are they readily available? What will the cost be?	
28.	Competition	Understanding who and where your competitors are is important. Is there a gap in the market? Or do you need to be near other similar businesses?	
29.	Costs	Where a business locates affects costs. Start-up businesses have limited funds available and restricts options.	

### 3.1.6 Business Planning

A <b>business plan</b> is a document setting out what a business does and what it hopes to achieve in the future.					Test yourself:
The purpose of business planning		The main sections of a business plan			a. List 5 common sections of a business plan. b. What is the difference between fixed and variable costs? c. Explain why creating a business plan is important for a new business. d. Explain one reason why the business plan should state the target customer group.
30.	Setting up a new business	35.	What the business is	39.	The firm's objectives
31.	Raising finance	36.	The founders/investors	40.	Pricing
32.	Set objectives	37.	The product/service	41.	Cash flow forecast
33.	Co-ordinate actions	38.	Market analysis – including target market and competitors	42.	Revenue forecast – including <b>fixed, variable, and total costs; profit and loss.</b>
34.	Detailing how functions of a business will be organised				

## Business - Unit 3.1 Business in the real world

### 3.1.7 Expanding a business

Methods of expansion		Achieved by		Test yourself:  a. Define organic growth. b. Describe the advantages and disadvantages of franchising. c. Explain the difference between a merger and a takeover. d. What benefits might a business have by gaining economies of scale. e. Evaluate how demotivation can occur if a business grows.
43.	Organic growth – also known as <b>internal growth</b> and happens by selling more of its own products	Franchising, opening new stores, e-commerce, outsourcing		
44.	External growth – also called <b>integration</b> , occurs through joining with another business	Merger, takeover		
Advantages of business expansion		Disadvantages of business expansion		
45.	Economies of scale	48.	Diseconomies of scale	
46.	More power in the market	49.	Decision-making becomes slower	
47.	Rewards for staff are often linked to business size	50.	Employees may feel isolated because there are so many of them. Can demotivate them	

### Key Terms

Key term	Definition	Key term	Definition
51. <b>Goods</b>	A physical product (tangible), such as a car	60. <b>Inflation</b>	The rate at which prices are increasing
52. <b>Services</b>	An intangible product (you cannot touch it), a haircut	61. <b>Cash flow</b>	The flow of money into and out of a business
53. <b>Customer</b>	Someone who buys a product from a business	62. <b>Revenue</b>	The income earned by a business in a given time
54. <b>Consumer</b>	Someone who uses goods and services	63. <b>Merger</b>	When two or more businesses agree to join
55. <b>Entrepreneur</b>	Someone who is willing to take risks starting a business	64. <b>Takeover</b>	When an existing business expands by buying more than half the shares in another firm
56. <b>Enterprise</b>	Another word for business		
57. <b>Innovative</b>	Someone who is creative and introduces new ideas	65. <b>Economies of scale</b>	A reduction in average unit cost that comes from producing on a large scale
58. <b>Opportunity cost</b>	The value of something that is given up in order to do something else		
59. <b>Interest rates</b>	The cost of borrowing money or reward for saving money	66. <b>Diseconomies of scale</b>	When growth leads to an increase in average unit cost

## Business - Unit 3.5 Marketing

### 3.5.1 Identifying and understanding customer needs

Key terms:			
1.	<b>Exchange process</b>	Occurs when someone gives up something in return for something else, e.g., a business exchanges a product for money.	a. Give two examples of a need.
2.	<b>Need</b>	Something that needs to be fulfilled to survive.	b. What is a 'consumer'?
3.	<b>Want</b>	Something that we would like to satisfy our needs.	c. What is a 'customer'?
4.	<b>Marketing mix</b>	The combination of factors that influence a customer's decision to purchase a product. This includes the <b>price, promotion, product, and place</b> (4Ps).	d. Explain how not identifying and understanding customer needs could impact on business costs.

### 3.5.2 Segmentation

Key Questions:		Answer:
5.	What is meant by ' <b>the market</b> '?	This is the focus on what demand there is for a product and what the sales are.
6.	What is <b>sales volume</b> ?	This measures the number of items sold.
7.	How is <b>market growth</b> calculated?	$\text{market growth} = \frac{\text{change in market size}}{\text{original market size}} \times 100$
8.	What is <b>segmentation</b> ?	This occurs when the market is divided into different groups of needs and wants.
9.	What are the benefits of segmentation?	Develops products to fit customer needs; targets customers more precisely; sets the price appropriately.
10.	Identify ways of segmenting a market.	Age, gender, location, income, by the stage someone has reached in their life cycle.

### 3.5.3 The purpose and methods of market research

Key Questions:		Answer:
11.	What is the purpose of market research?	To gather market information, including the demand for the product, the market share, the competition and help to identify the target market.
12.	What types of data can be used in market research?	Quantitative data and qualitative data.
13.	What are the main methods of gathering market research?	Primary market research and secondary market research.
14.	How can primary data be gathered?	Observing people's behaviour; interviewing people who may buy your products; telephone surveys; questionnaires; customer feedback; focus groups; internet research and printed press reading.
15.	What are the advantages of secondary market research?	It can be gathered quickly and cheaply. It can provide information on large sections of the population.
16.	What are the disadvantages of secondary market research?	The existing data may not be exactly what the business wants or needs. The data may also be out of date as much of the published data may be from the previous year or before.

## Business - Unit 3.5 Marketing

### 3.5.4 Elements of the marketing mix

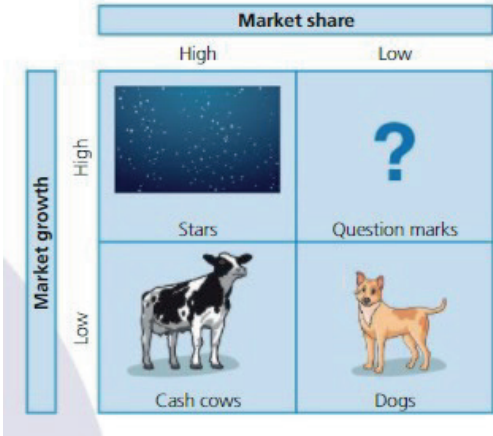
Key Questions:		Answer:
17.	What is the marketing mix?	This refers to all the activities influencing whether a customer buys a product. The elements of the mix can be analysed using the <b>4Ps: Price, Place, Product and Promotion</b> .
18.	What is meant by the term 'Product'?	Product refers to all the factors relating to the design, the specification, and the features of the product.
19.	What is meant by the term 'Promotion'?	Promoting a product means communicating something about it. This allows people to know that a business/ product exists and can be done through methods such as advertising in newspapers or online.
20.	What is meant by the term 'Price'?	This is the price set by a business and that customers will need to pay. This will involve careful consideration by a business as they will need to think about their costs.
21.	What is meant by the term 'Place'?	The place refers to the way in which products are distributed and how they become available to the customer. For example, are they sold direct to the customer (online) or via shops?
22.	What factors influence the marketing mix?	<b>The product</b> Is it distinctive? Is it a product that needs a unique design? How long does a customer expect it to last? Something unique and long lasting may be able to justify a higher price.
		<b>Competitors' products</b> What do they offer and how does it compare with your product?
		<b>The target customers</b> Who are you trying to sell to? How much do they earn? Why are they likely to buy your product? How much do they need it?
		<b>Business approach</b> Are you trying to match what your competitors do or are you trying to be different from and better than them? This may justify being more expensive.

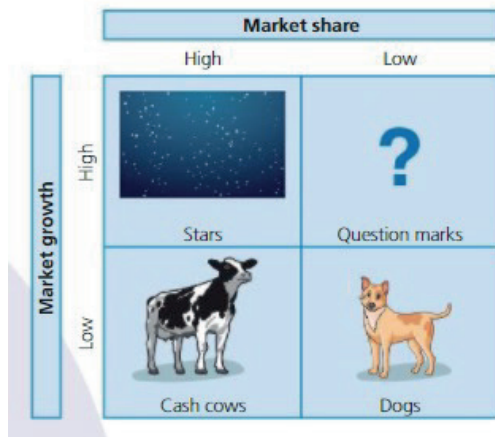
### 3.5.5 Using the marketing mix: product and pricing

Key Questions:		Answer:
23.	What factors will a business need to consider when developing a new product?	The design, the price that customers are willing to pay, the expected sales based on the demand for the product and the cost of development and production.
24.	What is <b>product differentiation</b> ?	This is the term used to describe the ways a business will make their product stand out as different from the competition. Businesses may differentiate their products by building a brand image and its <b>Unique Selling Point</b> (USP).
25.	What are the stages of new product development?	Generate idea; check the idea; develop the product; trial the product; launch it.
26.	What is a <b>product portfolio</b> ?	This is the collection of products that a firm produces. For example, Coca-Cola sells many different types of drinks.
27.	How do businesses analyse their product portfolios?	Businesses use a method of analysis called the <b>Boston Matrix</b> . This is a way of analysing a product's share and growth in their market.

## Business - Unit 3.5 Marketing

### 3.5.5 Using the marketing mix: product and pricing

Key Questions:		Answers:																
28.	What are the elements of the <b>Boston Matrix</b> and what do they mean?																	
		<b>Dogs</b>	A product has a low market share in a low-growth market.															
		<b>Cash Cows</b>	A product that has a high market share in a low-growth market.															
		<b>Question Marks</b>	A product that has a low market share in a fast-growth market.															
		<b>Stars</b>	A product that has a high market share in a fast-growth market.															
29.		<b>Test yourself:</b>																
		<div><b>Maths moment</b> Complete Table 5.4 to identify the type of product in the Boston Matrix.<table><thead><tr><th>Product's market share</th><th>Market growth rate</th><th>Type of product</th></tr></thead><tbody><tr><td>70%</td><td>25%</td><td></td></tr><tr><td>0.001%</td><td>0.1%</td><td></td></tr><tr><td>0.005%</td><td>30%</td><td></td></tr><tr><td>65%</td><td>0.2%</td><td></td></tr></tbody></table><p><i>Table 5.4</i> Identifying products in the Boston Matrix</p></div>		Product's market share	Market growth rate	Type of product	70%	25%		0.001%	0.1%		0.005%	30%		65%	0.2%	
Product's market share	Market growth rate	Type of product																
70%	25%																	
0.001%	0.1%																	
0.005%	30%																	
65%	0.2%																	
30.	Define the term ' <b>product life cycle</b> '.	The product life cycle shows how the sales of a product may change over time.																
31.	What are the five main stages of the <b>product life cycle</b> ?	<b>Development</b>	This is the initial stage, the idea of the product is developed and tested to see if it will work.															
		<b>Introduction</b>	This is when the product is launched, and sales begin. It can involve a lot of expenditure on promotion and publicity.															
		<b>Growth</b>	Growth is experienced when the product starts to sell faster. A business may need to find more outlets for the product at this stage.															
		<b>Maturity</b>	The sales rate begins to slow down. During this stage businesses may decide to introduce new versions of the product to keep sales up.															
		<b>Decline</b>	This occurs when sales start to fall. A business will need to make difficult decisions at this stage. Should they boost the product with marketing or remove it from the market?															



## Business - Unit 3.5 Marketing

### 3.5.5 Using the marketing mix: product and pricing

	Key Questions:	Answers:	
32.	What is meant by the term 'extension strategies'?	Extension strategies are attempts to maintain the sales of a product and prevent it from entering the decline stage of the product life cycle.	
33.	What extension strategies can a business use to stop sales falling?	Price reduction, advertising, updating packaging, adding different features, changing target market.	
34.	What are the different pricing methods that a business might use?	Price skimming	Setting a high price for a product when it first enters the market.
		Penetration pricing	Launching a new product at a low price to achieve fast sales.
		Competitive pricing	Matching the prices that competitors charge.
		Loss leader	Selling a product at a loss in the hope that the customer will buy other items from the business where they make a profit.
		Cost plus pricing	Where products are priced by covering the cost of it to the retailer and adding a percentage on top.

### 3.5.6 Promotion and distribution

Key Questions:		Answer:	
35.	What are <b>promotional activities</b> ?	These are the different ways in which a firm tries to communicate with its customers.	
36.	What are the main types of <b>promotional activity</b> ?	<b>Advertising</b>	These forms of communication must be paid for. Advertisements can include in print (news-papers/magazines), online, on the radio, TV/cinema.
		<b>Public relations activities</b>	These are the actions used by a business to arrange free media coverage of its activities and/or products.
		<b>Personal selling</b>	Using a sales force to promote and sell their products.
		<b>Sales promotions</b>	Short-term incentives to encourage customers to buy the product and can include discounts, buy one get one free offers, samples, coupons, point of sales displays, competitions, free gifts.
37.	What is <b>promotion</b> used for?	Promotion is the use of promotional activities to: <ul style="list-style-type: none"><li>• Inform customers or remind them about products.</li><li>• Create or change the image of a product.</li><li>• Show the benefits of a product.</li><li>• Increase sales by persuading customer to purchase.</li></ul>	
38.	What are the main factors that influence the promotional activities of a growing business?	<ul style="list-style-type: none"><li>• Costs and finance</li><li>• The target market</li><li>• Competitor's actions</li><li>• The nature of the market</li><li>• The nature of the products</li></ul>	

## Business - Unit 3.5 Marketing

### 3.5.6 Promotion and distribution

Key Questions:		Answer:	
39.	What is the <b>distribution channel</b> ?	This describes how the ownership of a product passes from the producer to the final customer.	
40.	What are the different <b>distribution channels</b> that business' use?	<b>Producers</b>	A producer supplies goods or services. For example, Cadbury produces chocolate and Direct Line provides insurance.
		<b>Wholesalers</b>	These buy products from producers in large amounts and supply in smaller quantities to retailers.
		<b>Retailers</b>	These are the shops that sell direct to the customer. Supermarkets such as Sainsbury's, chain stores like New Look and franchises such as McDonald's are all examples of retailers.
41.	Why is it important to get the <b>distribution channel</b> correct?	<ul style="list-style-type: none"> <li>• Different distribution channels cost different amounts and usually put up the prices for the customer.</li> <li>• Some businesses will want their products displayed in a certain way – if distribution to customers is handed over to a retailer, will they display the product as the producer would like it to be displayed? Image and control may be important.</li> </ul>	
42.	What is <b>E-commerce</b> ?	The process of buying and selling online.	
43.	What is <b>M-commerce</b> ?	This is buying and selling using a mobile device, e.g. a mobile telephone.	
44.	What are the benefits and drawbacks of selling through <b>E-commerce</b> and <b>M-commerce</b> ?	<b>Benefits</b>	<b>Drawbacks</b>
		Wider market available. More potential customers can order at any time from home.	Greater competition including globally.
		Websites and apps mean that businesses no longer need printed brochures saving costs.	Easier for customers to compare products on websites so businesses must work very hard to keep customers by offering free deliveries, returns etc.
		Costs can be saved if there are no physical shops; this includes rent, utilities, staffing etc.	May need to employ specialist web or app designers. Training may be necessary for some staff to use these.
		Available to small businesses as it is cheaper than having a physical store.	Security of the site is vital. Customers do not want their credit card details being used fraudulently or their personal data being accessed by others.

## Business - Finance for business formulae list

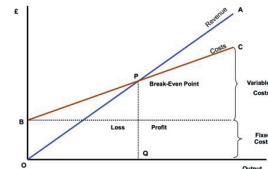
### Costs, profit, and loss

1.	Total costs	Total fixed costs + total variable costs	5.	Revenue	Selling price per unit x quantity sold
2.	Total fixed costs	Total costs – total variable costs	6.	Profit/loss	Revenue – total costs
3.	Total variable costs	Total costs – total fixed costs	7.	Average unit costs	$\frac{\text{Total costs}}{\text{Output}}$
4.	Gross profit	Sales revenue – cost of sales			

### Cashflow

8.	Net cash flow	Total cash inflows – total cash outflows in a given period
9.	Opening balance	Closing balance of the previous period
10.	Closing balance	Opening balance + net cash flow

### Break-even analysis

11.	Break-even point from a break-even chart	When total revenue = total costs	14.	Break-even chart
12.	Profit/loss from a break-even chart	Total revenue – total costs		
13.	Margin of safety	Actual or budgeted output – break-even point		

### Analysing the financial performance of a business

15.	Average rate of return (%)	$\frac{\text{Average annual profit (total profit/no. of years)}}{\text{Cost of investment}} \times 100$
16.	Gross profit margin (%)	$\frac{\text{Gross profit}}{\text{Sales revenue}} \times 100$
17.	Operating profit	Gross profit – overheads
18.	Net profit	Gross profit – overheads, tax, and interest
19.	Net profit margin (%)	$\frac{\text{Net profit}}{\text{Sales revenue}} \times 100$
20.	New current assets	Total current assets – total current liabilities
21.	Net assets	Non-current assets – total current liabilities
22.	Total equity	Value of net assets
23.	Market size	The total volume of sales of a product or the total value of sales of a product
24.	Market share	$\frac{\text{Sales of one product or brand or business}}{\text{Total sales of market as a whole}} \times 100$



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