

4472

English Literature Component 1: Section A: Macbeth

20% of your overall literature grade

Description	Mins	Example question	How to answer this question
<p>Macbeth EXTRACT (15 marks)</p> <p>AO1 – Understand the whole text, and support answers with examples/ quotes. Use a critical style.</p> <p>AO2 – Analyse language, form and structure and how they are used to create meanings.</p>	20	<p>Read the extract on the opposite page. Then answer the following question:</p> <p>Write about _____ (could be how characters speak and behave, a character's thoughts and feelings or how a character is presented). How do you think an audience might respond to this part of the play? Refer closely to details from the extract to support your answer.</p>	<ul style="list-style-type: none"> Read the question carefully to see if you've been asked to focus on a particular character or relationship, or the broader question, 'how might the audience respond?' Read the extract through once to work out what is happening and where it is from in the play. Make a note of what happens immediately before and after. The exam board choose a moment which is important to the play as a whole: it could be a turning point in a character's journey, or a moment of high tension. Read the extract again and highlight at least 5 quotations to discuss. You should cover a similar amount of quotations to your target grade. First lines and last lines are useful; stage directions count; one word quotations count. Make one word annotations next to the extract to ensure you have a variety of inferences when you start writing. Write a two sentence opening paragraph giving an overview of the extract (what is happening and why it is important). Track through the extract covering your quotations in chronological order. Make a variety of points as you go; use precise and analytical vocabulary; explain the effect of any terminology; zoom in if there is an opportunity to expand on your ideas. Use evidence, suggests, because to writer shorter, more concise paragraphs. However, remember to clearly explain what is happening in the extract rather than selecting evidence without its context in the scene. Do not write about any other parts of the play. Top band answers will select brief quotations; have detailed coverage; make concise and perceptive points. To achieve a grade 5 or higher, you should write more than one side of A4.
<p>Macbeth PLAY AS A WHOLE (25 marks)</p> <p>AO1 – Understand the whole text, and support answers with examples/ quotes. Use a critical style.</p> <p>AO2 – Analyse language, form and structure and how they are used to create meanings.</p> <p>AO4 VSSPS (worth 5 marks).</p>	40	<p>You will either be given a quotation about a theme or idea which you have to write about, e.g: 'Macbeth is a play about power'. Write about how Shakespeare presents power at different points in Macbeth. Refer to characters and events from the play in your answer.</p> <p style="text-align: center;">OR</p> <p>Be asked to write about how a character is presented at different points in the play, e.g: Write about the character of Lady Macbeth and how she is presented at different points in the play.</p>	<ul style="list-style-type: none"> Read the question carefully to see which character or theme you've been asked to write about. Write down a plan with quotations which covers all five acts. Include key analytical vocabulary choices too. Creating plans in advance of the exam will help speed you up in the exam hall. The examiner wants to see your range of ideas on the question so ensure you choose moments to discuss which reflect different sides to the question or show a development in the character. If more varied and noteworthy events occur at the end, it's okay for those paragraphs to be longer. Write about the character or theme in chronological order, writing a paragraph for each of the five acts. This is a similar approach to the <i>Blood Brothers</i> and <i>A Christmas Carol</i> questions. Your paragraphs should be more developed than the extract question. Lead with topic sentences which make a clear inference. Remember to spend some time analysing Shakespeare's methods: language and structural choices. You could include more than one quotation in each paragraph to support your ideas. Remember to focus on the events of the play and what happens too; don't just select quotations without explaining their context within the play. Spend the last three minutes proof-reading your work. There are 5 SPaG marks up for grabs! To achieve a grade 5 or higher, you should write at least three sides of A4.

PLOT (AO1)

Act One	Act Two	Act Three	Act Four	Act Five
<p>1.1 The play opens with the appearance of three witches. They express their intentions to intercept Macbeth.</p> <p>1.2 A soldier reports that Macbeth has been bravely defending King Duncan and Scotland from Norway.</p>	<p>2.1 Macbeth hallucinates and sees a floating dagger pointing to Duncan's chamber.</p> <p>Offstage between 2.1 and 2.2 While Duncan is asleep, Macbeth stabs him.</p> <p>2.2 In the aftermath of murder, Macbeth panics and Lady Macbeth must plant the bloody daggers.</p>	<p>3.1 Macbeth becomes king. Macbeth hires assassins to kill Banquo and his son Fleance because he is fearful that they may take the throne off him.</p> <p>3.2 Macbeth and Lady Macbeth discuss their precarious position.</p> <p>3.3 The assassins kill Banquo but Fleance escapes.</p>	<p>4.1 Macbeth goes to visit the witches once more and they make further prophecies: beware Macduff; none of woman born can harm him; and he will be safe until Birnam Wood comes to Dunsinane Castle. They also confirm that Banquo's heirs are still a threat. When he learns that Macduff has fled to England to join Malcolm's army, Macbeth orders Macduff's family be murdered.</p> <p>4.2 Macduff's wife and child are murdered.</p> <p>4.3 Macduff vows to seek revenge when Malcolm tells him of Macbeth's heartless deed.</p>	<p>5.1 Lady Macbeth has become plagued with fits of sleepwalking during which she believes she has blood on her hands.</p> <p>5.2 Other thanes prepare for battle against Macbeth.</p> <p>5.3 The doctor tells Macbeth his wife cannot be cured. Macbeth arrogantly prepares for battle.</p> <p>5.4 Malcolm's army disguise themselves with branches from Birnam Woods.</p> <p>5.5 Macbeth receives news that Lady Macbeth has died while he awaits the English army. He has an existential crisis.</p> <p>5.6 and 5.7 Macbeth and Macduff battle and eventually meet.</p> <p>5.8 Macbeth encounters Macduff in battle, who declares that he was not "of woman born" but was instead "untimely ripped" from his mother's womb (caesarean section). Macbeth continues to fight until Macduff kills and beheads him.</p> <p>5.9 Prince Malcolm now becomes King of Scotland.</p>
<p>1.3 Macbeth and his fellow general Banquo encounter three witches on the heath. The witches prophesise that Macbeth will receive the title the Thane of Cawdor and eventually become King of Scotland. Banquo will be father of kings, although not a king himself. Macbeth is told that he is now Thane of Cawdor; the previous thane betrayed Duncan and has been condemned to death for treason.</p>	<p>2.3 Duncan's death is discovered the next morning by Macduff. Duncan's sons, Malcolm and Donalbain, flee to England and Ireland, fearing for their lives.</p> <p>2.4 Another thane, Ross, discusses with an old man how the natural world has been corrupted because of the regicide – cannibal horses!</p>	<p>3.4 At a feast that same night, Banquo's ghost visits Macbeth, which terrifies him. Lady Macbeth masks his paranoia to their guests and chastises him for his cowardice. Macbeth decides to visit the witches for advice.</p> <p>3.5 Hecate, the queen of the witches speaks.</p> <p>3.6 Lennox, another thane, discusses his concerns for Scotland.</p>		
<p>1.4 Malcolm is appointed Prince of Cumberland, assuring he's next in line to the throne. Macbeth recognises Malcolm now stands between him and the throne.</p> <p>1.5 Macbeth writes to his wife, Lady Macbeth, telling her about the witches' prophecies. She calls upon evil spirits and vows to make them come true.</p> <p>1.6 Duncan arrives in the castle, greeted by a duplicitous Lady Macbeth.</p>				
<p>1.7 Lady Macbeth persuades Macbeth, using a variety of tactics, to kill the king. They plan drug Duncan's two servants and then blame the murder on them.</p>				

KEY QUOTATIONS FROM KEY SCENES (AO1)

<p>Act 1, Scene 1 'Fair is foul and foul is fair': <i>An eerie opening to the play showing the chaos and corruption to come</i></p> <p>Act 1, Scene 2 'Like valour's minion carved out his passage': <i>Macbeth's heroic and honourable origins</i></p> <p>Act 1, Scene 3 'Stay you imperfect speakers, tell me more': <i>Macbeth's intrigue about the Witches' prophecies</i> 'The instruments of darkness tell us truths, win us with honest trifles, and betray us in deepest consequence': <i>Banquo's scepticism and wariness about the Witches' prophecies</i></p> <p>Act 1, Scene 5 'Unsex me here and fill me from the crown to the toe topfull of direst cruelty': <i>Lady Macbeth's tenacious desires to be resolute and wicked in her schemes for regicide</i> 'Look like the innocent flower, but be the serpent under it': <i>Lady Macbeth's commands to her husband to act duplicitously</i></p> <p>Act 1, Scene 7 'I have no spur to prick the sides of my intent, but only vaulting ambition': <i>Macbeth's concern and fear about his foolish plan of regicide</i> 'Screw your courage to the sticking-place, and we'll not fail': <i>Lady Macbeth's aggressive encouragement of her husband</i></p>	<p>Act 4, Scene 1 • 'Now I see 'tis true, for the blood-boltered Banquo smiles upon me, and points at them for his': <i>Macbeth's misplaced fear regarding Banquo's lineage and the witches' prophecies</i> • 'Seize upon Fife; give to the edge o' the sword his wife, his babes, and all unfortunate souls that trace him in his line': <i>Macbeth's savage and ruthless command to kill the Macduffs</i></p> <p>Act 4, Scene 3 • 'All my pretty chickens and their dam at one fell swoop?': <i>Macduff's shock and grief upon hearing of his family's murders</i> • 'Let grief convert to anger; blunt not the heart, enrage it': <i>Malcolm's advice to Macduff, encouraging him to take vengeance</i></p>
<p>Act 2, Scene 1 'Art thou but a dagger of the mind, a false creation, proceeding from the heat-oppressed brain?': <i>Macbeth questions his paranoia hallucination</i></p> <p>Act 2, Scene 2 'But wherefore could not I pronounce "Amen"?': <i>Macbeth's crisis of faith in the aftermath of regicide</i> 'Will all great Neptune's ocean wash this blood clean from my hand?': <i>Macbeth's extreme woe and regret at the tangible evidence of regicide</i> 'My hands are of your colour; but I shame to wear a heart so white': <i>Lady Macbeth's supercilious dismissal of Macbeth's guilt</i></p> <p>Act 2, Scene 3 'Awake, awake...see the great doom's image': <i>Macduff's horror on encountering his dead king</i> 'I stand...against ...treasonous malice': <i>Banquo's unwavering commitment to avenging Duncan's death</i></p>	<p>Act 5, Scene 1 • 'I have almost forgot the taste of fears': <i>Macbeth's hubris in the face of Malcolm's army</i> • 'It is a tale told by an idiot, full of sound and fury, signifying nothing': <i>Macbeth's existential crisis on hearing the death of his wife</i></p> <p>Act 5, Scene 7 • 'Swords I smile at, weapons laugh to scorn, brandished by man that's of a woman born': <i>Macbeth's scorn at his enemies and ignorant belief in his invulnerability in the battlefield</i></p> <p>Act 5, Scene 8 • 'Macduff was from his mother's womb untimely ripped': <i>The moment of Macbeth's anagnorisis, he has been truly bewitched by the witches' words</i> • 'This dead butcher and his fiend-like queen': <i>Malcolm's apt assessment of the tyrannical villains the tragic heroes became</i></p>
<p>Act 3, Scene 1 'They hailed him father to a line of kings. Upon my head they placed a fruitless crown': <i>Macbeth's jealousy of Banquo and paranoia regarding his own newfound status as monarch</i></p> <p>Act 3, Scene 2 'O, full of scorpions is my mind, dear wife!': <i>Macbeth's anguish regarding his new-found status as king</i></p> <p>Act 3, Scene 4 'Never shake thy gory locks at me': <i>Macbeth's attempt to show bravery and fearlessness when confronted by Banquo's ghost</i> 'O proper stuff! This is the very painting of your fear': <i>Lady Macbeth rebukes her husband's fear</i> 'I am in blood stepped so far that, should I wade no more, returning were as tedious as go over': <i>Macbeth resolves to continue in his merciless tirade</i></p>	<p>How to revise • Create flash cards with the quotation on one side and as much as you can say on the reverse: act and scene, who says it and why, key analytical vocab, terminology, links to elsewhere in the play. • Upload the quotations to Quizlet and copy the italicised parts on the reverse for a pairs game. • Create your own gap fill activities. Increase the number of gaps to increase the challenge. • Do look, say, cover, write, check for each of them. • Make flash cards using images and pictures to help you memorise them.</p> <p>These are the key scenes too in terms of the extract question. Check out any revision videos analysing these on YouTube – Mr Bruff is an especially useful channel.</p>

KEY CHARACTERS (AO1)

<p>Macbeth: protagonist</p> <p>Shakespeare's eponymous tragic hero, Macbeth is a dynamic character. Established as the valiant and loyal Thane of Glamis, Macbeth is willing to sacrifice himself for Scotland, and holds the ideal qualities of kingship, but soon becomes a victim of ambition, his hamartia.</p> <p>Macbeth's greed and ambition, along with the persuasiveness of his wife, leads him to take a violent and bloody path to the throne. Following the format of a tragic hero, Macbeth has multiple tragic flaws in his character, the most prominent being his ambition and being too loyal to and trusting of his wife. These tragic flaws go on to play a major role in Macbeth's demise and lead him to become a tyrant.</p> <p>Macbeth fits every characteristic of a Shakespearean tragic hero. The audience see the full cycle of a rise to power, followed by a great demise. His ambition leads to his degeneration as a character which results in his ultimate downfall, death.</p>	<p>Lady Macbeth: ambitious wife of Macbeth.</p> <p>Lady Macbeth is determined, ruthless and ambitious, subverting the patriarchal female stereotype. She plays a crucial role in plotting King Duncan's regicide in order for the witches' prophecy to come true. She is powerful, more ruthless, and more ambitious than her husband and seems fully aware of this, knowing that she will have to forcefully persuade Macbeth into committing murder by challenging his morality and forcing him to ignore his conscience.</p> <p>Shakespeare utilises the character of Lady Macbeth to expose the audience to the dangers of deceit and sin, and her tragic demise serves as a warning about the danger of ambition.</p>	<p>Banquo: a <i>foil</i> to Macbeth.</p> <p>Banquo is a loyal Scottish nobleman, general, and partner in battle to Macbeth, also father of Fleance. The weird sisters prophesise that while Banquo will never be King of Scotland, his descendants will one day sit on the throne. Banquo is as ambitious as Macbeth, but, unlike Macbeth, he does not possess the fatal flaw of putting his selfish ambition above his morality or loyalty.</p> <p>Aware of the Witches' prophecy and an honourable servant to Scotland, Banquo is both a threat to Macbeth and a living example of the noble path that Macbeth betrayed. Following Banquo's murder Macbeth is haunted by Banquo's ghost, symbolising Macbeth's overbearing guilt for committing regicide.</p>	<p>The Witches: antagonists to Macbeth.</p> <p>The three weird sisters open the play, creating a sinister atmosphere and ominous and chaotic tone that will follow the play. The witches' knowledge of future events indicates they have supernatural powers. They provide prophecies that act as the catalyst for Macbeth's vaulting ambition by luring Macbeth to act upon his dark desires.</p> <p>There was real superstition and anxiety about the evils of witchcraft amongst all echelons of society. King James wrote a book called 'Demonology' which was a study of the evils of magic. He also asked Parliament to pass an anti-witchcraft law, which he then used to execute a number of witches in the North Berwick Witch Trials.</p>
<p>King Duncan: <i>King</i> and victim of regicide.</p> <p>The King of Scotland, and father of Malcolm and Donalbain. King Duncan is moral and virtuous king who puts the welfare of the country above his own and seeks to nurture his kingdom. Savagely murdered by Macbeth, his death disrupts the Great Chain of Being and causes disorder to the natural world.</p>	<p>Malcolm and Donalbain</p> <p>Malcolm – As the oldest son of King Duncan, he stands to inherit his father's throne, but fears for his life and flees, therefore leaving the throne open to Macbeth. Macbeth is defeated and Malcolm is crowned the rightful king of Scotland.</p> <p>Donalbain – The younger son of Duncan.</p>	<p>Fleance: the young son of Banquo.</p> <p>The witches prophesise in that as Banquo's son, Fleance, will inherit the throne at an unspecified future time. Macbeth immediately focusses on this final prophecy and becomes consumed by it, obsessed with ridding Scotland of anything he perceives to be a threat to his sovereignty. Shakespeare utilises the motif of light as Fleance carries a torch, symbolising guidance towards the future and qualities of Kingship. Macbeth's obsession with power prompts him to hire assassins to murder Banquo and Fleance, but Fleance escapes unharmed to Macbeth's dismay.</p>	<p>Macduff: contrast to Macbeth.</p> <p>A Scottish nobleman and Thane of Fife, he remains loyal to King Duncan's line throughout the play and is the eventual defeater of Macbeth. Macduff suspects Macbeth's duplicitly from early in the play and becomes one of the leaders of the rebellion to restore order to Scotland and overthrow tyrannical Macbeth from the throne. After Macbeth has Macduff's family brutally murdered, Macduff's desire for vengeance becomes more personal and powerful.</p>

KEY THEMES (AO1)

Tyranny versus kingship	Violence	Disorder	Loyalty and betrayal	Fear and fearlessness
<p>Kingship and power are intrinsically linked within the play. The possibility of ascending the throne is the driving force behind the motivations of Macbeth. Shakespeare contrasts the way the characters behave towards the possibility of power, and also how characters act once they have gained power. Shakespeare contrasts the behavior of a virtuous and benevolent king with that of a violent and ruthless ruler.</p>	<p>Violence supports the cyclical structure of the tragedy. The play opens with a bloody battle between Scotland and Norway and ends in a bloody battle between the forces of Malcolm (the rightful king of Scotland) and Macbeth (the usurper).</p> <p>Shakespeare warns that violent transgressions lead to more violent acts, even those of selfless intentions. We see that after Macbeth becomes king by committing regicide, he must continue to use violence to maintain his crown, until finally violence is all that remains.</p> <p>The violence Macbeth demonstrates on the battlefield in Act One is born from loyalty and honour, as he bravely defends Scotland.</p>	<p>The play subverts natural orders: Macbeth disrupts the natural succession of royalty; Lady Macbeth breaks gender norms; the supernatural imposes on the natural world; Macbeth and Lady Macbeth struggle with inner turmoil and conflicts. It is unclear how much control Macbeth has over his own fate. The witches' prophecies may be self-fulfilling as Macbeth's own ambition takes over and he seeks to make the prophecies a reality.</p>	<p>Macbeth's loyalties are conflicted between his comradeship for Duncan and Banquo and his loyalty to his wife. He makes the fatal decision to trust the witches' prophecies and his wife's judgement, choosing to betray Duncan and his own morality.</p> <p>Macbeth's loyalty fluctuates throughout the play. His loyalty and bravery in battle is rewarded but he is tempted by the supernatural and loyalty to his wife, Lady Macbeth.</p> <p>Macbeth betrays Banquo's loyalty out of paranoia and guilt.</p>	<p>Shakespeare utilises the witches to terrify and disturb a Jacobean audience before Macbeth is described as a fearless warrior on the battlefield. His fearlessness continues when meeting the witches when Macbeth's curiosity is greater than his fear of the supernatural, whilst Banquo demonstrates caution.</p> <p>Lady Macbeth is also presented as fearless when she constructs the plot of King Duncan's regicide, juxtaposing Macbeth's doubts and fears, which surface as his conscience battles against his ambition.</p> <p>After achieving power, Macbeth becomes increasingly paranoid and tyranny breeds through fear of losing power.</p>
<p>Ambition</p> <p>The whole play pivots around the idea of ambition. Shakespeare suggests that ambition can be dangerous when it is motivated by greed, as can be seen through the characters of Lady Macbeth and Macbeth. This is compared to Banquo being content to see the future unfold as it may, and Macduff's ambition to restore the rightful monarch.</p>	<p>Appearance vs reality</p> <p>The outward appearance of Macbeth as virtuous and loyal enables him to successfully commit regicide and ascend the throne. Loyalty and trust are juxtaposed by the ultimate sin.</p> <p>Shakespeare utilises the supernatural to explore the ways in which appearance can be manipulated and altered, warning the audience that no one and nothing can be trusted and that there are no certainties when it comes to morality.</p>	<p>Guilt</p> <p>Shakespeare uses blood, sleeplessness and hallucinations as motifs to explore how guilt manifests itself in both Macbeth and Lady Macbeth. Shakespeare explores guilt as an inevitable and unavoidable consequence of committing sin, haunting Macbeth both as a ghost that he sees, as well as the heaviness of his conscience.</p> <p>Innocence is a virtue that Shakespeare celebrates. The Macbeths pursue a façade of innocence while plotting regicide, and as they descend into a web of violence, they long to regain their innocence.</p>	<p>Masculinity and femininity</p> <p>Jacobean society was 'patriarchal'. Women were said to be inferior to men in The Chain of Being and a woman's role of obedience in Jacobean times was clearly defined and gender was an establishment upon which hierarchy was built. Women were expected to marry, to bear children and be subservient to men. Masculinity was seen as the desired trait. Whilst through her manipulation of Macbeth, Shakespeare associates her femininity to the biblical allusion of the fall of man.</p>	<p>Power and powerlessness</p> <p>The fragility of power is a central theme in Macbeth, dictating the development of his characters and relationship dynamics. Shakespeare warns his audience of the fatal danger of pursuing power which is not rightfully bestowed, exposing them to the tragic consequences.</p> <p>Conversely, powerless also plagues the Macbeths later in the play. Lady Macbeth, disregarded by her husband, feels powerless to his increasingly tyrannical actions but bears the guilt.</p> <p>Furthermore, Macduff's powerlessness when his family are slaughtered motivates him to seek vengeance.</p>

SHAKESPEARE'S METHODS - MOTIFS (AO2)

<p>Sleep <i>Hit count: 34</i></p> <p>What happens</p> <ul style="list-style-type: none"> Macbeth takes the cowardly option by killing his king while he sleeps and should be playing the host. Macbeth believes he hears cries from the guards. The castle are awoken from the beds to hear the news of regicide. Lady Macbeth becomes plagued with somnambulism (sleepwalking). <p>Why it's significant</p> <p>Sleeping Duncan aligns him with the heavenly image of the king, emphasising further that Macbeth is wholly in the wrong in killing him.</p> <p>Sleep symbolises purity, innocence and peace of mind.</p> <p>Lack of sleep is symbolic of the guilt that both the Macbeths feel. They have transgressed so far that rest cannot be granted to them.</p>	<p>Blood <i>Hit count: 43</i></p> <p>What happens</p> <ul style="list-style-type: none"> A soldier covered in blood reports of Macbeth and Banquo's success on the battlefield. Lady Macbeth craves her blood be thick enough stop her feeling 'remorse.' Macbeth returns from the scene of regicide covered in blood and believes his hands (and soul) will not be cleansed. The murderers return from Banquo's assassination with blood on their faces. Banquo appears as a ghost covered in blood. Banquo appears as an apparition with the Witches covered in blood pointing to his heirs. Lady Macbeth, during her sleepwalking, believes her hands are covered in blood. <p>Why it's significant</p> <p>Blood is closely linked with violence and is a tangible evidence that brutalities have occurred.</p> <p>Death and killing happen in an instant, but blood remains, and stains. At the times when both Macbeths feel most guilty, they despair that they will never be able to wash the blood—their guilt—from their hands.</p>	<p>Animals</p> <p>5 owls 10 horses 1 raven 2 lions 1 eagle 2 geese 2 cats 1 cricket 7 dogs 2 bats 2 serpents 6 birds 2 bears 1 scorpion And lots more/bear in the face of Malcolm's army.</p> <p>What happens</p> <ul style="list-style-type: none"> Lady Macbeth encourages her husband to act duplicitously like a serpent. The critters of the natural world react when Macbeth disrupts the natural order. Macbeth and his wife hear noises in the aftermath of regicide which they attribute to nocturnal animals. Horses eat each other as the order becomes disrupted. Macbeth describes his own mental state as painfully 'full of scorpions.' Macbeth vows to fight like a trapped scorpion. And lots more/bear in the face of Malcolm's army. Macbeth is referred to as a 'hellhound.' <p>Why it's significant</p> <p>Shakespeare draws on the connotations of animals and uses them as symbols to display positive or negative character traits.</p> <p>Macbeth begins as an 'eagle' and 'lion' but soon becomes an owl (who hunt, apparently cowardly, in the night, and then later a 'hellhound.'</p> <p>Lady Macduff and her son are associated with birds to suggest their helpless and vulnerability.</p>	<p>Biblical allusion What happens</p> <ul style="list-style-type: none"> Lady Macbeth encourages Macbeth to act like the serpent in the Garden of Eden. The washing of hands alludes to Pontius Pilate (who ordered Jesus' crucifixion). It represents being cleansed of sin. When there is knocking on the door to the Porter, Shakespeare alludes to the Book of Revelation where it is said Christ will knock on the door. The very shedding of blood is referred to in Genesis, suggesting if you shed blood, someone else shall shed yours. Through this lens, Macbeth's death is inevitable. The 'dusty death' Macbeth laments over is a reference to Genesis; here Macbeth sees the futility of his sinful actions. <p>Why it's significant</p> <p>The repeated biblical references remind the audience how far Macbeth has strayed from God. By killing God's representative in earth, he has desecrated the Divine Right of Kings.</p>
<p>SHAKESPEARE'S METHODS (DEVICES) (AO1)</p> <p>Soliloquy - where a character speaks their thoughts and feelings on stage. <i>Lady Macbeth's soliloquy is essential in demonstrating her wicked character.</i></p> <p>Dramatic irony - where the audience knows something the character doesn't. <i>The dramatic irony in act 4, scene 3 when Macduff is told of his family's murderers increases the audience's sense of pathos towards him.</i></p> <p>Imperative - commands. <i>Lady Macbeth's repeated imperative towards Macbeth demonstrates her dominance.</i></p> <p>Interrogative - questions. <i>The Macbeths' frantic interrogatives after Macbeth commits regicide reveal their guilt.</i></p> <p>Simile - comparing two things using as or like. <i>Lady Macbeth uses the simile 'like the innocent flower' to encourage her husband's duplicity.</i></p> <p>Metaphor - saying something is something else. <i>Macbeth uses a 'scorpion' metaphor to show his tortured mental state.</i></p> <p>Allusion - making a reference to another text or source. <i>Lady Macbeth's allusion to the 'perfumes of Arabia' demonstrates her belief that the evidence of her guilt is truly extensive.</i></p>		<p>SHAKESPEARE'S METHODS (DEVICES) (AO1)</p> <p>Rhyming couplet - two consecutive rhyming lines. <i>'Hear it not, Duncan, for it is a knell/ That summons thee to heaven or to hell.'</i></p> <p>Prose - unrhyming and not metrical lines. <i>Lady Macbeth's descent into madness is mirrored in her shift to prose.</i></p> <p>Verse - metrical and often rhyming lines. <i>Characters of high status speak in verse.</i></p> <p>Iambic pentameter - 10 syllables per line of stressed and unstressed.</p> <p>Palindrome - the same words repeated backwards. <i>'Fair is foul and foul is fair'</i></p> <p>Aside - where a character speaks to themselves or in confidence to someone else on stage without others hearing. <i>The Macbeths often use asides to communicate their nefarious plans.</i></p> <p>Entrances and exits - simply having characters come on and off stage. <i>When Duncan's body is found, there are myriad entrances and exits to create a sense of chaos.</i></p>	

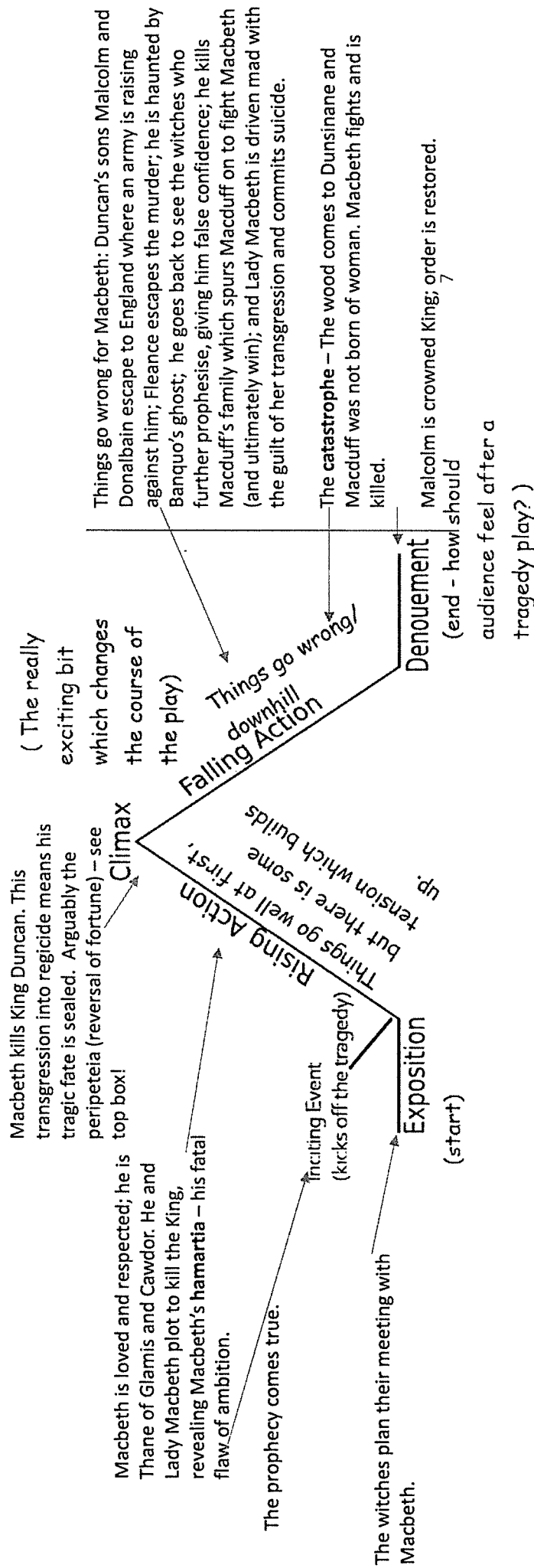
CONVENTIONS AND STRUCTURE OF A TRAGEDY PLAY (AO2)

Aristotle, a philosopher who live in Ancient Greece from 384-322 B.C., first set out the rules of tragedy, which Shakespeare used in Macbeth:

- The action should move towards a catastrophe involving a sudden reversal in fortune from happiness to misery (the peripeteia), often leading to the protagonist's death, along with the deaths of many others. In *Macbeth*, the ultimate peripeteia comes when he is killed by Macduff. However we could argue that the regicide of Duncan is also the catastrophe which leads to his sudden reversal of fortune because although he becomes King, it disrupts the natural balance and seals his tragic downfall.
- A tragic hero must be of noble birth - in other words, rich and powerful. Macbeth is already a Thane at the start of the play and he rises to ultimate power as King.
- The tragic hero must have a fatal flaw - their hamartia. A fatal flaw is some negative quality in their personality which will be 'fatal' - it will lead to their death. Macbeth's hamartia is his 'vaulting ambition'.
- This often takes the form of arrogance, pride or over-confidence - their hubris. Macbeth's hubris is encouraged by the witches - 'No man of woman born shall harm Macbeth'.
- The tragic hero will have a moment of recognition of that fatal flaw - their moment of anagnorisis. Macbeth's anagnorisis comes when he finds out Macduff was not 'of woman born'.
- At the end of the play there will be some kind of resolution that puts some things right. Malcolm becomes the rightful king.
- The audience will be left feeling 'cleansed' after living through the emotions of fear and pity shown in the play - a feeling of catharsis.



Tragedies have a set structure; the first part builds up to a turning point (Duncan's murder) which is the climax of the play. The second part deals with the aftermath where things fall apart from Macbeth. Everything that happens in Macbeth happens to drive the play through this structure to its tragic conclusion. We can see the structure of Macbeth as a triangle:



ESSAY SKILLS (AO1)		CONTEXT
<p><u>Critical verbs</u></p> <p>Shakespeare uses _____ (insert the question focus – the character/relationship/theme/series of events) _____ in order... to criticise... to warn... to expose... to teach... to celebrate... to reveal the importance of... to question... to establish... because.....but.....so.....</p> <p><u>Key phrases to use in your answer</u></p> <p>Macbeth's journey to destruction... Scrutinises the desire for power... Distorts the representation of women to create an atypical villain... The crumbling façade of power... The pressures of masculinity... The slippery nature of truth... The terror of regicide... Disrupts the natural order... Macbeth's transgressive deeds... The Macbeth's immorality, fuelled by greed and ambition...</p> <p><u>Tragic Terms</u></p> <p>Tragedy – a genre typically ending in the main character's death Pathos – emotional appeal (we feel invested in Macbeth) Catharsis – release of emotions at the end of a play Peripeteia – the reversal of fortunes Hamartia – fatal flaw Hubris – excessive pride Demise – downfall often leading to death Anagnorisis – sudden realisation of fate Zenith – the peak of a hero's fortunes Nadir – the lowest moment in a hero's journey</p>	<p><u>Adjectives to describe Macbeth</u></p> <p>Valiant - brave Intrepid - fearless Ruthless - no pity or compassion for others Ambitious - strong desire to succeed Hubristic - excessively proud or self-confident Paranoid - suspicious, mistrustful Tyrannical - exercising power in a cruel way Merciless - showing no mercy Usurper - taking power illegally or through force</p> <p><u>Adjectives to describe Lady Macbeth</u></p> <p>Ambitious - strong desire to succeed Manipulative - exercising control or influence Assertive - forceful Duplicitious - deceitful Supercilious - disdainful or contemptuous Callous - insensitive or cruel regard for others Calculating - scheming Tormented - mental suffering Neurotic – anxious and self-doubting Machiavellian - cunning, scheming, unscrupulous</p> <p><u>Adjectives to describe The Witches</u></p> <p>Uncanny - strange or mysterious Perplexing - puzzling Ardent - passionate Machiavellian - cunning, scheming, unscrupulous Calculating - scheming Disturbing - causes worry</p>	<p>Although there are no context marks, you should still be aware of the following:</p> <p><u>The Divine Right of Kings</u> The Christian kings of Europe once believed they were answerable to no one except God. The idea became known as the divine right of kings. The divine right was an ancient idea that began with Europe's medieval kings. They claimed that they had been chosen by God and were his representatives on Earth.</p> <p><u>The Great Chain of Being</u> The Elizabethans believed in "The Great Chain of Being". This was an idea that everyone was placed within a hierarchy by God, with the king at the head. By killing the king and taking Duncan's place, Macbeth subverts this natural order. Disorder in nature reflects this disorder in human affairs.</p> <p><u>The Role of Women</u> Elizabethan England was a fiercely patriarchal society with laws that heavily restricted what women could and couldn't do. Women were not allowed to attend school or university and were encouraged to be silent and obedient to male authority.</p>
	<p><u>Adjectives to describe Banquo</u></p> <p>Loyal - showing support or allegiance Intrepid - fearless Honourable - deserving of praise or respect Wary - showing caution Moral - concerned with the principles of right and wrong Dutiful - obedient Devoted - loving or loyal Discerning - showing good judgement Sceptical - having doubts or reservations</p> <p><u>Adjectives to describe King Duncan</u></p> <p>Worthy - deserving Virtuous - showing high moral standards Unsuspecting - unaware of the presence of danger Admired - respect and warm approval</p> <p><u>Adjectives to describe Macduff</u></p> <p>Loyal - showing support or allegiance Noble - fine qualities, high moral principles Zealous - showing great energy or enthusiasm Hostile - showing opposition or dislike</p>	

Factual Knowledge:

Orthodox Jews: Live closely to the teachings of the Torah as it came from God and cannot be changed. They will try to observe all 613 mitzvot. God’s rules are constant. Society may change but Jewish teachings do not.
Reform Jews: Reform Jews believe that some laws were products of their time and place, so it is not necessary to treat them as absolute. Religion should move with the times. They do not take the teachings of the Torah literally. Interpretation relies on individual reasoning and conscience.

The Nature of God

God is... One: The central prayer in Judaism is the **Shema**. It affirms that there is only one God. It is the most important prayer in Judaism and is recited by Jews daily – in the morning and in the evening. Three names for God are **creator, law-giver and judge**,

God is... Law Giver: God revealed to Moses the duties (mitzvot) expected of all Jews. God judges how each person follows the rules, e.g. the Ten Commandments. **God is... Judge:** God is a God of justice and mercy, but he is not a God who takes pleasure in wickedness. At Rosh Hashanah, Jews believe that God will judge every person. Ten days are given after Rosh Hashanah before Yom Kippur (the Day of Atonement). During this time, humans can reconcile for any bad deeds and ask for forgiveness. **God is... Creator:** The Torah shows how God is responsible for creating everything in existence. Each week, Jews celebrate Shabbat. This is a day of rest but also a celebration of creation. Just as God rested on the seventh day, so observant (Orthodox) Jews do not work on Shabbat.

Pikuach Nefesh is the belief that, when life is involved, all Sabbath laws or mitzvot may be overruled to protect the health of an individual. The overruling of the laws is not just permitted but required if it will save a person’s life. For example, Jews fast on Yom Kippur for ten days, however a sick person must break the fast. There are no consequences for breaking the mitzvot in these circumstances as it is not righteous to risk a life. In fact, it is foolish and sinful. Saving a life should take priority over everything - even if it means breaking some of the mitzvot in the Torah. In the Talmud, it says that Jews should 'live by' the Torah, not 'die by' it. To support life, all but three of the 613 mitzvot can be broken - idolatry, incest and adultery. In Judaism, the emphasis is on life, not death. God is the creator who has given life. A prayer is said in the morning that reflects this belief.

Judaism Beliefs Key Terms:

Covenant: a promise or agreement between two parties. Covenants were made between God with Noah, Abraham and Moses.

Kosher: (fit or proper) foods that are permitted to be eaten according to Leviticus Chapter 11. It is also used to refer to the purity of ritual objects such as Torah scrolls.

Messiah: the anointed one who Jews believe will bring in a new era or age for humankind. This will include rebuilding the Temple and bringing in an age of universal peace.

Mitzvot: the term has a mix of meaning. It is often used to refer to duties (such as the 613 in the Torah) and good deeds.

Shabbat: day of spiritual renewal and rest. Beginning at sunset on Friday and closing at nightfall on Saturday.

Shekinah: the place where God’s presence rests and can be felt.

Synagogue: house of assembly; building for Jewish public prayer, study and assembly.

Torah: the five books of Moses (Genesis, Exodus, Leviticus, Numbers and Deuteronomy). Regarded as the holiest books of the Torah.

The Messianic Age and the Messiah A future time of peace on earth, with no violence, hunger or crime. For many Jews, the coming of the Messiah and the resurrection of the dead will start the Messianic Age. Means ‘anointed’. This refers to the belief that the Messiah will be chosen by God to do a particular role. Maimonides said that the belief in the Messiah was one of the 13 Principles of Jewish faith. *This view is not shared by Reform Jews, who believe that it will be the good actions of humans that will bring about a Messianic Age of peace.*

There are two main reasons why there are different views about the

Messiah: There are no definite teachings about the Messiah in the Torah. Passages that Jews think are relevant have to be interpreted. There is a strong belief that humans should focus on the here and now. The world to come is beyond humans’ understanding, so we cannot know when the Messiah will come. For most Jews, the focus is not on a date but on particular actions that will bring about the Messiah.

Abrahamic Covenant

Abraham is considered the father of the Jewish people'. God promises to: 1. Make of Abraham a 'great nation'; guide Abraham to the Promised Land, 2. Make Abraham fruitful (give him lots of descendants/children), 3. Bless Abraham and the families of the earth through Abraham. As part of this, God gave Abraham the rite of circumcision.

The Covenant made with Moses:

God worked miracles through Moses, e.g. sending the plagues on Egypt. Moses spoke to God face-to-face, God chose Moses, God gave the Torah to Moses. This included the Ten Commandments, Moses established a covenant with God. As God's chosen people, the Israelites would keep the commandments, Moses was given both the Written Torah and the Oral Torah. Finally Moses was the first rabbi (teacher).

The Ten Commandments: They were given to Moses by God and should be followed by all Jewish people. Moses climbed Mount Sinai and after being up there 40 days, came back down with 2 stone tablets with the commandments written on them. There are another set of rules Moses learned, and in total there are 613 commandments he was told.

The Torah teaches that God gives Jews a choice whether or not to follow God's laws. As humans, we are made in God's image and we have the minds and souls to make choices for ourselves. Judaism teaches that individuals have been born with one of two inclinations or natural ways to act: 1. The inclination or natural urge to do good actions and 2. The inclination or natural urge to do evil actions. People are born with both of these inclinations in a natural balance, but as the person does more good or more bad, the balance changes. In Judaism, there is no belief in evil beings, such as the devil, but it is the inclination within everyone that creates evil in the world.

Shabbat

Shabbat: The origins of Shabbat lie in the Torah. It is one of the 10 commandments. This is every Saturday and remembers the 7th day God made the world and then rested, so Jews will do no work on this day. Shabbat starts at sunset on Friday until sunset on Saturday.

Death and Afterlife

There is no set view on Jewish beliefs about the afterlife –Jews have a special term for the afterlife – **Olam Ha-Ba**, which means, 'the world to come'. Some believe that you just die and end up in the ground. Jews believe that the importance of life is the way in which it is lived on earth. Reform Judaism does not have an official opinion - and generally considers there is no afterlife. Orthodox Jews sometimes believe that the souls of all are resurrected. After death, the souls come together in **Sheol**.

Orthodox Judaism: There is some form of resurrection. This is stated in daily prayers and at funerals. Prayers also refer to the soul being at rest under the wings of the Shekinah (divine presence of God). Some Orthodox Jews believe in bodily resurrection (body and soul are both raised). This means that some would not agree with organ donation or autopsy after death as the body has to remain whole.

Reform Judaism: The only afterlife we have is living on in the memories of those who remain on earth. Some reject the idea of the resurrection. As a result, references to Resurrection and the afterlife have been taken out of the prayer books. Some Reform Jews believe that the soul lives on after death - but no one agrees when and where.

Jews and Prayer: Jews have a duty to pray this does not just happen in the synagogue it should be a part of everyday life. Prayer connects believers with God and is a communication of love. Traditionally communal prayer requires 10 men to be present this is called a Minyan. Reform Jews will accept women in the numbers when forming a Minyan. There are many set prayers in the Siddur. **The Shema** prayer for Jews is a declaration of Jewish faith, reminding Jews daily of the oneness of God. This is recited 3 times daily.

Shabbat at the synagogue: This brings the Jewish community together each week. Services are held on Shabbat evening, Shabbat morning and late Shabbat. Shabbat morning is the longest service and can last between 2-3 hours. I

Shabbat at home: The mother welcomes Shabbat into the home with 2 candles as she does this she will recite the Shabbat blessing from the Siddur the synagogue prayer book. The father will start the meal with a Kiddush blessing then another blessing over the Challah bread.

Factual Knowledge: The Synagogue

The Synagogue is at the heart of the Jewish faith. It is a house of prayer, study and gathering. Some Orthodox Jews may use the synagogue 3 times a day to pray, more generally though services take place Mondays, Thursdays and Shabbat. The synagogue is also used for Study, Jews study the Torah and discuss this with other Jews. Children may also learn Hebrew at the synagogue. They Synagogue is also vital for the community and at the heart of celebrations such as weddings. The synagogue ensures the weak and vulnerable of the community are cared for.

The Features of the Synagogue:

The Ner tamid is an everlasting light. This represents the eternal presence of God. The mitzvah to keep a light burning at the temple in Jerusalem. This will always hang near the ark.

The Ark is precious, sacred and the most important place in the synagogue. It contains several Torah scrolls.

The Torah scrolls, each scroll is handwritten and contains the sacred words of God.

The Bimah, where the Torah scroll is read. The Bimah is usually central in Orthodox synagogues and at the front in reform synagogues.

The Yad, this is used to read from the Torah, it helps you point to the exact place where you should be reading from.

Dietary Requirements: Kosher

Kosher means something that is fitting and proper according to Jewish Law. The opposite of Kosher is treifah, which is used to describe actions and food that is forbidden. The laws concerning Kosher date back to the Torah. There are many references about not only what can and cannot be eaten, but also the way foods should be prepared. Foods which are forbidden include many types of birds and shellfish, as well as animals that do not chew the cud or have parted hooves.

Kosher food can be quite hard to find in Britain and quite expensive. Among Orthodox Jews, meat and dairy products are not allowed to be eaten or cooked together, although they can be cooked separately. Reform and Orthodox differ in the way that their kitchens are organised. Orthodox arrange things in such a way that there is no contact between meat and dairy products, whereas Reform traditions are much less concerned with such matters, however many Reform Jews are careful to observe the basic principles of *kashrut*.

Jewish Rituals

Brit Milah: Is the Hebrew name to describe the religious circumcision of boys at 8 days old. It can be carried out in a hospital, home or synagogue and is carried out by a mohel (male). Circumcision involves the removal of the foreskin and is performed in front of the minyan. Relationship with God is shown through the circumcision, it represents the covenant with Abraham. As part of the covenant God gave Abraham the rite of circumcision as the specific sign of the Abrahamic covenant.

Bar Mitzvah At the age of 13 a boy becomes bar mitzvah - he enters into Jewish adulthood. From this time he will be able to form part of the Minyan (minimum group of ten needed for prayers). According to Jewish law at the age of 13 a boy is considered responsible to fulfil the mitzvot in the Torah. The term 'Bar Mitzvah' means 'Son of Mitzvah.' At this age it is believed that a young male can enter into a covenant relationship with God. In the years before his bar mitzvah ceremony a boy learns Hebrew so he can read a portion of the Torah in the synagogue.

Marriage is seen as an important religious and spiritual ceremony in Judaism. It allows procreation, fulfilling the duty to be 'fruitful and multiply' and the bonding referred to in the Torah. Marriage is considered God-given which can be seen by the word Kiddushin (holy or sanctified) which is used for the betrothal ceremony and the first part of the ceremony. The second part of the ceremony is called the Nisuin which finalises the marriage.

Mourning Rituals There is a pattern of rituals that take place when someone has died in the Jewish community. If possible a person's last moments should be spent reciting the Shema.

Chevre Kadisha: The burial society attached to the synagogue prepare the body for the burial.

The funeral is arranged by the Onan (main mourner).

Burial: For most Jews the body will be buried further than cremated and this should be done as quickly as possible.

Shiva: There are set rituals after the funeral which represents the fact that life cannot immediately carry on as before after a loved one has died these are known as Shiva (Meaning 7) and lasts for one week.

Factual Knowledge:

Jewish Festivals

Rosh Hashanah – Many consider Rosh Hashanah as the day God created the world. Rosh means head or beginning. It is a happy time to celebrate the beginning of the world. It is also a serious time when they remember God as judge. Rosh Hashanah and Yom Kippur are connected in a process of judgement as many people believe God judges people for the deeds in the last year. Special services are held on the eve of Rosh Hashanah. Special foods are eaten such as pomegranates, apples and honey to symbolise a sweet new year. At the morning service a shofar (rams horn) is blown 100 times to represent the crying of the soul asking to be reunited with God. Some Jews will perform tashlikh when they cast away the crumbs in their pocket to symbolise casting away sins. During the next ten days Jews consider their deeds of the year and try to apologise to anyone they have done wrong to.

Yom Kippur – Often called the Day of Atonement, it is the holiest day of the year. It is the end of the 10 days of repentance. It is a day of self-denial with a fast through the day. Many people spend this day in the synagogue. Food and money is given to help the poor. Some Jews will visit the mikveh (pool of natural water) for spiritual cleaning before Yom Kippur. They fast for 25 hours. In the synagogue the Kol Nidrei (all vows) is sung and the story of Jonah is told. During the prayers Jews confess their sins to God. The service ends with reciting the Shema. After nightfall a single blast of the shofar marks the end of the service.

Judaism Beliefs Key Terms:

Covenant: a promise or agreement between two parties. Covenants were made between God with Noah, Abraham and Moses.

Kosher: (fit or proper) foods that are permitted to be eaten according to Leviticus Chapter 11. It is also used to refer to the purity of ritual objects such as Torah scrolls.

Messiah: the anointed one who Jews believe will bring in a new era or age for humankind. This will include rebuilding the Temple and bringing in an age of universal peace.

Mitzvot: the term has a mix of meaning. It is often used to refer to duties (such as the 613 in the Torah) and good deeds.

Shabbat: day of spiritual renewal and rest. Beginning at sunset on Friday and closing at nightfall on Saturday.

Sukkot – An important harvest festival that is counted as a mitzvah. It remembers the 40 year period when the Israelites were in the desert on their way to the Promised Land. Shelters or booths (sukkahs) are made which represents the temporary shelters they used in the desert. Families will often eat and some sleep in here. Two special objects are used during the festival an Etrog (citrus fruit) and a lulav (palm, myrtle and willow placed in a wooden holder). Bringing the four species together is a reminder that Jews should be united.

Sukkot lasts for 7 days and many Jews do not work on the first and second day. Jewish families build a sukkah with a roof that the stars can be seen through. They may eat and sleep here. Sukkah are sometimes decorated with prayers and picture of fruit and harvests. Each morning the lulav is waved and a blessing said to God.

Pesach – celebrates the freedom from slavery in Egypt which was led by Moses. It is often called Passover as God passed over the houses of the Israelites during the final plague. In the book of Exodus God commands that the festival should be held each year.

Many foods are eaten during the celebration which have a special meaning: food without leaven such as matzah as a remembrance that the Israelites did not have time to allow the bread to rise before they left. The festival is called the festival of freedom and prayers are said for those who are not free. Before it begins the house is cleared of any products that rise. Families attend the synagogue and go home for a Seder meal. There will be a Seder plate with symbolic foods (lamb's bone, roasted egg, green veg to dip in salt, bitter herbs, paste made from apples, walnut and wine). Prayers are said for those who are not free and prayers from the Haggadah. The door is left open for Elijah who some Jews believe will come after Pesach to announce the coming of the messiah.

Key Terms continued:

Shekhinah: the place where God's presence rests and can be felt.

Synagogue: house of assembly; building for Jewish public prayer, study and assembly.

Torah: the five books of Moses (Genesis, Exodus, Leviticus, Numbers and Deuteronomy). Regarded as the holiest books of the Torah.



What do I need to know?

- Know what it means for two shapes to be congruent.
- Know the conditions necessary for two triangles to be congruent. (ASA, SAS, SSS and RHS)
- Find unknown lengths given two similar shapes.
- Find unknown areas and volumes using an area and volume scale factor.

How do I recognise this topic?

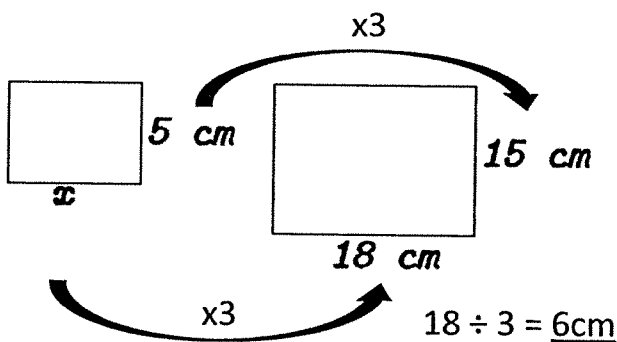
- Identify key words such as “congruent” and “similar” or “mathematically similar”.
- Congruency rules only apply to triangles. (ASA, SAS, SSS and RHS)
- When comparing 3D shapes that are similar, surface area and volume as typically referenced.

General Tips

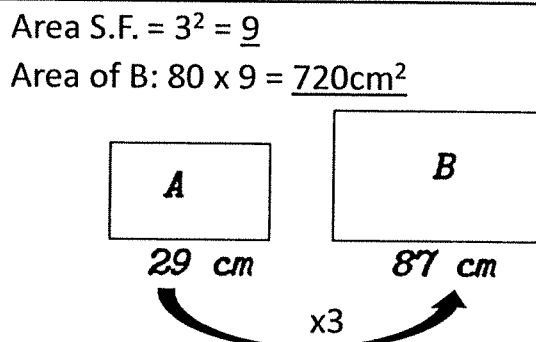
- Congruent shapes are **exactly the same**, just flipped or rotated. Try and see if you can visualise fitting the shapes on top of each other to show if they are congruent.
- When dealing with similar shapes, **always** work out the length (1-dimensional) scale factor when possible. You can then work out the area (2D) scale factor by squaring or the volume (3D) scale factor by cubing the length scale factor.
- It is possible to have a fractional scale factor (e.g.: -), use exact fractional calculations rather than rounded decimal calculations.

Worked Example

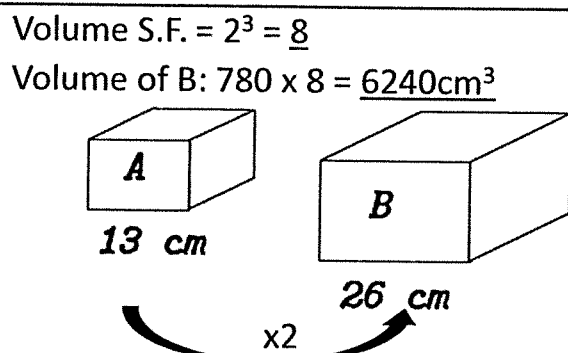
a) The shapes are similar, calculate the value of x .



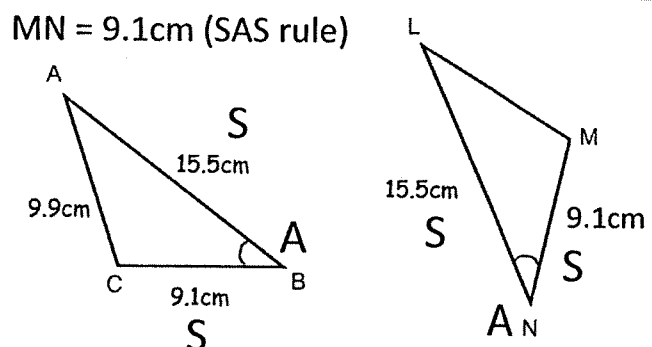
b) The shapes are similar, the area of A is 80cm^2 . Work out the area of shape B.



c) The shapes are similar, the volume of A is 780cm^3 . Work out the volume of B.



d) These two triangles are congruent with angles $B = N$. Write down the length MN.





What do I need to know?

- Able to perform and describe reflections of shapes.
- Able to perform and describe the rotation of shapes in either direction.
- Able to perform and describe translations of shapes using column vectors.
- Able to perform and describe enlargements of positive, fractional and negative scale factors.

How do I recognise this topic?

- Typically involves shapes and the following key words: “reflection”, “rotation”, “translation”, “enlargement” and “transformation”.
- Usually involves the coordinate grid and axes.

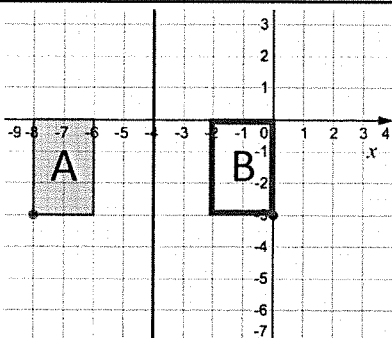
General Tips

- **Reflection:** count squares to the mirror line from a vertex (corner), then count the same amount of squares in the opposite direction to the mirror line. Repeat for other vertices.
- **Rotation:** if you don't have tracing paper, rotate the worksheet instead in the given direction.
- **Translation:** when reading a column vector, the number on the top part is the horizontal () movement and the bottom number is the vertical () movement (e.g.: $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ means 2 right and 1 up).
- **Enlargement:** work out the column vector from the centre of enlargement to one of the vertices, then multiply by the scale factor and use the new column vector from the centre to find your new vertex. Repeat for all other vertices.

Worked Examples

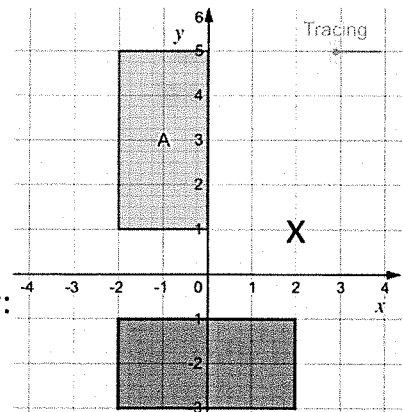
Use the tips above to perform the following transformations.

a) Reflect shape A against the line $x = -2$, label the new shape B

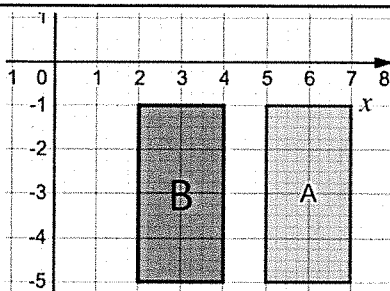


b) Rotate shape A 90° anticlockwise about the point (2, 1), label the new shape B.

90° is $\frac{1}{4}$ of a full turn.
About the point (2, 1) is the centre of rotation.
Anticlockwise means in the direction of this arrow:

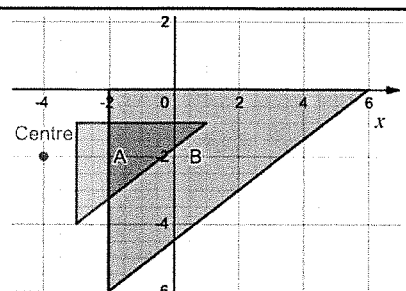


c) Translate shape A by the vector $\begin{pmatrix} 4 \\ -4 \end{pmatrix}$, label the new shape B.



d) Enlarge shape A by scale factor 2 about the point (-4, -2), label the new shape B.

First mark the centre.
Then, count the distance from the centre (-4, -2) to each corner of the shape, and multiply it by the scale factor 2.





What do I need to know?

- To remember and apply the formula for the area of a rectangle, triangle, parallelogram and trapezium.
- To work out the surface area of cubes, cuboids, triangular prisms and cylinders (prisms).
- To work out the surface area of spheres and cones, given the formula.

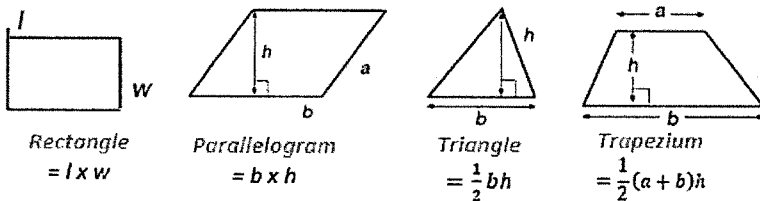
How do I recognise this topic?

- Look for the key word "area" and "surface area".
- 2D shapes typically involve area and 3D solids deal with surface area.

General Tips

- Identify that the question is asking you to work out "area" and/or "surface area".

• AREA



- Split any shapes into the above basic shapes and work out the area separately, then add/subtract as needed.

Worked Example

Area Bea makes a logo for a club in school. Work out the area of the logo.

Step 1 - trapezium and triangle
 Step 2 - $\frac{1}{2}(a+b)h$ and $\frac{1}{2}bh$
 Step 3 - $\frac{1}{2}(6+12) \times 6 + \frac{1}{2} \times 12 \times 15 = 54 + 90 = 144$
 Step 4 - 144 cm^2

Work out the area of the shape below.

The answer is Area = 149 cm^2
 Split the shape into two rectangles, and find the area of each rectangle.

Area = $21 \times 5 + 4 \times 11 = 105 + 44 = 149 \text{ cm}^2$

Surface Area

Step 1 - cuboid
 Step 2 - 6 rectangular faces
 formula $l \times w$
 Step 3 - front $9 \times 3 = 27$
 back $9 \times 3 = 27$
 top $9 \times 2 = 18$
 bottom $9 \times 2 = 18$
 side 1 = $2 \times 3 = 6$
 side 2 = $2 \times 3 = 6$
 total surface area = 102
 Step 4 - 102 cm^2

Shown below is solid cuboid

Work out the total surface area of the cuboid

Find the surface area of the cylinder with a radius of 3 cm and height of 4 cm, as shown on the diagram below.

The surface area of a cylinder is made of 2 circles and a rectangle, where the width of the rectangle is the circumference of the circle.

Give your answer correct to 1 decimal place.

Surface area = $2 \times \pi \times 3^2 + 2\pi \times 3 \times 4 = 131.9 \text{ cm}^2$

**What do I need to know?**

- Able to work out the volume of cubes and cuboids using the formula.
- Able to work out the volume of prisms and cylinders using the formula.
- Able to work out the volume of pyramids and cones using the formula.
- Able to work out the volume of spheres (given the formula) and frustums from cones/pyramids.

How do I recognise this topic?

- Look for key words such as “**volume**”, “**cross-section**” and “**capacity**”.
- Volume is always associated with some form of 3D solid or container.
- Metric units are cubed (e.g.: m^3/cm^3)

Step by Step Guide / General Tips

Step 1 - Identify the shape or shapes in the question.

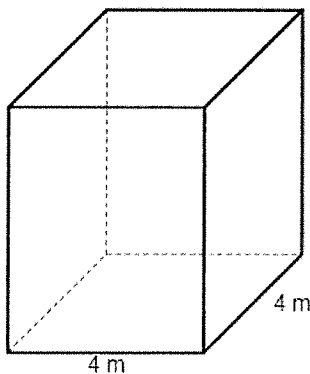
Step 2 - Select the correct formula.

Step 3 - Identify lengths of sides and substitute these measurements given into the formula.

Step 4 - Ensure that you have included correct units.

Worked Example

The diagram shows a fish tank in the shape of a cuboid.



The answer is 80 m^3

The volume of a cuboid is area of cross-section \times length.

$$4 \times 5 \times 4 = 80 \text{ m}^3$$

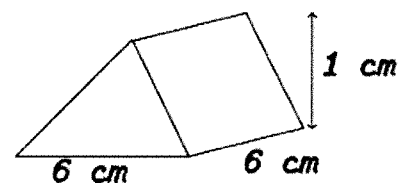
VOLUME

Cuboid
= $l \times w \times h$



Prism
= Area of cross section \times length

Work out the volume of the prism.



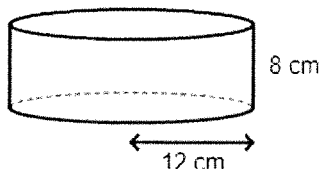
The answer is 18 cm^3

The cross-section is a triangle and its area is $\frac{1}{2} \times 6 \times 1 = 3$

The volume of a prism is cross-section \times length, therefore the volume is $3 \times 6 = 18$

Work out the volume of the fish tank.

A cylinder has a radius of 12 cm and height of 8 cm., as shown on the diagram below.

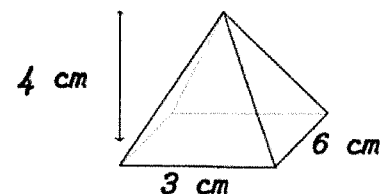


The answer is 3619.1 cm^3

The volume of a cylinder is $V = \pi r^2 h$, where $r = 12$ and $h = 8$

$$V = \pi \times 12^2 \times 8 = 3619.1$$

Work out the volume of this pyramid.



The answer is 24 cm^3

The volume of a pyramid is $\frac{1}{3} \times \text{base} \times \text{height}$, therefore the volume is:

$$\frac{1}{3} \times 3 \times 6 \times 4 = 24 \text{ cm}^3$$

Work out the volume of the cylinder.

Give your answer correct to 1 decimal place.



What do I need to know?

- Use and interpret maps and scale drawings
- Identify shapes that are congruent
- Understand similarity of triangles and of other plane figures, and use this to make calculations
- identify shapes that are similar, including all squares, all circles or all regular polygons with equal number of sides

How do I recognise this topic?

- Identify key words such as “congruent” and “similar” or “mathematically similar”.
- Congruency rules only apply to triangles. (ASA, SAS, SSS and RHS)

Step by Step Guide / General Tips

If two shapes are CONGRUENT, they are EXACTLY THE SAME — the SAME SIZE and the SAME SHAPE.

Similar shapes are exactly the same shape, but can be different sizes (they can also be rotated or reflected).

Worked Example

Two triangles are congruent if one of the four conditions below holds true:

SSS three sides are the same

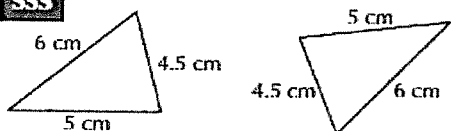
AAS two angles and a corresponding side match up

SAS two sides and the angle between them match up

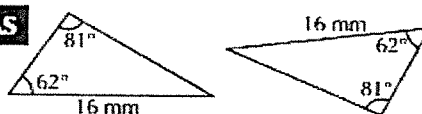
RHS a right angle, the hypotenuse and one other side all match up

The hypotenuse is the longest side of a right-angled triangle — the one opposite the right angle.

SSS

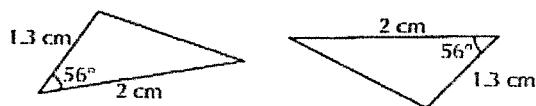


AAS

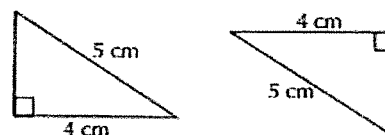


Make sure the sides match up — here, the side is opposite the 81° angle.

SAS



RHS



EXAMPLE:

Tony says, “Triangles ABC and DEF are similar.”
Is Tony correct? Explain your answer.

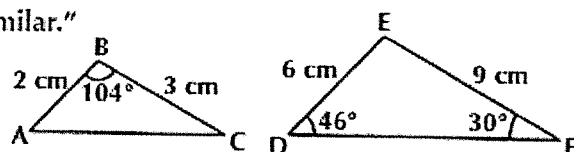
Check condition 3 holds — start by finding the missing angle in triangle DEF:

Angle DEF = $180^\circ - 46^\circ - 30^\circ = 104^\circ$ so angle ABC = angle DEF

Now check that AB and BC are proportional to DE and EF:

$DE \div AB = 6 \div 2 = 3$ and $EF \div BC = 9 \div 3 = 3$ so DE and EF are 3 times as long as AB and BC.

Tony is correct — two sides are proportional and the angle between them is the same so the triangles are similar.





What do I need to know?

- Able to perform and describe reflections of shapes.
- Able to perform and describe the rotation of shapes in either direction.
- Able to perform and describe translations of shapes using column vectors.
- Able to perform and describe enlargements of positive.

How do I recognise this topic?

- Typically involves shapes and the following key words: “reflection”, “rotation”, “translation”, “enlargement” and “transformation”.
- Usually involves the coordinate grid and axes.

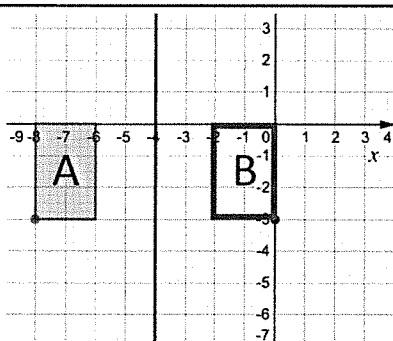
General Tips

- **Reflection:** count squares to the mirror line from a vertex (corner), then count the same amount of squares in the opposite direction to the mirror line. Repeat for other vertices.
- **Rotation:** if you don't have tracing paper, rotate the worksheet instead in the given direction.
- **Translation:** when reading a column vector, the number on the top part is the horizontal () movement and the bottom number is the vertical () movement (e.g.: $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ means 2 right and 1 up).
- **Enlargement:** work out the column vector from the centre of enlargement to one of the vertices, then multiply by the scale factor and use the new column vector from the centre to find your new vertex. Repeat for all other vertices.

Worked Examples

Use the tips above to perform the following transformations.

a) Reflect shape A against the line $x = -1$, label the new shape B

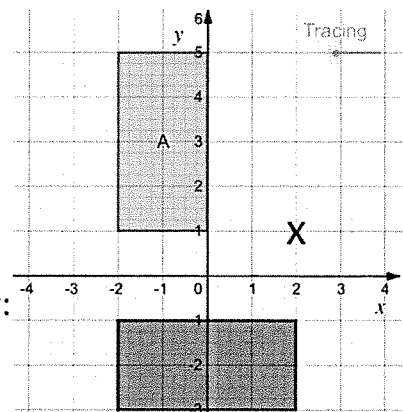


b) Rotate shape A 90° anticlockwise about the point (2, 1), label the new shape B.

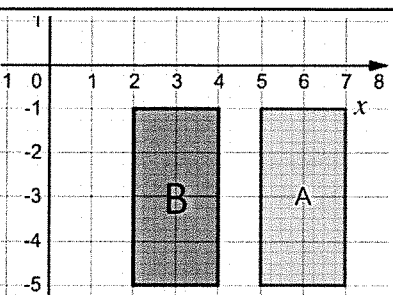
90° is $\frac{1}{4}$ of a full turn.

About the point (2, 1) is the centre of rotation.

Anticlockwise means in the direction of this arrow:

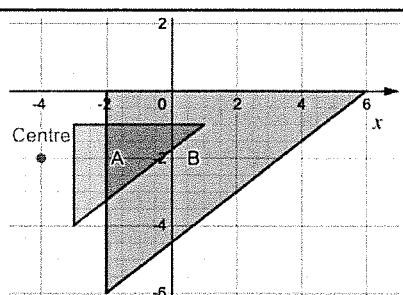


c) Translate shape A by the vector $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$, label the new shape B.



d) Enlarge shape A by scale factor 2 about the point (-4, -2), label the new shape B.

First mark the centre. Then, count the distance from the centre (-4, -2) to each corner of the shape, and multiply it by the scale factor 2.



**What do I need to know?**

- Able to find long and short sides of a right angle triangle using Pythagoras' Theorem.
- Model scenarios and apply Pythagoras' Theorem to solve problems.

How do I recognise this topic?

- Look for the key work "Pythagoras".
- Questions will **always** involve a right angle triangle, Pythagoras does not work for any other triangles.
- Pythagoras' Theorem deals with the **sides** of a triangle, any other angle (other than the right angle) is irrelevant. You should have the measurements of at least 2 sides of a triangle.

Step by Step Guide

1. Identify and label where the **hypotenuse** is (longest side of a right angle triangle).
2. Identify if a short or long side is required.
3. Square both numbers.
4. Add the result (if working out the longest side) or find the difference between the two numbers (if working out a short side).
5. Square root. (check units)

Worked Example**1) SQUARE THEM**

SQUARE THE TWO NUMBERS that you are given, (use the \square button if you've got your calculator.)

2) ADD or SUBTRACT

To find the **longest side**, **ADD** the two squared numbers. $a^2 + b^2 = c^2$
To find a **shorter side**, **SUBTRACT** the smaller from the larger. $c^2 - b^2 = a^2$

3) SQUARE ROOT

Once you've got your answer, take the **SQUARE ROOT** (use the $\sqrt{\quad}$ button on your calculator).
 $c = \sqrt{a^2 + b^2}$
 $a = \sqrt{c^2 - b^2}$

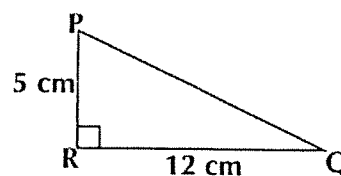
EXAMPLES:

1. Find the length of side PQ in this triangle.

1) Square them: $a^2 = 5^2 = 25$, $b^2 = 12^2 = 144$

2) You want to find the **longest side**, so **ADD**: $a^2 + b^2 = c^2$
 $25 + 144 = 169$

3) Square root: $c = \sqrt{169} = 13 \text{ cm}$



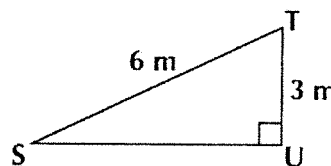
Always check the answer's sensible — 13 cm is longer than the other two sides, but not too much longer, so it seems OK.

2. Find the length of SU to 1 decimal place.

1) Square them: $b^2 = 3^2 = 9$, $c^2 = 6^2 = 36$

2) You want to find a **shorter side**, so **SUBTRACT**: $c^2 - b^2 = a^2$
 $36 - 9 = 27$

3) Square root: $a = \sqrt{27} = 5.196\dots$
 $= 5.2 \text{ m (to 1 d.p.)}$



Check the answer is **sensible** — yes, it's a bit shorter than the longest side.



What do I need to know?

- Label a right angle triangle with the key words "hypotenuse", "opposite" and "adjacent".
- Calculate unknown lengths of a right angle triangle using trigonometry.
- Calculate unknown angles of a right angle triangle using trigonometry.
- Recall and apply the exact trigonometric values.
- Learn the formula to the right.

<p>SOH</p> $\sin \theta = \frac{\text{Opp}}{\text{Hyp}}$	<p>CAH</p> $\cos \theta = \frac{\text{Adj}}{\text{Hyp}}$	<p>TOA</p> $\tan \theta = \frac{\text{Opp}}{\text{Adj}}$
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How do I recognise this topic?

- Involves a right angle triangle and another angle that is not 90°.
- Involves the maths functions "sin", "cos" and "tan".

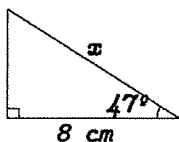
Step by Step Guide

1. Label the triangle with the key words.
2. Choose the appropriate trigonometric ratio.
3. Draw the formula triangle.
4. Cover what you need and use the triangle to work it out.
5. If working out an angle, press "shift" on the calculator before the appropriate trigonometric ratio.

Worked Example

Calculate a Length

Calculate the value of x .



Give your answer correct to 1 decimal place.

The answer is 11.7 cm

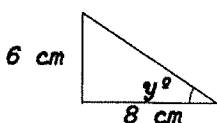
We use cos because we are involving the adjacent (8 cm) and the hypotenuse (x) of the triangle.

$$\begin{aligned} \cos 47 &= \frac{8}{x} \\ x &= \frac{8}{\cos 47} \\ x &= 11.7 \end{aligned}$$

<p>SOH</p> $\sin \theta = \frac{\text{Opp}}{\text{Hyp}}$	<p>CAH</p> $\cos \theta = \frac{\text{Adj}}{\text{Hyp}}$	<p>TOA</p> $\tan \theta = \frac{\text{Opp}}{\text{Adj}}$
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Calculate an Angle

Determine the value of y .



Give your answer correct to 1 decimal place.

The answer is 36.9°

We use tan because we are involving the opposite (6 cm) and the adjacent (8) of the triangle.

$$\begin{aligned} \tan y &= \frac{6}{8} \\ y &= \tan^{-1} \left(\frac{6}{8} \right) \\ y &= 36.9 \end{aligned}$$

<p>SOH</p> $\sin \theta = \frac{\text{Opp}}{\text{Hyp}}$	<p>CAH</p> $\cos \theta = \frac{\text{Adj}}{\text{Hyp}}$	<p>TOA</p> $\tan \theta = \frac{\text{Opp}}{\text{Adj}}$
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C2 Knowledge Organiser

1. INTRODUCTION TO BONDING

- There are three types of strong chemical bonding: ionic, covalent and metallic.
- Ionic bonding occurs when a **metal and non-metal** react forming **oppositely charged ions that attract**.
- Covalent bonding occurs when **non-metals** share a pair of **electrons**.
- Metallic bonding occurs in metals and alloys.
- Metals form positive ions - Group 1 elements form +1 ions, Group 2 elements form +2 ions.
- Non-metals form negative ions - Group 6 elements form -2 ions, Group 7 elements form -1 ions.

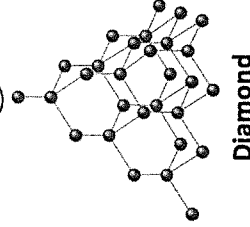
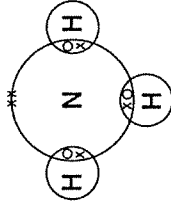


2. IONIC BONDING

- When a **metal** reacts with a **non-metal** electron(s) in the outer shell are **transferred**.
- **Metal** atoms **lose electrons** to become **positively charged ions**
- **Non-metal** atoms **gain electrons** to become **negatively charged ions**.
- An ionic compound is a **giant structure** of ions (**giant ionic lattice**) held together by **strong electrostatic forces** of attraction between the oppositely charged ions.
- Ionic compounds have **high melting and boiling points** due to the **strong electrostatic forces**. Therefore large amounts of energy is needed to break the ionic bond.
- When **molten or dissolved in water**, ionic compounds **conduct electricity** because the **ions are free to move so a charge can flow**.

3. COVALENT BONDING

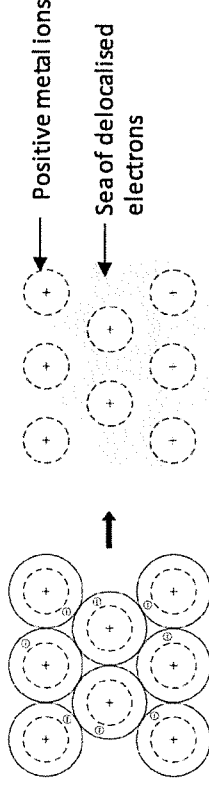
- **Small molecules** e.g. H₂O and CO₂ are usually gases or liquids at room temperature, and have **low melting and boiling points**. They have **weak intermolecular forces**, which require little energy to overcome. The **intermolecular forces increase with the size of the molecules**, so larger molecules have higher melting and boiling points. They do **not conduct electricity** because the molecules **do not have an overall charge**.
- **Giant covalent structures** e.g. Diamond, silicon dioxide and graphite have **very high melting and boiling points**. This is because all of the atoms in these structures are joined by **very strong covalent bonds**, this requires a lot of energy to overcome.



Diamond

4. METALLIC BONDING

- Metals consist of **giant structures** of atoms arranged in a **regular pattern**.
- The electrons in the outer shell of metal atoms are **delocalised** and are attracted to positive metal ions. **They have high melting and boiling points** as this attraction is strong.



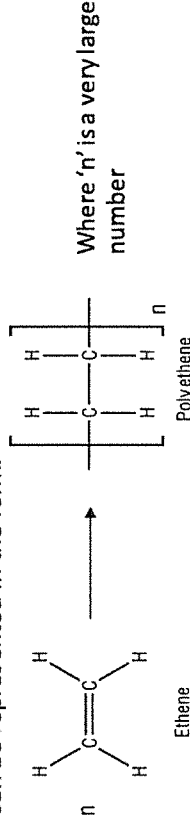
- Metals are **good conductors of electricity** because the delocalised electron in the metal **carry electrical charge** through the metal. Metals are **good conductors of thermal energy** because the energy is transferred by the delocalised electrons.

5. POLYMERS

Polymers are **very large molecules**.

The **forces between polymer chains are relatively strong** and so these substances are solids at room temperature.

Polymers can be represented in the form:

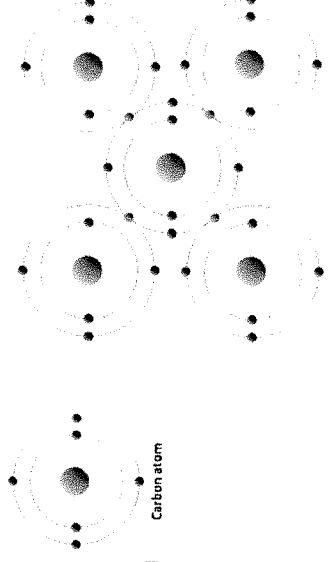


6. ALLOYS

- In pure metals, atoms are arranged in **layers**, which can **slide over each other**, which means metals are **soft** and allows metals to be **bent into shape**.
- Alloys are made by mixing a metal with another element which make them harder, as the **layers are disrupted due to different sized atoms**, so the **layers can no longer slide** over each other.

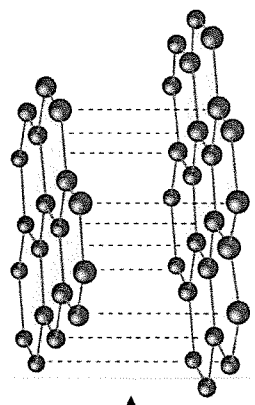
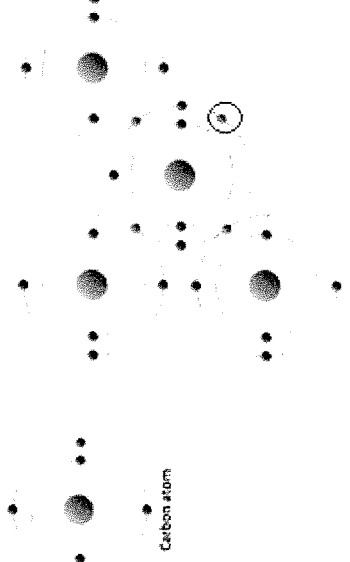
7. DIAMOND

- Diamond is made out of carbon atoms.
- In diamond, **each carbon atom forms 4 x covalent bonds with 4 other carbon atoms.**
- Also, due to diamond having many strong covalent bonds, **diamond has a very high boiling point and hard** due to a lot of energy being needed to overcome the covalent bonds.
- **Does not conduct electricity** as they don't have delocalised electrons.



8. GRAPHITE

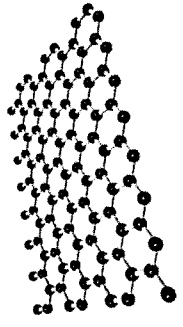
- Graphite is made out of carbon atoms.
- In graphite, **each carbon atom forms 3 x covalent bonds with 3 other carbon atoms.**
- Graphite is made of **hexagonal rings** with **weak forces** (see diagram below), this makes graphite **soft and slippery**.
- In graphite, one electron from each carbon atom is **delocalised** (diagram on right), so **a charge can flow**, so Graphite **can conduct electricity**.



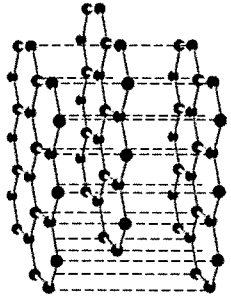
Weak forces between the layers of graphite, this causes graphite to be soft.

9. GRAPHENE

- Graphene is a **single layer of graphite** and is **used in electronics and composites**.
- This is because graphene is made up of many strong covalent bonds which make it **strong**.
- Each **carbon atom forms three covalent bonds** with the other carbon atoms, leaving an **electron which is delocalised**, so Graphene will **carry a charge** so **conduct electricity**.



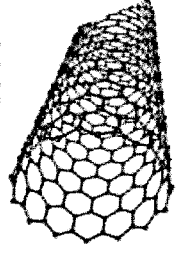
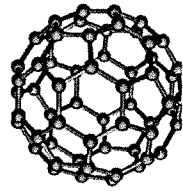
Graphene



Graphite

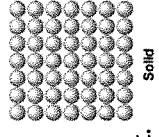
10. FULLERENE

- Fullerenes are molecules of carbon atoms with hollow shapes.
- The first discovered fullerene was Buckminsterfullerene (C_{60}) which has a spherical shape.
- Carbon nanotubes are cylindrical fullerenes with very high length to diameter ratios.
- Their properties make them useful for nanotechnology, electronic and materials.

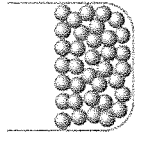


11. STATES OF MATTER

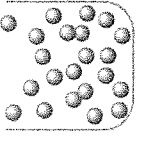
- The three states of matter are solid, liquid and gas.
- Melting and freezing take place at the melting point
- Boiling and condensing take place at the boiling point.
- The amount of energy needed to change state depend on the strength of the forces between the particles of the substance. The stronger the forces, the higher the melting and boiling point.



Solid



Liquid



Gas

P1 - Energy

<u>Energy Store</u>	<u>Example</u>
Kinetic	Moving objects
Gravitational	High objects
Chemical	Fuel, Food and Batteries
Electrostatic	Balloons and hair
Magnetic	Fridge Magnet
Elastic	Stretched rubber band
Nuclear	The nucleus of an atom
Thermal	Hot objects

Energy Definitions

System – A group of objects
Closed system – The amount of energy in the system is constant
Wasted Energy – Energy that is dissipated (spread out) and stored in less useful ways
Specific Heat Capacity – The amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.

Power – Rate of energy Transfer
 (1W = 1 Joule per second)

Energy Transfer

Mechanically	Using forces
Heating...	...of particles
Radiation	Light, Infra-red and sound
Electrically	In a circuit

Conservation of Energy

Energy cannot be created or destroyed – only transferred usefully, stored or dissipated.

Units

Energy – Joules (J)
 Work Done – Joules (J)
 Power – Watts (W)
 Distance – Metres (m)
 Time – Seconds (s)
 Mass – Kilograms (kg)
 Spring Constant – N/m
 Specific Heat Capacity – J/kg°C
 Gravitational Field Strength – N/kg

Reducing Unwanted Energy Transfer

Lubrication – Reduces friction, so less energy dissipated due to heating.
 Insulation – Low thermal conductivity – lower rate of energy transfer.
 Efficient – Wastes a lower proportion of the energy provided.

Equations to Learn

Kinetic Energy = $0.5 \times \text{Mass} \times (\text{Speed})^2$

G.p.e = $\text{mass} \times \text{gravitational field strength} \times \text{height}$

Energy = $\text{power} \times \text{time}$

Work done = $\text{power} \times \text{time}$

Efficiency = $\frac{\text{Useful output}}{\text{total input}}$ (This can be energy or power)



Equations on the Equation Sheet

Change in thermal energy = $\text{mass} \times \text{specific heat capacity} \times \text{temperature change}$
 Elastic Potential Energy = $0.5 \times \text{Spring Constant} \times (\text{Extension})^2$

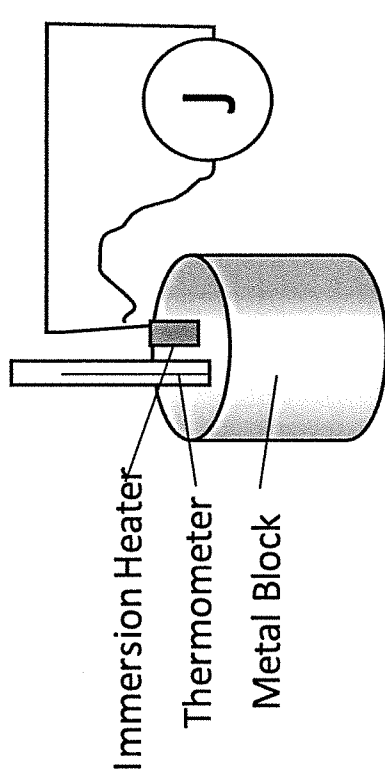
Core Practical – Specific Heat Capacity

Measure mass of sample.

Measure energy change for 1°C temperature change.

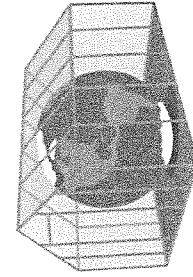
Use specific heat equation.

Insulate to reduce energy loss = more accurate result.



Prefix	Multiple	Standard form
Kilo	1,000	$\times 10^3$
Mega	1,000,000	$\times 10^6$
Giga	1,000,000,000	$\times 10^9$

Energy resource	What is it?	Positive	Negative
Fossil Fuels (coal, oil and gas)	Burnt to release thermal energy used to turn water into steam to turn turbines	Easy to transport, relatively cheap	Extraction can cause problems: fracking can lead to tremors. Carbon Dioxide released → Leads to Global Warming
Nuclear	Uranium fuel undergoes Nuclear Fission	No CO_2 produced. Lots of energy produced from small amounts of fuel.	Non-renewable. Radioactive waste remains dangerous for a long time. Possibility of disaster (Eg Chernobyl)
Biofuel	Fuel from living organisms	As plants grow, they absorb CO_2 : 'carbon neutral'.	Land used for fuel crops instead of farming (in developing countries). Habitats destroyed to use land for fuel crops.
Tides	"Tidal Barrage" traps water from tides to use to generate electricity.	Predictable due to consistency of tides. No greenhouse gases produced.	Expensive to set up. A barrage (dam) is built across a river estuary, flooding habitats and causing problems for ships and boats.
Waves	Up and down motion turns turbines	No waste products.	Can be unreliable depends on wave output as large waves can stop the pistons working.
Hydroelectric	Falling water spins a turbine	No waste products. Very reliable.	Habitats, farmland and houses can be flooded when dam is built.
Wind	Movement causes turbine to spin which turns a generator	No waste products.	Unreliable – wind varies. Visual and noise pollution. Dangerous to migrating birds.
Solar	Directly heats objects in solar panels or sunlight captured in photovoltaic cells	No waste products.	Unreliable due to light intensity (Eg: Night time or cloudy days). Making and installing solar panels expensive.
Geothermal	Hot rocks under the ground heats water to produce steam to turn turbine	No greenhouse gases produced.	Limited to a small number of countries. Geothermal power stations can cause earthquakes.



Uses of Energy Resources

Transport, Electricity Generation, Heating

Non-renewable energy resource

These will run out. It is a finite reserve. It cannot be replenished.

Renewable energy resource

Replenish as they are being used

PHYSICS 3

Particle Model of Matter

Required Practical

Density

Use displacement can to find volume of an irregular shape

Regular shapes:

Measure the length, width and height.

Multiply these numbers together to find the volume

Record the mass of the object using a balance

Find the density by dividing the mass (kg) by the volume (cm³)

Liquids:

Place a measuring cylinder on a balance and tare it to zero.

Record the volume of liquid by reading off of the measuring cylinder.

Record the mass by looking on the reading on the balance.

Calculate density by dividing mass by volume

Irregular objects.

Measure the mass using a balance.

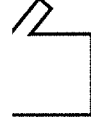
Fill a eureka can with water to the same level as the drip hole.

Place a beaker underneath the drip hole.

Attach a piece of string to your object and lower it gently into the eureka can.

Measure the volume of water in the beaker (the volume of water displaced will be the same as the volume of the object)

Calculate the density of the object by dividing its mass by the volume of displaced water.



2

Definitions

1

Density – How compact a substance is

Internal Energy – The sum of the kinetic and potential energy of the particles in a substance

Specific Heat Capacity – The amount of energy required to raise the temperature of 1kg of a substance by 1°C

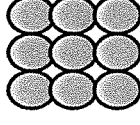
Specific Latent Heat – The amount of energy required to change the state of 1kg of a substance with no change in temperature

SLH of fusion – Solid to liquid

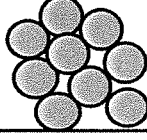
SLH of Vaporisation – Liquid to gas

Arrangement

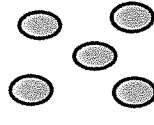
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Solid: All touching, no gaps, neatly arranged. Vibrate around fixed points.



Liquid: All touching, small gaps, randomly arranged. Move freely.



Gas: Spread out, large gaps, randomly arranged. Move freely with a range of speeds in random directions.

4

Units

Density: kg/m³

Mass: kg

Volume: m³

Thermal Energy: J

Specific Heat Capacity: J/kg°C

Temperature: °C

Specific Latent Heat: J/kg

5

Changes of State

Melt: Solid → Liquid

Freeze: Liquid → Solid

Boil: Liquid → Gas (When all particles have enough energy)

Evaporate: Liquid → Gas (When some particles have enough energy)

Condense: Gas → Liquid

Sublimate: Solid → Gas (Eg: Iodine and CO₂)

Internal Energy

Heating changes the energy stored in a system.

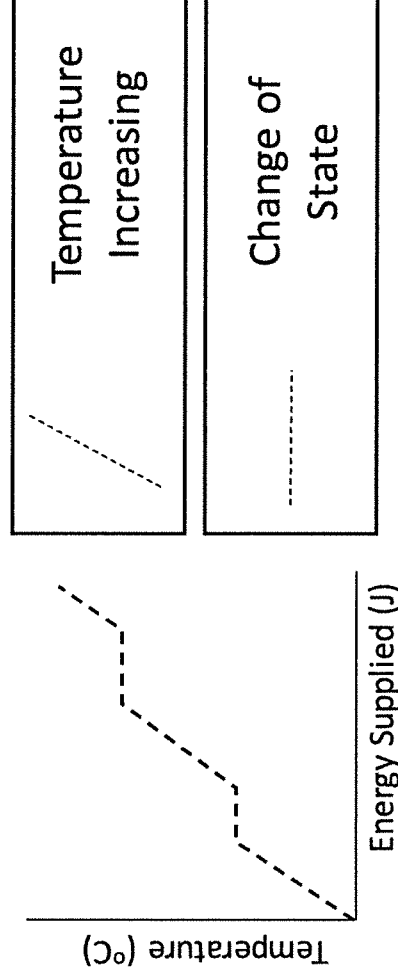
Kinetic Energy – Speed of Particles

Potential Energy – Distance between particles

Heating Curves

Raising temperature = Increase Kinetic Energy

Changing State = Increase in Potential Energy



Specific Heat Capacity

The increase in temperature of a substance

depends on:

- Mass
- Type of Material
- Energy Supplied

Specific Latent Heat

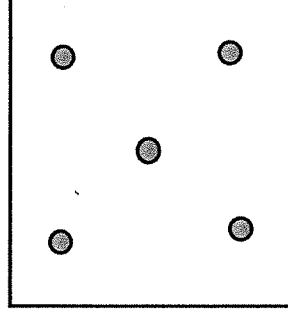
Energy needed to change state depends

on:

- Mass
- Type of Material

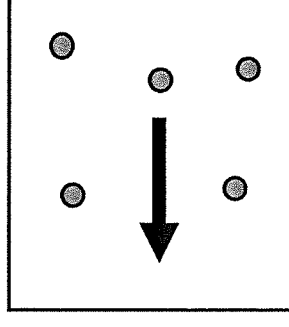
Particle Motion in Gases

- Brownian Motion – Particles move with a range of speeds in random directions
- Particles are in constant motion
- Temperature related to average kinetic energy.



Pressure in Gases

- Particles collide with walls of container
- Producing a force
- Causing an outwards pressure.
- Higher temperatures have faster particles
- So pressure increases.



Equations to Learn

Mass = Density x Volume

Equation on the Equation Sheet

Change in Thermal Energy = Mass x Specific Heat Capacity x Temperature Change
Energy for a change of state = Mass x Specific Latent Heat

Week 1

Ultimate guide to get A* in GCSE Art // 15 Quick Tips!!

By Genevieve Hall

https://www.youtube.com/watch?v=HTw_KqfWtD0

The Key Knowledge You Need To Know After This Video:

- Use different media
- Show a development of your idea
- Try to pick a theme and stick with it
- Describe, Analyse, Evaluate and Interpret
- Don't go all out with the background
- Highlight keywords
- Don't go overboard with biographical information.
- Try to make each page 70% visual
- Justify every decision you make.
- Show improvement.
- Stencil – TRACE outlines.
- Show your processes.
- Don't leave space blank.
- Be original



Week 4

Writing your thoughts and opinions about a drawing by the artist Stephanie Ledoux.



Word Bank:
COLOUR: stylised / simplified / observed / appropriate / evocative / symbolic / soft / aged.

LINE: fluid / weight of line / strength of line / textured.

LIGHT: tonal/ highlights/ shadows / mid tones/ soft / harsh.

TEXTURE: varied / smooth / exciting / creases / fur / hair / textured/ rough / layered.

COMPOSITION: foreground / background/ layered / focal point / incomplete.

TYPE OF ART: portrait / travel / documentary / rough / sketch / experimental / textural.

MEDIUM: mixed media / collage / paint / wash / charcoal / chalk / print / papers.

FEELING: curious / wonder/ cultural / anthropological.



Week 2

Stephanie Ledoux: 5 feet high TRAVEL PORTRAITS!!

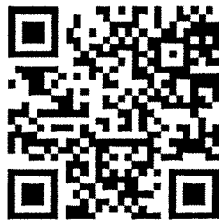
By 😊👩🏻🎨 Stéphanie Ledoux EXHIBITION w/ Maud Villaret

By Following the White Rabbit

<https://www.youtube.com/watch?v=bxV0eUdHa0s>

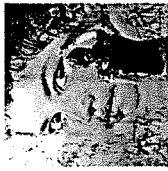
The Key Knowledge You Need To Know After This Video:

- Where was the exhibition being held? Paris
- Who else did Stephanie Ledoux partner up with to produce this exhibition? Maud Villaret.
- What type of art does the above artist create? Textile art.
- What is the main theme or focus for Stephanie Ledoux's work? Portraits.
- Name at least three techniques she uses to produce her work: painting, drawing and collage.
- What things are added to the flat pieces of work to give more interest and texture? Balls of fabric, earrings, leathers, shells, beads.
- The narrator says she really loves the "artistic cases" she creates. What does Stephanie Ledoux place inside them? Things she has brought from her travels, art materials used and her art work
- How does the narrator describe how the two artists work with each other? Like ping pong, one will start a piece then pass it to the other to work on and so on –narrator says this is "so clever...an interesting process"
- Where was Stephanie Ledoux's 'travel journal sketchbook' from? Papua New Guinea.

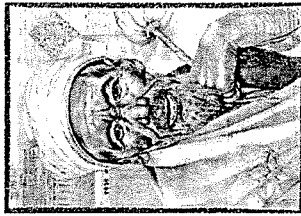


Week 5

Annotating your own work.



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GCSE Literacy
How to annotate booklet.



Week 3

Key terms and Vocabulary Definition finding.



The Key Terms You Need To Know Are:

- Emphasis** - Draw the viewers' attention to something in your work by emphasising the shadows around it for example.
- Layer** - Build up a piece of artwork in stages and using different materials.
- Outcome** - The final piece you end up making.
- Technique** - A way of applying a material.
- Collage** - A set of standards your work will be judged and graded on.
- Transfer** - To trace an image, flip the tracing paper over and then transfer it onto another surface.
- Tone** - The particular quality of brightness, darkness, or hue of a shade of a colour – Adding Black.
- Dark's of shadow** - The darkness of a shadow.
- Highlight** - The white area which shows where the light is reflecting of the object.
- Light source** - Where is the light coming from.
- Mid tone** - All the middle tones NOT just black and white but all the greys.
- Three Dimensionality** - Showing how an object takes up space.

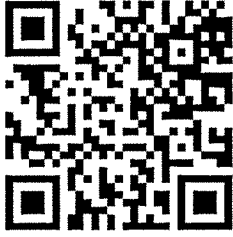
Week 6

Practice & Develop Your Skills Further.



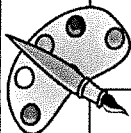
How to Draw a Realistic Dog | Tutorial for BEGINNERS
By Ali Haider

How to Draw a Realistic Dog | Tutorial for BEGINNERS - YouTube








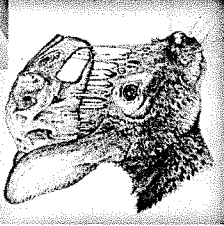
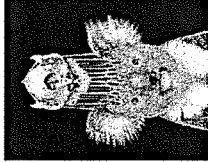
Challenging Yourself: Jimmie's Studios.

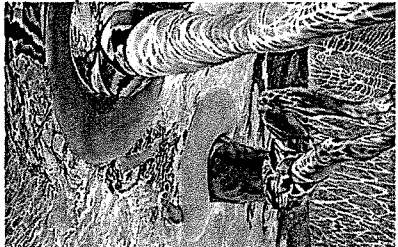
The practice you get when you consistently draw. Whether you are actively trying to improve or not, the act of consistent and repeated action over time will improve your ability to draw. Take up a daily sketching habit. Whether you like it or not, if you commit to a daily drawing practice you are going to see an improvement. Drawing on a consistent basis doesn't have to be a huge commitment! Get a small portable sketchbook to carry around with you. Are you sitting on the bus or in the car? Sketch what you see out the window. What do you see at lunch or in the gym? Go somewhere quiet and draw whatever comes to mind. What do you see at home? Draw what you see. It doesn't need to be perfect and it's not going to be marked. The act of drawing, whatever it may be, will take you one step closer to mastery.



Y9

Art & Design Knowledge Organiser - 2

<p>Week 1 What is Crosshatching? - Pen and ink drawing for beginners By Shoo Raynor https://www.youtube.com/watch?v=huD94n20iBY</p>		<p>The Key Knowledge You Need To Know After This Video: What is hatching? Using lines to trick the eye into seeing tone. What is cross hatching? Adding more layers of lines in different directions. What does this do? Increases the tonal value – making it darker.</p>	<p>Week 4 Writing your thoughts and opinions about a drawing by the artist Paul Jackson.</p>	<p>Word Bank: COLOUR: monochrome / translucent / opaque / tint / tone / highlight / grey. LINE: cross-hatching / textural / tonal / mark-making / broken / weight. LIGHT: tone / observed / realistic. TEXTURE: realistic / observed / varied / suggestive / rough / fur / layered / realistic. COMPOSITION: close-up / subject matter / focal point / foreground / profile TYPE OF ART: portrait / wild life / fantasy / observed / imaginative. MEDIUM: ink / wash / brush / pen / water. FEELING: disturbing / fascinating / morbid / creative / masculine / contemporary / fashionable.</p> 
<p>Week 2 Animals Leave Their Skeletons Behind In Stunning Dark Drawings By Paul Jackson By lbeautifulphtography https://www.youtube.com/watch?v=pwufha82b1Q</p>		<p>Can you recognise the key characteristics and style of Paul Jacksons art work? What are they?</p>	<p>Week 5 Annotating your own work.</p>	 <p>All Saints VLE Art & Design GCSE Y9 –Y11 GCSE Literacy How to annotate booklet.</p> 
<p>Week 3 Key terms and Vocabulary Definition finding.</p> 	<p>The Key Terms You Need To Know Are: Ensure: Make certain that (something) will occur or be the case. Link: Make strong connections and links between your work and the artists that you have researched. Component: A part of your piece of artwork e.g. the background to your painting. Exclude: Don't use. Get rid of. Initial: Your first thoughts and ideas – the starting point. Consistency: How much water you add to paint can affect its consistency. Wash: Paint or ink with lots of water used to add a slight coloring to the background. Translucent: Thin layers of paint or ink so that you can see how the tone or piece of artwork has been built up. One-que: Think layer of paint – Not see through. Tip pen: pointed end part of a pen, which distributes the ink on the writing surface. Contrast: The difference between the black of the ink and the pure white of the paper for example. Detail: Looking at all the small components that make up an object and trying to draw/capture them e.g. fur on a dog OR scales on a snake. Fantasy: Use of your imagination, does not exist in reality e.g. mixing two animals together to make a hybrid creature. Cross Hatching: Shading with closely drawn parallel lines. Texture: How something feels and trying to capture that by using the different qualities of the art material you are using.</p>	<p>Week 6 Practice & Develop Your Skills Further.</p> 	<p>How to Draw With Pen and Ink - Cross Hatching - 3 Ways to Shade With Fountain Pen (Vanishing Point) By Fine Art Tips https://www.youtube.com/watch?v=0Bmb-1ndkZs</p>	
<p>Creating an Inspired Practice Just like the way you watch anime, and are blown with those bits of new ideas screaming to be captured on your sketch pad? Inspired practice is when you act on that burning passion to create, try new things, and capture your ideas. Often this can be an intense drawing session where you completely lose yourself in the process, and come out completely exhausted, with a real sense of achievement. Inspired practice often comes in rapid bursts of learning through observation and enthusiasm. It can be incredibly addictive! However, it comes with a catch. It isn't easy to maintain, it can be incredibly fickle, difficult to conjure and very hard to keep. But it is still a powerful tool in your creative arsenal. We have all experienced difficult times or gone through depressive periods. It can make inspired practice seem so far away, and unreachable. The key to this is addressing yourself first before you address your artwork or craft. Otherwise, you will be fighting an uphill battle (which can often make progress slower). It could look like getting out of the house with friends or taking up a different hobby. Also, your surroundings will greatly help in improving your drawing. Make sure you have a clean and tidy workspace, ideally dedicated to your creativity. Clean space motivates you and inspires you to do great things. Cleanliness also removes any obstacles to expressing your creativity. So, practicing art sometimes doesn't seem easy. Then you get inspired by something. Practicing art sometimes doesn't seem easy. Then you get inspired by something. Another way to inspire yourself is to learn a new tool or technique that allows you to do something more efficiently on a computer or paper. Sometimes, you just can't help but grab the closest piece of paper and try out the new tricks you have just learned. And finally, get out of the house and go somewhere inspiring. Getting out into nature or go to a museum or art show. By stepping out of your regular routine, and actively seeking these experiences, you can cultivate rapid bursts of inspired learning. Ultimately, when surrounded by things that inspire you, and are in the emotional state where you are feeling, you can carry out those creative intentions and skyrocket your ability to draw in a short burst of time. That is the power of inspired practice.</p>				



Week 1
Photorealism
 By: Emily Ward
<https://www.youtube.com/watch?v=5Xq38-LDII>



The Key Knowledge You Need To Know After This Video:

- When did the art movement begin? 1960's
- Where did it begin? New York.
- What movements had been happening beforehand? Pop art, Minimalism, Abstract expressionist.
- What was the name of the group of artists who came after? Realist.
- What didn't they like? Looseness, Lack of skill, Of Abstract impressionist art.
- What did the Realist painters do? Went back to basics of griding and details.
- What is photorealism? The interaction of what is real and un real.
- How do they use light and colour? As one element.
- Who are the artists of this movement? Chuck Close / Richard Estes / Audrey Flack
- What are the characteristics of their art work? Larger than life, Worked from a photograph, A still moment in time, Of an idealised everyday object or scene, Detailed.

Week 4
Writing your thoughts and opinions about a painting by the artist Lorraine Shemish.

Word Bank:
COLOUR: observed / realistic
LINE: smooth / invisible / realistic
LIGHT: observed / exaggerated / reflections / highlights / shadows
TEXTURE: observed / realistic / wet / hair
COMPOSITION: dramatic / dynamic / birds eye view point / worms eye view point / underwater / contemporary / portrait / figurative / sport/ action
TYPE OF ART: photorealistic / contemporary / portrait / figurative / MEDIUM: oil paints.
FEELING: active / dynamic / exciting / happy / fun

Week 2
Lorraine Shemish | "The Space Between Us" | Artist Documentary
 By: Lorraine Shemish
<https://www.youtube.com/watch?v=CfIYcPv7d4s>



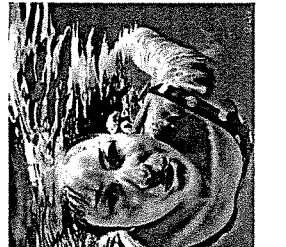
The Key Knowledge You Need To Know After This Video:

- How does she explain that ballet influenced her? Wasn't very verbal. Expected to raise above what you could do naturally. Ballet denies the existence of gravity. --How does she describe dance? A pure visual form.
- What does she say about paint? It wants to be led.
- How does she describe how she makes painting's? From the inside out. From NY inside out.
- What does she say the hardest thing about painting is? Not what you put in but what you leave out.
- What does she say is most important in a painting i.e. not how well you paint the figure? The space in-between things.


Week 5
Annotating your own work.



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 GCSE Literacy
 How to annotate booklet.




Week 3
Key terms and Vocabulary Definition finding.

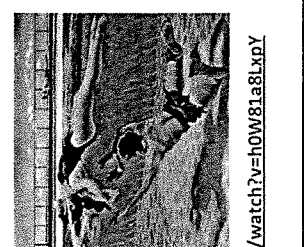


The Key Terms You Need To Know Are:
Demonstrate: Show someone how to do something.
Framework: A structure – Certain steps to follow in order to achieve something.
Maximises: Make something as large as possible.
Remove: Take something away OR use a rubber to erase it.
Sufficient: Enough. E.g. you have enough paint in your pallet mixed up.
Application: Thing how you apply a certain material onto a surface E.g. you may use a paint brush to paint onto a surface.
Layer: building up a piece of artwork in stages so that the different stages are visible.
Blend: Mixed together.
Pressure: E.g. Using varied pressures on a pencil to create different tones.
Polished: high quality, finished no mistakes, skillful.
Photography: The art form of taking photographs.
Figurative Art: which included a figure as its main subject or focus.
Seamless: smooth and continuous, with no apparent gaps or spaces between one part and the next.
Awes Inspiring: Looking at a piece of art and being inspired by it because it is impressive but then also thinking "I'll never be able to do that".
Photorealism: A piece of art that is so realistic it looks like a photograph rather than a painting or drawing someone has made.

Week 6
Practice & Develop Your Skills Further.

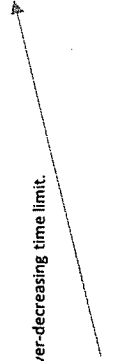


Grid method for Drawing Outlines
 By Sourav Joshi Arts
<https://www.youtube.com/watch?v=h0W81a8LXPY>



Challenge Yourself:
Repeat An Image Over And Over
 This activity involves choosing a single image or object and drawing it many times over with an ever-decreasing time limit.
Step 1: Find a picture and draw it on a piece of paper. Time how long it takes.
Step 2: Draw the same image again. However, see if you can draw it quicker.
Step 3: Continue to replicate the image as best you can and continue to reduce the time limit.


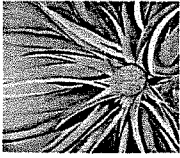
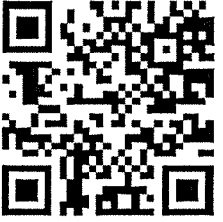
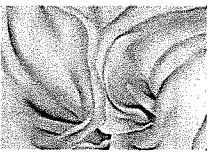



After doing this at least 20 times, you will notice something interesting...
 Look at the first image you draw and then the last image you drew.
 You will notice you are looser and more relaxed.
 By this stage, you will be more efficient at being aware of the most relevant forms, details, lines, and silhouettes of the image.
 This exercise helps you understand an image or object as a whole because you are rapidly interpreting it.
 When drawing the eye, don't just practice drawing it once.
 Draw it, again and again, aiming to get quicker and more efficient.
 By the time you have done this exercise, you will have drawn the object repeatedly and will be confident you can do it again.



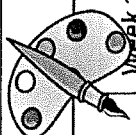


Art & Design Knowledge Organiser - 4

<p>Week 1 Ink Drawing Techniques for Beginners</p> <p>By: Devin Ellie Kurtz</p> <p>https://www.youtube.com/watch?v=8KCM1317m5E</p>		<p>The Key Knowledge You Need To Know After This Video:</p> <ul style="list-style-type: none"> -Name two different types of pens that can be used for ink drawing? Fine liners and brush pens. -What would be helpful to do before you start an ink drawing? Test out the thickness of pen so you know where you will need to use it. -What are work tips perfect for? Long lines makes that go from thick to thin. -How do you do to help you practice getting long thick to thin lines? Spend time turning over lines. -What does the advice you to use a variety of and what can they do to a piece? Fine and thick lines, help to bring interest, can help direct the eye. Good way to separate elements and exterior of a character or background element. -How do you use instead of a pen to add texture? An old brush. -How to you make ink washes? Mix ink with water. -What are the techniques does the advice you to practice apart from practicing making different washes? Using wet ink over dry ink. -What effect does using this layering technique give to your work? Depth. -What is the technique called where you use ink on top of -What was her final tip to help when it is hard to leave white areas of paper? Use white ink for highlighting. 	<p>Week 4</p> <p>Writing your thoughts and opinions about a painting by the artist Patricia Ariel.</p>	<p>Word Bank:</p> <p>COLOUR: monochrome / cool / calm / vibrant / fluid / uncontrolled / washy/ transparent / layered. LINE: varied / contour lines / cross-hatched / controlled. LIGHT: realistic / highlights / shadows / tone / soft. TEXTURE: realistic / hair / drips / dribbles / layered. COMPOSITION: focal point / subject matter / close-up / foreground/ layered / unfinished / faded away. TYPE OF ART: portrait / contemporary / fantasy stylised/ mixed media/ mother nature / youthful. MEDIUM: mixed media/ ink / fine liner / pen / pencil/ dip pen / ink wash. FEELING: moody/ whimsical / ephemeral / relaxed /modern /dream / calm / soothed.</p>
<p>Week 2</p> <p>Graphite Drawing demo with Patricia Ariel - time lapse</p> <p>By The House Of Mirrors Studio</p> <p>https://www.youtube.com/watch?v=GfifANeh16vY</p> <p>Patricia Ariel</p> <p>By For You</p> <p>https://www.youtube.com/watch?v=VFZFWJL7J74</p>		<p>Can you recognise the key characteristics and style of Patricia Ariel art work?</p> <p>What are they?</p>	<p>Week 5</p> <p>Annotating your own work.</p>	<p>All Saints VLE Art & Design GCSE Y9 -Y11 GCSE Literacy How to annotate booklet.</p>
<p>Week 3</p> <p>Key terms and Vocabulary Definition finding.</p>	<p>The Key Terms You Need To Know Are:</p> <p>Hence: "The proportion of the eyes in this drawing are not correct hence it not looking like the sitter".</p> <p>Occupy: Fill or take up.</p> <p>Adequate: Satisfactory.</p> <p>Contrast: "The difference/ contrast between the blackness of the ink to the pure whiteness of the paper".</p> <p>Investigate: Research.</p> <p>Weight of line: How thick or thin a line is</p> <p>Mixed Media: Mixing different materials and techniques together on one piece of artwork/outcome.</p> <p>Portraiture: Artwork that pictures a person's face.</p> <p>Contemporary: E.g. "A contemporary artist is someone who is making artwork in the same time period as yourself".</p> <p>Modern: New, fresh, different from the past.</p> <p>Unfinished: Not completed to a polished neat finish.</p> <p>Contrasting: Different.</p> <p>Worked (Area): "Work over and over a specific area".</p> <p>Combination: "I am going to make a piece which is a combination of painting techniques and effects".</p> <p>Positive Space: Something added and on top.</p> <p>Negative Space: The unused /minus space.</p>	<p>Week 6</p> <p>Practice & Develop Your Skills Further.</p>	<p>Ink Drawing Techniques for Beginners</p> <p>By Devin Elle Kurtz</p> <p>Ink Drawing Techniques for Beginners - YouTube</p>	
<p>Challenge Yourself: Draw From Direct Observation</p> <p>The ability to produce a 2D representation of a 3D object is an essential skill of any artists. And it isn't easy.</p> <p>The task of replicating what you see in a 3D space and producing it on a 2D piece of paper as a representation of 3D space uses a part of our brain that needs to be exercised repeatedly. Go to a life drawing class and socialize. (All the introverts just collectively groaned)</p> <p>Nobody is good at life drawing at first. It is not something people do naturally. As artists, it is something we need to learn and practice.</p> <p>Ever heard the saying "Draw what you see, not what you know"? This is what we are training our brain to do.</p> <p>By practicing drawing from life, you train your mind to understand 3D space and form to eventually be able to replicate and manipulate objects without the objects even being present.</p> <p>Now, by this stage, you might be thinking, "Aaaaah drawing fruit and cups is sooooo boring." It doesn't have to be. Ultimately, you get to choose what you draw.</p> <p>Pick interesting items to draw. What looks cool or has an interesting texture? Set up your lighting so you get interesting shadows and forms. A simple desk lamp beside your collection of objects can make a massive difference. WARNING: Resist the temptation to draw from a photo. There is no doubt that working from a photo reference is convenient and easy, BUT it can also lead to the development of bad habits. You want to master the ability to translate 3D space to 2D space. A photograph is already in 2D. When you work from real life, you experience you subject matter in a way a photo would never allow. You can touch it, walk around it, smell it and see the object within the context of its environment. For the purpose of this exercise, stick to drawing objects from real life.</p>				

<p>Week 1</p> <p>The Rules Of Abstraction With Matthew Collings</p> <p>By: Art documentaries</p> <p>https://www.youtube.com/watch?v=Bg3oQ_OgQ_o</p>		<p>The Key Knowledge You Need To Know After This Video:</p> <ul style="list-style-type: none"> -What are the two basic questions many people have about abstract art? How do we respond to it? AND is it about something? -Why are hidden in abstract art? Rules that you might not expect. -Why where people's sense of what was real up for grabs? Because everyday existence was changing rapidly because of science. -How did artist see spirituality? Both as a means of challenging the power of science and as a way of harnessing it. -Who started the spiritual movement of THEOSOPHY? Helena Blavatsky. -What two things did she take and mix together? Eastern religion and science. -When did Abstract art start? At the peak of THEOSOPHY's popularity. -What does THEOSOPHY say about colours and shapes? They can symbolise the souls journey. 	<p>Week 4</p> <p>Writing your thoughts and opinions about a painting by the artist Georgia O'Keeffe.</p> 	<p>Word Bank:</p> <p>COLOUR: observed / stylised / simplified / complementary / harmonious / discordant / clashing.</p> <p>LINE: Smooth / confident / stylised / simplified.</p> <p>LIGHT: exaggerated / direct / tonal / shadow / highlight .</p> <p>TEXTURE: Smooth / air-brushed</p> <p>COMPOSITION: close up / snap-shot view point / symmetrical / foreground.</p> <p>TYPE OF ART: modern / feminine / glossy / painting / natural forms</p> <p>MEDIUM: oil paint</p> <p>FEELING: feminine / glossy / glamorous / nostalgic / curious / ambiguous.</p>
<p>Week 2</p> <p>Georgia O'Keeffe: A Brief History (School Friendly)</p> <p>By watch And Learn</p> <p>https://www.youtube.com/watch?v=C3IKpM0H4EK</p>		<p>The Key Knowledge You Need To Know After This Video:</p> <ul style="list-style-type: none"> -What was Georgia O'Keeffe the mother of? American Modernism -What is she best known for? Painting of flowers and sky scrapers and Mexico desert -What effect did growing up on a farm have on her? Fascination and love of nature. -Why was she frustrated? Art school - of being told what to paint didn't express her feelings and emotions. -What is abstract art? Doesn't show the world as it really is. Uses colours and shapes to show feelings. -How did she meet Alfred? He owned a gallery, a friend sent him some of her work to look at. -How did he help her career? Put on her first exhibition. -How did she paint flowers? Enlarged abstract views. Bright colours. -How did her move to New Mexico influence her art work? Bones and unusual landscapes of the desert. 	<p>Week 5</p> <p>Annotating your own work.</p> 	<p>All Saints VLE Art & Design GCSE Y9 –Y11 GCSE Literacy</p> <p>How to annotate booklet.</p> 
<p>Week 3</p> <p>Key terms and Vocabulary Definition finding.</p>	<p>The Key Terms You Need To Know Are:</p> <p>Option: A choice.</p> <p>Error: A Mistake.</p> <p>Job: A Job.</p> <p>Resolve: Find a solution to a problem OR resolve and finish a project.</p> <p>Commit o something you say are going to do E.g. During my exam I shall commit only one hour to the drawing out of the letters no more.</p> <p>Zoomed in viewpoint: Close up, under the microscope, view of an object.</p> <p>Enlarged: Make something bigger.</p> <p>Blended: Mixed together.</p> <p>Focal Point: The thing which your eye is drawn to first, the center of interest in the piece of artwork.</p> <p>Complementary Colour: Red + Yellow = Orange, Red + Blue = Purple, Yellow + Blue = Green.</p> <p>Tertiary Colour: A light or darker tone of the secondary colours. E.g. Adding more yellow to the orange will make it lighter BUT adding more red will make it darker.</p> <p>Undertone: The hidden, deeper meaning or feeling a piece of artwork gives you.</p> <p>Mood: The feeling a piece of artwork gives you.</p>	<p>Week 6</p> <p>Practice & Develop Your Skills Further.</p>	<p>How to use Acrylic Paint - Georgia O'Keeffe Artist Study</p> <p>By Slaughter's Studio</p> <p>https://www.youtube.com/watch?v=AGWLV8Hf_UY</p>	 
<p>Challenge Yourself:</p> <p>Deconstruct And Simplify Structure...</p> <p>Deconstruction is when you take a complex image or object and break it down into simple shapes and geometry.</p> <p>To practice deconstruction, find an image, object, person or animal and break it down into its basic shapes and forms. Many things can be broken down and represented as a collection of cubes, spheres, cylinders and other basic shapes. It makes drawing so much easier. Breaking down complex shapes into simpler shapes will teach your brain to understand how form and space work. If you can deconstruct something, you can reconstruct it (which is the next exercise).</p>				

Y9



Week 1

Portrait Painting Techniques -
Toning, Gridding and Skin
Tones

By: Andrew Trschler

<https://www.youtube.com/watch?v=67IMIP2KesQ>



The Key Knowledge You Need To Know After This Video:

- Why does he prime his new white canvas with a "mid tone"?
The white will make anything and everything look dark in comparison. So that he can see all of the different tones he is using better he primes the canvas first. When laying on lighter colours he will be able to see them more clearly.
- Why is it important to think carefully about this mid tone colour you put down first? It will influence the tone and colour of everything else you lay on top.
- What colour does he tell you to use? Burnt umber.
- What does he use to water down the oil paint - YOU CAN'T USE WATER?
Turpentine. Oil.
- What do you need to do with the rag? Wipe off the excess paint.
- Why does the ground colour need to be thin? You might get problems with drying times later once you start trying to paint over thicker painted ground.
- What method is used to accurately draw onto the canvas surface? Gridding up.
- When using this method what do you need to make sure you do? Use the right proportion. Width to Height of photo will transfer up/larger to the width and height of the canvas.

Week 2

An interview with artist
Andrew Salgado

By: Maclean's

<https://www.youtube.com/watch?v=vfkg9u5XAkE>



The Key Knowledge You Need To Know After This Video:

- Why does he like to operate outside his comfort zone? It's a dangerous - more exciting place to work in.
- Where is his studio? London.
- What happened in 2008? Victimised as a result of his sexuality.
- What effect did this have on his art work? Made his work political. He has something to say.
- What are the themes he explores in his paintings? Identity, masculinity, sexuality.
- What element does he say definitely exists in his artwork?
Darkness.
- What does he say has happened in recent years? The concept (idea behind the art) has fallen away and more interested in the techniques.
- What does he call himself? An abstract painter.
- What three things does he believe makes a successful artist?
Talent / hard work and perseverance.

Week 3

Key terms and Vocabulary
Definition finding.



The Key Terms You Need To Know Are:

- Label: A written note to accompany an image or to identify something clearly on an image/picture.
- Overall: Overall I think this piece of work was quite successful because.....
- Approximate: I produced this rough sketch/draft to give me an idea of the approximate locations for the figures in this piece.
- Communicate: Spoken or visual information.
- Despite: Despite having never used oil pastel before I think this study was successful.
- Eye: The mood of a piece of art can give you how a mark looks.
- Tool: A tool has a specific application or use.
- Colour Palette: The artists use of a blind colour palette makes this piece seem dark and moody.
- Masculine: The colours are very masculine (blue).
- Feminine: The lines are very curvaceous and feminine.
- Dynamic: A grade 9 student's ideas for a final piece will show that they have changed and been adjusted, modified - look dynamic.
- Sanding: Usually a light brown wash purchased to dampen the brightness of a white piece of paper or canvas.
- Example: E.g. Georgia O'Keefe's paintings of flowers are often thought to represent the womb of a woman.
- Responsive: Be responsive to teacher feedback and advice.

Challenge Yourself: Tutorial Marathon

Finding several tutorials around a subject you love is a great start when learning how to practice drawing.
Do you have some how-to art books or videos that you have been itching to try?
A solid tutorial marathon is a perfect way to tackle a new drawing skill. Spend a dedicated amount of time to learn from great creative resources.
The key here is to keep your choice of tutorials to a narrow selection of themes. If you tackle everything from anatomy, to drawing spaceships, or perspective, in one sitting, then your brain will not be able to process it all.
Pick one subject. If you spend several hours consistently and methodically apply yourself to master one particular aspect of art, by the end of that session will have taken very clear steps and learned the finer aspects of that topic.
As a result, you will experience a definite feeling of progress.
Can't find any tutorials to try?

Art & Design Knowledge Organiser - 6

Word Bank:

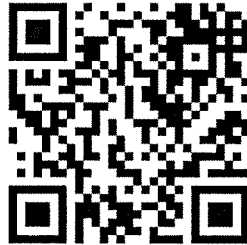
COLOUR: exaggerated / realistic / heightened / vivid/ primary / secondary/ tertiary.
LINE: uncontrolled / bold / blocky / vigorous / lively / expressive / confident / dribble.
LIGHT: observed / stylised / colourful/harsh / bright / bold.
TEXTURE: faceted / layered/ blocked / thick / impasto / uneven / rough / unfinished.
COMPOSITION: close up / snap shot view point / subject matter / focal point.
TYPE OF ART: modern/ contemporary / portrait / masculine / expressive / action painting / fluid/ incomplete/ gestural.
MEDIUM: oil paint / paint thinners / palette knife
FEELING: vigorous / exciting / dramatic / powerful / masculine / movement / dynamism

Week 4

Writing your thoughts and opinions about a painting by the artist Andrew Salgado.

Week 5

Annotating your own work.



All Saints VLE
Art & Design
GCSE Y9 -Y11
GCSE Literacy
How to annotate booklet.

Week 6

Practice & Develop Your Skills Further.

Andrew Salgado - Storytelling - part 1

By Andrew Salgado

<https://www.youtube.com/watch?v=UQcXSR5dQw>



Year 9 French Half-Term 3 – Free Time Activities

Quiz 3.1 – hobbies and time phrases

I go into town / to the cinema / to the pool	Je vais en ville / au cinéma / à la piscine
I play football in the park at the weekend	Je joue au foot dans le parc le weekend
I sing in a choir from time to time	Je chante dans une chorale de temps en temps
I watch films / the TV after school	Je regarde des films / la télé après le collège
I walk the dog every day	Je promène le chien tous les jours
I stay at home / at mine in the evening	Je reste à la maison / chez moi le soir

Quiz 3.2 – past tense hobbies with avoir

I (have) watched a film	J' ai regardé un film
He (has) listened to music	Il a écouté de la musique
She (has) sung in a choir	Elle a chanté dans une chorale
We (have) done swimming	Nous avons fait de la natation
They (have) walked the dog	Ils ont promené le chien
They (have) played tennis	Elles ont joué au tennis

Quiz 3.3 – past tense hobbies with être

I (am) went into town	Je suis allée	en ville
He (is) went to the cinema	Il est allé	au cinéma
She (is) stayed at home	Elle est restée	à la maison
We (are) went to the shops	Nous sommes allés	aux magasins
They (are) "gone out" into town	Ils sont sortis	en ville
They (are) climbed the mountain (girls)	Elles sont montées	la montagne

Quiz 3.4 – future tense with hobbies

I will play football ***	je vais jouer au foot
I will listen to music	je vais écouter de la musique
I would like to buy a phone	je voudrais acheter un portable
I would like to sing a song	je voudrais chanter une chanson
I hope to go into town	j'espère aller en ville
I will play football	je vais jouer au foot

***we know the "er" means "to" in English, but when we use "I will" it's still indicating future tense so we still have to use it. (like I will = I'm going TO...)

Past tense with avoir & être

AVOIR IN PAST		
person	avoir (have)	past tense activity
j'	ai	mangé
il	a	regardé
elle	a	écouté
nous	avons	dansé
ils	ont	pris – took
elles	ont	vu - saw
NO extra 'e' or 's' added to end		

ÊTRE IN PAST (showing you moved somewhere)		
je	suis	allée
tu	es	allée
il / elle / on	est	allée
nous	sommes	allées
vous	êtes	allées
ils /elles	sont	allées
Only add e if girls involved s for plural people		
Remember not all will have é in them as they're not all ER verbs, but the feminine and plural rules still apply!		
e.g. nous sommes sorties		
IR verb, ends in -i in the past, then add fem and plural rules where needed		

Parallel texts

<p>Normally I go to the park with my friends where I play football. I watch sometimes films at the cinema because it's really fun</p> <p>I love to listen to music when it rains and I like to do bike riding in summer, however I don't like to do skiing because it's too difficult.</p> <p>Last weekend I went to the cinema with my friends in order to watch a new film. It was a film of war. I think that the film was interesting because it was historical.</p> <p>This weekend, I will go to the park of theme with family because it's really fun. In addition, I would like to do ice skating in order to relax and to have fun. I would say that it will be great.</p>	<p>Normalement, je vais au parc avec mes copains où je joue au foot. Je regarde quelquefois des films au cinema car c'est vraiment intéressant.</p> <p>J'adore écouter de la musique quand il pleut et j'aime faire du vélo en été, pourtant je n'aime pas faire du ski car c'est trop difficile.</p> <p>Le weekend dernier, je suis allée au cinéma avec mes copains pour regarder un nouveau film. C'était un film de guerre. Je pense que le film était intéressant vu que c'était historique.</p> <p>Ce weekend, je vais aller au parc d'attractions en famille car c'est vraiment amusant. En plus, je voudrais faire du patin à glace pour me relaxer et pour m'amuser. Je dirais que ça sera formidable.</p>
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Key skills

- Using ER verbs in the present tense with hobbies.
- Using steps to success to write complex sentences
- Using avoir in the past (free time)
- Using être verbs in the past (free time)
- Using higher-level opinions

Year 9 French Half-Term 4 – Healthy lifestyle (la vie saine)

Quiz 4.1 – food and drink

I eat some chicken	Je mange du poulet
I eat some jam	Je mange de la confiture
I drink some water	Je bois de l' eau
I eat cereal	Je mange des céréales
I don't eat	Je ne mange pas
I don't drink	Je ne bois pas

Quiz 4.2 – opinions on food and drink

I love to eat / eating	j'adore manger
It's delicious	c'est délicieux
It's disgusting	c'est dégoûtant
Salty / sweet	salé / sucré
Good for your health	bon pour la santé
Bad for your health	mauvais pour la santé

Quiz 4.3 – healthy lifestyle key phrases

I eat a balanced diet	Je mange un régime équilibré
I eat healthily every day	Je mange sainement tous les jours
I do exercise once a week	Je fais de l'exercice une fois par semaine
It's healthy / it's unhealthy	C'est sain / it's malsain
It's good for (your) health	C'est bon pour la santé
It's bad for (your) health	C'est mauvais pour la santé

Quiz 4.4 – healthy lifestyle key verbs

I eat five portions of fruit and vegetables	Je mange cinq portions de fruits et de légumes
I try to eat less sugar	J'essaie de manger moins de sucre
I try to drink water every day	J'essaie de boire de l'eau tous les jours
I avoid fatty foods	J'évite les matières grasses
To keep in shape / to stay in good health	Pour garder la forme / pour rester en bonne santé
A good source of proteins / vitamins	Une bonne source de protéines / vitamines

Quiz 4.5 – giving advice

You must eat a balanced diet	Il faut manger un régime équilibré
You must do exercise	Il faut faire de l'exercice
You must avoid too much sugar	On doit éviter de manger trop de sucreries
You must try to eat fruit and vegetables	On doit essayer de manger du fruit et des légumes
You must not take drugs or smoke	Il ne faut pas prendre les drogues ou fumer

Parallel texts

<p>In order to stay in good health, I eat a diet balanced every day and I avoid eating too much sugar because it's extremely unhealthy.</p> <p>I would say that cigarettes are disgusting and I have never smoked. Also, I don't take drugs because drugs cause lots of problems of health.</p> <p>Recently to stay in shape, I tried to eat five portions of fruit and vegetables and I drank plenty of water. After having done that, I went to the sports centre where I played badminton with my friends.</p> <p>Next weekend, in order to improve my health, I hope to avoid eating fast food and drink alcohol. In addition, I would like to drink more water and do more sport. In my opinion, that would be practical and healthy.</p>	<p>Pour rester en bonne santé, je mange un régime équilibré tous les jours et j'évite de manger trop de sucre car c'est extrêmement malsain.</p> <p>Je dirais que les cigarettes sont dégoûtantes et je n'ai jamais fumé. Aussi, je ne prends pas de drogues car les drogues causent beaucoup de problèmes de santé.</p> <p>Récemment pour garder la forme, j'ai essayé de manger cinq portions de fruit et de légumes et j'ai bu plein d'eau. Après avoir fait cela, je suis allé au centre sportif où j'ai joué au badminton avec mes copains.</p> <p>Le weekend prochain, pour améliorer ma santé, j'espère éviter de manger le fastfood et boire de l'alcool. En plus, j'aimerais boire beaucoup d'eau et faire plus de sport. A mon avis, ça serait pratique et sain.</p>
<p>In order to stay in good health, I eat a diet balanced every day and I avoid eating too much sugar because it's extremely unhealthy.</p> <p>I would say that cigarettes are disgusting and I have never smoked. Also, I don't take drugs because drugs cause lots of problems of health.</p> <p>Recently to stay in shape, I tried to eat five portions of fruit and vegetables and I drank plenty of water. After having done that, I went to the sports centre where I played badminton with my friends.</p> <p>Next weekend, in order to improve my health, I hope to avoid eating fast food and drink alcohol. In addition, I would like to drink more water and do more sport. In my opinion, that would be practical and healthy.</p>	<p>Pour rester en bonne santé, je mange un régime équilibré tous les jours et j'évite de manger trop de sucre car c'est extrêmement malsain.</p> <p>Je dirais que les cigarettes sont dégoûtantes et je n'ai jamais fumé. Aussi, je ne prends pas de drogues car les drogues causent beaucoup de problèmes de santé.</p> <p>Récemment pour garder la forme, j'ai essayé de manger cinq portions de fruit et de légumes et j'ai bu plein d'eau. Après avoir fait cela, je suis allé au centre sportif où j'ai joué au badminton avec mes copains.</p> <p>Le weekend prochain, pour améliorer ma santé, j'espère éviter de manger le fastfood et boire de l'alcool. En plus, j'aimerais boire beaucoup d'eau et faire plus de sport. A mon avis, ça serait pratique et sain.</p>

Key skills

1. Listening for patterns and identifying differences in sounds of words in context
2. Using du / de la / des correctly to identify genders of food items
3. Giving and explaining opinions on food and drink
4. giving advice for a healthy lifestyle using two verbs together
5. Learning and retrieving vocabulary

All Saints Absolutes Year 9 German / Term 2a – Freetime

Quiz 3.1 – using gern/nicht gern accurately

I like playing football because I am sporty	Ich spiele gern Fußball, weil ich sportlich bin
I don't like eating pizza because it's terrible	Ich esse nicht gern Pizza denn es ist furchtbar
I don't like to visit my grandparents	Ich besuche nicht gern meine Großeltern
We like walking when the weather is nice	Wir wandern gern , wenn das Wetter schön ist
I like my mobile phone	Ich mag mein Handy
I don't like the beach	Ich mag den Strand nicht

Quiz 3.2 – freetime activities in the present tense using time phrases

I go shopping in town	Ich gehe in die Stadt einkaufen	EXTRA – use STEPS to SUCCESS to improve your range of language
We do lots of sport	Wir treiben viel Sport	, um fit zu bleiben
I relax at home	Ich entspanne <u>mich</u> zu Hause	, wenn ich müde bin
In the evening I meet my friends	Am Abend treffe ich meine Freunde	, da es empfehlenswert ist
If I have time I go out with friends	Wenn ich Zeit habe, gehe ich mit Freunden <u>aus</u>	, um frische Luft zu schnappen
My siblings paint and draw	Meine Geschwister malen und zeichnen	, obwohl es langweilig ist
She / he she uses the internet	Er/sie benutzt das Internet	jedoch ist es eine Zeitverschwendung

Quiz 3.3 – past tense using “haben” with the 4-part rule

I have eaten cake	Ich habe Kuchen gegessen	EXTRA – use STEPS to SUCCESS to improve your range of language
I have played football	Ich habe Fußball gespielt	Als es sonnig war, habe ich.....
I bought new clothes	Ich habe neue Klamotten gekauft	, obwohl es teuer war.
We watched television	Wir haben ferngesehen	Ich fand es unvergesslich.
They visited family	Sie haben Familie besucht	Als das Wetter schön war, haben wir.....
He/she saved money	Er / sie hat Geld gespart	

Quiz 3.4 – giving information about your hobbies

I go into town to meet my friends	Ich gehe in die Stadt, um meine Freunde zu treffen
I laze around and watch Netflix	Ich faulenze und ich sehe Netflix
I like watching TV because it's interesting	Ich sehe gern fern, da es interessant ist
I go shopping, mainly for clothes	Ich gehe einkaufen, hauptsächlich für Klamotten
I go on my phone for hours	Ich gehe an mein Handy stundenlang
I like playing computer games	Ich spiele gern Computerspiele

Quiz 3.5 How to talk about a photograph

P	On the photo there is a family	Auf dem Foto gibt es eine Familie
A	They are going to the cinema	Sie gehen ins Kino
L	They are in a town, maybe it's Germany	Sie sind in einer Stadt vielleicht ist es Deutschland
M	In my opinion they are happy	Meiner Meinung nach sind sie glücklich
C	They are wearing fashionable clothes	Sie tragen modische Kleidung

O	I think that the photo is interesting because I also love films	Ich denke, dass das Foto interessant ist denn ich liebe auch Filme
W	The weather is probably cold because they are wearing a coat	Das Wetter ist wahrscheinlich kalt denn sie tragen einen Mantel

Parallel texts

<p>For me is freetime very important. therefore meet I like my friends at the weekend in order fun to have.</p> <p>I like doing sport very much because I fit to stay want. I think also that sport relaxing is. With my family go we Saturdays into town for example go we shopping, in order clothes to buy. Sometimes go we to the cinema, although it expensive is, however is the popcorn really delicious.</p> <p>Next week will I perhaps with friends computer games to play. In my opinion will it extremely funny be. Nevertheless, must I homework to do and that is never interesting.</p>	<p>Für mich ist Freizeit sehr wichtig daher treffe ich gern meine Freunde am Wochenende. um Spaß zu haben</p> <p>Ich treibe sehr gern Sport, weil ich fit bleiben will. Ich denke auch, daß Sport entspanned ist. Mit meiner Famile gehen wir samstags in die Stadt zum Beispiel gehen wir einkaufen, um Klamotten zu kaufen. Manchmal gehen wir ins Kino, obwohl es teuer ist, jedoch ist das Popcorn ganz lecker!</p> <p>Nächste Woche werde ich vielleicht mit Freunden Computerspiele spielen. Meiner Meinung nach wird es ganz lustig sein. Trotzdem muss ich Hausaufgaben machen und das ist nie interessant.</p>
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Don't forget your vocab book pages 8 - 15

Geography – Hydrology and Flooding

Keywords

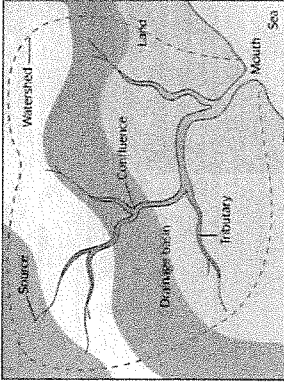
1. Transpiration	Water loss from plants through pores in the leaves
2. Evaporation	Where water changes from a liquid to a vapour
3. Evapotranspiration	The combined loss of water from plants and the land
4. Throughflow	Water moving through soil
5. Stemflow	Water flowing down the stem of a plant or tree to the ground
6. Percolation	Water moving down through the rock
7. Interception	Rainwater being trapped by trees or buildings and being prevented from reaching the ground
8. Precipitation	Water moving from the atmosphere to the ground – rain, hail, snow
9. Baseflow	The normal flow of rate of water in the river caused by groundwater
10. Groundwater	Water in the rocks
11. Infiltration	Water moving downwards into the soil
12. Groundwater flow	Water moving through the rocks
13. Water table	The level of water in the ground
14. Watershed	Boundary of a drainage basin
15. Drainage basin	The area a river collects its water from it can also be called the catchment area
16. Drip flow	Rainwater that falls onto vegetation and then drips onto the ground
17. Peak discharge	The highest amount of water in a river after a storm
18. Peak rainfall	The highest amount of rain which falls
19. Lag time	The time between the peak rainfall and the peak discharge
20. Condensation	The process where water changes from a gas back to a liquid
21. Porous	A rock which has many tiny gaps in it that allow it to store water e.g. sandstone or chalk
22. Impermeable	Soil or rock which does not allow water to pass through it e.g. clay
23. Permeable	A rock which allows water to pass through e.g. Limestone
24. Mouth	The point where a river enters the sea or lake
25. Overland flow	The movement of water over the surface of the land
26. Source	Point where a river starts
27. Surface stores	Places where water is found on the surface of the ground in such as rivers and lakes
28. Tributary	A smaller river which joins a larger river
29. Confluence	Point where two rivers meet
30. Distributary	Found at a delta where the river splits to work its way through the material it has deposited

Hydrology Revision Questions

- How would an increase in deforestation impact the hydrological cycle?
- How would an increase in urbanisation impact the hydrological cycle?
- How does impermeable rock impact a drainage basin?
- What is the difference between tributary and confluence?
- What is the difference between permeable and impermeable rock?
- How can people impact the hydrological cycle?
- How can humans impact the drainage basin of a river?
- What is the difference between infiltration and percolation?

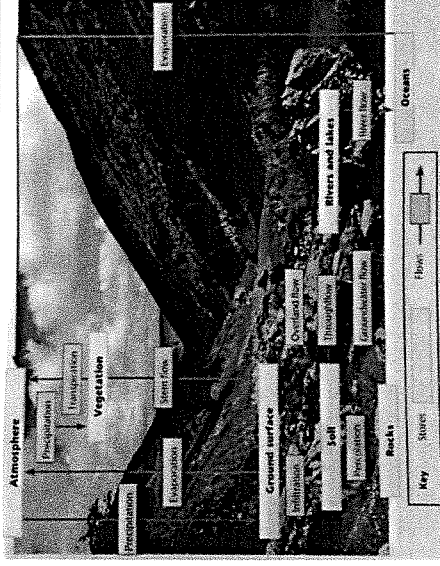
31. Drainage Basin

- The area from which a river gets its water, rain that falls in this area makes its way to the river
- Drainage basins are separated by a watershed which is often mountain ranges
- Multiple streams with different sources form within a basin, which all join (confluence) the main channel
- Includes the mouth where the river flows into a lake or ocean
- Humans can impact the drainage basin by building near the river on the floodplain



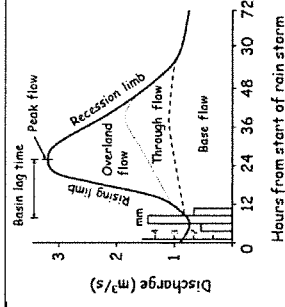
32. Hydrological Cycle

- Cycle of water with stores and flows
- Stores: atmosphere, vegetation, ground surface, soil, rocks, rivers, lakes and oceans
- Flows: precipitation evaporation, transpiration, stem flow, overland flow, infiltration, throughflow, percolation, groundwater flow, river flow, evaporation
- Rate of flow are impacted by climate, vegetation cover and type, permeability, porosity, land use, soil type
- People impact the cycle by changing the land use and increasing the amount of impermeable land, which increases overland flow on roads and pavements (pluvial flood) and water can flow quickly to the river via drains (fluvial flood)



33. Storm Hydrograph

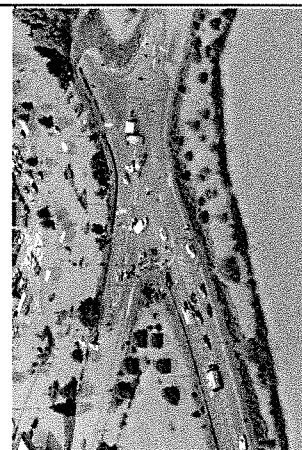
- X-axis shows hours from the start of a rain storm
- Y-axis shows discharge in m³/s on the line graph
- Y-axis also shows precipitation levels in mm on the bar chart
- Base flow - expected river levels without a storm. Through flow - shows the amount of water which travelled to the river through the soil.
- Overland flow - the water which reached the river on the ground surface
- Peak rainfall - highest point on the bar chart. Peak discharge - highest point on the line graph. Lag time - time between peak rainfall and peak discharge



- Why would planting trees reduce flood risk?
- Describe how water travels around the hydrological cycle.
- What is peak rainfall and peak discharge on a storm hydrograph?
- What is the difference between a rising limb and a recession limb on a storm hydrograph?
- Why are storm hydrographs useful? Who would use them?
- How do you calculate lag time?
- If the peak rainfall was at 6am and peak discharge was at 11am, what is lag time?
- Why is base flow included on a storm hydrograph?

Geography - Tewkesbury Floods (HIC)

1. Where is the River Severn drainage basin?	<ul style="list-style-type: none"> • Central Wales, Shropshire, Worcestershire, Gloucestershire
2. What was the date of the flood studied?	<ul style="list-style-type: none"> • June 2009 (90mm on the 20th June)
3. How big is the drainage basin?	<ul style="list-style-type: none"> • 6,900²km plus the River Avon with 4,000²km
4. How much rain fell?	<ul style="list-style-type: none"> • Twice the usual amount in May and June
5. What do we call the conditions before the flood?	<ul style="list-style-type: none"> • Antecedent conditions
6. What happened when more rain fell in June?	<ul style="list-style-type: none"> • There was flooding from overland flow
7. Why was there extra rain?	<ul style="list-style-type: none"> • There was a low-pressure depression coming from the Atlantic
8. What causes the extra rain?	<ul style="list-style-type: none"> • Global warming leading to sea expansion and extra evaporation so more clouds and rain
9. What happened to the drains?	<ul style="list-style-type: none"> • They became blocked so the pluvial flood water was not able to be diverted to the river
10. How did building houses cause the flooding?	<ul style="list-style-type: none"> • More impermeable surfaces were created, did not allow infiltration into the soil, water went into drains and reached the river more quickly
11. How did construction cause the floods?	<ul style="list-style-type: none"> • The railway embankment built on the floodplain meant that the water could not spread out so the water became deeper
12. Name groups of people affected by the 2009 flood	<ul style="list-style-type: none"> • Café owner (Mandy Crump) - out of the café for 8 months with £40,000 damage • M5 closed • The Plough Inn beside river at Upton upon Severn • Schools closed - students had to go to other schools to sit GCSEs • Local residents wanting to sell their house - Dave Witts, secretary of local flood group- house values dropped • Local residents flooded - John and Marion Badham, Abbey Terrace, Tewkesbury - adapted their house with tiles and light furniture • Severn Trent Water Authority employees had to work extra hours
13. What are the Economic effects of the flood?	<ul style="list-style-type: none"> • M5 closed so deliveries were delayed, people could not get to work, cost of repairing road • Tewkesbury, Gloucester, Evesham flooded and many houses under water which need repairs • Mythe water treatment works at Tewkesbury shut down as flood water got near the electrics. Water supply in the area cut off. Local people needed 90 water tankers, 1,100 bowzers and 5 million litres bottled water. Repairs and new flood defences cost £25 million and took 8 weeks and left 350,000 people without a water supply. • Businesses flooded and closed, e.g. Mandy Crump at Crumpets Tea Shop in Tewkesbury. Shop under 3 feet of water. Out of the café for 8 months with £40,000 damage. • Other businesses that were not flooded lost out on trade because people assumed they had been flooded as well • Difficult to sell houses in the area because of their history of being flooded - leads to lower prices
14. What were the social effects of the flood?	<ul style="list-style-type: none"> • Many people had to move out of their houses for up to a year, while they dried out and were re-plastered and re-wired • People had to redesign their houses to make them flood proof (soft engineering) - lighter furniture that can be moved upstairs, plugs higher up the wall, tiled floors, flood gates on doors • Schools closed during floods - students had to go to other schools to sit GCSE's • 10,000 people stranded on M5
15. What were the environmental effects of the	<ul style="list-style-type: none"> • R Severn floods quite often, so not too many houses had been built on the floodplain, so the effects could have been worse. • Crops destroyed • Blocked drains meant that rain water could not drain away from roads or car parks and so it causes pluvial floods • Sensors now placed on drains near river to make sure that they are kept clear of leaves and branches • Whole area flooded had to be cleared of mud and sewage deposits after the floods went down.

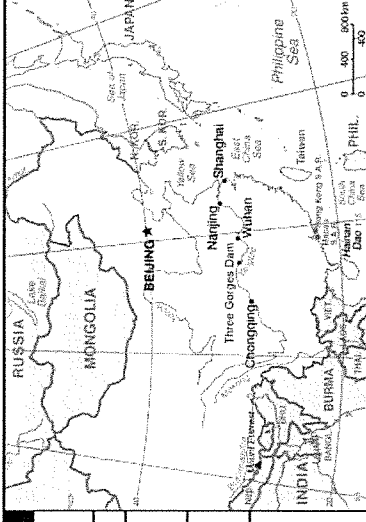


Background and Causes

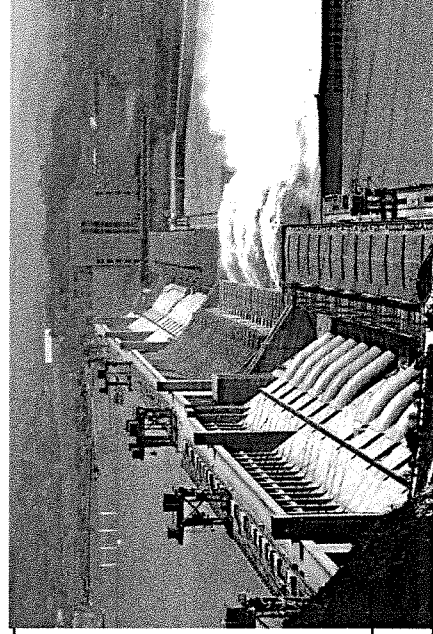
Stakeholders

Effects

Geography - Three Gorges Dam (NIC)



<p>1. What is the location of the Three Gorges Dam?</p>	<ul style="list-style-type: none"> The Three Gorges Dam is a <u>mega-dam</u> located on the <u>Yangtze River</u> in central <u>China</u>
<p>2. How long did it take to build?</p>	<ul style="list-style-type: none"> <u>15</u> years
<p>3. Why was it built?</p>	<ul style="list-style-type: none"> The dam was built in response to the <u>seasonal flooding</u> that takes place along the Yangtze that has <u>killed hundreds of thousands of people</u>
<p>4. How much did it cost to build?</p>	<ul style="list-style-type: none"> The overall cost of the dam is estimated at roughly <u>¥180 billion</u>
<p>5. What other costs were involved?</p>	<ul style="list-style-type: none"> It will take nearly a decade for the dam to pay for itself by <u>generating electricity</u> The inundation (flooding) of land behind the dam however is costly because many <u>factories</u> were located behind the dam and had to be <u>relocated</u>, often at a high cost In addition, the <u>lack of annual flooding</u> means that much of the <u>farmland</u> that is located on the Yangtze's floodplain will gradually become <u>less fertile</u>, reducing <u>agricultural yield</u>
<p>6. How many people had to leave their homes?</p>	<ul style="list-style-type: none"> Over <u>1.2 million</u> people were required to <u>leave their homes</u> as they were going to be inundated by the dam's reservoir
<p>7. What happened to those who did not want to leave?</p>	<ul style="list-style-type: none"> The people who refused to leave were <u>forcibly removed</u> from their homes The reservoir ended up <u>flooding 13 cities</u> and <u>hundreds of villages</u> Those that were <u>displaced</u> were relocated to cities that had been <u>specially constructed</u> for the dam
<p>8. What were the positive social impacts?</p>	<ul style="list-style-type: none"> For many of the people living in <u>poverty</u> who were displaced, the new homes they were given represented a <u>substantial improvement</u> in terms of <u>quality and living standards</u>
<p>9. Why is the building of the dam a problem for sediment?</p>	<ul style="list-style-type: none"> The Yangtze transports a lot of <u>sediment</u> that is now being <u>blocked</u> behind the dam This is going to result in the <u>gradual destruction</u> of the Yangtze's delta and <u>increased erosion</u> downstream of the dam The blocked sediment will <u>alter the chemical composition</u> of water upstream from the dam This, in turn, will result in a <u>reduction in biodiversity</u> and the potential <u>extinction of several species of animals</u>
<p>10. Why is blocked sediment a problem for farmers?</p>	<ul style="list-style-type: none"> The farmers who relied on the fertile soil produced by floods will now have to use <u>artificial fertiliser</u> that will <u>drain into the river</u> and <u>pollute the downstream</u> section of the river
<p>11. What is a positive environmental impact of the dam?</p>	<ul style="list-style-type: none"> The Three Gorges Dam serves as a <u>hydroelectric power plant</u> that will supply <u>5%</u> of China's power and will result in <u>millions of tonnes of coal not being burnt</u>
<p>12. What has China done about deforestation?</p>	<ul style="list-style-type: none"> China plans to <u>redouble its forestry development efforts</u> in the next 30 years A massive <u>afforestation programme</u> along the upper Yangtze river would raise tree coverage in the region from <u>22.1%</u> to <u>45%</u> The floods, which <u>killed over 3,000 people</u> and caused <u>billions of dollars</u> in <u>infrastructure damage</u>, have been widely blamed on the <u>environmental destruction</u> caused by years of <u>logging</u>
<p>13. How have the Chinese Government changed the shape of the river and what is the effect of this?</p>	<ul style="list-style-type: none"> Over the past decades, much has been done to <u>straighten</u> out the river and the meandering section has been <u>shortened by 80 kilometres</u> A river channel may be <u>widened</u> or <u>deepened</u>, increasing the volume the river can hold (increase its load) A river channel may also be <u>straightened</u> so that water can travel <u>faster</u> along the course The channel course of the river can also be altered, <u>diverting floodwaters</u> away from settlements Straighter, deeper river channels mean that <u>flood water travels</u> through and out of those areas <u>much faster</u>, reducing flooding in the straightened areas Straightening also means that difficult rivers become much easier to <u>navigate</u> and this can improve <u>business and trade</u>
<p>14. What problem can this cause?</p>	<ul style="list-style-type: none"> Altering the river channel may lead to a <u>greater risk of flooding downstream</u>, as the water is carried there faster

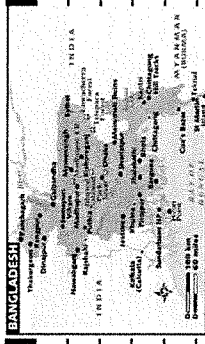


Background and cost

Impacts

Other Management

Geography - Bangladesh Floods (LIC)



- South of the Himalayas, east of India, west of Myanmar, coastline on the Bay of Bengal
- 1998, 2004 and 2007
- Ganges, Meghna, Brahmaputra
- The Meghna, Brahmaputra and the Ganges combined reach over 1,000,000km²
- Monsoon season May-September causes saturates soils so more surface run-off
- Antecedent conditions
- Seasonal snowmelt from Himalayas, 3 major rivers which have a confluence in Bangladesh, Monsoon season, storm surges
- Deforestation in the upper course, settlements on floodplains (Dhaka) rapid urbanisation with correct infrastructure, climate change
- Increased temperature causes low pressure depressions in the Indian Ocean, leading to storm surges along the coast of Bangladesh
- This adds pressure to the river floods
- Warmer temperatures also cause more evaporation, so heavier rains fall
- Thermal expansion also means that the Indian Ocean increases in volume, adding pressure to the coastline

1. Where is Bangladesh?
2. What was the years of the floods studied?
3. Name the 3 rivers that flow into Bangladesh.
4. How big is the drainage basin?
5. How does rain cause flooding in Bangladesh?
6. What do we call the conditions before the flood?
7. Why else does Bangladesh flood naturally?
8. How do human contribute to the floods in Bangladesh?
9. How does climate change impact Bangladesh's coastline?

Background and Causes

- Char islanders have to relocate during and after major floods, displaced and homeless, infertile agricultural land
- More than 450 people died and more than 30 million people in Bangladesh affected
- Of the country's 64 districts, 43 are affected by the rising waters
- Around 40% of the country's capital, Dhaka, was covered by water and Government figures report more than 150,000 homes were destroyed and more than half a million acres of crops destroyed
- Floodwaters place the population at risk from a range of water-borne diseases, including diarrhoea, dysentery, typhoid and cholera
- Outbreaks of diarrhoea have already been reported, especially in the capital, where sewers mix with floodwater and water supplies were contaminated

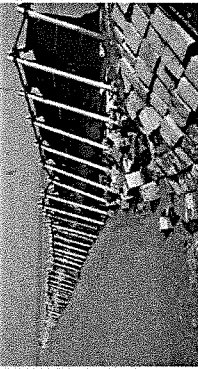
10. What were the main impacts from the floods?



Impacts

- The Flood Action Plan (FAP) was set up in 1990 supported by several wealthy countries and the World Bank
- Its aim was to reduce the impact of the floods that occurred annually in Bangladesh
- The FAP's objectives were to set up regional planning groups to study and monitor local river processes, followed by the construction of huge embankments to protect the land, initially from river flooding.
- It was intended to construct coastal embankments to protect from storm surges brought by cyclones but these have not been completed. As a result, the FAP is not considered to have been a complete success. Over 3 million people have been killed by coastal flooding in the last 30 years

11. What is the FAP?



- Cluster villages which are raised above flood levels and high schools, shops, sustainable housing and community boats for floods
- Improved drainage (pipes and storage underground) and Dhaka's Western Flood embankment
- Sustainable farming through Practical Action: Noor's super ducks, Moshir's pumpkins, Faruk's fish
- Oxfam distributes emergency supplies

12. What are the hard engineering methods used?
13. What are the soft engineering methods used?

- The Bangladeshi Government cannot afford the high maintenance costs of the scheme
- The embankments are at risk of erosion from the rivers
- River channelisation by FAP embankments has increased the risk of flood damage for downstream areas
- An estimated 8 million people were forced to move due to the FAP, people who relied on farming and fishing to support themselves
- Today, smaller, more sustainable projects tend to be favoured such as flood embankments to protect important urban areas (like Dhaka), improved forecasting and early warning systems and the building of flood shelters (areas of raised land to provide a safe haven for people in times of flood)

14. Challenges faced by the government



Responses

- Cluster villages which are raised above flood levels and high schools, shops, sustainable housing and community boats for floods
- Improved drainage (pipes and storage underground) and Dhaka's Western Flood embankment
- Sustainable farming through Practical Action: Noor's super ducks, Moshir's pumpkins, Faruk's fish
- Oxfam distributes emergency supplies

15. Explain the causes of river floods using an example you have studied.
16. Explain how river floods can impact named groups of people.
17. What is the difference between hard and soft engineering?
18. How can river floods be managed?

Flooding Revision Questions

19. Is a river flood more likely to be caused by people or occur naturally?
20. Why are the impacts of the Bangladesh floods more severe than Tewkesbury?
21. Compare the causes of river flood in two examples you have studied.
22. Should hard engineering or soft engineering be used in LIC flood management?

River Flood Management

	How it works	Advantages	Disadvantages
Afforestation	<ul style="list-style-type: none"> Trees are planted near to the river. This means greater interception of rainwater and lower river discharge. This is a relatively low cost option, which enhances the environmental quality of the drainage basin. Environmental groups and local residents often prefer softer options, such as planting trees. Soft options cause little damage to the environment and do not involve the resettlement of communities. 	<ul style="list-style-type: none"> Helps to reduce climate change Trees reduce risk of landslide Prevents desertification Natural habitats created Conservation of endangered species Leisure activities created Assurance of wood supply Employment opportunities 	<ul style="list-style-type: none"> Decrease in land value for owner Less space for development or agriculture Risk of wildfires depending on climate Leisure may lead to litter Can be expensive depending on area planted/scale
Land Use	<ul style="list-style-type: none"> Local authorities and the national government introduce policies to control urban development close to or on the floodplain. This reduces the chance of flooding and the risk of damage to property. There can be resistance to development restrictions in areas where there is a shortage of housing. Enforcing planning regulations and controls may be harder in LEDCs. 	<ul style="list-style-type: none"> More expensive buildings/land uses are further away from the river, so have reduced flood risk. Less damage is caused, leading to fewer insurance claims. 	<ul style="list-style-type: none"> Not always possible to change existing land uses. Planners have to decide what type of flood to plan for.
Managed	<ul style="list-style-type: none"> The environmental agency monitors rivers and issues warnings via newspapers, TV, radio and the internet when they are likely to flood so people can prepare. 	<ul style="list-style-type: none"> People have time to try to protect their properties, e.g. with sandbags. Many possessions can be saved, resulting in fewer insurance claims. 	<ul style="list-style-type: none"> Some people may not be able to access the warnings. Flash floods may happen too quickly for a warning to be effective. They do not stop land from flooding - they just warn people that a flood is likely.
Flood Wall/	<ul style="list-style-type: none"> Raise the river banks so the channel can contain a larger volume of water before bursting its banks. Can be used to raise the height of the river bank to a level where the river might not burst its banks. Can be permanent features or incorporated into the design of an area and become invisible. Can also be temporary structures where flood gates or removable 'stoplogs' are built to protect a stretch of river. 	<ul style="list-style-type: none"> Cheap with a one-off cost. Allow for flood water to be contained within the river, protecting particular areas of high value from flooding. 	<ul style="list-style-type: none"> Looks unnatural and reduces access to the river. Water speeds up and can increase flood risk downstream.
River Engineering	<ul style="list-style-type: none"> The river channel may be widened or deepened allowing it to carry more water. A river channel may be straightened so that water can travel faster along the course. The channel course of the river can also be altered, diverting floodwaters away from settlements. Water is usually stored in a reservoir behind the dam. This water can then be used to generate hydroelectric power or for recreation purposes. Altering the river channel may lead to a greater risk of flooding downstream, as the water is carried there faster. 	<ul style="list-style-type: none"> More water can be held in the channel. It can be used to reduce flood risk in built-up areas. Improves the river as a shipping route. Silt from the river makes an excellent fertiliser. 	<ul style="list-style-type: none"> Dredging needs to be done frequently. Speeding up the river increases flood risk downstream.
Dam Construction	<ul style="list-style-type: none"> Dams are often built along the course of a river in order to control the amount of discharge. Water is held back by the dam and released in a controlled way. This controls flooding. Water is usually stored in a reservoir behind the dam. This water can then be used to generate hydroelectric power or for recreation purposes. Building a dam can be very expensive. Sediment is often trapped behind the wall of the dam, leading to erosion further downstream. Settlements and agricultural land may be lost when the river valley is flooded to form a reservoir. Governments and developers often favour large hard engineering options, such as dam building. Building a dam and a reservoir can generate income. Profits can be made from generating electricity or leisure revenue. 	<ul style="list-style-type: none"> Can be used to produce electricity by passing the water through a turbine within the dam. Reservoirs can attract tourists. 	<ul style="list-style-type: none"> Very expensive. Dams trap sediment, which means the reservoir can silt up and hold less water. Habitats are flooded, destroying ecosystems and often leading to rotting vegetation. This releases methane which is a greenhouse gas. Settlements are lost leading to the displacement of people. In some countries locals are not always consulted and have little say in where they are relocated.

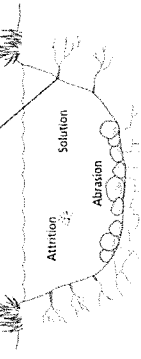
Geography – River Processes

	Keywords
1. Upper course	Where the river source is found at high altitude, vertical erosion creates waterfalls, gorges and v-shaped valleys
2. Waterfall	An erosional feature with a steep drop off a rocky ledge
3. Gorge	Vertical valleys left by a retreating waterfall
4. V-shaped valley	Steep-sided valley with inter-locking spurs
5. Middle Course	Where the relief becomes gentler, the river becomes wider and deeper and more lateral erosion takes place
6. Meander	A bend in a river with erosion and deposition
7. Ox-bow lake	A meander bend which has been cut-off from the river channel
8. Lower course	Where the land is flat and the river mouth meets the sea/lake where deposition occurs
9. Floodplain	The land next to the river which floods when the discharge increases
10. Levee	After a flood, deposition on the river bank builds up creating a natural embankment
11. Estuary	Tidal area at the river mouth with fresh and salt water
12. Delta	Where the river divides into distributaries
13. Erosion	Breaking down rock
14. Vertical erosion	Rock eroded downwards, deepening river channel
15. Lateral erosion	Rock eroded sideways, widening river channel
16. Transportation	Sediments (rocks, pebbles, sand) moved by the water
17. Deposition	Sediments dropped by a river
18. Load	The sediments a river carries
19. Bedload	Larger particles moved along a river bed
20. River bed	The bottom of the river channel
21. River bank	The sides of the river channel
22. Sediment	Material moved and deposited in a different location
23. Long profile	A line showing the gradient of a river from source to mouth
24. Cross profile	A cross-section drawn across the river valley
25. Discharge	The volume of water at a given point in a river (cumecs)
26. Velocity	Speed of flow, usually measured in metres per second (m/s)

31. Erosion

There are two main types of erosion: Vertical and Lateral. However, four processes can be identified. These are:
Hydraulic action – the force of the water hitting the river bed and banks, **forces air in cracks** and breaks rock off.
Abrasion – when the load carried by the river scrapes the bed or banks, dislodging particles into the flow of water.
Attrition – when stones **carried** by the river **knock against** each other, gradually **making stones smaller** and less rounded.

Solution – when the river flows over limestone or chalk, the rock is slowly **dissolved**. This is because it is soluble in mildly acidic river water.



32. Transportation

The material transported by a river is called its load. The four main processes of transportation are:

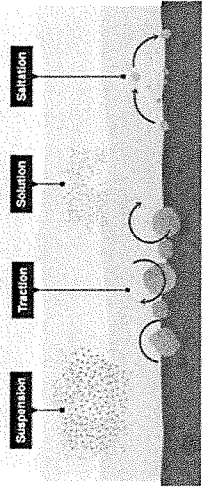
Traction – **large** particles rolled on the river bed.

Saltation – ‘**bouncing**’ of particles too heavy to suspend.

Suspension – small sediment **held** in the river (floating).

Solution – dissolved load.

The size and total amount of load that can be carried will depend on the river’s rate of flow – its velocity.

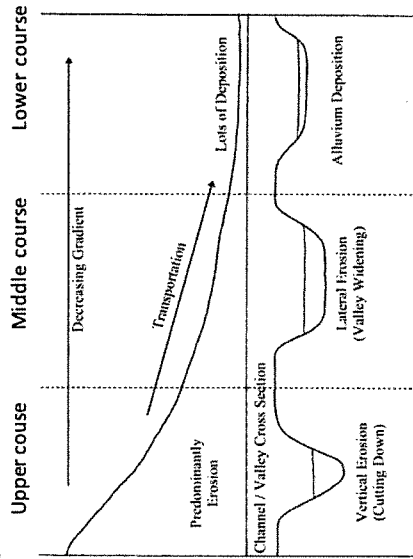


34. River profiles

33. Deposition
 This occurs when the velocity of the water decreases. It no longer has enough energy to transport its sediment so it is deposited (dropped).
 a) Larger rocks tend to be deposited in the upper course of a river. They are only transported for very short distances (traction) with high flow.
 b) Finer sediment is carried further downstream, mostly held in suspension. This material will be deposited on the bed and banks, where velocity is slowed by friction.
 c) A large amount of deposition occurs at the river mouth, where the interaction with tides, along with the very gentle gradient, greatly reduces the river’s velocity.

Long profile

Cross profile



Rivers Revision Questions

- Describe how a river’s long profile changes throughout its course
- Describe how a river’s cross profile changes throughout its course
- Explain why a river’s long profile changes throughout its course
- Explain why a river’s cross profile changes throughout its course
- What are the main differences between the upper, middle and lower course of a river?
- Explain how a river erodes material
- What is the difference between vertical and lateral erosion and where in a river do they take place?
- Which is the most powerful type of erosion? Why?
- Can solution as erosion occur in any river? Why?
- What is the difference between abrasion and attrition?

45. Why is solution both a type of erosion and transportation?

46. Explain how a river transports material

47. Explain how erosion types change going downstream of a river and explain why

48. Explain how transportation types change going downstream of a river and explain why

49. How does velocity change the type of erosion that occurs?

50. How does velocity change the type of transportation that occurs?

51. How does discharge change along the course of a river?

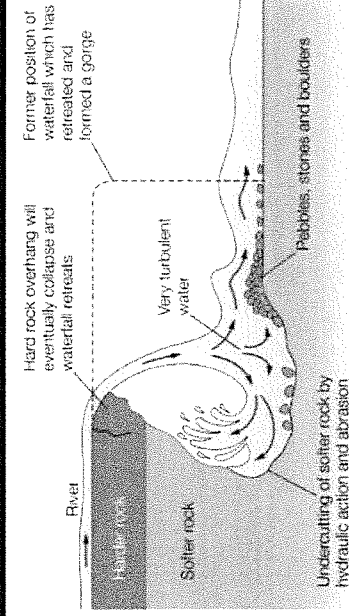
52. What is the difference between the river bed and the river bank?

53. What is the difference between sediment, load and bedload?

54. Look back at the hydrology absolutes and review storm hydrographs. How do you think storm hydrographs would look after floods in the upper, middle and lower course?

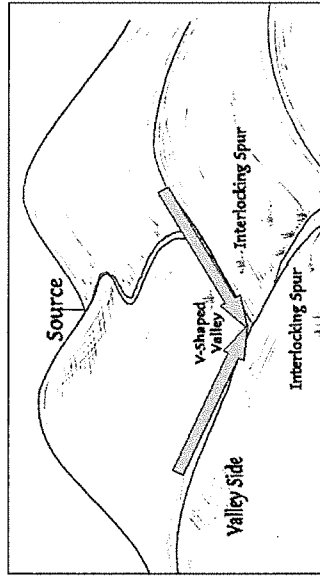
Geography – River Features

- a) The soft rock (less resistant to erosion, like sandstone) is eroded quicker than the hard rock (more resistant to erosion, like granite) and this creates a step.
- b) Hydraulic action continues which undercuts the hard rock, forming an overhang.
- c) Abrasion and hydraulic action erode at the bottom of the waterfall to create a plunge pool.
- d) Over time this gets bigger, increasing the size of the overhang until the hard rock is no longer supported and it collapses.
- e) This process continues and the waterfall retreats upstream.
- f) A steep-sided valley is left where the waterfall once was. This is called a gorge.



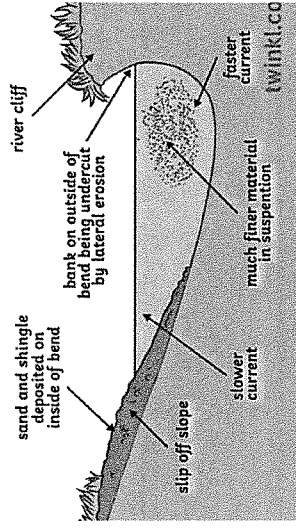
Upper Course

- a) Rivers begin high up in the mountains so they flow quickly downhill eroding the landscape vertically.
- b) The river cuts a deep notch down into the landscape using hydraulic action, abrasion and solution.
- c) As the river erodes downwards the sides of the valley are exposed to freeze-thaw weathering which loosens the rocks (some of which will fall into the river) and steepens the valley sides.
- d) The rocks which have fallen into the river assist the process of abrasion and this leads to further erosion.
- e) The river transports the rocks downstream and the channel becomes wider and deeper creating a V-shaped valley
- f) Interlocking spurs occur if there are areas of hard rock which are harder to erode, the river will bend around it. This creates interlocking spurs of land which link together like the teeth of a zip.



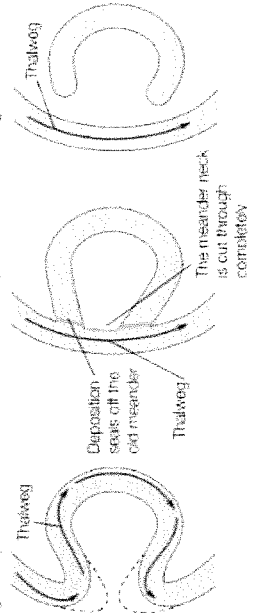
- a) As a river goes around a bend, most of the water is pushed towards the outside. This causes increased speed and therefore increased erosion (through hydraulic action and abrasion).

- b) The lateral erosion on the outside bend causes undercutting of the bank to form a river cliff.
- c) Water on the inner bend is slower, causing the water to slow down and deposit the eroded material, creating a gentle slope of sand and shingle.
- d) The build-up of deposited sediment is known as a slip-off slope (or sometimes river beach).



Middle Course

- f) The neck of the meander is gradually eroded.
- g) Water now takes the shortest (straightest) route.
- h) Deposition occurs off the old meander.
- i) The meander neck is cut through completely.
- a) Due to erosion on the outside of a bend and deposition on the inside of a meander, the shape of a meander will change over a period of time.
- b) Erosion narrows the neck of the land within the meander and as the process continues, the meanders move closer together.

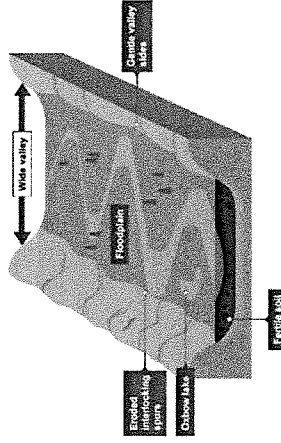


- c) When there is a very high discharge (usually during a flood), the river cuts across the neck, taking a new, straighter and shorter route.
- d) Deposition will occur to cut off the original meander, leaving a horseshoe-shaped oxbow lake.

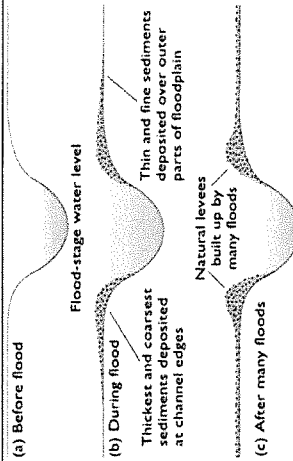
Lower Course

Geography – River Features

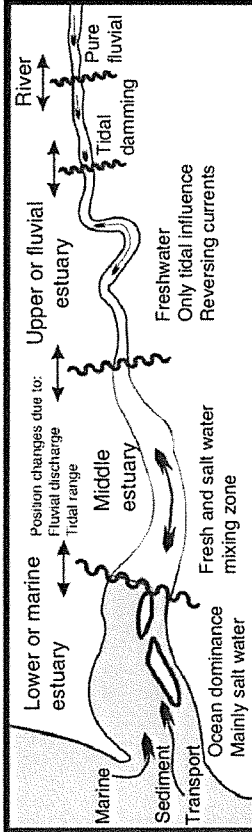
- A floodplain is an area of land which is covered in water when a river bursts its banks.
- Floodplains form due to both erosion and deposition.
- Erosion removes any interlocking spurs, creating a wide, flat area on either side of the river.
- During a flood, material being carried by the river is deposited (as the river loses its speed and energy to transport material). Over time, the height of the floodplain increases as material is deposited on either side of the river.
- Floodplains are often agricultural land, as the area is very fertile because it's made up of alluvium (deposited silt from a river flood). The floodplain is often a wide, flat area caused by meanders shifting along the valley.



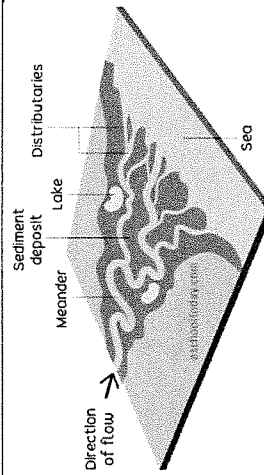
- Levees occur in the lower course of a river when there is an increase in the volume of water flowing downstream and flooding occurs.
- Sediment that has been eroded further upstream is transported downstream.
- When the river floods, the sediment spreads out across the floodplain.
- When a flood occurs, the river loses energy. The largest material is deposited first on the sides of the river banks and smaller material further away.
- After many floods, the sediment builds up to increase the height of the river banks, meaning that the channel can carry more water (a greater discharge) and flooding is less likely to occur in the future.



- An estuary can be found at the river mouth, where the river meets the sea.
- As the river approaches the mouth, it slows down so deposition increases.
- Built up sediment from deposition can create sand bars, marshland or mudflats.
- The river here is tidal and when the sea retreats the volume of the water in the estuary is reduced.
- When there is less water, the river deposits silt to form mudflats which are an important habitat for wildlife.



- Deltas are found at the mouth of large rivers - for example, the Mississippi.
- A delta is formed when the river deposits its material faster than the sea can remove it.
- There are three main types of delta, named after the shape they create.
 - Arcuate or fan-shaped - the land around the river mouth arches out into the sea and the river splits many times on the way to the sea, creating a fan effect.
 - Cuspedate - the land around the mouth of the river juts out arrow-like into the sea.
 - Bird's foot - the river splits on the way to the sea, each part of the river juts out into the sea, rather like a bird's foot.
- The separate channels created by the deposition are called distributaries.



- Explain from memory how each of the 8 river features are created
- Explain how river features and the processes that make them, change as rivers travel downstream
 - Which of the river features involve a flood? Why?
 - What 3 types of erosion occur to create waterfall and gorges?
 - Explain the relationship between v-shaped valleys and interlocking spurs

Rivers Revision Questions

- Explain how a meander can become an ox-bow lake
- Why does a river have a floodplain?
- What is alluvium?
- Explain how levees and an earth embankment (Tewkesbury and Bangladesh) are similar
- Why are estuaries and deltas tidal?
- Explain why deltas could not form if erosion did not take place in the upper course

Y9 HALF TERM 3	MUMBAI
1. Where is Mumbai located?	North west coast of India on Arabian Sea coast
2. What is the population of Mumbai?	18.4 million in 2015
3. How many commute into Mumbai?	7.5 million commute every day.
4. How has Mumbai grown?	City has grown northwards and inland up Thane Creek, expanding now along railway lines
5. How has Mumbai's population changed?	Natural increase is main reason for Mumbai's growth in 20 th Century even though fertility rates are falling. 2007, 2.2 million in rural areas, 1.8 million in urban areas.
6. What are Mumbai's pull factors?	Cheap train fares, jobs, training opportunities, education/university, marriage, move to be with family.
7. What are the push factors?	Poor housing, health care and sanitation. Most migrate to Mumbai from within state of Maharashtra - rural or other urban areas.
8. What are the socio-economic features of Mumbai?	India has more young, professionals in IT/Banking etc. with higher wages. Often people who were first in family to go to University. 3 rd most expensive office space in the world.
9. Which areas of Mumbai have the rich group of people?	middle-class areas - 'SoBo' (South Mumbai and Ballywood) Tata
10. Which areas of Mumbai have the poor people?	Dharavi - 60% of Mumbai's population in 7% of the area. Chawls (flats), shanties, squatties, pavement-dwellers
11. What are the transport systems in Mumbai like?	New underground system to move commuters quickly - Metro Reduce traffic congestion and overcrowded suburban railways to be completed in 2021. Construction started in 2008 and first operations 2014. 360,000 people per day at the moment - will rise massively.
12. What is the location of Dharavi?	7km north of Mumbai Central Business District (CBD)
13. What is the housing like in Dharavi?	Live and work next door. Family businesses - leather, pottery, recycling. Narrow streets, high density per house, some electricity. No toilets. Self-build.

	Some more established. Some still shanty houses with sheeting and cardboard - newest migrants
14. What aspects of the housing show deprivation?	Few communal toilet blocks. Water for few hours per day.
15. How do they deal with waste disposal and recycling?	They have 'Ragpickers' recycle 80% of Mumbai's waste - (only 20% in UK).
16. What is Vision Mumbai?	Plan to spend \$40 million of private investment to improve quality of living - better roads and rail, demolish slums and build 1.1 million low cost homes, reduce pollution
17. What is Sale of Land to Financial district?	Dharavi is next door to Mumbai's financial district and land is worth \$10 million so some land has been sold and developers have provided affordable homes in return.
18. What is the Micro Credit scheme?	Informal workers take small loans from Micro Credit scheme and pay back, e.g. for after school clubs, small machines for businesses. Charities provide the banking
19. What is the Bhandi Bazaar Shanty Improvement	Mixed area of chawls and shops. 20,000 people live here. Overcrowded. No waste disposal. Water few hours per day. Plan to demolish 250 buildings and replace with 17 high rise tower blocks. Plans to be sustainable - houses/shops/work all together - can walk there. Wide roads and tree-lined pavements to replace narrow alleyways but may get rid of pavement-dwellers from new streets. Open spaces and parks. Connections to public transport. Buildings will have natural light, solar power, sewage, CCTV, rainwater harvesting, electricity, Internet.
20. What is South Mumbai like?	SoBo is wealthiest area - on coast outside CBD. Near Ballywood. Apartment blocks, restaurants, 5* hotels, open spaces, cricket clubs, expatriates/very wealthy Indians. Could be any wealthy area in the world.

History

Year 9

Topic: Early Elizabeth England: Queen, government and religion 1585-69

Timeline of events: Elizabethan England	
1.	1558- Elizabeth I is crowned Queen of England
2.	1559- Elizabeth's coronation
3.	1559- Elizabeth implemented her Religious Settlement
4.	1559- Mary Queen of Scots becomes Queen of France when her husband becomes King Francis II
5.	1560- Treaty of Edinburgh. Scottish Protestants overthrow Mary Queen of Scots mother
6.	1560- Mary return to Scotland after Francis dies
7.	1562- French religious war: Catholics vs. Protestants
8.	1563- Statute of Artificers. An Act of Parliament to fix prices, set maximum wages and restrict workers freedoms
9.	1565- Mary Queen of Scots marries Lord Darnley
10.	1566- Archbishop of Canterbury issued further guidelines for priests
11.	1566- The Pope instructs Catholic's not to attend Church of England services
12.	1566- Dutch Revolt
13.	1566- Mary Queen of Scots gives birth to her son James
14.	1567- Lord Darnley murdered and Mary marries the Earl of Bothwell
15.	1568- Mary flees to England from Scotland

Key words	
1	Courtiers Members of nobility who spend most of their life with Elizabeth
2	Divine Right Belief that the monarch's right to rule came from God
3	Succession Who was going to take the throne after the monarch died
4	The Reformation Challenge to the teachings and power of the Roman Catholic Church
5	Clergy Religious leaders such as bishops and priests
6	Royal Supremacy This is when the monarch is head of the Church
7	Papacy The system of Church government ruled by the Pope
8	Heretics Deny the teachings of the Church
9	Martyr Someone killed for his or her beliefs
10	Act of Supremacy Made Elizabeth Supreme Governor of the Church of England
11	Act of Uniformity Established the appearance of churches and the form of services
12.	Royal Injunctions Instructions on how to worship God
13.	Puritans Protestants who want to remove all Catholic rituals from the Church of England
14.	Privy Council The committee of ministers appointed by Elizabeth to advise her.
15	Secretary of State Supervised all government business and managed Parliament meetings.



Key individuals				
Mary Queen of Scots	Henry VIII	Anne Boleyn	Philip of Spain	William Cecil
Elizabeth's Catholic cousin who was Queen of Scotland	Elizabeth's father	Elizabeth's mother who was executed by Henry VIII	King of Spain who launched the Spanish Armada against Elizabeth	Elizabeth's most important advisor and Secretary of State

History

Year 9

Topic: Early Elizabethan England: Challenges at home and abroad 1569-88

Timeline of events: Elizabethan England	
1.	1569– The Revolt of the Northern Earls
2.	1570– Pope Pius V excommunicates Elizabeth from the Catholic Church
3.	1571– The Ridolfi Plot
4.	1576– The Spanish Fury
5.	1576– Pacification of Ghent
6.	1583– The Throckmorton Plot
7.	1584– Treaty of Joinville
8.	1585– All Catholic priests are ordered to leave the country
9.	1585– Treaty of Nonsuch
10.	1585– War begins with Spain
11.	1586– The Babington Plot
12.	1587– Mary Queen of Scots is executed
13.	1587– Drake singses the King of Spain's beard by leading an assault on the Spanish fleet in Cadiz harbour
14.	1588– Philip II of Spain launches the Armada. The Spanish are ultimately defeated at The Battle of Gravelines.

Key words	
1	Sacked Robs town or city using violence
2	Civil War A war between people of the same country
3	Conspiracy A secret plan with the aim of doing something against the law
4	Papal bull A written order issued the pope
5	Council of the North Used to implement Elizabeth's law and authority in the north of England.
6	New world The continents of North and South America
7	Fireships Emptying ships set on fire and sent in the direction of the enemy to cause damage and confusion
8	Warning beacons Fires lit at well known locations on hills to warn of enemy ships or troops
9	Excommunicate No longer a member of the Catholic Church
10	Armada Spanish word meaning a naval fleet or group of warships
11	Revolt An uprising or rebellion against the monarch
12	Earl A senior noble who played an important role in governing England
13	Double Agent Someone who pretends to be on one side but is actually on the other
14	Spymaster Francis Walsingham, Elizabeth's chief spy responsible for her security
15	Jesuits Extreme Catholics carrying out the wishes of the Pope
16	Gravelines A town on the boarder of France and the Spanish Netherlands
17.	Galleon Large but slow fighting ships used by the Spanish
18.	Fleet Group of ships
19.	Cadiz Spain's main western port– the site of much of the Armadas preparations
20.	Gloriana The image of Elizabeth as divine, powerful and in control



Key individuals			
Francis Walsingham	Sir Francis Drake	Duke of Medina Sidonia	Duke of Palma
Elizabeth's Secretary of State	An English privateer and excellent sailor	Leader of the Spanish Armada	Lord Charles Howard
			Lord High Admiral of the English fleet
			Leader of the Spanish army based in the Netherlands

History

Year : 9

Topic : Modern Medicine 1900 to present.

Timeline		
1	1896	First medical use of X-rays.
2	1909	Japanese scientist, Hata created the first 'magic bullet' named Salvarsan 606.
3	1911	National Insurance Act introduced.
4	1928	Alexander Fleming identified penicillin in his laboratory.
5	1929	Fleming published his findings
6	1932	Gerhard Domagk discovered prontosil.
7	1939	Florey & Chain revived Fleming's research into penicillin.
8	1941	Florey & Chain trialled penicillin on a human with some success.
9	1942	US pharmaceutical companies began to mass produce penicillin.
10	1942	Government introduced the diphtheria vaccination.
11	1948	The National Health Service was established.
12	1950	Government introduced the poliomyelitis & whooping cough vaccinations.
13	1950	British Medical Research Council prove there is a link between smoking and lung cancer.
14	1951	Franklin & Wilkins created images of DNA using x-rays.
15	1953	Crick & Watson discovered the double helix structure of DNA.
16	1956	Jonas Salk's polio vaccination was introduced in the UK.
17	1956	Clean Air Act introduced following London's Great Smog of 1952.
18	1956	First successful kidney transplant in the USA, between identical twins.
19	1957	John C. Sheehan creates a chemical copy of penicillin, this drug could now target different diseases.
20	1961	Government introduced tetanus vaccination.
21	1962	A more effective polio vaccination was introduced.
22	1963	First successful lung transplant.
23	1967	First successful liver and heart transplants.
24	1968	Government introduced measles vaccination.
25	1968	Another Clean Air Act was introduced.
26	1970	Government introduced rubella vaccination.
27	1984	The last case of someone contracting polio in the UK.
28	1990	Human Genome Project was launched.

Key words		
1	Hereditary	A disease caused by genetic factors—it can be passed from parents to their children.
2	DNA	Deoxyribonucleic acid—carries genetic information, this information determines characteristics such as hair and eye colour.
3	Antibiotic	Any treatment that destroys or limits the growth of bacteria in the human body.
4	NHS	The National Health Service—launched by the government in 1948. Provided medical care for the whole population of Britain and was funded by National Insurance contributions.

Key people		
1	Francis Crick & James Watson	Discovered the DNA had a double helix structure.
2	Franklin & Wilkins	X-ray photos of DNA.
3	Jonas Salk	Developed and discovered one of the first polio vaccinations.
4	Howard Florey & Ernst Chain	Worked together at Oxford University, and were pioneers in the mass production of penicillin.
5	Aneurin Bevan	The Labour Minister of Health between 1945-51. He oversaw the creation and implementation of the National Health Service in 1948.
6	Alexander Fleming	Discovered the bacteria 'penicillin'.
7	Paul Ehrlich	His laboratory discovered arsphenamine (Salvarsan), the first effective medicinal treatment for syphilis. He popularized the concept of a magic bullet.

Common technologies used to make a diagnosis.		
Blood tests (since 1930s)	Blood pressure monitoring (since 1880s)	Endoscopes (since 1900s)
ECGs (since 1900s)	Blood sugar monitoring (since 1960s)	MRI scans (since 1970s)
X-rays (since 1890s)	Ultrasound scans (since 1940s)	CT scans (since 1970s)

	New technology	Treatment made possible
Medical treatments	Advanced x-rays	Can target and shrink tumours (radiotherapy).
	Smaller, cheaper machines	Dialysis and heart bypasses.
	Robotics	Better prosthetic limbs.
Surgical treatments	Microsurgery	Organ transplants.
	Laparoscopic (key hole) surgery	Can operate inside the body through a tiny cut = quicker healing.

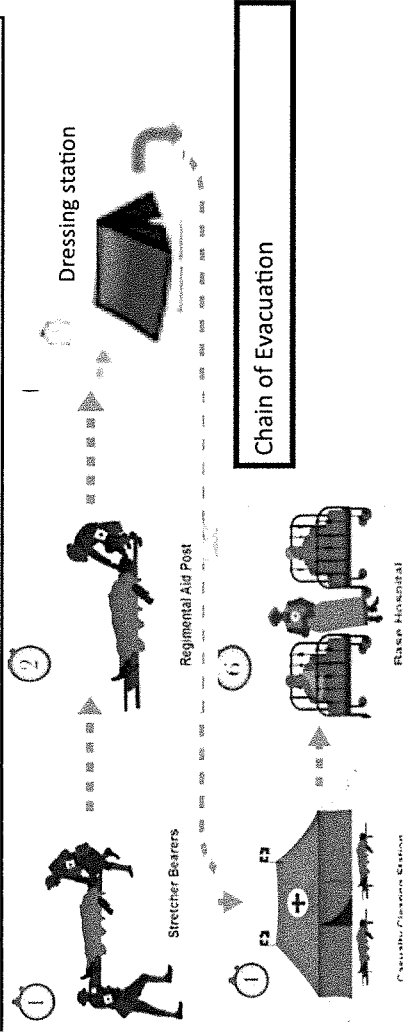
History

Year 9

Topic Western Front

Timeline	
1. 1914-1915	Gunshot to the leg = 20% chance of survival
2. 1915	Lawrence Bruce Robertson pioneered blood transfusion in the British sector
3. 1915	Richard Lewisohn added sodium citrate to blood
4. July 1915	Gas masks supplied to British troops
5. January 1916	FANY allowed to drive ambulances for the British
6. 1916	Thomas splint came in to use. Improved survival rate of broken legs (Femur) to 82%
7. 1916	Francis Rous and James Turner add glucose citrate to blood=stored for up to 4 weeks.
8. 1917	Blood bank at Cambrai begins to save many lives
9. 1917	Harvey Cushing's new brain surgery techniques improve the survival rate from 50% to 71%
10. 1918	240,000 men had lost limbs

Key Battles	
1. 1914	First battle of Ypres, prevent Germans reaching the sea
2. 1915 April - May	Second battle of Ypres Chlorine gas used for the first time
3. 1916 July- Nov	Battle of the Somme over 400,000 British casualties
4. 1917 April	Arras- saw use of underground hospital
5. 1917 July	Third battle of Ypres, 245,000 British casualties
6. 1917 Oct	Battle of Cambrai, 500 tanks used



Key words

1. Blood Transfusion	Blood taken from a healthy person and given to another person
2. Universal Blood group (o)	The blood group that can be given to anyone
3. Trench Foot	Painful swelling of the feet caused by standing in cold muddy water
4. Gangrene	Decomposition of body tissue due to loss of blood supply
5. Trench Fever	Flu like symptoms often spread by lice.
6. Shell Shock	Mental health issue related to the stresses of the battlefield
7. RAMC	Royal Army Medical Corps responsible for medical care of the troops
8. Chlorine gas	First used by the Germans in 1915 at the second battle of Ypres
9. FANY	First Aid Nursing Yeomanry founded in 1907, provided frontline support e.g. driving ambulances.
10. Phosgene gas	Used in 1915 near the end of Ypres
11. Neurosurgery	Surgery carried out on the nervous system especially the brain
12. Chain of evacuation	System for removing wounded from the frontline to a suitable place for treatment.

Key Individuals

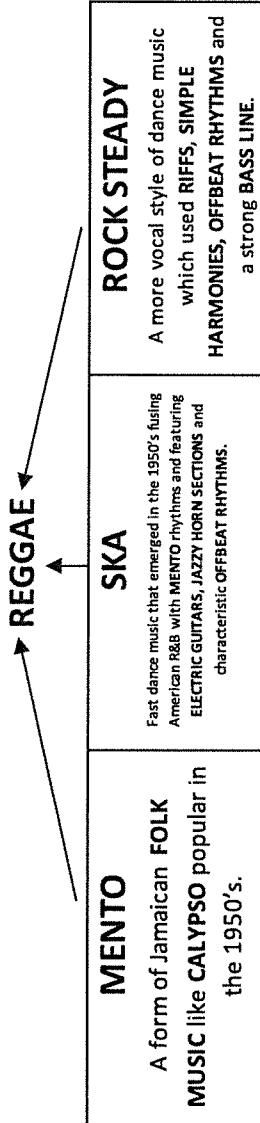
1. Harold Gillies	Developed plastic surgery techniques mainly at Queens Hospital, Sidcup.
2. Harvey Cushing	Developed new techniques for brain surgery, using magnets to locate shrapnel and local anaesthetic.
3. Geoffrey Keynes	Designed a portable blood transfusion kit.
4. Lawrence Bruce Robertson	Pioneered blood transfusion in British Sector
5. Alexis Carrel and Henry Dakin	Together developed a new way to prevent infection, where anti-septic was flushed in to a wound using rubber tubes before the wound was closed up. Carrel Dakin method.

Exploring Reggae and Syncopation

Offbeat

A. How did Reggae develop?

REGGAE is one of the traditional musical styles from JAMAICA. It developed from:



Reggae was first heard in the UK in the 1950's when immigrants began to settle. During the 1960's, people began importing singles from Jamaica to sell in UK shops. Now, Reggae is known as the national music of Jamaica.

D. Offbeat Rhythms & Syncopation

OFFBEAT RHYTHMS – Rhythms that emphasise or stress the **WEAK BEATS OF A BAR**. In music that is in 4/4 time, the first beat of the bar is the strongest, the third the next strongest and the second and fourth are weaker. Emphasising the second and fourth beats of the bar gives a “missing beat feel” to the rhythm and makes the music sound **OFFBEAT**, often emphasised by the **BASS DRUM** or a **RIM SHOT** (hitting the edge of a **SNARE DRUM**) in much Reggae music.

ONBEAT RHYTHM GRID

Pulse/ Beat	1	2	3	4	1	2	3	4
On-beat rhythms (strong beats)	J	↓	↓	↓	J	↓	↓	↓

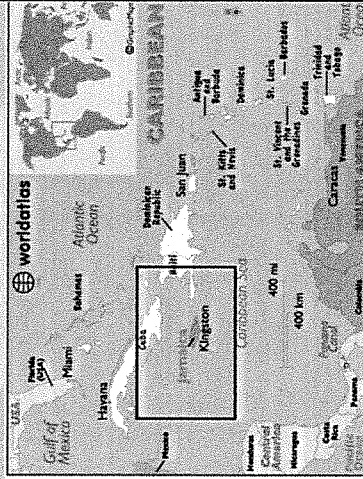
OFFBEAT RHYTHM GRID

Pulse/ Beat	1	2	3	4	1	2	3	4
Off-beat rhythms (weak beats)	↓	↓	↓	↓	↓	↓	↓	↓

SYNCOPATION – A way of changing a rhythm by making

feel – another common feature of Reggae music.

B. Where is Jamaica?



C. What are Reggae Songs About?

Reggae is closely associated with **RASTAFARIANISM** (a religious movement worshipping Haile Selassie as the Messiah and that black people are the chosen people and will eventually return to their African homeland). The **LYRICS** of Reggae songs are strongly influenced by Rastafarianism and are often political including themes such as **LOVE, BROTHERHOOD, PEACE, POVERTY, ANTI-RACISM, OPTIMISM** and **FREEDOM**.

G. Who was Bob Marley?

BOB MARLEY was a famous reggae singer, **SONGWRITER**, and musician who first became famous in his band The Wailers, and later as a **SOLO ARTIST**. He was born Nesta Robert Marley on February 6th, 1945 in Nine Mile, Saint Ann, Jamaica. Although he grew up in poverty, he surrounded himself with music and met some of the future members of The Wailers. Bob Marley became involved in the Rastafarian movement and this influenced his music style greatly. Bob Marley and The Wailers worked with several famous musicians before becoming famous on their own. His career flourished and he became a cultural icon. He was the first international superstar to have been born in poverty in a Third-World country.



F. Reggae Key Words

- MELODY** – The main ‘tune’ of a piece of music, often sung by the **LEAD SINGER**.
- IMPROVISATION** – Previously unprepared performance.
- CALL AND RESPONSE** – Similar to a “Question and Answer” often the call sung by the lead singer and answered by the backing singers or instruments (the response) – musical dialogue.
- SIMPLE HARMONIES** – using a limited number of **CHORDS**, mainly **PRIMARY TRIADS** such as the **TONIC, DOMINANT** and **SUBDOMINANT** chords.

5. RIFF – A repeated musical pattern. Often the **BASS GUITAR** plays repeated **MELODIC BASS RIFFS** in Reggae songs.

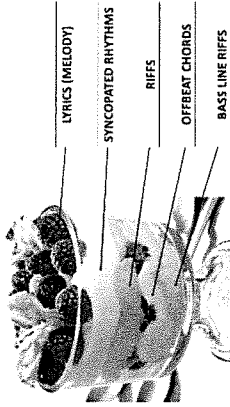
6. BASS/BASS LINE – The lowest pitched part of a piece of music often played by the **BASS GUITAR** in Reggae which plays an important role.

7. CHORD – 2 or more notes played together in **HARMONY**.

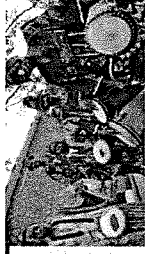
8. RHYTHM – A series of long and short sounds.

9. TEXTURE – Layers of sound combined to make music.

THICK TEXTURAL LAYERS (see F9) "The Reggae Trifle" is an example of how many Reggae songs are 'layered'.



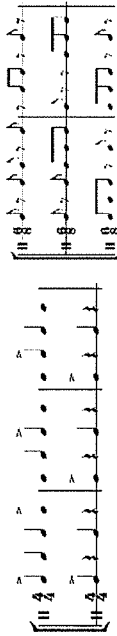
African instruments are often made from plants and animal products such as hide and bone. African musicians are very fond of **PERCUSSION** instruments and use a wide variety of drums (called **MEMBRANOPHONES**). Drums are traditionally used as an accompaniment to singing, dancing, working and communicating between villages. Drummers are typically the most respected members of their community.



African Drums

Characteristic Rhythms and Metres, Traditional Rhythm Patterns & Repetition and Ostinato

REPETITION and **CYCLIC RHYTHMS** used to organise music. A repeated rhythm pattern (**OSTINATO** or **TIMELINE**) is used as a basis for **IMPROVISATION** to "hold the piece together". Use of **SYNCPATION**, **POLYRHYTHMS** (shown below right), **CYCLIC RHYTHMS** and **CROSS-RHYTHMS** (shown below left). **MASTER DRUMMER** can give musical 'cues' to performers to change rhythms during a performance and can also choose to **ACCENT** different beats within a **RHYTHM CYCLE**.



Texture

In West Africa, drum ensembles have 3-5 players each with a distinctive method of striking their drum and playing interlocking rhythms. This creates a **THICK** and complex **POLYPHONIC** texture.

Pitch & Melody and Harmony & Tonality

Most African melodies are based on a "limited number of pitches" - four, five, six or seven note **SCALES** and are normally short and simple, often expanded by **REPETITION** and **IMPROVISATION**. The pitch in African drumming is largely determined by the tuning of the drums. African singers often create vocal harmony by singing in thirds, fourths or fifths. **UNISON** and **PARALLEL OCTAVE** harmony is also common. The basic form of African Vocal Music is **CHORAL SINGING** known as **CALL AND RESPONSE** where one singer (**SOLOIST**) or small group of singers sings a line and the whole group (**CHORUS**) makes a reply (often a fixed **REFRAIN**) - like a "musical conversation" - in alternation with the "lead singer". The soloist often **IMPROVISES**. African singers often "shout words" (**VOCABLES**) and male and female singers enjoy using their highest **VOCAL REGISTER** known as **FALSETTO**. African singing can be accompanied by instruments but can also be unaccompanied (**A CAPPELLA**).

Dynamics

Since African Drumming is often performed outside and at social gatherings and celebrations, the dynamics are generally **LOUD (FORTE - f)** or **VERY LOUD (FORTISSIMO - ff)**, but like changes in tempo, can be indicated by the **MASTER DRUMMER**.

Tempo

FAST - designed for dancing and social gatherings - tempo will match the dance steps. The **MASTER DRUMMER** can both establish the tempo as well as speed up (**ACCELERANDO**) or slow down (**DECELERANDO**) or even set a new tempo with musical 'cues'.

Ensemble

A **MASTER DRUMMER** often leads giving signals to the rest of the group to change rhythms or sections of the piece and can also control the **TEMPO**. He often **IMPROVISES** highly complicated rhythms and can indicate the ending of a piece of music as well as playing the "CALL" to **CALL AND RESPONSE SECTIONS** which are 'responded' by the drum ensemble.

Form & Structure and Phrasing

The structure of a piece of African drumming depends on the **MASTER DRUMMER** and has no fixed or determined length, entirely dependent on the rhythms used.

Musical Characteristics of Folk Music

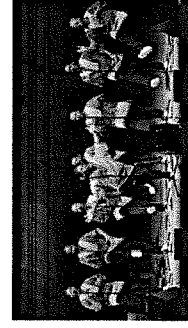
Traditional drums such as the **DJEMBE**, **TALKING DRUM** and **DUNDUN** remain popular in African music today, often combined with a

Impact of Modern Technology on Traditional Music

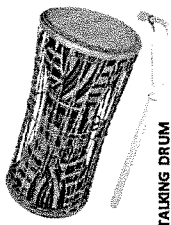
African music has been a major influence on development of popular music contributing rhythms, structures, melodic features and the use of improvisation to such styles as blues, gospel and jazz,



Artists, Bands & Performers of African Drumming

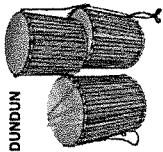


occasions and celebrations. Many Africans believe that music serves as a link to the spirit world.



TALKING DRUM

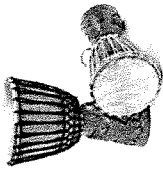
DUNDUN



Other percussion instruments such as clappers, maracas, scrapers, gongs and xylophones (called BALAFONS) produce their sound by vibration and are known as IDIOPHONES.

number of percussion instruments, brought over to America by slaves. High quality stringed instruments and woodwind recordings of traditional African music are now possible instruments. RHYTHM remains a key feature of African drumming.

Ladysmith Black Mambazo



Bolokada Conde

Stringed instruments (CHORDOPHONES) such as bows, lyres, zithers, harps and the KORA are popular as well as some woodwind instruments (AEROPHONES) such as whistles, flutes, reed pipes, trumpets and horns.

Instrumentation – Typical Instruments, Timbres and Sonorities



BALAFON MBIRA FLUTE GOURD MARACAS KORA

1.3.1 Networks and Topologies

Types of network:

- LAN (Local Area Network)
- WAN (Wide Area Network)

Factors that affect the performance of networks

The different computers in a client server and peer-to-peer network

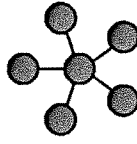
The hardware needed to connect stand-alone computers into a Local Area Network:

- Wireless access points
 - Routers
- Switches
- NIC (Network Interface Card)
- Transmission media

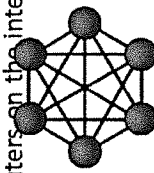
Star and Mesh network topologies

Network topologies are the way the network is laid out, there are many types of topologies but the most common are:

STAR – all the computers are connected to a central hub/switch/server.



MESH – this is where all the devices or nodes are directly connected to each other (i.e. routers connected to routers on the internet)



There are a few factors that could effect the performance of a network they are:

- **Bandwidth** – the amount of data that can be transferred in a given time.
- **Transmission media** – fibre optic cabling uses light so transfer quicker than copper which uses electricity.
- **Wireless** - the performance depends on **signal quality**, **distance** from the access point they are, **interference** from other wireless networks and **physical obstructions** such as walls

LAN - Computers and devices connected over a single site or small geographical area.

- The hardware for a LAN is owned by the organisation that uses it
- They are often used in businesses, schools and universities.

WAN – Computers and devices connected over a wider area.

- Wans connect LANs that are in different geographical areas i.e. different countries.
- Organisations will normally need to hire infrastructure (i.e. communication lines) from telecommunication companies.
- The internet is one big WAN

All devices need a **NETWORK INTERFACE CARD** in order to connect to a network

This contains a **MAC ADDRESS** – a code which uniquely identifies a device.

ROUTERS connect devices across a WAN (including the internet)

A **SWITCH** allows devices to connect on a LAN

Physical networks use wired **TRANSMISSION MEDIA** (cables such as twisted-pair copper, coaxial or fibre optic)

Peer-to-peer: Devices connected directly (with no server)

- Pros – easy to maintain, no dependence on server systems
- Cons – no centralised management, backups need to be done individually, coping file between devices means duplicate files, less reliable.

Client-server: computers (clients) connected to a central server which could provide services like:

- Sharing files
- Internet access
- Shared programs
- Shared peripherals (i.e. printers)
- Pros – files are stored and accessed centrally, easier to back up, software updates are sent out in one go, security is managed centrally and servers are always on.
- Cons – expensive to set up, requires specialist to maintain, dependant on the server working, server can become over loaded if too many clients access it at once.

1.3.1 Networks and Topologies

The internet as a worldwide collection of computer networks:

- DNS (Domain Name Server)
- Hosting
- The Cloud
- Web servers and clients

The internet is basically a giant WAN – it is a network of networks.

Any computer or device that is connected to the internet has a IP address which acts as its 'address' on the internet.

URLs are made up of different sections

<http://www.ocr.org.uk>

http - tells the computer to use the hypertext transfer protocol which puts the packets together to be used in a web browser
www - tells us that this is a webpage and that it is located on the world wide web
ocr.org.uk - is the domain name

A DNS is the server that translates the domain name (the website name) into its IP address
This makes accessing the internet easier as we only have to remember website names instead of the IP address

When a user types in the URL, the DNS looks up the URL and matches its IP address

A web server holds the data needed for the website (both the content of the website and the layout).

When someone wants to view a web page their web browser sends a request to the web server.
The web server processes that request and prepares the data that has been requested, before sending it back.

The web browser then receives that data and displays the web page to the viewer.

The web host is acting as a server (controlling access to a centralised resource)

The web browser is acting as a client (requesting access to that resource).

The cloud uses the internet to store files and applications

- Some servers will run applications
- Some servers will store data.

The benefits of the cloud are that you can:

- Increase storage e.g. from mobile phones
- Access files from anywhere in the world
- Collaborate with others from around the world.

The drawbacks of cloud are:

- No internet no access
- If the cloud fail data is lost
- Can be quite expensive

1.3.2 Wired and wireless Networks, protocols and layers

Ethernet networks require physical cables to be connected

Cons

- This makes it much harder to change or move around .
- Cables can also be trip hazards so are routed along walls and under floors

Pros

- Ethernet networks are more secure because you need physical access to the cables
- The connections are more stable, faster and less susceptible to interference.

Modes of connection:

- Wired
 - Ethernet
- Wireless
 - Wi-Fi
 - Bluetooth

wireless networks require physical cables to be connected

Cons

- Wi-Fi networks are vulnerable to hacking because the connection can be intercepted by anyone in range.
- Wall or obstructions will reduce the signal strength
- Electrical objects can cause interference
- Transfer speeds are slower than Ethernet

Pros

- Wi-Fi allows movement of devices without moving cabling
- You don't need to purchase extra cables to connect devices
- Adding clients is easier



Wireless	Up to 100m range	Ideal for connecting personal devices	Does not need a router
Wireless	150-350 ft range	Slower than wired ETHERNET connections	Needs a wireless router and uses 2.4 & 5ghz frequencies

1.3.2 Wired and wireless Networks, protocols and layers

- Encryption
- IP addressing and MAC addressing
- Standards
- Common protocols including:
 - TCP/IP (Transmission Control Protocol/Internet Protocol)
 - HTTP (Hyper Text Transfer Protocol)
 - HTTPS (Hyper Text Transfer Protocol Secure)
 - FTP (File Transfer Protocol)
 - POP (Post Office Protocol)
 - IMAP (Internet Message Access Protocol)
 - SMTP (Simple Mail Transfer Protocol)
- The concept of layers

Encryption

Encryption software **SCRAMBLES** (encrypts) data to stop third-parties from accessing it.

To decrypt the data, a special 'KEY' is needed. The computer uses the key and a set of instructions to turn the data back into its original form.

SYMMETRIC

Risky – single key to both encrypt & decrypt the message.

ASYMMETRIC

Safer – uses two keys **PUBLIC & PRIVATE** key to decrypt the message

Standards and Protocols

- A network standard is a set of **agreed requirements** for hardware and software.
- Standards are important as they allow **manufactures** to create products that are **compatible** with other manufactures.
- A network protocol is a **set of rules** for how **devices communicate** and how data is transmitted across a network.
- Communication protocols specify how communication between two devices is carried out.

Addressing

There are two main types of addressing used in networks

IP addressing

- IP addressing is used when sending data between TCP/IP networks i.e. over the internet.
- IP address are assigned by the ISP or network manager.
- There are 2 versions **IPv4** (uses 32 bits) & **IPv6** (uses 128 bits).

MAC Addressing

- Every device needs a **unique** identifier so it can be found on the network.
- MAC addresses are **assigned** to all network-enabled devices by the **manufacturer**.
- They are **Unique** and **cannot be changed**
- MAC addresses are **48 or 64-bit** binary numbers, these converted into hexadecimal to make it easier to understand.

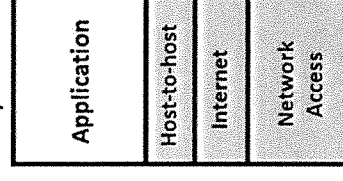
Common protocols

- **TCP/IP** – this is the protocol that dictates how data is sent across networks.
 - TCP (Transmission Control Protocol) rules for how devices connect on a network
 - IP (Internet Protocol) for directing packets to their destination
- **HTTP** (Hyper Text Transfer Protocol) – Used by web browsers to access websites and communicate with web servers
- **HTTPS** (Hyper Text Transfer Protocol Secure) More secure version of HTTP used on websites that have sensitive data.
- **FTP** (File Transfer Protocol) – Used to access, edit and move files between devices on a network.
- **POP3** (Post Office Protocol) – Used to receive emails from a server, after which it is deleted from the server.
- **IMAP** (Internet Message Access Protocol) – Used to receive emails from a server, remains on the server after downloading.
- **SMTP** (Simple Mail Transfer Protocol) – Used to send emails

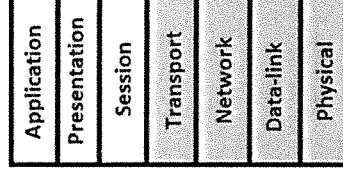
The concept of Layers

- Layers are groups are protocols which have similar functions
- Layers are self contained, the protocols in each layer don't need to know what is happening in the other layers
- Each layer serves the layer above

TCP/IP model



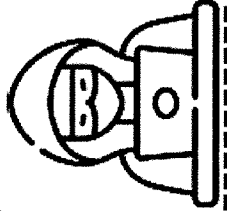
OSI model



1.4.1 Threats To Computer Systems And Networks

Forms of Attack:

- Malware
- Social engineering, e.g. phishing, people as the 'weak point'
- Brute-force attacks
- Denial of service attacks
- Data interception and theft
- The concept of SQL injection



SOCIAL ENGINEERING involves exploiting human weaknesses in order to gain access to a computer system/network.

The most common way it is done is **Phishing**

PHISHING emails are sent by criminals and are designed to steal money or login details they contain links or attachments which, if clicked, allow access to the system.



BRUTE FORCE ATTACKS – this involves a hacker attempting to gain access to a network, they do this by guessing a users password using a trail and error method until it is found. They use software created that produces hundreds of likely password combinations that are commonly used.

HOW TO SPOT A PHISHING EMAIL

- Spelling mistakes
- Suspicious origin address
- Impersonal (i.e. no name)
- Asks for personal information
- Contains links attachments



DENIAL OF SERVICE (DoS) attacks are designed to 'crash' a network or website. Criminals do this by bombarding it with so many requests (traffic) that it cant function properly.

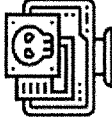
These are used to silence a website that the malicious user disagrees with. Can be used as a smoke screen to hide another attack that is happening on the server. **DISTRIBUTED DENIAL OF SERVICE (DDoS)** uses a large number of computers to attack. This is more effective than using one system because a large number of systems can generate more traffic. DDoS attacks make use of botnet – collection of zombie computers that have been infected with code that gives the malicious user control over that machine

Malware is software which can cause damage to a computer.

- Malware is installed on devices without the users knowledge, typical actions of malware are.
 - Deleting, changing files
 - Locking files
 - Monitoring actions
 - Changing permission to allow hacker access

Types of malware

- Worms
- Viruses
- Spyware
- Ransomware
- Trojans



People as the weak point – where illegal access is obtained by influencing people within a company, common way of doing this is over the telephone: Someone calls the employee and pretends to be a network administrator, they persuade the employee to disclose information e.g. their login details or sensitive company data.



DATA INTERCEPTION and theft is done when data is being sent across a network. The packets are **intercepted**.

Wireless networks are most venerable to data interception because **no physical access** is required. Data can also be accessed if it is being transferred across a WAN as it uses telecommunications as part of its infrastructure. **Packet sniffing** software is used to intercept the packets as they move round the network.

SQL INJECTION – this refers to using SQL statements to access databases.

By exploiting vulnerabilities hackers could access systems containing customer data, intellectual property or other sensitive information. Should an attacker gain access to the database they could:

- Bypass authentication** procedures and impersonate specific users
- Execute queries, **exposing** data
- Alter** data, resulting in integrity issues
- Delete** data

1.4.2 Identifying And Preventing Vulnerabilities

Common prevention methods:

- Penetration testing
- Anti-malware software
- Firewalls
- User access levels
- Passwords
- Encryption
- Physical security

Penetration testing is done under controlled environment by a qualified person.

They check for current vulnerabilities and explore potential ones
They may use tools/software to help them

FIREWALLS

Software that performs a 'barrier' between a potential attacker and the computer system.

- Can be held on a **server**, or a **standalone** computer.
- Many have this feature as part of an anti-virus package.
- **Not 100% effective** – an attacker could exploit a vulnerability.
- Monitors application and network usage.
- Has the ability to block access from certain computer users and disable processes which may be perceived as a threat.

There are two different types of firewall:

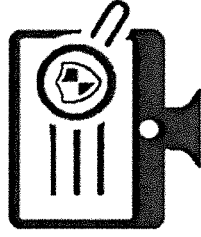
- **Hardware firewall** – runs on its own physical device
- **Software firewall** – part of another system i.e. installed as part of a antivirus or operating system

There are different types of hacker:

White Hat Hacker – they have permission and are authorised to act as a penetration tester.

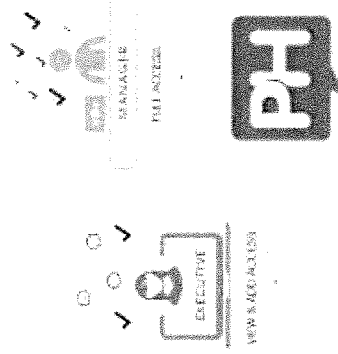
Grey Hat Hacker – they may not have permission to perform penetration testing but will inform the organisation is they find vulnerabilities

Black Hat Hacker – someone who does not have permission and has malicious intent, these are the ones that penetration testers are trying to stop



Anti malware software scans the system checking for viruses. They need to be kept up to date to ensure that they find and remove new malware.

Some anti-malware software offers real-time protection of the system, it monitors the traffic and stops malware entering.



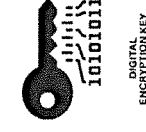
Strong or Secure Passwords

- 12 characters or more.
- The greater the characters, the stronger the password.
- Mixture of capitals, lower case letters, numbers and symbols.

Physical security is used to prevent physical access to devices, and to prevent theft.

Steps may include:

- door locks
- window locks or bars
- intruder alarm systems
- CCTV systems
- laptop locks (e.g. Kensington locks)
- security guards.



Encryption

Where data is translated into code so that only authorised users, or users with the key can decrypt it.

Users must need the key in order to decrypt the coded file.

It uses an algorithm to encode the data so that it is unreadable. The data then has to have the algorithm run on it again to make it readable.

Component of fitness	Fitness test	Equipment	Prior to the test	Test procedures
Muscular Endurance	1 minute Press-up Test	Stop watch, mat, assistant, pen and paper.	Warm up. Set the timer for a minute/ check stop watch is on 0.	Assistant to count how many Press-ups in one minute. Half press-ups or full press-ups can be attempted, however cannot switch between them. Write down your results at the end.
Aerobic Endurance	1 minute Sit-up Test	Stop watch, mat, assistant, pen and paper.	Warm up. Set the timer for a minute/ check stop watch is on 0.	Assistant to count how many sit-ups in one minute. Assistant can hold the participants feet. Participant must not swing arms. Write down your results at the end.
	Multi stage fitness test	Flat non-slip surface/ 30-metre tape measure/ Marking Cones/ The Multi-Stage Fitness Test/ CD Player or app.	Warm up. Measure 20 meters and place two cones out.	Press start on the recording. It will start with 3 beeps. Participants must reach the end of the 20m before the beep. They will continue until they can no longer keep up with the beeps. Record the level.
Speed	12 minute cooper run	Track or swimming pool that has been measured. Eg. running track 400m. Stop watch, assistant, pen and paper.	Perform a warm up Ensure assistant is ready.	Complete as many laps as possible around 100m track in 12 minutes/ You need a stop watch to time and count how many laps you complete/Multiply the number of laps by 100 to find out the distance in metres
	30 m Sprint	Stop watch, assistant, tape measure, cones, pen and paper.	Warm up. Measure 30 meters and place two cones out.	Assistant stands at the finish with a stop watch. When they shout go, the participant will run as fast as they can to the other end and stop the timer. Repeat 3 times. Record the best score.
Flexibility	Sit and reach	Box/ Metre ruler/ Assistant.	Warm up and stretch your hamstrings. Take shoes off and place heels on the box.	Legs need to be straight / knees flat on floor/ No footwear / bare feet. Reach as far forward as possible. Move slowly / no bouncing. Maintain position for two seconds
Agility	Illinois Agility test	Flat non-slip surface/ 8 cones/ Stopwatch/ Assistant.	Warm up. Measure out a box 10m by 5m with 4 cones placed in the centre of the box Ensure the participant knows the route.	Lie face down by the start of the cone. On go run the course as quick as you can. Stop the stop watch when you pass the finish line. Record the results.
Power	Vertical Jump Test	Vertical jump board or Wall/Tape measure/ Chalk/ Assistant	Warm up Prepare the test.	The athlete chalks the end of their fingertips. The athlete stands side onto the wall, keeping both feet remaining on the ground, reaches up as high as possible with one hand and marks the wall with the tips of the fingers (Mark 1). The athlete from a static position jumps as high as possible and marks the wall with the chalk on his fingers (M2). The assistant measures and records the distance between M1 and M2. Record the results.
Reaction Time	Standing Long Jump/ Broad Jump	Tape measure, assistant.	Warm up. Prepare the test.	Stand with your feet behind the line. Swing your arms and try and jump as far as possible. Take the reading from the back of your foot. Repeat 3 times. Record the longest distance in recorded.
	Ruler Drop	Ruler	Elbow at 90 degrees/ with the assistant holding the ruler parallel to the wall.	Elbow at 90 degrees/ with the assistant holding the ruler parallel to the wall. The assistant drops the ruler, and you have to catch it with your thumb and index finger. Mark the distance on the ruler.
Strength	Grip Dynamometer 1 rep max	Grip dynamometer/ Assistant/ Stop watch.	Perform a warm up. Calibrate the grip dynamometer to your age. Hold parallel to your body.	Hold parallel to your body. The athlete using their dominant hand applies as much grip pressure as possible on the dynamometer. The assistant records the maximum reading (kg). The athlete repeats the test 3 times. The assistant uses the highest recorded value to assess the athlete's performance.
Balance	Stalk stand	Stop watch/ Warm dry location (Gym) Assistant	Warm up. Remover shoes Hands on hips, lift right leg and place sole of right foot against the side of the left kneecap	On GO your partner will start the stopwatch and performer raises heel of left foot to stand on toes Aim is to hold this position for as long as possible – repeat with other leg Four attempts – 2 on each leg and record the best time achieved
Coordination	Alternate-hand wall-toss test	1 tennis ball, tape measure, cone, smooth wall, pen and paper.	A mark on the floor 2 metres from the wall, the subject then stands behind the line and faces the wall.	Stand two metres away from a smooth wall. Assistant shouts "GO" and starts the stopwatch. The athlete throws a tennis ball with their right hand against the wall and catches it with the left hand, throws the ball with the left hand and catches it with the right hand. This cycle of throwing and catching is repeated for 30 seconds. The assistant counts and records the number of catches.

Continuous training

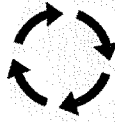
1. Continuous training

Involves a steady but regular pace at a moderate intensity (aerobic) which should last for at least 20 minutes- 2 hours.

Ensures there is no build up of lactic acid because oxygen is present

i.e. running, walking, swimming, rowing or cycling.

Used by a **marathon runner**, **rower**, **cyclist**, **footballers**.



Continuous training

2. Fartlek training – Referred to as ‘speed play’

This is a form of continuous training, due to having no rests

Improves both aerobic and anaerobic system (endurance and speed)

Involves a variety of changing intensities over different distances, terrains, speeds and gradients

i.e. **1 lap at 50% max, 1 lap walking, 1 lap at 80% (aerobic and anaerobic used)**

Used by **games players – Hockey players, Footballers to develop their aerobic and anaerobic performance,**

Interval training

4. Interval training - Involves **periods of work followed by periods of rest. i.e. Sprint for 20 metre + walk back to start.**

Used by a **200m sprinter, Footballer, Handballer, Netball player.**

This can be adapted to improve speed or endurance. E.g. to train for endurance an athlete would perform long interval training. E.g. 400m X8 reps X3 sets.

Interval training

5. Plyometrics training

Involves high-impact exercises that develop **power. i.e. bounding/hopping and Jumping.**

e.g. **squat jumps, Single leg hops, bounding, box jumps, depth jumps.**

Used by **long jumpers, 100 m sprinters**

basketball players, High Jumpers.



Interval training

3. Weight/Resistance training – A form of training that uses progressive resistance against a muscle group. Used by **cyclists.**

Muscular strength: High weight x low repetitions

Muscular endurance: Low weight x high repetitions

E.g. Rugby players would need weights to improve their strength when tackling.

E.g. Weight lifters, to be able to lift a heavier weight.

E.g. Rowers to improve their endurance to go for longer.



Interval training

6. Circuit training - A series of exercises completed one after another. Each exercise is called a station. Each station should work a different area of the body to avoid fatigue. It involves repetitions of exercises, the bodyweight is usually the resistance, each station is timed, there is a rest period between each station.

i.e. **press ups, sit ups, squats, shuttle runs, lunges, box jumps.**

Interval training

7. HIIT Training

These are High Intensity Interval Training activities where short bursts of speed and recovery are used throughout the session.

Exertion levels are high (7/10) for between 30 secs and 3 mins.

Work output is much shorter than recovery time

Helps burn fat and develop the cardio respiratory system.

Examples might be Body pump, High Impact Aerobics, Spinning.

4 Principles of training [SPOR]

Principles of training - Guidelines that ensure training is effective and results in positive adaptations. These principles are used when planning an Exercise/training Programmes

1. Specificity

Training should be matched to the requirements of the sport or position the performer is involved in. Training must be specifically designed to develop the right aspect:

- Muscles e.g. Build biceps do bicep curls
- Type of fitness e.g. To improve strength do weights/ To improve power do plyometrics
- Skills e.g. to improve dribbling in Basketball work on your technique
- Developed e.g. A long jumper would need to perform *plyometrics*, such as box jumps.to develop their power, which will create a larger jump

2. Progression: Training should gradually increasing over time

Using overload in a progressive way over the course of a programme. Once adaptations have happened overload needs to be applied to make gains again. Training gradually becomes more difficult / challenging, Because body has made adaptations /got stronger, Must be gradual to avoid injury.

e.g. lifting more in week 12 than in week 2 of the programme.
e.g. Gradually progress the sessions by 10 minutes at a time.

3. Overload: Working the body harder than normal

This is required to put the body under stress so that we can improve our component of fitness or skill. Work harder than normal / puts body under stress. So that fitness adaptations / improvements will occur. Links with FITT principle

Increase frequency/ intensity/ duration or time of training / or change type of training




e.g. bench press 50kg x 10 repetitions and increase to 55kg x 5 repetitions.

Links with FITT- Frequency- Lift weights for longer/ Intensity- work harder e.g. 50kg instead of 40kg/ Time- longer training sessions.

4. Reversibility

If training is not regular, adaptations will be reversed. This can happen when:

- Suffering from illness and cannot train
- Injury
- Working too hard (too much overload applied without progression)
- After an off-season.

<p>Frequency </p>	<p>How often training takes place.</p>	<p>Increase training from once a week to two</p>
<p>Intensity </p>	<p>How hard the exercise is.</p>	<p>Increase resistance from 10kg to 15kg or increase incline on the treadmill.</p>
<p>Time </p>	<p>The length of the session.</p>	<p>Increase training session from 45 minutes to 55 minutes.</p>
<p>Type</p>	<p>The method of training used.</p>	<p>Change to from interval training to Fartlek training.</p>

Training Zones

1. Calculating Maximum Heart Rate (MHR)
220-age=
e.g. 220-14 = 206
2. Aerobic Zone: When training to improve our cardiovascular endurance you will need to ensure you are working in the aerobic zone. This is 60-80 % of you MHR
3. e.g. If I am 20 years of age my Max HR will be 200. Therefore I will need to ensure my HR does not exceed 160 and must be above the minimum threshold of 60% therefore over 120 bpm.
- 4: Anaerobic Zone: When training to improve our speed or anaerobic fitness we will need to train in our Anaerobic zone above 85 MHR
5. e.g. if I am 14 years old. My Max HR would be 206. If I need to develop my anaerobic endurance I will need



Warm up: The five components of a warm-up are as follows.

- 1. Pulse raising.** This includes exercises that slowly increase heart rate and gradually increase body temperature, for example jogging, cycling, skipping or gentle running.
- 2. Mobility.** Exercises that take the joints through their full range of movement (ROM), for example arm swings, hip circles, ankle rotations, heel flicks, open/close the gate/lunges/rotations/groin walk.
- 3. Stretching.** This can include developmental stretches, gradually increasing the difficulty of each stretch or dynamic stretches that include more ballistic movements (for example, lunges) or static stretches where the body remains still or static while stretching. Examples of stretches include open and close the gate, groin walk for more dynamic exercises and slowly trying to touch your toes for more static stretches.

TIP: Ensure when providing an example, it must be sport specific. For example a 100m Sprinter will perform jogging around a track twice (800m) gradually increasing the speed to enable more blood/oxygen to be delivered to the working muscles)

- 4. Dynamic movements.** This involves movements that show a change of speed and direction, for example shuttle runs, skipping, running in and out of cones, zigzag running, high knees, heel flicks, a gility ladders.
- 5. Skill rehearsal.** This involves practising or rehearsing common movement patterns and skills that will be used in the activity, for example dribbling drills for football or passing drills for netball.

Physical benefits of a warm-up (why we perform a warm up)

1. The warm-up enables the body to prepare for exercise and decreases the likelihood of injury and muscle soreness.
2. Increase heart rate (release of adrenaline). Increased respiratory rate.
3. Increase flexibility of muscles and joints.
4. Increase pliability of ligaments and tendons.
5. There is also a release of adrenaline that will start the process of speeding up the delivery of oxygen to the working muscles.
6. An increase in muscle temperature will help to ensure that there is a ready supply of energy and that the muscle becomes more flexible to prevent injury.
7. Increase speed of muscle contractions.



Cool down

The key components of a cool-down are:

- 1. Low - moderate (medium) intensity exercises – gradually lower the pulse rate and the heart rate and reduce the body's temperature, for example easy movement exercises or light running/jogging.**
- 2. Stretching – includes steady and static stretches, for example hamstring stretch, quadriceps stretch.**

Physical benefits of a cool-down | Blood pressure?

The cool-down is crucial in: You must use the word **gradually (HR, Blood pressure, breathing rate and temperature) to gain the mark.**

1. Cool-downs also prevent/reduce blood pooling in the veins, which can cause dizziness.
2. Helping the body's transition back to a resting state or speeds up recovery.
3. **Gradually** lowering heart rate or maintains elevated heart rate, ~~returns pulse back to a resting state.~~
4. **Gradually** lowering or maintains elevated body/muscle temperature - ~~slowly returns body temperature back to normal.~~
5. ~~Circulating blood and oxygen. Reducing the risk of blood pooling.~~ Maintains circulation of blood/ oxygen flow to muscles that have been working .
6. **Gradually** reduces blood pressure.
7. **Gradually reducing /** maintains elevated breathing (respiratory) rate. Number of breaths taken is slowly reduced.
8. Help **reduce** the risk of fainting, nausea and light headedness.
9. Increasing the removal of waste products such as lactic acid. The oxygen can more effectively be flushed through the muscle tissue and will oxidise any lactic acid, which needs to be dispersed.
10. **Reducing** the risk of muscle soreness (or delayed onset of muscle soreness – DOMS) and stiffness. Less likely to feel aches and pains.
11. **Reduces risk of damage to joints.** Aiding recovery by stretching muscles, i.e. lengthening and strengthening muscles for next workout/use. Maintenance stretches to return muscle to normal length. Lengthening and strengthening muscles for next workout.

Developed points:

For example a Footballer would perform low intensity exercises, to gradually lower HR and get more oxygen to the working muscles to flush out the lactic acid. This will allow them to not be as sore after the competition. Therefore allowing them to train sooner.