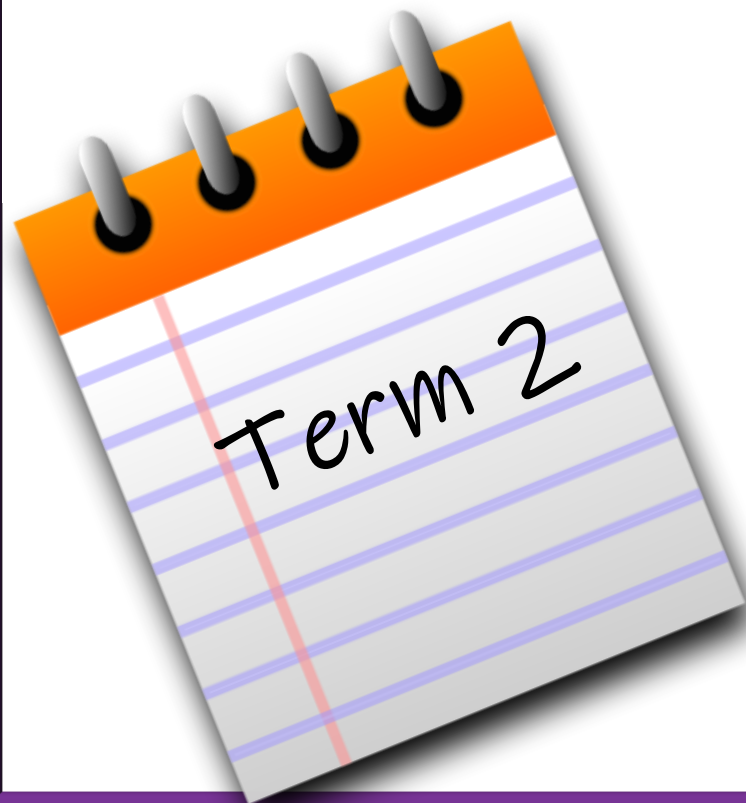


# The Knowledge Organisers Pack



Year  
10





# Contents Page



English

Page 1 - 15

Art

Page 69 - 72

Mathematics (F)

Page 16 - 24

Catering

Page 73

Mathematics (F)

Page 25 - 36

Geography

Page 74 - 75



Science

Page 37 - 45

History

Page 76 - 77

Computer Science

Page 46

Religious Education

Page 78



Design Technology

Page 47 - 67

Music

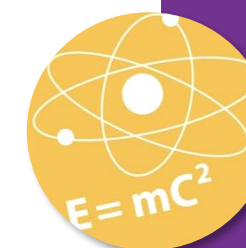
Page 79 - 81

French

Page 68

PE

Page 94







# Bayonet Charge

## KNOWLEDGE ORGANISER

**Context** – *Bayonet Charge* was written by Ted Hughes, and was first published in 1957.

**Ted Hughes** – Ted Hughes (1930-1998) was an English poet and children's writer, who served as the Poet Laureate between 1984 and his death. *Bayonet Charge* is unusual for a Hughes poem in that it focuses on a nameless soldier in the WWI – although he did write other war-themed poems, much of his work focused instead on nature and the animal kingdom in particular, and myths and legends. His father had fought in the war.



**World War I** – World War I, also known as the 'Great War', was a global war originating in Europe that took place from July 1914 to November 1918. It involved all of the world's major powers, opposing the Allies (including Russia, France, UK, and USA) against the Alliance (Germany, Austro-Hungary, the Ottoman Empire). Over 9 million armed forces and 7 million civilians were killed in the war.



**The Bayonet** – A bayonet is a bladed weapon that is similar to a knife or sword. It is designed to be fitted onto or underneath the muzzle of a rifle or similar firearm. From the 17th Century, up until WWII, the bayonet was a primary weapon for infantry attacks and combat at close quarters. It also served other purposes as a general purpose survival knife (when detached). Famously, those attacking in WWI were often mown down by machine guns before they had opportunity to use them.



**Going 'Over the Top'** – The use of trench warfare significantly influenced the high death toll. Attacks involved going 'over the top' across 'No Man's Land' (in the middle) where attackers were open to machine gun fire, mines, and shells. Even if successful, casualties were huge. Life in the trenches were awful, with diseases like trench foot rife. Men would often spend weeks at a time on the front line, where they would need to sleep, eat, and defecate in close proximity in the trenches.



### Language/Structural Devices

**Juxtaposition** – Hughes places violent imagery alongside descriptions of nature, to demonstrate how out of place and unnatural the events of the war are. For example, he describes the pain and discomfort of the soldier as he stumbles around, surrounded by 'rifle fire' and 'bullets', yet juxtaposes language associated with 'field of clods' and 'green hedge'. Positioning the two ideas next to one another emphasises the extremity of both, showing how preternatural the war seems.

**Varied Verbs** – Varied verbs are used to show the reader the manner in which actions are completed, telling us a great deal about the soldier himself and his environment. For example, 'stumbling' demonstrates the soldier's inexperience, whilst 'lugged' shows us the physical strain and discomfort that the soldier is experiencing. Furthermore, 'dazzled' and 'smacking' show portray to the reader the depth of confusion and violence that are prevalent on No Man's Land.

**Quote:** "Open silent, its eyes standing out.  
He plunged past with his bayonet toward the green hedge"

**Quote:** "Stumbling across a field of clods towards a green hedge/ That dazzled with rifle fire, hearing."

**Personification/ Metaphors** – Hughes' use of figurative language gives the poem a violent undercurrent, demonstrating the pain and suffering of the warzone. Bullets are personified as 'smacking' the sky, presenting both sound imagery and an association with pain. The symbolic use of the wounded hare, during the 3rd stanza, shows the terror and trauma of injuries sustained on No Man's Land.

**Alliteration/ Repetition** – Hughes uses the repetition of sounds and words for emphasis and to replicate sounds throughout the poem. For example, the alliteration of the 'h' sound throughout the opening stanza expresses the soldier's heavy breathing as he charges. Furthermore, harsh, awkward sounds are repeated e.g. 'plunged past' to demonstrate the discomfort felt by the soldier.

**Quote:** "Threw up a yellow hare that rolled like a flame  
And crawled in a threshing circle, its mouth wide."

**Quote:** "In raw-seamed hot khaki, his sweat heavy,"

**Form/Meter** – The poem is written in 3 stanzas – the first stanza has 8 lines, the second 7, and the third 8 again. Each stanza is filled with words and images, representative of the thick mud that the soldier must run through. The varying line lengths are suggestive of his quicker and slower progress through the mud. There is no clear rhyme scheme, demonstrating the disorder and chaos of the scene.

**Structure** – The three stanzas depict three very different moments in the poem. The first is fast-paced, depicting the action of the soldier running across No Man's Land. The dashes show that the soldier is, however, starting to hesitate and think. The second stanza happens in slow motion as he contemplates his actions (3 lines are broken by punctuation). In the 3rd stanza, the soldier rushes once more towards death.

**Quote:** He plunged past with his bayonet toward the green hedge/ King, honour, human dignity, etcetera

**Quote:** "In bewilderment then he almost stopped -  
In what cold clockwork of the stars and the nations"

**Themes** – A theme is an idea or message that runs throughout a text.

**Suffering** – In addition to the mental anguish that the soldier experiences, a physical undercurrent of pain and suffering is evident throughout the poem. In stanza 1, for example, the soldier's discomfort is made clear through vocabulary such as 'raw' and 'sweat'. The image of the injured hare in stanza 3 represents his stricken comrades.



**The Futility of War** – The poem portrays one of the most terrifying acts of this or any war, the charge 'over the top'. This was close to a suicide mission, as they were exposed to machine guns and shells. The soldier seems to stop still in time (stanza 2) and question the rationale for carrying out his actions ('running...for a reason').



### Line-by-Line Analysis

| STANZA | LINE | POEM  | ANALYSIS   |
|--------|------|---|--|
| 1      | 1    | Suddenly he awoke and was running- raw                    | An anonymous soldier charges across <u>no man's land</u> . The use of the <u>adverb</u> 'suddenly' to open the poem thrusts the reader immediately into the action. The <u>verb</u> 'awoke' gives a sense of realism – this isn't a nightmare. Suggests preceding events have been a daze in comparison. <u>Repetition</u> of the word 'raw' and the <u>hyperbole</u> used to describe 'heavy sweat' suggest he is inexperienced and uncomfortable. <u>Violent imagery</u> is used to describe the warzone – <u>personification</u> of the bullets 'smacking' the belly out of the air. <u>Similes</u> used in lines 6 & 8 further describe his discomfort.  |
|        | 2    | In raw-seamed hot khaki, his sweat heavy,                 |  |
|        | 3    | Stumbling across a field of clods towards a green hedge   |  |
|        | 4    | That dazzled with rifle fire, hearing                     |  |
|        | 5    | Bullets smacking the belly out of the air -               |  |
|        | 6    | He lugged a rifle numb as a smashed arm;                  |  |
|        | 7    | The patriotic tear that had brimmed in his eye            |  |
|        | 8    | Sweating like molten iron from the centre of his chest, - |  |
| 2      | 9    | In bewilderment then he almost stopped -                  | Hughes slows down time in the second stanza, opening with words such as 'stopped' and 'bewilderment', as the soldier considers his actions and surroundings. The surroundings of the 'stars' and 'nations' shows the <u>feeling of insignificance</u> felt by the soldier. Meanwhile, the idea of a man 'running in the dark', 'listening...for the reason' suggests that there is <u>no rational reason</u> for him to be doing this, no reason for war. The last line makes it seem as if the soldier has been turned to stone by his indecision.  |
|        | 10   | In what cold clockwork of the stars and the nations       |  |
|        | 11   | Was he the hand pointing that second? He was running      |  |
|        | 12   | Like a man who has jumped up in the dark and runs         |  |
|        | 13   | Listening between his footfalls for the reason            |  |
|        | 14   | Of his still running, and his foot hung like              |  |
|        | 15   | Statuary in mid-stride. Then the shot-slashed furrows     |  |
| 3      | 16   | Threw up a yellow hare that rolled like a flame           | The land around is described as 'shot-slashed', giving an <u>image of the carnage</u> that is taking place. From beneath, an <u>injured hare</u> emerges and its movements are associated with pain 'threshing', 'mouth wide', 'like a flame.' This <u>symbolises</u> wounded comrades – not literally mentioned in order to present his isolation. <u>Alliteration of the harsh 'p'</u> sound in 'plunged past' shows the unnaturalness of what he is doing, <u>juxtaposed</u> with the image of nature ('green hedge'). Line 20 – reasons to go to war – 'etcetera' suggests they are <u>not worth listing</u> . The simile on 21 shows he is attacking out of desperation – not moral principle. The last line shows the ease with which he may lose control. |
|        | 17   | And crawled in a threshing circle, its mouth wide         |  |
|        | 18   | Open silent, its eyes standing out.                       |  |
|        | 19   | He plunged past with his bayonet toward the green hedge,  |  |
|        | 20   | King, honour, human dignity, etcetera                     |  |
|        | 21   | Dropped like luxuries in a yelling alarm                  |  |
|        | 22   | To get out of that blue crackling air                     |  |
|        | 23   | His terror's touchy dynamite.                             |  |

### Poems for Comparison

|                                    |  |
|------------------------------------|--|
| <b>Exposure/ War Photographer</b>  | <i>Bayonet Charge</i> can be compared and contrasted with these poems in its approach to <u>pain and suffering</u> .             |
| <b>Charge of the Light Brigade</b> | <i>Bayonet Charge</i> can be compared and contrasted with this poem in the approach to the theme of the <u>futility of war</u> . |

### Influences on the Poet

|   |  |
|---|--|
| <i>The big, ever-present, overshadowing thing was the First World War, in which my father and my Uncles fought, and which seemed to have killed every other young man my relatives had known. About his father's experience in war: 'I never questioned him directly. Never. I can hardly believe it now, but I didn't. He managed to convey the horror so nakedly that it fairly tortured me when he did speak about it.'</i><br><i>'My 1st world war nightmare – a dream lived all the time, in my father's memory. How can one confront or come to terms with it.'</i> |  |
|---|--|





# CHECKING OUT ME HISTORY KNOWLEDGE ORGANISER



**Context** – *The Emigrée* was written by John Agard and was published in 2007.

**John Agard** – John Agard (born 1949) is an Afro-Guyanese poet and playwright who now lives in the UK. When he moved to the UK in the 1970s, he began teaching people about Caribbean culture and worked in a library. He often conveys his Caribbean voice in his poems, using non-standard spelling to represent his accent. His poems are often rebellious in nature, challenging common ways of thinking.



**Guyana** – Guyana is a country on the northern mainland of South America. However, it is often considered as a Caribbean region because of its strong cultural and historical links to Anglo Caribbean nations. It was governed by Britain from the late 18<sup>th</sup> Century and known as British Guiana until the 1950s. It gained independence in 1966. Many Guyanese families have since emigrated to the UK – in 2009 there were 24,000 Guyanese-born people living in the UK.



## The Battle of Hastings and Dick Whittington

**Whittington** – The event that the speaker mentions as taking place in 1066 (line 6) is the Battle of Hastings. It is the event in which William of Normandy defeated King Harold. It is a staple topic of history lessons in the UK. **Dick Whittington** is another commonly-taught history folklore – concerning the rise from poverty of a man who sold his cat to a rat-infested country.



**Toussaint L'Ouverture and Nanny de Maroon** – Toussaint L'Ouverture was a leader in the Haitian Revolution. He showed strong political and military skill, which resulted in the first free colonial society – race was not considered the basis of social standing. Nanny of the Maroons was an outstanding Jamaican leader, who became known as a figure of strength in fights against the British. Neither of these figures are commonly discussed in the British education system.



## Language/Structural Devices

**Repetition** – Repetition is one of the most powerful tools that Agard uses in *Checking Out Me History*. Aside from the rhythmic effect that it creates throughout the poem, repetition of certain words and phrases reinforces meanings. E.g., the repetition of the line starter 'dem tell me' suggests that what is to follow is not the speaker's own thoughts. The repetition also demonstrates the dullness and monotony that he associates with the version of history he is told.

**Imagery** – There is a stark contrast between the vivid imagery Agard utilises when asserting features of history that he deems as a part of his identity, and the lack of imagery he employs throughout the mention of the traditional British figures in history (e.g. '1066' and 'Dick Whittington'). Whilst he is deliberately vague about the details of the latter, he uses light imagery such as 'beacon', 'fire-woman', and 'star' when describing the former – this shows how they enlighten him.

**Quote:** "Dem tell me/ Dem tell me/  
Wha dem want to tell me"

**Quote:** "And even when de British said no/ She still brave  
the Russian snow/ A healing star"

**Colloquialism** – Agard uses colloquial language throughout the poem, creating a number of effects. Primarily, it is used to reflect his lack of conformity to 'standard' ideas (e.g. speaking Standard English). Discourse markers such as 'and all dat' show his disinterest in the topics being transmitted – fillers like these are used in moments where we can't/won't divulge more precise details.

**Non-Standard Spelling** – Agard deliberately uses non-standard spellings throughout the poem in order to reflect the Caribbean accent of the speaker. For example, Agard uses 'dem' in a number of lines across the poem, rather than 'them.' He also shortens the word 'about' to 'bout.' Agard is attempting to give a voice to those in society who are not ordinarily granted one – his non-standard voice reflects this.

**Quote:** "Dem tell me bout 1066 and all dat  
Dem tell me bout Dick Whittington and he cat"

**Quote:** "Dem tell me  
Wha dem want to tell me"

**Form/Meter** – The poem consists of ten stanzas of varying lengths. Standard form and couplets, triplets or quatrains are used in the sections of the poem that detail the history imposed on the speaker, whilst his own history is written in italics and an irregular rhyme scheme – these features may represent that the speaker's version of history is 'different' and rebellious when compared to what society expects.

**Structure** – *Checking Out Me History* can be split into three rough stages. The first begins with the poet stating his case about having one version of history told to him, with the suggestion that this is done deliberately to 'blind' him to his own identity. The middle section of the poem flits between features of colonial and his own version of history. The final section expresses his refusal to accept the given version.

**Quote:** "Dem tell me bout Lord Nelson and Waterloo  
But dem never tell me bout Shaka de great Zulu"

**Quote:** "But now I checking out me own history  
I carving out me identity"

**Themes** – A theme is an idea or message that runs throughout a text.

**Challenging those in Power** – Agard's poem puts forward a message that rebels against the established order. He refers to those in power as 'dem', and repeats 'dem tell me' in advance of each establishment-prescribed historical teaching. The italicised detail, in addition to the final stanza, reveal the speaker's refusal to accept this.



**Identity** – The speaker's identity is partially evident through their non-standard spellings, reflective of their accent. However, the speaker struggles to find any resemblance to his own identity in the historical teachings that have been imposed on him, which mainly tells the colonial side of events. He resolves to 'carve out' his own identity in the end.



## Line-by-Line Analysis

| STANZA | LINE | POEM  | ANALYSIS  |
|--------|------|---|---|
| 1      | 1    | Dem tell me   | <b>Stanzas 1-2:</b> The speaker immediately addresses the key message in the poem, that an unnamed 'dem' (them) are preventing him from exploring his <u>own</u> identity. The style of the <u>non-standard spelling</u> reflects a <u>Caribbean accent</u> , leading the reader to assume that the 'dem' is the community that the speaker has emigrated to (considering the poet and the later content, most likely UK). The metaphors suggest the speaker has been bandaged and blinded in order to stop them learning about their own culture.  |
|        | 2    | Dem tell me   |   |
|        | 3    | Wha dem want to tell me                             |   |
| 2      | 4    | Bandage up me eye with me own history               | <b>Stanzas 3-4:</b> The speaker references the history that they have been told about, before expressing details about the history that they <u>failed to inform him of</u> . The <u>colloquialism</u> 'and all dat' in reference to the prescribed history that was communicated shows that the speaker does not care for it. The speaker then shows their knowledge of Toussaint; the increased <u>pace</u> and <u>rhyme</u> here reflects the speaker's enthusiasm.  |
|        | 5    | Blind me to me own identity                         |   |
| 3      | 6    | Dem tell me bout 1066 and all dat                   | <b>Stanza 5:</b> The speaker repeats the themes of stanza 3, regarding the <u>prescribed history</u> imposed upon people. However the references become more <u>trivial and insignificant</u> , for example 'de cow who jump over de moon' (a reference to the <u>nursery rhyme</u> ). Such teachings appear <u>insignificant</u> when compared to the <u>rich world histories</u> that could have been explored.   |
|        | 7    | Dem tell me bout Dick Whittington and he cat        |   |
|        | 8    | But Toussaint L'Ouverture                           |   |
|        | 9    | No dem never tell me bout dat                       |   |
| 4      | 10   | <i>Toussaint</i>                                    | <b>Stanza 6:</b> In much the same way that the speaker deplored the lack of historical teachings about Toussaint, he <u>critiques</u> the lack of education provided about Nanny de Maroon. Once more, he communicates his understanding about this historical figure's achievements, utilising <u>rhyme/half-rhyme</u> to make the topic appear <u>engaging, enticing</u> . The <u>nature-based imagery</u> further brings the story to life. And yet, the establishment would rather teach about British inventors and nursery rhymes.  |
|        | 11   | <i>A slave</i>                                      |   |
|        | 12   | <i>With vision</i>                                  |   |
|        | 13   | <i>Lick back</i>                                    |   |
|        | 14   | <i>Napoleon</i>                                     |   |
|        | 15   | <i>Battalion</i>                                    |   |
|        | 16   | <i>And first Black</i>                              |   |
|        | 17   | <i>Republic born</i>                                |   |
|        | 18   | <i>Toussaint de thorn</i>                           |   |
|        | 19   | <i>To de French</i>                                 |   |
| 5      | 20   | <i>Toussaint de beacon</i>                          | <b>Stanzas 7-8:</b> The speaker further details the history that they have been exposed to throughout their education. The <u>one-sided colonial view</u> of this history becomes further apparent, as the speaker mentions Lord Nelson (famous for winning many battles for the British) and 'ole King Cole' (another British nursery rhyme) amongst other <u>white-British historical figures</u> , with no mention of the other side. Once again, the poet <u>repeats</u> 'Dem tell me' – thus reflecting the <u>repetitive and unvarying</u> given version of history.  |
|        | 21   | <i>Of de Haitian Revolution</i>                     |   |
|        | 22   | Dem tell me bout de man who discover de balloon     |   |
|        | 23   | And de cow who jump over de moon                    |   |
| 6      | 24   | Dem tell me bout de dish ran away with de spoon     | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 25   | But dem never tell me bout Nanny de Maroon          |   |
|        | 26   | <i>Nanny</i>  |   |
|        | 27   | <i>See-far woman</i>                                |   |
| 7      | 28   | <i>Of mountain dream</i>                            | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 29   | <i>Fire-woman struggle</i>                          |   |
|        | 30   | <i>Hopeful stream</i>                               |   |
|        | 31   | <i>To freedom river</i>                             |   |
| 8      | 32   | Dem tell me bout Lord Nelson and Waterloo           | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 33   | But dem never tell me bout Shaka de great Zulu      |   |
|        | 34   | Dem tell me bout Columbus and 1492                  |   |
|        | 35   | But what happen to de Caribs and de Arawaks too     |   |
| 9      | 36   | Dem tell me bout Florence Nightingale and she lamp  | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 37   | And how Robin Hood used to camp                     |   |
|        | 38   | Dem tell me bout ole King Cole was a merry ole soul |   |
|        | 39   | But dem never tell me bout Mary Seacole             |   |
| 10     | 40   | <i>From Jamaica</i>                                 | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 41   | <i>She travel far</i>                               |   |
|        | 42   | <i>To the Crimean War</i>                           |   |
|        | 43   | <i>She volunteer to go</i>                          |   |
|        | 44   | <i>And even when de British said no</i>             |   |
|        | 45   | <i>She still brave the Russian snow</i>             |   |
| 10     | 46   | <i>A healing star</i>                               | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 47   | <i>Among the wounded</i>                            |   |
|        | 48   | <i>A yellow sunrise</i>                             |   |
|        | 49   | <i>To the dying</i>                                 |   |
| 10     | 50   | Dem tell me   | <b>Stanzas 9-10:</b> The speaker gives more details about the life of <u>Mary Seacole</u> . At this point the reader is able to note that all three of the historical references to the speaker's history contain associations with <u>light</u> : 'beacon', 'fire woman', and 'star.' This demonstrates how these figures illuminate the speaker's true historical identity. The speaker then <u>reiterates their message</u> from the first line, with the added <u>declaration</u> that they are <u>unwilling to accept</u> the given version of history. This sums up the <u>rebellious tone</u> of the poem. |
|        | 51   | Dem tell me wha dem want to tell me                 |   |
|        | 52   | But now I checking out me own history               |   |
|        | 53   | I carving out me identity                           |   |

## Poems for Comparison

| London   | The Emigrée/ The Prelude  |
|--|---|
| <i>Checking Out Me History</i> can be compared with this poem in approaching the themes of <u>Challenging those in power</u> . | <i>Checking Out Me History</i> can be compared with these poems in its approach to the theme of <u>identity</u> . |

## Words from the Poet

*The sooner we can face the fact that Western education is entrenched with preconceived notions of other societies, the better. It's healthy and liberating to question those perceptions. Has British society made progress in its attitudes. Yes, but there's still a long way to go. I don't think we realise that there is a great possibility here for a genuine enrichment of diversity, despite whatever conflicts exist.* The Telegraph, March 2013.





# EXPOSURE

## KNOWLEDGE ORGANISER

### Context – Exposure was written by Wilfred Owen in 1917.

**Wilfred Owen** – Wilfred Edward Salter Owen (1893-1918) was a British poet and soldier. He was one of the predominant World War I poets, detailing the horrors of trench warfare in a similar style to his mentor: Siegfried Sassoon. His poetry brought a sense of realism to public perceptions of war, in stark contrast to the earlier works of poets such as Rupert Brooke at the time. Owen was killed one week before the end of the war.



**World War I** – World War I, also known as the 'Great War', was a global war originating in Europe that took place from July 1914 to November 1918. It involved all of the world's major powers, opposing the Allies (including Russia, France, UK, and USA) against the Alliance (Germany, Austro-Hungary, the Ottoman Empire). Over 9 million armed forces and 7 million civilians were killed in the war.



**Trench Warfare** – The use of trench warfare significantly influenced the high death toll. Attacks involved going across No Man's Land (in the middle) where attackers were open to machine gun fire, mines, and shells. Even if successful, casualties were huge. Life in the trenches were awful, with diseases like trench foot rife. Men would often spend weeks at a time on the front line, where they would need to sleep, eat, and defecate in close proximity in the trenches.



**Exposure to the Weather** – The majority of the fighting took place in Europe, where the soldiers faced extremities in temperature and weather over the years. Rain would quickly accumulate in the trenches (sometimes to waist height) whilst in the winter months soldiers would often be battered by snow, hail, and sub-zero temperatures. The winter of 1916-17 was so cold that many lost fingers and toes to frostbite. Trenches offered little to no protection. Even clothes and blankets froze solid.



### Language/Structural Devices

**Personification/Pathetic Fallacy** – Owen persistently personifies the weather to create the impression that the weather is as much of danger to the soldiers as the enemy itself. The weather is constantly referred to as an enemy, for example through suggesting it 'knives' the men, gathers a 'melancholy army' against them, and uses 'stealth' to attack them. The use of pathetic fallacy (e.g. the 'mad gusts') even add emotions and malice to the forces of nature.

**Sibilance/Alliteration/Assonance** – These language techniques are used to echo/mimic the sounds (or in some cases silence) that the men are exposed to. For example, repetitive use of the 'w' and 's' sounds are representative of the whistling of the wind around them, and even the muffled whispering of the men. Furthermore, awkward 'o' sounds emphasise words, and represents the difficulty the men have in taking their minds off the cold misery that they face.

**Quote:** "Our brains ache, in the merciless iced east winds that knive us"

**Quote:** "Slowly our ghosts drag home: glimpsing the sunk fires, glozed"

**Similes/Metaphors** – Similes and metaphors are used to figuratively describe the physical and psychological pain that the men are enduring. For example, the dawn of a new day is compared to a 'melancholy army' being amassed – a new day signals a repeat of the cycle of misery and despair.

**Varied Verbs** – Owen uses some interesting and original verbs to present the discomfort of movement and actions by the exposed soldiers. For example, the frost makes their hands 'shriveled' and their foreheads 'pucker', whilst they are 'shaking.' These are young men in their prime and yet the description of their actions makes them resemble the old and infirm.

**Quote:** "Dawn massing in the east her melancholy army."

**Quote:** "We cringe in holes, back on forgotten dreams, and stare, snow-dazed"

**Form/Structure** – The poem is conventional in the sense that each stanza is five lines long, with eight stanzas in total. Half-rhyme is used throughout to create a A-B-B-A-C rhyme scheme. The fifth line adds a little more to what would normally be expected – this could be seen as representative of the war dragging on for longer than anyone thought.

**Versification** – Each of the eight stanzas ends with a short half line. At the end of the first, third, fourth, and eighth lines the refrain 'but nothing happens' is added. This hammers home the message that despite all of the pain and suffering being described, little changes. The last lines, when read alone one after the other, tell their own melancholy story.

**Quote:** "Shrivelling many hands, and puckering foreheads crisp/The burying-party, picks and shovels in shaking grasp."

**Quote:** "What are we doing here? Is it that we are dying?"

### Themes – A theme is an idea or message that runs throughout a text.

**Suffering** – In order to get across his message across, it was essential that Owen presented the barbaric, appalling nature of war in a realistic manner and tone. In this poem, Owen portrays the quieter moments of war, the painful periods in between the battle and bloodshed. Here, physical pain and psychological trauma can both be taken in more fully, and are described vividly and frankly.



**The Futility of War** – In contrast to many poems at the time that glorified war and fighting for one's country, Owen's poems typically depict war in a harsh light, in order to demonstrate how horrific and futile it is. 'Exposure', in this sense, is no different. His bleak and shockingly realistic portrayal of the soldier's experiences (in this case caused by both the opposition and the forces of nature) forms a stark contrast to general public opinions at the time.



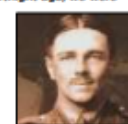
### Line-by-Line Analysis – Remember that this is an extract from the poem, not the whole poem.

| STANZA | LINE | POEM  | ANALYSIS  |
|--------|------|---|---|
| 1      | 1    | Our brains ache, in the merciless iced east winds that knive us ... | The reader is delivered to the bleak French landscape, and the use of personification (winds...knive) brings the conditions to life. This is a hostile environment; even nature is against them. Alliteration w/ sounds mimic whispers. 'We' is used to demonstrate that the narrator is among the soldiers. The soldiers fear the silence.                   |
|        | 2    | Wearied we keep awake because the night is silent ...               |   |
|        | 3    | Low drooping flares confuse our memory of the salient ...           |   |
|        | 4    | Worried by silence, sentries whisper, curious, nervous,             |   |
| 2      | 5    | But nothing happens.  | Pathetic fallacy is used to attribute anger to the wind – again making the place seem inhospitable. The simile used over the top two lines creates connotations of pain. Even though the action of the war is in the distance, it is still at the forefront of their minds. The soldiers question what they are doing – the reason for fighting is long lost. |
|        | 6    | Watching, we hear the mad gusts tugging on the wire,                |   |
|        | 7    | Like twitching agonies of men among its brambles.                   |   |
|        | 8    | Northward, incessantly, the flickering gunnery rumbles,             |   |
| 3      | 9    | Far off, like a dull rumour of some other war.                      | Dawn is typically associated with freshness, happiness, but here it brings 'poignant misery.' They are trapped in an endless cycle of war. Dawn itself is then personified as an enemy, and a metaphor is used to describe an attack by a 'melancholy army.' The repeated last line shows the anxiety of waiting for death – 'nothing happens.'               |
|        | 10   | What are we doing here?   |   |
|        | 11   | The poignant misery of dawn begins to grow ...                      |   |
|        | 12   | We only know war lasts, rain soaks, and clouds sag stormy.          |   |
| 4      | 13   | Dawn massing in the east her melancholy army                        | Sibilance (repeating 's' sound) is used at the beginning of the stanza to add emphasis to the sounds being described. More personification is used – even the snowflakes seem to be conscious in deciding who to attack/where they will fall. The wind is personified in its apathy in the face of the untold suffering and hardship.                         |
|        | 14   | Attacks once more in ranks on shivering ranks of grey,              |   |
|        | 15   | But nothing happens.  |   |
|        | 16   | Sudden successive flights of bullets streak the silence.            |   |
| 5      | 17   | Less deadly than the air that shudders black with snow,             | The icy flakes are compared to assassins that stalk out the soldiers. Varied verb in 'cringed' creates a vivid image of the soldiers weakly covering from the weather. The juxtaposition of the 'blossoms' and 'snow-dazed' dream enhances the extremity of the misery of the lines before. The last line answers the question at the end of stanza 2.        |
|        | 18   | With sidelong flowing flakes that flock, pause, and renew,          |   |
|        | 19   | We watch them wandering up and down the wind's nonchalance,         |   |
|        | 20   | But nothing happens.  |   |
| 6      | 21   | Pale flakes with fingering stealth come feeling for our faces—      | Assonance of the awkward 'o' sound opening the stanza is representative of the effort that it takes to think of anywhere but their ghastly present environment. Use of the word 'ghost' creates the sense that these men are already dead – effective when considering later in the stanza: the men have been forgotten already.                              |
|        | 22   | With crusted dark-red jewels; crickets jingle there;                |   |
|        | 23   | Deep into grassier ditches. So we drowse, sun-dozed,                |   |
|        | 24   | Littered with blossoms trickling where the blackbird fusses.        |   |
| 7      | 25   | —Is it that we are dying?   | The speaker questions the existence of warming stimuli, as it has been so long since they have experienced such comforts. The spring that will follow the current winter makes them feel afraid, as they fear that they will not be alive to see it. Due to the agony of their predicament, God's love of the men is itself questioned.                       |
|        | 26   | Slowly our ghosts drag home: glimpsing the sunk fires, glozed       |   |
|        | 27   | With crusted dark-red jewels; crickets jingle there;                |   |
|        | 28   | For hours the innocent mice rejoice: the house is theirs;           |   |
| 8      | 29   | Shutters and doors, all closed: on us the doors are closed,—        | The last stanza is perhaps the most haunting. The effects of frost are described using varied verbs and adjectives (shrivelling, crisp). The soldiers (half frozen themselves) attempt to bury those killed from exposure. Metaphor – eyes are physically frozen/ numb to the horror of what they are doing. Last line shows nothing is being achieved.       |
|        | 30   | We turn back to our dying.  |   |
|        | 31   | Since we believe not otherwise can kind fires burn;                 |   |
|        | 32   | Now ever suns smile true on child, or field, or fruit.              |   |
| 9      | 33   | For God's invincible spring our love is made afraid;                |   |
|        | 34   | Therefore, not loath, we lie out here; therefore were born,         |   |
|        | 35   | For love of God seems dying.  |   |
|        | 36   | Tonight, this frost will fasten on this mud and us,                 |   |
| 10     | 37   | Shrivelling many hands, and puckering foreheads crisp.              |   |
|        | 38   | The burying-party, picks and shovels in shaking grasp,              |   |
|        | 39   | Pause over half-known faces. All their eyes are ice,                |   |
|        | 40   | But nothing happens.  |   |

### Poems for Comparison

|                                    |   |
|------------------------------------|---|
| <b>Remains</b>                     | Exposure can be contrasted with this poem in relation to the theme of <u>Suffering</u> and the <u>Horrors of War</u> .  |
| <b>Charge of the Light Brigade</b> | Exposure can be compared with this poem in relation to the theme of <u>suffering</u> and can be contrasted with this poem in their approach to the <u>futility of war</u> . |

### Thoughts of the Poet

|   |   |
|---|---|
| Dear Mother, immediately after I sent my last letter, more than a fortnight ago, we were rushed up into the Line. Our A Company led the Attack, and of course lost a certain number of men. I had some extraordinary escapes from shells & bullets...I think the worst incident was one wet night when we lay up against a railway embankment. A big shell lit on the top of the bank, just 2 yards from my head. Before I awoke, I was blown in the air right away from the bank! My brother officer of B Coy, 21st L. Goughier lay opposite in a similar hole. But he was covered with earth, and no relief will ever relieve him, nor will his Rest be a 9 days' Rest. I think that the terribly long time we stayed unrelieved was unavoidable yet it makes us feel bitterly towards those in England who might relieve us, and will not. WEO | <br>Page 3 |
|---|---|





# KAMIKAZE

## KNOWLEDGE ORGANISER



**Context** – *Kamikaze* was written by Beatrice Garland, and was published in 2013.

**Beatrice Garland** – Beatrice Garland is an English poet that won the 2001 National Poetry Prize for her poem 'Undressing.' She wrote no poetry for some time after, instead focusing her attention on her other work, as a physician for the National Health Service and a teacher. She describes writing poetry as 'a marvelous part of one's interior private life' and cites John Donne and Seamus Heaney as influences. She enjoys writing poems about the experiences of others around the world.



**Japan in World War II** – Japan entered World War II with a surprise attack on Pearl Harbour (a US military base) on December 7<sup>th</sup>, 1941. The Japanese fought on the side of the Axis powers alongside Nazi Germany and Italy, taking a leading role in fighting across Asia. The Japanese military culture of never accepting defeat meant that they were the last of the Axis powers to surrender – only after the catastrophic losses suffered from two atomic bombs dropped by the USA on Hiroshima and Nagasaki.



**Japanese Seafaring Culture** – Throughout the poem, Garland makes specific references to 'fishing boats' and the 'green-blue translucent sea.' Largely owing to its geographical make-up as a series of islands, Japan's history is steeped in seafaring traditions. Many Japanese people in the past lived and worked near/on the sea, as fishing and inter-island trading were key features of life. Garland compares this peaceful life with the position that the kamikaze pilot finds himself.



**Kamikaze Pilots** – During the Second World War, the term 'kamikaze' was used to describe pilots who were sent on suicide missions. They were expected to crash their planes into enemy targets, e.g. ships, forcing heavy damage and casualties to the enemy, but also killing themselves. The word 'kamikaze' translates as 'divine wind.' The tradition of facing death rather than capture and defeat was deeply engrained in Japanese culture, meaning pilots would face this with loyalty.



### Language/Structural Devices

**Imagery** – Garland creates imagery through a range of techniques – primarily the use of interesting and specific vocabulary – the 'huge' flag, 'little' boat and 'translucent' sea being prime examples. Garland also utilises powerful colour imagery, noting the 'green-blue' of the ocean, the flashing 'silver', and the 'dark shoals.' Each of these details combine to create a vivid depiction of the life-filled scene that the pilot looks down upon. This helps the reader to empathise with the pilot and the decision that he takes.

**Enjambment** – Garland utilises enjambment to help the reader experience the pilot's altering mindset whilst on the kamikaze mission. Enjambment is first used in stanza one, to echo the incantations (chants) of loyalty that the pilot repeats to himself early in the flight – the lack of punctuation reflect that he is not stopping and dwelling on thoughts of death. Enjambment occurs at many other points, but particularly in stanza 4, as fond memories of his past flood into his mind and overtake the incantations, altering his mindset.

**Quote:** "at the little fishing boats/ strung out like bunting/ on a green-blue translucent sea"

**Quote:** "a shaven head/ full of powerful incantations/ and enough fuel for a one-way/ journey into history"

**Double Meanings and Metaphors** – Garland weaves double meanings and metaphors throughout the text to juxtapose ideas about war and death with the more peaceful backdrop of the Japanese fishing scene. For example, the 'dark shoals of fishes' could easily represent the flight of Japanese war planes heading towards destruction, whilst 'silver' presents ideas of honours and glory for those who die.

**Alliteration and Sibilance** – Garland uses alliteration to portray the peaceful, laidback life of the pilot before the war – for example the softy repeated 'l' sounds in 'later', 'looked', 'little', and 'like.' Garland also uses sibilance through the openings to the words 'safe', 'shore', 'salt-sodden' and 'awash.' These help to recreate the sounds of the sea and the storms that the pilot remembers from his youth.

**Quote:** "the dark shoals of fishes/ flashing silver as their bellies/ swivelled towards the sun"

**Quote:** "– yes, grandfather's boat – safe to the shore, salt-sodden, awash."

**Form/Structure** – The poem has a consistent, regular form throughout. There are 7 stanzas, each containing 6 lines. This regular structure could be seen to represent the regimented order of Imperial Japan. However, there is no apparent consistent rhyme scheme, meaning a lack of flow. This could represent the confusing influences in the pilot's mind.

**Pronouns** – Third person pronouns are used throughout the poem to describe the pilot, for example 'he,' and 'his.' 'He' is not named – representative of the fact that he no longer has a voice – in the eyes of his community he has been dishonoured. The italics towards the end of the poem indicates a shift towards the first person (we, my).

**Further Thought:** Line lengths vary more in stanzas 6&7. Does this represent the disorder in the pilot's later life?

**Quote:** "live as though/ he had never returned, that this/ was no longer the father that we loved."

**Themes** – A theme is an idea or message that runs throughout a text.

**Personal Consequences of War** – Rather than focusing upon bloody details or evoking violent imagery, this poem deals with the lasting effects that war can inflict on people, families, and communities. This poem not only deals with the kamikaze pilot's own story, but the implications for those around him.



**Courage/ Honour** – In the Imperial Japanese context, demonstrating courage and honour for one's country are deemed as a compulsory commitment. By seemingly neglecting this, and opting to live, the kamikaze pilot is described as being 'dead' to those around him anyway – the only difference is that he brings shame upon his family for generations. The reader is encouraged to consider: Is this what honour/ courage are? Is the pilot treated fairly?



### Line-by-Line Analysis

| STANZA | LINE | POEM  | ANALYSIS   |
|--------|------|---|--|
| 1      | 1    | Her father embarked at sunrise                      | The kamikaze fighter prepares for their suicide mission. The use of the word 'sunrise' immediately gives connotations of Japan (the land of the rising sun). The enjambment suggests he is trying to prepare without stopping to think about the magnitude of his task. The shaven head and the incantations suggest the authority of the Japanese military, it has been drummed into him that this is the honourable thing to do. The 'journey into history' suggests that he will always be remembered positively for his brave and noble act. |
|        | 2    | with a flask of water, a samurai sword              |  |
|        | 3    | in the cockpit, a shaven head                       |  |
|        | 4    | full of powerful incantations                       |  |
|        | 5    | and enough fuel for a one-way                       |  |
|        | 6    | journey into history                                |  |
| 2      | 7    | but half way there, she thought,                    | This is a testimony of the pilot's daughter, making the reader question its authenticity. She is telling her children about these events – suggesting that they are important for conveying a lesson to the children. The poet uses colour imagery (green-blue), adjectives (translucent) and a simile (strung out like bunting) to suggest the serenity and beauty of life for the seafaring peoples of Japan. The beauty of these fishing boats is ironic as the pilot is supposed to be looking for warships.                                 |
|        | 8    | recounting it later to her children,                |  |
|        | 9    | he must have looked far down                        |  |
|        | 10   | at the little fishing boats                         |  |
|        | 11   | strung out like bunting                             |  |
|        | 12   | on a green-blue translucent sea                     |  |
| 3      | 13   | and beneath them, arcing in swathes                 | Military and patriotic symbols run throughout the description of the tranquil image of seafaring Japan, for example 'arcing in swathes' and 'like a huge flag.' The 'figure of eight' creates an image of an infinity symbol, suggesting the pilot is trapped – perhaps war seems like an endless cycle? It is possible that the 'fishes' are metaphors for aircraft, whilst the imagery used in 'silver' and 'swivelled' is indicative of the honours/glories bestowed on those who die for their country.                                      |
|        | 14   | like a huge flag waved first one way                |  |
|        | 15   | then the other in a figure of eight,                |  |
|        | 16   | the dark shoals of fishes                           |  |
|        | 17   | flashing silver as their bellies                    |  |
|        | 18   | swivelled towards the sun                           |  |
| 4      | 19   | and remembered how he                               | The fond memories of times gone by sow further seeds of doubt as to whether he should go through with the kamikaze mission. Nostalgia with 'brothers.' Once more there is enjambment, as though these thoughts are rushing into his mind, perhaps overtaking the incantations of the opening stanza. The imagery created by erecting the pebble 'cairn' in the face of the wave 'breakers' awakens the idea that people (like the defences) will eventually succumb to nature.   |
|        | 20   | and his brothers waiting on the shore               |  |
|        | 21   | built cairns of pearl-grey pebbles                  |  |
|        | 22   | to see whose withstood longest                      |  |
|        | 23   | the turbulent inrush of breakers                    |  |
|        | 24   | bringing their father's boat safe                   |  |
| 5      | 25   | – yes, grandfather's boat – safe                    | The word 'safe' is repeated – used at the end of the first line in the 5 <sup>th</sup> stanza and the last line of the stanza before – surely demonstrating the pilot's thought process, moving away from completing the mission and towards safety. There is sibilance in 'safe', 'shore', 'salt-sodden' and 'awash', replicating the sounds of the sea and the storms. The detail the vast array of fish demonstrates the clarity of the memory in the pilot's mind.   |
|        | 26   | to the shore, salt-sodden, awash                    |  |
|        | 27   | with cloud-marked mackerel,                         |  |
|        | 28   | black crabs, feathery prawns,                       |  |
|        | 29   | the loose silver of whitebait and once              |  |
|        | 30   | a tuna, the dark prince, muscular, dangerous.       |  |
| 6      | 31   | <i>And though he came back</i>                      | The use of italics indicates a return to the first person perspective. It is ambiguous as to whether the pilot returned out of fear or lack of loyalty, or for some other reason, e.g. inability to find targets etc. In any case, these men and their families were often shamed. The pilot's wife and community thus turned their back on him, treating him as if he were dead. The children still chattering and laughing suggests their innocence.   |
|        | 32   | <i>my mother never spoke again</i>                  |  |
|        | 33   | <i>in his presence, nor did she meet his eyes</i>   |  |
|        | 34   | <i>and the neighbours too, they treated him</i>     |  |
|        | 35   | <i>as though he no longer existed,</i>              |  |
|        | 36   | <i>only we children still chattered and laughed</i> |  |
| 7      | 37   | <i>till gradually we too learned</i>                | The children too eventually become culturally conditioned to see the shame in their father's actions – they are taught that he no longer deserves respect. It is clear now that this is a lesson to the children. The pilot may well have spent the rest of his life thinking that it would have been better for him to have gone through with the kamikaze. We note that the pilot is never given a voice, reflective of his now invisible position in society.   |
|        | 38   | <i>to be silent, to live as though</i>              |  |
|        | 39   | <i>he had never returned, that this</i>             |  |
|        | 40   | <i>was no longer the father we loved.</i>           |  |
|        | 41   | And sometimes, she said, he must have wondered      |  |
|        | 42   | which had been the better way to die.               |  |

### Poems for Comparison

|  |  |
|--|--|
| <b>Poppies/ War Photographer</b>                   | <i>War Photographer</i> can be compared and contrasted with these poems through the theme of <u>personal consequences of war</u> . |
| <b>Bayonet Charge/ Charge of the Light Brigade</b> | <i>War Photographer</i> can be compared and contrasted with these poems through the themes of <u>courage and honour</u> .          |

### Words from the Poet

I have always read – poetry from the sixteenth century right up to the 2010s, as a result of a first degree in Eng. Lit. – and partly because no job can satisfy every need, perhaps particularly not the need for something personal and self-examining. I spend a lot of the day listening to other people's worlds. Writing poems offsets that: poetry is a way of talking about how each of us sees, is touched by, grasps, and responds to our own different worlds and the people in them. [www.beatricegarland.co.uk](http://www.beatricegarland.co.uk)







# LONDON

## KNOWLEDGE ORGANISER

**Context** – London was written by William Blake in 1792, and was published in *Songs of Experience* in 1794.

**William Blake** – William Blake (1757-1827) was an English poet and painter. He is known as being one of the leading figures of the Romantic Movement, as well as for his personal eccentricities. Blake rejected established religious and political orders for their failures, particularly in how children were made to work – this was one of many things that he viewed as being a part of the 'fallen human nature.' He lived in London for his whole life, barring three years in which he resided in Felpham.



**London in 1792** – London was already a large city with nearly a million people. The Industrial Revolution had brought new machinery that saved time, making some very rich, however it put many out of jobs. Machinery was often hazardous to operate, and those working with it were paid poorly. There was no government support for these people, so many lived in total poverty. For every 1,000 children born, almost 500 died before they were 2. Most children couldn't go to school, and had to work.



**Songs of Innocence and Experience** – Published in 1794, these two sets of poems were created by Blake with the aim of showing the 'Two Contrary States of the Human Soul.' The Songs of Innocence collection contains poems that are uplifting, celebrating childhood, nature, and love in a positive tone. The Songs of Experience section (of which London was one of the poems) offered a contrasting tone towards these ideas. Some of the topics covered in these poems were the dangerous working conditions, child labour, and poverty.



**Romanticism** – Romanticism was an artistic, literary, musical, cultural and intellectual movement that originated in Europe in the latter half of the 18th Century, peaking in the mid-19th Century. Romanticism is characterised by its emphasis on emotions – glorifying nature and past events – memories and settings are often imaginatively described using vivid imagery. Although Blake struggled to make a living during his lifetime, his ideas and influence were later considered amongst the most important of all the Romantic Poets.



### Language/Structural Devices

**Sight Imagery** – Perhaps unsurprisingly, considering Blake's artistic talents, the poem is awash with visual imagery, with a clear picture of London vividly painted in the mind of the reader. For example, the speaker details the 'marks' in every face that he meets, which provides a visual connotation of the people's skin being physically imprinted by their hardships – the reader can picture their cuts, bruises and ailments. Similarly, the use of the word 'blackning' in stanza 3, creating a dirty image of pollution and corruption in the city.

**Sound Imagery** – The pained and anguished sounds of London also accompany the reader as they are guided through the city by the speaker. Particularly from stanza 2 onwards, the reader is shown how helpless and destitute the citizens feel through the sounds that they make, from the 'cry' of men and infants, to the 'sigh' of the soldiers, and the 'curse' and 'blast' of the harlots at night. The sound imagery aids the reader in hearing the grim pain of each of the people that the speaker encounters.

**Quote:** "And mark in every face I meet  
Marks of weakness, marks of woe."

**Quote:** "In every cry of every Man,  
In every Infants cry of fear,"

**Metaphors** – Figurative language is highly prevalent throughout the poem, particularly in lines 3 and 4 of each stanza. For example, the soldiers' blood does not literally run down the walls of the palace; this is a means of showing that those in power have caused the soldiers to experience pain and suffering. In the same way, the 'manacles' that the citizens wear are in fact shackles of the mind.

**Repetition/ Anaphora** – Blake repeats words and phrases to emphasise their importance. For example, the word 'charter'd' is repeated throughout the opening stanza to show how rigid and unchanging London is. The anaphora used in stanza 2 of 'In every' emphasises the frequency and consistency of the pain and suffering – it is happening all over and is clear to see and hear.

**Quote:** "And the hapless Soldiers sigh  
Runs in blood down Palace walls"

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

**Form/Structure** – The poem is written in four equal stanzas of four lines, each in iambic tetrameter. Alternating rhyme is used throughout in the scheme of ABAB. The rhyme creates deliberate emphasis on words that underline the tone of the poem, e.g. 'cry' and 'sigh.' The poem is told from the viewpoint of a first person narrator who is walking the streets.

**Varied Verbs** – Blake uses a range of interesting verbs to demonstrate the wearisome and pained manner in which actions are carried out in London. Often these are figurative. For example, the harlots 'blight' the marriage hearse, and 'blasts' the new-born infants' tear. Such verbs are carefully selected to attain the maximum impact on the reader.

**Quote:** "I wander thro' each charter'd street/ Near where the  
charter'd Thames does flow/ And mark in every face I meet  
Marks of weakness, marks of woe."

**Quote:** "Blasts the new-born Infants' tear  
And blights with plagues the Marriage hearse"

### Themes – A theme is an idea or message that runs throughout a text.

**Death/Mortality** – The poem is full of dark imagery that creates a constant sense of darkness and death across the poem. The mortality of all manner of people in London, from the child chimney sweepers, to the 'hapless soldiers', even the institution of marriage, is depressingly detailed by Blake – it is as though London is slowly strangling itself.



**Loss and Suffering** – The people in London are described as being helpless – constrained by the authorities but also the 'manacles' generated by their own perceptions and ideas. The 'sigh' of the soldier and the marks of 'woe' and 'weakness' in the people suggests that the people feel that they are trapped in an inescapable cycle of suffering.




### Line-by-Line Analysis

| STANZA | LINE | POEM   | ANALYSIS  |
|--------|------|--|---|
| 1      | 1    | I wander thro' each charter'd street,        | The opening stanza sets the <u>tone</u> and <u>setting</u> for the remainder of the poem. The <u>repetition</u> of the word 'charter'd' shows how legally defined, mapped out, or in this case, <u>confined</u> the place is – Everything, it seems, is already decided, and is subject to government control – there is little room for freedom or imagination. This particular spot is near the Thames River – which too has been 'charter'd.' In each of the faces that the speaker sees, he notes how society seems to be <u>wearing them down</u> and hurting them ('weakness' and 'woe'). The word 'mark' has a dual meaning: to notice something, but also to physically imprint something. The impact of living in this place is having a noticeable impact on the people there. This creates a <u>melancholy</u> tone.   |
|        | 2    | Near where the charter'd Thames does flow.   |   |
|        | 3    | And mark in every face I meet                |   |
|        | 4    | Marks of weakness, marks of woe.             |   |
| 2      | 5    | In every cry of every Man,                   | The second stanza gives some further insight into the speaker's feelings regarding the people that he passes by. Blake uses <u>more repetition</u> , this time of the word 'cry', emphasising the desperate sorrow in this city. He also uses anaphora to emphasise the word 'every' – to make clear that all here feel the same, there are no real exceptions. 'Manacles' are some kind of chain or shackles that keep people <u>imprisoned</u> . The idea that these are 'mind-forg'd' shows that these are <u>metaphorical</u> manacles that are created by society and the people's own ideas. This early use of the words 'charter'd', 'ban' and 'manacles' show that Blake feels that society <u>imprisons</u> people with pressures and ideals.  |
|        | 6    | In every Infants cry of fear,                |   |
|        | 7    | In every voice: in every ban,                |   |
|        | 8    | The mind-forg'd manacles I hear              |   |
| 3      | 9    | How the Chimney-sweepers cry                 | In the third stanza, the speaker delves further into his feelings against what he sees in London. He begins with the chimney sweep, a dirty and dangerous job which shortened life expectancy, often done by <u>child orphans</u> (orphans of the church), who were small enough to fit down chimneys. The 'blackning', therefore, can refer to the physical blackening of the children covered in soot, their <u>symbolic blackening</u> in being drawn closer to death, and the church's <u>metaphorical blackening</u> (becoming more evil) in being involved in such horrific child labour. Lines 11 and 12 use the <u>metaphor</u> of the soldier's blood running down the wall of the palace to show that those in power have blood on their hands for sending so many men into war. The soldier's 'hapless sigh' suggests that he feels powerless to change things.                          |
|        | 10   | Every blackning Church appalls,              |   |
|        | 11   | And the hapless Soldiers sigh                |   |
|        | 12   | Runs in blood down Palace walls              |   |
| 4      | 13   | But most thro' midnight streets I hear       | The speaker then turns his attention to the things that he encounters at night in London. The idea that the 'Harlot' is 'youthful' is troubling, for it shows that even those that are <u>young and innocent</u> are being drawn into prostitution. Even worse, the subject of her 'curse' is the tears of 'new-born Infants' – this shows the hardened heart of those <u>corrupted</u> by the city. Another metaphor is used to show how the harlot 'blights with plagues the marriage hearse' – in the sense that the existence of young prostitutes in the city is destroying the institution of marriage. This is also clear from the <u>semi-oxymoronic</u> idea of the 'marriage hearse.' It also references some of the damaging and disgusting diseases that are being spread across the city. In short, those that are innocent become quickly corrupted and <u>infected</u> in this city. |
|        | 14   | How the youthful Harlots curse               |   |
|        | 15   | Blasts the new-born Infants' tear            |   |
|        | 16   | And blights with plagues the Marriage hearse |   |

### Poems for Comparison

|                   |  |
|-------------------|--|
| <b>Ozymandias</b> | London can be compared and contrasted with this poem in relation to the theme of <u>death/mortality</u> .        |
| <b>Exposure</b>   | London can be compared and contrasted with this poem in the approach to the theme of <u>loss and suffering</u> . |





### The Poet's Influences

|  |   |
|--|---|
| In Blake's London, the condition of the poor and their children were desperate...the rise in the population, poor harvests and war created serious hardships. Orphans and the illegitimate children of the poor could be sold into apprenticeships that offered meagre prospects; young boys were used to sweep chimneys (prostitution and dire housing conditions were continuing problems). Some philanthropic initiatives attempted to address these issues, but asylums and charity schools were often linked to the exploitative apprenticeship system. From the British Library – <a href="http://www.bl.uk">www.bl.uk</a> |  |
|--|---|







# My Last Duchess KNOWLEDGE ORGANISER

| Context – <i>My Last Duchess</i> was written by Robert Browning, and was first published in January 1842.   |   |
|---|---|
| <b>Robert Browning</b> – Robert Browning (1812-1889) was an English poet and playwright whose position as one of the foremost Victorian poets was characterised by his success with the dramatic monologue. Many of his poems utilise satire and dark humour, coupled with his extensive knowledge of historical settings. Browning had a love of history and European culture, and it is said that he could read, write, and converse in Latin, Greek, and French by the age of 14!  |   |
| <b>Browning's Love Life</b> – Robert Browning married fellow successful poet Elizabeth Barrett, who was six years his elder. He had been transfixed by her 'exquisite poetry' which led him to write to her. She had an overbearing father, and so the Brownings had to escape to Italy in order to be married on 12 <sup>th</sup> January 1846. They lived in Pisa and then Florence in Italy, where they bore a son, named Robert (nicknamed Pen) in 1849. She died on 18 <sup>th</sup> June 1861 in her husband's arms. After her death, both father and son moved back to London. |   |
| <b>Alfonso II d'Este</b> – The poem is strongly believed to have been written from the viewpoint of Alfonso II d'Este, the 5 <sup>th</sup> Duke of Ferrara. At the age of 25, he married the 13 year old Lucrezia de' Medici, the daughter of the Grand Duke of Tuscany. She was not well educated, and it is clear that D'Este felt himself above her socially. However, she brought a sizeable dowry. After marrying her, he abandoned her for 2 years, before she died mysteriously at 16. It was rumoured that he poisoned her.   |  |
| <b>The Italian Renaissance</b> – The Italian Renaissance was the earliest form of the great European Renaissance, a period of great achievement and change which began in Italy in the 14 <sup>th</sup> Century. It marked the transition between medieval times and modern Europe. The word 'renaissance' means 'rebirth.' of the art and literature produced at the time remains amongst the most well-celebrated in the world. Furthermore, the people and events of the time have influenced a vast body of further works.  |  |

| Language/Structural Devices   |  |
|---|--|
| <b>Irony</b> – Browning uses irony to get across the true meaning of the poem: Despite the Duke's harangue of the Duchess's character traits, this is not a poem lamenting her, but rather the Duke's own tyranny, ego-centrism, and jealousy. Several language features create this, for example the rhetorical question he utilises to assert that he should never 'stoop', an idea which is immediately contradicted by the 'command' (a verb reflecting his oppressive nature) to have her killed.<br><b>Quote:</b> "Much the same smile? This grew; I gave commands; Then all smiles stopped together. There she stands" | <b>Spoken Language Features</b> – In order to keep the poem conversation-like in terms of its vocabulary and tone, Browning uses a number of spoken language features through the voice of the Duke. For example, a number of words are used in their contracted forms, for example 'that's' rather than 'that is' in the first line. Hedges and fillers are also used, as occur naturally in speech and to lessen the impact of statements. Examples are 'I said', and 'I repeat.'<br><b>Quote:</b> "Will't please you sit and look at her? I said 'Fra Pandolf' by design, for never read" |
| <b>Enjambment</b> – Enjambment is used throughout the entirety of the poem, as sentences run across lines of poetry. The effect of this is two-fold. Primarily, it reflects the long, rambling sentences of the conversation hogging, egotistical Duke. Secondly, it makes the poem difficult to read, disrupting the flow to create a stop-start rhythm – representative of the awkward nature of the conversation.<br><b>Quote:</b> "Her husband's presence only, called that spot Of joy into the Duchess' cheek; perhaps"   | <b>Personal Pronouns</b> – The poem is filled with personal pronouns (e.g. 'I', 'my', 'me', 'myself') as one might expect in a poem that is about someone who is totally self-absorbed, has a high opinion of himself, and is exceptionally selfish. A number of these personal pronouns relate to his own sense of self-worth ('my gift', 'my favour') and love of possessions, including his wife ('my duchess').<br><b>Quote:</b> "Somehow—I know not how—as if she ranked My gift of a nine-hundred-years-old name"  |
| <b>Form</b> – The poem is one of Browning's best known dramatic monologues – dramatic as fictional characters play out a scene, and a monologue in that there is only one (mono) speaker. It is written in one long speech, presented as a conversation, although the reader only ever hears the Duke's viewpoint. This is reflective of the Duke's need for power.<br><b>Quote:</b> "At starting, is my object. Nay, we'll go Together down, sir. Notice Neptune, though,"   | <b>Structure</b> – The poem is written in iambic pentameter, meaning that each line has five iambs (de-dums). It is said that such a meter fits the natural conversational rhythm of English particularly well – an apt choice then, for a poem depicting a scene of this nature. The rigid rhyming couplets aim to mimic the speaker's sense of order and power.<br><b>Quote:</b> "That's my last Duchess painted on the wall, Looking as if she were alive. I call!"   |

| Themes – A theme is an idea or message that runs throughout a text.   |   |
|---|---|
| <b>Power and Oppression</b> – The Duke is fixated with power – both the social and political power that he holds, and the power that he attempted to wield over his wife. He wanted to oppress her in the same manner as everything else under his power. His rare art collection demonstrates that he gets what he wants, but only if he chooses to do it.   |  |
| <b>Madness</b> – Through all of his courtesies and indulgences towards his guest, the speaker attempts to thinly-conceal what is apparently some form of insanity. Whilst he speaks of her various flaws, the reader cannot help but note that they may be (in fact, are likely to be) entirely innocent. The speed at which the Duke switches back into trivial conversation after heavily implying that he had her murdered confirms the reader's suspicion that he is in fact mad. |  |

| Line-by-Line Analysis |      |   |  |
|-----------------------|------|---|--|
| STANZA                | LINE | POEM  | ANALYSIS   |
| 1                     | 1    | That's my last Duchess painted on the wall,           | <b>Lines 1-13</b> – The opening two lines alert the reader to the fact that the speaker is a Duke (his wife was a Duchess) and that she is most probably dead. The use of the word 'last' suggests that he has likely had other duchesses before. The Duke compliments the work of the painter (Fra Pandolf) before asking (although it is more like an order) his guest to look upon the painting in more detail. He suggests that people would like to enquire about how the painter put so much depth and expression into the painting, but do not dare. This, alongside the fact that the Duke is the only one allowed to draw the curtain to observe the portrait, shows him as a somewhat imperious and dictatorial character. |
|                       | 2    | Looking as if she were alive. I call                  |  |
|                       | 3    | That piece a wonder, now; Fra Pandolf's hands         |  |
|                       | 4    | Worked busily a day, and there she stands.            |  |
|                       | 5    | Will't please you sit and look at her? I said         |  |
|                       | 6    | "Fra Pandolf" by design, for never read               |  |
|                       | 7    | Stronger like you that pictured countenance,          | <b>Lines 14-24</b> – The Duke then imagines some of the ways that Fra Pandolf may have encouraged the Duchess to achieve the 'spot of joy' in her face. He suggests that flirtatious or complimentary comments from the painter would have been enough to make her blush. The Duke is judgmental about the ease at which the Duchess would blush or be pleased by something – lamenting it as though it were a voluntary reaction ('too soon', 'too easily'). His diatribe continues as he accuses her of liking 'whate'er' and looking 'everywhere' – clearly a jibe at what he views as promiscuous/flirtatious behaviour.   |
|                       | 8    | The depth and passion of its earnest glance,          |  |
|                       | 9    | But to myself they turned (since none puts by         |  |
|                       | 10   | The curtain I have drawn for you, but I)              |  |
|                       | 11   | And seemed as they would ask me, if they durst,       |  |
|                       | 12   | How such a glance came there; so, not the first       |  |
|                       | 13   | Are you to turn and ask thus. Sir, 'twas not          | <b>Lines 25-34</b> – The Duke then elaborates on the Duchess's shallow nature – her tendency to see the same pleasure in everything – no matter how small. What seems to be of greater concern to him, however, is who she directs her pleasure towards. For example, he suggests that his 'gift of a nine-hundred years old name' would be received identically to a simple 'bough of cherries' picked by 'officious fool'. He is pretentious and discriminatory – he believes that her social elevation in marrying into his family should have been the thing that she took most pleasure in for life. The fact that it was not irks him.   |
|                       | 14   | Her husband's presence only, called that spot         |  |
|                       | 15   | Of joy into the Duchess' cheek; perhaps               |  |
|                       | 16   | Fra Pandolf chanced to say, "Her mantle laps          |  |
|                       | 17   | Over my lady's wrist too much," or "Paint             |  |
|                       | 18   | Must never hope to reproduce the faint                |  |
|                       | 19   | Half-flush that dies along her throat." Such stuff    | <b>Lines 35-46</b> – It becomes clear that the Duke and Duchess were not in an open and honest relationship. He lists the reasons that he chose not to address the flaws that he perceived with her, beginning by using a rhetorical question to assert that he would not 'stoop' to her level (showing again that he feels as though he is above her), but also because he knows that someone like her would make an excuse and avoid being 'lessoned'. Shockingly, the Duke instead chose to give 'commands' (most likely to have her killed) so that the 'smiles stopped altogether.'   |
|                       | 20   | Was courtesy, she thought, and cause enough           |  |
|                       | 21   | For calling up that spot of joy. She had              |  |
|                       | 22   | A heart—how shall I say?—too soon made glad,          |  |
|                       | 23   | Too easily impressed; she liked whate'er              |  |
|                       | 24   | She looked on, and her looks went everywhere.         |  |
|                       | 25   | Sir, 'twas all one! My favour at her breast,          | <b>Lines 47-53</b> – With a chilling calmness, the Duke then reiterates his earlier 'as if alive' statement regarding the picture. As the Duke suggests joining the party back downstairs, it is revealed that the recipient of this tale is a servant of a Count, the daughter of whom the Duke is attempting to win over. With a shocking show of capriciousness, the Duke begins negotiating the finer details regarding the marriage arrangement. His self-absorbed, flippant manner is exposed for a final time as he boasts of a bronze Neptune that he owns.  |
|                       | 26   | The dropping of the daylight in the West,             |  |
|                       | 27   | The bough of cherries some officious fool             |  |
|                       | 28   | Broke in the orchard for her, the white mule          |  |
|                       | 29   | She rode with round the terrace—all and each          |  |
|                       | 30   | Would draw from her alike the approving speech,       |  |
|                       | 31   | Or blush, at least. She thanked men—good! but thanked |  |
|                       | 32   | Somehow—I know not how—as if she ranked               |  |
|                       | 33   | My gift of a nine-hundred-years-old name              |  |
|                       | 34   | With anybody's gift. Who'd stoop to blame             |  |
|                       | 35   | This sort of trifling? Even had you skill             |  |
|                       | 36   | In speech—which I have not—to make your will          |  |
|                       | 37   | Quite clear to such an one, and say, "Just this       |  |
|                       | 38   | Or that in you disgusts me; here you miss,            |  |
|                       | 39   | Or there exceed the mark"—and if she let              |  |
|                       | 40   | Herself be lessoned so, nor plainly set               |  |
|                       | 41   | Her wits to yours, forsooth, and made excuse—         |  |
|                       | 42   | E'en then would be some stooping; and I choose        |  |
|                       | 43   | Never to stoop. Oh, sir, she smiled, no doubt,        |  |
|                       | 44   | Whene'er I passed her; but who passed without         |  |
|                       | 45   | Much the same smile? This grew; I gave commands;      |  |
|                       | 46   | Then all smiles stopped together. There she stands    |  |
|                       | 47   | As if alive. Will't please you rise? We'll meet       |  |
|                       | 48   | The company below, then. I repeat,                    |  |
|                       | 49   | The Count your master's known munificence             |  |
|                       | 50   | Is ample warrant that no just pretense                |  |
|                       | 51   | Of mine for dowry will be disallowed;                 |  |
|                       | 52   | Though his fair daughter's self, as I avowed          |  |
|                       | 53   | At starting, is my object. Nay, we'll go              |  |
|                       | 54   | Together down, sir. Notice Neptune, though,           |  |
|                       | 55   | Taming a sea-horse, thought a rarity,                 |  |
|                       | 56   | Which Claus of Innsbruck cast in bronze for me!       |  |

| Poems for Comparison    |   | Influences on the Poet   |
|-------------------------|---|--|
| <b>Ozymandias</b>       | <i>My Last Duchess</i> can be compared and contrasted with this poem through the theme of power and oppression, and the unpleasant voice in the monologue | Camille Guthrie writes of Browning's influences in creating the poem: <i>The Duchess's portrait is thought to be modeled after a painting of Lucrezia di Cosimo de' Medici (1545–1561). Married at 13 to the Duke of Ferrara and Modena, Alfonso II d'Este (1533–1597), she came with a big dowry, as the daughter of the Grand Duke of Tuscany would, yet soon died at the age of 16 from suspected malaria or tuberculosis or, as it's speculated, of poisoning. The Duke of Ferrara then brokered a deal with the Count of Tyrol to marry a daughter of the Holy Roman Emperor (after that wife died, he married her niece).</i> <a href="http://www.poetryfoundation.org">www.poetryfoundation.org</a> |
| <b>Kamikaze/Poppies</b> | <i>My Last Duchess</i> can be compared and contrasted with these poems in that it provides a single viewpoint regarding a time of conflict.               |  |





# Ozymandias

## KNOWLEDGE ORGANISER

**Context** – *Ozymandias* was written by Percy Bysshe Shelley, and was first published in January 1818.

**Percy Bysshe Shelley** – Percy Bysshe Shelley (1792-1822) was one of the major English Romantic Poets. Shelley was not particularly famous in his lifetime, but his popularity grew steadily after his death. Shelley was involved in a close circle of poets and writers, for example his second wife Mary Shelley (the author of *Frankenstein*) and Lord Byron. His poems have influenced a number of social and political movements since, particularly his theories on non-violence in protest and political action.



**Ramesses II** – Ramesses II, also known as Ramesses the Great, is often regarded as the most powerful and celebrated Egyptian pharaoh of the Egyptian Empire. In Greek, his name is often translated as 'Ozymandias.' He led several successful military expeditions, including to the Levant and into Nubia. In the early part of his reign, he built many cities, temples and monuments. Estimates of his age of death vary, but most suggest around 90 or 91 – a reign of over 66 years!



**Ancient Egypt** – Ancient Egypt refers to a civilisation of ancient north-east Africa, along the lower reaches of the Nile River. At its peak, Ancient Egypt held both significant territory and power over the surrounding areas, including the Near East. Part of the success of the civilisation has been attributed to the ability to adapt to the conditions of the Nile Valley for agriculture, the formation of military forces, and the influence of scholars and education – all overseen by a 'Pharaoh' or 'Emperor.'



**Egyptian Ruins** – A number of remnants of Egyptian culture exist as ruins today. Each complex houses the tomb of a different Egyptian pharaoh, and in front of them lies the Sphinx. One of the largest (and certainly the most famous of these) is the Pyramids of Giza (just outside Cairo). The Valley of Kings is located opposite Luxor on the west bank of the River Nile, where pharaohs (including Ramesses II) were mummified and buried in deep tombs along with sacred artifacts.



### Language/Structural Devices

**Caesurae** – Caesurae is a break in the rhythm within a line – Shelley does this at several points throughout the poem, each time to create significant effects. For example, the first break is after "Who said" on the second line. This pause mimics the traveller's sharp intake of breath before recalling the details of the scene. Another example comes after 'Stands in the desert.' The use of the full stop at this point reinforces the isolation of the statue amongst the vast desert.

**Quote:** "Two vast and trunkless legs of stone  
Stand in the desert. . ."

**Alliteration** – Shelley uses the sounds within words to create harsh and soft enunciations across lines, in keeping with the tone and meanings that the poem addresses. For example, when describing Ozymandias' expression, Shelley repeats the harsh 'c' sound in 'cold command' to add to the idea that this was a harsh leader. Conversely, the soft 'l' sound is repeated in 'lone and level sands,' emphasising the beauty of nature.

**Quote:** "And wrinkled lip, and sneer of cold command,"

**Form/Meter** – The poem is a sonnet (it is in one stanza and has 14 lines) however it does not fit the rhyme scheme of a typical sonnet. Some lines are split/separated by full stops. It is written in iambic pentameter, meaning that each line contains 5 stressed and 5 unstressed syllables. This creates a persistent rhythm across the poem – relentless like time.

**Quote:** "Of that colossal Wreck, boundless and bare  
The lone and level sands stretch far away."

**Varied Verbs** – Varied verbs are used to show the reader what Ozymandias was like as a ruler e.g. the verbs 'frown', 'sneer', and 'command' make the reader consider Ozymandias as a tyrant-like ruler. This influences the reader away from sympathising with the ruler's fall from grace. Varied verbs are also used to show that the emperor's power no longer stands in the way it once did, for example 'shattered', 'stand', 'stretch' show its decay and isolation.

**Quote:** "Half sunk a shattered visage lies, whose frown,  
And wrinkled lip, and sneer of cold command,"

**Juxtaposition/ Oxymoron** – The juxtaposition of contrasting vocabulary helps to show the irony in Ozymandias' bold statements of power. For example, the words etched onto the pedestal give an idea of immortality and grandeur: 'King' and 'Mighty' contrast sharply with the reality of 'Nothing' and 'decay.' Another example is the use of the oxymoron in the term 'colossal Wreck.'

**Quote:** "Look on my Works, ye Mighty, and despair!  
Nothing beside remains. Round the decay"

**Structure** – The opening line and a half are the narrator's words (up until the colon) at which point the traveller's words make up the rest of the poem. This makes the message seem more objective – these aren't the thoughts of the narrator, rather the musings of someone who has visited the place first-hand. The traveller is merely recalling what has been seen.

**Quote:** "I met a traveller from an antique land,  
Who said—"Two vast and trunkless legs of stone"

**Themes** – A theme is an idea or message that runs throughout a text.

**Transience** – The 'colossal wreck' that has become of Ozymandias' statue is a clear demonstration of the idea that everything, no matter how grand and vast it once was, is temporary, and will fall victim to the sands of time. Shelley's underlying message is exceptionally bleak – in time, nothing that any of us do will eventually matter.



**Power and Oppression** – Ozymandias' power, although once substantial, is one attribute that has failed to stand the test of time – the surroundings of his ruins making his assertions of power seem ridiculous. His oppressive nature ("hand that mocked, heart that fed") can oppress no more. Shelley doubtlessly intended to send a message to those in his contemporary society who abused positions of power and oppressed others – it won't last forever.



### Line-by-Line Analysis

| STANZA | LINE | POEM   | ANALYSIS  |
|--------|------|--|---|
| 1      | 1    | I met a traveller from an antique land,              | <b>Lines 1-4</b> – The idea of a traveller from an antique land grabs the reader's attention, as there is promise of a story. 'Antique' suggests the subject matter is old and precious. The adjectives 'trunkless' 'half-sunk' and 'shattered' describe what the 'vast' statues have become – they appear to be a shadow of what they once were.   |
|        | 2    | Who said—"Two vast and trunkless legs of stone       |   |
|        | 3    | Stand in the desert. . . . Near them, on the sand,   |   |
|        | 4    | Half sunk a shattered visage lies, whose frown,      | <b>Lines 5-8</b> – The facial expression of the statue is described in some detail – the 'frown', 'wrinkled lip' and 'sneer' suggesting that the authoritative and oppressive nature of the ruler was 'well-read' by the sculptor. Alliteration of the harsh 'c' sound is used in 'cold command', possibly to reflect the ruler's harsh command. The traveller suggests that these features of the ruler remain imprinted upon lifeless objects, even though the ruler and the sculptor are now dead. Line 8 gives more details of the King's nature. |
|        | 5    | And wrinkled lip, and sneer of cold command,         |   |
|        | 6    | Tell that its sculptor well those passions read      |   |
|        | 7    | Which yet survive, stamped on these lifeless things, | <b>Lines 9-11</b> – The engraving on the pedestal gives an indication of the power that Ozymandias once had. Whoever had the statue commissioned (likely Ozymandias himself) believed that the remnants of his legacy would still intimidate visitors/observers far into the future. Line 11 is one of the most famous lines in poetry – "Look on my Works, ye Mighty, and despair!" is a proud boast of his immense power. The imperative verb and the use of the exclamation mark gives this sense of authority and animation.                      |
|        | 8    | The hand that mocked them, and the heart that fed;   |   |
|        | 9    | And on the pedestal, these words appear:             |   |
|        | 10   | My name is Ozymandias, King of Kings;                | <b>Lines 12-14</b> – When juxtaposed with the description of what lay around the broken statue, the ironic truth in relation to these boasts is revealed. 'Nothing' and 'decay' are words used to demonstrate that the ruler is no longer powerful. The 'lone and level' sands (a metaphor for the sands of time) remains, and has brought the powerful ruler (literally in this case) to his knees.  |
|        | 11   | Look on my Works, ye Mighty, and despair!            |   |
|        | 12   | Nothing beside remains. Round the decay              |   |
|        | 13   | Of that colossal Wreck, boundless and bare           |   |
|        | 14   | The lone and level sands stretch far away."          |   |

### Poems for Comparison

|                                    |   |
|------------------------------------|---|
| <b>Charge of the Light Brigade</b> | <i>Ozymandias</i> can be compared and contrasted with transience (COLB aims to create a positive memory of the soldiers)        |
| <b>London</b>                      | <i>Ozymandias</i> can be compared and contrasted with this poem in the approach to the theme of the <u>power and oppression</u> |

### Influences on the Poet

Shelley ordered a copy of *Bibliotheca Historica* in 1812, which contained a section on a statue of Ramesses II: One of these, made in a sitting posture, is the greatest in all Egypt, the measure of his foot exceeding seven cubits....This piece is not only commendable for its greatness, but admirable for its cut and workmanship, and the excellency of the stone. In so great a work there is not to be discerned the least flaw, or any other blemish. Upon it there is this inscription: – 'I am Ozymandias, king of kings; if any would know how great I am, and where I lie, let him excel me in any of my works.' (I, p.53)





# Poppies – by Jane Weir

## KNOWLEDGE ORGANISER



**Context** – *Poppies* was written by Jane Weir, and was published in *The Guardian* in 2009.

**Jane Weir** – Jane Weir was born in 1963, to a British mother and an Italian father. She spent her childhood growing up in both Italy and northern England. She also lived in Northern Ireland during the troubled 1980s, which allowed her to continue to take in different cultures and traditions. *Poppies* was written after Carol Ann Duffy asked Jane Weir (and other poets) to compose poems to raise awareness of the mistreatment and deaths of British soldiers in Afghanistan and Iraq.



**Poppies** – Poppies are a type of flowering plant that have become known as a symbol of remembrance for military personnel killed serving the UK, Canada, Australia and New Zealand in war. Small artificial poppies are traditionally worn in these countries in the lead up to Remembrance/Armistice Day. The poppy as a symbol of remembrance was first inspired by the WWI poem 'In Flanders Fields', which describes how poppies were the first flowers to grow in the fields churned up by soldiers' graves.



**Armistice Day** – Armistice Day is celebrated every year on 11<sup>th</sup> November, in order to celebrate the Armistice signed by the Allies of World War I and Germany. It took place on the 11<sup>th</sup> hour of the 11<sup>th</sup> day of the 11<sup>th</sup> month, in 1918. The date also coincides with Remembrance Day (UK) and Veterans Day (US). In Britain, many people attend an 11am ceremony held at the Cenotaph in London – an event that is organised by the Royal British Legion, a charity devoted to continuing the memory of those who served in WWI and all subsequent wars.



**The Iraq/ Afghanistan Conflicts** – The War in Afghanistan began in 2001 after 9/11, when USA and its allies invaded Afghanistan in order to rid the country of Al-Qaeda, through removing the Taliban from power. The Iraq war began in 2003, when a United States-led government invaded Iraq in order to overthrow Saddam Hussein. In both wars, the power vacuum that resulted from removing these powers meant that the coalition troops faced several years in battle against insurgents, in which many were killed.



### Language/Structural Devices

**Imagery** – Weir uses imagery to accentuate the contrast between the horrific manner in which the son has assumedly died, and the comforts of home. For example, the use of the term 'Sellotape Bandaged' causes the reader to consider a battlefield injury, whilst on another level gives a more comforting image of a mother cleaning cat hairs off her son's blazer. The same is true of her pinning the poppy on her son, a nurturing image which is contrasted with the words 'spasm' and 'red', presenting the idea of a horrific, violent death.

**Quote:** "I pinned one onto your lapel, crimped petals, spasms of paper red, disrupting a blockade"

**Metaphors** – Figurative language is highly prevalent throughout the poem, particularly from the third stanza onward. For example, the door to the house represents the door to the world. The release of the songbird symbolises the narrator letting go of something that has given her joy. Furthermore, the dove represents the symbol of peace – showing the narrator that their son is now at peace.

**Quote:** "After you'd gone I went into your bedroom, released a song bird from its cage."

**Form/Structure** – At first glance, the poem appears to have a strong, regular form. There are four stanzas – the first and last have 6 lines, whilst the middle stanzas have 11 and 12. But, a closer look reveals that 19 of the 35 lines in the poem have breaks in the middle. This is suggestive of a narrator that is trying to keep calm, but is breaking down inside.

**Quote:** "play at/being Eskimos like we did when you were little/ I resisted the impulse"

**Varied Verbs** – A wide range of verbs are used to demonstrate the manner in which actions are carried out – this helps to carry the tone and key messages of the poem. For example, the narrator reminisces about fond memories from the past, using positive verbs such as 'play' and 'smoothed.' Verbs used to describe their interactions in the present all offer connotations of pain and discomfort, e.g. 'flattened,' 'pinned,' and 'graze.' The variation in these verbs helps to form the sharp contrasts that shape the poem.

**Quote:** "All my words flattened, rolled, turned into felt,"

**Interesting Adjectives** – Weir uses few adjectives throughout the poem (largely in keeping with its simple and sombre tone) but those that are included are hugely descriptive. For example, the use of the adjective 'intoxicated' gives the reader a depth of understanding about both the son's mindset heading into war (enthusiastic) and the narrator's trepidation regarding the son's mindset.

**Quote:** "A split second and you were away, intoxicated."

**Narrative Structure** – The time sequence throughout the poem changes along with the narrator's emotions. The reader is led through the time sequence from 'three days before' (line 1), 'before you left' (3), 'after you'd gone' (23), to 'this is where it has led me' (25). At the end of the poem, the narrator finds themselves caught between the past and the present.

**Quote:** "and this is where it has led me, skirting the church yard walls, my stomach busy"

**Themes** – A theme is an idea or message that runs throughout a text.

**Remembrance** – Weir opens the poem mentioning 'Armistice Day' – a day all about remembrance – and this is a theme that runs throughout the entirety of the poem. The reader is forced to consider the soldier not just as a number or statistic, but rather as someone's son, who have shared innumerable memories with the person.




**Loss and Suffering** – By telling the poem from the viewpoint of the parent, Weir gives a voice to the relatives and friends who are forced to endure loss and suffering away from the battlefield at home. Although they do not experience the physical pain of battle, the psychological and emotional suffering can be just as potent.



### Line-by-Line Analysis

| STANZA | LINE | POEM  | ANALYSIS   |
|--------|------|---|--|
| 1      | 1    | Three days before Armistice Sunday                | The poem starts with the speaker's close relative (assumed to be a son) leaving. <i>Armistice Sunday</i> is associated with remembrance, so the mention of this in the first line sets the tone of the poem. The description of the poppy provides a <u>powerful piece of imagery</u> – the 'spasms of red' on a 'blockade' could just as easily symbolise a soldier who has been brutally shot dead in action. The speaker shows fear through using the <u>symbol of remembrance</u> as a token of goodbye.   |
|        | 2    | and poppies had already been placed               |  |
|        | 3    | on individual war graves. Before you left,        |  |
|        | 4    | I pinned one onto your lapel, crimped petals,     |  |
|        | 5    | spasms of paper red, disrupting a blockade        |  |
|        | 6    | of yellow bias binding around your blazer.        |  |
| 2      | 7    | Sellotape bandaged around my hand,                | The behaviours that the narrator speaks of are typical of those exhibited between a <u>parent and their child</u> (in this case likely a mother and son). The speaker describes partaking in some nurturing tasks (e.g. cleaning his blazer of fluff, smartening up his shirt) but appears to feel sorrow at not being able to do the other things that he has outgrown (e.g. Eskimo kiss, rub fingers through hair, etc.). To substantiate this idea, the use of the <u>interesting verb 'stealed'</u> is used to show how the narrator retains a stiff upper lip in the face of an emotional time. The use of the <u>metaphor 'blackthorns of your hair'</u> makes reference to both the visual appearance of the son's hair and the fact that it is <u>now</u> something that the speaker cannot touch, since the son is no longer a child.   |
|        | 8    | I rounded up as many white cat hairs              |  |
|        | 9    | as I could, smoothed down your shirt's            |  |
|        | 10   | upturned collar, stealed the softening            |  |
|        | 11   | of my face. I wanted to graze my nose             |  |
|        | 12   | across the tip of your nose, play at              |  |
|        | 13   | being Eskimos like we did when                    |  |
|        | 14   | you were little. I resisted the impulse           |  |
|        | 15   | to run my fingers through the gelled              |  |
|        | 16   | blackthorns of your hair. All my words            |  |
|        | 17   | flattened, rolled, turned into felt,              |  |
| 3      | 18   | slowly melting. I was brave, as I walked          | Another <u>metaphor</u> is used to describe the narrator as 'melting', referencing the fact that they feel as though they are falling apart inside through the despair of the parting moment. The verb 'threw' suggests that the narrator wants this desperate moment to be over <u>hastily</u> . The simile 'world overflowing like a treasure chest' describes the idea that the narrator is full of 'overflowing' emotions. The interesting adjective 'intoxicated' is used to describe the son as he leaves – possibly an indication that he is enthusiastic about going away to war, not fully aware of the atrocities that take place there. The mention of releasing the songbird is unlikely to be literal – rather a <u>metaphor</u> regarding the narrator 'letting go' of something that has brought them joy. Doves are often seen as <u>symbolic of peace</u> , leading the narrator to follow it – giving the idea of them hoping for peace, but also representing the idea that they have little to do with their son gone. |
|        | 19   | with you, to the front door, threw                |  |
|        | 20   | it open, the world overflowing                    |  |
|        | 21   | like a treasure chest. A split second             |  |
|        | 22   | and you were away, intoxicated.                   |  |
|        | 23   | After you'd gone I went into your bedroom,        |  |
|        | 24   | released a song bird from its cage.               |  |
|        | 25   | Later a single dove flew from the pear tree,      |  |
|        | 26   | and this is where it has led me,                  |  |
|        | 27   | skirting the church yard walls, my stomach busy   |  |
|        | 28   | making tucks, darts, pleats, hat-less, without    |  |
|        | 29   | a winter coat or reinforcements of scarf, gloves. |  |
| 4      | 30   | On reaching the top of the hill I traced          | The speaker is led by the dove to a war memorial. Here the bird departs – thus suggesting that its sole purpose was to lead the speaker there. We can imply from this that <u>the son has died in the war</u> – the memory of him leaving is the last moment the narrator will ever have with him. Even in the final stanza, <u>language relating to textiles/ clothing (stitch)</u> as there is earlier in the poem (blazer, scarf, gloves) is representative of domestic comfort, in contrast to language showing the <u>violence and horror of war</u> (red, spasms). Ending the poem, the narrator reaches for memories but only hears silence.  |
|        | 31   | the inscriptions on the war memorial,             |  |
|        | 32   | leaned against it like a wishbone.                |  |
|        | 33   | The dove pulled freely against the sky,           |  |
|        | 34   | an ornamental stitch, I listened, hoping to hear  |  |
|        | 35   | your playground voice catching on the wind.       |  |

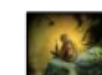
### Poems for Comparison

|                   |  |  |
|-------------------|--|--|
| <b>Ozymandias</b> | <i>Poppies</i> can be compared and contrasted with this poem in relation to the theme of <u>remembrance</u> .            | <p>The poem came out of sadness and anger, the two emotions combined, and it was written quickly, which is fairly unusual. At the time the news was full of conflict: Iraq, Afghanistan, Israel, and of course we'd had the Gulf War, and various 'trial wars' in Africa...</p> <p>We very rarely hear the woman speak. I have two sons myself and I'd read in the newspapers, seen on TV the verdicts from the inquests on soldiers killed in Iraq. Who could forget the harrowing testimonies of the soldiers' families, and in particular their Mothers...and I was angry and frustrated at the quality, or what I perceived as 'voicelessness' and ability to be heard or get any kind of justice. I wanted to write a poem from the point of view of a mother and her relationship with her son, a child who was loved, cherished and protected...and it had led to this... heightened and absolute fear that parents experience in letting their children go, the anxiety and ultimately the pain of loss...</p>  |
| <b>Exposure</b>   | <i>Poppies</i> can be compared and contrasted with this poem in the approach to the theme of <u>loss and suffering</u> . |  |





# REMAINS KNOWLEDGE ORGANISER



**Context** – *Remains* was written by Simon Armitage, and was published in *The Not Dead* in 2008.

**Simon Armitage** – Simon Armitage (born 1963) is an English poet, playwright, and novelist. He is the current Professor of Poetry at the University of Leeds, and also a Fellow of the Royal Society of Literature. His poems are characterised by their ease of accessibility, their realist style, and their cutting critique. Many of Armitage's poems contain a darkly comic, although *Remains* in particular is without the element of comedy.



**Modern Conflicts** – Even since the catastrophic world wars of the early twentieth century, Britain has still found itself in numerous conflicts around the world – amongst the most notorious of these have been the conflicts in Iraq, Afghanistan, and the Falklands. Poetry has a long-standing tradition of trying to document war experiences for those at home. *Remains* is set in Basra in the Iraq, which was the scene of the Battle of Basra in 2003.



**'The Not Dead'** – 'The Not Dead' was initially a Channel Four documentary featuring testimonies from ex-military personnel who had served in numerous conflicts. Armitage was reportedly so inspired by the programme that he produced a collection of war poetry using the same name (featuring 'Remains'). The poems are written in response to the testimonies of soldiers, many of whom have been through events that they struggle to forget even years afterwards.



**Psychological Effects of War** – The incidence of ex-servicemen with anxiety, depression, and PTSD (post-traumatic stress disorder) is exceptionally high. Furthermore, the rate of suicide amongst ex-soldiers around the world is far higher than the general populace. Many struggle to get over the horrors that they have seen in war, and are haunted by bad memories. In this sense, 'The Not Dead' are the ghosts of ex-comrades and enemies trapped inside the memories of those that live on.



## Language/Structural Devices

**Figurative Language** – Armitage uses a number of figurative language techniques to demonstrate both the physical actions and the psychological consequences of the war. For example, the 'blood-shadow' that remains on the street after the event serves as a physical reminder of the violence that has taken place, but can also be seen as a psychological manifestation of the speaker's guilt over his part in the death of the looter.

**Violent/ Graphic Imagery** – It is befitting that in a poem dealing with the horrific and unsettling memories of the ex-serviceman, the speaker does not leave out more explicit and uninhibited details from his depiction. An image is etched in the reader's mind of a man, writhing in agony, with parts of their body detached from their original place, 'left for dead.' Furthermore, these grotesque details are juxtaposed with commonplace actions to make the event seem everyday.

**Quote:** "End of story, except not really. His blood-shadow stays on the street, and out on patrol"

**Quote:** "and tosses his guts back into his body. Then he's carted off in the back of a lorry."

**Alliteration** – Armitage repeats specific sounds both to echo the scene of conflict, and to also affect the tone of the poem. For example, the alliteration of the 's' sound in 'sun-stunned, sand-smothered' to replicate the sizzling, scorching heat of the desert, whilst the heavy 'd' sound in 'dug', 'dead', 'drink', 'drugs' mirrors the depressed state of the speaker.

**Colloquialisms** – The speaker uses a number of colloquial terms to mirror army culture and unity, and also his apparent youth inexperience. (e.g. 'mate, legged it'). These colloquialisms later combine to imply that the soldiers have disregard for human life – words such as 'tossed' and 'carted' suggest actions are not carried out with care or empathy.

**Quote:** "dug in behind enemy lines/ not left for dead in some distant, sun-stunned, sand-smothered land"

**Quote:** "And one of them legs it up the road, probably armed, possibly not."

**Form** – *Remains* is written in 8 stanzas, the first 7 of which are mostly unrhymed quatrains. The final stanza contains only two lines, perhaps reflecting the disintegration of the speaker's psychological state. There is a more regular rhythmic pattern throughout the first part of the poem, but this breaks down as the speaker's memories flood back later.

**Structure** – *Remains* is written as a monologue. It is clearly a reflection of the past, and yet is largely written in the present tense, which is representative of the fact that the memories from the past have accompanied the speaker into the present. There is the occasional use of enjambment to make the monologue seem more conversational.

**Quote:** "but near to the knuckle, here and now, his bloody life in my bloody hands."

**Quote:** "Well myself and somebody else and somebody else are all of the same mind."

**Themes** – A theme is an idea or message that runs throughout a text.

**Suffering/ The Horrors of War** – The poem offers graphic details of the horrific events that take place in war. The poem not only covers the brutality of armed combat, but also graphic details regarding the grotesque effects of bullets on the human body, and the agony suffered by those who are wounded. It really is the stuff of nightmares.



**The Lasting Effects of War** – The poem deals with the lasting impact of war on those that experience it – in this case the ex-servicemen who took part in the fighting. The speaker is forced to deal with the horrifying images of what he has seen long after the events themselves, and carries the guilt of his actions like a burden. These factors contribute to his weakened psychological state, which appears fraught by anxiety and PTSD.



## Line-by-Line Analysis

| STANZA | LINE | POEM  | ANALYSIS  |
|--------|------|---|---|
| 1      | 1    | On another occasion, we get sent out                                | The speaker is relaying a story to an unknown third party – assumedly some kind of psychiatrist. The time and place of the event is established. 'On another occasion' suggests that this is only one of many horrific events. The use of slang e.g. 'legs it' and his lack of awareness about whether the man was armed makes the reader consider that the soldier is likely young/inexperienced.  |
|        | 2    | to tackle looters raiding a bank.                                   |   |
|        | 3    | And one of them legs it up the road,                                |   |
|        | 4    | probably armed, possibly not.                                       |   |
| 2      | 5    | Well myself and somebody else and somebody else                     | The memory of the finer details of the event seem somewhat hazy, a commonly-reported side-effect after a traumatic event – the speaker cannot remember exactly who he was with. Line 6 makes the reader consider their military training – they manage their situation through actions and responses like machines – their human empathy apparently withdrawn.  |
|        | 6    | are all of the same mind,   |   |
|        | 7    | so all three of us open fire.                                       |   |
|        | 8    | Three of a kind all letting fly, and I swear                        |   |
| 3      | 9    | I see every round as it rips through his life –                     | The opening lines of stanza 3 undo the past few lines, by showing the human element to the soldier. There is violent imagery of the bullets 'ripping' through his skin, and the emotional aspect of his life coming to an end. In lines 11 and 12, the speaker checks himself & returns to hardened army description of the looter.   |
|        | 10   | I see broad daylight on the other side.                             |   |
|        | 11   | So we've hit this looter a dozen times                              |   |
|        | 12   | and he's there on the ground, sort of inside out,                   |   |
| 4      | 13   | pain itself, the image of agony.                                    | The figurative statement in line 13 shows how etched into the speaker's mind the man lying in agony has become. The imagery created throughout the remainder of the stanza is truly haunting, which is exacerbated by the use of the casual, unceremonious manner in which it is carried out (words such as 'mates', 'tosses' and 'carted' heavily imply this).   |
|        | 14   | One of my mates goes by   |   |
|        | 15   | and tosses his guts back into his body.                             |   |
|        | 16   | Then he's carted off in the back of a lorry.                        |   |
| 5      | 17   | End of story, except not really.                                    | The speaker begins to discuss the lasting effect in the days and weeks that immediately follow. The 'blood-shadow' attacks the speaker with a physical reminder of what has happened. It becomes clear that the speaker needs to get away from the location of the event, which seems to be the case in line 20. However, the stanza ends with 'But I blink' which leaves the reader in a state of anticipation.                          |
|        | 18   | His blood-shadow stays on the street, and out on patrol             |   |
|        | 19   | I walk right over it week after week.                               |   |
|        | 20   | Then I'm home on leave. But I blink                                 |   |
| 6      | 21   | and he bursts again through the doors of the bank.                  | Where the poem was slow-paced and regular, it now becomes a stream of consciousness rush of half-finished words and phrases, as it becomes evident that speaker is also affected by the memory of the incident even at home and when asleep. There is no rest from the memories, and a sense of desperation in the increased, irregular rhythm of the poem now, reflecting his anxiety.   |
|        | 22   | Sleep, and he's probably armed, possibly not.                       |   |
|        | 23   | Dream, and he's torn apart by a dozen rounds.                       |   |
|        | 24   | And the drink and the drugs won't flush him out –                   |   |
| 7      | 25   | he's here in my head when I close my eyes,                          | The speaker reiterates how the enemy is now always with him – through the repetition the reader gains an increasing sense of how tiring it must be to live with this day after day. The use of military terms, e.g. 'dug-in' shows how the army has subsumed his personality. Line 27 gives the reader hazy imagery of the faraway scene of the event, utilising alliteration of the 's' sound to reflect the searing heat of the desert. |
|        | 26   | dug in behind enemy lines,  |   |
|        | 27   | not left for dead in some distant, sun-stunned, sand-smothered land |   |
|        | 28   | or six-feet-under in desert sand,                                   |   |
| 8      | 29   | but near to the knuckle, here and now,                              | The final stanza offers no respite, reflective of how he has no escape from the memories that haunt his mind. The reader now considers the dual meaning of the title: the 'remains' of the man tossed onto the lorry, 'left for dead' & the 'remains' of the speaker who is forever haunted.  |
|        | 30   | his bloody life in my bloody hands.                                 |   |

## Poems for Comparison

| Exposure/ Bayonet Charge   | War Photographer/ Poppies  | Thoughts of the Poet   |
|--|--|--|
| <i>Remains</i> can be contrasted with these poems in relation to the themes of suffering and the horrors of war. | <i>Exposure</i> can be compared with these poems in relation to the theme of the lasting effects of war. | "Never having been to the front line, turning the words, phrases and experiences of these soldiers into verse has been the closest I've ever come to writing 'real' war poetry, and as close as I ever want to get," said Simon.<br><br>The <i>Not Dead</i> received excellent reviews in the press and moving responses on the Web from other veterans. "I wasn't present when the three men read the poems to camera, but it can't have been easy for them. In my view, it was a supreme act of bravery." Simon added. From <a href="http://www.simonarmitage.com">www.simonarmitage.com</a> |





# STORM ON THE ISLAND



**Context** – *Storm on the Island* was originally published in Seamus Heaney's 1996 *Death of Naturalist* collection.

**Seamus Heaney** – Seamus Heaney (1939-2013) was a Northern Irish poet and playwright, who received the 1995 Nobel Prize in Literature. He is recognised as one of the major poets of the 20<sup>th</sup> Century. His poems were usually written in a traditional style about passing ways of life. His poetry is accessible, using a simple diction and a range of poetic devices to build imagery. Heaney often used his poetry to reflect upon 'The Troubles', which plagued the country throughout his early adulthood.



**The Troubles** – The Troubles is the name given to the conflict in Northern Ireland during the late 20<sup>th</sup> Century. Over 3,600 people were killed and thousands more were injured. Two separate factions fought over the constitutional status of the country, with the goal of the unionist side to remain part of the UK, and the nationalist side to become part of Ireland. As a result, the violence also spilled into Great Britain and Ireland. It was settled in the Good Friday agreement of 1998.



**Ireland** – Ireland is an island in the North Atlantic, separated from Great Britain by the North Channel, the Irish Sea, and St. George's Channel. The island is made up of the Republic of Ireland (often shortened to 'Ireland'), which makes up about five-sixths of the island, and Northern Ireland, which is a part of the UK. The Irish climate is heavily influenced by the Atlantic Ocean, which borders it to the east. Ireland is the second-most populous island in Europe, with about 6.6 million inhabitants.



**Irish Islands** – There are several hundred islands off the coast of Ireland, many of which harbour extremely small populations; on a number of these islands, the population is below 100 people. Often isolated tens of kilometres off the Irish mainland, these places are often fully exposed to the elements of the Atlantic Ocean. Some islands report long periods of time in enforced solitude from storms. It is important for these people to live in tight-knit communities, looking out for one another.



## Language/Structural Devices

**Extended Metaphor** – *Storm on the Island*, on a literal level, details an event perfectly summarised by the title. However, on a deeper, more figurative level, the storm is representative of the political storm that raged across Northern Ireland at the time. The storm pummeling the island is a metaphor for the violence that was taking place in Northern Ireland.

This is evident even in the title (island is a homophone of Ireland). Furthermore, the first 8 letters of the poem's title spell out the word 'Stormont.' Stormont is the name given to the government buildings in Northern Ireland in Belfast. This makes it clear that this poem also carries a political message. Imagery associated with terrorist violence can be found throughout several other sections of the poem, for example words such as 'blast', 'exploding', 'fear', and 'bombarded' not only represent the manner in which the storm attacks the island, but also the horror that was ensuing in Northern Ireland through the terrorists' violence.

**Quote:** "Blast: you know what I mean - leaves and branches Can raise a chorus in a gale"

**Structure** – The poem is written in one solid block of 19 unrhymed lines, ending with a half-rhyming couplet. Each line of the blank verse contains ten or eleven syllables, following the natural pattern of English so that the reader feels as though Heaney is talking to them. The form itself mirrors the houses, squat and solid, bearing the brunt of the storm. It also presents the storm as one single event.

**Quote:** "We are bombarded by the empty air. Strange, it is a huge nothing that we fear."

**Personification/Similes** – In order to demonstrate the sheer power of nature throughout the poem, Heaney chooses to personify several aspects of storm. For example, the speaker shares that the storm 'pummels' the houses – presenting the storm as some kind of fighter or bully. Later on in the poem, the sea is personified as it is presented that it 'spits like a tame cat turned savage' – also using a simile to demonstrate that all of nature appears to be against them.

**Quote:** "So that you can listen to the thing you fear Forgetting that it pummels your house too."

**Interesting Vocabulary** – Heaney uses a wide variety of interesting vocabulary choices to show the power and effect of the storm. Many of these words have meanings within the semantic field of warfare, for example: strafes, salvo, bombarded, exploding, shelter, and company. All of this combines to create vivid sight and sound imagery that is befitting both the scene of the storm and a warzone.

**Quote:** "Turned savage. We just sit tight while wind dives And strafes invisibly. Space is a salvo."

**Enjambment and Caesura** – Heaney employs enjambment and caesura to break up and fragment the poem in some places, and to build it to a crescendo in others. This creates an uneven rhythm, rather like the storm itself. The enjambment picks up the rhythm, which then hits an abrupt stop at each moment of caesura – granting power to hard monosyllabic words such as 'blast' and 'lost.'

**Quote:** "Which might prove company when it blows full Blast: you know what I mean - leaves and branches"

## Themes – A theme is an idea or message that runs throughout a text.

**Nature** – As the islanders have become acutely aware, humanity is easily overpowered by the forces of nature – The natural world can make man feel extremely small and insignificant. Despite being relentlessly 'pummelled' and 'bombarded' by the storm, the islanders just have to 'sit it out', knowing that they are no match for the storm.



**Fear/Isolation** – The people on the island are out of touch with anyone beyond the island (and in fact beyond their own house) during the storm. Their isolation is demonstrated through the lack of trees, which the speaker suggests could offer some company, and the now 'savage' nature of the ocean. This is bare, barren, and lonely.



## Line-by-Line Analysis

| STANZA | LINE | POEM  | ANALYSIS  |
|--------|------|---|---|
| 1      | 1    | We are prepared: we build our houses squat,       | <b>Lines 1-4</b> – The speaker describes how the community prepares for the storm. The collective personal pronoun 'we' to start the poem shows the strength of the community. The way the houses are built suggests storms are regular, and that they survive them through their collective strength – hard 'k' and 't' sounds reflect this. The word 'wizened' shows that the land is dried up/ shrivelled, but what is ironic about the lack of vegetation that the barren land offers is that there is little that would take flight and become a danger in a strong storm.   |
|        | 2    | Sink walls in rock and roof them with good slate. |   |
|        | 3    | The wizened earth had never troubled us           |   |
|        | 4    | With hay, so as you can see, there are no stacks  |   |
|        | 5    | Or stools that can be lost. Nor are there trees   | <b>Lines 5-8</b> – The poem begins to shift in tone, towards one of fear and danger. The speaker suggests that the trees may prove 'company' in a strong storm, as if aspects of nature comforting – this emphasises the loneliness of the land. Blast isolated by the enjambment and caesura, enhancing its strength. The sound of word is onomatopoeic, and makes the reader consider a bomb. The personal pronoun 'you' encourages the reader to reflect on their own experiences of violent storms. The 'tragic chorus' narrate the events in a Greek tragedy, in which a catastrophic ending is inevitable – security is eclipsed by sounds of fear. |
|        | 6    | Which might prove company when it blows full      |   |
|        | 7    | Blast: you know what I mean - leaves and branches |   |
|        | 8    | Can raise a tragic chorus in a gale               |   |
|        | 9    | So that you can listen to the thing you fear      | <b>Lines 9-13</b> – The tone has now clearly shifted from one of safety to one of danger as the intensity and violence of the storm is described. The word 'pummels' means to strike repeatedly with the fist – the storm is therefore being personified into an aggressive and persistent fighter that bullies the islanders. 'No trees' is repeated, to emphasise the feeling of isolation. 'No natural shelter' suggests that nature is entirely against them. An oxymoron is used to show the nature of the sea – it is 'comfortable' with its violence (exploding) – once again, there are connotations here of bombs detonating.                    |
|        | 10   | Forgetting that it pummels your house too.        |   |
|        | 11   | But there are no trees, no natural shelter.       |   |
|        | 12   | You might think that the sea is company,          |   |
|        | 13   | Exploding comfortably down on the cliffs          | <b>Lines 14-16</b> – From this point onwards, the fear of the islanders is conveyed through the increasing imagery of war. Caesuras (e.g. after 'But no') prolong the storm. Even domesticated nature now seems to be against the islanders, as in the simile used to compare the sea and the tame cat 'turned savage.' The cat, much like the weather, turns from tame to savage. Furthermore, the water is personified through the imagery of the water 'spitting.' The villagers must simply let it pass.  |
|        | 14   | But no: when it begins, the flung spray hits      |   |
|        | 15   | The very windows, spits like a tame cat           |   |
|        | 16   | Turned savage. We just sit tight while wind dives |   |
|        | 17   | And strafes invisibly. Space is a salvo.          | <b>Lines 17-19</b> – The final lines continue to employ images of war. 'Strafes' means to attack with gunfire, once again showing how the storm mirrors the violent conflict. The use of the adverb 'invisibly' suggests that the attack is by stealth – the wind cannot be seen and this in some ways makes it worse. The interesting verb 'bombarded' shows the people are trapped and feel attacked from all angles. 'Empty air' is a play on words, meaning a mere threat, but this is more than that. The last line shows that the people do not know what to expect.  |
|        | 18   | We are bombarded by the empty air.                |   |
|        | 19   | Strange, it is a huge nothing that we fear.       |   |

## Poems for Comparison

|                              |  |
|------------------------------|--|
| <b>Exposure</b>              | <i>Storm on the Island</i> can be compared and contrasted with this poem through its presentation of the weather and nature. |
| <b>The Prelude (extract)</b> | <i>Storm on the Island</i> can be compared and contrasted with these poems through its presentation of fear and isolation    |

## Words from the Poet

All of us, Protestant poets, Catholic poets - and don't those terms fairly put the wind up you? - all of us probably had some notion that a good poem was "a paradigm of good politics", a site of energy and tension and possibility, a truth-telling arena but not a killing field. And without being explicit about it, either to ourselves or to one another, we probably felt that if we as poets couldn't do something transformative or creative with all that we were a part of, then it was a poor lookout for everybody. In the end, I believe what was envisaged and almost set up by the Good Friday Agreement was prefigured in what I called our subtleties and tolerances - allowances for different traditions and affiliations, in culture, religion and politics. It all seems simple enough. Seamus Heaney Interview with Dennis O'Driscoll, *The Guardian*, 2008. Page 10





# The Charge of the Light Brigade KNOWLEDGE ORGANISER

**Context** – The Charge of the Light Brigade was written by Alfred, Lord Tennyson, in 1854

**Alfred, Lord Tennyson** – Alfred, Lord Tennyson (1809-1892) was a poet, whose work remains popular today. Many phrases from his work have become commonplace in English today. He was one of 11 children, and received a good literary education. He began publishing poems whilst still a student at Cambridge. In 1850, he became Poet Laureate, writing poems on matters of national importance until his death in 1892.



**The Crimean War** – The Crimean War was a military conflict fought between 1853 and 1856, in which the Russian Empire lost to an alliance of France, Britain, the Ottoman Empire, and Sardinia. The causes for the war are notoriously blurry, however relate to a reluctance to allow Russia to gain land during the Ottoman decline. Despite these unclear intentions, it has become known for its bloodiness and catastrophic mismanagement.



**Attitudes to War** – Public perceptions of war have significantly altered since Lord Tennyson's era, owing largely to the horrendous impact of WWI, WWII and the Vietnam War. Many at the time felt that war was worthwhile and glorious, and that there was no honour greater than dying for one's country. Whilst Tennyson was predominantly against the idea of war (the poem shows disgust for the treatment of soldiers), he presents that taking orders and dying for one's country is honourable.



**The Battle of Balaklava** – The Battle of Balaklava was fought on 25<sup>th</sup> October 1854 as a part of the Crimean War. During this battle, 'The Charge of the Light Brigade' took place. The cavalry were intended to be sent to prevent Russians from removing captured guns, however a miscommunication resulted in them charging directly at an artillery battery, surrounded, and under withering direct fire. They reached the battery, but high casualties forced them to quickly retreat.



## Language/Structural Devices

**Rhetorical Questions/ Imperative Verbs** – Tennyson makes smart use of rhetorical questions and imperative verbs to both encourage the reader to think deeply about the situation, and to gain exert authority over how the reader should react to the poem. For example, the rhetorical question 'was there a man dismayed?' manipulates the reader into considering that there was a good cause to be upset about the order. Furthermore, the imperative verb 'honour' tells the reader exactly how they should think of the soldiers.

**Quote:** "Honour the charge they made!  
Honour the Light Brigade."

**Metaphors** – The predominant metaphor used throughout the poem compares the battleground to the 'valley of death', and an extension of this (as the soldiers reach the opposition battery) is the jaws of death. This creates a sense of ominous certainty that the men will perish when they enter. This makes the return of a number of them seem all the more remarkable.

**Quote:** "Into the valley of Death  
Rode the six hundred."

**Form/Structure** – The poem is composed of six stanzas which vary in length from six to twelve lines. Each of the stanzas shares similarities, for example ending with the refrain 'six hundred', thus emphasising the most important message in the poem. The poem also makes use of anaphora (the same words repeated at the beginning of lines).

**Quote:** "Cannon to right of them / Cannon to left of them / Cannon in front of them."

**Alliteration** – A range of alliteration is used throughout the poem to recreate the sounds that the soldiers hear in the battlefield environment. There is a visceral effect, for example, that is created when the reader traverses the line 'stormed at with shot and shell.' The repeated 's' sound replicating the violence of the moment. Alliteration is also utilised to capture the reactions of the world to the event – the repeated 'wo' sound in 'All the world wondered' depicting the astonishment of those reading about the battle.

**Quote:** "Charging an army, while  
All the world wondered."

**Varied Verbs** – Tennyson uses some interesting and original verbs to portray the actions, sights, and sounds on the battlefield. For example, the artillery is described using the words 'volleyed', 'thundered', and 'stormed.' Such powerful verbs make the artillery seem like an almighty force of nature (note the connotations of violent weather), something far bigger and stronger than the Light Brigade.

**Quote:** "Volleyed and thundered;  
Stormed at with shot and shell"

**Rhythm/Rhyme** – The poem is written in dimeter – meaning that there are two stressed syllables per line. These are usually followed by at least two unstressed syllables, creating the sound of Light Brigade riding into battle on horseback. The use of sporadic rhyme further strengthens this rhythm, creating a flow to the poem as it is read aloud.

**Quote:** "Flashed all their sabres bare / Flashed as they  
turned in air / Sab'ring the gunners there."

**Themes** – A theme is an idea or message that runs throughout a text.

**Remembrance** – Tennyson's predominant aim in the poem is to create a lasting memory of the bravery of the anonymous men in the Light Brigade. Clear respect is shown for the men throughout the entirety of the poem, but the clear attempts to cement their legacy come in the 2<sup>nd</sup> half, through vocabulary such as 'hero' and 'glory.'



**The Futility of War** – Whilst Tennyson's poem conforms to the idea that death for one's country in war is deemed 'honourable', it also shows thinly veiled disgust at the treatment of the men in the Light Brigade. This is most evident in the lines 'though the soldier knew/ Someone had blundered.'



## Line-by-Line Analysis

| STANZA | LINE | POEM                               | ANALYSIS  |
|--------|------|------------------------------------|---|
| 1      | 1    | Half a league, half a league,      | A 'league' is an old way to measure distance, equating to around 3 miles. The repetition of this commences a rolling rhythm that continues through the poem, <u>resembling the sound of horses' hooves galloping</u> . Tennyson uses a <u>metaphor</u> in describing the opposition-dominated battlefield as 'the valley of death.' This has <u>religious connotations</u> (Psalm 23). 'Light' brigade is in opposition to the 'heavy' artillery, and yet they are being asked to 'Charge for the guns!' It is assumed 'he' refers to the commander.  |
|        | 2    | Half a league onward,              |   |
|        | 3    | All in the valley of Death         |   |
|        | 4    | Rode the six hundred.              |   |
|        | 5    | "Forward, the Light Brigade!       |   |
|        | 6    | Charge for the guns!" he said.     |   |
| 2      | 7    | Into the valley of Death           | Once more the order is repeated to charge forward. The poet uses a <u>rhetorical question</u> to question the sense of the order – yet affirms that the soldiers carried out the order even though they knew there had been a mistake ( <u>someone had blundered</u> ). The <u>anaphora</u> involving the lines beginning 'their' is representative of some form of <u>chant or recitation</u> , thus adopting the voice of the soldiers – it is not their place to answer back or question, just to 'do and die' (follow orders knowing that they will likely die). The last two lines are repeated (a refrain) to emphasise the main action of the poem – the 600 men charging in.  |
|        | 8    | Rode the six hundred.              |   |
|        | 9    | "Forward, the Light Brigade!"      |   |
|        | 10   | Was there a man dismayed?          |   |
|        | 11   | Not though the soldier knew        |   |
|        | 12   | Someone had blundered.             |   |
| 3      | 13   | Theirs not to make reply,          | The <u>anaphora</u> of cannon creates the sense that the cannons are everywhere – the soldiers are hugely outnumbered and facing enemy fire from all angles. The use of <u>varied verbs</u> (volleyed and thundered) creates the reverberating sound of the cannons firing, whilst the <u>alliterative</u> use of the 's' sound in 'stormed at with shot and shell' reflects the <u>violence</u> of the attack that they face. The adverb 'boldly' reflects their undeterred demeanour, even though the <u>extension of the metaphor</u> (becoming the 'jaws of death') makes this appear more and more like a suicide mission.   |
|        | 14   | Theirs not to reason why,          |   |
|        | 15   | Theirs but to do and die.          |   |
|        | 16   | Into the valley of Death           |   |
|        | 17   | Rode the six hundred.              |   |
|        | 18   | Cannon to right of them,           |   |
| 4      | 19   | Cannon to left of them,            | Sabres are the type of curved sword that these type of cavalymen would have been carrying. Remember that they are charging into gunfire, and yet they themselves are not armed with guns. The <u>repetition</u> of sabre/sabring highlights the deficit that they hold. However, 'flashed' gives the idea of being proud and imperious, even in the face of such danger. Tennyson once more uses <u>alliteration</u> , this time of the 'w' sound in 'all the world wondered.' In this case wondered means they were filled with awe, and the repeated 'wo' sounds reflect the voices of those reading about the story around the world. The Light Brigade is able to break through the enemy line – a big achievement. They are then forced to retreat, but it is clear that some have died. |
|        | 20   | Cannon in front of them            |   |
|        | 21   | Volleyed and thundered;            |   |
|        | 22   | Stormed at with shot and shell,    |   |
|        | 23   | Boldly they rode and well,         |   |
|        | 24   | Into the jaws of Death,            |   |
| 5      | 25   | Into the mouth of hell             | In a near repeat of the beginning of stanza 3, the Light Brigade are surrounded by cannons, however the use of the <u>preposition 'behind'</u> shows us that they have now turned around and are riding back. Note the use of <u>rhyme in this stanza</u> , stressing 'shell', 'fell', 'hell' and 'well.' These four words alone emphasise how horrific and dangerous the battle was, yet how the Light Brigade fought strongly and were prepared to die for their country in the face of it. The 'jaws of death' metaphor had suggested certain death, and yet 'what was left of them' rode back out – thus demonstrating their achievement against the odds. The main difference, as the last line expresses, is there are far fewer of them.   |
|        | 26   | Rode the six hundred.              |   |
|        | 27   | Flashed all their sabres bare,     |   |
|        | 28   | Flashed as they turned in air      |   |
|        | 29   | Sabring the gunners there,         |   |
|        | 30   | Charging an army, while            |   |
| 6      | 31   | All the world wondered.            | In the final paragraph, Tennyson aims to drive home his message of their <u>glory</u> , and cement their places as legends. The use of 'O' and an exclamation mark shows the speaker's sheer astonishment at the bravery of the cavalry's charge. The speaker then uses 'honour' as an <u>imperative verb</u> , to command the reader to remember and respect the noble six hundred.  |
|        | 32   | Plunged in the battery-smoke       |   |
|        | 33   | Right through the line they broke; |   |
|        | 34   | Cossack and Russian                |   |
|        | 35   | Reeled from the sabre stroke       |   |
|        | 36   | Shattered and sundered.            |   |
| 5      | 37   | Then they rode back, but not       | In the final paragraph, Tennyson aims to drive home his message of their <u>glory</u> , and cement their places as legends. The use of 'O' and an exclamation mark shows the speaker's sheer astonishment at the bravery of the cavalry's charge. The speaker then uses 'honour' as an <u>imperative verb</u> , to command the reader to remember and respect the noble six hundred.  |
|        | 38   | Not the six hundred.               |   |
|        | 39   | Cannon to right of them,           |   |
|        | 40   | Cannon to left of them,            |   |
|        | 41   | Cannon behind them                 |   |
|        | 42   | Volleyed and thundered;            |   |
| 6      | 43   | Stormed at with shot and shell,    | In the final paragraph, Tennyson aims to drive home his message of their <u>glory</u> , and cement their places as legends. The use of 'O' and an exclamation mark shows the speaker's sheer astonishment at the bravery of the cavalry's charge. The speaker then uses 'honour' as an <u>imperative verb</u> , to command the reader to remember and respect the noble six hundred.  |
|        | 44   | While horse and hero fell.         |   |
|        | 45   | They that had fought so well       |   |
|        | 46   | Came through the jaws of Death,    |   |
|        | 47   | Back from the mouth of hell,       |   |
|        | 48   | All that was left of them,         |   |
| 6      | 49   | Left of six hundred.               | In the final paragraph, Tennyson aims to drive home his message of their <u>glory</u> , and cement their places as legends. The use of 'O' and an exclamation mark shows the speaker's sheer astonishment at the bravery of the cavalry's charge. The speaker then uses 'honour' as an <u>imperative verb</u> , to command the reader to remember and respect the noble six hundred.  |
|        | 50   | When can their glory fade?         |   |
|        | 51   | O the wild charge they made!       |   |
|        | 52   | All the world wondered.            |   |
|        | 53   | Honour the charge they made!       |   |
|        | 54   | Honour the Light Brigade,          |   |
| 6      | 55   | Noble six hundred!                 |   |

## Poems for Comparison

|                    |  |
|--------------------|--|
| <b>Mametz Wood</b> | <i>Exposure</i> can be compared and contrasted with this poem in relation to the theme of <u>remembrance</u> .                       |
| <b>Exposure</b>    | <i>The Charge of the Light Brigade</i> can be compared and contrasted with this poem in the approach to the <u>futility of war</u> . |

## The Poet's Influences



|  |
|--|
| <b>FROM THE TIMES, OCTOBER 25<sup>th</sup>, 1854:</b> If the exhibition of the most brilliant valour, of the scenes of courage... I shall proceed to describe, to the best of my power, what occurred under my own eye, and to state the facts which I have heard from men whose veracity is unimpeachable, reserving to myself the right of private judgement in making public and in suppressing the details of what occurred on this memorable day – At 00 our Light Cavalry Brigade rushed to the front... The Russians opened on them with guns from the redoubts on the right, with volleys of musketry and rifles. They swept proudly past, glittering in the morning sun in all the pride and splendour of war. We could hardly believe the evidence of our senses. Surely that handful of men were not going to charge an army in position? Alas! it was but too true – their desperate valour knew no bounds, and for indeed was it removed from its so-called better part – discretion. They advanced in two lines, quickening the pace as they closed towards the enemy. |
|--|







# Extract from **The Prelude** KNOWLEDGE ORGANISER



| Context – <i>The Prelude</i> was originally written in 1798, but was frequently rewritten and published in 1850.  |   |   |
|---|---|---|
| <b>William Wordsworth</b> – William Wordsworth (1812-1889) is one of the most famous poets in English Literature. He was born and raised in the Lake District, a beautiful natural area of the UK which clearly influenced the subject matter and themes in his writing. After living in France for a while, returning, and then marrying, Wordsworth was made the Poet Laureate. In 1847, after the death of his daughter, Wordsworth was said to be so upset that he could no longer write poetry. He died in 1850. |  | <b>Romanticism</b> – Romanticism was an artistic, literary, musical, cultural and intellectual movement that originated in Europe in the latter half of the 18 <sup>th</sup> Century. In most areas it peaked in the early 19 <sup>th</sup> Century. Romanticism is characterised by its emphasis on emotions, as well as glorifying nature and past events – memories and settings are often colourfully described. It was partially in response to the scientific rationalisation of nature of the era.   |
| <b>Writing the Prelude</b> – Wordsworth began writing <i>The Prelude</i> in 1798, after experiencing homesickness when in Germany. It is a long autobiographical poem that is written in 14 books. It was not published until shortly after his death, in 1850. The poet uses childhood memories to share his quest for understanding in life. This extract in particular refers to a childhood memory in which he commandeers a boat before realising the magnitude and power of nature around him.                  |  | <b>The Title</b> – The full title of the poem is <i>The Prelude: Growth of a Poet's Mind</i> . The poem endeavours to do exactly as its subtitle implies, with each section roughly corresponding to a section in his poetic development. Wordsworth himself likened <i>The Prelude</i> to a Gothic cathedral, explaining (in another of his texts, <i>The Excursion</i> ) that the poem was like 'an antechapel through which the reader might pass' in order to gain access to the main body of his work. |

| Language/Structural Devices   |   |
|---|---|
| <b>Imagery</b> – Wordsworth uses vivid imagery to create the night-time atmosphere throughout the opening of the extract, using vocabulary associated with peace to describe the tranquil natural phenomena. For example, words such as 'stealth', 'idly', and 'glittering' paint a quiet, peaceful scene in the mind of the reader. This is at odds with the sinister, almost gothic-like imagery that is created in the second half of the poem through vocabulary such as 'grave', 'black' and 'grim.' | <b>Personification</b> – In order to demonstrate the sheer power of nature throughout the poem, Wordsworth chooses to personify several aspects of nature at different points in the extract. For example, it is initially inferred that nature itself (she) guided him to take the boat that evening. Later on in the poem, the mountain peak that so terrifies the speaker is heavily personified, for e.g. through the terms 'voluntary power instinct' and 'upreared its head' – giving it purpose. |
| <b>Quote:</b> "Small circles glittering idly in the moon/<br>Until they melted all into one track."   | <b>Quote:</b> "As if with voluntary power instinct,<br>Upreared its head. I struck and struck again."   |
| <b>Alliteration</b> – The repetition of particular sounds is used effectively by Wordsworth to evoke both tone and atmosphere at different points in the poem. For example, the frequent use of soft 'l' and 'm' sounds at the beginning of the poem (leaving, glittering, light, like) create a feeling of tranquility and peacefulness. This is in contrast to the ominous 'd' sound (days, dim, darkness) that dominates later.  | <b>Similes/Metaphors</b> – Wordsworth also uses a number of figurative language techniques to paint a precise image in the mind of the reader, which alters as the tone of the poem changes. For example, the boat is initially described as being like a graceful 'swan', as the speaker is content and peaceful. Later, when feeling far more vulnerable, the speaker describes their vessel as simply being 'bark.'  |
| <b>Quote:</b> "That spectacle, for many days, my brain<br>Worked with a dim and undetermined sense"   | <b>Quote:</b> "And, as I rose upon the stroke, my boat<br>Went heaving through the water like a swan;"  |
| <b>Structure</b> – There are no stanzas throughout the extract, yet Wordsworth opts to use lots of punctuation to clarify meanings and enable the reader to separate ideas. The extract is like a complete story in itself, in that it starts with 'one summer evening' and ends with the effect of the action 'trouble to my dreams.' The repeated use of 'and' throughout the poem gives it a spoken feel, like someone telling a story.  | <b>Oxymoron</b> – An oxymoron is used in line six as the speaker states 'it was an act of stealth, and troubled pleasure.' Pleasure is usually something to be enjoyed, whilst someone that is 'troubled' is tormented to the degree that they cannot take pleasure from something. Whilst the boy does take pleasure from taking the boat, it is implied that he cannot enjoy it fully, for some kind of underlying fear.  |
| <b>Quote:</b> "Like living men, moved slowly through the mind<br>By day, and were a trouble to my dreams"   | <b>Quote:</b> "Pushed from the shore. It was an act of stealth<br>And troubled pleasure, nor without the voice"   |

| Themes – A theme is an idea or message that runs throughout a text.  |   |
|--|---|
| <b>Nature</b> – As the speaker realises in this extract from <i>The Prelude</i> , humanity is only one part of nature. The natural world can make man feel extremely small and insignificant. The speaker feels power after taking the boat and directing it as he pleases, but is soon levelled by the power of nature (in the form of a large mountain).       |  |
| <b>Loneliness</b> – Throughout large sections of <i>The Prelude</i> , Wordsworth is often on his own, and he makes it clear that this is important to him. He is able to think more clearly when he is alone, and is more affected by experiences and places. In this sense, a more spiritual and mystical atmosphere is created through the idea of loneliness. |  |

| Line-by-Line Analysis |      |   |  |
|-----------------------|------|---|--|
| STANZA                | LINE | POEM  | ANALYSIS   |
| 1                     | 1    | One summer evening (led by her) I found           | <b>Lines 1-10</b> – Wordsworth immediately personifies nature as her – stating that nature itself was guiding him. The little boat seems to symbolise a vessel for the emotional, spiritual journey that he is on. As he 'unlooses' the boat, he is setting his imagination free. The speaker then opens themselves to all that nature has to offer, with Wordsworth using vivid imagery to describe its wonders. There is alliteration of soft 'l' and 'm' sounds, reflecting the serenity. The oxymoron 'troubled pleasure' suggests conflicted emotions – nature shows pure beauty but also power.                              |
|                       | 2    | A little boat tied to a willow tree               |  |
|                       | 3    | Within a rocky cove, its usual home.              |  |
|                       | 4    | Straight I unloosed her chain, and stepping in    |  |
|                       | 5    | Pushed from the shore. It was an act of stealth   |  |
|                       | 6    | And troubled pleasure, nor without the voice      |  |
|                       | 7    | Of mountain-echoes did my boat move on;           |  |
|                       | 8    | Leaving behind her still, on either side,         |  |
|                       | 9    | Small circles glittering idly in the moon,        |  |
|                       | 10   | Until they melted all into one track              |  |
|                       | 11   | Of sparkling light. But now, like one who rows,   | <b>Lines 11-20</b> – The speaker at this point is sure of his destination – the words 'chosen', 'fixed', and 'unswerving' demonstrate this sense of purpose and direction, whilst the 'horizon' represents the ultimate destination as a poet. The mention of the stars, with all their celestial beauty, and the use of the adjective 'elfin', however, point towards something more powerful and mystical. The simile comparing the boat to a swan signifies the beauty and elegance with which it moves through the water. This is a tranquil and beautiful image of nature.  |
|                       | 12   | Proud of his skill, to reach a chosen point       |  |
|                       | 13   | With an unswerving line, I fixed my view          |  |
|                       | 14   | Upon the summit of a craggy ridge,                |  |
|                       | 15   | The horizon's utmost boundary; far above          |  |
|                       | 16   | Was nothing but the stars and the grey sky.       |  |
|                       | 17   | She was an elfin pinnacle; lustily                |  |
|                       | 18   | I dipped my oars into the silent lake,            |  |
|                       | 19   | And, as I rose upon the stroke, my boat           |  |
|                       | 20   | Went heaving through the water like a swan;       |  |
|                       | 21   | When, from behind that craggy steep till then     | <b>Lines 21-28</b> – There is a drastic shift in tone, when the speaker encounters a beast of nature that he can only describe as 'black' and 'huge.' There is repetition of the word 'huge' to emphasise its size, but also to mimic the boy's stumbling fear. The peak is heavily personified, for example the suggestion that it has a 'purpose', as if it is bringing some kind of message or intent towards him and that it 'upreared its head' and was 'growing.' The separation it creates between him and the stars represents the idea that nature is standing between him and the divine – it appears stronger than him. |
|                       | 22   | The horizon's bound, a huge peak, black and huge, |  |
|                       | 23   | As if with voluntary power instinct,              |  |
|                       | 24   | Upreared its head. I struck and struck again,     |  |
|                       | 25   | And growing still in stature the grim shape       |  |
|                       | 26   | Towered up between me and the stars, and still,   |  |
|                       | 27   | For so it seemed, with purpose of its own         |  |
|                       | 28   | And measured motion like a living thing,          |  |
|                       | 29   | Strode after me. With trembling oars I turned,    |  |
|                       | 30   | And through the silent water stole my way         | <b>Lines 29-37</b> – The speaker turns back for the willow tree with 'trembling oars', demonstrating his pure anxiety. The boat is now described as 'bark', which makes it seem more fragile than before – a perception influenced by the speaker's fear. At the beginning of the poem man is painted as being at one with nature, but it seems as though here he has realised that nature also has a great many dangers, and should be feared. The vocabulary used e.g. 'dim' and 'grove' give a sense of foreboding.   |
|                       | 31   | Back to the covert of the willow tree;            |  |
|                       | 32   | There in her mooring-place I left my bark, -      |  |
|                       | 33   | And through the meadows homeward went, in grave   |  |
|                       | 34   | And serious mood; but after I had seen            |  |
|                       | 35   | That spectacle, for many days, my brain           |  |
|                       | 36   | Worked with a dim and undetermined sense          |  |
|                       | 37   | Of unknown modes of being: o'er my thoughts       |  |
|                       | 38   | There hung a darkness, call it solitude           | <b>Lines 38-44</b> – The final lines reveal the lasting effect that this experience has had on the speaker. What had used to be 'familiar' and 'pleasant' was now 'darkness' and 'solitude', as he realised that he could not control nature, and that the world around him was more dangerous than he had known. The use of the terms 'huge' and 'mighty' show that he now saw nature as a greater power; 'do not live' gives the impression that these powers are immortal. The speaker's mindset was forever altered.   |
|                       | 39   | Or blank desertion. No familiar shapes            |  |
|                       | 40   | Remained, no pleasant images of trees,            |  |
|                       | 41   | Of sea or sky, no colours of green fields;        |  |
|                       | 42   | But huge and mighty forms, that do not live       |  |
|                       | 43   | Like living men, moved slowly through the mind    |  |
|                       | 44   | By day, and were a trouble to my dreams           |  |

| Poems for Comparison             |  | Influences on the Poet   |
|----------------------------------|--|--|
| <b>Exposure</b>                  | <i>The Prelude</i> can be compared and contrasted with this poem through its presentation of nature.       | Many of Wordsworth's poems were influenced by his sister Dorothy, whose journal he liked to read. For example: "When we were in the woods beyond Gowbarrow Park we saw a few daffodils close to the waterside. We fancied that the lake had floated the seeds ashore, and that the little colony had so sprung up. But as we went along there were more and yet more; and at last under the boughs of the trees, we saw that there was a long belt of them along the shore, about the breadth of a country turnpike road. These beautiful descriptions of the natural surroundings were imitated in sections of Wordsworth's poems, for example 'I Wandered Lonely as a Cloud' and 'The Prelude.'" |
| <b>Poppies/ War Photographer</b> | <i>The Prelude</i> can be compared and contrasted with these poems through its presentation of loneliness. |  |





# THE ÉMIGRÉE

## KNOWLEDGE ORGANISER



**Context** – *The Émigrée* was written by Carol Rumens and was first published in *Thinking of Skins* in 1993.

**Carol Rumens** – Carol Rumens (born 1944) is a British poet, who was born and brought up in the culturally-diverse south of London. She has taught at numerous universities as a lecturer, and has also used her fluent understanding of Russian to translate many Russian poems. Critics have described her as 'having a fascination with elsewhere', which is clear in *The Émigrée*, a poem in which the speaker feels permanently 'elsewhere.'



**Thinking of Skins** – *Thinking of Skins* is the anthology in which *The Émigrée* appears. In this, one of her most popular poetry collections, Rumens confronts both personal and political issues in her engagement with other lives. The poems in this collection are often set against the backdrop of Eastern Europe and Russia, and Rumens adopts a wide variety of voices in exploring themes such as suffering, persecution, love, separation, death and displacement.



**Emigration** – Emigration is the act of leaving one's country in order to settle permanently in another. Someone who emigrates is often known as an emigrant, however in this poem Rumens employs the feminine form of the word – Emigrée – to provide a voice to a female speaker. Emigrants may leave their home country for many reasons, including to escape war, tyranny, poverty, or simply to seek a better life abroad.



**Emigration to the United Kingdom** – Throughout the time of Rumens' upbringing, the population of the UK was undergoing major changes as a result of widespread immigration. In the early 1990s, (when the poem was written), immigration was overtaking 'homegrown' population increases for the first time. In multicultural south London, Rumens will have doubtlessly encountered many emigrants experiencing life in a new country.



### Language/Structural Devices

**Metaphor** – Rumens employs a number of different metaphors across the poem, normally with the intent of creating visual imagery of the speaker's homeland. For example, the tyrant's regime in the homeland is referred to as a 'sickness' – this suggests that the city's current state is not its true nature, and the speaker patiently waits for it to return to health. Another example is the 'bright, filled paperweight' – a metaphor for the positive memory she holds of her city.

**Personification** – Rumens uses personification across the poem in order to emphasise the attributes of different places and concepts. The city itself is personified – flying to the speaker in 'its own white plane' and acting 'docile.' The speaker also suggests that the city takes her 'dancing through the city/ of walls.' These examples of personification add to the positive image of the city – we understand the buzz the speaker feels when reflecting on her home city.

**Quote:** "my original view, the bright, filled paperweight. It may be at war, it may be sick with tyrants,"

**Quote:** "but my city comes to me in its own white plane... I comb its hair and love its shining eyes."

**Similes** – A number of similes are utilised to add to the visual imagery of the poem. In stanza 1, Rumens creates an image of waves rising and falling between the speaker and her city, emphasising the position of isolation (an ocean between them). Later in stanza 3, the city is compared to paper, for being 'docile.' This suggests that the city feels within her control, and conforms to her beliefs and desires.

**Interesting Verbs and Adjectives** – Rumens' vocabulary choices are used to enhance meanings within the poem. For example, the use of the interesting verb 'branded' helps to show that the reader will always remember the city, but also evokes ideas of pain regarding the separation. Furthermore, the use of the adjectives 'white' and 'graceful' help to create a heavenly image of the speaker's city.

**Quote:** "...and the frontiers rise between us, close like waves... It lies down in front of me, docile as paper."

**Quote:** "but I am branded by an impression of sunlight. The white streets of that city, the graceful slopes"

**Form/Meter** – The poem consists of three stanzas. The opening two stanzas are 8 lines long and the third is 9 lines long. It has been suggested that the extra line at the end reflects the poet's unwillingness to let go. The poem does not use a regular rhythm or rhyme scheme, which perhaps reflects the feeling disrupted life of the émigrée. The line at the end of each stanza ends with the words 'of sunlight' (a refrain).

**Structure** – The poem is presented as a first person account by an émigrée. The first stanza introduces the speaker's thoughts about her homeland, the second adds more depth about forces keeping her from home, and the third deals with the discontent she feels in her new home. As the homeland is not named, the poem seems to be offering a more general consideration of the emotional implications of emigration.

**Quote:** "My city hides behind me. They mutter death, and my shadow falls as evidence of sunlight."

**Quote:** "There once was a country... I left it as a child but my memory of it is sunlight-clear"

**Themes** – A theme is an idea or message that runs throughout a text.

**Identity** – The speaker struggles to find her identity in her new city, which contrasts heavily with her home city. This is evident through her repetition of 'they', (the 'others' in her new city) who she perceives as being in some way sinister and unwelcoming. Words such as 'walls', and 'mutter' shows the distrust between them.



**Exile and Isolation** – The speaker is an exile from an unknown city – a place that she clearly still considers as her emotional and spiritual home. She frequently compares her home to the 'sunlight.' In contrast, she considers her new home, which others see as 'safe', as a 'dark' place. It is evident that she feels exceptionally isolated in her new city.



### Line-by-Line Analysis

| STANZA | LINE | POEM   | ANALYSIS  |
|--------|------|--|---|
| 1      | 1    | There once was a country... I left it as a child         | In the opening stanza, the speaker views her home through rose-tinted spectacles, using <u>weather imagery</u> . The first line is written like the opening to a story, but suggests loss. Memories of childhood are often hazy, but the speaker's memories are <u>happy</u> and <u>bright</u> ('sunlight clear'). 'November' implies that things were getting <u>colder, darker</u> and <u>gloomier</u> – suggests a dark point in the country's history. The 'paperweight' <u>metaphor</u> helps the reader to see that no matter what bad things she hears about her country, it will always be <u>positive</u> in her <u>mind</u> . The suggestion that the country is 'sick' with <u>tyrants</u> makes the reader think that the country is at no fault, it is stricken by plague, but the use of 'branded' in the final line of the stanza shows that the speaker's <u>positive</u> view of country is <u>permanent</u> .   |
|        | 2    | but my memory of it is sunlight-clear                    |   |
|        | 3    | for it seems I never saw it in that November             |   |
|        | 4    | which, I am told, comes to the mildest city.             |   |
|        | 5    | The worst news I receive of it cannot break              |   |
|        | 6    | my original view, the bright, filled paperweight.        |   |
|        | 7    | It may be at war, it may be sick with tyrants,           |   |
|        | 8    | but I am branded by an impression of sunlight.           |   |
| 2      | 9    | The white streets of that city, the graceful slopes      | The speaker fondly remembers her home city, in <u>direct defiance</u> to the erosive effects that <u>time and oppression</u> have on its memory. The use of the adjectives 'white' and 'graceful' in the opening line make the home city seem <u>heavenly</u> . Time is personified as an enemy in war, as it 'rolls its tanks' and creates a <u>separation</u> between the speaker and her homeland. In the second half of the poem, the speaker seems to express that she wishes to speak in her <u>native language</u> , but has been in some way prevented from doing so – 'banned by the state.' Holding this language and being unable to use it makes the speaker feel 'like a hollow doll' (a simile). But she can't forget the language that she used to speak; the inclusion of another sense ( <u>taste</u> ) adds to the <u>vividness</u> of the imagery.   |
|        | 10   | glow even clearer as time rolls its tanks                |   |
|        | 11   | and the frontiers rise between us, close like waves.     |   |
|        | 12   | That child's vocabulary I carried here                   |   |
|        | 13   | like a hollow doll, opens and spills a grammar.          |   |
|        | 14   | Soon I shall have every coloured molecule of it.         |   |
|        | 15   | It may by now be a lie, banned by the state              |   |
|        | 16   | but I can't get it off my tongue. It tastes of sunlight. |   |
| 3      | 17   | I have no passport, there's no way back at all           | The speaker opens the third stanza with a statement that makes the situation seem desperate and hopeless, and yet the second line revives the mood – the city is personified, and the speaker's memory is compared (through a metaphor) to a white plane that brings visions of it rushing back to her. The similes 'docile as paper' suggests that the memories yield to her every desire, rather like a blank sheet of paper does to an artist – what it becomes is within her control. There is a childlike joy in how the speaker treats the memories – rather like nurturing a cherished pet (line 20). The speaker then reveals contrasting perceptions of the city that she is in now – those around her see it as a 'free city' but she sees it as restrictive (city of walls). The darkness in the new city contrasts with the brightness she feels from her own city. Repetition of 'they' makes these unknown 'others' appear menacing and unwelcoming. She feels the need to defend her old city, as to her it is still 'sunlight.' |
|        | 18   | but my city comes to me in its own white plane.          |   |
|        | 19   | It lies down in front of me, docile as paper;            |   |
|        | 20   | I comb its hair and love its shining eyes.               |   |
|        | 21   | My city takes me dancing through the city                |   |
|        | 22   | of walls. They accuse me of absence, they circle me.     |   |
|        | 23   | They accuse me of being dark in their free city.         |   |
|        | 24   | My city hides behind me. They mutter death,              |   |
|        | 25   | and my shadow falls as evidence of sunlight.             |   |

### Poems for Comparison

|                                      |  |  |
|--------------------------------------|--|--|
| <b>The Prelude/ Kamilhaze</b>        | <i>The Émigrée</i> can be compared and contrasted with these poems in its approach to the theme of <u>identity</u> .               | <i>"I think in my social attitudes I am a fighter. I don't want to write polemic: I don't want to write about what I haven't experienced for myself. So the material available is limited, and the tone must remain true to my voice. But I am angry about many things, and deeply disappointed with the human race. We are incapable of learning from history. I have very little hope for the future. I have begun exploring this in my latest poems."</i> Page 13 |
| <b>Exposure/ Storm on the Island</b> | <i>The Émigrée</i> can be compared and contrasted with this poem in the approach to the themes of the <u>Exile and Isolation</u> . |  |







# TISSUE KNOWLEDGE ORGANISER



**Context** – *Tissue* was published in Imtiaz Dharker's *The Terrorist at my Table* collection in 2006.

**Imtiaz Dharker** – Imtiaz Dharker (born 1954) is a contemporary poet who was born in Pakistan and raised in Scotland. She has won the Queen's Gold Medal for her poetry. In her five poetry collections to date, she often deals with the search for meaning and identity, and the position of women and multiculturalism in contemporary society. Some of the other themes that she has covered include home, freedom, journeys, communal conflict and politics.



**Tissue** – The poem explores the power and fragility of tissue. Tissue can mean two things – 1. A very thin type of paper – There are a number of references to the real life uses that we have for paper, for example in maps, architects drawings, and receipts. Whilst paper is considered as an incredibly important resource in the poem, its fragility is also considered: 'tissue' can easily erode, become damaged. 2. Human tissue – our make-up, our skin. In this way, tissue is used as an extended metaphor for life.



**The Qur'an** – The Qur'an is the central religious text of Islam, which Muslims believe to be a direct disclosure of truth from God (Allah). Muslims believe that the Qur'an was verbally communicated by Allah to the prophet Muhammad through the angel Gabriel, slowly over 23 years. Muslims regard the book as the ultimate miracle of Muhammad. The Qur'an describes itself as a book of guidance for mankind. In many Islamic cultures, it forms the basis for the law.



**Impressionistic Poetry** – Impressionistic poetry relates to poems or aspects of poems that do not have a secure, single interpretation. Poets may make their meaning deliberately ambiguous to generate further discussion and thought about regarding potential meanings – thus drawing on the reader's own impressions and ideas to create meaning. Aspects of *Tissue* may be described as 'impressionistic.' As literature students, we should relate meaning to the stated topic (e.g. power and conflict).



## Language/Structural Devices

**Extended Metaphor**  
Dharker uses an extended metaphor throughout the poem, in comparing the life of mankind to tissue/ paper – both fragile and powerful at the same time. The physical frailties of paper are exposed in numerous places across the poem by Dharker, who expresses that it can 'fall away on a sigh/ a shift in the direction of the wind.' This is much the same as human life/ mankind, which can be easily eradicated by forces of nature. Paper, like human tissue, thins with 'age or touching', and can be altered by interactions (e.g. when it is 'smoothed', 'stroked'.) However, the power of mankind is also explained, mainly through the practical uses of paper stated in the poem (for example maps, receipts, the Qur'an) which are each related to important areas of life (travel, finances, religion). Dharker maintains despite more permanent 'capitals and monoliths' being built, the grand design of nature lay in our tissue – what we achieve in our lives 'never meant to last.'

**Alliteration/Sibilance/Repetition** – A number of sounds and words are repeated. For example, in stanza 5 there is repetition of the 'm' sound (maps, marks, make, mountain) making the whole stanza a mouthful – this mirrors the complexity of life being described through the metaphor with maps. Furthermore, words, such as 'transparent' are repeated – emphasising their importance to Dharker's message (transparent can mean 'see through' but also 'honest').

**Quote:** "that rivers make, roads, railtracks, mountainfolds,"

**Similes** – Dharker uses a simile to compare our lives to paper kites. As this immediately follows details relating to how we use paper for transactions/ money, the most commonplace interpretation is that money can give us what feels like freedom (flying) but that we are still tied down by it (kite strings). Another interpretation is that our lives are at the mercy of greater forces, such as nature or the weather.

**Quote:** "and never wish to build again with brick or block, but let the daylight break"

**Quote:** "and what was paid by credit card might fly our lives like paper kites."

**Structure** – *Tissue* is constructed of largely unrhymed, quatrains, which reflects the irregularity of life and the flimsy nature of tissue paper. However, the quatrains themselves are fairly regular, perhaps representing the control of man. The final stanza is only one line long, which naturally draws the reader's attention to the main idea of the poem: that the tissue represents humankind.

**Enjambment** – Dharker uses enjambment across the poem in order for multiple purposes. Primarily, enjambment in the poem undermines the controlled order of the poem – this reflects the message: mankind's power is undermined by its fragility. Enjambment also leaves lines hanging on words and their meanings. For example, in the opening line, the reader is forced to consider the dual meaning of the word 'light.'

**Quote:** "turned into your skin."

**Quote:** "Paper that lets the light/ shine through, this/ is what could alter things."

**Themes** – A theme is an idea or message that runs throughout a text.

**The Power of Mankind** – Dharker makes references throughout the poem to the power of mankind through the extended metaphor with paper. The reader is shown that human life has the ability to 'let the light shine through', 'alter things', and 'trace a grand design.' Mankind is challenged to outlast even seemingly more permanent structures such as buildings.



**The Fragility of Mankind** – Throughout the poem, Dharker also expresses the fragility of life and mankind in general. Through the extended metaphor comparing life to 'tissue' (a particularly thin and flimsy type of paper), Dharker shows that mankind is weak and vulnerable in relation to nature and time.



## Line-by-Line Analysis

| STANZA | LINE | POEM                                     | ANALYSIS  |
|--------|------|--|---|
| 1-2    | 1    | Paper that lets the light                | <b>Stanza 1</b> – The extended metaphor between paper and life begins. The light shining through may represent the influence of God, for light is often used as a symbol of truth or representation of the divine. The poet suggests that this is what can make a positive difference ('could alter things'). As we age, skin becomes thinner, but we also gain wisdom.<br><b>Stanza 2</b> – The speaker continues the metaphor by suggesting that life, like the thinly worn pages of books, can be touched by others. The poem then begins to question whether we can outlive the paper records that we create.   |
|        | 2    | shine through, this                      |   |
|        | 3    | is what could alter things.              |   |
|        | 4    | Paper thinned by age or touching,        |   |
|        | 5    | the kind you find in well-used books,    |   |
|        | 6    | the back of the Koran, where a hand      |   |
|        | 7    | has written in the names and histories,  |   |
|        | 8    | who was born to whom,                    |   |
| 3-4    | 9    | the height and weight, who               | <b>Stanza 3</b> – Reference is given to birth and death certificates, important moments in life that we formalise with paper. The extended metaphor is used again in 'smoothed', 'stroked', to show how lives are impacted by interactions with others – emotionally, physically and socially. This also exposes the fragility of human life; how it can be impacted by others.<br><b>Stanza 4</b> – The speaker then transgresses to a more speculative tone, considering what it would be like if buildings were made of paper – how they would quickly 'shift' and 'drift' – the question is raised in the mind of the reader whether human impact will outlive buildings.   |
|        | 10   | died where and how, on which sepia date, |   |
|        | 11   | pages smoothed and stroked and turned    |   |
|        | 12   | transparent with attention.              |   |
|        | 13   | If buildings were paper, I might         |   |
|        | 14   | feel their drift, see how easily         |   |
|        | 15   | they fall away on a sigh, a shift        |   |
|        | 16   | in the direction of the wind.            |   |
| 5-6    | 17   | Maps too. The sun shines through         | <b>Stanza 5</b> – The speaker gives a further example of a use of paper in everyday life – in the recording of maps. The extended metaphor persists here through the consideration of marks on the map (river, roads, etc.) and human marks (veins, scars, etc.) Sibilance of 's' helps to highlight the happier times in life. Maps are presented as delicate – subject to change depending upon the political conflicts and wars – just as the human skin can be impacted in life.<br><b>Stanza 6</b> – Another use for paper is receipts – this stanza demonstrates how our lives are ruled by money. Whilst money may make us feel free, the kite simile emphasises how it keeps us tied down – not actual freedom. |
|        | 18   | their borderlines, the marks             |   |
|        | 19   | that rivers make, roads,                 |   |
|        | 20   | railtracks, mountainfolds,               |   |
|        | 21   | Fine slips from grocery shops            |   |
|        | 22   | that say how much was sold               |   |
|        | 23   | and what was paid by credit card         |   |
|        | 24   | might fly our lives like paper kites.    |   |
| 7-8    | 25   | An architect could use all this,         | <b>Stanza 7</b> – Another reference to practical uses of paper is provided in designs/architects drawings. The speaker expresses through this how paper has the potential to be more powerful than brick (links with creativity and ingenuity) and people's lives can be more powerful too.<br><b>Stanza 8</b> – The human construction is considered against the brick buildings. It is presented as a far more wonderful structure. Again the speaker returns to the religious idea of light shining through – 'grand design' suggesting that the perfect image of God is found in the living tissue of man.  |
|        | 26   | place layer over layer, luminous         |   |
|        | 27   | script over numbers over line,           |   |
|        | 28   | and never wish to build again with brick |   |
|        | 29   | or block, but let the daylight break     |   |
|        | 30   | through capitals and monoliths,          |   |
|        | 31   | through the shapes that pride can make,  |   |
|        | 32   | find a way to trace a grand design       |   |
| 9-10   | 33   | with living tissue, raise a structure    | <b>Stanza 9</b> – Human life is deemed to be far more fleeting than buildings of brick, which shows the fragility of mankind. Yet, it is also suggested that it has the potential to be far more powerful. The speaker once more shares that, like paper, lives are affected by those who touch them.<br><b>Stanza 10</b> – The personal pronoun 'your' addresses the readers directly. The line is set alone to emphasise the message. Whilst lives can be mapped out by tissue (paper) we should be encouraged to make something far more powerful (but less lasting) with our human tissue/ lives.   |
|        | 34   | never meant to last,                     |   |
|        | 35   | or paper smoothed and stroked            |   |
|        | 36   | and thinned to be transparent,           |   |
|        | 37   | turned into your skin.                   |   |

## Poems for Comparison

| Poems for Comparison                     | Influences on the Poet  |
|--|---|
| <b>London/ My Last Duchess</b>           | <i>Tissue</i> can be compared and contrasted with these poems through its presentation of the power of mankind.     |
| <b>Ozymandias/ The Prelude (Extract)</b> | <i>Tissue</i> can be compared and contrasted with these poems through its presentation of the fragility of mankind. |

"As a child, I wasn't exposed to much poetry. Of course, I knew Keats and others but there was no connection in my life. Gerard Manley Hopkins, as I said, was the first one to really connect with me. Now, I can't choose a favourite poet or poem. It changes every day – anything that knocks me out. It could be new poets like John Agard or Caroline Bird; Carol Ann Duffy's 'Prayer' is one – anything that's fresh and alive. In Elizabeth Bishop's 'One Art' – although I don't usually like very structured forms – she uses the villanelle form (repeating the first and third lines) to convey loss so well. Interview with Young Poets Network at [www.poetrypodcast.org.uk](http://www.poetrypodcast.org.uk)







# War Photographer KNOWLEDGE ORGANISER

**Context** – War Photographer was written by Carol Ann Duffy, and was published in 1985.

**Carol Ann Duffy** – Carol Ann Duffy (1955–present) is a Scottish author and poet. She is Professor of Poetry at Manchester Metropolitan University, and has been the Poet Laureate since 2009. She is the first woman, Scot, and LGBT poet to hold the position. Duffy wrote the poem due to her friendship with a war photographer. She was intrigued with a particular challenge that war photographers faced – recording horrific events without being able to do anything to help the subjects.



**War Photographers** – War photography involves photographing armed conflict and the effect of this on people and places. War photographers often have to place themselves in harms way, and are sometimes injured or killed themselves attempting to capture the required images/ getting images out of the war arena. Photojournalistic tradition (and other factors, e.g. differing cultures, etc.) suggests that war photographers should not influence what is being captured.



**Conflicts mentioned in the Poem** – 'Belfast' seemingly refers to 'The Troubles' in Northern Ireland in the late 20<sup>th</sup> Century, in which more than 3,500 people were killed. 'Beirut' may be referring to the Siege of Beirut, which resulted from a breakdown of cease-fire in the 1982 Lebanon War. 'Phnom Penh' refers to the Cambodian capital, which was heavily affected in the Cambodian genocide between 1975 and 1979, which killed approximately 1.3 to 3 million Cambodians.



**Dangers for War Photographers** – In the modern day, journalists and war photographers are protected by the international conventions of armed warfare, yet are still often considered targets by opposing groups. Sometimes this is the case in order for a group to show their hatred of the other, whilst in other cases photographers are targeted to prevent the facts from being widely shared. For example, in the Iraqi War between 2003 and 2009, 36 photographers were abducted or killed.



## Language/Structural Devices

**Religious Analogy** – Duffy creates an analogy between the photographer developing his images and a priest conducting a sermon – fuelling the analogy with a number of vocabulary choices related to the semantic field of religion – e.g. 'ordered rows', 'mass', 'priest', 'church', 'red light' and 'ghost'. The analogy is apt as both the war photographer and the priest have to deal with death and suffering on a frequent basis, and in a sensitive manner. Furthermore, the church and the darkroom both function as a 'sanctuary.'

**Varied Verbs** – Varied verbs are used to support Duffy's understated imagery throughout the poem. These verbs inform the reader of the manner in which actions take place. Whilst Duffy does not directly describe the victims of war, the use of varied verbs to describe the subjects' actions (and the actions of those close to them) influences the reader towards forming their own images. Some key examples of this are the 'running' children, the 'twist' of the half-formed ghost and the 'cries' of the man's wife.

**Quote:** "as though this were a church and he a priest preparing to intone a Mass."

**Quote:** "A stranger's features faintly start to twist before his eyes."

**Double Meanings and Metaphors** – Duffy uses a number of words and phrases that contain both surface level and deeper level meanings. This helps to show the pain buried beneath the surface of the war photographer's consciousness. An example is the 'ordered rows' to describe the spools – on a deeper level this gives the reader an image of the rows of coffins of dead soldiers being lined up neatly.

**Alliteration and Sibilance** – Duffy uses these techniques to recreate the horrific sounds of war, creating an undertone of violence even in the calmer moments of the poem. For example, the alliteration of the harsh 'B' sound in 'Belfast, Beirut', in addition to the repeated 'S' sound through 'spools', 'suffering', and 'set' in line 2 serve to emphasise the intensity and the pain of war.

**Quote:** "with spools of suffering set out in ordered rows."

**Quote:** "Belfast, Beirut, Phnom Penh. All flesh is grass."

**Form/Structure** – The poem has a consistent, regular form throughout. There are 4 stanzas, each containing 6 lines of similar length. There is also a consistent rhyme scheme (ABBCDD) in each stanza. This regular structure represents the war photographer's attempts to find some sense of order in amongst the chaos of war – e.g. ordering the photos.

**Pronouns** – Third person pronouns are used throughout the poem to describe the war photographer, for example 'he,' and 'his.' 'He' is not named. This is representative of the fact that the war photographer must hold a certain detachment from his work. The use of 'they' to describe the people of Rural England, shows how distant he feels from them.

**Quote:** "From the aeroplane he stares impassively at where he earns his living and they do not care."

**Quote:** "He has a job to do. Solutions slop in trays beneath his hands."

**Themes** – A theme is an idea or message that runs throughout a text.

**Remembering Victims** – The war photographer feels increasingly separated from those in his home country, who are indifferent to the pain and suffering of the subjects that his images present. Unlike them, he has the suffering of the victims etched into his memory. To those reading from afar, the victims become mere statistics.



**The Horror of War** – Duffy's skillful imagery helps to depict the terrible pain and suffering of those in conflict. Unlike the graphic images that we are considered to have become desensitised to, Duffy often leaves the reader of the poem to create their own images of horror – for example with the dying man, the only clues that the reader is given are the 'twisted' features and the 'cries' of his wife.



## Line-by-Line Analysis

| STANZA | LINE | POEM   | ANALYSIS   |
|--------|------|--|--|
| 1      | 1    | In his dark room he is finally alone                 | The poem opens in the photographer's darkroom, which is a quiet and sombre place. The opening stanza is filled with religious imagery (e.g. 'as though this were a church', 'priest', 'mass', 'ordered rows'). The religious imagery demonstrates how, like a priest, the photographer too often deals with death and suffering. The reader is given the impression that the darkroom is a sanctuary for the photographer – just as the church is for a religious person. It is clear that the photographs are of horrific events (the cities mentioned are associated with atrocities) and the line 'all flesh is grass' emphasises the fragility of human life.  |
|        | 2    | with spools of suffering set out in ordered rows.    |  |
|        | 3    | The only light is red and softly glows,              |  |
|        | 4    | as though this were a church and he                  |  |
|        | 5    | a priest preparing to intone a Mass.                 |  |
|        | 6    | Belfast. Beirut. Phnom Penh. All flesh is grass.     |  |
| 2      | 7    | He has a job to do. Solutions slop in trays          | The opening line 'he has a job to do' is suggestive of the idea that revisiting these images is something that he is forced to face for work, rather than doing so for pleasure. 'Solutions slop in trays' takes on a double meaning – not only the onomatopoeia of the chemicals being used, but also the hope that these photographs may aid the resolution of the conflicts that they depict. 'Did not tremble then' suggests that the photographer is forced to distance himself from the subject of his photographs whilst working – he can let his guard down only when he has returned to 'Rural England.' The remainder of the stanza is devoted to juxtaposing the 'pain' felt in Rural England and in warzones. It is implied that pain in the former can often be appeased by sunny weather, and yet in the latter children have the danger of landmines when they play. 'Running children in nightmare heat' evokes memories of notorious war photos from the Vietnam War of children running with napalm burns. |
|        | 8    | beneath his hands, which did not tremble then        |  |
|        | 9    | though seem to now. Rural England. Home again        |  |
|        | 10   | to ordinary pain which simple weather can dispel,    |  |
|        | 11   | to fields which don't explode beneath the feet       |  |
|        | 12   | of running children in a nightmare heat.             |  |
| 3      | 13   | Something is happening. A stranger's features        | The opening line of the stanza creates drama and suspense – the photographer is no longer in control of the photograph developing. The use of the interesting verb 'twist' give the reader an image of pain and suffering, whilst the idea of a 'half formed ghost' once again creates a dual meaning – on one level the photograph is only half formed and so still faint, and another it implies that the subject of the photograph was somebody who was dying. The photographer remembers how the wife was crying, and although he could not speak the same language of her, sought approval through looks. The analogy with a priest is once again utilised here, as the photographer is forced to deal with people and their families sensitively in their dying moments. The interesting verb 'stained' suggests that the blood has formed a mark that will be difficult to remove, both physically from the ground and psychologically from his memory.   |
|        | 14   | faintly start to twist before his eyes,              |  |
|        | 15   | a half-formed ghost. He remembers the cries          |  |
|        | 16   | of this man's wife, how he sought approval           |  |
|        | 17   | without words to do what someone must                |  |
|        | 18   | and how the blood stained into foreign dust.         |  |
| 4      | 19   | A hundred agonies in black and white                 | The 'hundred agonies' that the photographer has witnessed contrasts with the 'five or six' that the editor will pick out – demonstrating that the suffering of war dwarfs what is heard/seen in the media at home. 'Five or six' also suggests nonchalance from the editor – suggestive of the lack of compassion that society has for the subjects of these photographs. This idea is expanded as the reader is considered – they may feel some short-lived emotions when confronted with the pictures, but it will not significantly alter the course of their day – which is made to seem relatively trivial and luxurious. As the photographer departs again, the use of 'they' shows his sense of separateness from his countrymen – his pictures will make little difference.  |
|        | 20   | from which his editor will pick out five or six      |  |
|        | 21   | for Sunday's supplement. The reader's eyeballs prick |  |
|        | 22   | with tears between the bath and pre-lunch beers.     |  |
|        | 23   | From the aeroplane he stares impassively at where    |  |
|        | 24   | he earns his living and they do not care.            |  |

## Poems for Comparison

|   |  |
|---|--|
| <b>Charge of the Light Brigade/ Poppies</b> | War Photographer can be compared and contrasted with this poem in relation to the theme of remembering victims.            |
| <b>Exposure/ Out of the Blue</b>            | War Photographer can be compared and contrasted with this poem in the approach to the theme of the horror of war/conflict. |

## Words from the Poet

|   |  |
|---|--|
| "Poetry isn't something outside of life; it is at the centre of life. We turn to poetry to help us to understand or cope with our most intense experiences...Poetry has changed since the days of Larkin – he's a good poet, but poetry has changed for the better. It's not a bunch of similarly educated men – it's many voices, many styles. The edge has become the centre...Poetry can't lie... The poem tells the truth but it is not a documentary" Interview in <i>The Times</i> (2009) |  |
|---|--|



# Maths - Foundation

## Basic percentages

### Key vocabulary

**Fraction** - A quantity which is not a whole number.

**Decimal** - A decimal number is often used to mean a number that uses a decimal point followed by digits that show a value smaller than one.

**Percentage** - Amount out of one hundred.

**Increase** - To make bigger.

**Decrease** - To make smaller.

**Depreciate** - Decrease in value over time.

**Multipliers** - a quantity by which a given number is to be multiplied.

### Assessment style question

A primary school has 212 students.  
50% of the students are boys.  
How many of the students are boys?

A fish tank, that is full of water, has sprung a leak.  
12% of the water is lost every hour.  
What percentage of the water is lost after three hours?

A cereal bar weighs 24g.  
The cereal bar contains 3.8g of protein.  
Work out what percentage of the cereal bar is protein.

### Picture perfect

**Reverse percentages**

John pays £60 for a bag after getting 20% discount. How much did it originally cost?

Remember: Original price is always equal to 100%

Sale price = 100% - 20% = 80%

£60 ÷ 80 = £75

£75 × 80 = £60

## Always remember

| Fraction         | Percentage | Decimal |
|------------------|------------|---------|
| 1 whole          | 100%       | 1       |
| $\frac{1}{2}$    | 50%        | 0.5     |
| $\frac{1}{4}$    | 25%        | 0.25    |
| $\frac{3}{4}$    | 75%        | 0.75    |
| $\frac{1}{10}$   | 10%        | 0.1     |
| $\frac{9}{10}$   | 90%        | 0.9     |
| $\frac{1}{100}$  | 1%         | 0.01    |
| $\frac{99}{100}$ | 99%        | 0.99    |

### on a calculator

39% of 82  
 $0.39 \times 82$

Change to a decimal and multiply

### fraction to %

$\frac{15}{20} = \frac{75}{100} = 75\%$

OR

$15 \div 20 \times 100 = 75\%$

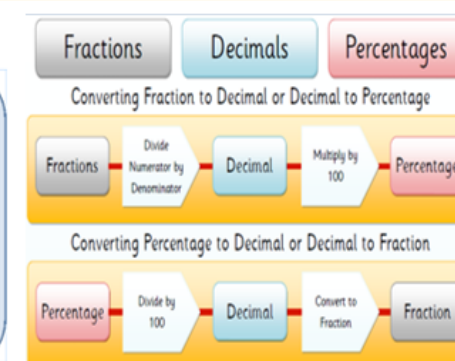
### without a calculator

50% - half  
25% - half and half  
75% - 50% + 25%

10% - divide by 10  
5% - half 10%  
20% - double 10%

Simple interest = amount  $\times$  multiplier  $\times$  time

Compound interest = amount  $\times$  multiplier<sup>time</sup>



### increasing

Increase £60 by 12%

12% of 60 =  $0.12 \times 60 = £7.20$

New amount = £60 + £7.20 = £67.20

**ADD**

### decreasing

decrease £60 by 12%

12% of 60 =  $0.12 \times 60 = £7.20$

New amount = £60 - £7.20 = £52.80

**SUBTRACT**



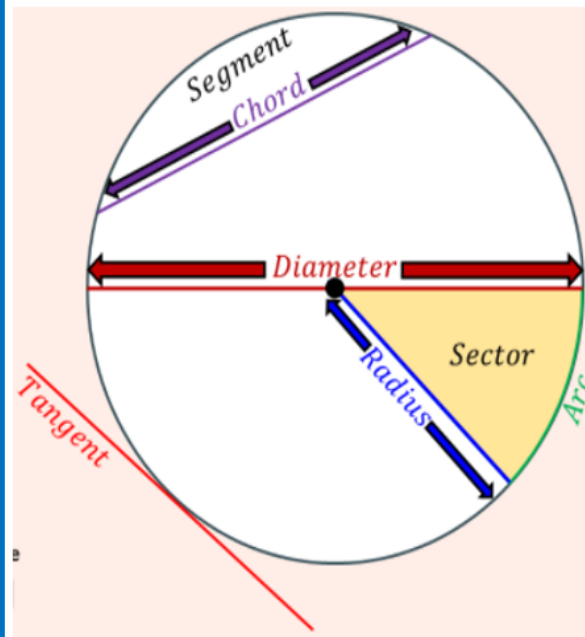
# Maths - Foundation

## Circumference and area

### Key vocabulary

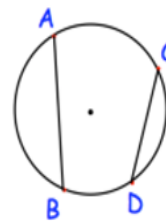
|   |
|---|
| <b>Circumference</b>  |
| The perimeter <b>around</b> the circle                          |
| <b>Diameter</b>   |
| The distance <b>across the centre</b> of the circle             |
| <b>Radius</b>   |
| The distance from the <b>centre to the edge</b> of the circle   |
| <b>Sector</b>   |
| Part of the <b>area</b> of a circle, enclosed by two radii      |
| <b>Arc</b>  |
| Part of the <b>circumference</b> of a circle                    |
| <b>Tangent</b>  |
| A straight line that touches the curve of the circle at a point |
| <b>Chord</b>  |
| A straight line segment between two points on the circle edge   |
| <b>Segment</b>  |
| The area created by the chord                                   |

### Picture perfect



### Assessment style question

Nicole is a wedding organiser.  
The guests are to sit at circular tables with a diameter of 180cm.  
Each guest needs 70cm around the circumference of the table.  
There are 18 tables at the venue.  
A total of 145 guests are attending the wedding  
Are there enough tables?



- Draw a circle with two chords, AB and CD.
- Construct the perpendicular bisector of AB.
- Construct the perpendicular bisector of CD.
- What do you notice about where the two perpendicular bisectors meet?

### Always remember

**Area**

$A = \pi r^2$  → Pi times the radius squared

Diameter is double the radius

$A = \pi \times 6.5^2$   
 $A = \pi \times 42.25$   
 $A = 132.73m^2$

**Sector**

Calculate the **proportion** of the circle required then use area formula

$A = \frac{n^\circ}{360} \pi r^2$

$\frac{85^\circ}{360^\circ} (\pi \times 6^2)$   
 $26.7cm^2$

**Circumference**

$C = \pi d$   
 $C = 2\pi r$

The circumference is always about three times the length of the diameter

$C = \pi \times 12cm$   
 $C = 37.7cm$

**Arc length**

Calculate the **proportion** of the circle required then use circumference formula

$L = \frac{n^\circ}{360} \pi d$

$\frac{85^\circ}{360^\circ} (\pi \times 12)$   
 $8.90cm$



# Maths - Foundation

## Solving equations

### Key vocabulary

Equation  
Expression  
Identity  
Formulae  
Inequality  
Solve  
Simplify  
Like terms  
Co-efficient  
Expand  
Factorise

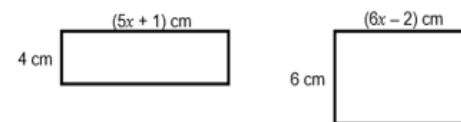
### Picture perfect

$$\begin{array}{rcl}
 5x - 2 & = & 3x + 4 \\
 -3x & & -3x \\
 \hline
 2x - 2 & = & 4 \\
 +2 & & +2 \\
 \hline
 2x & = & 6 \\
 & & x = 3
 \end{array}$$

### Assessment style question

(a) Solve  $4x + 1 = 9$

These two rectangles have the same area.



(b) Solve  $2x - 5 = 4$

Write down an equation to show this.

[1 mark]

### Always remember

#### Solving simple two-step equations

To solve an equation, find the value that makes the equation true.

Solve  $2x + 3 = 13$

This means:  $x \times 2 + 3 = 13$

To solve, we reverse the process:

$$\begin{array}{rcl}
 x \times 2 + 3 & = & 13 \\
 x \times 2 & = & 10 \\
 2x & = & 10 \\
 x & = & 5
 \end{array}$$

Use the opposite (inverse) operation and undo in reverse order.

We have solved the equation when we get to a single value of  $x$  (here,  $x = 5$ ).

Solve  $4x + 6 = 14$

$$\begin{array}{rcl}
 4x + 6 & = & 14 \\
 4x & = & 8 \\
 x & = & 2
 \end{array}$$

Solve  $3x - 8 = 19$

$$\begin{array}{rcl}
 3x - 8 & = & 19 \\
 3x & = & 27 \\
 x & = & 9
 \end{array}$$

#### Inequality Symbols

|        |                          |
|--------|--------------------------|
| $\neq$ | not equal                |
| $<$    | less than                |
| $\leq$ | less than or equal to    |
| $>$    | greater than             |
| $\geq$ | greater than or equal to |



# Maths - Foundation

## Indices

### Key vocabulary

**Square:** A square number is the result of multiplying a number by itself.

**Cube:** A cube number is the result of multiplying a number by itself twice.

**Root:** A root is the reverse of a power.

**Indices:** These are the squares, cubes and powers.

**Operation:** In maths these are the functions  $\square \square + -$ .

### Picture perfect

## indices

$$a^0 = 1 \quad a^{m/n} = (\sqrt[n]{a})^m$$

$$a^{-n} = \frac{1}{a^n} \quad a^{-1} = \frac{1}{a}$$

$$a^{1/n} = \sqrt[n]{a} \quad a^{1/2} = \sqrt{a}$$

### Assessment style question

Question 1: Can you spot any mistakes?

$$6^2 = 12$$

$$1^7 = 7$$

$$2^6 \times 2^3 = 4^9$$

$$7^{15} \div 7^5 = 7^3$$

$$10^4 = 40$$

$$2^6 = 32$$

$$6^3 \times 6^4 = 6^{12}$$

Question 1: Can you spot any mistakes?

### Always remember

### Basic Laws of Indices

#### Special indices to consider

|           |                                  |
|-----------|----------------------------------|
| $x^1 = x$ | Anything to the power 1 = itself |
| $x^0 = 1$ | Anything to the power 0 = 1      |
| $1^x = 1$ | 1 to the power of anything = 1   |

These laws can be applied if the bases are the same

|   |   |
|---|---|
| $x^a \times x^b = x^{a+b}$<br>$z^3 \times z^7 = z^{10}$ | When multiplying powers with the same base – Add the powers   |
| $x^a \div x^b = x^{a-b}$<br>$s^2 \div s^5 = s^{-3}$     | When dividing powers with the same base – Subtract the powers |
| $(x^a)^b = x^{a \times b}$<br>$(e^4)^3 = e^{12}$        | When raising the power (brackets) – Multiply the powers       |

### Advanced Laws of Indices

#### Negative Indices

$$x^{-n} \rightarrow \frac{1}{x^n}$$

Find Reciprocal  
Apply Positive Power  
Apply top and bottom

$$z^{-3} = \left(\frac{1}{z}\right)^3 = \frac{1}{z^3} \quad 6^{-2} = \left(\frac{1}{6}\right)^2 = \frac{1}{36}$$

#### Fractional Indices

$$x^{\frac{m}{n}} = (\sqrt[n]{x})^m$$

Root by denominator first  
Then power of numerator

$$x^{\frac{1}{2}} = \sqrt{x} \quad x^{\frac{1}{3}} = \sqrt[3]{x} \quad x^{\frac{1}{4}} = \sqrt[4]{x} \quad x^{\frac{2}{3}} = (\sqrt[3]{x})^2$$

$$64^{\frac{2}{3}} = (\sqrt[3]{64})^2 = (4)^2 = 16$$

#### Negative Fractional Indices

$$x^{-\frac{a}{b}} = \frac{1}{(\sqrt[b]{x})^a}$$

Negative Fractional Powers:  
Apply reciprocal first!

$$9^{-\frac{3}{2}} = \frac{1}{9^{\frac{3}{2}}} = \frac{1}{(\sqrt{9})^3} = \frac{1}{(3)^3}$$



# Maths - Foundation

## Perimeter & Area

### Key vocabulary

Perimeter  
 Area  
 Length  
 Width  
 Height  
 Circumference  
 Radius  
 Diameter  
 Pi ( $\pi$ )  
 Units<sup>2</sup>  
 Compound area

### Picture perfect



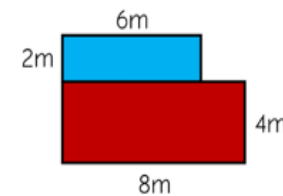
### Finding the Area (compound shapes)

To work out the area of compound shapes, you need to break them into individual rectangles.

$$6\text{cm} \times 2\text{cm} = 12\text{cm}^2$$

$$8\text{cm} \times 4\text{cm} = 32\text{cm}^2$$

$$12\text{cm}^2 + 32\text{cm}^2 = 44\text{cm}^2$$



### Assessment style question

A rectangle has a perimeter of 18cm.  
Write down a possible pair of values for its length and width

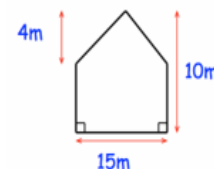
An isosceles triangle has a perimeter of 73cm  
An equilateral triangle has a perimeter of 51cm  
The triangles are put together to make a kite.



Work out the perimeter of the kite.

Find the area of the triangle with a base of 12cm and perpendicular height of 9cm.

William is painting the side of his house.  
He has 8 litres of paint and each litre of paint covers 16m<sup>2</sup>  
Does William have enough paint?



### Always remember

Perimeter units include mm, cm, m, km etc.

Area units include mm<sup>2</sup>, cm<sup>2</sup>, m<sup>2</sup> etc.

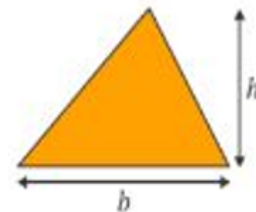
Area of a rectangle:

$$A = l \times w$$



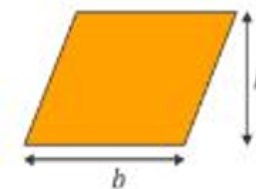
Area of a triangle:

$$A = \frac{bh}{2}$$



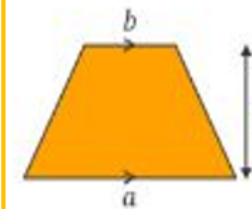
Area of a parallelogram:

$$A = b \times h$$



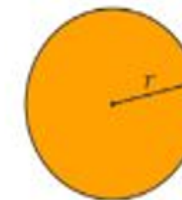
Area of a trapezium:

$$A = \frac{1}{2}(a + b)h$$



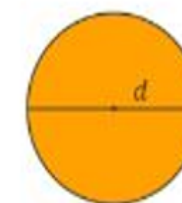
Area of a circle:

$$A = \pi r^2$$



Circumference of a circle:

$$C = \pi d$$





# Maths - Foundation

## Properties of polygons

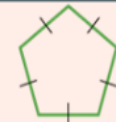
### Key vocabulary

### Picture perfect

#### Regular

Side lengths are the same

Interior and exterior angles the same



#### Irregular

Side lengths are not ALL the same

Interior and exterior angles the not ALL the same



Equal sides are marked with a dash through the line

#### Convex

The shape is 'bulging' outwards

All angles less than  $180^\circ$



#### Concave

The shape has 'caved' inwards

One or more angles is greater than  $180^\circ$

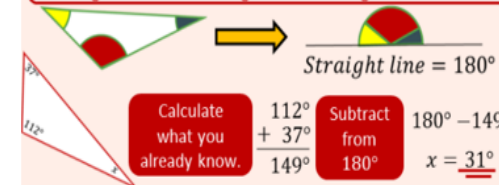


### Assessment style question

## Always remember

### Triangles

All three angles can be orientated to fit on a straight line  $\rightarrow$  All angles in a triangle make  $180^\circ$



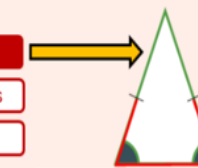
Exterior angle = Sum of two angles on opposite side.



#### Isosceles triangle

It has two equal lengths

It has two equal angles



They are classified by the number of sides they have

| Number of sides | Name of shape |
|-----------------|---------------|
| 3               | Triangle      |
| 4               | Quadrilateral |
| 5               | Pentagon      |
| 6               | Hexagon       |
| 7               | Heptagon      |
| 8               | Octagon       |
| 9               | Nonagon       |
| 10              | Decagon       |

### Polygons

Knowledge of triangles is important

| Number of sides | Number of | Sum of interior angles     | Regular interior angle               | Regular exterior angle |
|-----------------|-----------|----------------------------|--------------------------------------|------------------------|
| 3               | 1         | $180^\circ$                | $60^\circ$                           | $120^\circ$            |
| 4               | 2         | $360^\circ$                | $90^\circ$                           | $90^\circ$             |
| 5               | 3         | $540^\circ$                | $108^\circ$                          | $72^\circ$             |
| 6               | 4         | $720^\circ$                | $120^\circ$                          | $60^\circ$             |
| 7               | 5         | $900^\circ$                | $129^\circ$                          | $51^\circ$             |
| 8               | 6         | $1080^\circ$               | $135^\circ$                          | $45^\circ$             |
| $n$             | $(n - 2)$ | $(n - 2) \times 180^\circ$ | $\frac{(n - 2) \times 180^\circ}{n}$ | $360^\circ \div n$     |

The number of triangles in a shape will always be **TWO** less than the number of sides





# Maths - Foundation

## Ratio

### Key vocabulary

**Ratio** -Ratio compares the size of **one part** to **another part**.

**Proportion** -Proportion compares the size of **one part** to the size of the **whole**.

**Proportional** - a change in one is always accompanied by a change in the other.

**Simplifying** - Divide each part of the ratio by a common factor

**Equivalent**- Ratios are equivalent if they have the same simplest form.

### Picture perfect

Share £20 in the ratio **2:5:3**

1) Find the **total number of parts**

$$2 + 5 + 3 = 10$$

2) Divide the **amount** by the **total number of parts**

$$£20 \div 10 = £2 = 1 \text{ part}$$

3) Multiply each number in the **ratio** by the value of **1 part**

$$\begin{array}{ccc} 2 & : & 5 & : & 3 \\ \downarrow \times £2 & & \downarrow \times £2 & & \downarrow \times £2 \\ £4 & : & £10 & : & £6 \end{array}$$

### Find Two Equivalent Ratios

5:20

Multiply

$$\begin{array}{l} 5:20 \rightarrow \frac{5}{20} \\ \frac{5}{20} \cdot \frac{2}{2} = \frac{5 \cdot 2}{20 \cdot 2} = \frac{10}{40} \\ \frac{10}{40} \rightarrow 10:40 \end{array}$$

Divide

$$\begin{array}{l} 5:20 \rightarrow \frac{5}{20} \\ \frac{5}{20} \div \frac{5}{5} = \frac{5 \div 5}{20 \div 5} = \frac{1}{4} \\ \frac{1}{4} \rightarrow 1:4 \end{array}$$

### Always remember

## Ratios

A ratio is a way of comparing two or more quantities.

Purple paint is made by mixing **blue** and **red** paint in the ratio of **2 to 3**.



To make mortar, **sand** and **cement** are mixed together in the ratio of **5 to 2**.



**Lilly, Jack and Jo** have shared the money in the ratio of **2 to 6 to 3**.



A ratio must be written in the correct order, with the **quantity** mentioned **first** written **first**.

Ratios are easier to work out when they are in their simplest form. To simplify ratios, both numbers must be **divided by their highest common factor**.



The ratio of **blue** to **red** tiles is **6 to 3** but this can be simplified.

$$\begin{array}{l} 6:3 \\ \div 3 \quad \div 3 \\ 2:1 \end{array}$$

3 is the highest common factor of 6 and 3, so divide both numbers by 3.

### Dividing in a Ratio

Sometimes an amount needs to be divided according to a particular ratio. **Ava, Isla and Freya** made £315 selling balloons at a fayre. They agreed to split the money in the ratio of **3:2:4**. How much money does each person get?

1 Add the numbers in the ratio to calculate the total number of parts.  $3 + 2 + 4 = 9$

2 Find the value of **1 part** by dividing the total amount by the total number of parts, 9.  $315 \div 9 = 35$   
1 part = 35

3 Multiply the value of **1 part**, 35, by the numbers in the ratio to calculate how much money each person gets.  $3 \times 35 = 105$   
 $2 \times 35 = 70$   
 $4 \times 35 = 140$

4 315 divided in the ratio of **3:2:4** is **105:70:140**.  
Check your answer by adding together the values.  $105 + 70 + 140 = 315$

### Assessment style question

Shannon is revising for her summer exams. The table below shows the number of minutes Shannon spends revising on each of 5 evenings. It also shows the number of minutes Shannon spends relaxing on the 5 evenings.

|                            | Monday | Tuesday | Wednesday | Thursday | Friday |
|----------------------------|--------|---------|-----------|----------|--------|
| Number of minutes revising | 88     | 198     | 150       | 133      | 160    |
| Number of minutes relaxing | 20     | 40      | 28        | 25       | 34     |

Sophie is making 400 scones. She uses butter, sugar and flour in the ratio 2:1:9. Here are the costs of those ingredients.

|        |                    |
|--------|--------------------|
| Butter | £2.20 per 500g     |
| Sugar  | £1.60 per kilogram |
| Flour  | 60p per 1.5kg      |

The total mass of the butter, sugar and flour in each scone is 30g

Work out the total cost of these ingredients for the 400 scones.

Mrs Chambers is organising a school trip to a museum for year 7 and year 8. She needs to work out the total cost of the museum tickets and bus hire. The table below shows the museum ticket prices.

| Visitor Age | Price  |
|-------------|--------|
| 0 - 3       | free   |
| 4 - 12      | £4.50  |
| 13 - 17     | £6.50  |
| 18+         | £11.50 |

Each bus has 51 seats and costs £125

Altogether 300 students want to go on the trip. The ratio of the number of students to the number of teachers is 25:1. The ratio of the number of students in year 7 to the number of students in year 8 is 8:7.

At the time of the trip, all of the students in year 7 are 11 or 12 years old. Of year 8 students, the ratio of number of 12 year olds to 13 year olds is 2:3. Work out the total price of the school trip.



# Maths - Foundation

## Real life Graphs

### Key vocabulary

**Coordinates** - a set of value that show an exact position on a coordinate grid

**Linear equation** - an equation, when plotted, makes a straight line

**Gradient** - the steepness of the line of a linear equation

**y-intercept** - where the linear equation cuts the y-axis

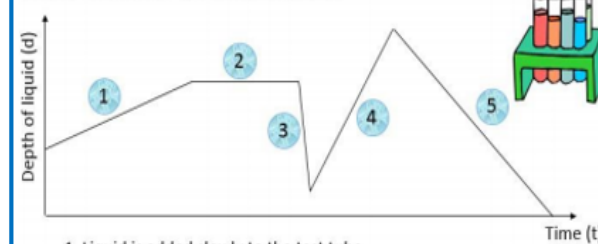
**Substitution** - when you replace an unknown for a given value

### Picture perfect

Graphs can be used to represent a number of real life situations. It is important to read the labels on both axes to determine the meaning of the graph.

Example:

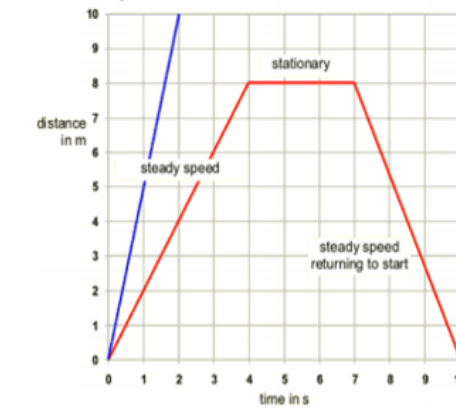
A test tube containing a chemical liquid is used in an experiment. During the experiment the **depth d** of the liquid changes with **time t**. Match the different parts of the graph to the statements below.



1. Liquid is added slowly to the test tube.
2. The level of the liquid remains constant.
3. Some liquid is poured out quickly.
4. Some liquid is poured in quite quickly.
5. The test tube is emptied.

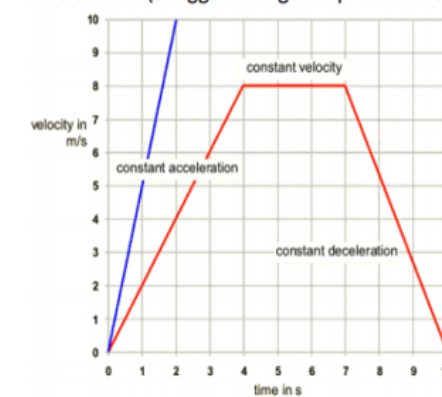
### Always remember Distance-time graphs

Distance time graphs show distance away from a point. When an object is stationary, the line on the graph is horizontal. When an object is moving at a steady speed, the line on the graph is straight, but sloped. The **steeper** the line, the greater the **speed** of the object.



### Speed-time graphs

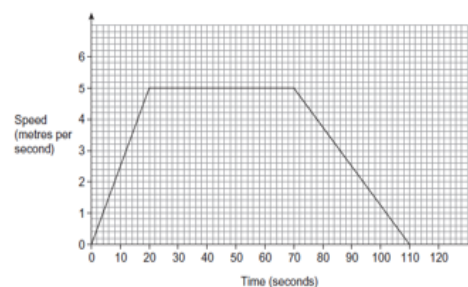
A speed-time graph tells us **changes over time**. When the object is travelling at a constant speed, the line on the graph is horizontal. When an object is accelerating or decelerating, the line on the graph is sloped. The **steeper** the gradient of the line, the greater the **acceleration** (a bigger change in speed in the same time).



### Assessment style question

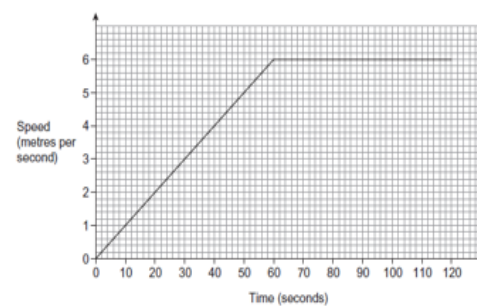
The distance around a cycle track is 400 metres.

Robin cycles on the track. Here is his speed-time graph.



(a) Show that Robin cycles **exactly** once around the track in 110 seconds.

(b) Sanjay cycles on the same track. Here is his speed-time graph.



Does Sanjay cycle the first 400 metres in a quicker time than Robin? You **must** show your working.

(3)



# Maths - Foundation

## Standard Form

### Key vocabulary

- Standard form
- Ordinary number
- Power
- Index Laws
- Convert
- Ordinary number
- Adding, subtracting
- Multiplying, dividing

### Picture perfect

#### Basic Structure

$$1 \leq a < 10 \leftarrow a \times 10^b \rightarrow \text{Whole number}$$

$$2.83 \times 10^6 = 2830000$$

Positive power of 10 = Large number

$$3.14 \times 10^{-4} = 0.000314$$

Negative power of 10 = Small decimal number

### Standard Form

Positive Power = Large Number

$$4.3 \times 10^6 = 4\,300\,000$$

Negative Power = Small Number

$$2.1 \times 10^{-3} = 0.021$$

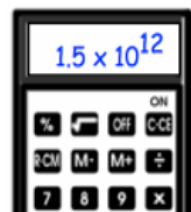
| Ordinary Number | Standard Form         |
|-----------------|-----------------------|
| 29              | $2.9 \times 10^1$     |
| 350             | $3.50 \times 10^2$    |
| 4716            | $4.716 \times 10^3$   |
| 600000000       | $6 \times 10^8$       |
| 0.3             | $3 \times 10^{-1}$    |
| 0.09            | $9 \times 10^{-2}$    |
| 0.0071          | $7.1 \times 10^{-3}$  |
| 0.000502        | $5.02 \times 10^{-4}$ |

**Assessment style question** Peter has multiplied two numbers using his calculator. The calculator shows the answer. He can remember that one number was 5000. What was the other number used in the multiplication?

The mass of Earth is  $5.97 \times 10^{24}$

The mass of Jupiter is  $1.898 \times 10^{27}$

Using a calculator, work out how many times heavier Jupiter is than Earth. Give your answer to one decimal place.



### Always remember

A number is converted into **standard form** when the number is very large or very small, this mainly used in science and astronomy.

- The format of a number in standard form consists of a number between 1 and 10 **but cannot be 10**, multiplied by a power of 10.

$$(1 \leq x < 10) \times 10^n$$

- Converting a **very small number into standard form**: Size of a bacteria is 0.00000037  $0.00000037 = 3.7 \times 10^{-7}$
- Converting a **very large number into standard form**: Distance from Earth to the sun is 147100 million metres  $147\,100\,000\,000 = 1.471 \times 10^{11}$
- Converting into a **small ordinary number**  $2.4 \times 10^{-6} = 0.0000024$
- Converting into a **large ordinary number**  $5.67 \times 10^9 = 5\,670\,000\,000$

#### Common mistakes:

- When not in standard form but in the same format as the number is not between  $1 \leq x < 10$   
(too big)  $76.18 \times 10^6 = 7.618 \times 10^7$  and (too small)  $0.12 \times 10^{-6} = 1.2 \times 10^{-7}$   
When the number is getting smaller the power gets bigger, and when the number gets bigger the power gets smaller

#### Multiply/Divide Standard form

Separate the numbers and powers of 10.  
Multiply/Divide numbers,  
Apply laws of indices to power of 10s  
Give answer in Standard form

$$(4.6 \times 10^4) \times (3 \times 10^3)$$

$$4.6 \times 3 \times 10^4 \times 10^3$$

$$13.8 \times 10^7 \quad \times$$

$$1.38 \times 10^8 \quad \checkmark$$

$$(1.56 \times 10^{-4}) \div (7.5 \times 10^{-7})$$

$$1.56 \div 7.5 \times 10^{-4} \div 10^{-7}$$

$$0.208 \times 10^3 \quad \times$$

$$2.08 \times 10^2 \quad \checkmark$$

#### Add/Subtract Standard form

Take numbers out of Standard form.

Add/Subtract values.

Convert answer back to Standard form.

$$(3.23 \times 10^4) + (8.2 \times 10^3)$$

$$= 32300 + 8200$$

$$= 40500$$

$$= 4.05 \times 10^4$$



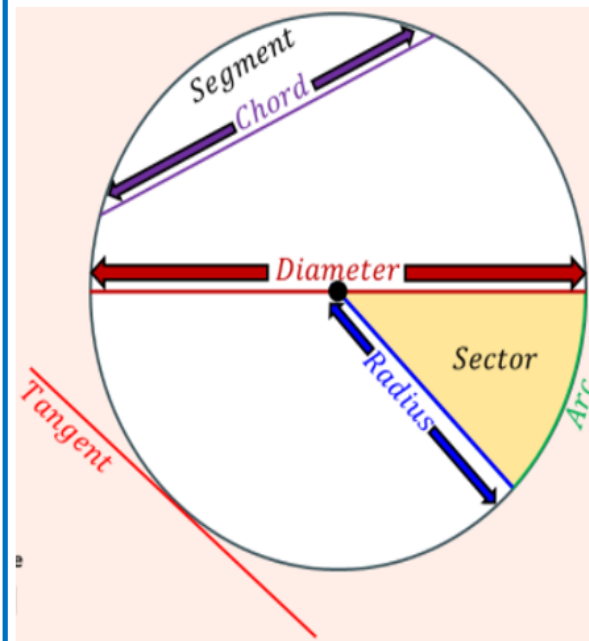
# Maths - Higher

## Circumference and area

### Key vocabulary

|   |
|---|
| <b>Circumference</b>  |
| The perimeter <u>around</u> the circle                          |
| <b>Diameter</b>   |
| The distance <u>across the centre</u> of the circle             |
| <b>Radius</b>   |
| The distance from the <u>centre to the edge</u> of the circle   |
| <b>Sector</b>   |
| <u>Part of the area</u> of a circle, enclosed by two radii      |
| <b>Arc</b>  |
| <u>Part of the circumference</u> of a circle                    |
| <b>Tangent</b>  |
| A straight line that touches the curve of the circle at a point |
| <b>Chord</b>  |
| A straight line segment between two points on the circle edge   |
| <b>Segment</b>  |
| The area created by the chord                                   |

### Picture perfect

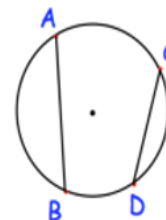


### Assessment style question

Nicole is a wedding organiser.  
The guests are to sit at circular tables with a diameter of 180cm.  
Each guest needs 70cm around the circumference of the table.  
There are 18 tables at the venue.  
A total of 145 guests are attending the wedding  
Are there enough tables?



- Draw a circle with two chords, AB and CD.
- Construct the perpendicular bisector of AB.
- Construct the perpendicular bisector of CD.
- What do you notice about where the two perpendicular bisectors meet?



### Always remember

**Area**

$A = \pi r^2$  → Pi times the radius squared

Diameter is double the radius

$A = \pi \times 6.5^2$   
 $A = \pi \times 42.25$   
 $A = 132.73m^2$

**Sector**

Calculate the proportion of the circle required then use area formula

$A = \frac{n^\circ}{360} \pi r^2$

$\frac{85^\circ}{360^\circ} (\pi \times 6^2)$   
 $26.7cm^2$

**Circumference**

$C = \pi d$   
 $C = 2\pi r$

The circumference is always about three times the length of the diameter

$C = \pi \times 12cm$   
 $C = 37.7cm$

**Arc length**

Calculate the proportion of the circle required then use circumference formula

$L = \frac{n^\circ}{360} \pi d$

$\frac{85^\circ}{360^\circ} (\pi \times 12)$   
 $8.90cm$



# Maths - Higher

## Equations

### Key vocabulary

**Inverse:** This is another word for opposite. We complete the opposite operation to the one shown in the question.

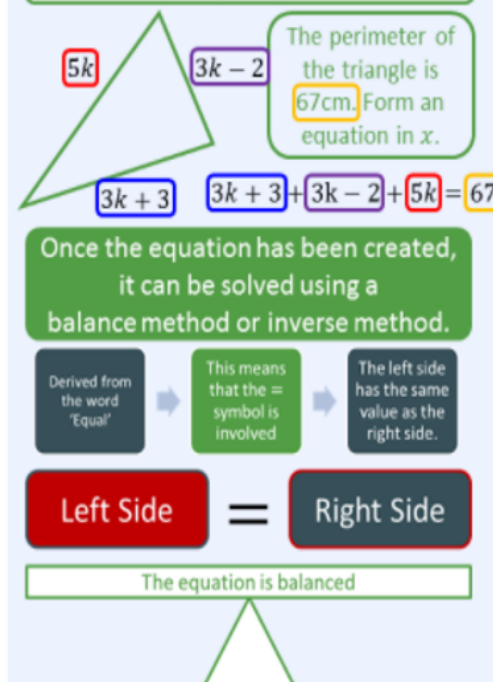
**Integer:** A whole number.

**Equation:** A mathematical statement that shows that two expressions are equal.

**Solve:** To get the solution or answer to a question.

### Picture perfect

#### Creating equations



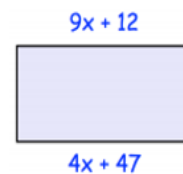
### Assessment style question

Shown is a rectangle

(a) Explain why  $9x + 12 = 4x + 47$

(b) Find  $x$

Explain why  $8x + 3 = 2(4x + 1)$  has no solution.



Spot the mistake:

Solve  $7x - 5 = 5x + 23$

$$\begin{array}{r} -5x \quad -5x \\ 2x - 5 = 23 \\ -5 \quad -5 \\ 2x = 18 \\ \div 2 \quad \div 2 \\ x = 9 \end{array}$$

### Always remember

As with all mathematical calculations, please remember to use

**BIDMAS:** Brackets then Indices then Division & Multiplication then Addition & Subtraction

### Solving linear equations

General 4 step process

- Expand brackets and simplify (collect like terms)
- If  $x$  is on both sides, eliminate smallest value
- Eliminate excess number
- Divide and solve for  $x$



$$3(x + 1) = 2(x + 2)$$

$$\begin{array}{r} 3x + 3 = 2x + 4 \\ -2x \quad -2x \\ x + 3 = 4 \\ -3 \quad -3 \\ x = 1 \end{array}$$

### Advanced equations

Equations where fractions are involved

Fractions are divisions and can be eliminated by multiplying

$$\frac{x}{2} = 5 \quad x = 10$$

$$\times 2 \quad \times 2$$

Remove variable from denominator

$$\frac{2y}{(3-y)} = 4 \rightarrow 2y = 4(3-y)$$

$$\times (3-y) \quad \times (3-y)$$

Cross-multiplying allows us to move terms in a fraction from one side of an equation to the other

$$\frac{x+1}{3} = \frac{x}{2} \rightarrow 2(x+1) = 3x$$

An equation with TWO UNKNOWNNS

$$\begin{array}{r} -3x \quad -1 \quad -3x \quad -1 \\ 5x + 1 = 3x + 17 \\ +2 \quad 2x = 16 \div 2 \\ x = 8 \end{array}$$



# Maths - Higher

## Indices

### Key vocabulary

**Square:** A square number is the result of multiplying a number by itself.

**Cube:** A cube number is the result of multiplying a number by itself twice.

**Root:** A root is the reverse of a power.

**Indices:** These are the squares, cubes and powers.

**Operation:** In maths these are the functions  $\square \square + -$ .

### Picture perfect

## indices

$$a^0 = 1 \quad a^{m/n} = (\sqrt[n]{a})^m$$

$$a^{-n} = \frac{1}{a^n} \quad a^{-1} = \frac{1}{a}$$

$$a^{1/n} = \sqrt[n]{a} \quad a^{1/2} = \sqrt{a}$$

### Assessment style question

Question 1: Can you spot any mistakes?

$$6^2 = 12$$

$$1^7 = 7$$

$$2^6 \times 2^3 = 4^9$$

$$7^{15} \div 7^5 = 7^3$$

$$10^4 = 40$$

$$2^6 = 32$$

$$6^3 \times 6^4 = 6^{12}$$

Question 1: Can you spot any mistakes?

### Always remember

### Basic Laws of Indices

#### Special indices to consider

|           |                                  |
|-----------|----------------------------------|
| $x^1 = x$ | Anything to the power 1 = itself |
| $x^0 = 1$ | Anything to the power 0 = 1      |
| $1^x = 1$ | 1 to the power of anything = 1   |

These laws can be applied if the bases are the same

|   |   |
|---|---|
| $x^a \times x^b = x^{a+b}$<br>$z^3 \times z^7 = z^{10}$ | When multiplying powers with the same base – Add the powers   |
| $x^a \div x^b = x^{a-b}$<br>$s^2 \div s^5 = s^{-3}$     | When dividing powers with the same base – Subtract the powers |
| $(x^a)^b = x^{a \times b}$<br>$(e^4)^3 = e^{12}$        | When raising the power (brackets) – Multiply the powers       |

### Advanced Laws of Indices

#### Negative Indices

$$x^{-n} \rightarrow \frac{1}{x^n}$$

Find Reciprocal  
Apply Positive Power  
Apply top and bottom

$$z^{-3} = \left(\frac{1}{z}\right)^3 = \frac{1}{z^3} \quad 6^{-2} = \left(\frac{1}{6}\right)^2 = \frac{1}{36}$$

#### Fractional Indices

$$x^{\frac{m}{n}} = (\sqrt[n]{x})^m$$

Root by denominator first  
Then power of numerator

$$\frac{1}{x^2} = \sqrt{x} \quad \frac{1}{x^3} = \sqrt[3]{x} \quad \frac{1}{x^4} = \sqrt[4]{x} \quad x^{\frac{2}{3}} = (\sqrt[3]{x})^2$$

$$64^{\frac{2}{3}} = (\sqrt[3]{64})^2 = (4)^2 = 16$$

#### Negative Fractional Indices

$$x^{-\frac{a}{b}} = \frac{1}{(\sqrt[b]{x})^a}$$

Negative Fractional Powers:  
Apply reciprocal first!

$$9^{-\frac{3}{2}} = \frac{1}{9^{\frac{3}{2}}} = \frac{1}{(\sqrt{9})^3} = \frac{1}{(3)^3}$$



# Maths - Higher

## Measures

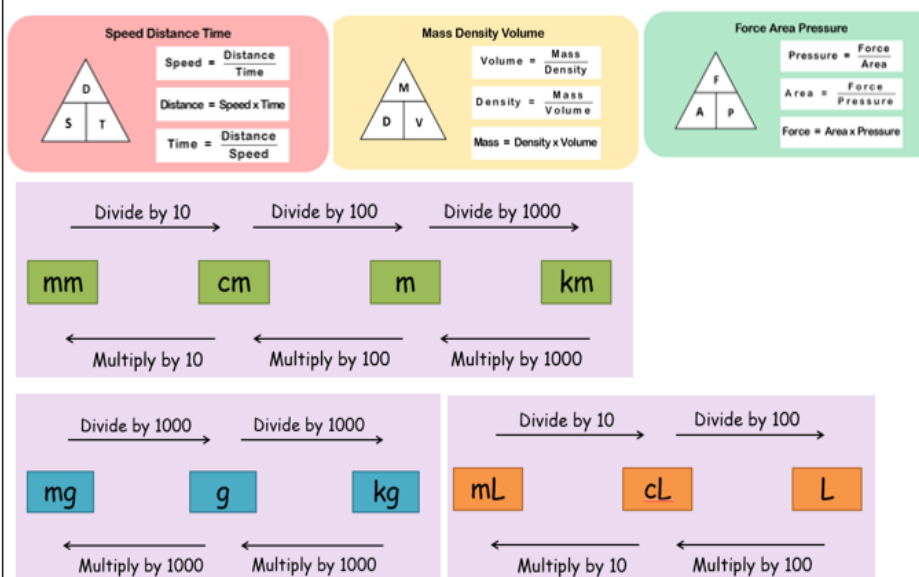
### Key vocabulary

Metric, imperial, speed, density, conversion, length, capacity, mass, upper and lower bounds, limits of accuracy, error interval

### Next Steps

- Area and volume conversions

### Picture perfect



### Always remember

| Length        | Mass              | Capacity                       |
|---------------|-------------------|--------------------------------|
| 1 cm = 10 mm  | 1 g = 1000 mg     | 1 cl = 10 ml                   |
| 1 m = 100 cm  | 1 kg = 1000 g     | 1 cm <sup>3</sup> = 1 ml       |
| 1 km = 1000 m | 1 tonne = 1000 kg | 1 litre = 1000 ml              |
|               |                   | 1 litre = 1000 cm <sup>3</sup> |

### Upper and Lower Bounds

Any recorded measurement has almost certainly been rounded. The true value will be somewhere between the lower and upper bound.

Lower bound = smallest possible number that rounds up to the given number.

Upper bound = largest possible number that rounds down to the given number.

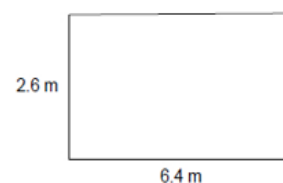
The lower and upper bounds are sometimes known as limits of accuracy and the range between them is the error interval.

### Assessment style question:

Tom's car travels 40 miles per gallon.  
One litre of petrol costs £1.19  
1 gallon = 4.5 litres

Work out the cost of petrol when Tom drives 200 miles.

The dimensions of a rectangular floor are to the nearest 0.1 metres.



A force of 345 Newtons is applied to the floor.  
The force is to the nearest 5 Newtons.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the upper bound of the pressure.  
Give your answer to 4 significant figures.  
You **must** show your working.

# Maths - Higher

## Perimeter and Area

### Key vocabulary

**Perimeter-** The length around a shape

**Area-** The size within a shape

**Surface Area-** The total areas of each face of a 3D shape

**Regular-** All the sides and angles of a shape are equal

**Perpendicular height-** The height that forms a right angle with the base length.

**Face-** The flat surface of a 3D shape

**Edge-** The line where two faces meet

**Vertex-** Corner of a shape

**Prism-** A 3D shape that has the same face when you cut it along its length. Eg: a cuboid, a loaf of bread.

**Cross section-** The constant face of a prism. Eg: for a cylinder its cross section is a circle.

### Picture perfect

#### Perimeter

The total distance **AROUND** a 2D shape

Adding all the side lengths together

$$\begin{array}{|c|c|} \hline 100m & 100 + 100 + 35 + 35 \\ \hline 35m & 270m \\ \hline 100m & \end{array}$$

The process does not change if we have algebraic terms

$$\begin{array}{c} x & y & x & x & y \\ & \diagdown & / & \diagdown & / \\ 2x & & 3x & & 2x - y \end{array} = 9x + 2y$$

#### Rectangular areas

The total **space** taken up by a 2D shape

Multiplying two side lengths together

Area of rectangle  $\square = l \times w$

$$\begin{array}{|c|c|} \hline 12cm & \text{Area} = 6cm \times 12cm \\ \hline 6cm & 72cm^2 \\ \hline \end{array}$$

### Assessment style question

A cube has a volume of  $27cm^3$  and a surface area  $36cm^2$ .

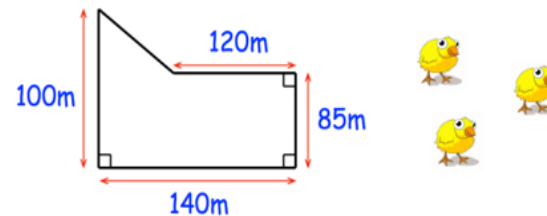
How long is each side?

A cube has a volume of  $8cm^3$

What is the surface area?

A cube has a surface area of  $6cm^2$ . What is its area?

Question 2: Farmer Martin keeps chickens in the field below. Each chicken needs  $3m^2$ . What is the maximum number of chickens that he can keep?



### Always remember

#### Triangular areas

The area of a triangle takes up **half** the space of the rectangle that is formed around it

$$\text{Area of triangle} = \frac{1}{2}(b \times h)$$

$$\begin{array}{|c|c|} \hline 4m & A = \frac{1}{2}(7m \times 4m) = \frac{1}{2}(28m^2) \\ \hline 7m & 14m^2 \\ \hline \end{array}$$

Be sure to use perpendicular heights

Calculate base  $\times$  height first

Remember to **halve** your answer!

#### Rectangular areas

With compound shapes, break it down.

$$\begin{array}{|c|c|c|} \hline 5cm & 5cm & 5cm \\ \hline A & B & C \\ \hline 5cm & 5cm & 12cm \\ \hline 3cm & & \end{array}$$

$$\begin{array}{l} A = 60cm^2 \\ B = 20cm^2 \\ C = 60cm^2 \\ \hline 140cm^2 \end{array}$$

#### Parallelogram

Imagine a tilted rectangle

$$\square = b \times h$$

Be sure to use **perpendicular heights**

#### Trapezium

A more complex formula to know

$$\square = \frac{1}{2}(a + b) \times h$$

$$\begin{array}{|c|c|} \hline a & \text{Add the parallel sides} \\ \hline b & \text{Halve it} \\ \hline h & \text{Multiply by height} \\ \hline \end{array}$$



# Maths - Higher

## Properties of polygons

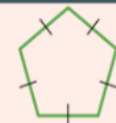
### Key vocabulary

### Picture perfect

#### Regular

Side lengths are the same

Interior and exterior angles the same



#### Irregular

Side lengths are not ALL the same

Interior and exterior angles the not ALL the same



Equal sides are marked with a dash through the line

#### Convex

The shape is 'bulging' outwards

All angles less than  $180^\circ$



#### Concave

The shape has 'caved' inwards

One or more angles is greater than  $180^\circ$

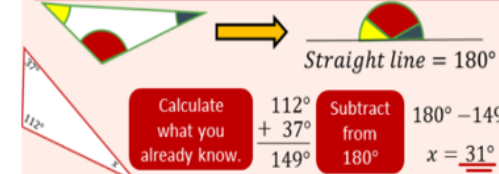


### Assessment style question

## Always remember

### Triangles

All three angles can be orientated to fit on a straight line  $\rightarrow$  All angles in a triangle make  $180^\circ$



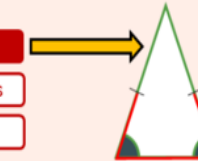
Exterior angle = Sum of two angles on opposite side.



### Isosceles triangle

It has two equal lengths

It has two equal angles



They are classified by the number of sides they have

| Number of sides | Name of shape |
|-----------------|---------------|
| 3               | Triangle      |
| 4               | Quadrilateral |
| 5               | Pentagon      |
| 6               | Hexagon       |
| 7               | Heptagon      |
| 8               | Octagon       |
| 9               | Nonagon       |
| 10              | Decagon       |

### Polygons

Knowledge of triangles is important

| Number of sides | Number of $\triangle$ | Sum of interior angles     | Regular interior angle               | Regular exterior angle |
|-----------------|-----------------------|----------------------------|--------------------------------------|------------------------|
| 3               | 1                     | $180^\circ$                | $60^\circ$                           | $120^\circ$            |
| 4               | 2                     | $360^\circ$                | $90^\circ$                           | $90^\circ$             |
| 5               | 3                     | $540^\circ$                | $108^\circ$                          | $72^\circ$             |
| 6               | 4                     | $720^\circ$                | $120^\circ$                          | $60^\circ$             |
| 7               | 5                     | $900^\circ$                | $129^\circ$                          | $51^\circ$             |
| 8               | 6                     | $1080^\circ$               | $135^\circ$                          | $45^\circ$             |
| $n$             | $(n - 2)$             | $(n - 2) \times 180^\circ$ | $\frac{(n - 2) \times 180^\circ}{n}$ | $360^\circ \div n$     |

The number of triangles in a shape will always be **TWO** less than the number of sides



# Maths - Higher

## Ratio and Proportion

### Key vocabulary

**Ratio:** Relationship between two or more numbers.  
**Part:** This is the numeric value '1' of, would be equivalent to.  
**Simplify:** Divide all parts of a ratio by the same number.  
**Equivalent:** Equal in value.  
**Convert:** Change from one form to another.  
**Scale:** The ratio of the length in a drawing to the length of the real thing.  
**Proportion:** A name we give to a statement that two ratios are equal.  
**Exchange rate:** The value of one currency for the purpose of conversion to another.

### Assessment style question

Sophie is making 400 scones. She uses butter, sugar and flour in the ratio 2:1:9. Here are the costs of those ingredients.

|        |                    |
|--------|--------------------|
| Butter | £2.20 per 500g     |
| Sugar  | £1.60 per kilogram |
| Flour  | 60p per 1.5kg      |

The total mass of the butter, sugar and flour in each scone is 30g

Work out the total cost of these ingredients for the 400 scones.

James is making concrete using cement, sand and gravel in the ratio 1 : 2 : 3  
 James has:  
 63kg cement  
 112kg sand  
 210kg gravel

What is the maximum amount of concrete that James can make?

### Picture perfect

**Ratio:** The is the relationship between two or more numbers and each number is separate by a colon.



The ratio of footballs to rugby balls: 1:4

The ratio of rugby balls to footballs: 4:1

Football is mentioned first so that is why the 1 comes before 4.

Rugby is mentioned first so that is why the 4 comes before 1.

### Always remember

Is the relationship between two or more quantities

It is written in the form  $a : b$

Compares one part to another part



The ratio of red to blue is 4 : 5

The ratio of blue to red is 5 : 4

Sentence structure is important!

Simplifying Ratios

$12 : 8 \xrightarrow{\div 4} 6 : 4 \xrightarrow{\div 2} 3 : 2$

Divide all numbers by the same value

The ratio of boys to girls in a Geography class is 15 : 5

What fraction of the class is girls?

$\frac{5 \text{ girls}}{20 \text{ total parts}} \Rightarrow \frac{1}{4}$

Direct Proportion

As one value increases, the other increases at the same rate

Three Coffees cost £7.50, How much would five Coffees cost?

Find the value of one coffee then multiply by quantity needed

$£7.50 \div 3 = £2.50 \text{ per coffee}$   
 $£2.50 \times 5 = £12.50$

Inverse Proportion

As one value increases, the other decreases at the same rate

It takes 3 men 4 days to build a wall. How long would it take 2 men?

Find the time taken by one man then divide by quantity stated

$3 \text{ men} \times 4 \text{ days} = 12 \text{ days}$   
 $12 \text{ days} \div 2 \text{ men} = 6 \text{ days}$

### Sharing in a given ratio

Find total number of parts → Find value of one part → Multiply by original ratio

Share \$40 in the ratio 3 : 5

Find total number of parts → Add the ratio parts together

$3 + 5 = 8$

Find value of one part → Divide amount by number of parts

$\$40 \div 8 = \$5$

Each part of the ratio is worth \$5

Multiply by original ratio  
 $3 : 5 \xrightarrow{\times \$5} \$15 : \$25$

Mark and John have sweets in the ratio 3 : 4, If Mark has 27 sweets. How many does John have?

$27 \div 3 = 9 \text{ sweets per part}$

$4 \times 9 = 36 \text{ (John's sweets)}$

### Map scale factors

It is the ratio of a distance on the map/model to the corresponding size in real life.

Written in the form  $1 : n$

Map or Model  $\xrightarrow{\times \text{scale factor}}$  Real life  
 Real life  $\xrightarrow{\div \text{scale factor}}$  Map or Model

Know your conversions

$10\text{mm} = 1\text{cm}$   
 $100\text{cm} = 1\text{m}$   
 $1000\text{m} = 1\text{km}$

A map has a scale of 1:25000. Michael is 6cm from his home. How far from home is he? Give your answer in km

$6\text{cm} \times 25000 = 150000\text{cm}$   
 $150000\text{cm} \xrightarrow{\div 100} 1500\text{m} \xrightarrow{\div 1000} 1.5\text{km}$



# Maths - Higher

## Real Life Graphs

### Key vocabulary

Graph  
Real life  
Distance  
Time  
Depth/water level  
Money  
Interpret  
Draw  
Describe

### Picture perfect

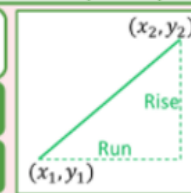
#### Rate of Change

A rate that describes how one quantity changes in relation to another quantity

It is represented by the Gradient of a line

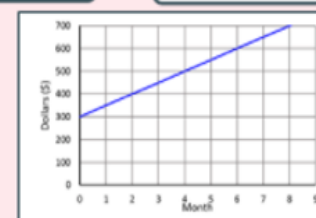
$$\text{Gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Gradient} = \frac{\text{Rise}}{\text{Run}}$$



#### Interpreting Rates of Change

Gradient → Amount of (y) per Amount of (x)



Rate of change = \$50 per month

### Assessment style question

A conversion graph to convert between Euros and US Dollars.

Horizontal axis: Euros from 0 to €100

Vertical axis: US Dollar (decide scale yourself)

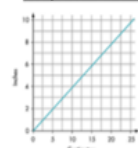
|            |       |
|------------|-------|
| US Dollars | \$ 77 |
| Euros      | € 70  |

Example 2: Using the graph below, identify what A, B and C mean in terms of travel.



A = steady speed,  
B = no movement,  
C = steady speed back to start

Using a conversion graph

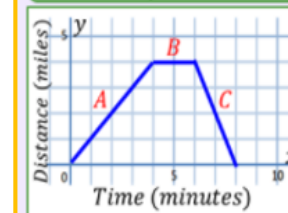


Conversion graphs can be used to convert between any 2 units which have a linear relationship. Here, you can use the graph to convert between inches and centimetres

### Always remember

#### Distance – Time graphs

Distance - Time graphs record the journey of an object as it begins to move away from and return to a point.



A Moving away  
B Stationary  
C Returning

Gradient = Speed

Not all objects travel at a constant speed



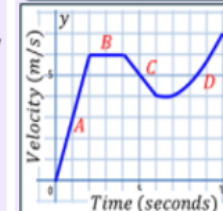
$$\text{Gradient} = \frac{\text{rise}}{\text{run}}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Calculate speed at a specific point by creating a tangent.

#### Velocity – Time graphs

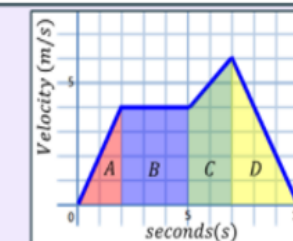
Velocity - Time graphs record the velocity of a particle moving along a straight line



Stage A  
Constant rate of acceleration  
Stage B  
Steady 'constant' speed  
Stage C  
Constant rate of deceleration  
Stage D  
Increasing rate of acceleration

The gradient of the line is the acceleration.

Area under graph = Distance travelled

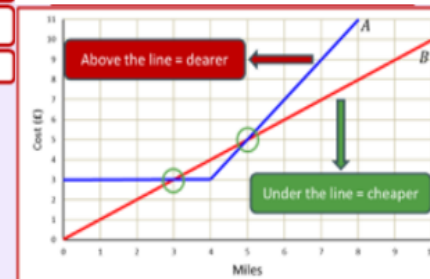
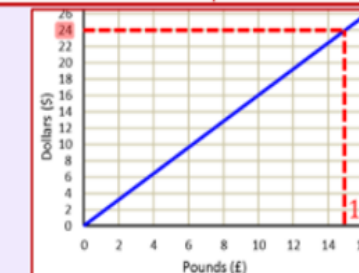


### Financial graphs

Currency Conversions

Predict future costs

Cost Comparisons



# Maths - Higher

## Standard Form

### Key vocabulary

Indices  
Power  
Power of ten  
Standard form  
Ordinary number  
Convert

### Picture perfect

#### Basic Structure

$$1 \leq a < 10 \leftarrow a \times 10^b \rightarrow \text{Whole number}$$

$$2.83 \times 10^6 = 2830000$$

Positive power of 10 = Large number

$$3.14 \times 10^{-4} = 0.000314$$

Negative power of 10 = Small decimal number

#### Powers of 10:

$$10^6 = 1000000$$

$$10^3 = 1000$$

$$10^2 = 100$$

$$10^1 = 10$$

$$10^0 = 1$$

$$10^{-1} = 0.1$$

$$10^{-2} = 0.01$$

$$10^{-3} = 0.001$$

$$10^{-6} = 0.000001$$

### Standard Form

Positive Power = Large Number

$$4.3 \times 10^6 = 4\,300\,000$$

Negative Power = Small Number

$$2.1 \times 10^{-3} = 0.021$$

### Always remember

#### Add/Subtract Standard form

Take numbers out of Standard form.  
Add/Subtract values.  
Convert answer back to Standard form.

$$\begin{aligned} & (3.23 \times 10^4) + (8.2 \times 10^3) \\ &= 32300 + 8200 \\ &= 40500 \\ &= \underline{\underline{4.05 \times 10^4}} \end{aligned}$$

#### Multiply/Divide Standard form

Separate the numbers and powers of 10.  
Multiply/Divide numbers,  
Apply laws of indices to power of 10s  
Give answer in Standard form

$$\begin{aligned} & (4.6 \times 10^4) \times (3 \times 10^3) \\ & \quad \boxed{4.6 \times 3} \times \boxed{10^4 \times 10^3} \\ & \quad 13.8 \times 10^7 \quad \times \\ & \quad \underline{\underline{1.38 \times 10^8}} \quad \checkmark \end{aligned}$$

$$\begin{aligned} & (1.56 \times 10^{-4}) \div (7.5 \times 10^{-7}) \\ & \quad \boxed{1.56 \div 7.5} \times \boxed{10^{-4} \div 10^{-7}} \\ & \quad 0.208 \times 10^3 \quad \times \\ & \quad \underline{\underline{2.08 \times 10^2}} \quad \checkmark \end{aligned}$$

### Assessment style question

Here are five numbers.

47 000       $4.5 \times 10^4$        $5 \times 10^3$        $2.8 \times 10^5$       125 000

Work out the difference between the largest and smallest numbers.

Give your answer in standard form.

Solve  $\frac{x}{0.02} = 3.1 \times 10^{-4}$

Give your answer in standard form.



# Maths - Higher

## Surds

### Key vocabulary

**Indices:** The number of times a number is multiplied by itself.

**Roots:** - Square Root - Cube Root

**Surds:** Surds are numbers left in 'square root form' (or 'cube root form' etc). They are therefore irrational numbers. The reason we leave them as surds is because in decimal form they would go on forever.

**Rationalise:** The process by which a fraction is rewritten so that the denominator contains only rational numbers, i.e. no roots.

### Picture perfect

#### Law of Surds

- $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$
- $\sqrt{a} \times \sqrt{a} = \sqrt{a^2} = a$
- $a\sqrt{b} \times c\sqrt{d} = ac\sqrt{bd}$
- $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$
- $\frac{\sqrt{a}}{\sqrt{b}} = \frac{\sqrt{a}}{\sqrt{b}} \cdot \frac{\sqrt{b}}{\sqrt{b}} = \frac{\sqrt{ab}}{b}$
- $\frac{a}{\sqrt{b}} = \frac{a}{\sqrt{b}} \cdot \frac{\sqrt{b}}{\sqrt{b}} = \frac{a\sqrt{b}}{b}$

### Always remember

Surds are expressions which contain an irrational square root

$$\sqrt{a} \times \sqrt{b} = \sqrt{a \times b} \quad \sqrt{3} \times \sqrt{7} = \sqrt{3 \times 7} = \sqrt{21}$$

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}} \quad \frac{\sqrt{6}}{\sqrt{10}} = \sqrt{\frac{6^3}{10^5}} = \sqrt{\frac{3}{5}}$$

$$\sqrt{a} + \sqrt{b} \neq \sqrt{a+b} \quad \sqrt{5} + \sqrt{20} = \sqrt{25} \times$$

Writing in the form  $a\sqrt{b}$

Think square numbers  $\sqrt{200}$  Square Factors = 4, 25, 100  
Choose the largest square factor  
 $\sqrt{100} \times \sqrt{2} = 10\sqrt{2}$

### Rationalising the denominator

Rationalising the denominator involves removing all of the roots from the bottom of a fraction.

$$\frac{6}{\sqrt{3}} \Rightarrow \frac{6}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} \quad \text{Multiply top and bottom by irrational root} \Rightarrow \frac{6\sqrt{3}}{\sqrt{9}} \Rightarrow \frac{6\sqrt{3}}{3}$$

### A more complex denominator

$$\frac{5}{3 + \sqrt{2}} \Rightarrow \frac{5}{3 + \sqrt{2}} \times \frac{3 - \sqrt{2}}{3 - \sqrt{2}} \quad \text{Multiply top and bottom by Conjugate (opposite root)}$$

$$= \frac{5(3 - \sqrt{2})}{(3 + \sqrt{2})(3 - \sqrt{2})} \quad \text{Expand and simplify}$$

$$= \frac{15 - 5\sqrt{2}}{9 - 3\sqrt{2} + 3\sqrt{2} - 2} = \frac{15 - 5\sqrt{2}}{7}$$

### Assessment style question

Question 1: Find the area of each of these rectangles

- (a)  $\sqrt{10}$  cm  $\sqrt{5}$  cm (b)  $\sqrt{12}$  cm  $\sqrt{3}$  cm (c)  $\frac{9}{2}$  cm  $2\sqrt{2}$  cm

Question 2: Find the perimeter of each of these rectangles

- (a)  $\frac{10}{3}$  cm  $\frac{5}{3}$  cm (b)  $\sqrt{10} + \sqrt{2}$  cm  $\sqrt{10} - \sqrt{2}$  cm (c)  $\sqrt{72}$  cm  $\sqrt{18}$  cm

Mrs Jenkins is making decorations for a wedding. She needs  $18\sqrt{5}$  metres of ribbon in total. Mrs Jenkins has 40 metres of ribbon. Does she have enough ribbon?



# Maths - Higher

## Standard Form

### Key vocabulary

Indices  
Power  
Power of ten  
Standard form  
Ordinary number  
Convert

### Assessment style question

Here are five numbers.

47 000     $4.5 \times 10^4$      $5 \times 10^3$      $2.8 \times 10^5$     125 000

Work out the difference between the largest and smallest numbers.

Give your answer in standard form.

### Picture perfect

#### Basic Structure

$$1 \leq a < 10 \quad \leftarrow a \times 10^b \quad \rightarrow \text{Whole number}$$

$$2.83 \times 10^6 = 2830000$$

Positive power of 10 = Large number

$$3.14 \times 10^{-4} = 0.000314$$

Negative power of 10 = Small decimal number

Powers of 10:

$$10^6 = 1000000$$

$$10^3 = 1000$$

$$10^2 = 100$$

$$10^1 = 10$$

$$10^0 = 1$$

$$10^{-1} = 0.1$$

$$10^{-2} = 0.01$$

$$10^{-3} = 0.001$$

$$10^{-6} = 0.000001$$

### Standard Form

Positive Power = Large Number

$$4.3 \times 10^6 = 4\,300\,000$$

Negative Power = Small Number

$$2.1 \times 10^{-3} = 0.021$$

### Always remember

#### Add/Subtract Standard form

Take numbers out of Standard form.

Add/Subtract values.

Convert answer back to Standard form.

$$(3.23 \times 10^4) + (8.2 \times 10^3)$$

$$= 32300 + 8200$$

$$= 40500$$

$$= 4.05 \times 10^4$$

#### Multiply/Divide Standard form

Separate the numbers and powers of 10.

Multiply/Divide numbers,

Apply laws of indices to power of 10s

Give answer in Standard form

$$(4.6 \times 10^4) \times (3 \times 10^3)$$

$$4.6 \times 3 \times 10^4 \times 10^3$$

$$13.8 \times 10^7 \quad \times$$

$$1.38 \times 10^8 \quad \checkmark$$

$$(1.56 \times 10^{-4}) \div (7.5 \times 10^{-7})$$

$$1.56 \div 7.5 \times 10^{-4} \div 10^{-7}$$

$$0.208 \times 10^3 \quad \times$$

$$2.08 \times 10^2 \quad \checkmark$$



# Maths - Higher

## Surds

### Key vocabulary

**Indices:** The number of times a number is multiplied by itself.

**Roots:** - Square Root - Cube Root

**Surds:** Surds are numbers left in 'square root form' (or 'cube root form' etc). They are therefore irrational numbers. The reason we leave them as surds is because in decimal form they would go on forever.

**Rationalise:** The process by which a fraction is rewritten so that the denominator contains only rational numbers, i.e. no roots.

### Picture perfect

#### Law of Surds

- $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$
- $\sqrt{a} \times \sqrt{a} = \sqrt{a^2} = a$
- $a\sqrt{b} \times c\sqrt{d} = ac\sqrt{bd}$
- $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$
- $\frac{\sqrt{a}}{\sqrt{b}} = \frac{\sqrt{a}}{\sqrt{b}} \cdot \frac{\sqrt{b}}{\sqrt{b}} = \frac{\sqrt{ab}}{b}$
- $\frac{a}{\sqrt{b}} = \frac{a}{\sqrt{b}} \cdot \frac{\sqrt{b}}{\sqrt{b}} = \frac{a\sqrt{b}}{b}$

### Always remember

Surds are expressions which contain an irrational square root

$$\sqrt{a} \times \sqrt{b} = \sqrt{a \times b} \quad \sqrt{3} \times \sqrt{7} = \sqrt{3 \times 7} = \sqrt{21}$$

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}} \quad \frac{\sqrt{6}}{\sqrt{10}} = \sqrt{\frac{6^3}{10^5}} = \sqrt{\frac{3}{5}}$$

$$\sqrt{a} + \sqrt{b} \neq \sqrt{a+b} \quad \sqrt{5} + \sqrt{20} = \sqrt{25} \times$$

Writing in the form  $a\sqrt{b}$

Think square numbers  $\sqrt{200}$  Square Factors = 4, 25, 100  
Choose the largest square factor  
 $\sqrt{100} \times \sqrt{2} = 10\sqrt{2}$

### Rationalising the denominator

Rationalising the denominator involves removing all of the roots from the bottom of a fraction.

$$\frac{6}{\sqrt{3}} \Rightarrow \frac{6}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} \quad \text{Multiply top and bottom by irrational root} \Rightarrow \frac{6\sqrt{3}}{\sqrt{9}} \Rightarrow \frac{6\sqrt{3}}{3}$$

### A more complex denominator

$$\frac{5}{3+\sqrt{2}} \Rightarrow \frac{5}{3+\sqrt{2}} \times \frac{3-\sqrt{2}}{3-\sqrt{2}} \quad \text{Multiply top and bottom by Conjugate (opposite root)}$$

$$= \frac{5(3-\sqrt{2})}{(3+\sqrt{2})(3-\sqrt{2})} \quad \text{Expand and simplify}$$

$$= \frac{15-5\sqrt{2}}{9-3\sqrt{2}+3\sqrt{2}-2} = \frac{15-5\sqrt{2}}{7}$$

### Assessment style question

Question 1: Find the area of each of these rectangles

- (a)  $\sqrt{10}$  cm  $\sqrt{5}$  cm (b)  $\sqrt{12}$  cm  $\sqrt{3}$  cm (c)  $9\sqrt{2}$  cm  $2\sqrt{2}$  cm

Question 2: Find the perimeter of each of these rectangles

- (a)  $10\sqrt{3}$  cm  $5\sqrt{3}$  cm (b)  $\sqrt{10} + \sqrt{2}$  cm  $\sqrt{10} - \sqrt{2}$  cm (c)  $\sqrt{72}$  cm  $\sqrt{18}$  cm

Mrs Jenkins is making decorations for a wedding. She needs  $18\sqrt{5}$  metres of ribbon in total. Mrs Jenkins has 40 metres of ribbon. Does she have enough ribbon?

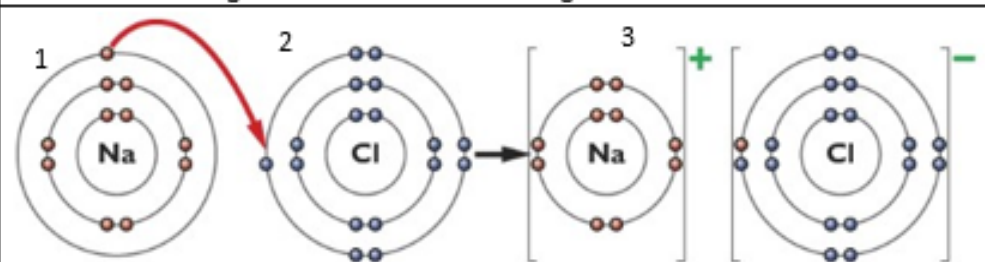


## 1. Key Words

| Key Word                 | Definition  |
|--------------------------|---|
| Ion                      | Charged particle  |
| Electrostatic attraction | Attraction between ions of opposite charge  |
| Intermolecular forces    | Forces that pull molecules together   |
| Ionic bonding            | Bonding that occurs between a metal and non-metal elements, where electrons are lost or gained from the outer shell of the atom |
| Covalent bonding         | Bonding that occurs between non-metal elements, where electrons are shared on the outer shell of the atoms                      |
| Metallic bonding         | Bonding that occurs in metal elements and alloys  |
| Delocalised electron     | Electron that can move freely in the element  |

## 2. Ionic Bonding

Metal atoms lose electrons to become positive ions  
Non-metal atoms gain electrons to become negative ions



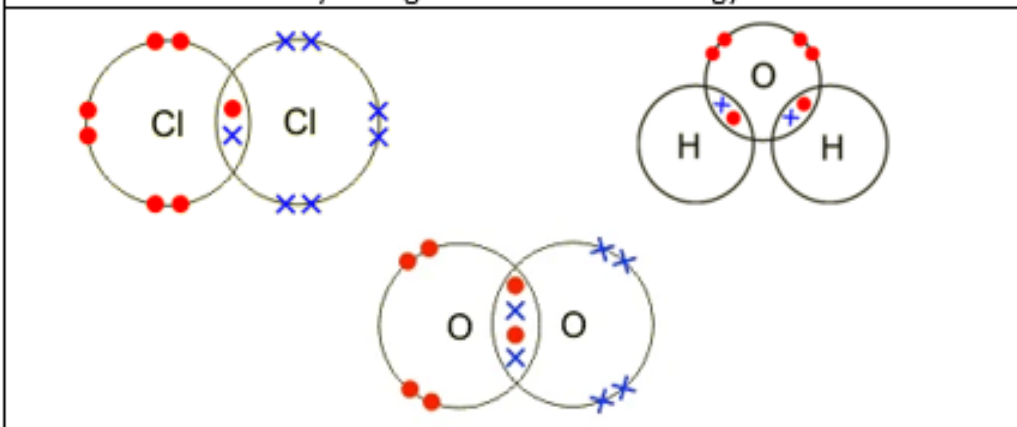
|   |  |
|---|--|
| 1 | Sodium loses an electron from its outer shell to become Na <sup>+</sup>        |
| 2 | Chlorine gains an electron to its outer shell to become Cl <sup>-</sup>        |
| 3 | The oppositely charged ions are pulled together by an electrostatic attraction |

## 3. Giant Ionic Lattice

| Properties                                      | Reason   |
|---|--|
| High melting and boiling points                 | Atoms are arranged in a large lattice structure with oppositely charged ions next to each other. This means a lot of energy is needed to overcome the forces of attraction |
| Do not conduct electricity as a solid           | Ions are fixed in position and not able to move  |
| Conducts electricity as a liquid or in solution | Ions can move freely and carry a charge  |

## 4. Covalent Bonding

In a covalent bond the electrons on the outer shell are shared to make up full and stable outer shell.  
Covalent bonds are very strong and take a lot of energy to break

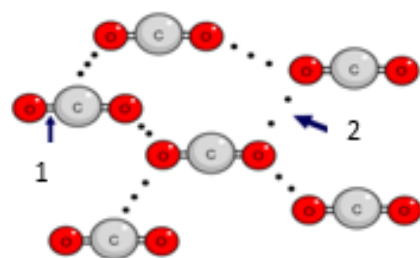


|   |                                |   |                          |   |                         |
|---|--------------------------------|---|--------------------------|---|-------------------------|
| 1   | Chlorine gas - Cl <sub>2</sub> | 2 | Water - H <sub>2</sub> O | 3 | Oxygen - O <sub>2</sub> |
| Chlorine and water have single bonds as they share <b>ONE</b> pair of electrons |                                |   |                          |   |                         |
| Oxygen has a double bond as it shares <b>TWO</b> pairs of electrons             |                                |   |                          |   |                         |



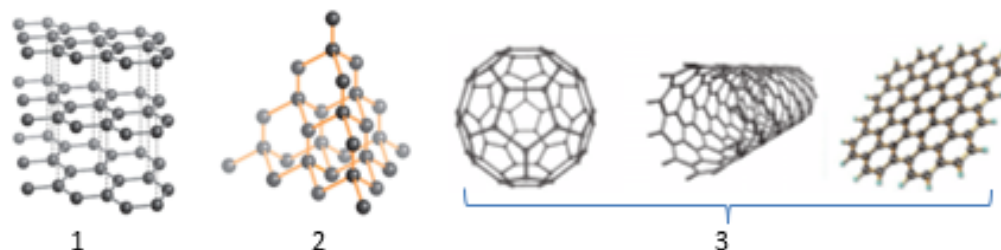
## 5. Small covalent molecules

Properties: Gases, Low boiling and melting points, Low density



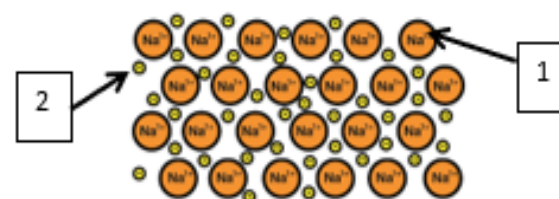
- |   |  |
|---|--|
| 1 | Strong covalent bonds that require a lot of energy to break          |
| 2 | Weak intermolecular forces that do not required much energy to break |

## 6. Allotropes of carbon

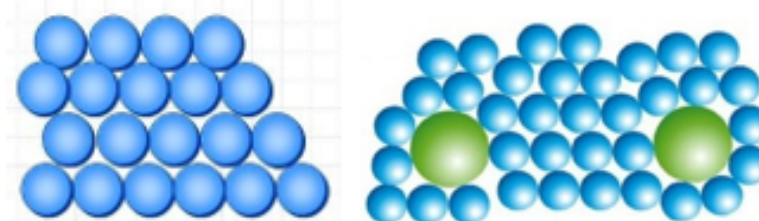


| Property                   | 1                   | 2                   | 3                         |
|----------------------------|---------------------|---------------------|---------------------------|
| Name                       | Graphite            | Diamond             | Graphene or fullerene     |
| Number of bonds per carbon | 3                   | 4                   | 3                         |
| Melting point              | High                | Very high           | High                      |
| Hardness                   | Soft                | Very hard           | Flexible and strong       |
| Delocalised electrons      | yes                 | No                  | Yes                       |
| Conduct electricity        | Yes                 | No                  | Yes                       |
| Uses                       | Pencils, electrodes | Drill bits and gems | Electronics and nanotubes |

## 7. Metallic Bonding



- |   |                       |
|---|-----------------------|
| 1 | Positive metal ions   |
| 2 | Delocalised electrons |













- |   |            |  |
|---|------------|--|
| 3 | Pure Metal | Metal can be easily shaped as the layers can easily slide over each other  |
| 4 | Alloy      | Atoms of the different metals are different sizes so the particles are not arranged in layers. This makes the metal harder as the atoms cannot slide over each other |

### Challenge Questions

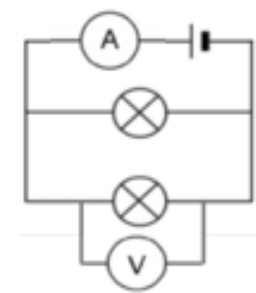
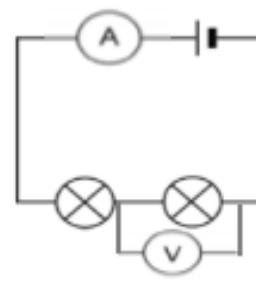
- |   |  |
|---|--|
| 1 | Why can graphite conduct electricity, but diamond cannot?            |
| 2 | Draw the ions for the ionic bonding of magnesium oxide.              |
| 3 | Explain why carbon dioxide is a gas, but sodium chloride is a solid. |
| 4 | Evaluate the use of alloys and pure metals in building materials     |

| 1. Element Symbols |                                |  |
|--------------------|--------------------------------|--|
|                    | Key word                       | Definition   |
| 1                  | Cell                           | Powers the circuit   |
| 2                  | Battery                        | Several cells in series  |
| 3                  | Filament bulb                  | Emits light when a current flows through it  |
| 4                  | Ammeter                        | Used to measure current  |
| 5                  | Voltmeter                      | Used to measure potential difference   |
| 6                  | Fixed resistor                 | A component that slows the current in the circuit by a fixed amount  |
| 7                  | Variable resistor              | A resistor where the resistance in can be changed  |
| 8                  | Diode                          | Resistor that has a high resistance in the negative direction around the circuit, but a low resistance in the positive |
| 9                  | Light emitting diode (LED)     | Resistor that emits light when a current flow through it   |
| 10                 | Light dependent resistor (LDR) | Resistor that is sensitive to light  |
| 11                 | Thermistor                     | Resistor that is sensitive to temperature  |

|   |   |   |  |    |   |
|---|---|---|--|----|---|
| 1 |  | 6 |  | 10 |  |
| 2 |  | 7 |  | 11 |  |
| 3 |  | 8 |  |    |   |
| 4 |  | 9 |  |    |   |

| 2. Electricity Equations |            |   |
|--------------------------|------------|---|
|                          | Equation   | Symbols and units   |
| Charge                   | $Q = It$   | Q = Charge (Coulombs – C)<br>I = Current (Amps – A)<br>t = time (seconds – s)                       |
| Resistance               | $V = IR$   | V = potential difference (Volts – V)<br>I = Current (Amps – A)<br>R = Resistance (Ohms – $\Omega$ ) |
| Power                    | $P = I^2R$ | P = Power (Watts – W)<br>I = Current (Amps – A)<br>R = Resistance (Ohms – $\Omega$ )                |
| Power                    | $P = IV$   | P = Power (Watts – W)<br>I = Current (Amps – A)<br>V = potential difference (Volts – V)             |
| Energy transferred       | $E = QV$   | E = Energy (Joules – J)<br>Q = Charge (Coulombs – C)<br>V = potential difference (Volts – V)        |

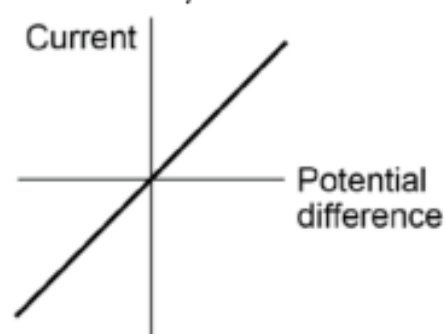
| 3. IR Characteristics   |   |
|---|---|
| Parallel  | Series  |
|  |  |
| Current splits at the junction  | Current is the same at all point in the circuit                                       |
| Potential difference is not shared  | Potential difference is shared  |
| Calculating total resistance  |   |
| $1/R_{total} = 1/R_1 + 1/R_2 + 1/R_3 \dots\dots\dots$                                 | $R_{total} = R_1 + R_2 + R_3 \dots\dots\dots$   |



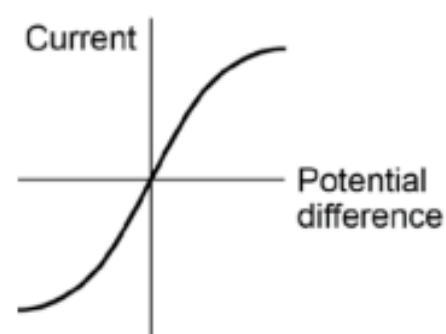
## 4. I-V Characteristics

Different types of components in a circuit will be affected differently by changes in current and potential difference.

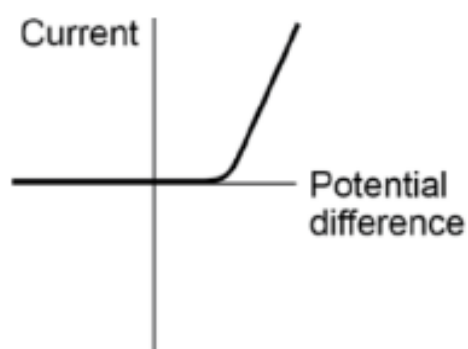
Fixed resistor / Metal wire



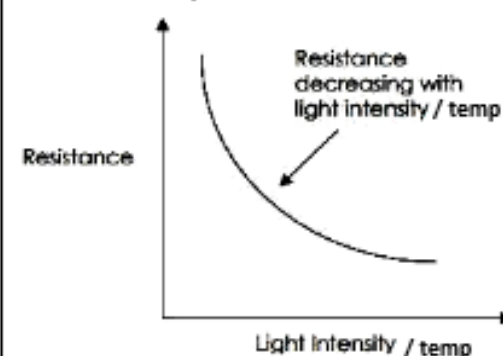
Filament bulb



Diode



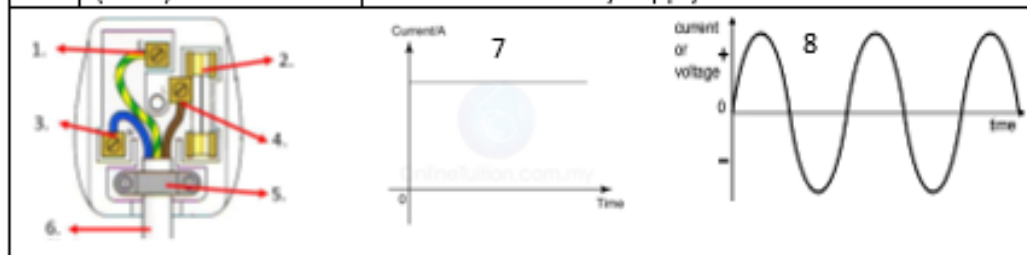
Thermistor / LDR



## Challenge Questions

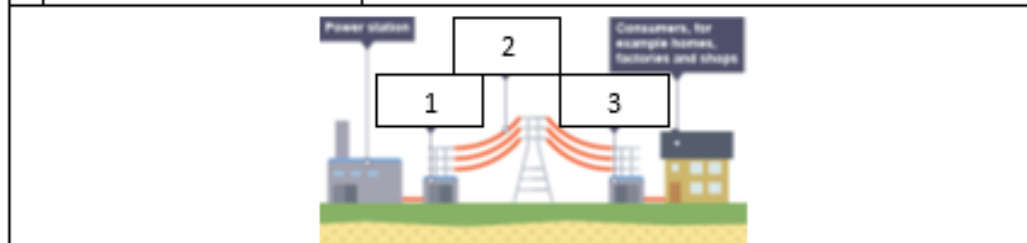
|   |   |
|---|---|
| 1 | Why do you think the lights in a house need to be on a parallel circuit?    |
| 2 | Describe the relationship between the length of a wire and the resistance.  |
| 3 | Compare and explain the I-V characteristics of a filament bulb and a diode. |
| 4 | Explain how an LDR is used to control street lamps                          |

|   |                            |  |
|---|----------------------------|--|
| 1 | Earth wire                 | Protects the circuit from causing electrocution in metal appliances                        |
| 2 | Fuse                       | Melts if the current is too high so that the circuit is broken                             |
| 3 | Neutral wire               | Carries the current away from the appliance  |
| 4 | Live wire (230V)           | Carries the current to the appliance   |
| 5 | Cable grip                 | Holds the cables in place to prevent them being pulled out                                 |
| 6 | Double insulated cable     | Prevents an electric shock   |
| 7 | Direct current             | Current that is constant in the negative or positive direction, usually found in batteries |
| 8 | Alternating current (50Hz) | Current that changes direction 50 times a second, from the mains electricity supply        |



## 6. Electricity Equations

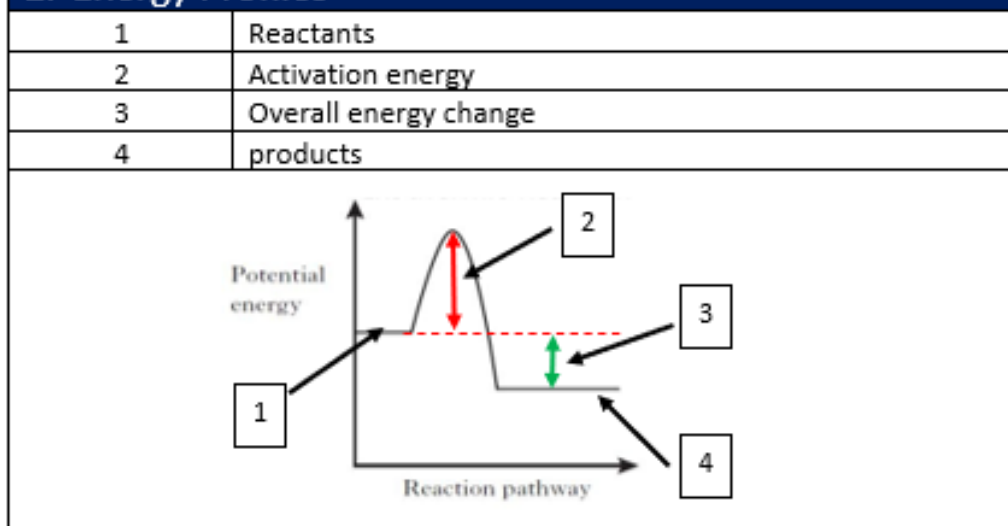
|   |                       |   |
|---|-----------------------|---|
| 1 | Step up transformer   | Increases the voltage and decreases the current |
| 2 | Transmission cables   | High voltage in cables reduces energy losses    |
| 3 | Step down transformer | Decreases the voltage and increases the current |



## 1. Key Words

| Key Word          | Definition   |
|-------------------|--|
| Exothermic        | Reaction that has an overall increase in thermal energy  |
| Endothermic       | Reaction that has an overall decrease in thermal energy  |
| Activation energy | Amount of energy needed for a reaction to occur  |
| Decomposition     | Use of thermal energy to break down a compound e.g. calcium carbonate $\rightarrow$ calcium oxide + carbon dioxide |

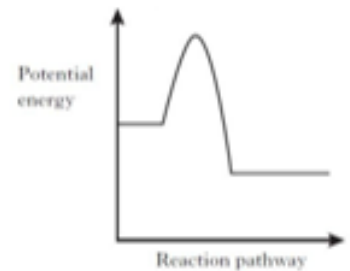
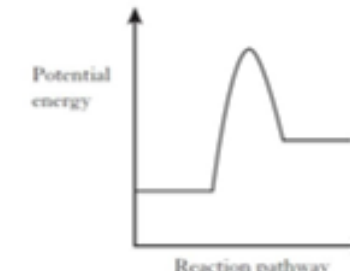
## 2. Energy Profiles



## Challenge Questions

|   |  |
|---|--|
| 1 | What type of reaction occurs in the following: sports injury cold pack and burning magnesium?  |
| 2 | Why does the temperature increase in an exothermic reaction?   |
| 3 | How could you investigate if a reaction was exothermic or endothermic?   |
| 4 | If the overall energy change in a reaction is -30 kJ. Calculate the bond energy of I - Cl. (use the table in section 4 to help you)<br>$I-I + Cl-Cl \rightarrow 2I-Cl$ |

## 3. Exothermic and Endothermic Reactions

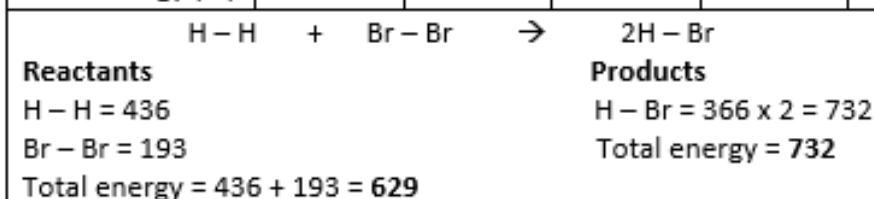
| Exothermic reaction   | Endothermic reactions  |
|---|--|
|                                  |                                     |
| Energy of the products is lower than the energy of the reactants, so thermal energy is released to the surroundings | Energy of the products is higher than the energy of the reactants, so thermal energy is taken in from the surroundings |

## 4. Calculating Bond Energies (HT only)

Energy must be supplied to break the bonds in the reactants  
Energy is released when bonds in the products are made

### Example:

| Bond             | H - H | Br - Br | H - Br | I - I | Cl - Cl |
|------------------|-------|---------|--------|-------|---------|
| Bond energy (kJ) | 436   | 193     | 366    | 150   | 242     |



$$\text{Overall energy change} = 629 - 732 = -103 \text{ kJ}$$

The reaction is exothermic

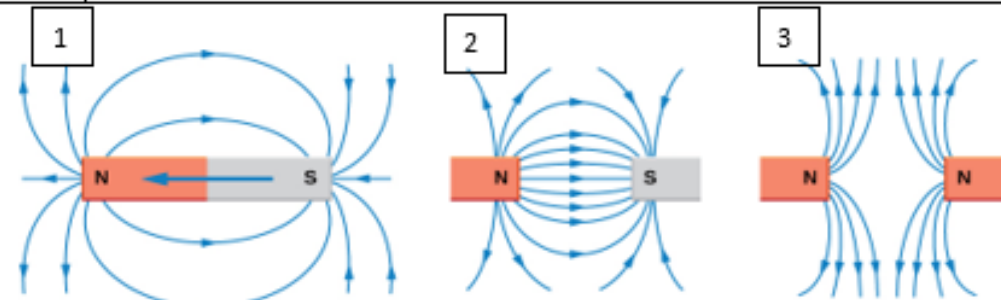


## 1. Key Words

|                  |   |
|------------------|---|
| Permanent magnet | A material that is always magnetic                                  |
| Magnetic field   | Area around a magnet where the force of magnetism affects an object |
| Poles            | The ends of a magnet where the magnetic field is the strongest      |

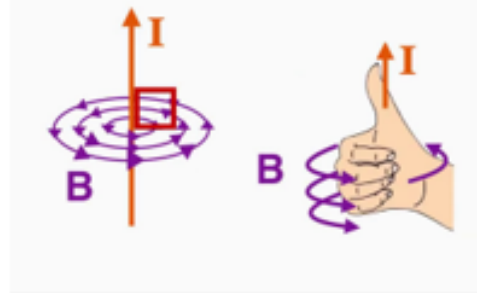
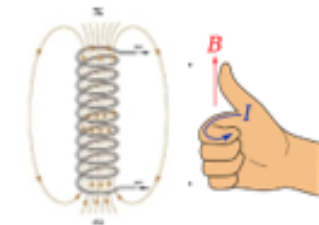
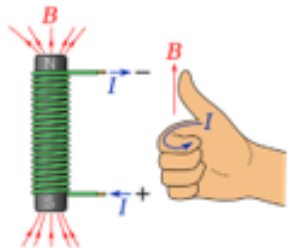
## 2. Magnetic fields

|   |   |
|---|---|
| 1 | Magnetic field of a bar magnet travels from north to south with the strongest field strength at the <u>poles</u> shown by the lines being closer together |
| 2 | When opposite poles are placed near each other the magnetic field travels from the north to south poles of each magnet causing a force of attraction      |
| 3 | When like poles are placed near each other the magnetic field of each magnet repels the other causing the magnets to push away from each other            |



## 3. Current-carrying wire

The right hand thumb rule can be used to work out the direction of the magnetic field

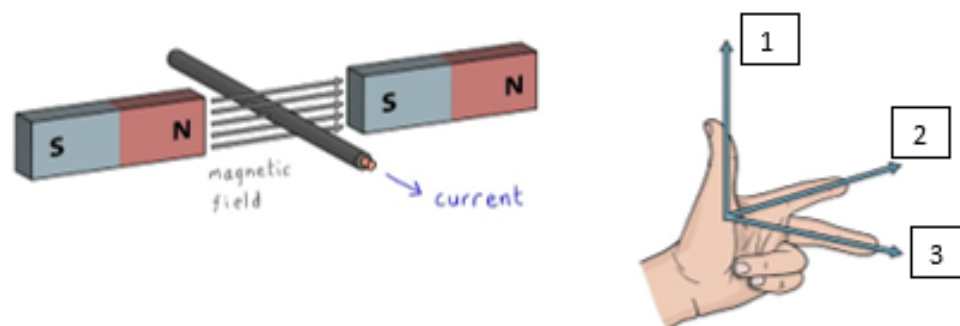
|  |   |   |
|--|---|---|
| Straight wire  | I | Direction of current  |
|  | B | Direction of magnetic field   |
|    |   |   |
| Solenoid (coiled wire)   | I | Direction of current  |
|  | B | Direction of magnetic field   |
|   |   |   |
| <b>Electromagnet</b><br>Adding an iron core to a solenoid increases the strength of the magnetic field.<br>An electromagnet can be turned on or off. |   |  |

## 4. The Motor Effect – HT only

The motor effect is when a magnet and a current carrying conductor exert a force on each other

### Flemings Left Hand Rule

|   |                                 |
|---|---------------------------------|
| 1 | Direction of the force          |
| 2 | Direction of the magnetic field |
| 3 | Direction of the current        |



### Challenge Questions

|   |   |
|---|---|
| 1 | Suggest some uses for an electromagnet and why it is useful in each situation.  |
| 2 | How could you use a magnet to sort 3 unlabelled pieces of metal to identify a magnet, a piece of iron and a piece of aluminium? |
| 3 | Explain how the motor effect is used to generate electricity in a power station   |
| 4 | Explain the purpose of a split ring commutator in an electric motor   |

## 5. Magnetic Flux Density – HT only

The magnetic flux density is a measure of the total magnetic field passing through an area.

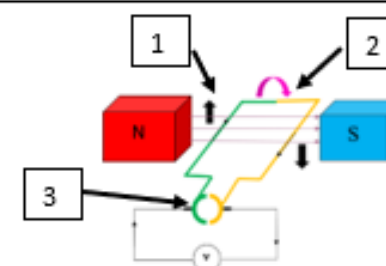
The size of a force on a conductor can be calculated using the following formula

$$F = BIl$$

|   |                                    |
|---|------------------------------------|
| F | Force in newtons (N)               |
| B | Magnetic flux density in tesla (T) |
| I | Current in amps (A)                |
| L | Length in metres (m)               |

## 6. Electric Motors – HT only

|   |   |
|---|---|
| 1 | Direction of force                            |
| 2 | Current carrying wire and direction of travel |
| 3 | Split-ring commutator                         |



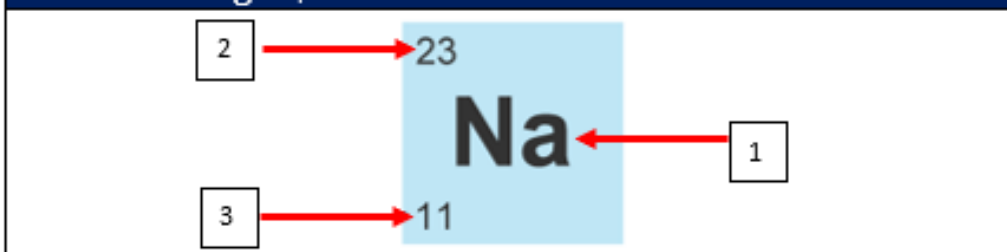
Direct current is passed through the wire → Each side of the coil experiences opposite forces → The coil rotates



## 1. Key Words

|                                 |   |
|---------------------------------|---|
| Relative atomic mass ( $A_r$ )  | This is the relative mass of an atom of an element compared to other elements.          |
| Relative formula mass ( $M_r$ ) | This is the <u>sum total</u> of the relative atomic mass of all the atoms in a compound |

## 2. Calculating $M_r$



|   |   |
|---|---|
| 1 | Element symbol  |
| 2 | Atomic mass (total number of protons and neutrons in the nucleus) |
| 3 | Atomic number (number of protons in the nucleus)                  |

### Example 1: Sodium Chloride (NaCl)

Atomic mass of Na = 23  
Atomic mass of Cl = 35.5  
 $M_r = 23 + 35.5 = 58.5$

### Example 2: Aluminium Oxide ( $Al_2O_3$ )

Atomic mass of Al = 27      There are 2 atoms of Al, so  $27 \times 2 = 54$   
Atomic mass of O = 16      There are 3 atoms of O, so  $16 \times 3 = 48$   
 $M_r = 54 + 48 = 102$

## 3. Percentage by mass

Percentage by mass =  $\frac{\text{total atomic mass of element in the compound} \times 100}{\text{Relative formula mass of the compound}}$

### Example 1: Percentage by mass of sodium in sodium chloride

Atomic mass of Na = 23  
 $M_r$  of NaCl = 58.5  
Percentage by mass =  $\frac{23 \times 100}{58.5} = 39.3\%$

### Example 2: Percentage by mass of oxygen in aluminium oxide

Atomic mass of O = 16      There are 3 atoms of O, so  $16 \times 3 = 48$   
 $M_r$  of  $Al_2O_3$  = 102  
Percentage by mass =  $\frac{48 \times 100}{102} = 47\%$

## 4. Calculating Moles (HT only)

|                   |   |
|-------------------|---|
| Mole              | Number of particles needed to make the mass equal to the relative atomic mass |
| Avogadro constant | $6.022 \times 10^{23}$ particles in 1 mole                                    |

$$\text{Moles (M)} = \frac{\text{mass (g)}}{\text{Relative formula mass}}$$

### Example: 27.4g of sodium chloride is made in a reaction, how many moles have been made?

$M_r$  of NaCl = 58.5  
Moles (M) =  $\frac{27.4}{58.5} = 0.47M$

## 5. Calculating concentration

Conversions: there are 1000cm<sup>3</sup> in 1dm<sup>3</sup>

128cm<sup>3</sup> in to dm<sup>3</sup>     $128 \div 1000 = 0.128\text{dm}^3$

1.45dm<sup>3</sup> in to cm<sup>3</sup>     $1.45 \times 1000 = 1450\text{cm}^3$

$$\text{Concentration (g/dm}^3\text{)} = \frac{\text{mass (g)}}{\text{Volume (dm}^3\text{)}}$$

**Example: 27.4g of sodium chloride is added to 500cm<sup>3</sup> of water. What is the concentration in g/dm<sup>3</sup>?**

Conversion:  $500\text{cm}^3 \div 1000 = 0.5\text{dm}^3$

$$\text{Concentration} = \frac{27.4}{0.5} = 54.8 \text{ g/dm}^3$$

## 6. Calculating concentration in Moles (HT only)

$$\text{Concentration (M/dm}^3\text{)} = \frac{\text{Moles(M)}}{\text{Volume (dm}^3\text{)}}$$

**Example: 27.4g of sodium chloride is added to 500cm<sup>3</sup> of water. What is the concentration in g/dm<sup>3</sup>?**

Conversion:  $500\text{cm}^3 \div 1000 = 0.5\text{dm}^3$

$$\text{Concentration} = \frac{27.4}{0.5} = 54.8 \text{ g/dm}^3$$

## Challenge Questions

- |   |  |
|---|--|
| 1 | Calculate the M <sub>r</sub> of the following compounds: $\text{LiF}$ , $\text{MgCl}_2$ , $\text{H}_2\text{SO}_4$ and $\text{MgSO}_4$                                |
| 2 | Identify is the following sentence is correct<br>'The percentage by mass of Mg in $\text{MgCl}_2$ , is the same as the percentage by mass of Be in $\text{BeF}_2$ .' |
| 3 | What mass of potassium chloride ( $\text{KCl}$ ) is needed to make a 500cm <sup>3</sup> solution with a concentration of 0.5M/dm <sup>3</sup> ?                      |
| 4 | Using the Avogadro constant, calculate the number of particles in 47g of aluminium oxide   |



## KNOWLEDGE ORGANISER



### UNIT R082 - DIGITAL GRAPHICS



#### Target audience:

You need to know your target audience: Who are they? What kind of things do they do? What products do they use? How old are they? What are they interested in? The answers to these questions and many more will help you better understand the people you are designing for. Getting an understanding of these individuals helps you create with ease and make something you know will relate to them

#### Asset table

An asset table is a list of all of the assets, images and information you have collected for the project - listing where you got it from and describing any legal issues with using it

#### Planning

You will need to create a work plan which lists all of the tasks involved in the whole project. You then need to estimate how long each task will take and create a chart or diary to record how long they REALLY take to complete. Build in some contingency time in case things go wrong! Add this to the plan and explain why you had to use it if things don't go according to plan all the time.

#### Client Requirements

Your client is the person you will be working for. They will tell you what to plan, design or create for them.

The Client will set out requirements that they want you to follow when you plan the project - eg:

Purpose, Theme, Style, Genre, Content



#### Scenario:

**Your client, a game publisher called NuComputerGames, is releasing a computer game called TIMECHASER, aimed at 14-16 year olds and priced at £29.99. In the game the player can travel through time using doorways which are open for a limited period of time. The player has a special Timewatch to help them find the doorways. NuComputerGames plan to promote this game through an advertisement in a magazine which is available in print and online formats. This should be created as a digital graphic and should include a range of appropriate text and images to make it suitable as an advertisement for the game. NuComputerGames requires two versions of the final digital graphic. One will be of suitable quality to be used in a full colour printed magazine and will be a half page advertisement of 215 mm wide x 140 mm high. The graphic should then be re-purposed for use online at a lower resolution. This should be 600px wide to fit the online format. Read through all of the tasks carefully, so that you know what you will need to do to complete this assignment.**

#### Export Options

Digital Graphics need to be saved in different formats for different purposes - the size and resolution will be different for:

Print use

Websites

Multimedia

Check the client brief!

#### What type of file formats do digital graphics use?

.tiff  
.jpg  
.png  
.bmp  
.gif  
.pdf

You will need to find out the different uses and properties of these different file formats and be able to describe why different formats are suitable for different situations.

#### Why are digital graphics used?

- To entertain
- To inform
- To advertise
- To promote
- To educate

#### What can you change about an image to make it more suitable for different uses?

- Size in Pixels
- Resolution (Dots per inch)
- Quality
- Compression

#### Where are digital graphics used?

- Magazine covers
- CD/DVD covers
- Adverts
- Websites
- Multimedia Products
- Games

#### Visualisation

A Visualisation is a sketch or diagram of what you think the final graphic might look like

#### Why are digital graphics used?

- To entertain
- To inform
- To advertise
- To promote
- To educate

#### Which resources will be needed to make your digital graphic?

- Digital Camera
- Internet
- Computer System
- Serif Software

#### Tools and Techniques

You need to show evidence of the tools and techniques you have used:

- Cropping / Cutout Studio
- Rotating
- Changing Brightness / contrast/Colour adjustment

#### Technical Compatibility

Your final image must meet the technical specification set by the client.

Correct size in Pixels and Correct Resolution

In Serif Draw Plus - File > Export > Adjust the size and resolution to fit the client brief

## Eduqas Design & Technology (1-9) Materials: Smart Materials

### 1. Modern materials

**1.1 Corn Starch Polymers** – plastics that are **biodegradable** and not toxic to the environment. They are easy to recycle.

| Name                      | Uses   | Characteristics   |
|---------------------------|--|---|
| Polylactic acid (PLA)     | <ul style="list-style-type: none"> <li>Disposable food and drink containers</li> <li>3D Printed Items</li> </ul> | <ul style="list-style-type: none"> <li>Smooth or textured finish</li> <li>Easy to Colour</li> <li>Easy to mould</li> <li>Fully biodegradable</li> </ul>                  |
| Polyhydroxybutyrate (PHB) | <ul style="list-style-type: none"> <li>Bottles</li> <li>Pots</li> <li>Disposable food containers</li> </ul>      | <ul style="list-style-type: none"> <li>Smooth or textured finish.</li> <li>Easy to Colour</li> <li>Easy to mould</li> <li>Fully (but slowly) biodegradable.</li> </ul>  |
| Biopol™                   |  |   |

**1.2 Flexible MDF** – Is made from wood pulp fibres in the same way as standard MDF, with the addition of grooves cut along the length of the board leaving about 2mm of the MDF intact which allows the MDF to become flexible.



**1.3 Titanium** – Pure titanium does not react with the human body and is used by the medical profession for artificial joints and dental implants. It has a high strength to weight ratio and has excellent corrosion resistance.



**1.4 Graphene** – thinnest material ever discovered, a million times thinner than a human hair, 200 times stronger than steel. It is transparent, impermeable and highly conductive.



**1.5 Nanomaterials** - Their use in electronics has helped miniaturisation whilst improving conductivity. IN the textiles industry, they have been used as protective coatings to improve water resistance and give UV protection.



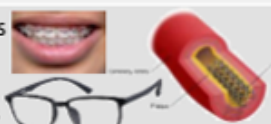

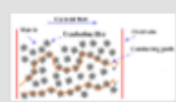
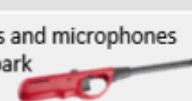



**1.6 Metal Foams** - Porous metal structures, often made from Titanium and Aluminium use as little as 25% of the mass. This makes them extremely lightweight but retaining most of the properties of the base material.



### 2. Smart Materials

**A material that reacts to an external stimulus or input to alter its functional or aesthetic properties..** They can react to heat, light, pressure, moisture and electricity.

| Name                                  | Stimulus                        | What is does?  | Uses   |
|---------------------------------------|---------------------------------|--|--|
| 2.1 Thermochromic pigments            | Heat                            | Changes colour when heat is applied.   | <ul style="list-style-type: none"> <li>Flexible thermometers</li> <li>Temperature indicators</li> <li>Novelty goods</li> </ul>                                        |
| 2.2 Photochromic pigments & particles | UV Light (Natural Light)        | Changes colour in sunlight/UV Light  | <ul style="list-style-type: none"> <li>Transition Lens Sunglas</li> <li>Nail varnish</li> <li>Clothing</li> <li>Novelty goods</li> </ul>                              |
| 2.3 Shape memory alloy<br>Nitinol     | Heat or Electricity             | Returns to original/pre set shape when heated to 70°C or electricity is applied. | <ul style="list-style-type: none"> <li>Glasses Frames</li> <li>Fire Sprinklers</li> <li>Dental Braces</li> <li>Surgical Stents</li> </ul>                             |
| 2.4 Polymorph                         | Heat                            | Becomes mouldable by hand when heated to 62°C                                    | <ul style="list-style-type: none"> <li>Personalisation of products</li> <li>Repairs</li> <li>Prototyping &amp; Modelling</li> </ul>                                  |
| 2.5 Quantum Tunnelling Composite      | Pressure                        | Varies the amount of electrical current depending on pressure applied.           | <ul style="list-style-type: none"> <li>Touch sensitive pads</li> <li>Wearable technology</li> <li>Variable speed controls</li> </ul>                                |
| 2.6 Piezoelectric Material            | Movement, stress or electricity | Stress or movement produces electrical signal or <i>vice versa</i> .             | <ul style="list-style-type: none"> <li>Mobile phone speakers and microphones</li> <li>Gas Lighters ignition spark</li> </ul>                                        |
| 2.7 Litmus Paper                      | Levels of PH in substances.     | Changes colour depending on chemical balance.                                    | <ul style="list-style-type: none"> <li>Scientific experiments</li> <li>Soil testing for gardener/farmers</li> <li>Testing swimming pools and fish tanks</li> </ul>  |




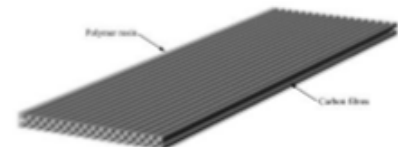


## Eduqas Design & Technology (1-9)

### Materials: Composite materials & Technical Textiles






#### 1. Composite Materials

2 or more materials combined to create a new material with improved properties.

| Name                                  | Appearance   | Image   | Characteristics  | Uses   |
|---------------------------------------|--|---|--|--|
| Glass Reinforced Plastic (GRP)        | Glass fibre matting covered in a smooth resin with a glossy finish. Can be coloured, complex shapes can be formed.   |  | Lightweight, strong, resistant to heat, chemicals and corrosion. Waterproof. Labour intensive to produce.  | Car body parts, pipes, helmets, boat hulls.                    |
| Carbon Fibre Reinforced Plastic (CRP) | Carbon in the form of graphite is soft. But very thin strands of carbon are very stiff. These carbon fibres are useful for reinforcing other materials to make them tougher. They are embedded in strong plastics to make composite materials. |  | Lightweight, strong, good tensile strength, rigid, very expensive resistant to heat, chemicals and corrosion. Waterproof. Labour intensive to produce. | Skateboards, boat hulls and high performance sports equipment. |

#### 2. Technical Textiles

A technical textile is a textile developed with enhanced properties to withstand specific uses.

| Name   | Appearance  | Image   | Characteristics  | Uses   |
|--|---|---|--|--|
| Gore-Tex®  | Thin membrane between an liner and outer material.                        |  | Has the desirable properties of nylon, but is also 'breathable'. Lets water vapour from sweat pass to the outside, but it stops rain drops from passing to the inside.   | Outdoor clothing and footwear  |
| Kevlar® by DuPont™ (Polyparaphenylene terephthalamide) | Naturally a yellowish gold material which can be dyed.                    |  | Very strong artificial fibre. It is woven to make a material that is used for light and flexible body armour. High thermal protection, non flammable, good chemical resistance.  | Body Armour, safety clothing   |
| Conductive Fabrics and Thread                          | A silvery fabric or thread.   |  | Electrical current passes through the thread linking electrical components. It allows flexible and wearable control of electronic products.  | Wearable inputs and processes such as switches, lights, clothing, toys etc.    |
| Fire Resistant Fabrics                                 | Appearance varies. Most can be dyed to change colour.                     |  | Protects the wearer from ignition from naked flame. Heat resistant.  | Fire blankets, safety clothing. Race car driver protection.                    |
| Microfibers and Microencapsulation                     | A thin synthetic fibre woven into products. Can be dyed to change colour. |  | Polyester or nylon microfibres are 60 to 100 times finer than a human hair. They can be blended with synthetic or natural fibres. Thermoplastic polyester or nylon microfibres can be heat-treated to give them coils, crimps and loops, which makes these textured yarns stretchy and warm. | Clothing for outdoor pursuits, active sports, underwear, knitwear and carpets. |

## Eduqas Design & Technology (1-9) Materials: Paper & Boards

### 1. Paper

| Type             | Description and uses   |
|------------------|--|
| Layout paper     | <ul style="list-style-type: none"> <li>lightweight, thin white paper</li> <li>used for initial ideas</li> <li>takes colour media well</li> <li>low cost</li> </ul>   |
| Tracing paper    | <ul style="list-style-type: none"> <li>thin, translucent paper</li> <li>making copies of drawings</li> <li>high cost</li> </ul>  |
| Cartridge paper  | <ul style="list-style-type: none"> <li>good quality white paper</li> <li>available in different weights</li> <li>general purpose work</li> <li>can be used to make simple models</li> <li>medium cost</li> </ul> |
| Bleedproof paper | <ul style="list-style-type: none"> <li>smooth, hard paper</li> <li>used with water-based and spirit-based felt-tip pens</li> <li>medium cost</li> </ul>  |
| Grid paper       | <ul style="list-style-type: none"> <li>printed square and isometric grids in different sizes</li> <li>a guide for quick sketches and working drawings</li> <li>low cost</li> </ul>                               |

### 2. Selection of materials or components

When selecting materials and components considering the factors listed below:

- Functionality: application of use, ease of working
- Aesthetics: surface finish, texture and colour.
- Environmental factors: recyclable or reused materials, product mileage.
- Availability: ease of sourcing and purchase.
- Cost: bulk buying.
- Social factors: social responsibility.
- Cultural factors: sensitive to cultural influences.
- Ethical factors: purchased from ethical sources such as FSC.

What is the FSC? <http://www.fsc-uk.org/en-uk/about-fsc/what-is-fsc/fsc-principles>

### 3. Boards

| Type              | Description and uses  |
|-------------------|---|
| Corrugated card   | <ul style="list-style-type: none"> <li>strong and lightweight</li> <li>used for packaging protection and point of sale stands</li> <li>available in different thicknesses</li> </ul>  |
| Duplex board      | <ul style="list-style-type: none"> <li>large foam-based board</li> <li>different finishes available including metallic and hologrammatic</li> <li>used for food packaging, e.g. take-away pizza boxes</li> </ul>  |
| Foil lined board  | <ul style="list-style-type: none"> <li>quality cardboard with a aluminium foil lining</li> <li>ideal for ready made meals or take away meal cartons</li> <li>The foil retains the heat and helps keep the food warm</li> </ul>  |
| Foam core board   | <ul style="list-style-type: none"> <li>very light, very stiff and very flat.</li> <li>It has a white, rigid polystyrene foam centre, with smooth white paper laminated onto both faces.</li> <li>It is easy to cut with a knife, a mount cutter or on a wall cutter</li> <li>great for modelling</li> </ul> |
| Ink jet card      | <ul style="list-style-type: none"> <li>Has been treated so that it will give a high quality finish with inkjet ink</li> <li>available in matt and gloss</li> </ul>  |
| Solid white board | <ul style="list-style-type: none"> <li>top quality cardboard made from quality bleached wood pulp.</li> <li>used for hard backed books and more expensive items</li> <li>excellent print finish</li> </ul>  |

### 4. Paper and Boards- Stock sizes and weights

Paper and board is available in sizes from A0 (biggest) to A7 (smallest). The most common size is A4.

Each size is half the one before, eg A4 is half the size of A3.

They are also sold by weight: GSM – grams per square metre.

Card thickness or calliper is traditionally measured in Microns. 1000 Microns = 1mm, so the higher the value, the thicker the card or paper.



### 5. Properties of paper and boards.

| Type               | Weight or thickness | Uses  | Relative cost (10= high) |
|--------------------|---------------------|---|--------------------------|
| Newsprint          | 50gsm               | Newspapers                                  | 1                        |
| Layout Paper       | 60gsm               | Sketches and tracing                        | 3                        |
| Tracing Paper      | 70 gsm              | Tracing                                     | 4                        |
| Sugar Paper        | 90gsm               | Cheap mounting work                         | 2                        |
| Inkjet/Photo paper | 150-230gsm          | Photos/Pres entations                       | 9                        |
| Board (Card)       | 230-750 microns     | Model-making                                | 5                        |
| Mount Board        | 230-1000 microns    | Model-making, High picture quality mounting | 9                        |
| Corrugated Card    | 3000-5000 microns   | Packaging protection                        | 5                        |

### 7: KEY WORD FOCUS

You should be able to explain the meaning of each of these words by the end of this rotation.

|                |   |
|----------------|---|
| <b>GSM</b>     | Grams per Square Metre                                    |
| <b>Microns</b> | Thickness of paper or card.<br>1000microns =1mm thickness |



## Eduqas Design & Technology (1-9) Materials & Working Properties

### 1. Woods


#### Man-Made Woods

|  |  |   |   |
|--|--|---|---|
|   | <b>Medium density fibreboard (MDF)</b> | <b>Description:</b><br>Has a smooth, even surface<br>Easily machined and painted<br>Durable in water and fire-resistant<br>Often veneered or painted to improve its appearance                | <b>Uses:</b><br>Furniture and interior panelling                                |
|   | <b>Chipboard</b>                       | <b>Description:</b><br>Made from chips of wood glued together with urea formaldehyde (glue)<br>Usually veneered with an attractive hardwood or covered in plastic laminate                    | <b>Uses:</b><br>Kitchens and bedroom furniture<br>Shelving and general DIY work |
|   | <b>Plywood</b>                         | <b>Description:</b><br>Is very strong board constructed of layers of veneer or plies, which are glued together with the grains at 90° to each other<br>Interior and exterior grades available | <b>Uses:</b><br>Furniture making<br>Rboat building and exterior work            |
|  | <b>Hardboard</b>                       | <b>Description:</b><br>Is a very cheap particle board<br>Can have a laminated plastic surface   | <b>Uses:</b><br>Kitchen unit and furniture back panels                          |

#### Hard Woods

|   |                 |  |   |
|---|-----------------|--|---|
|  | <b>Oak</b>      | <b>Description:</b><br>Is very strong, light brown wood<br>Open grained<br>Very hard, but quite easy to work with  | <b>Uses:</b><br>High quality furniture<br>Beams used in building<br>Veneers         |
|  | <b>Mahogany</b> | <b>Description:</b><br>Reddish brown in colour<br>Easy to work with  | <b>Uses:</b><br>Outdoor furniture<br>Ship fittings<br>Bars<br>Veneers               |
|  | <b>Beech</b>    | <b>Description:</b><br>Is straight-grained hardwood with a fine texture<br>Light in colour<br>Very hard but easy to work with<br>Can be steam bent                         | <b>Uses:</b><br>Furniture<br>Toys<br>Tool handles                                   |
|  | <b>Ash</b>      | <b>Description:</b><br>Open grained<br>Easy to work with<br>White cream colour, often stained black<br>Can be laminated (i.e. glued into veneers which are glued together) | <b>Uses:</b><br>Tool handles<br>Sports equipment<br>Furniture<br>Saddles<br>Veneers |

#### Soft Wood

|   |             |   |   |
|---|-------------|---|---|
|  | <b>Pine</b> | <b>Description:</b><br>Pale yellow coloured with dark lines and a fine, even texture<br>Medium in weight<br>Soft and stable<br>Non-saprotic | <b>Uses:</b><br>Readily available for DIY work<br>Mainly used for constructional work and simple joinery<br>Furniture |
|---|-------------|---|---|

### 2. Plastics

#### Acrylic



**Properties:**  
• Hard wearing  
• Will not shatter  
• Can be coloured  
• Bathtubs, School Projects, Display signs

#### Polypropylene



**Properties:**  
• High impact strength  
• Softens at 150°C  
• Can be flexed many times without breaking  
• School chairs, Crates

#### High Impact Polystyrene (HIPS)



**Properties:**  
• Light but strong  
• Widely available in sheets  
• Used for casings of electronic products

#### Polythene (LDPE)



**Properties:**  
• Weaker and softer than HDPE  
• Lightweight  
• Carrier Bags + Squeeze Bottles

#### Polythene (HDPE)



**Properties:**  
• Stiff strong plastic  
• Used for pipes and bowls  
• Buckets

#### Urea formaldehyde



**Properties:**  
• Colourless plastic  
• Can be coloured  
• Door and cupboard handles, Electrical fittings

### 3. Material Properties

#### Strength

The ability of a material to stand up to forces being applied without it bending, breaking, shattering or deforming in any way.

#### Elasticity

The ability of a material to absorb force and flex in different directions, returning to its original position.

#### Ductility

The ability of a material to change shape (deform) usually by stretching along its length.

#### Malleability

The ability of a material to be reshaped in all directions without cracking.

#### Hardness

The ability of a material to resist scratching, wear and tear and indentation.

#### Toughness

A characteristic of a material that does not break or shatter when receiving a blow or under a sudden shock.

### 3. Metals

#### Aluminium



**Properties:**  
• Light Weight  
• Light grey in colour  
• Can be polished to a mirror like appearance  
• Rust resistant

#### Mild Steel



**Properties:**  
• Heavy  
• Dark grey in colour  
• Rusts very quickly if exposed

#### Stainless Steel



**Properties:**  
• Heavy  
• Shiny appearance  
• Very resistant to wear / rust.

#### Cast Iron



**Properties:**  
• He melted pig iron with some quantities of other metals  
• Strong in compression  
• Brittle

#### Copper



**Properties:**  
• Reddish brown metal.  
• Soft  
• Excellent conductor of heat and electricity

#### Brass



**Properties:**  
• Yellow metal  
• Hard  
• Alloy

### 4. Composites

#### Carbon Fibre

Expensive in comparison to other materials.

Very good strength to weight ratio.

Used in the manufacture of high end sports cars and sports equipment.



#### GRP Fibreglass

GRP is composed of strands of glass which are woven to form a flexible fabric. The fabric is normally placed in a mould and polyester resin is added.

Glass reinforced plastic is lightweight and has good thermal insulation properties. It has a high strength to weight ratio



## Eduqas Design & Technology (1-9) Materials & Working Properties: Textiles

### 1. Fabrics

#### Natural Fabrics

|               |   |  |   |
|---------------|---|--|---|
| Cotton        | Soft, good absorbency, prints well, machine washable, strong breathable | Origins from the Cotton Plant.                 | Uses: Jeans, towels, Shirts, dresses, underwear |
| Wool          | High UV protection, flameproof, breathable, durable insulating          | Origins from Sheep.                            | Uses: Jumpers, Coat, blankets                   |
| Silk          | Smooth, Soft, Strong  | Origins from the silk worm.                    | Uses: Wedding dresses, lingerie.                |
| Linen         | Strong, cool in hot weather   | Origins from the flax plant                    | Uses: Trousers, tops.                           |
| Leather/Suede | Strong, hardwearing, durable.   | Origins from the skin of animals, mainly cows. | Uses: Jackets, Trousers, Shoes.                 |

#### Synthetic fabrics

|                   |  |  |
|-------------------|--|--|
| Polyester         | Durable, wrinkle resistant, stain resistant                                  | Uses: Shirts, jackets. Also used in safety belts, conveyor belts and tyre reinforcement. |
| Polyamide (Nylon) | Durable, high abrasion resistance  | Uses: Sportswear, carpets.   |
| Elastane (Lycra)  | Stretchy, durable, high stain resistance                                     | Uses: Sportswear, Swimwear, tights.  |
| Viscose           | Soft, comfortable, absorbent, easily dyed.                                   | Uses: Dresses, linings, shorts, shirts, coats, jackets and outerwear.                    |
| Acrylic           | Absorbent, retains shape after washing, easily dyed, resistance to sunlight. | Uses: Jumpers, tracksuits, linings in boots.   |

### 1. Fabrics

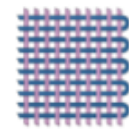
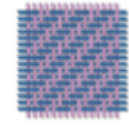
#### Blended and mixed Fabrics

These fabrics take on the positive characteristics of their combinations


|                  |                                |                      |
|------------------|--------------------------------|----------------------|
| Cotton/Polyester | Easy care and crease resistant | Uses: School shirts. |
|------------------|--------------------------------|----------------------|

### 2. Fabric Construction



#### Woven

|             |   |  |
|-------------|---|--|
| Plain Weave | Extremely strong and hard wearing               |   |
| Twill Weave | Extremely high strength and abrasion resistant. |  |


#### Knitted

|                 |                                 |   |
|-----------------|---------------------------------|---|
| Knitted fabrics | Stretchy, soft and comfortable. |  |
|-----------------|---------------------------------|---|


#### Non-Woven

|                |  |   |
|----------------|--|---|
| Bonded Fabrics | These are webs of fibres held together by glue or stitches.                              |  |
| Felted Fabrics | Felt is made by combining pressure, moisture and heat to interlock a mat of wool fibres. |  |


### 3. Care Labels

 Washing Label- will usually have a max. temp number included

 Hand Wash only

 Do not wring out

 Tumble Dry


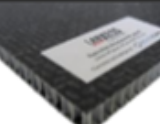
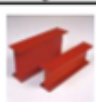


 Iron on low heat. The more dots the higher the heat setting

 Do not bleach


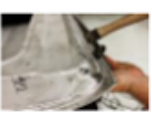




## Eduqas Design & Technology (1-9) Materials: Forces & Stresses

### 1: Forces and Stresses

| Force              | Description   | A fair test for each force/stress.   | How a material / object can be adapted to resist                                    | Examples  |
|--------------------|---|--|---|---|
| <b>Tension</b>     | Forces pulling in opposite directions.                            | Apply the same weight to each material and suspended in the same manner.                     | Concrete can have steel bars inserted to reinforce.                                 |    |
| <b>Compression</b> | Forces that are trying to crush or shorten.                       | Insert materials into a vice/clamp and apply the same amount of twists to the handle.        | Composite panels can have a honeycomb structure sandwiched in the middle to resist. |    |
| <b>Bending</b>     | Flexing force   | Apply the same weight to the material.   | Steel beams have an I profile to resist bending.                                    |   |
| <b>Torsion</b>     | Twisting force.   | Use clamps & stands to hold the materials and turn in opposite directions at the same angle. | The diagonals on a tower crane help the structure against torsion.                  |  |
| <b>Shear</b>       | A strain produced when an object is subjected to opposing forces. | Place the material between a tool that works in opposite directions. e.g. Shears             | Bolts are hardened and have unthreaded shanks to help stop shearing.                |  |

### 2. Improving functionality of materials

| Process            | Description   | Result  | Example   | Visual Example  |
|--------------------|---|---|---|---|
| Lamination         | Layering of thin materials                                    | Depending on the direction of lamination it can make boards stiffer or actually more flexible | Plywood: Laminations at 90 degrees to each other - Rigid<br>Flexi-ply: laminations all the same direction - Bendy |    |
| Bending / Folding  | Folding a 90 degree edge on sheet metal / plastic             | Makes the panel more rigid  | Body panels on cars   |    |
| Webbing            | Modern polymer fabrics woven together                         | Extremely strong and durable fabric   | Seat belts  |  |
| Fabric interfacing | A strengthening material added to the unseen face of a fabric | Adds strength / shape   | Shirt collars   |  |

### 1: The Modification of properties for specific purposes

| Process                 | Material | Purpose   |
|-------------------------|----------|---|
| Seasoning               | Timber   | Removes the moisture content so that the timber will not shrink, warp and twist |
| Annealing (heating)     | Copper   | Softens the copper to make it more malleable                                    |
| Addition of Stabilisers | PVC      | Stops plastic become brittle with exposure to the sun                           |



Timber being seasoned in a kiln




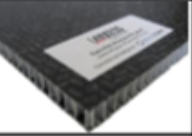

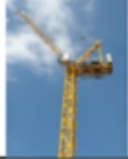

Copper bowl being annealed







Metal compounds (stabilisers) are added to PVC for UV protection

## Eduqas Design & Technology (1-9) Materials: Forces & Stresses

### 1: Forces and Stresses

| Force              | Description   | A fair test for each force/stress.   | How a material / object can be adapted to resist                                    | Examples  |
|--------------------|---|--|---|---|
| <b>Tension</b>     | Forces pulling in opposite directions.                            | Apply the same weight to each material and suspended in the same manner.                     | Concrete can have steel bars inserted to reinforce.                                 |    |
| <b>Compression</b> | Forces that are trying to crush or shorten.                       | Insert materials into a vice/clamp and apply the same amount of twists to the handle.        | Composite panels can have a honeycomb structure sandwiched in the middle to resist. |    |
| <b>Bending</b>     | Flexing force   | Apply the same weight to the material.   | Steel beams have an I profile to resist bending.                                    |   |
| <b>Torsion</b>     | Twisting force.   | Use clamps & stands to hold the materials and turn in opposite directions at the same angle. | The diagonals on a tower crane help the structure against torsion.                  |  |
| <b>Shear</b>       | A strain produced when an object is subjected to opposing forces. | Place the material between a tool that works in opposite directions. e.g. Shears             | Bolts are hardened and have unthreaded shanks to help stop shearing.                |  |

### 2. Improving functionality of materials

| Process            | Description   | Result  | Example   | Visual Example  |
|--------------------|---|---|---|---|
| Lamination         | Layering of thin materials                                    | Depending on the direction of lamination it can make boards stiffer or actually more flexible | Plywood: Laminations at 90 degrees to each other - Rigid<br>Flexi-ply: laminations all the same direction - Bendy |    |
| Bending / Folding  | Folding a 90 degree edge on sheet metal / plastic             | Makes the panel more rigid  | Body panels on cars   |    |
| Webbing            | Modern polymer fabrics woven together                         | Extremely strong and durable fabric   | Seat belts  |  |
| Fabric interfacing | A strengthening material added to the unseen face of a fabric | Adds strength / shape   | Shirt collars   |  |

### 1: The Modification of properties for specific purposes

| Process                 | Material | Purpose   |
|-------------------------|----------|---|
| Seasoning               | Timber   | Removes the moisture content so that the timber will not shrink, warp and twist |
| Annealing (heating)     | Copper   | Softens the copper to make it more malleable                                    |
| Addition of Stabilisers | PVC      | Stops plastic become brittle with exposure to the sun                           |



Timber being seasoned in a kiln

Copper bowl being annealed



Metal compounds (stabilisers) are added to PVC for UV protection

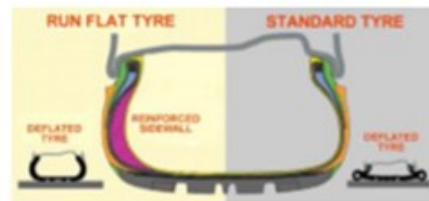


## Eduqas Design & Technology (1-9) Specialist Technical Principles

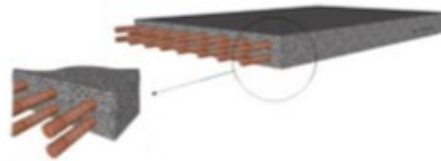
### 1. Key Terms

#### Reinforcing

Strengthening a material so it withstands force and stress  
Car tyre



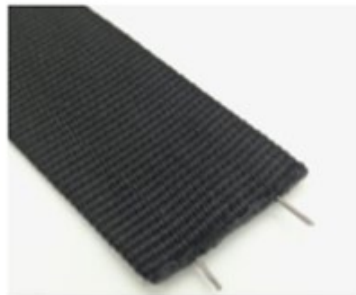
Concrete



Denim - rivets



Webbing



### 2. Key Terms

#### Laminating

Stiffening a material to improve strength, stability and flexibility.

Plywood



Paper



### 3. Key Terms

#### Fabric Interfacing

An additional layer of fabric to support certain areas of fabric.

Shirt Collar



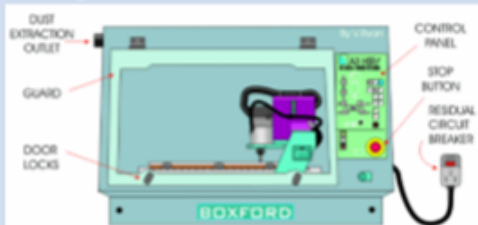
Baseball cap - peak



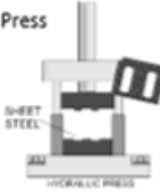


## Eduqas Design & Technology (1-9)

### Materials: Origin, Manufacturing & Surface Print

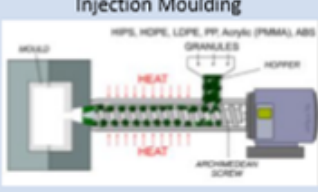
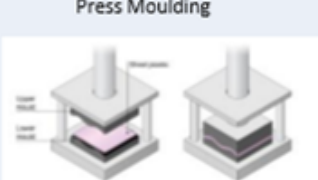
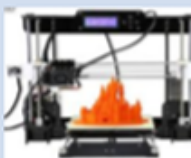
#### 1. Wood

| Material                 | Original Source | Commercial Manufacturing   | Surface Finish   |
|--------------------------|-----------------|--|--|
| Hardwood - Oak           | Deciduous Tree  | CNC Routing and turning<br> | Oil – Soaks into the timber, must be reapplied frequently.   |
| Softwood - Pine          | Coniferous Tree |  | Wood preservative – Protects from fungal or insect attack and prevents rot. Reapplication may be required. |
| Manufactured Board - MDF | Trees           |  | Paint – painted on with a roller or brush, can also be sprayed. Needs a primer and undercoat.              |

#### 2. Metal

| Material                      | Original Source  | Commercial Manufacturing   | Surface Finish   |
|-------------------------------|--|--|--|
| Ferrous metal – Steel         | Iron ore (rocks and minerals)  | Hydraulic Press<br> | Galvanising: involves dipping metal into a bath of molten zinc. The zinc provides a good corrosion resistant finish.                 |
| Non-ferrous metal - aluminium | Bauxite ore (rocks and minerals)   | Die Casting<br>     | Anodising: provides a hard-wearing corrosion-resistant finish. Anodising involves electrolysis and uses acids and electric currents. |
| Alloy - Duralumin             | Metal ore (rocks and minerals)<br>Alu 94%<br>Copper 4%<br>Magnesium 1%<br>Manganese 1% | CNC Milling<br>     | Powder coating: process used in industry. The powder is sprayed onto products which run through an oven.                             |

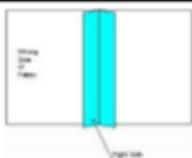
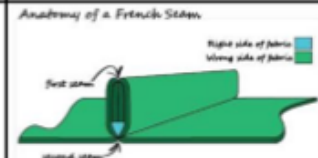
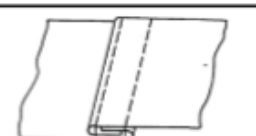


#### 3. Polymer

| Material                                      | Original Source  | Commercial Manufacturing  | Uses  |
|---|------------------|---|---|
| Thermoplastic - ABS                           | Crude Oil        | Injection Moulding<br> | Toys (Lego), hard hats, electronic castings |
| Thermosetting plastic                         |                  | Press Moulding<br>     | Electrical fittings, handles                |
| Biodegradable Plastic – Polylactic acid (PLA) | Vegetable starch | 3D printing<br>        | Rapid prototyping, disposable items         |



## Eduqas Design & Technology (1-9) Textile based materials

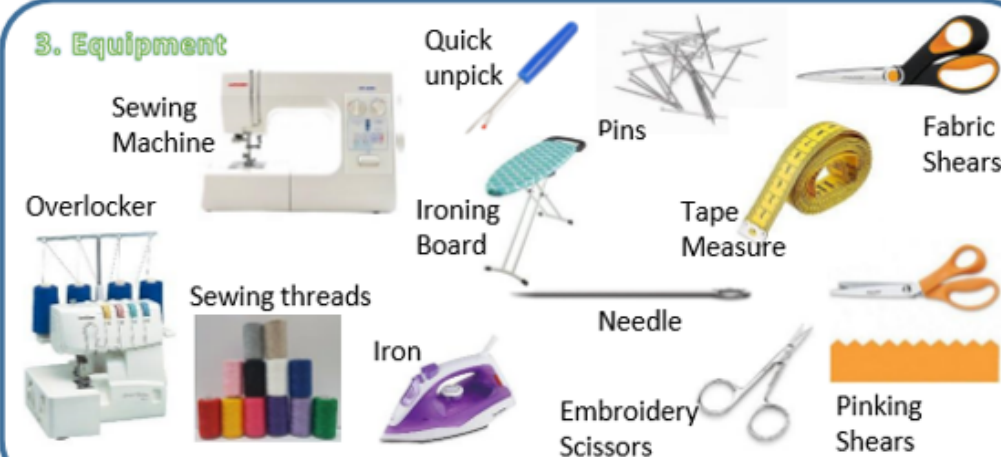
### 1. Construction Techniques

|                       |  |   |
|-----------------------|--|---|
| Open seam             | This is used as the main method for constructing textile products. It is normally finished with overlocking to neaten the edges and prevent fraying. |    |
| French Seam           | This seam is used on delicate fabrics that can not be overlocked. It is generally used within lingerie.  |    |
| Machine and Fell Seam | Very strong double stitched seam for heavy fabrics. Commonly used on jeans.  |   |
| Overlocking           | Used to neaten seams to prevent fraying. Generally hidden on the inside of a product.  |  |
| Binding               | Used to finish a curved edge on a product, where over-locking is not suitable.   |  |

### 2. Decorative Techniques



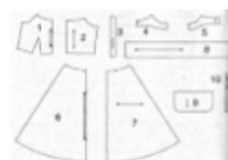
### 3. Equipment



### 4. Key Terminology

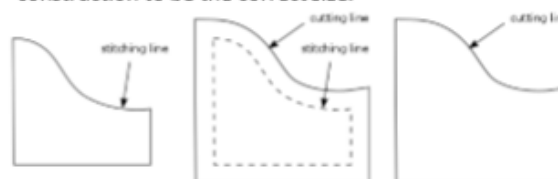
#### Pattern

This is the term given to a paper template to aid in the cutting out of fabric for accurate construction.



#### Seam Allowance

This is usually a 1cm 'boarder' around your pattern to allow for construction to be the correct size.



#### Right Side

This is the 'correct' side of the fabric that you wish to see.

#### Wrong Side

This is the side of the fabric that you do not wish to see.



#### Pressing

This is the term given when ironing your product; e.g. press your seams open, would refer to when an open seam is sewn and they need to be pressed outwards to give a flat finish.

## Eduqas Design & Technology (1-9) Timber Based Materials

### 1.1 Timber Conversion

After a tree is felled (chopped down) and then cut into manageable lengths, it is then converted into planks. At this point it is known as timber. Timber is supplied in two main types of finish. **Rough Sawn** or **planed all round (PAR)**. Rough sawn timber is not planed and is rough all around to touch. It is often used for exterior tasks or where the finish is not important. PAR has a much smoother finish as it has been planed down on all sides. It is used for furniture and internal features such as windows or doors. Finishes such as varnish or paint can be easily applied. Planed timber is less absorbent than rough sawn timber.



Timber is available in many different shapes and sizes, standardized to enable different varieties to be used together.

### 1.2 Seasoning

Once timber is converted into a workable form, it is **seasoned** in order to reduce the moisture content. Typically a newly felled tree will have a moisture content of over 50% and is known as green timber. The moisture content needs to be reduced to below 20% for most exterior applications, below 15% for interior work and below 10% for interior areas that are constantly heated.

Uneven evaporation of the water content can cause some common faults such as twisting, cupping and bowing which can render the timber useless for many tasks. If the end grain dries too quickly, it can cause the plank to split.



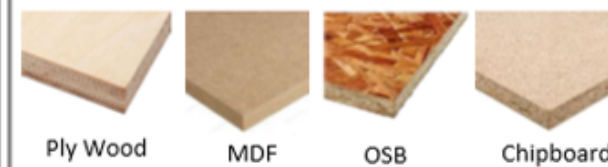
There are two methods of seasoning; air-drying or kiln drying. Air dried timber is stacked so that air can circulate around the planks and evaporation can take place. It takes approximately one year per 25mm of plank thickness to season and in the UK the moisture content typically reduces to around 18%.

Kiln-dried timber (A kiln is basically a Giant Oven) can have a much lower moisture content and it is a much faster process, meaning the timber can be sold much sooner. It costs more than air drying, as heat and pressure is used but no additional land is required to store the timber while seasoning takes place. Kiln dried timber is less prone to faults and the heat also kills off bacteria and insects that may attack the timber.

### 1.3 Manufactured Board

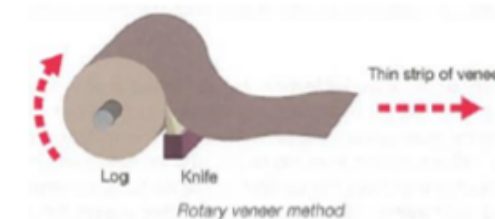
Natural timber is combined with the adhesive to make manufactured boards. They can be made from waste, low-grade and recycled timber and are usually produced in pale brown natural finish. Each manufactured board is produced in a slightly different way, the two main processes used are **lamination** and **compression**.

Plywood and block board use the lamination method where layers of wood are bonded together using an adhesive. Medium Density Fibreboard (MDF), chipboard, oriented strand board (OSB) and hardboard use the compression method where wood is shredded, chipped or pulped, then heated and compressed under high pressure, in most cases using adhesives to bond the particles together.



### 1.4 Veneer

Some manufactured boards are covered in a thin slice of natural timber called a **veneer**. These natural wood slices are taken from the trunk of a tree and are bonded to the surface of cheaper sheet materials. Veneers are commonly seen on medium density fibreboard (MDF) and plywood. There are two methods of veneer production; rotary and knife cut. Rotary veneer production produces the longest sheets and involves rotating a whole trunk on an industrial machine similar to a wood turning lathe. It is a bit like a huge pencil sharpener creating one long ribbon of veneer.






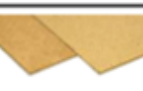
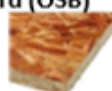
## Eduqas Design & Technology (1-9) Timber Based Materials Sources, origins & properties

### 1.5 Advantages and disadvantages of manufactured board



#### Manufactured Board

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>Available in large sheets, very stable which saves time and energy joining arrow planks together.</li> </ul>                          | <ul style="list-style-type: none"> <li>Adhesives used to bond the boards can contain hazardous particles that can cause cancer.</li> </ul>   |
| <ul style="list-style-type: none"> <li>No defects such as warping. Twisting, cupping and splitting which occur in natural wood, meaning less waste.</li> </ul>               | <ul style="list-style-type: none"> <li>Machining and sanding some boards especially MDF, causes very small particles of dust to be released, easily breathed in, even through a mask.</li> </ul> |
| <ul style="list-style-type: none"> <li>They do not have knots or resin pockets which can be hard to work around, avoiding waste and protecting tools from damage.</li> </ul> | <ul style="list-style-type: none"> <li>Tools can blunt easily owing to the adhesives in the boards.</li> </ul>   |
| <ul style="list-style-type: none"> <li>Smooth finish which requires very little preparation.</li> </ul>  | <ul style="list-style-type: none"> <li>Many traditional wood joints cannot be used effectively with manufactured board.</li> </ul>   |
| <ul style="list-style-type: none"> <li>Makes use of low grade, recycled and waste wood.</li> </ul>   | <ul style="list-style-type: none"> <li>Edges can be hard to finish.</li> </ul>   |
| <ul style="list-style-type: none"> <li>Available in many different finishes, veneers and laminates.</li> </ul>   | <ul style="list-style-type: none"> <li>Most boards are prone to absorb moisture if not treated.</li> </ul>   |

### 1.6 Additional common manufactured boards

| Name   | Characteristics   | Uses   |
|--|---|--|
| Blockboard<br>                  | Stable, tough, relatively heavy, finishes well, indoor use owing to adhesives used.           | Furniture, doors, shelving, indoor construction.             |
| Hardboard<br>                   | Flexible in large sheets, even strength, easily damaged by water unless treated. Inexpensive. | Furniture and picture frame backings. Internal panelling.    |
| Oriented Strand Board (OSB)<br> | Rigid and even strength in all directions, good water resistance.                             | Construction hoarding, interior and exterior house building. |

### 1.7 Additional softwoods

| Name   | Characteristics   | Uses   |
|--|---|--|
| Redwood<br> | Easy to work and machines well. Some rot resistance.                      | Outdoor furniture, beams, posts, decking, veneers.               |
| Cedar<br>   | Easy to work, can blunt tools, finishes well, naturally resistant to rot. | Outdoor furniture, fences cladding for buildings, roof shingles. |

### 1.8 Sustainable timber production

Wood is considered to be a sustainable product, as new trees can be grown to replace those used for timber and fuel. The main issue facing timber production is that in many parts of the world, it is being used at a far greater rate than it is being replanted. The result is an unsustainable supply of timber, which is frequently illegally obtained. This is causing many problems to the land in the countries where it is happening. Some countries are suffering from **desertification** due to **deforestation**. This activity is also thought to be a contributing factor in **global warming**.



## Eduqas Design & Technology (1-9) Polymers: Sources, origins & properties

### 2.1 Plastics additives

Many different chemicals and compounds can be added to enhance the functional and aesthetic properties of plastics. **Pigments** are added to change the colour, **plasticisers** are added to increase flexibility and **fragrances** can be added, as seen in some children's toys and air-freshening products.



*UV light can make plastic brittle and faded.*

**Stabilisers** can be added to make plastic resistant to heat and light. One of the main issues with plastic degradation is the effect that ultraviolet (UV) light has on it. Over time, plastic becomes brittle and can lose its colour, starting to yellow or fade. By adding UV stabilisers, this process can be slowed down, enabling a product to last longer and perform its task more efficiently.

### 2.2 Availability of plastics.

Plastics are abundant in our modern society and are available in many forms. They help us to solve complex design problems because they can be manufactured to have a very high strength-to-weight ratio and have many versatile properties. This means that we can use less materials to make a stronger product. Plastics last for a very long time which means they are a value for money material.

### 2.3 Sustainability of plastics

End of life considerations are important for all products, but as most plastics take so long to biodegrade extra care should be taken to decide how it should be managed.



Many responsible companies producing plastic products conduct a **Life Cycle Assessment (LCA)** which informs them of the environmental impact of manufacturing their products. The information gathered helps them decide how to deal with their product when it has reached the end of its working life.

Almost all plastics are recyclable or biodegradable in some form – however, the difference in the quality of the recycled products varies dramatically.

Thermosetting plastics are generally considered non-recycled although they are frequently ground down and used as a filler material or they are used for **energy recovery** through incineration.

Thermoplastics are much more easily recycled for use as a recycled plastic product. If the plastics are carefully separated into the different types, the resulting material remains high quality and commands a higher price than mixed plastics. It is important to recycle as much as possible, and poorly discarded plastics are becoming a major environmental concern, especially in our countryside, rivers and ocean.

### 2.4 Biodegradable plastics

Some of the newer plastics are made from vegetable starches and are fully biodegradable and composted. The natural bacteria in the soil break down the plastic very quickly, largely owing to being exposed to moisture and higher temperature.



*Modern biopolymer pellets are made from vegetable and corn starches.*




Bioplastics are non-toxic and are already being widely used in a range of products. Since biopolymers readily decompose they cannot be recycled. Small amounts mixed in with other recyclable thermoplastics can produce low grade recycled plastic or render a batch unusable.





## Eduqas Design & Technology (1-9) Polymers: Sources, origins & properties

### 3.1 Common biodegradable plastics

Starch based biopolymers and common thermoplastics

| Name   | Appearance  | Image   | Characteristics  | Uses  |
|--|---|---|--|---|
| Polyactic acid<br>PLA  | Smooth or textured finish, easily coloured  |    | Widely used in 3D printers, available on reels, non-toxic, fully biodegradable, easily moulded                         | Bottles, pots, disposable food and drink containers, pens, phone cases and 3D printing products                                   |
| Polycaprolactone<br>PCL<br>Polymorph<br>62°C<br>Coolmorph™<br>42°C | An off-white mouldable translucent pellet which can be hand-shaped. Can be coloured with pigments |  | Easily mouldable and re-mouldable at low temperature in hot water, non-toxic, reusable and fully biodegradable         | Repairs, hand-shaped artefacts, jewellery, modifications and personalisation of products. Excellent for prototyping and modelling |
| Polyhydroxybutyrate<br>PHB<br>Biopol™                              | Smooth or textured finish, easily coloured  |  | Quite brittle with limited chemical resistance. Non-toxic, slow but fully biodegradable, easily processed and moulded. | Bottles, pots, household items and disposable food containers   |

| Name                                   | Appearance  | Image   | Characteristics  | Uses  |
|--|---|---|--|---|
| ABS<br>Acrylonitrile butadiene styrene | Very Smooth finish, can be textured, easily coloured                                    |    | Tough, hard, good chemical resistance, good impact resistance, can be 3D printed, easily injection moulded and extruded. | Electronic castings, 3D printed products, hard hats, Lego™            |
| Nylon<br>Polyamide                     | Smooth, easily coloured, available in various thicknesses of sheet, bar, film or thread |  | Self-lubricating, very low friction, hard wearing, easily machined, can be woven into fabrics                            | Clothing, tights, rope, cogs, gears, bushes, pipes, tents, parachutes |

## Eduqas Design & Technology (1-9) Polymers: Working with polymer based materials

### 4.1 Selecting appropriate plastics

Looking at the different types of plastics it is possible to work out which varieties can be used for a given task. Considerations will include:

- Aesthetics
- Size of product
- Where it will be used
- Stability
- Cost
- Size of material available
- Required finish
- Availability
- Weight
- Desired properties
- Workability
- How long it is to last

### 4.2 Standard material stock forms, types and sizes

Most plastics comes in arrange of standard shapes and sizes. This enable materials to be more interchangeable, and the manufactures of tools and equipment to be aware of the material they need to cope with.

### 4.3 Sheet, rod and tube sizes

- Metric is the standard measurement system for plastic forms. Sheet material normally starts at around 1mm thick and increases to over 20mm thick; lengths and widths vary depending on the type of plastic and the thickness required. Rod is available from 2mm to well over 100mm diameter and tubing is available from 5mm to around 1 meter in diameter.
- Tubes are a little more complicated to measure, as you need to decide on the wall thickness you require. Too thin a wall section can mean the product lacks strength and too thick can add unnecessary weight and cost to your product.
- Wall thickness is usually measured in millimeters; however, traditionally it is known as the **gauge** and some tubular plastics may still be sold by gauge. As the gauge number increases, the wall thickness decreases.



### 4.4 Plastics as powder granules, foam and films

The majority of the plastics that are used in the design and technology workshop tend to be sheet, rod or tube, but they are also available in a variety of other forms.



Powders and granules are mainly used in plastic processing such as plastic dip coating, injection moulding and extrusion. The granules are heated until they become soft and can then be shaped as required. Powders tend to be bonded to the surface of hot materials such as metals. Both are available in a wide range of colours.

Rolls of plastic film are widely used for packaging, especially in the food industry. Films can easily be heat-sealed to make them airtight and tamper proof.



Expanded plastics and foams are also used by the packaging industry, and one of the most common forms in expanded polystyrene. It is incredibly lightweight and protects the contents of a packet from impact damage. Expanded plastics are also used in cars to soften areas such as dashboards and bumpers, which are prone to impact.

Plastic foams are used by the furniture industry to soften seating and beds and can even be used as floor coverings that are soft underfoot.

### 4.5 Standard Components

To temporarily attach plastic to itself or to other material a few different methods can be used. Machine screws have a finer thread than self-tapping screws and they have no point on the end. Plastic can be internally tapered with a screw thread, allowing machine screws to be inserted, but the internal thread can easily strip if too much **torque** is applied.

**Self-tapping screws** can be used without the need for a screw thread to be cut first. This special screw cuts its own thread. The correct size pilot hole must be drilled first otherwise plastics can crack or shatter as pressure is applied when it is screwed into position.

### 4.6 Hinges

Hinges are used to attach doors, windows and other openings to frames and carcasses. They can be made from many different materials but most commonly they are made from plastic and metal. Plastic hinges can be welded, glued, screwed or bolted to other plastics. Many varieties of hinge come in brass or steel finish; the steel versions can be galvanized to protect them from rusting when outside. Metal hinges will need to be bolted or screwed into position. Screws and bolts will need to be a countersunk variety in order for them to lay flat or flush, so the hinge can completely close. Metal hinges are often sold in pairs, plastic hinges are sold in pairs or by length. Both need to be carefully aligned to ensure accurate operation.

#### Common types of hinges for use with plastics.

| Name               | Characteristics   | Image | Name                        | Characteristics   | Image |
|--------------------|---|-------|-----------------------------|---|-------|
| Plastic butt hinge | Standard hinge for openings, can be glued, welded or bolted to the product                      |       | Piano style hinge           | Long plastic butt-style hinge, cut to required length       |       |
| Plastic fold hinge | Extruded profile, holds two sheets of plastic, single centre layer allows flexing               |       | Plastic or glass door hinge | Allows sheet materials to be held with clamping grub screw  |       |
| Butterfly hinge    | Decorative version of the butt hinge, can be mounted on plastic with countersunk nuts and bolts |       | Flush hinge                 | This profile, mounted with small countersunk nuts and bolts |       |



## Eduqas Design & Technology (1-9) Polymers: Working with polymer based materials

### 5.1 Shaping, processing and machining polymers

A vast array of tools is available in the workshop in order to help us make the products we require. Tools enable us to mark out materials, cut to size, waste (remove material), add material, deform, reform, and apply a finish.

Before undertaking any activity in a workshop you need to be aware of the Health and Safety rules that apply to each of the machines, tools, pieces of equipment and materials that you use. Your teacher will guide you in this area, but you must ensure that the correct personal protective equipment (PPE) is worn when operating machinery and using tools and equipment.

### 5.2 Drilling

Drilling a hole into plastic requires careful speed control. Large diameter drill bits require a slower speed than narrower ones to avoid overheating and the potential for the plastic to melt. The feed rate is another factor to consider – too much pressure can cause the plastic to crack.

A pillar drill is good for accuracy and is powerful enough to drill larger holes in thicker materials. A cordless drill is very adaptable and usually has variable speeds.



### 5.3 Common drill bits used with plastics

| Name            | Characteristics   | Image | Name           | Characteristics  | Image |
|-----------------|---|-------|----------------|--|-------|
| Twist drill bit | General purpose drill bit, also used on plastic, metal and wood   |       | Hole saw       | Used to cut large holes. They can easily overheat due to fast peripheral speed                       |       |
| Countersink bit | Used to ensure countersunk screw heads are flush with the surface |       | PCB drill bits | Very small drill bits for drilling copper-clad plastic board, fitted to a shank for ease of mounting |       |

### 5.4 Cutting and sawing plastics

Saws are used to cut materials to size. The hacksaw and junior hacksaw are common plastic cutting handsaws that are used to cut straight lines. The coping saw and Abrafile enable curved lines to be followed in thin material. The hacksaw has a robust blade and be used for thicker material than the junior hacksaw, which is for light work.

The scroll saw and band saw are powered and can be used for curves and straight cuts through different thicknesses of material. With powered saws, you need to be aware that the plastic can easily overheat and melt. This can clog the blade and you may find the plastic bonds itself back together after being cut.

Extraction and appropriate PPE needs to be considered when using powered equipment.



### 5.5 Wasting by hand and abrading

Using hand tools and power tools to accurately shape plastic takes practice in order to achieve a high quality finish.

Abrading plastic can be performed by machines but is best finished and polished by hand. Hand abrading using files and wet-and-dry paper is best for hard-to-reach areas and it also allows you to apply force where it is needed most.

Wet and dry comes in different grades; the grit density determines how rough or smooth it is. Similar to glass paper, it is measured in grit per square inch – the lower the grit number, the rougher it is. Wet and dry paper starts at 150 grit and is available up to 2000 grit, which is so fine it has a polishing effect.

A disc or belt sander is best used for easy to reach sections that can be held safely. Bobbin sanders can be used for internal curves.

### 5.6 Wasting and abrading tools and materials



| Name              | Image | Characteristics   | Name          | Image | Characteristics  |
|-------------------|-------|---|---------------|-------|--|
| Files             |       | Steel file with serrations on the blade that smooth the surface. Different shaped profiles and grades of cut available  | Abrasive pads |       | Similar to abrasive paper, removes small surface scratches ready to be polished                                |
| Wet and dry paper |       | Paper backed abrasive material used to clean up and apply a smooth surface, used wet or dry, medium to very fine grades | Brasso        |       | Although designed for metal the polish gives plastic a very smooth and high shine finish, applied with a cloth |

### 5.7 Addition, Deforming and reforming

#### Laminating with plastics

Laminating involves bonding strips or sheets of materials together in layers. It can be done with thick materials in order to create very strong structures or very thin materials to create tough and flexible products. Plastics are frequently laminated with other materials such as glass or wood to improve aesthetics or functionality. Laminated safety glass is now used in all car windscreens. It contains a thin film of plastic, usually polyvinyl butyral (PVB) or ethylene-vinyl acetate (EVA) which holds the inner and outer glass layers together when it is cracked or shattered. Without the laminated plastic layer, the glass would fly out, potentially causing serious injury.



Plastic laminated boards are very popular for flooring products, kitchen worktops and much flat packed furniture. With these products, the plastic laminate is bonded to the surface of a manufactured board with adhesive – usually a contact adhesive that creates a strong and instant bond.

Plastic laminate comes in many colours and different effects. It can even be printed on with photographic images and is most popularly used to resemble marble or granite for kitchen worktops and wood grain effect for flooring and furniture products. The quality can be so good that it is sometimes difficult to tell if it is real or not.

The laminating process involves layering the materials with an adhesive and holding it in the chosen position using a former or jig. Pressure is applied through a press, a set of clamps or by using a vacuum. In industry melamine formaldehyde is often used for lamination, as it provides a very robust and hard-wearing surface and has a high quality finish.

## Eduqas Design & Technology (1-9) Polymers: Working with polymer based materials

### 6.1 Line bending

Bending most plastic involves heat unless they are very thin. Strip heaters are used for line bending which is a good way to create a permanent fold in a piece of thermoplastic such as acrylic.



#### Line bending process:

1. Use a marker pen or chinagraph pencil to mark out where the bend lines will be
2. Turn on the strip heater so that it comes up to a working temperature
3. Put on heat-proof gloves and have a tray of water ready to cool the workpiece
4. Place the marked line of the workpiece across the heating strip
5. Allow the plastic to heat through (the time needed will depend on the thickness of the material, thicker materials may need to be turned over to heat from both sides)
6. Test for flexibility as the workpiece approaches the right temperature (too cool can lead to it cracking, too hot can lead to scorching and blistering)
7. Bend the workpiece to the required angle (a jig or former may be used to ensure accuracy)
8. Once the workpiece has set it can be cooled in the water tray



### 6.2 Vacuum forming

Vacuum formed products include items such as plastic egg boxes and bath tubs. A sheet of thermoplastic is heated and pressed into the former (mould) by atmospheric pressure, as the vacuum reduces the pressure below the softened thermoplastic. The plastic takes on the shape of the mould, then cools and sets in position before the mould is removed.

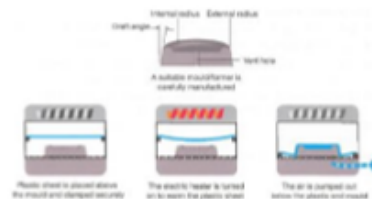
HIPS (High impact polystyrene) is the most commonly used plastic to vacuum form within schools. In industry PETG, ABS and acrylic are also used.



To ensure a good product is made, the mould must:

- Have a positive draft angle  $>3^\circ$  to ensure easy removal of the material from the mould.
- Avoid under cuts that would make the removal of the mould impossible.

- Not have too deep a profile so that the plastic is drawn too thin and could easily burst.
- Have vent holes drilled to avoid vent pockets where there are dips in the profile.
- Have corners and edges rounded with a small radius to aid removal.
- Have a smooth finish so as not to adhere to the hot plastic – a release agent can be applied to the mould to assist removal.



### 6.3 3D printing

3D printing enables physical objects to be formed from reels of thermoplastics. 3D printers use special CAD files, usually in STL or VRML format, and converts them into a series of coordinates that the printer will follow., building up the image in layers.

There are different types of 3D printers available, including the following:

- **Stereolithography (SL)** involves using lasers to part sure the printed shape from a bath of liquid resin. This is an expensive but very accurate method.
- **Digital light processing (DLP)** is similar to stereolithography but uses a powerful light source rather than a laser.
- **Laser sintering** uses a powdered material instead of a resin bath. The solid shape is created as the heat from the laser fuses and solidifies the powder.
- An extrusion method also known as **Fused Deposition Modelling (FDM)** is the most popular in schools and involves melting plastic filament with the heated extrusion head.

The most common in schools are single-head printers that use reels of printable plastic filament. ABS and PLA are usually used in FDM style printers and come in pre-coloured cartridges. New and interesting materials are frequently being developed which allow for printing in wood, steel and brass effect. Soft rubbery materials are also becoming available, making prototype products even more realistic.

Very complex shapes can be 3D printed and some filament printers can print in more than one colour. Dry powder printers can even print in full colour.

3D printers can print other material besides plastics, including metals, paper, ceramics and even food. 3D bio-printing is also being developed, meaning that in the future we may be able to successfully print replacement body parts.

### 6.4 Resin casting

Thermosetting polymers can be used to produce a variety of products by casting them into a mould where they set and permanently take on the shape of the mould. The types of thermosetting polymers used in casting are made up of two parts; the resin itself and a hardener known as a **catalyst**.

To cast thermosetting resin, you begin by preparing the mould. Then the resin is thoroughly mixed with the correct amount of the catalyst. The mixed liquid polymer is then poured into the mould and left to set or **cure**. Once fully cured the casting is removed from the mould and is ready for use.

### 6.5 Welding plastics

There are two ways to weld plastic; with heat or with chemicals.

A chemical weld is more often used in schools and involves using a solvent based liquid that dissolves the surface of the pieces of plastic being joined. The two styles of chemical weld are liquid solvent cement and a thicker variety called dichloromethane methyl meth acrylate, known as Tensol 12. both products are methane based and need to be treated with appropriate care and PPE. Tensol must be used in a ventilated room as it has high VOC levels.

Liquid solvent cement has a water-like consistency and is applied with either a fine tipped paint brush or a syringe. The surfaces being joined need to be flush as the cement will not fill any gaps. The cement is drawn along the joint by **capillary action**. Liquid solvent cement will join styrene, ABS, Acrylic and butyrate in any combination. The join sets very quickly but is not particularly strong in thin sections. The solvent cement can damage the surface of the plastic if not applied carefully.

Tensol 12 is best used on acrylic but will work with HIPS, PETG and polycarbonate. It is a much thicker solvent and is able to fill small gaps, but a flush accurate joint will always be much stronger. Tensol 12 is applied to the surface of the joint and can take around three hours to dry.

Heat welding plastic involves using a special hot air gun which accurately heats the areas being welded together as well as a plastic filler rod that is applied to the weld joint. Filler rods are available in HDPE, rigid PVC, LDPE, PP and ABS making it a versatile way to join many plastics.



## Eduqas Design & Technology (1-9) Polymers: Commercial Manufacturing & Quality Control

### 7.1 Plastics for commercial products

Plastics are widely used in commercial products. They have particular properties, such as electrical and thermal insulation, that are hard to find in other materials and most of them are waterproof and hygienic. Many plastics, such as polyethylene used for plastic bags, possess a good strength to weight ratio. Plastics offer value for money as a manufacturing material.



Thermoplastics are a very popular materials for seating products, as they are easy to mould and have a good level of flexibility. They are also lightweight, tough, durable, waterproof, corrosion resistant and chemical resistant making them easy to clean. Many plastics have a scratch resistant surface which helps to keep them looking good for longer. They are easily coloured and can be given a textured surface if required.

Thermosetting plastics are generally harder but more brittle than thermoplastics; they do not melt if they get hot. This is the key property that makes them so useful in electrical fittings. Urea formaldehyde is the main thermosetting plastic used for electrical fittings and is an excellent electrical insulator with good tensile strength. It can reach a very high temperature before heat distortion occurs, making the fitting stable even if there is an electrical fault.



### 7.2 Commercial production techniques

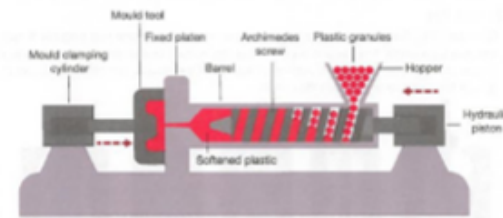
There are many different plastic processing methods used in industry including **blow moulding** for bottles, **rotational moulding** for hollow shapes and **vacuum forming**. **Injection moulding** and **extrusion** are two processes that offer great repetitive accuracy and enable a high level of detail to be achieved.

### 7.3 Injection moulding

This process is ideal for complex shapes. Firstly a mould needs to be made; these are generally constructed from steel in two parts. They need to be very accurate as any blemishes will be transferred to every moulding produced.



1. Granules of the chosen plastic are fed into the hopper
2. The hopper feeds the Archimedes screw that drags the granules past a heater, where they are softened and become plasticised as they travel forward
3. The plastic is in a soft, pliable form as it reaches the end of the screw, where it collects until there is enough to fill the mould
4. At this point a **hydraulic piston** forces the softened plastic into the mould under pressure, filling it up
5. The plastic sets quickly, the mould is separated and **ejector pins** release the moulding
6. The process is repeated.



### 7.4 Extrusion

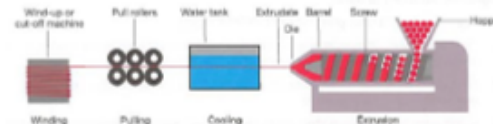
**Extrusion** is used to create a continuous flow of plastic that is pushed through a **die** to create a specific profile. Extrusion is used for cables, pipes, mouldings and even plastic film used for bags and packaging.

The extrusion process starts off in a similar way to injection moulding, using a die instead of a mould. The die sets the profile of the extruded plastic and must be made to a very precise tolerance.

A continuous flow of the softened plastic passes through the die at just the right temperature and flow rate to hold the shape.



The extruded plastic then passes onto a cooling table or cooling through where it fully solidifies and is either wound onto a spool or drum if thin and flexible, or cut into lengths if rigid.



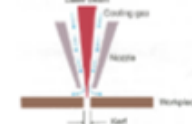
### 7.5 Blow moulding

Blow moulding feeds an extruded plastic tube known as a **parison** into a hollow mould such as a mould for a bottle. The parison is pinched at the bottom as the mould closes and filled with heated compressed air until the parison inflates to fill the mould.



### 7.6 Quality control

When products are made, checking that they are being produced correctly is an essential stage. This is known as **quality control (QC)** and is crucial to ensure dimensional accuracy is consistent and that the product is reliable and safe to use.



Laser cutters are one of the most accurate ways to cut a number of different plastics. (Note that use of some plastics, for example PVC, should be avoided as they will give off poisonous fumes when heated.) The laser itself can follow a design to a very fine tolerance, but they must be set up correctly considering the following.

- **Kerf allowance** – Every laser removes a little material and the thickness of the cut is known as the 'kerf' which can range from 0.1 mm to over 1 mm, depending on which material is used. Allowing for this variation is important to ensure the product fits correctly as it will affect the tolerance of the component being manufactured.
- **Power and speed settings** – Lasers cut using a combination of speed and power. The deepest cut would be on the slowest speed at the highest power and the lightest engraving would require the fastest speed and the least power. It is important to select the correct settings for the type of thickness of material and the type of cut or engraving required.
- **Focusing the beam** – The focal length of the laser will affect the quality of the cut or etch. Incorrect focus will mean the workpiece will not be cut through correctly and the kerf usually becomes much wider. Many lasers have an autofocus fitted, but it still needs to be set. Manual focusing can be done with a simple measuring tool or pin.
- **Clean mirrors and lenses** – One of the most common issues with laser cutters is that the power seems to drop off as the cutting head moves away from the laser source. This can mean that the work furthest away may not be cut through efficiently. If this happens it often means that the laser's lenses and mirrors need to be cleaned. This is a specialist job that your teacher or workshop technician should perform.

## Eduqas Design & Technology (1-9) Polymers: Commercial Manufacturing & Quality Control

### 8.1 Plastic surface treatments and finishes

The reason for applying a finish to plastic's fall into two main categories; protective and aesthetics. Most plastics are self-finishing, but a number of more interesting finishes can be applied.

Adding aesthetic appeal may mean colouring plastic by painting or applying graphics, or electroplating with a desired metal like chrome, nickel or even gold. Plastics can be enhanced to give it a sheen or shine, or matt surface finish, by rubberising or lacquering. It can even be coated in a fur effect. Protection can make it less prone to UV corrosion and colour fade.

### 8.2 Common plastic based finishing techniques

Plastic finishes vary dramatically in method and application. A number of specialist techniques are on offer, depending on the desired finish. Many of the paint on and spray on products are solvent based and are not very environmentally friendly, as they contain high levels of volatile organic compounds (VOCs). This means that they give off fumes that are considered hazardous to health and should be used according to the manufacturer's instructions, normally in a well ventilation area with a mask being worn.

| Name                              | Image   | Characteristics   | Name                                   | Image   | Characteristics  |
|-----------------------------------|---|---|--|---|--|
| Painting - spray primer and paint |  | Plastics are primed and sprayed with paints for aesthetics and protection from UV degradation                 | Heat transfer printing                 |  | Image is printed onto special paper and transferred onto the surface with a heat press   |
| Vinyl decals                      |  | Printed and cut self-adhesive vinyl can be attached to most surfaces  | Hydrographic printing                  |  | Colour images are printed onto water soluble film which floats on a tank, the product is submerged and the image wraps around it |
| Flocking                          |  | Electrostatically charged strands of plastic stand on end and one end is bonded to the material with adhesive | Electroplating and electroless plating |  | Plastics are covered in a conductive layer or etched before plating with nickel, chrome, copper, tin or gold                     |
| Engraving and frosting            |  | Laser-engraved surface that can reflect light effectively, frosting covers larger areas to make opaque        | Rubberising spray                      |  | A slightly textured coating that can be sprayed onto various materials, provides grip and has a matt aesthetic                   |


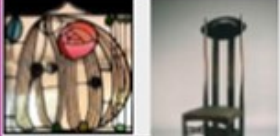
### 8.3 Polishing








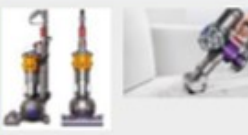








Plastic can become rough or scratched when it is processed. It can also become weathered and faded if left outside. Polishing techniques can be used to restore a high quality finish. Brasso® is often used to give a lustrous shine to certain polymers such as acrylic. Many other plastic polishes are available as are a number of products that restore faded and weathered plastics.

Notes:



# Eduqas Design & Technology (1-9) The Work of Others: Industrial & Product Design

| Name                            | Facts  | Logo  | Examples  |
|---------------------------------|--|---|---|
| <b>Raymond Templier</b>         | RAYMOND TEMPLIER (1891 - 1968) like many of his contemporaries in jewelry, was born to a family with a long tradition as jewelers.   |    |    |
| <b>Gerrit Rietveld</b>          | Gerrit Thomas Rietveld; 24 June 1888 – 25 June 1964) was a Dutch furniture designer and architect. One of the principal members of the Dutch artistic movement called De Stijl, Rietveld is famous for his Red and Blue Chair.   |    |    |
| <b>Charles Rennie Macintosh</b> | Charles Rennie Mackintosh (7 June 1868 – 10 December 1928) was a Scottish architect, designer, water colourist and artist. His artistic approach had much in common with European Symbolism. His work was influential on European design movements such as Art Nouveau and Secessionism. |   |   |
| <b>Aldo Rossi</b>               | Aldo Rossi (3 May 1931 – 4 September 1997) was an Italian architect and designer who achieved international recognition in four distinct areas: theory, drawing, architecture and product design. He was the first Italian to receive the Pritzker Prize for architecture.               |  |  |
| <b>Ettore Sottsass</b>          | Ettore Sottsass (14 September 1917 – 31 December 2007) was an Italian architect and designer during the 20th century. His work included furniture, jewellery, glass, lighting, home objects and office machine design, as well as many buildings and interiors.                          |  |  |

| Company Name        | Facts  | Logo  | Examples  |
|---------------------|--|---|---|
| <b>Alessi</b>       | Alessi is a housewares and kitchen utensil company in Italy, producing everyday items from plastic and metal, created by famous designers.   |    |    |
| <b>Apple</b>        | Apple Inc. is an American multinational technology company headquartered in Cupertino, California that designs, develops, and sells consumer electronics, computer software, and online services.  |    |    |
| <b>Braun</b>        | Braun GmbH formerly Braun AG, is a German consumer products company based in Kronberg. From 1984 until 2007, Braun was a wholly owned subsidiary of The Gillette Company, which had purchased a controlling interest in the company in 1967. |    |    |
| <b>Dyson</b>        | Dyson Ltd. is a British technology company established by James Dyson in 1987. It designs and manufactures household appliances such as vacuum cleaners, hand dryers, bladeless fans, heaters and hair dryers.                               |   |   |
| <b>GAP</b>          | The Gap, Inc. commonly known as Gap Inc. or Gap, (stylized as GAP) is an American worldwide clothing and accessories retailer.   |  |  |
| <b>Primark</b>      | Primark known as Penneys in the Republic of Ireland) is an Irish clothing and accessories company which is a subsidiary of AB Foods, and is headquartered in Dublin.   |  |  |
| <b>Under Armour</b> | Under Armour, Inc. is an American company that manufactures footwear, sports and casual apparel.   |  |  |
| <b>Zara</b>         | Zara is a Spanish clothing and accessories retailer based in Arteixo, Galicia. It is the main brand of the Inditex group, the world's largest apparel retailer.  |  |  |

Eduqas Design & Technology (1-9)  
Maths in Design & Technology

|  |   |
|--|---|
| <p>You may be asked to work out <b>Mechanical Advantage, Load or Effort</b>. Remember this triangle and you will know which equation to use.</p> <div style="text-align: center;"> </div>  |   |
| <p>To work out MECHANICAL ADVANTAGE</p> $\text{MECHANICAL ADVANTAGE} = \frac{\text{LOAD}}{\text{EFFORT}}$  | <p>Example</p> <p>MA = <math>\frac{875\text{N}}{125\text{N}}</math> MA is 7 or as a ratio 7:1</p>   |
| <p>To work out LOAD</p> $\text{LOAD} = \text{MECHANICAL ADVANTAGE} \times \text{EFFORT}$   | <p>Example</p> <p>Load = <math>7 \times 125</math> LOAD is 875N</p>   |
| <p>To work out EFFORT</p> $\text{EFFORT} = \frac{\text{LOAD}}{\text{MECHANICAL ADVANTAGE}}$  | <p>Example</p> <p>Effort = <math>\frac{875\text{N}}{7}</math> EFFORT is 125N</p>  |
| <p>The diagram below shows the movement of a lever which is part of a toy. The distance from point A to the pivot is 10mm. The distance from point B to the pivot is 40mm. If point A moves 10mm to the right, how far would point B move to the left?</p> <div style="text-align: center;"> </div>  | <p>To work out distance moved:</p> $\frac{\text{DISTANCE B}}{\text{DISTANCE A}} \times \text{DISTANCE A MOVED}$ $\frac{40\text{mm}}{10\text{mm}} \times 10 = 40\text{mm}$   |
| <p><b>Gear Ratio</b></p> <p><b>Velocity Ratio</b> — also known as gear ratio</p> <p><b>Low gear ratio = more speed with less force</b></p> <p>Driver has 60 teeth the driven has 30 teeth<br/>The gear ratio is 1:2.<br/>Driver rotates once : Driven rotates twice</p> <p><b>High Gear ratio = less speed with more force</b></p> <p>Driver has 25 teeth the driven has 75 teeth<br/>The gear ratio is 3:1.</p>                     | <p><b>VELOCITY RATIO</b> = <math>\frac{\text{DISTANCE MOVED BY EFFORT}}{\text{DISTANCE MOVED BY LOAD}}</math></p> <div style="text-align: center;"> </div> <p><math>\frac{30}{60} = 0.5 = 1:2</math></p> <div style="text-align: center;"> </div> <p><math>\frac{75}{25} = 3 = 3:1</math></p> |
| <p><b>Design and Technology Formulas and Equations</b></p>   |   |
| <p>In order to balance the 5N force placed at 0.5 m from the FULCRUM, we require 10N on the opposite side at 0.25m to keep the seesaw balanced.</p> <div style="text-align: center;"> </div>   |   |
| <p><b>To work this out:</b></p> <p>The force (or weight) needs to be doubled on the opposite side</p> <p>The distance from the Fulcrum needs to be halved on the opposite side</p>   |   |
| <div style="text-align: center;"> </div>   |   |
| <p><b>To work out FORCE</b></p> $\text{FORCE} = (\text{LOAD} \times \text{D1}) / \text{D2}$ <p>FORCE = <math>(8 \times 0.9) / 1.2</math><br/>FORCE = <math>(7.2) / 1.2</math><br/>FORCE = 6KG</p>  |   |
| <div style="text-align: center;"> </div>   |   |
| <p><b>To work out DISTANCE 1:</b></p> $\text{DISTANCE1} = (\text{LOAD2} \times \text{D2}) / \text{LOAD1}$ <p>DISTANCE = <math>(6 \times 1.2) / 8</math><br/>DISTANCE = <math>(7.2) / 8</math><br/>DISTANCE = 0.9m</p>  |   |
| <div style="text-align: center;"> </div>   |   |
| <p><b>To work out DISTANCE 2:</b></p> $\text{DISTANCE2} = (\text{LOAD1} \times \text{D1}) / \text{LOAD2}$ <p>DISTANCE = <math>(8 \times 0.9) / 6</math><br/>DISTANCE = <math>(7.2) / 6</math><br/>DISTANCE = 1.2m</p>  |   |
| <p><b>Tangent (Trigonometry)</b></p> <div style="display: flex; justify-content: space-between;"> <div> <p>TAN = <math>\frac{\text{Opposite}}{\text{Adjacent}}</math></p> <div style="text-align: center;"> </div> </div> <div> <p>To work out the height of B</p> <p>TAN 30° = 0.58</p> <p>0.58 = <math>\frac{15}{\text{Adjacent}}</math></p> <p>Adjacent = <math>\frac{15}{0.58}</math></p> <p><b>B = 25.9cm</b></p> </div> </div> |   |



# Verb Endings

1. Find the infinitive
  2. Remove AR/ ER / IR
  3. Add endings to stem
- I speak: hablar -> habl -> hablo

| Presente      |              | AR   | ER   | IR   |
|---------------|--------------|------|------|------|
| yo            | I            | o    | o    | o    |
| tú            | you (s)      | as   | es   | es   |
| el/ella       | he /she / it | a    | e    | e    |
| nosotros      | we           | amos | emos | imos |
| vosotros      | you (pl)     | áis  | éis  | ís   |
| ellos / ellas | they         | an   | en   | en   |

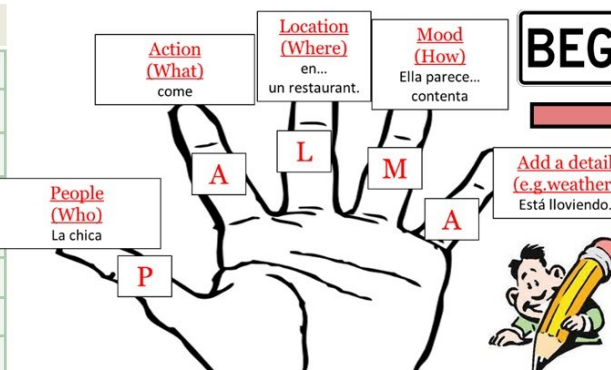
| Preterito     |              | AR     | ER / IR |
|---------------|--------------|--------|---------|
| yo            | I            | é      | í       |
| tú            | you (s)      | aste   | iste    |
| el/ella       | he /she / it | ó      | ió      |
| nosotros      | we           | amos   | imos    |
| vosotros      | you (pl)     | asteis | isteis  |
| ellos / ellas | they         | aron   | ieron   |

| Imperfect     |              | AR     | ER / IR |
|---------------|--------------|--------|---------|
| yo            | I            | aba    | ía      |
| tú            | you (s)      | abas   | ías     |
| el/ella       | he /she / it | aba    | ía      |
| nosotros      | we           | ábamos | íamos   |
| vosotros      | you (pl)     | abais  | íais    |
| ellos / ellas | they         | aban   | ían     |

## ¿¿¿ PREGUNTAS ???

|             |                  |
|-------------|------------------|
| ¿Qué?       | What?            |
| ¿Cuándo?    | When?            |
| ¿Cuál(es)?  | Which?           |
| ¿Quién(es)? | Who?             |
| ¿Dónde?     | Where?           |
| ¿Cuánto(s)? | How many / much? |
| ¿Por qué?   | Why?             |
| ¿Cómo?      | How?             |

| PRESENT          | PAST              | FUTURE                   |
|------------------|-------------------|--------------------------|
| normalmente      | normally          | ayer                     |
| en general       | in general        | yesterday                |
| siempre          | always            | anteayer                 |
| todo el tiempo   | all the time      | the day before yesterday |
| a menudo         | often             | el lunes pasado          |
| a veces          | sometimes         | last Monday              |
| de vez en cuando | from time to time | el martes próximo        |
| nunca            | never             | next Tuesday             |
|                  |                   | en dos días              |
|                  |                   | in 2 days                |
|                  |                   | la semana que viene      |
|                  |                   | next week                |
|                  |                   | el año que viene         |
|                  |                   | next year                |
|                  |                   | en el futuro             |
|                  |                   | in the future            |



## BEGIN

## Opinion

|                         |                       |
|-------------------------|-----------------------|
| a mi ver                | In my opinion         |
| desde mi punto de vista | From my point of view |
| diría que               | I would say           |
| creo que                | I believe that        |
| pienso que              | I think that          |
| para mí                 | For me                |
| opino que               | I think that          |

|            |              |
|------------|--------------|
| I like     | I don't like |
| me encanta | odio         |
| me gusta   | no me gusta  |
| me chifla  | no aguanto   |
| me flipa   | detest       |

## "because"

|   |            |
|---|------------|
| P | porque     |
| P | puesto que |
| Y | ya que     |
| D | dado que   |
| C | como       |

|       |        |            |
|-------|--------|------------|
| es    | era    | será       |
| it is | it was | it will be |

## Quantifiers

|                 |          |
|-----------------|----------|
| muy             | very     |
| bastante        | quite    |
| un poco         | a bit    |
| mucho           | a lot    |
| raramente       | rarely   |
| demasiado/a (s) | too much |
| casi            | almost   |



## Connectives

|                       |                   |
|-----------------------|-------------------|
| y                     | and               |
| pero                  | but               |
| o                     | or                |
| donde                 | where             |
| también               | also              |
| por ejemplo           | for example       |
| (des) afortunadamente | (un) fortunately  |
| por otro lado         | on the other hand |
| especialmente         | especially        |
| sin embargo /         | however           |
| no obstante           |                   |
| al principio /        | firstly           |
| primeramente/         |                   |
| primero               |                   |
| entonces              | then              |
| después               | after             |
| finalmente            | finally           |
| mientras              | while             |



| SER             | ESTAR     |
|-----------------|-----------|
| Description     | Position  |
| Occupation      | Location  |
| Characteristics | Action    |
| Time            | Condition |
| Origin          | Motion    |
| Relationship    |           |

|             |       |
|-------------|-------|
| yo          | soy   |
| tú          | eres  |
| el/ella     | es    |
| nosotros    | somos |
| vosotros    | sois  |
| ellos/ellas | son   |



|             |         |
|-------------|---------|
| yo          | estoy   |
| tú          | estás   |
| el/ella     | está    |
| nosotros    | estamos |
| vosotros    | estáis  |
| ellos/ellas | están   |

## Future

It hasn't happened yet...so keep the full infinitive - AR / ER / IR

|               |      |
|---------------|------|
| yo            | é    |
| tú            | ás   |
| el /ella      | á    |
| nosotros      | emos |
| vosotros      | éis  |
| ellos / ellas | án   |


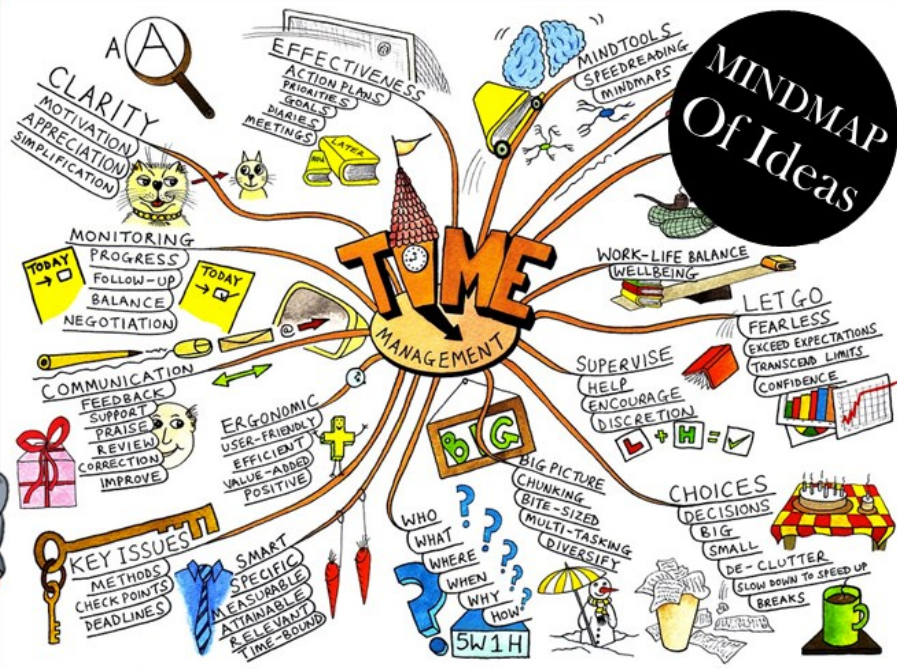


¿Cuántos años tienes?

TENER + NUMBER + AÑOS

NOT SER NOT ESTAR


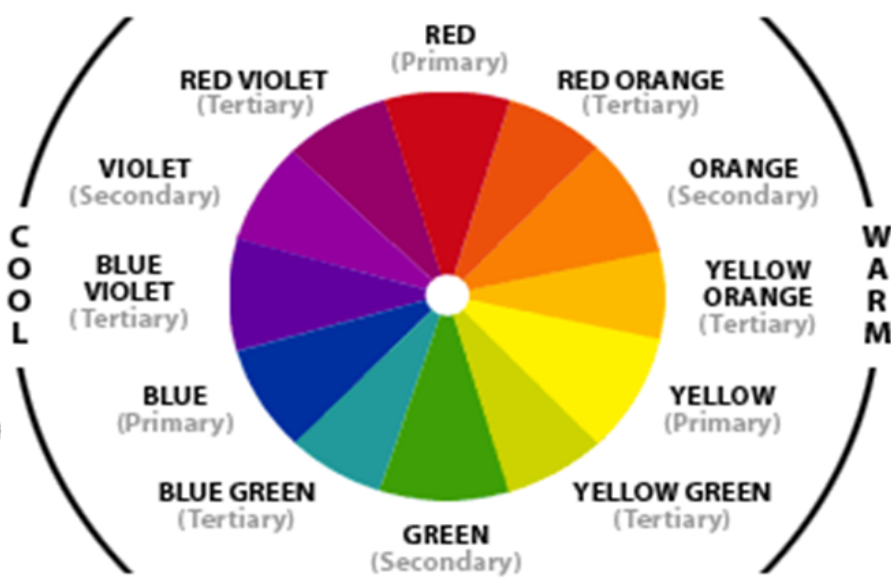


tengo Once años


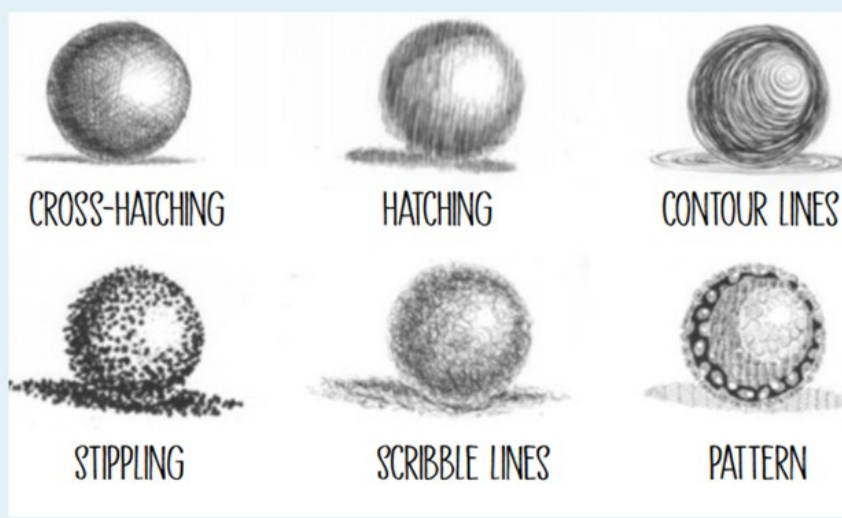

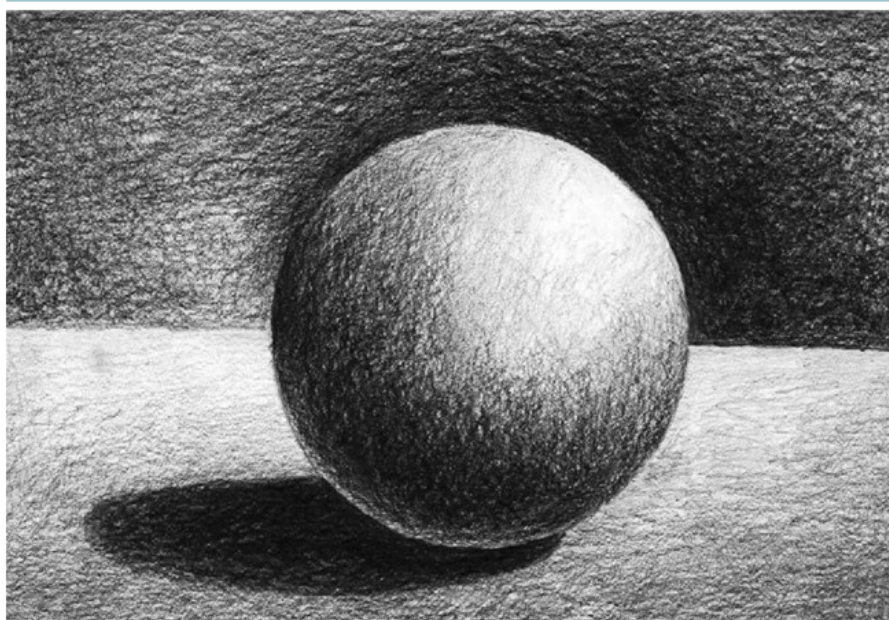


| Key Vocabulary...   |   | Picture This...   | Deeper Learning...   |
|---|---|---|---|
| <b>MIND MAPPING</b>   | A graphical way to represent ideas around your theme. Use of keywords and branches to show breadth of initial ideas.  |   | <b>ANALYSING ARTWORK:-</b><br><b>CONTENT:</b> <ul style="list-style-type: none"> <li>What is the work about?</li> <li>Is the work realistic/abstract?</li> <li>Has it been exaggerated?</li> <li>Are there recurring features?</li> <li>What is the theme of the work?</li> <li>What message is communicated?</li> </ul>  |
| <b>VISUAL MOODBOARD</b>   | A collection of imagery and collaged ideas to present a visual understanding of your theme. Keep to a style of scheme of colour.                                  |   | <b>FORM:</b> <ul style="list-style-type: none"> <li>What colour does the artist use?</li> <li>What shapes does the artist use?</li> <li>What mark-making techniques?</li> <li>How big is the work – why?</li> <li>Does the artist have a style?</li> </ul>  |
| <b>ARTIST RESEARCH</b>  | Show your understanding of contemporary and historical artists and artistic movements by analysing their work. To draw in their style and discuss your intention. |   | <b>PROCESS:</b> <ul style="list-style-type: none"> <li>How has the work been made?</li> <li>What media/material has the artist used?</li> </ul>   |
| <b>Always remember...</b>  |   |  | <b>MOOD:</b> <ul style="list-style-type: none"> <li>How does the work make you feel?</li> <li>Does the colour, texture, form or composition effect your mood?</li> <li>Does the work reminisce about a dream in any way?</li> </ul>   |
| <b>DON'T LIMIT YOURSELF</b>   | Even if it doesn't link to your starting point, it may relate to your theme.<br><br>Add annotations and sketches to show/explain your thought process.            |   | <b>The Big Question...</b>  |
| <b>PRIMARY SOURCES</b>  | When researching a theme, collect images, photos, samples, magazine cuttings etc.<br><br>Make sure all images are relevant.                                       |   | <b>NEXT STEPS:</b> <ul style="list-style-type: none"> <li>What is your intention?</li> <li>How will you use this style?</li> <li>What features will you try to replicate?</li> <li>How are you going to use this knowledge to further develop your work?</li> <li>How are you going to develop your own imagery in response to the artist and/or movement?</li> </ul> |
| <b>PRESENTATION</b>   | Pull your boards together by being consistent.<br><br>Stick to a particular style and/or colour scheme.<br><br>Use DAFONT for titles if unsure.                   |   |   |

**Activity:** Take (10-15) of your own images linked to your theme (primary research) from observation. You will then draw from these images and develop further by exploring different media in the style of your chosen artist and/or movement.










| Key Vocabulary...   |   | Picture This...   | Deeper Learning...   |
|---|---|---|---|
| <b>MEDIA</b>  | The substance an artist uses to create art e.g. collage, coloured pencils, paint etc.   |   | <b>COLOUR THEORY</b><br>PRIMARY = RED, YELLOW, BLUE<br>SECONDARY = ORANGE, GREEN, PURPLE<br>TERTIARY = SECONDARY + PRIMARY<br>SHADE = ADD BLACK<br>TINT = ADD WHITE<br>HARMONIOUS = COLOURS NEXT TO EACH OTHER ON COLOUR WHEEL<br>COMPLEMENTARY = OPPOSITE ON COLOUR WHEEL<br>MONOCHROMATIC = ONE COLOUR AND VALUES (LIGHT TO DARK)<br>HUE = PIGMENT OF ONE COLOUR<br>WARM = RED, ORANGE, YELLOW<br>COOL = BLUE GREEN, PURPLE |
| <b>MATERIALS</b>  | The same idea as media but can also refer to what the work is created on e.g. canvas, paper or clay.  |   |   |
| <b>TECHNIQUES</b>   | The method used to complete the artwork, can be generic such as painting or more focussed such as blending.   |   |   |
| <b>PROCESSES</b>  | The method used to create artwork that usually follows a range of steps rather than just one skill.   |   |   |
| <b>Always remember...</b>    |   |  | <b>The Big Question...</b><br><b>NEXT STEPS:</b><br>Have you chosen an image by refining and selecting through your images/drawings?<br>Have you developed this image further by using a variety of media, materials, techniques and processes?<br>Have you pushed this further by applying another method?   |
| <b>COLOURED PENCILS</b>   | <ul style="list-style-type: none"> <li>Apply using a soft circular motion</li> <li>Start with the lightest colours and build up</li> <li>Avoid applying a thick line of tone</li> </ul> |   |   |
| <b>WATERCOLOUR</b>  | <ul style="list-style-type: none"> <li>Mix your own variations of paint instead of straight from palette</li> <li>Avoid too much water as paper will bobble</li> </ul>                  |   |   |
| <b>ACRYLIC PAINT</b>  | <ul style="list-style-type: none"> <li>Mix your own paint instead of out of tub</li> <li>Add colour to white to lighten rather than white to colour.</li> </ul>                         |   |   |
| <b>COLLAGE</b>  | <ul style="list-style-type: none"> <li>Rip or cut (not both)</li> <li>Overlap to avoid gaps</li> <li>Use a variety of tones</li> </ul>  |   |   |
| <b>OIL PASTELS</b>  | <ul style="list-style-type: none"> <li>Start with lightest first</li> <li>Press on heavy for strong coverage</li> <li>Blend by overlapping</li> </ul>                                   |   |   |
| <b>Activity:</b> Take your favourite drawings and photocopy original before altering. Link to artist style and use a variety of techniques and processes to push further. Change scale and material to add depth to your artwork. |   |   |   |

| Key Vocabulary...  |  | Picture This...   |  | Deeper Learning...   |
|--|--|---|--|---|
| <b>OBSERVATIONAL DRAWING</b>   | Drawing from looking at an image or object.  |    |  | <b>ANNOTATION: -</b>  |
| <b>PRIMARY OBSERVATION</b>   | Drawing from an object that is directly in front of you.   |   |  | <b>STEP 1: DESCRIBE</b>   |
| <b>SECONDARY OBSERVATION</b>   | Drawing from an image.   |   |  | <ul style="list-style-type: none"><li>• What is this an image of?</li><li>• What have you done?</li><li>• What was the purpose of the piece?</li></ul>  |
| <b>PHOTOGRAPHS</b>   | Using a camera to record images – this is classed as primary observation.  |   |  | <b>STEP 2: EXPLAIN</b>  |
| <b>SKETCHES</b>  | Basic sketches and doodles can act as a starting point to aid in developing an idea.   |   |  | <ul style="list-style-type: none"><li>• How was the work made?</li><li>• How did you produce the effect?</li><li>• How did you decide on composition?</li></ul>   |
| Always remember...    |  | STAGES OF DRAWING   |  | <b>STEP 3: REFLECT</b>  |
| <b>CROSS-HATCHING</b>  | <p>Cross-hatching uses fine parallel lines drawn closely together to create the illusion of shade or texture in a drawing.</p> <p>It is the drawing of two layers of hatching at right-angles to create a mesh-like pattern.</p> |    |  | <ul style="list-style-type: none"><li>• Why did you use this specific method?</li><li>• Why are some areas better than others?</li><li>• What might you do differently next time?</li><li>• Why might you do it differently?</li><li>• How will your develop in response?</li></ul> |
| <b>HATCHING</b>  | <p>For pencil or pen-and-ink drawing. Hatching is one of the quickest ways to fill in the dark areas.</p> <p>By drawing a lot of fine lines that are parallel, the area as a whole is perceived as being darker.</p>             |   |  |   |
| <b>STIPPLING</b>   | The art or process of drawing, painting, or engraving using numerous small dots or specks.   |   |  |   |
| <b>Activity:</b> Try to annotate or evaluate whenever you have an idea or a change in direction. Write about a technique that was successful or if something didn't go as planned. |  | <b>The Big Question...</b>  |  |   |
|  |  | <b>NEXT STEPS: -</b>  |  |   |
|  |  | <ul style="list-style-type: none"><li>• Produce a range of tones by varying the pressure and layering</li><li>• Consider using softer pencils for darker shades</li><li>• Apply tone using a soft circular motion to create a smooth coverage. Filling all the white gaps and avoid shading in different directions</li><li>• Add detail/interest by applying tone using mark-making techniques</li><li>• Mark-making can be produced by making your own tools/paintbrushes</li></ul> |  |   |

Page 71



| Key Vocabulary...  |   | Picture This...   | Deeper Learning...    |
|--|---|---|--|
| <b>ROUGH IDEA</b>  | Basic sketches of a final idea.<br><br>Label to ensure clarity.   | <b>COMPOSITIONAL LAYOUTS:</b><br><br><b>RULE OF THIRDS</b><br><br><b>LEADING LINES</b><br><br><b>BALANCED ELEMENTS</b><br><br><b>CROP</b> | <b>FORMAL ELEMENTS OF ART: -</b><br><b>COLOUR:</b> Primary colours cannot be mixed by using any other colours but in theory, all other colours are made from them.<br><br><b>Red + Yellow = Orange</b><br><b>Blue + Yellow = Green</b><br><b>Red + Blue = Purple</b><br><br>Orange, Green and Purple are secondary colours. All other colours (primary + secondary = tertiary).<br><br>Colour schemes could be adhered to fit with theme.<br><br><b>SHAPE:</b> An area closed by line. Geometric or basic.<br><br><b>FORM:</b> Form is a 3D shape which can be sculpted using clay, wire or Modroc.<br><br>In 2D art, tone and perspective can be used to create an illusion of 3-dimensions using light and dark to create shadows.<br><br><b>TEXTURE:</b> Surface quality. The way it feels physically or the way it is made to feel.<br><br><b>tone:</b> Light to dark to create depth. This could be a shade or how dark or light a colour appears. Tones are created by the way the light falls onto a 3D object.<br><br><b>PATTERN:</b> Created by repeating lines, shapes, tones or colour. The design used to create a pattern is often referred to as a motif. Motifs can be simple shapes or complex arrangements.<br><br>Patterns can be man-made, like a fabric or wallpaper design, or natural, such as the markings on animal fur.<br><br><b>LINE:</b> Line can be used to portray different qualities such as: contours, feelings or expressions and movements. |
| <b>VISUAL OR MAQUETTE</b>  | An image or model created from selected materials (usually smaller in scale than intended).   |   |  |
| <b>FINAL PIECE</b>   | An image or sculpture that is the end product of your project/journey.<br><br>Visual representation of pulling all prep work together to showcase your ideas and journey.  |   |  |
| <b>Always remember...</b>  |   | <b>FORMAL ELEMENTS</b><br>   |  |
| <b>RULE OF THIRDS</b>  | The rule of thirds is a guideline which applies to the process of composing visual images.<br><br>The horizon sits at the horizontal line dividing the lower third of the photo from the upper two-thirds.  |   |  |
| <b>LEADING LINES</b>   | Leading lines refers to a composition technique whereby the viewer's eye is attracted to lines that lead directly to the principle subject in the image.  |   |  |
| <b>BALANCED ELEMENTS</b>   | When different parts of a photo command your attention equally, perfect balance is achieved.  |   |  |
| <b>CROP</b>  | Cropping is the removal of unwanted outer areas from a photograph or illustrated image.   |   |  |
| <b>Activity:</b> Create a draft copy of your final design ideas. Make sure to label and photocopy sections if using a combination of a number of pieces. |   | Page 72   |  |

## Yr10 Knowledge organiser spring term PASTRY

|                    |   |  |   |
|--------------------|---|--|---|
| Short Crust Pastry |  |  |  |
| Flaky Pastry       |  |  |  |
| Choux Pastry       |  |  |  |
| Filo Pastry        |  |  |  |

### Blind Baking What is it?

The pastry case is lined with parchment paper and then filled with baking beans and baked in the oven until cooked. The baking beans stop the pastry from puffing up too much, ensuring there is space for a filling.



### Making pastry (except for choux)

1. All ingredients and equipment should be kept cool.
2. Rolling out should be done gently and avoid overhandling
3. Rolling should be done in short, even strokes
4. Add the cold water a little at a time
5. Use finger tips only for rubbing in

Pastry is differentiated from bread by having a higher fat content, which contributes to a flaky or crumbly texture. A good pastry is light and airy and fatty, but firm enough to support the weight of the filling. When making a shortcrust pastry, care must be taken to blend the fat and flour thoroughly before adding any liquid. This ensures that the flour granules are adequately coated with fat and less likely to develop gluten. Overmixing results in tough pastry. In other types of pastry such as flaky, the characteristic flaky texture is achieved by repeatedly rolling out a dough, spreading it with butter, and folding it to produce many thin layers

### Sausage rolls – a problem?

When considering pastry products, the advantages are that there is variety, they are filling, they can be cheap, sweet or savoury and in the correct amounts, they can make a useful part of a meal.

There are disadvantages -  
Pastry products can be high in fat, sugar and salt. Those containing meat are not suitable for vegetarians and pork or beef products are not suitable for some cultural diets.

Pastry products can lack vitamins and minerals as they were often a cheap filler. A diet lacking in vitamins and minerals can lead to poor health and certain conditions

### Key vocabulary

Shortener

Fats

Vegetable fats

Plant fats

Crumbly

Flaky

Layers

Pliable

Chill

Baking blind

Gluten

Soft flour

Cholesterol

CHD

Scurvy

Beri beri

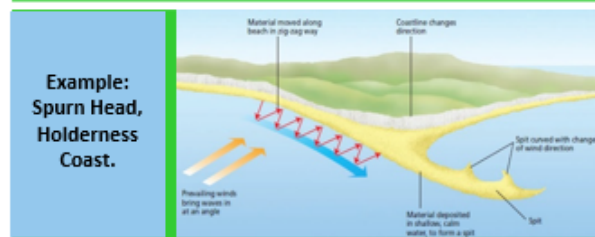
Vegetarians

Lacto  
vegetarians

Vegans



### Formation of Coastal Spits - Deposition



- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.

### How do waves form?

Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

### Why do waves break?

- 1) Waves start out at sea.
- 2) As waves approach the shore, friction slows the base.
- 3) This causes the orbit to become elliptical.
- 4) Until the top of the wave breaks over.

### Project

Research a section of UK coastline that is under threat. Examine how the coast is being threatened, the underlying geology and what short and long term impacts will affect it. You can do this digitally or on paper but you must submit this as a printed piece of work. Also include:

| Background   | Management  |
|--|---|
| How has this area of coast been formed? What is threatened and how will it impact the local community? What measures have already been put in place? Are they effective? | What solutions are being used to help solve these problems? What solutions could they use? Is the cost of these solutions worth the benefit? Why? |

### Types of Erosion

| The break down and transport of rocks – smooth, round and sorted. |  |
|---|--|
| <b>Attrition</b>  | Rocks that bash together to become smooth/smaller.                             |
| <b>Solution</b>   | A chemical reaction that dissolves rocks.                                      |
| <b>Abrasion</b>   | Rocks hurled at the base of a cliff to break pieces apart.                     |
| <b>Hydraulic Action</b>   | Water enters cracks in the cliff, air compresses, causing the crack to expand. |

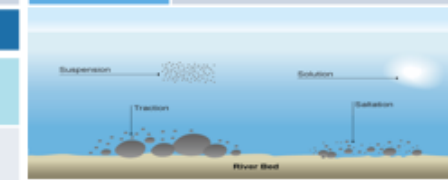
### Types of Weathering

Weathering is the breakdown of rocks where they are.

|                    |  |
|--------------------|--|
| <b>Carbonation</b> | Breakdown of rock by changing its chemical composition.      |
| <b>Mechanical</b>  | Breakdown of rock without changing its chemical composition. |

### Types of Transportation

| A natural process by which eroded material is carried/transported. |   |
|--|---|
| <b>Solution</b>  | Minerals dissolve in water and are carried along.                           |
| <b>Suspension</b>  | Sediment is carried along in the flow of the water.                         |
| <b>Saltation</b>   | Pebbles that bounce along the sea/river bed.                                |
| <b>Traction</b>  | Boulders that roll along a river/sea bed by the force of the flowing water. |



### What is Deposition?

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

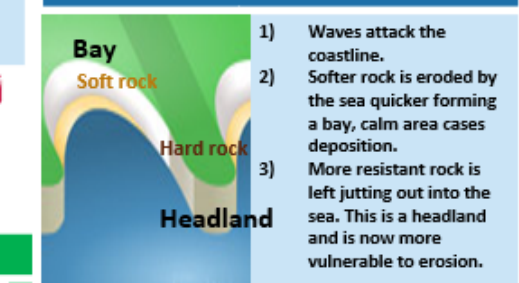
### Mass Movement

A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.

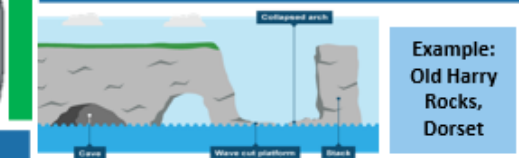
- 1) Rain saturates the permeable rock above the impermeable rock making it heavy.
- 2) Waves or a river will erode the base of the slope making it unstable.
- 3) Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
- 4) The debris at the base of the cliff is then removed and transported by waves or river.



### Formation of Bays and Headlands



### Formation of Coastal Stack

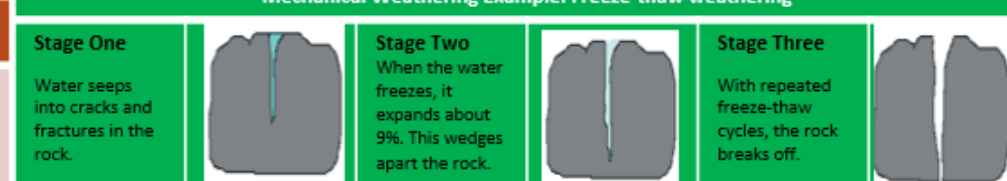


- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below – arch collapses leaving stack.
- 6) Further weathering and erosion leaves a stump.

## Physical Landscapes in the UK

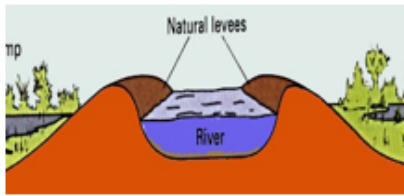
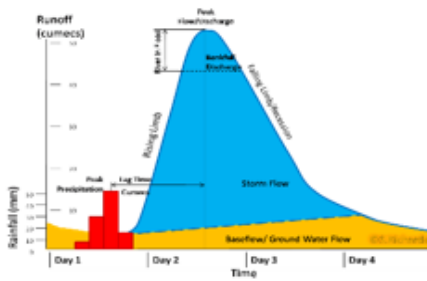
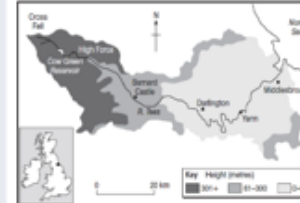


### Mechanical Weathering Example: Freeze-thaw weathering



### Size of waves

| Size of waves  | Types of Waves  |  |
|--|---|--|
|  | Constructive Waves  | Destructive Waves  |
| <ul style="list-style-type: none"> <li>Fetch how far the wave has travelled</li> <li>Strength of the wind.</li> <li>How long the wind has been blowing for.</li> </ul> | This wave has a swash that is stronger than the backwash. This therefore builds up the coast. | This wave has a backwash that is stronger than the swash. This therefore erodes the coast. |
|  |   |  |






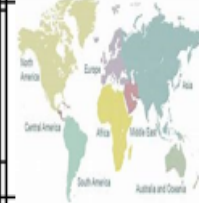

| Coastal Defences   |   |   | Water Cycle Key Terms                  |   | Lower Course of a River   |  |
|--|---|---|--|---|---|--|
| Hard Engineering Defences  |   |   | Precipitation                          | Moisture falling from clouds as rain, snow or hail.                                       | Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.  |  |
| Groynes  | Wood barriers prevent longshore drift, so the beach can build up.                   | ✓ Beach still accessible.<br>✗ No deposition further down coast = erodes faster.                      | Interception                           | Vegetation prevent water reaching the ground.   | <b>Formation of Floodplains and levees</b><br>When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.   |  |
| Sea Walls  | Concrete walls break up the energy of the wave. Has a lip to stop waves going over. | ✓ Long life span<br>✓ Protects from flooding<br>✗ Curved shape encourages erosion of beach deposits.  | Surface Runoff                         | Water flowing over surface of the land into rivers  |    |  |
| Gabions or Rip Rap   | Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.       | ✓ Cheap<br>✓ Local material can be used to look less strange.<br>✗ Will need replacing.               | Infiltration                           | Water absorbed into the soil from the ground.   |   |  |
| Soft Engineering Defences  |   |   | Transpiration                          | Water lost through leaves of plants.  | ✓ Nutrient rich soil makes it ideal for farming.<br>✓ Flat land for building houses.  |  |
| Beach Nourishment  | Beaches built up with sand, so waves have to travel further before eroding cliffs.  | ✓ Cheap<br>✓ Beach for tourists.<br>✗ Storms = need replacing.<br>✗ Offshore dredging damages seabed. | Physical and Human Causes of Flooding. |   | River Management Schemes  |  |
| Managed Retreat  | Low value areas of the coast are left to flood & erode.                             | ✓ Reduce flood risk<br>✓ Creates wildlife habitats.<br>✗ Compensation for land.                       | Physical: Prolong & heavy rainfall     | Long periods of rain causes soil to become saturated leading runoff.                      | Soft Engineering  | Hard Engineering   |
| Project  |   |   | Physical: Relief                       | Steep-sided valleys channels water to flow quickly into rivers causing greater discharge. | Afforestation – plant trees to soak up rainwater, reduces flood risk.<br>Demountable Flood Barriers put in place when warning raised.<br>Managed Flooding – naturally let areas flood, protect settlements.   | Straightening Channel – increases velocity to remove flood water.<br>Artificial Levees – heightens river so flood water is contained.<br>Deepening or widening river to increase capacity for a flood. |
| Research a UK River. You need to include locational detail, geomorphic processes and how the river is managed at specific points to benefit people. You can do this digitally or on paper but you must submit this as a printed piece of work. Also include: |   |   | Human: Land Use                        | Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.  | Hydrographs and River Discharge   |  |
|  |   |   | Upper Course of a River                |   | River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall   |  |
|  |   |   | Formation of a Waterfall               |   | 1. Peak discharge is the discharge in a period of time.<br>2. Lag time is the delay between peak rainfall and peak discharge.<br>3. Rising limb is the increase in river discharge.<br>4. Falling limb is the decrease in river discharge to normal level.  |  |
|  |   |   | Middle Course of a River               |   |    |  |
|  |   |   | Formation of Ox-bow Lakes              |   | Case Study: The River Tees  |  |
|  |   |   | Step 1                                 | Step 2  | Location and Background<br>Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.   |  |
|  |   |   | Step 3                                 | Step 4  | Geomorphic Processes<br><b>Upper</b> – Features include V-Shaped valley, rapids and waterfalls. High Force waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.<br><b>Middle</b> – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.<br><b>Lower</b> – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary. |  |
|  |   |   |  |   |    |  |
|  |   |   |  |   | <b>Management</b><br>- Towns such as Yarm and Middlesbrough are economically and socially important due to houses and jobs that are located there.<br>- Dams and reservoirs in the upper course, controls river's flow during high & low rainfall.<br>- Better flood warning systems, more flood zoning and river dredging reduces flooding.  |  |



| Key Vocabulary...  |   | Timeline   |        |  | Important People  |   |
|--|---|--|--------|--|---|---|
| USSR (Soviet Union)  | A collection of nations including Russia which were all governed by a single communist government from 1917-1991. | Yalta Conference   | 1945   | A conference in February where Churchill, Stalin and Roosevelt met to discuss post-war Europe.         | Josef Stalin  | Communist leader of the USSR from 1923 until his death in 1953. Led the country during WWII.  |
| Dictatorship   | A system of government in which one person has absolute power to make all decisions.                              | Potsdam Conference   | 1945   | A conference in July where Attlee, Stalin and Truman met to discuss post-war Europe.                   | Winston Churchill   | British politician and statesman who was the Prime Minister during WWII.                      |
| Communist  | A political system in which the government controls everything including all wages and businesses.                | First use of nuclear bomb.   | 1945   | In August the USA dropped two nuclear weapons on Japan.  | Franklin D. Roosevelt   | Longest serving US President of all time until his death in 1945. Led the USA during WWII.    |
| Capitalist   | Political ideas which are focussed little government intervention, and the right to freely trade to make money.   | Iron Curtain Speech  | 1946   | Churchill gives a speech in the US in which he says that Europe has been divided by an 'Iron Curtain'. | Harry S. Truman   | Was Roosevelt's vice president and became the president on his death and served from 1945-53. |
| Cold War   | A state of mistrust and tension between two or more countries. Not an actual war but the threat of war.           | US intervention in Greece and Turkey   | 1947   | The defeated Germany is forced to accept harsh terms for peace after losing WWI.                       |   |   |
| Conflict   | Opposing actions between two different groups, if violent it can be called a war.                                 | Truman Doctrine  | 1947   | Truman unveils his new policy which is aimed at stopping the spread of communism.                      |   |   |
| Tension  | The potential for disagreements and opposing ideas to turn into conflict.   | Berlin Blockade  | 1948-9 | Stalin blocks land access to West Berlin, the West supplies it by air                                  |   |   |
| Democracy  | The idea that a nation should choose its own leaders.   | Formation of NATO  | 1949   | NATO, the alliance of capitalist countries is created to help defend the West.                         |   |   |
| What changed over the period?  |   | Always Remember...   |        |  | Deeper Learning...  |   |
| In 1945, the United States along with Britain were in a successful wartime alliance against Nazi Germany. As soon as this war was won, the Grand Alliance started to break down as disagreements over the future of Europe allowed old enmities to resurface.<br>By 1949, the USA and the USSR were locked in a state of Cold War, not daring to attack each other directly for fear of nuclear weapons but working against each other's interests wherever possible around the world. |   | <ul style="list-style-type: none"><li>The alliance between the USA and USSR was a marriage of convenience, it only worked whilst they had a common enemy: Nazi Germany.</li><li>The USA was <u>capitalist</u> and the USSR was communist. These are opposite systems and incompatible with each other.</li><li>Europe was divided between countries in the Soviet 'sphere of influence' and 'Western' countries, which had capitalist democratic governments. This divide was called the 'Iron Curtain'.</li></ul> |        |  | <p>State the key events and the year they occurred in the early Cold War.</p> <p>Describe the communist and capitalist systems of government.</p> <p>Explain why the Cold War started in the years after WWII.</p> <p>'The development of nuclear weapons was the main cause of the Cold War'. How far do you agree with this statement?</p> <p>Project: Create a fact-file on the life of Josef Stalin, his actions and beliefs.</p> |   |
| Activity - 'The main cause of tension between East and West in the 1940s was the Berlin Blockade.' How far do you agree with this statement?   |   |  |        |  |   |   |

| Key Vocabulary...   |   | Timeline  |      |  | Important People   |  |
|---|---|---|------|--|--|--|
| USSR (Soviet Union)   | A collection of nations including Russia which were all governed by a single communist government from 1917-1991.     | NATO formed   | 1949 | The North Atlantic Treaty Organisation, an alliance of capitalist countries.               | Josef Stalin   | Communist leader of the USSR from 1923 until his death in 1953. Controlled the Eastern Bloc with harsh measures.                                   |
| De-Stalinisation  | A process of change after the death of Stalin where the USSR would pursue a more peaceful approach beginning in 1953. | Death of Stalin   | 1953 | The leader of the USSR dies leading to a power struggle amongst his possible successors.   | Nikita Khrushchev  | By 1956 he had become the successor to Stalin and tried to take a more peaceful approach until the Hungarian Uprising.                             |
| Sputnik   | The world's first man-made satellite, launched by the USSR in 1957, starting the Space Race.                          | West Germany joins NATO   | 1955 | The USSR feels threatened as West Germany brought into the alliance.                       | Dwight D. Eisenhower   | President of the USA from 1953 until 1961. Refused to apologise for the US spying on the USSR and lying about it.                                  |
| Brinkmanship  | A risky game of pushing the threat level to the limits to encourage the other side to back down.                      | Warsaw Pact formed.   | 1955 | An alliance of communist countries formed to oppose NATO.                                  | John F. Kennedy  | President of the USA from 1961 until his assassination in 1963. Failed to respond to the Berlin Wall but dealt with the Cuban Missile Crisis well. |
| Arms Race   | A continual build-up of weapons and soldiers to gain an advantage over the other side.                                | The Secret Speech   | 1956 | Khrushchev gives a speech in which he signals de-Stalinisation.                            |  |  |
| Intelligence  | Information about the enemy gained by spying or some other secret way.  | The Hungarian Uprising  | 1956 | Led by Imre Nagy, the Hungarian people rebel against communism.                            |  |  |
| ICBM  | Inter-continental ballistic missile, developed in the 1950s to launch nuclear weapons across the world.               | Development of ICBMs  | 1957 | The USSR develops the technology to use nuclear weapons without dropping them from planes. |  |  |
| Summit  | A meeting between the overall leaders of different countries.   | Launch of Sputnik I   | 1957 | Both sides fear weapons orbiting over their territories in satellites.                     |  |  |
|   |   | U2 Spy Plane Crisis   | 1960 | A US plane is shot down in the USSR derailing the Paris Peace Summit.                      |  |  |
|   |   | Berlin Wall Built   | 1961 | A wall is built overnight separating West Berlin from East Germany.                        |  |  |
| What changed over the period?   |   | Always Remember...  |      |  | Deeper Learning...   |  |
| After the death of Stalin, Khrushchev became the Soviet leader and gave his 'Secret Speech' which signalled that the USSR would take a more peaceful approach and try to coexist with the West. This was proven to be false when Khrushchev sent tanks into Hungary in 1956 to deal with the uprising there. By the late 1950s the Space Race was well underway and ICBMs had made the Cold War even more serious. When Kennedy took office in the USA in 1961 he inherited a very poor relationship with the East which was immediately worsened by the building of the Berlin Wall. |   | <ul style="list-style-type: none"><li>The leaders of the USSR and the USA changed but the differences between their political and economic systems did not.</li><li>NATO was formed in 1949 but the Warsaw Pact was not formed until 1955, when West Germany was invited into NATO. The USSR had fought a brutal war against Germany which had killed tens of millions, to allow Germany into the enemy alliance was too close for the USSR.</li><li>The nuclear arms race was well underway by the 1950s but the development of H-bombs and ICBMs only increased the perceived threat.</li></ul> |      |  | <p>State the key events and personalities involved in the Hungarian Uprising.</p> <p>Describe the U2 Spy Plane Crisis.</p> <p>Explain why the Berlin Wall was built, and the official reasons given by the USSR.</p> <p>'The Secret Speech caused the Hungarian Uprising'. How far do you agree with this statement?</p> <p>Project: Create a fact-file on the Space Race, beginning with Sputnik and ending with Apollo 11.</p> |  |
| Activity - 'The main cause of tension between East and West in the 1950s was the West Germany joining NATO.' How far do you agree with this statement?  |   |   |      |  |  |  |



| Key Vocabulary...           |  | Picture This...   |   | Always Remember...   |
|-----------------------------|--|---|---|--|
| <b>Worship</b>              | Worship is the act of religious praise to give <b>thanks</b> to God and ask for <b>forgiveness</b> . It shows their <b>love</b> of God.  |    | <b>Salvation<br/>Atonement<br/>Reconciliation</b> | Christians believe in one God who is understood in three parts or persons: God the Father, Jesus the son and the Holy Spirit. This is called the Trinity. The Trinity is active in a Christian's life. |
| <b>Public &amp; private</b> | Worship can be in public in a church with other Christians and it can also be in private on their own.   |   |   |  |
| <b>Liturgical</b>           | Worship which follows a set pattern each time, for example, prayers, Holy Communion, reading the Bible. Roman Catholic and Church of England worship in a liturgical way.  |   |   |  |
| <b>Non-liturgical</b>       | Worship which does not follow a set pattern each time, for example, not celebrating the Holy Communion at every service but spending more time reading the Bible. Methodist and Baptist churches worship in a non-liturgical way.  |    | <b>Christian Aid</b>                              | <b>Deeper Learning...</b><br>Create a connection map to show the role of the church in the local community and the world wide community.   |
| <b>Spontaneous</b>          | Worship which follows no structure at all but is guided by the Holy Spirit: Quaker Christians sit in silence until someone feels moved to speak by the Holy Spirit.  |   |   |  |
| <b>Sacrament</b>            | A outward ceremony/sign of an inward, deep spiritual meaning. Holy Communion and baptism are sacraments. The bread & wine at Holy Communion mean the body & blood of Jesus' sacrifice on the cross and the water of baptism symbolises the washing away of sin and welcoming a person into Christianity. |   | <b>Persecution</b>                                | <b>Sacred writings</b><br>   |
| <b>Transubstantiation</b>   | The belief Roman Catholic Christians have that the bread & wine at Holy Communion actually miraculously turns into the body & blood of Jesus' sacrifice.   |  | <b>Corrymeela Community</b>                       |  |
| <b>Pilgrimage</b>           | A religious and spiritual journey, for example, to Lourdes (France) and Iona (Scotland)  |  | <b>Church growth</b>                              |  |
| <b>Mission</b>              | Mission is the calling to spread the faith. The church has a mission to tell people about the Son of God (Jesus) who came into the world to bring salvation. Jesus gave the disciples the Great Commission when he asked them to go out into the world to spread his teachings.                          |  | <b>Street Pastors</b>                             |  |
| <b>Evangelism</b>           | When a Christian spreads the faith by telling other about Jesus' teachings.  |   |   |  |
| <b>Persecution</b>          | When a religious person is bullied and received bad treatment because of their religion, for example, not being able to build a church, being put in prison or even killed.  |   |   |  |
| <b>Atonement</b>            | Paying the price for sin   |   |   |  |
| <b>Reconciliation</b>       | Fixing a broken relationship, for example, when Jesus died on the cross he fixed the broken relationship between God and humans caused by sin. He atoned for human sin and gave salvation.   |   |   |  |

**Activity – Plan your evaluation answer to 12 mark questions.**

1. "The most important duty of a Christian is to worship God." 2. The best way to understand God is to go on a pilgrimage." 3. "Evangelism is wrong." 4. "Baptism is the most important sacrament."



## Year 10 HT 3 – Area of Study 2 Knowledge Organiser

### 1950s – Rock 'n' Roll

Elvis Presley bringing black & white music together  
Swing rhythms  
Electric guitar (Stratocaster) invented 1954  
12 bar blues was important structure for early songs  
Strophic verse only  
Influenced by Blues, Country music & Gospel

### 1960s – British Rock

The Beatles played in clubs and pubs to get music known.  
Guitar driven songs with rhythm guitar strumming patterns, backing vocals, occasional lead guitar solos, backing vocal harmony.  
Popular because they used a variety of styles Rock 'n' Roll, Rock, Ballad.  
Some songs based on chord progressions, others composed over riffs.  
Structure included strophic songs and verse & chorus + bridge . instrumental

### 1990s Britpop & female pop icons

Oasis and Blur dominated British pop music mid 90s, simple guitar driven songs with catchy tunes and lyrics about "Britishness"  
Female artists such as Whitney Houston, Beyonce (formerly in girl band Destiny's Child), Mariah Carey, Annie Lennox, Lauryn Hill, Celine Dion demonstrate the range of styles including Hip Hop, Rock, Power Ballads and Pop, popular in the 90s.

### 1970s – spectrum of styles

**Rock** – Large stadium events, light shows, performed for huge audiences. Used distortion effect on lead guitars, extended solos in instrumental section  
**Heavy Metal** – loud,, distortion effect, virtuosic guitar solos, screaming vocals, head banging  
**Glam Rock** loud, brash, highly colourful costumes, added keyboard synthesiser / saxophones  
**Disco** lighter rock with highly choreographed dances, up tempo, catchy choruses for everyone to join in  
**Punk Rock** loud, rebellious lyrics, played in small venues, like heavy metal but paired down to basics  
**Reggae** street music of Jamaica, laid back beat on off beat, prominent bass riffs, vocal harmony, lyrics influenced by slavery and Rastafarian beliefs

### 1980s – Synthesisers, Music Video

Disco gave way to dance pop up tempo music with heavy drum beat for nightclubs.  
Electronic genres emerged such as house, garage, Jungle, drum & bass developing into urban genres Such as hip hop and R & B  
Synth pop with clear structures of intro, verse, chorus verse, chorus, bridge, chorus, outro, memorable melodies  
Huge interest followed iconic bands on stadium tours with highly virtuosic extended guitar solos in the instrumentals, use of distortion and whammy bars  
Synthesisers were popular adding a new electronic style with producers taking on as greater role as the Performers /bands such as Queen, Jon Bon Jovi, Elton John, Madonna, Michael Jackson, Green Day, David Bowie are still popular today

**Strophic introduction & verses**  
Simple chord structure and the same melody for each section.  
Examples include Jailhouse Rock,, songs based on 12 bar blues (such as Rock Around The Clock

### Chord sheet

Written in courier new font as every syllable is the same size  
C/G C chord with G in bass

C Cmaj7 F  
Imagine there's no heaven,  
C Cmaj7 F  
It's easy if your try,  
C Cmaj7 F  
No hell below us,  
C Cmaj7 F  
Above us only sky  
F Am/B Dm7 F/C  
Imagine all the people,  
G C/G G7  
Living for to - day - a ha



### Adding additional parts

To create further interest BVs (backing vocals) added to chorus, typically 3 or 6 notes lower

Chords can be played as a block chord or spread out as an arpeggio / arpeggiated to give variety to the song  
The notes of the chords below are played in a different order to make it smoother



### Ballad / Power Ballad

Typically a ballad tells a story. Lyrics can be comic, dramatic or most commonly about love.  
A power ballad is an emotional song delivered with powerful vocals.  
The songs build up perhaps from a single instrument accompaniment and simple vocals to an increased texture with added drums, guitars, strings (violins / cellos) heightening the emotion. Vocally harmonies and counter-melodies are often added and with some great singers, vocal ad libs (extra melodic material) add further emotion to the song.  
Imagine – John Lennon, Angels – Robbie Williams, We Are The Champions – Queen, I Will Always Love You – Whitney Houston  
Typical structure – intro, verse 1 (1instrument) 2nd verse (added instrument), chorus (+backing vocals), chorus with further increased texture

### Song structure

**INTRO** chords (Imagine) o riff (Another One Bites The Dust)  
**VERSE** often A A B A (melody similar except in 3rd line)  
**BRIDGE** vocal additional musical material leading to chorus  
**CHORUS** more up beat and catchy (mostly sung in a rap)  
**VERSE 2** as before sometimes with added backing vocals  
**BRIDGE** as before  
**CHORUS** as before with additional vocals / instruments  
**INSTRUMENTAL** usually 8 bars long, improvised melody  
**CHORUS** repeated with additional ad libs



## Year 10 HT 4 – Area of Study 1 Knowledge Organiser

### The Baroque Concerto

1600-1750

#### Key Vocabulary

|                              |  |
|------------------------------|--|
| Concertino                   | A group of solo instruments played in the Concerto Grosso.   |
| Continuo<br>(Basso Continuo) | Instruments providing a harmonic (and bass) accompaniment in Baroque music, usually harpsichords and cello.                |
| Concerto                     | A musical composition for a solo instrument or instruments accompanied by an orchestra.                                    |
| Ripieno                      | The larger ensemble (usually the orchestra's string section).  |
| Virtuoso                     | A performer who has an outstanding technical ability on their instrument. The music they play is described as 'virtuosic'. |
| Ornamentation                | Decorative notes that help to fill out a melody. E.g. Trills, Turns, Grace notes.  |
| Terraced dynamics            | Dynamics change suddenly (by step).  |
| Ritornello form              | A form where 'little returns'/repetitions of a theme are divided by [solo] episodes.                                       |

#### Balanced phrases

Phrase length of an even number

#### Polyphonic/contrapuntal

Independent melodies played at the same time.

#### Homophonic

All parts moving together in harmony

#### Concerto Grosso

A small group of soloists accompanied by an orchestra (usually just strings)

#### Solo Concerto

A solo instrumentalist accompanied by an orchestra.

#### Features of Baroque Music

- Use of the harpsichord as a continuo instrument
- Use of pairs of oboes/horns
- Use of recorders
- Imitation
- Counterpoint / contrapuntal / polyphonic
- Dialogues between instruments and voices / imitation
- Ornamentation/trills
- Step/dynamic volume changes

#### Key Baroque Composers

- Corelli
- Bach
- Handel
- Vivaldi

#### The Concerto Grosso

A small group of soloists accompanied by a large group of instruments.

These two groups are contrasted with one another. Sometimes both play together, sometimes one plays by itself, or the two groups might imitate one another.

Typical instruments used: Strings, Woodwind (records, oboes, bassoons), Brass (Trumpets and horns without valves), Timpani.

Example: Bach's Brandenburg Concerto No. 4 in G major

#### The Solo Concerto

Developed after The Concerto Grosso.

Now just one soloist instrument accompanied by an orchestra.

Technically demanding passages for the soloist.

Example: Vivaldi's 'The Four Seasons'

## 1750-1820

### Key Classical Composers

- Mozart
- Beethoven
- Haydn

### Alberti bass



Crescendos (gradually getting louder)

Diminuendos (gradually getting softer)

## The Classical Concerto

|                                  |  |
|----------------------------------|--|
| Melody and accompaniment texture | The melody is played alongside an accompaniment.   |
| Balanced Phrases                 | Phrases of equal length. Usually in 'question and answer' type form.   |
| Diatonic                         | Uses only the notes that fit within the key/scale of the piece.  |
| Cadenza                          | An improvised solo section for the soloist to show off their skill (as a virtuoso)   |
| Virtuoso                         | An instrumentalist who is technically very advanced. Music they play would be called 'Virtuosic'   |
| Alberti bass                     | A form of accompaniment used frequently in the Classical era. A broken chord figure usually played in quavers giving a sense of 'movement' to the piece. |
| Tutti                            | A passage to be performed with all voices or instruments together.   |

### The Cadenza:

- The Cadenza is usually played towards the end of the first movement and sometimes is improvised based on one or more themes from the first movement.
- Shows off the 'skills' of the soloist.
- Starts with a long/loud orchestral chords (IC).
- Ends with a trill by the soloist

### Ornament

A decoration of a note to make it more interesting e.g. A trill or mordent.

### Movement

Sections in a piece, usually named after their tempo markings. E.g. 'Adagio' or 'Andante'.

### How has the concerto changed/ developed?

- The orchestra becomes larger.
- Dynamic ranges are increased, use of Crescendos and Diminuendos.
- No longer use a Continuo section.
- The piano was developed in the Classical period, becoming used as a solo instrument in The Concerto.
- Movements are longer than in The Baroque era.
- Use of the Cadenza
- The piano and violin were often the solo instrument.

### The Orchestra

The orchestra becomes larger than in the Baroque period:

Strings- bigger sections

Woodwind- Paired instruments

Brass- Paired French horns and trumpets

Percussion- Timpani

### Suggested listening:

Mozart's *Flute Concerto in D Major*, Beethoven's *Piano Concerto No. 1*, Haydn's *Trumpet concerto in E♭ major*

### Features of the Classical style:

- strings form core of accompaniment
- woodwind used as a section
- Use of piano/ use of clarinet in orchestra (only if they are actually in the piece!!)
- melody with/accompaniment / homophonic
- Some ornamentation (NOT 'lets off')
- gradual dynamic changes
- Diatonic harmony/ simple chords
- Clear cadences
- Balanced phrases / Regular 4 bar phrases
- Small Orchestras



## GCSE Physical Education – Components of Fitness

**Health** – A state of complete mental, physical and social well-being (not merely the absence of disease or infirmity).

**Fitness** - The capacity to carry out life's activities without getting too tired.





**Well-being** – a feeling or mental state of being contented, happy, prosperous and healthy.

**Sedentary** – a lifestyle that is inactive and involves much sitting down

Relationship between these:

- Regular **exercise** increases general **health, fitness** and **well-being**.
- High levels of **fitness** can in turn have a positive impact on **well-being** and **sedentary** lifestyles.

### Health Related Components of Fitness

| Component   | Definition   | Sporting Example  |
|---|--|---|
| <b>Muscular Strength</b>  | The ability of a muscle to exert force for a short period of time.   |   |
| <b>Muscular Endurance</b>   | The ability to use voluntary muscles, over long periods of time without getting tired.                               |  |
| <b>Flexibility</b>  | The range of movement at a joint.  |  |
| <b>Cardiovascular Endurance (stamina)</b><br><b>VO2 Max</b><br>O2 intake per minute | The ability of the heart and circulatory system to continuously exercise without tiring (for a long period of time). |  |

How to remember this?  
B – Bob  
M – Munches  
M – More  
F – Fried  
C – Chicken



### Skill Related Components of Fitness

| Component            | Definition  | Sporting Example  |
|----------------------|---|---|
| <b>Coordination</b>  | The ability to move different limbs at different times or to do more than one task at a time effectively. |    |
| <b>Reaction Time</b> | The ability to react quickly in sport situations to outwit your opponent or outspurt another athlete      |  |
| <b>Agility</b>       | The ability to change direction under control, whilst maintaining speed, balance and power.               |  |
| <b>Balance</b>       | The ability to keep your body mass or centre of mass over a base of support.                              |  |
| <b>Speed</b>         | The ability to move the body quickly.   |  |
| <b>Power</b>         | The ability to combine speed and strength.  |  |

How to remember this?  
C  
R  
A  
B  
S  
P



## GCSE Physical Education – Components of Fitness

[illegible]

**Keywords:**



## GCSE Physical Education – Fitness Testing

### Muscular Strength

**Test:** Hand Grip Dynamometer Test

**Protocol:** Grip the dynamometer in one hand. Start with your hand up and bring down to side while pulling in handle. No swinging your hand.



| Advantages  | Disadvantages   |
|---|---|
| <ul style="list-style-type: none"> <li>• Simple and easy to complete</li> </ul> | <ul style="list-style-type: none"> <li>• Only one size of dynamometer which may affect reading.</li> <li>• Focuses solely on forearm strength.</li> </ul> |

### Muscular Endurance

**Test:** sit up test (metronome)

**Protocol:** Complete full sit ups in time to the beat on the recording



**Test:** Maximal press up test

**Protocol:** complete as many press-ups as possible resting in the "up" position



| Advantages   | Disadvantages   |
|--|---|
| <ul style="list-style-type: none"> <li>• Simple test to complete</li> <li>• Minimal equipment needed.</li> </ul> | <ul style="list-style-type: none"> <li>• Difficult to assess whether each repetition is performed correctly. Difficult to accurately measure large groups.</li> </ul> |

### Flexibility

**Test:** Sit and Reach Test

**Protocol:** Sit with legs straight out in front and soles of feet against box/table. Reach forward without bending knees. No jerking movements.



| Advantages  | Disadvantages   |
|---|---|
| <ul style="list-style-type: none"> <li>• Quick and easy to perform.</li> <li>• Data table readily available for comparison</li> </ul> | <ul style="list-style-type: none"> <li>• Can cause injury if not fully warmed up appropriately.</li> <li>• Only measures flexibility of lower back and hamstrings.</li> </ul> |

### Cardiovascular Fitness (Aerobic Endurance)

**Test:** 12 min Cooper Run

**Protocol:** Continuously run/swim for 12 minutes. Distance recorded.



| Advantages   | Disadvantages   |
|--|---|
| <ul style="list-style-type: none"> <li>• Minimal equipment needed</li> <li>• Test can be self administered.</li> </ul> | <ul style="list-style-type: none"> <li>• Inaccuracy of heart rate measurements</li> <li>• Motivation dependant</li> </ul> |

**Test:** Multi-Stage Fitness Test

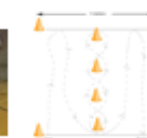
**Protocol:** Shuttle run continuously for 20 metres. Record the level and point that you cannot continue at that pace for.

| Advantages  | Disadvantages  |
|---|--|
| <ul style="list-style-type: none"> <li>• Simple test to complete</li> </ul> | <ul style="list-style-type: none"> <li>• Motivation dependant</li> </ul> |

### Agility

**Test:** Illinois Agility Test

**Protocol:** Start lying down at the start line. Complete course as quick as possible (10m x 5m – 4 central cones)



| Advantages  | Disadvantages   |
|---|---|
| <ul style="list-style-type: none"> <li>• Simple and easy to complete</li> </ul> | <ul style="list-style-type: none"> <li>• Motivation dependant / Timing errors.</li> </ul> |

### Speed

**Test:** 30m Sprint Test

**Protocol:** Start from stationary position. Complete distance in the quickest possible time. Time is stopped when chest crosses the line.



| Advantages   | Disadvantages   |
|--|---|
| <ul style="list-style-type: none"> <li>• Quick test to complete.</li> <li>• Minimal equipment needed and can be performed anywhere with a flat 50m run.</li> </ul> | <ul style="list-style-type: none"> <li>• Running surfaces/weather conditions can affect the results.</li> <li>• Inaccuracies with stopwatch usage.</li> </ul> |

### Power

**Test:** Vertical jump Test

**Protocol:** Stand next to wall and mark an initial reach while feet are flat on the ground. Standing jump to reach as high as possible. Measure distance from first mark to second.



| Advantages  | Disadvantages  |
|---|--|
| <ul style="list-style-type: none"> <li>• Quick and easy to perform.</li> <li>• Easy to complete with large groups.</li> </ul> | <ul style="list-style-type: none"> <li>• Technique plays a large role in successful completion.</li> </ul> |

### Reliability /Validity

**Validity** relates to whether the test actually measures what it sets out to measure.

**Reliability** is a question of whether the test is accurate. It is important to ensure that the procedure is correctly maintained for ALL individuals.



Results can be improved:

- By using experienced testers & calibrating equipment
- Ensuring performers have the same level of motivation to complete each test
- Repeatedly test to avoid human error (x3)

## GCSE Physical Education – Fitness Testing

[illegible]

**Keywords:**



## GCSE Physical Education – Types of Training

**Continuous training** - Involves a steady but regular pace at a moderate intensity (aerobic) which should last for at least 20 minutes. i.e. running, walking, swimming, rowing or cycling.  
Used by a **marathon runner**.



| Advantages   | Disadvantages   |
|--|---|
| <ul style="list-style-type: none"> <li>• Ideal for beginners</li> <li>• Highly effective for long distance athletes</li> </ul> | <ul style="list-style-type: none"> <li>• Can be extremely boring as repetitive</li> </ul> |

**Fartlek training** – Referred to as ‘speed play’ This is a form interval training but without rest. Involves a variety of changing intensities over different distances and terrains.

i.e. 1 lap at 50% max, 1 lap walking, 1 lap at 80% (aerobic and anaerobic used)  
Used by **games players – Hockey players**



| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• More enjoyable than interval and continuous training</li> <li>• Good for sports which require changes in speed</li> <li>• Easily adapted to suit the individuals level of fitness and sport.</li> </ul> | <ul style="list-style-type: none"> <li>• Performer must be well motivated particularly when intensity is high</li> <li>• Difficult to assess whether performer is performing at the correct intensity</li> </ul> |

**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**



| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Variety of equipment to prevent boredom</li> <li>• Strengthens the whole body or the muscle groups targeted.</li> <li>• Can be adapted easily to suit different sports</li> </ul> | <ul style="list-style-type: none"> <li>• Requires expensive equipment</li> <li>• If exercises are not completed with the correct technique it can cause injury to the performer</li> </ul> |

### HIIT Training

These are High Intensity Interval Training activities where 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  
Examples might be Body pump, High Impact Aerobics, Spinning.



**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**



| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Quick and easy to set up.</li> <li>• Can mix aerobic and anaerobic exercise which replicates team games.</li> </ul> | <ul style="list-style-type: none"> <li>• It can be hard to keep going when you start to fatigue (high motivation and self discipline needed)</li> <li>• Over training can occur if sufficient rest is not allowed between sessions (48 hours)</li> </ul> |

### Plyometrics training

Involves high-impact exercises that develop **power**. i.e. *bounding/hopping, squat jumps*. Used by **long jumpers, 100 m sprinters or basketball players**.

| Advantages  |
|---|
| <ul style="list-style-type: none"> <li>• Easy to set up requiring little or no equipment</li> <li>• Hugely effective in developing power</li> </ul>         |
| Disadvantages   |
| <ul style="list-style-type: none"> <li>• Can result in injury if not fully warmed up.</li> <li>• Can place a great stress on joints and muscles.</li> </ul> |



**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.  
i.e. *press ups, sit ups, squats, shuttle runs*.



| Advantages   | Disadvantages  |
|--|--|
| <ul style="list-style-type: none"> <li>• Quick and easy to set up</li> <li>• Easy to complete with large groups</li> <li>• Can be adjusted to be made specific for certain sports. i.e. <i>netball specific circuit</i></li> </ul> | <ul style="list-style-type: none"> <li>• Technique can be affected by fatigue and can increase risk of injury</li> <li>• Must have motivation and drive to complete the set amount of repetitions and sets.</li> </ul> |

| Advantages   | Disadvantages   |
|--|---|
| <ul style="list-style-type: none"> <li>• Variety avoids boredom</li> <li>• Instructor will challenge &amp; motivate</li> <li>• Great way to meet new people</li> </ul> | <ul style="list-style-type: none"> <li>• Gym membership can be expensive.</li> <li>• Group classes are not tailored to individual needs.</li> </ul> |

## GCSE Physical Education – Methods of Training

[illegible]

**Keywords:**



## GCSE Physical Education – Principles of Training

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

### FITT Principle

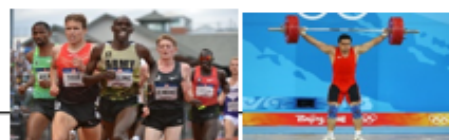
|                  |                                 |  |
|------------------|---------------------------------|--|
| <b>Frequency</b> | How often training takes place. | <i>Increase training from once a week to two</i>                                   |
| <b>Intensity</b> | How hard the exercise is.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

### 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:

- Muscles
- Type of fitness
- Skills

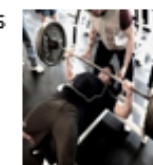


### PAR-Q – Physical Activity Readiness Questionnaire

Conducted before fitness testing or an activity programme to examine the performer's readiness for training or any health conditions/lifestyle choices that may affect the successful completion.

### Progression

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, e.g. lifting more in week 12 than in week 2 of the programme.



### Overload

Working the body harder than normal/gradually increasing the amount of exercise you do. *i.e. bench press 50kg x 10 repetitions and increase to 55kg x 5 repetitions.*

### Reversibility

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

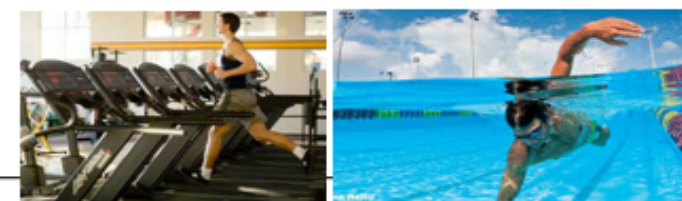
- Suffering from illness and cannot train
- Injury
- After an off-season.



### Individual needs

All athletes programmes would differ depending on:

- Performer's goals/targets
- Strength and weaknesses
- Age/gender
- Current health/fitness levels



### Overtraining

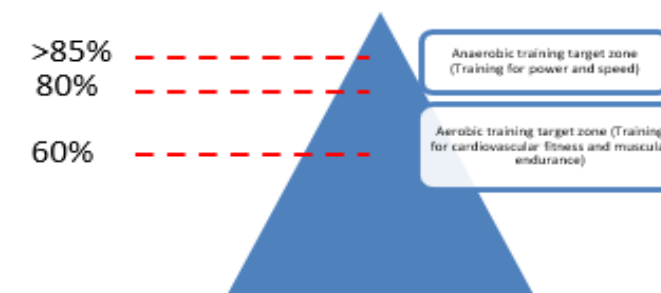
Occurs when you **train too hard** and do not allow the body enough **rest/recovery time**. Signs/symptoms include: extended muscle soreness, frequent illness & increase injuries.

### Calculating Training Zones/Thresholds of Training

**Maximum Heart Rate (MHR) = 220 – age**

**Aerobic target zone: 60–80% of MHR**  
(60% =  $x 0.6$  / 80% =  $x 0.8$ )

**Anaerobic target zone: > 85% MHR**  
(85% =  $x 0.85$ )



## GCSE Physical Education – Principles of Training

[illegible]

**Keywords:**



## GCSE Physical Education – Warm up and cool down, injury and prevention

**Injury prevention** – to prevent injury performers and coaches should recognise and identify risks and reduce them.



Using the right principles of training to overuse injuries



Understand and following the rules of the sport during play



Using appropriate protective clothing



Checking the equipment to make sure it is in good condition and age appropriate



Following a full warm up and cool down



Checking the facilities



Ensuring competition is balanced

### Warm up

|                          |  |
|--------------------------|--|
| <b>Pulse raiser</b>      | An activity that increases heart rate and temperature.                       |
| <b>Stretches</b>         | An activity that increases the elasticity of muscles, tendons and ligaments. |
| <b>Mobility</b>          | An activity that takes the joint through the full range of motion.           |
| <b>Dynamic movements</b> | An activity that involves changes in speed and direction.                    |
| <b>Skill rehearsal</b>   | An activity that mirrors game demands.                                       |

### Cool Down

|                               |   |
|-------------------------------|---|
| <b>Low intensity exercise</b> | An activity that gradually decreases temperature and heart and breathing rates. |
| <b>Stretches</b>              | Static stretches that decrease muscle temperature.                              |

## Injuries

### Soft tissue injuries

**Strain** – Twist or tear to a muscle or tendon.

**Sprain** – Twist or overstretch to a ligament.

Treatment for strain and sprain = **RICE** (Rest, Ice, Compression, Elevation) for 24 - 48 hours.



**R** – rest the injured part.



**I** – Apply ice to reduce the swelling for a maximum of 10 minutes.



**C** – Compress the injured area using a bandage.



**E** – Elevate the injured part to decrease the blood supply.

### Head Injury

**Concussion** – An injury to the brain caused by a knock to the head. Common in contact sports. If an athlete is concussed, they may:

- Become unconscious.
- Feel sick, dizzy or drowsy.
- Get confused, stare & suffer memory loss.



### Spinal Injury

A serious and painful injury to the spine. This could be paralyzing or fatal. This may occur during a rugby scrum or falling off a horse.

### Fracture – a broken bone.

Open/compound/complex fracture – bone through the skin

Closed/simple fracture – bone remains in the skin.

Greenstick fracture – bone bends (younger children)

Stress fracture - repeated or prolonged forces against the bone



**Dislocations** - a sudden impact to a joint can cause the bones that meet to become disconnected or moved out of place.



### Blisters

These are caused through friction and rubbing e.g. on footwear. Fluid is released under the skin to form a protective layer. The swelling becomes painful.

## GCSE Physical Education – Performance-enhancing drugs, injury and prevention

[illegible]

**Keywords:**



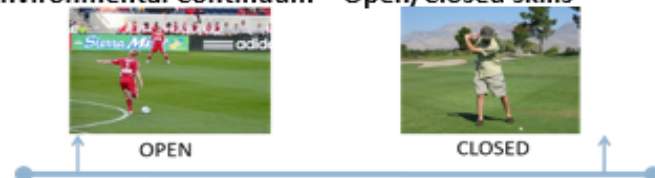
## GCSE Physical Education – Sports Psychology

### Classification of skill

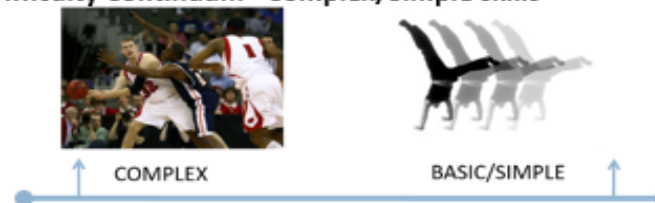
Skills are specific tasks that can be learnt and practiced. *i.e. Golf swing / Lay up / Tennis volley*

**Continuum** = sliding scale of extremes at each end

### Environmental Continuum – Open/Closed skills



### Difficulty Continuum - Complex/Simple skills



### Skilful Movement

- **Efficiency** e.g. no wasted energy – good timing
- **Pre-determined** e.g. planned like a routine
- **Co-ordinated** e.g. run and kick/hit
- **Fluent** e.g. one skill transfers into another
- **Aesthetic** e.g. technique looks good

### SMART Targets

Goal setting motivates performers

- Short Term goals:
- Long Term goals:
- Outcome goals: result based
- Performance goals: technique based

### Mental Preparation

- **Imagery** e.g. pictures in the mind
- **Mental Rehearsal** e.g. internal view / external view
- **Selective Attention** e.g. filtering relevant information
- **Positive Thinking** (self talk) e.g. rehearsing success
- **Concentration** –

### Mental Preparation for Performance

**Mental rehearsal/Imagery** involves the athlete imagining themselves in an environment performing a specific activity using all of their senses.

This can be used to:

- Familiarise the athlete with a competition site or a complex play pattern or routine.
- Motivate the athlete by recalling images of their goals or of success in a past competition.
- Perfect skills or skill sequences the athlete is learning or refining.
- Reduce negative thoughts by focusing on positive outcomes



### Feedback

Vital part of information processing which provides confidence, motivation and improves performance.

**Intrinsic feedback:** This comes from within the performer. Kinaesthetic senses provide feelings from muscles/joints about the action.

**Extrinsic feedback:** This comes from results and match analysis.

1. Knowledge of results – the outcome

2. Knowledge of performance – techniques used

**Knowledge of Results:** Information provided to the athlete detailing stats and data from the event/training

**Knowledge of Performance:** Information provided to the athlete after the performance in terms of technique and tactical decision making.

### Guidance (Positive & Negatives)

**Visual guidance:** Learners are shown the whole action by the coach. *i.e. demonstration/use of video playback.*

**Verbal guidance:** Learners listen to information given to a performer often using associated terminology. *i.e. instructions told to a team.*

**Manual guidance:** Coaches will physically move a performer and support them in performing a skill. *i.e. Trampolining somersault support.*

**Mechanical guidance:** Learners use equipment to help support the practicing of a skill. *i.e. floats during swimming stroke development.*



| Specific   | Measureable  | Achievable  | Recorded  | Timed   |
|--|--|---|---|---|
| Targets must be concise and clear.<br><i>"To take a 0.5 second off my time personal best time"</i> | Must be measured and compared. Easy to monitor.<br><i>"I will time my runs every training session for the next five weeks of training"</i> | Target must be challenging but yet reachable. Motivating.<br><i>"My coach and I devised the training programme around improving leg power for my start"</i> | Needs to be recorded to track progress.<br><i>"We keep a diary of times and distances for every training session to inform the planning for the next one and plot progress against our aim"</i> | Set for a particular time to be completed.<br><i>"We agreed to do the training programme four times per week for the next five weeks"</i> |

## GCSE Knowledge Organiser (2) – Blood Brothers

Written By Willy Russell in 1982

A contemporary plot revolving around fraternal twins Mickey and Eddie (Edward) who are separated at birth. One is raised in a wealthy family (Eddie) while the other is raised by a poor family (Mickey). Their different backgrounds take them to opposite ends of the social spectrum and the clear difference in upbringing leads to tragic consequences.

### ACT ONE

Act one begins with the Narrator summing up the story before we flash back to the beginning and Mrs Johnstone telling us about her life so far.

This is followed by the first interaction between Mrs Johnstone and Mrs Lyons where we can clearly see the difference in class. Mrs Johnstone is cleaning for Mrs Lyons as they have a conversation about Mrs Lyons inability to have children and Mrs Johnstone being pregnant again. Mrs Johnstone then finds out she is having twins.

Mrs Lyons then concocts a plan for Mrs Johnstone to give her one of the babies but they mustn't tell anyone. Mrs Lyons will lie to her husband as he is away with work and she makes Mrs Johnstone swear on the bible.

Once the babies are born, one is given to Mrs Lyons and she begins to bring him up as her own. Mrs Johnstone returns to work but Mrs Lyons starts to change and doesn't like Mrs Johnstone giving the baby (Edward) any attention. Mrs Lyons then fires Mrs Johnstone who threatens to expose the secret but Mrs Lyons reminds her of the oath they both took.

The story then jumps to when the twins are seven years old and we are introduced to Mickey who is struggling as the youngest in the family and wishing he was older. Edward then enters and they meet for the first time. There is an instant connection even though it is clear they have completely different backgrounds. The boys decide to become 'Blood Brothers' completely unaware they are actually twins by birth.

Mickey then meets Mrs Lyons for the first time as he goes to Eddie's house to 'call for him' and instantly Mrs Lyons realises who he is, panics and forbids Edward from seeing him again.

We then meet Linda for the first time and can already see she is very fond of Mickey as they sneak to Edward's house. We start to see Mrs Lyons become more paranoid and frantic at the point wanting to move away thinking that will solve the problem of Mickey.

We see the kids get in trouble with the police and this reinforces to Edwards family that his new friends are a bad influence. They plan to move away to the countryside. Before they leave Edward goes to say goodbye to Mickey and has an emotional farewell with Mrs Johnstone where she gives him a locket with a picture of her and Mickey in, but it has to be kept a secret.

Mrs Lyons is much happier once they move believing Edward is away from Mickey and the secret is safe. Mrs Johnstone then gets word that she is also being moved to the countryside by the council so her family can have a better future.

At the end of Act one we see both families looking forward to their new lives.

### ACT TWO

At the start of Act two the brothers are now 14 years old and the contrast is evident straight away. Mickey is being forced to go to school by his mum and Edward is saying goodbye after a break from boarding school.

Linda begins to make her feelings for Mickey more obvious much to his embarrassment and the different attitudes to education becomes more clear. Edward is doing very well at school but gets expelled for refusing to hand over his secret locket and swearing at the teacher. Mickey is constantly shouted at and picked on by the teacher but he shows no interest in learning or doing well.

Mrs Lyons finds out about the locket and we see panic begin to resurface whilst we also see Linda desperately trying to be noticed by Mickey in a romantic way.

Edward and Mickey then meet again and their friendship picks up where it left off. Mrs Johnstone becomes aware of the friendship but is happy to see Eddie and doesn't reveal the secret.

Mrs Lyons finds out where Mrs Johnstone lives and goes to confront her. By this point Mrs Lyons is completely irrational and paranoid about the secret being revealed and losing Edward.

Edward goes off to university and Mickey and Linda finally begin a relationship. Linda soon becomes pregnant and they get married. Mickey then loses his job and struggles to find work just before Edward returns from university expecting everything to be the same.

Mickey helps Sammy to rob a shop to get some money and ends up being caught and sent to prison. He becomes extremely depressed and dependent on medication. Edward confesses his love for Linda and she admits to having feelings for him too. There are rumours of an affair at this point.

Mickey comes out of prison but really struggles to get back to normality. He is completely dependent on his anti depressants and becomes threatening and abusive towards Linda. Linda seeks help from Eddie who manages to get them a house to live in and a job for Mickey but he becomes aware of who has done this for them and gets extremely jealous. Linda tries desperately to get Mickey off the medication and keep her family together but Mickey is a completely different person than at the start of the play.

Mickey finds out about the 'affair' between Linda and Eddie and goes to confront Eddie at his place of work with a gun. Linda finds out and dashes off to tell Mrs Johnstone what Mickey is about to do.

Mickey is withdrawing from his medication so is completely irrational and confused about what is going on. He confronts Edward who is suitably terrified and tries to calm Mickey down. Mickey believes Eddie has taken everything from him and he erratically waves around the gun.

The police and Mrs Johnstone arrive and she confesses what happened to the brothers when they were born. Mickey is horrified he wasn't given away and accidentally shoots Edward. The police immediately shoot Mickey. Both brothers are dead.



## GCSE Knowledge Organiser – Blood Brothers

Written By Willy Russell in 1982

### Key Vocabulary

**Subtext** – An underlying meaning or theme in a conversation or piece of writing.

**Dramatic Climax** – It's the highest point of action before the plot is resolved, usually late in the play.

**Character Motivation** – The reason behind an action.

**Dramatic Convention** – The specific actions or techniques that an actor or director uses.

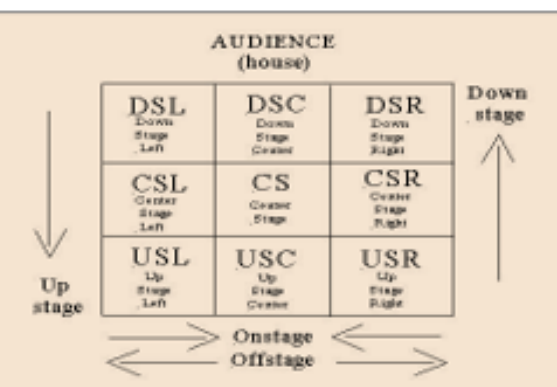
**Theme** – Explored through the text and subtext.

**Tragicomedy** – A play containing elements of both comedy and tragedy.

**Socio-political** – Combining social and political factors.

### Themes

|              |                   |
|--------------|-------------------|
| Social class | Friendship        |
| Love         | Poverty & Debt    |
| Superstition | Nature Vs Nurture |



### Always Remember



Blood Brothers is set in the 1960's



You will answer four questions on the play



Research the props, setting and costumes from the time to help make your answers accurate

Look carefully where the extract comes in the play, remember you have the full script to help you



When answering a question as if in role as that character always use 'I' instead of the character's name, it shows you have read the question



Always read the question more than once before you begin your answer



Always highlight the key points/ instructions in the question to make sure you don't miss anything



Always check/ re read your response to make sure you answered all the question, it makes sense and you have backed up all your ideas with examples

### Social Context

After the appointment of Margaret Thatcher in 1979 to the role of prime minister the manufacturing industry suffered. She sold off many publically owned companies and closed down many coal mines. The result of this was a short term economic downturn and a huge increase in unemployment. The working class areas of the North West were most affected. Russell shows the effects of this in the play through Mickey's unemployment; poverty struggles; an increase in crime and a demand for better housing.

### Cultural Context

Reference to Marilyn Monroe is consistent within the play and refers to the 'perfect' image and fantasy woman everyone viewed her as. Throughout the play Mrs Johnstone longs for a life like hers and the public image she portrayed. In reality Monroe died of a pill overdose which compares with Mickey's addiction to anti-depressants later in the play. Popular culture became more accessible (ie film, music, tv) in the 1950's and is seen as a way to escape for the Johnstone family through dancing and games.

### Historical Context

There is a clear link at this time between poverty and under-achievement at school. Edward is sent to a private, fee paying boarding school and will take O levels, A levels and go on to university. Mickey leaves school and goes into employment and in the end is made redundant. Manual workers like Mickey were much more affected by the closure of factories and the scarcity of work. Terraced council housing was popular with most working class families but they were cramped and lacked central heating. They were often located in the inner city and were dirty. Willy Russell's aim is to show that there are disadvantages to being poor and working class. The failure to succeed is down to lack of opportunity not ability.

Blood Brothers is a tragi-comedy and socio-political play

Blood Brothers is a Musical

### Theatrical Conventions

|                                     |        |                 |                    |
|-------------------------------------|--------|-----------------|--------------------|
| Narration                           | Chorus | Spoken Dialogue | Musical Interludes |
| Set changes in clear view           | Songs  | 'Token' props   | Direct Address     |
| Contrasting locations on same stage |        |                 |                    |