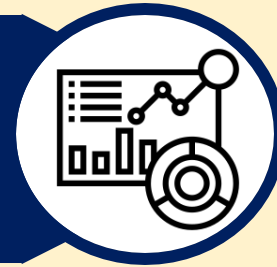


Knowledge Organisers



Term 1 and 2

Year 10

Contents List

Maths

English

Science

Options subjects



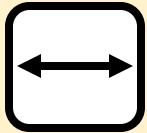
How to revise

Successful Learning Takes Place Over Time

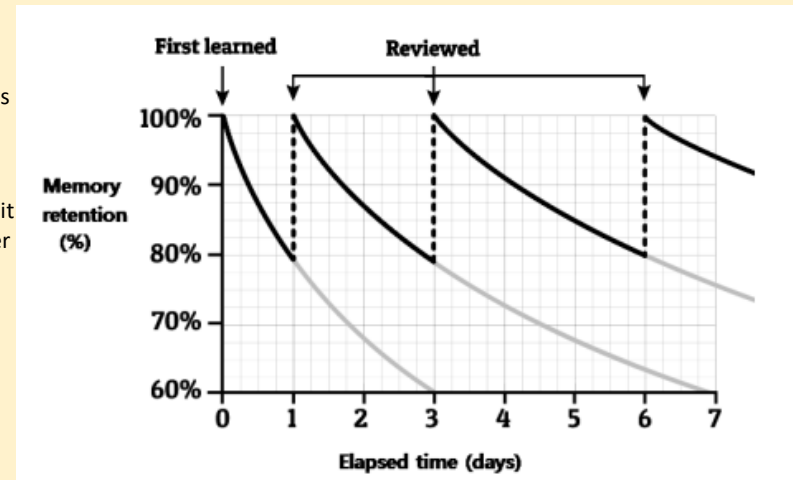


It's rare for anyone to be completely comfortable with something they learn for the first time. This could be a new piece of music, dance move, language or chemistry. We all have to practice. In most instances, the aim is to be at your optimum on the day it matters, e.g. the performance, race or exam. Everything leading up to this point is part of the process of improving. It's about the long-term rather than the short-term, which also means there are no quick fixes. During this period, it's okay to make mistakes; it's okay to feel frustrated. What matters is what you do about it.

Space out your learning on a subject



Spacing out your learning over time is far more effective than last-minute cramming. This is based on research into how we forget and how we remember. The speed at which we forget something will depend on many factors such as the difficulty of the material, how meaningful it was to us, how we learned it and how frequently we relearn or remember it. The last factor tells us that when we learn something for the first time, we need to review it quickly afterwards. The more times we force ourselves to remember something, the longer the gap between reviews, which the diagram below illustrates nicely. The Leitner system and Cornell Notes mentioned earlier provides a wonderful way of achieving this, but the principle applies to all of the learning strategies mentioned in this booklet



Revision strategies

List It



This is a simple free recall task that is very versatile. It can feel challenging, but this is a good thing, and it provides clear feedback on what you do and don't know. Choose a topic, set yourself a time limit and...

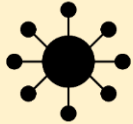
- List as many keywords as you can
- List as many facts as you can
- List as many key events/quotes/individuals as you can
- List as many causes of X as you can
- List as many consequences of Y as you can

Flashcards



Flashcards have the potential to be a powerful learning aid. However, how successful this is will depend on the thought you put into making them in the first place and then how they're used. It's very important to remember that they're for testing, not summarising

Mapping



Mapping is a brilliant way of organising and learning information, demonstrated on various pages in this booklet. It helps you break down complex information, memorise it, and see the connections between different ideas.

Self-testing



Research has shown that every time you bring a memory to mind, you strengthen it. And the more challenging you make this retrieval, the greater the benefit. Self-testing improves the recall of information, transfer of knowledge and making inferences between information. Equally, there are many indirect effects, such as a greater appreciation of what you do and don't know, which helps you plan your next steps.

Flashcards



Flashcards are small sheets of paper or card with matching pieces of information on either side. They are a useful tool for learning facts and allow you to quickly check whether you have remembered something correctly.

When making and using flashcards:

Do:	Don't:
✓ ...make flashcards quickly.	X ...spend more time making flashcards than actually using them.
✓ ...put a single piece of information of each flashcard.	X ...put lots of information onto each flashcard.
✓ ...sort your flashcards according to your confidence with them (see below).	X ...revise the flashcards in the same order every time that you use them.
✓ ...test yourself on the flashcards from memory.	X ...only read through flashcards.

How to make flashcards:

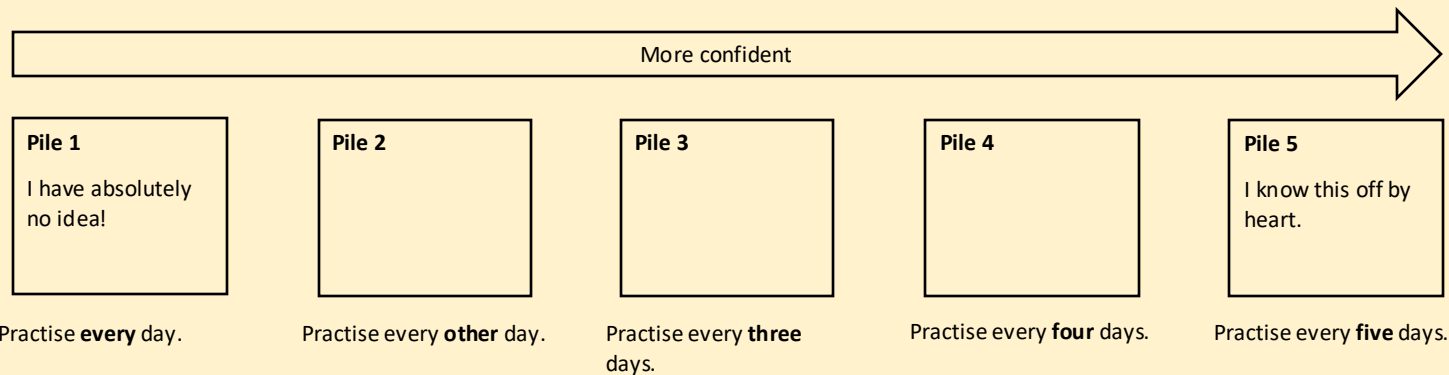
- You can buy a set of flashcards or use a free website such as Quizlet.
- Find the information you want to put onto flashcards using your existing revision resources (e.g. a knowledge organiser).
- Fold a piece of A4 paper into 10.
- Write the questions on the top half of the paper.
- Write the answers on the bottom half of the paper.
- Cut the paper along the dotted lines shown here.
- Fold the strips of paper so that the writing is on either side.

1861	groynes	osmosis	Where is the pharmacy?
Pasteur published his paper about germ theory.	A low wall on the coastline which slows longshore drift	Net movement of water from a high concentration to low concentration across a partially permeable membrane	Où est la pharmacie?

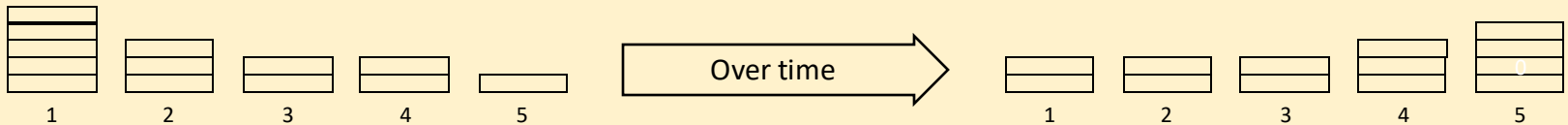
Definition 1	Definition 2	Definition 3	Definition 4	Definition 5
Answer 1	Answer 2	Answer 3	Answer 4	Answer 5

How to use flashcards:

1. Test yourself using the flashcards.
2. As you test yourself, sort the flashcards into up to five piles according to how confident you are with the content.
3. Put the piles into numbered envelopes (1-5).
4. Test yourself on the different piles on different days (see below):



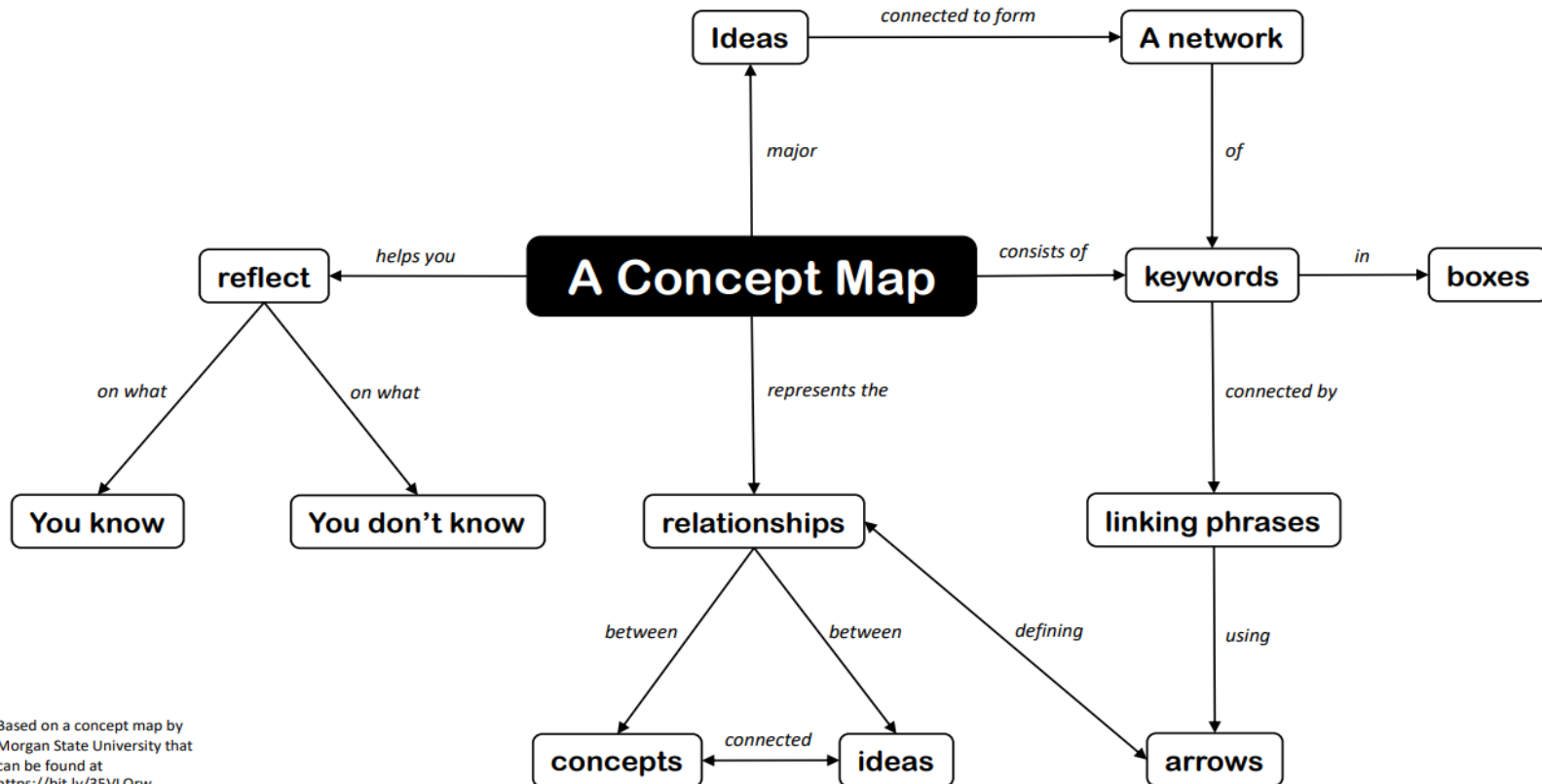
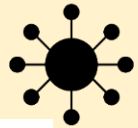
5. As you test yourself on the different piles, move the cards into different piles as you become more confident.



Useful resources:

www.quizlet.com – This free website allows you to quickly create flashcards which you can print, use on a computer, or use on your phone.

Mapping



Based on a concept map by
Morgan State University that
can be found at
<https://bit.ly/35VLQrw>

1	Factors of 16 are:	$\begin{array}{r} 16 \\ 1 \times 16 \\ 2 \times 8 \\ \cancel{3 \times} \\ 4 \times 4 \end{array}$ 1, 16, 2, 8, 4, <u>5</u> (5 factors)
2	Which sentence is correct? 5 is a multiple of 15 15 is a multiple of 5	15 is a multiple of 5 because $15 = 5 \times 3$
3a	A prime number is...	A whole number with only two factors, one and itself.
3b	List the first 10 prime numbers	2, 3, 5, 7, 11, 13, 17, 19, 23, 29
4b	1 is not a prime because...	It has only one factor: 1. A prime has exactly two factors.
5	15 is not a prime because...	It has four factors: 1, 3, 5, 15. A prime has exactly two factors.
6	Product means...	Multiply

7	If it says "write 40 as a product of its prime factors the method is..."	$\begin{array}{c} 40 \\ / \quad \backslash \\ 10 \quad 4 \\ / \backslash / \backslash \\ (5) (2) (5) (2) \end{array}$ Answer: $2 \times 2 \times 5 \times 5$ Index form: $2^2 \times 5^2$
7	Express 30 as a product of its prime factors	$30 = 2 \times 3 \times 5$
8	Write $2 \times 2 \times 2 \times 3 \times 5 \times 5$ in index form	$2^3 \times 3 \times 5^2$
9	First three multiples of 10:	10, 20, 30
10	Which sentence is correct? 2 is a multiple of 8 8 is a multiple of 2	8 is a multiple of 2 because $8 = 2 \times 4$
11	How to spot a multiple of 10	It ends in 0
12	How to spot a multiple of 5	It ends in 0 or 5
13	How to spot a multiple of 2	It is even, it ends in 0, 2, 4, 6 or 8

1	HCF stands for...	Highest Common Factor
2	LCM stands for ...	Lowest Common Multiple
3	Find the LCM of 6 and 10	$\underline{6}$: 6, 12, 18, 24, <u>30</u> , 36, ... $\underline{10}$: 10, 20, <u>30</u> The LCM of 6 and 10 is 30
4	Find the HCF of 12 and 30	Factors of <u>12</u> : 1, 2, 3, 4, <u>6</u> , 12 Factors of 30: 1, 2, 3, 5, <u>6</u> , 10, 15, 30 The HCF of 12 and 30 is 6
5	Imagine you are finding the HCF and LCM of 60 and 84. You have written them both as a product of primes using factor trees so <u>that</u> $60 = 2 \times 2 \times 3 \times 5$ $84 = 2 \times 2 \times 3 \times 7$ What would this look like in a Venn diagram?	
6	Using the Venn diagram above. How would you find the HCF of 60 and 84?	Multiply the numbers in the <u>intersection</u> $2 \times 2 \times 3 = 12$ (HCF)
7	Using the Venn diagram above. How would you find the LCM of 60 and 84?	Multiply the numbers in the union (all of them) $2 \times 2 \times 3 \times 5 \times 7 = 420$ (LCM)

Laws of Indices

1	Simplify $x^3 \times x^4$	x^7 (add powers)
2	Simplify $3x^2 \times 4x^9$	$4 \times 3 \times x^2 \times x^9 = 12x^{11}$
3	You cannot apply the power rule to $3^4 \times 5^4$ <i>because ...</i>	The base numbers are not the same
4	Simplify $x^{12} \div x^4$	x^8 (subtract powers)
5	Simplify $\frac{12x^9}{4x^4}$	$3x^4$
6	Simplify $(x^5)^2$	x^{10} (multiply powers)
7	Simplify $(4x^5)^2$	$(4)^2 \times (x^5)^2 = 16x^{10}$
8	Anything to the power of zero is	1

Negative & Fractional Indices

1	Anything to the power of zero is	1
2	$25^{\frac{1}{2}} =$	$\sqrt{25} = \pm 5$
3	$8^{\frac{1}{3}} =$	$\sqrt[3]{8} = 2$
4	$8^{\frac{2}{3}} =$	2 is power (on top and in charge) 3 is root (bottom of tree) $(\sqrt[3]{8})^2 = (2)^2 = 4$
5	$5^{-1} =$	$\frac{1}{5^1} = \frac{1}{5}$
6	$5^{-2} =$	$\frac{1}{5^2} = \frac{1}{25}$
7	$25^{-\frac{1}{2}} =$	$\frac{1}{\sqrt{25}} = \frac{1}{5}$
8	$8^{-\frac{1}{3}} =$	$\frac{1}{\sqrt[3]{8}} = \frac{1}{2}$

Surds

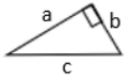
1	A surd is	A square root that cannot be simplified
2	Which of these is a surd? $\sqrt{2}$ $\sqrt{4}$ $\sqrt{10}$ $\sqrt{15}$ $\sqrt{16}$	$\sqrt{2}$ $\sqrt{10}$ $\sqrt{15}$ are surds
3	$\sqrt{3} + \sqrt{3}$	$2\sqrt{3}$
4	$6\sqrt{3} - 2\sqrt{3}$	$4\sqrt{3}$
5	$4\sqrt{3} + 2\sqrt{5}$ cannot be simplified because...	They are not like terms
6	$\sqrt{5} \times 3 =$	$3\sqrt{5}$ (number first, surd second)
6	$\sqrt{3} \times \sqrt{5}$	$\sqrt{15}$
7	$6\sqrt{3} \times 2\sqrt{5}$	$12\sqrt{15}$
8	$\sqrt{3^2} = \sqrt{\quad} \times \sqrt{\quad} = \sqrt{\quad} = \underline{\quad}$	$\sqrt{3^2} = \sqrt{3} \times \sqrt{3} = \sqrt{9} = 3$
9	$\sqrt{5^2} =$	5
10	$\sqrt{5} \times -\sqrt{5}$	-5

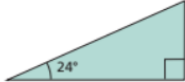
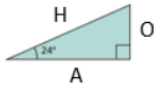
Surds continued

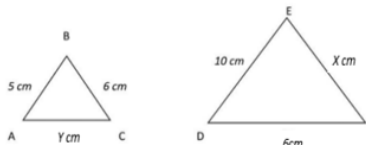
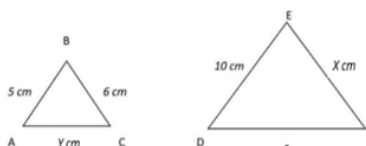
10	$\frac{10\sqrt{5}}{5} =$	$2\sqrt{5}$
11	$\frac{12 - 8\sqrt{6}}{2} =$	$6 - 4\sqrt{6}$
12	$\frac{12\sqrt{5}}{\sqrt{5}}$	12
13	$\frac{12\sqrt{10}}{6\sqrt{2}}$	$2\sqrt{5}$
14	Write $\sqrt{75}$ in the form $a\sqrt{b}$	Choose $\sqrt{\text{largest square}} \times \sqrt{b}$ $\sqrt{75} = \sqrt{25} \times \sqrt{3}$ $= 5 \times \sqrt{3} = 5\sqrt{3}$
15	Write $\sqrt{80}$ in the form $a\sqrt{b}$	Choose $\sqrt{\text{largest square}} \times \text{surd}$ Largest square factor of 80 = 16 $\sqrt{80} = \sqrt{16} \times \sqrt{5}$ $= 4 \times \sqrt{5} = 4\sqrt{5}$

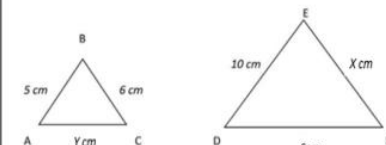
16	What method could you use to expand $(4 + \sqrt{5})(4 - \sqrt{5})$	Draw a grid <table border="1"> <tr> <td>x</td><td>4</td><td>$\sqrt{5}$</td></tr> <tr> <td>4</td><td>16</td><td>$4\sqrt{5}$</td></tr> <tr> <td>$-\sqrt{5}$</td><td>$-4\sqrt{5}$</td><td>-5</td></tr> </table> $16 + 4\sqrt{5} - 4\sqrt{5} - 5 = 11$	x	4	$\sqrt{5}$	4	16	$4\sqrt{5}$	$-\sqrt{5}$	$-4\sqrt{5}$	-5
x	4	$\sqrt{5}$									
4	16	$4\sqrt{5}$									
$-\sqrt{5}$	$-4\sqrt{5}$	-5									
16	Rationalise the denominator means	Ensure there is no surd on the bottom of a fraction									
17	What would you do to rationalise $\frac{3}{\sqrt{5}}$	$\frac{3}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{3\sqrt{5}}{\sqrt{25}} = \frac{3\sqrt{5}}{5}$									
18	What could you multiply by to rationalise the denominator of $\frac{5}{5+\sqrt{2}}$	Change the sign on the denominator to cancel surds $\frac{5}{5+\sqrt{2}} \times \frac{5-\sqrt{2}}{5-\sqrt{2}}$									

Pythagoras

1	Conditions needed to use Pythagoras	Right angled triangle Finding a length 2 other lengths known
2	Hypotenuse means	Longest side (opposite the right angle)
3	Pythagoras' theorem formula is	$a^2 + b^2 = c^2$
4	Label a, b and c where c is the hypotenuse 	
6	Finding the hypotenuse (longest side c) use...	Square Add Square root
5	Finding a shorter side (a or b) use	Square Subtract Square root

1	A useful mnemonic for trigonometry is	SOH CAH TOA
2	Conditions for when to use the SOH CAH TOA method are	Right angled triangle Finding a side – angle and one other side given OR Finding an angle – 2 sides given
6	Label this triangle using O,A and H 	
7	Use SOH CAH TOA TO write the three equations for sin, cos and tan	$\sin(\theta) = \frac{O}{H}$ $\cos(\theta) = \frac{A}{H}$ $\tan(\theta) = \frac{O}{A}$
8	What would you type in to find x? $\cos(20) = \frac{x}{12}$	$\cos(20) \times 12$
9	What would you type in to find x? $\cos(20) = \frac{12}{x}$	$\frac{12}{\cos(20)}$
10	When finding the angle θ you need to press	SHIFT $\sin^{-1}(\frac{O}{H})$ $\cos^{-1}(\frac{A}{H})$ $\tan^{-1}(\frac{O}{A})$

1	A scale factor is	The number we multiply by to enlarge a shape's lengths
2	If the scale factor is 2...	All the lengths are multiplied by 2
3	If the scale factor is $\frac{1}{2}$	All the lengths are halved (divided by 2)
4	Positive integer scale factors make the shape	Larger
5	Positive scale factors between 0 and 1 make the shape	Smaller
6	Two shapes are similar if they have	Same corresponding angles Lengths enlarged by the same scale factor
7	These two shapes are similar Work out the scale factor 	10 and 5 correspond to each other $10 \div 5 = 2$
8	Work out the length x 	Scale factor = 2 $X = 6 \times 2 = 12 \text{ cm}$

9	Work out the length Y 	Scale factor = 2 $6 \div 2 = 3 \text{ cm}$
10	Which of these angles is the angle ABC equal to in the larger triangle? EDF DEF EFD	DEF
11	The area scale factor of similar shapes is the length scale factor _____	The area scale factor of similar shapes is the length scale factor squared $ASF = LSF^2$
12	The volume scale factor of similar shapes is the length scale factor _____	The area scale factor of similar shapes is the length scale factor cubed $VSF = LSF^3$

Non-Calculator Percentages

1	To find 10%	Divide by 10
2	To find 1%	Divide by 100
3	To find 50%	Half it
4	To find 25%	Half it and half it again (divide by 4)
5	To find 75%	Add together 50% and 25% (or divide by 4 x by 3)
6	How can I find 35%?	Find 30% - Calculate 10%, x by 3 Find 5% - Calculate 10% and half it $35\% = 30\% + 5\%$
7	How could I find 90%?	Find 10% and x by 9 OR find 10% and subtract it from the original number (100%)
8	What about 160%?	Find 10%, x by 6 then add it on to the original number (100%)
9	Increase by 10%	Find 10% and add it on
10	Decrease by 20%	Find 10%, double it then subtract it
11	Write 35 out of 50 as a percentage	Make the denominator 100 $\frac{35}{50} = \frac{70}{100} = 70\%$
12	What about when the denominator is not a factor of 100?	Simplify it Make the denominator out of 100
13	Write 18 out of 30 as a percentage	Simplify $\frac{18}{30}$ to $\frac{6}{10}$ Make the denominator 100 $\frac{6}{10} = \frac{60}{100} = 60\%$

1	To calculate a percentage of an amount you...	Divide it by 100 and write as a decimal Multiply by it by the number
2	Calculate 23% of 520	0.23×520
3	Calculate 6% of 520	0.06×520
4	Calculate 6.5% of 520	0.065×520
5	Calculate 18.9% of 520	0.189×520
6	To increase an amount by a percentage, you...	Add the percentage to 100 Divide by 100 and write as a decimal Multiply it by the number
7	Increase 520 by 23%	$100\% + 23\% = 123\%$ 1.23×520
8	Increase 520 by 6%	$100\% + 6\% = 106\%$ 1.06×520
9	Increase 520 by 6.5%	$100\% + 6.5\% = 106.5\%$ 1.065×520
10	Increase 520 by 18.9%	$100\% + 18.9\% = 118.9\%$ 1.189×520
11	To decrease an amount by a percentage, you...	Subtract the percentage from 100 Divide by 100 and write as a decimal Multiply by the number
12	Decrease 520 by 23%	$100\% - 23\% = 77\%$ 0.77×520
13	Decrease 520 by 6%	$100\% - 6\% = 94\%$ 0.94×520
14	Decrease 520 by 6.5%	$100\% - 6.5\% = 93.5\%$ 0.935×520
15	Decrease 520 by 18.9%	$100\% - 18.9\% = 81.1\%$ 0.811×520

Percentages : Profit / Loss

1	Profit means	Money you earn is more than money you spend
2	Loss means	Money you earn is less than the money you spend
3	To calculate percentage change	$\frac{\text{new value} - \text{original value}}{\text{original value}} \times 100$
4	Calculate the percentage profit if I buy a TV for £150 and sell it for £180	$\frac{180-150}{150} \times 100 = 0.2 = 20\% \text{ profit}$
5	Calculate the percentage loss if I buy a TV for £150 and sell it for £112.50	$\frac{112.50 - 150}{150} \times 100 = -0.25 = 25\% \text{ loss}$

Reverse Percentages

1	To reverse a percentage change, you...	Find the decimal used to increase/decrease Divide by the decimal
2	A price has increased by 20% to £72. What was the price before the increase?	Decimal used to increase by 20% $\square 1.20$ $72 \div 1.20 = \pounds 60$
3	In a sale the price has decrease by 20% to £64 (sale price). What was the price before the decrease? (normal price)	Decimal used to decrease by 20% $\square 0.80$ $64 \div 0.80 = \pounds 80$

Repeated Percentage Change & Interest

1	The compound interest formula can be found...	On my exam aid $p \left(1 + \frac{r}{100}\right)^n$
2	If I invest £3000 at 3.9% compound interest for 5 years. Using the formula form my exam aid... what is the value of p, r and n?	$p = 3000$ $r = 3.9$ $n = 5$
3	What would this look like typed in?	$3000 \left(1 + \frac{3.9}{100}\right)^5$
4	What is the answer when you type this in written as an answer that makes sense for money?	3632.444542 = £3632.44 (rounded to 2 decimal places as money)
5	How can I calculate the amount of interest I have earnt?	Answer – original $3632.44 - 3000 = \pounds 632.44$ (interest earnt)
6	How can I change the formula if there is a decrease?	Change the plus to a minus $p \left(1 - \frac{r}{100}\right)^n$
7	A car is valued at £20 000 and depreciates at a rate of 20% per year. How much will it cost in 4 years? Using the exam aid, what is the value of p, r and n?	$p = 20\,000$ $r = 20$ $n = 4$
8	What would this look like typed in?	Change the plus to a minus $20000 \left(1 - \frac{20}{100}\right)^4$ = £8192.00

1	$0.\dot{3}6$ means	0.36363636... 36 recurs
2	$0.3\dot{6}$ means	0.36666666... 6 recurs
3	$0.5\dot{3}6$ means	0.536363636... 36 recurs
4	$0.53\dot{6}$ means	0.536536536... 536 recurs
5	What should you write if it says convert $0.\dot{3}6$ to a fraction	Let $x = 0.36363636...$ $10x = 3.63636363...$ $100x = 36.36363636...$ $1000x = 363.63636363...$
6	Which two equations should you subtract? $x = 0.45454545$ $10x = 4.54545454$ $100x = 45.45454545$ $1000x = 454.5454545$	$x = 0.45454545$ $10x = 4.54545454$ $100x = 45.45454545$ $1000x = 454.5454545$ 100x and x match up after the decimal point So $100x - x$
7	Which two equations should you subtract? $x = 0.306306306...$ $10x = 3.06306306$ $100x = 30.6306306$ $1000x = 306.306306$	$x = 0.306306$ $10x = 3.063063$ $100x = 30.630630$ $1000x = 306.306306$ 1000x and x match up after decimal point So $1000x - x$
8	Which two equations should you subtract? $x = 0.054545454$ $10x = 0.545454545$ $100x = 5.454545454$ $1000x = 54.545454545$	$x = 0.054545454$ $10x = 0.545454545$ $100x = 5.454545454$ $1000x = 54.545454545$ 1000x and 10x match up after the decimal point So $1000x - 10x$
9	Ben has subtracted two equations and got $990x = 450$ What is the fraction you write in its simplest form	$\frac{450}{990} = \frac{5}{11}$



Pot – Shamshad Khan

Shamshad Khan (1964-) is a contemporary British poet of Pakistani heritage whose work often explores questions of identity, culture, and belonging in a postcolonial world. Growing up in Britain while connected to South Asian heritage influences her interest in how identity is shaped across cultures. Her poetry frequently examines how histories of empire and migration continue to affect individuals and communities today.

The British Museum and imperial collecting practices: The poem draws heavily on the history of the British Empire and its practice of collecting artefacts from colonised countries, often removing them from their cultural and historical contexts. Many such objects are now housed in institutions like the British Museum, leading to ongoing debates about restitution and ownership. This reflects wider concerns about how Western institutions have historically controlled and interpreted non-Western cultures, often silencing the voices of the people to whom these objects originally belonged. The pot therefore represents not just a single object, but a broader history of cultural displacement and appropriation, as well as colonial expansion and the extraction of resources.

Context: “Pot” reflects the legacy of the British Empire, particularly the removal of artefacts from colonised countries and their display in British museums. These objects are often separated from their original cultural context, raising ethical debates about ownership, history, and restitution. The poem engages with modern discussions about whether such items should be returned to their countries of origin.

Key techniques:

Symbolism: Kahn uses this to turn the pot into a representation of cultural identity and heritage, allowing a physical object to stand for a much larger historical narrative.

Personification: this gives the pot a sense of life and voice, emphasising its lost context and suggesting it has its own story that has been suppressed or altered.

Ambiguous collective **voice** (“they”): suggests authority, power, and conflict around ownership, creating distance between those in power and the object itself.

Tone: it's reflective and conversational, mirroring the ongoing debate about ownership, encouraging readers to question accepted narratives.

 Homing – Liz Berry

Liz Berry (1980) is a modern poet from the Black Country in the Midlands of England. Her work is deeply rooted in regional identity, dialect, and working-class heritage, and she often celebrates voices that have historically been marginalised. Berry draws on her personal experiences to show how language connects to identity and memory.

Context: The poem reflects social attitudes toward accent and class in Britain, where Received Pronunciation (standard English) has traditionally been associated with education and authority. Many people have felt pressure to suppress regional accents to succeed socially or professionally. The poem explores the emotional impact of this suppression and the loss of cultural identity that can result.

Language and place: 'Homing' discusses the importance of dialect and accent in Britain, where language has long been tied to class and social status. References to elocution lessons and phrases like “how now brown cow” highlight historical attempts to train speakers into Received Pronunciation, seen as the “correct” form of English. This reflects a society where regional accents—particularly working-class ones like those from the Black Country—have often been judged, marginalised and viewed negatively. The poem therefore celebrates dialect as an important part of regional identity and cultural heritage, while critiquing pressures to conform.

Key techniques:

Extended metaphor of the accent “kept your accent in a box”: this represents the suppression and repression of identity over time.

Dialect and phonetic spelling: this is used later in the poem, which contrasts with earlier standard English, symbolising a reclaiming of identity and regional voice.

Industrial **imagery** (e.g. references to metal and machinery): this connects the language to the Black Country’s historical industries, linking accent to pride in working-class roots and craftsmanship.

Structurally, the shift from suppression to release is similar to the emotional journey of rediscovery and belonging.



Name Journeys – Raman Mundair

Raman Mundair (1971-) was born in India and moved to Britain (Manchester) aged 5, and is now based in Shetland and Glasgow. Her poetry reflects the experience of migration, displacement, and living between cultures, often focusing on how identity is shaped by language and heritage.

Hindu mythology: the poem draws on Indian mythology, referencing figures such as Rama and Sita, to connect the speaker's personal experience to a wider cultural and historical tradition. These references suggest that the speaker's journey is part of a larger narrative of exile, endurance, and identity.

Migration to Britain and assimilation: at the same time, the poem reflects the experience of migration to Britain, where names and languages are often unfamiliar and misinterpreted. This highlights the tension between preserving cultural heritage and adapting to a new environment, revealing the complexity of diasporic (or bicultural) identity.

Context: The poem explores the impact of migration on personal identity, particularly how names can be changed, mispronounced, or misunderstood in a new culture. It reflects the difficulty of maintaining cultural heritage while adapting to life in Britain, and the emotional tension of belonging to two different worlds.

Key techniques:

Extended metaphor (name as a journey): this presents identity as not fixed, but changing and evolving constantly, through time and place.

Mythological allusion: this enriches the poem, linking the speaker's personal life and struggles with well-known cultural stories and history.

Enjambment: this creates a flowing, fluid, continuous movement that reflects shifting identity across cultures and the ongoing and unsettled nature of migration.

Sensory imagery linked to sound and language emphasises the physical and emotional experience of both being spoken about, speaking (having a voice), and being heard.



👏 A Century Later – Imtiaz Dharker

Imtiaz Dharker (1954-) is a globally recognised poet who was born in Pakistan and raised in Scotland, giving her a multicultural perspective on identity and inequality. Her work often focuses on themes such as gender, conflict, and human rights, particularly in relation to women’s experiences.

Context: Written in 2014, the poem draws a connection between war and the struggle for girls’ education, showing that violence still affects ordinary lives a century after World War I. It reflects contemporary global issues, particularly in regions where girls risk their safety simply by going to school.

Gender inequality, women’s rights movements, and education: this poem reflects global issues surrounding girls’ education and gender inequality, particularly in regions affected by conflict. It is often linked to real-world events such as the attack on Malala Yousafzai in 2012, which highlighted the dangers some girls face simply by attending school.

Key techniques:

Extended metaphor (comparing school to a battlefield): this transforms a place of learning into one of life-threatening risk and highlights everyday danger.

Semantic field of war (“firing line”, “target”): this creates tension and emphasises the violence faced by the speaker.

Juxtaposition (youth vs violence and brutality): this increases the emotional impact, emphasising vulnerability and a sense of injustice.

Structurally, the poem builds from threat to resilience, reinforcing the idea of resistance and hope despite oppression.

Ongoing global conflicts affecting civilians: it also connects to a broader historical context, being written 100 years after World War I, suggesting that violence and injustice continue despite supposed progress. These references connect the poem to themes concerning the ongoing struggle for human rights and equality.



On an Afternoon Train from Purley to Victoria, 1955 – James Berry

James Berry (1924 – 2017) was a Jamaican-born poet who migrated to Britain as part of the Windrush Generation. His work often explores the experiences of Caribbean immigrants, including issues of race, identity, and belonging in post-war Britain.

Context: Set in 1955 (but published in 1995), the poem reflects a time when Britain was becoming more multicultural following immigration from the Caribbean post WWII. However, this period was also marked by racism and widespread ignorance about other cultures, which the poem subtly exposes through everyday interaction.

Windrush migration and Post-war British society: the poem is set during the era of the Windrush Generation, when many Caribbean migrants arrived in Britain following World War II. While these migrants were invited to help rebuild the country, they often encountered racism and a lack of understanding about their identities and histories. The conversation in the poem highlights common misconceptions, such as confusion about Jamaica's location and culture, reflecting a broader ignorance within British society at the time. This situates the poem within a period of significant social change and cultural tension.

Key techniques:

Dialogue form: the creates realism and immediacy, drawing the reader into an everyday interaction.

Irony and gentle humour: this exposes the woman's ignorance without making the tone direct or confrontational, making the critique more subtle.

Contrast (between the woman's politeness and prejudice): polite manners paired with misunderstanding based on stereotyping and ignorance creates dramatic irony, encouraging the reader to recognise the gap between intention and impact.

Structurally, the poem's conversational flow mirrors natural speech, reinforcing its authenticity and believability.



👑 England in 1819 – Percy Bysshe Shelley

Percy Bysshe Shelley (1792 - 1822) was a Romantic poet known for his radical political beliefs and strong criticism of authority and social injustice. His poetry often challenged the ruling classes and called for change, which made his work controversial at the time.

Context: The poem was written in response to the Peterloo Massacre in 1819, when peaceful protestors demanding political reform were attacked by the army. It reflects widespread dissatisfaction with the monarchy, government, and social conditions in England during this period of poverty and unrest. It was originally rejected for publication for being too controversial!

King George III, monarchy, the Peterloo Massacre, and corruption: Shelley's poem is deeply rooted in the political turmoil of early 19th-century Britain, particularly the Peterloo Massacre, when peaceful protestors demanding reform were attacked by the army. It criticises the monarchy, government, and institutions such as the Church, all of which Shelley saw as corrupt and failing the people. The poem reflects widespread poverty, lack of political representation, and public anger, capturing a moment when society seemed on the brink of change. These references align with Romantic concerns about liberty, justice, and revolution.

Key techniques:

Listing: the poem catalogues the failures of different institutions, creating a relentless sense of overwhelming decay and corruption.

Violent, grotesque **imagery** ("leech-like") : shows exploitative and parasitic nature of those in power.

Subverted sonnet form: Shelly uses (and subverts) a traditional love poem structure to deliver a political attack (or protest), creating contrast between form and content.

Structurally, the final lines introduce a volta-like shift, hinting at the possibility of hope or revolution emerging from suffering. Some consider this an afterthought, indicating that Shelley is half-hearted in his hope!



Poetry Key Words			
Enjambment	The running over of a sentence from one line to the next without a piece of punctuation at the end of the line.	Form	The physical structure of a poem e.g. it's shape or systems used
Rhythm	The beat or pace of a poem	Imagery	The words used to convey images to the reader, could be sound images, not just visual
Anaphora	A repetition of words, phrases or clauses to have an emotional impact on the reader	Structure	The organisation of a poem including stanzas, rhyme scheme or meter
Theme	An idea explored within a text	Plosive	“b,” “p,” “t” and “d” sounds – which can be harsh, aggressive or shocking
Sibilance	Repeated “S” sounds – most often caused by “s” “ss” and “c.” These can be harsh, smooth or sickly.	Alliteration	A repetition of consonant sounds.
Oxymoron	A figure of speech in which two contradictory things are placed together in a way which makes peculiar sense.	Onomatopoeia	Words which attempt to imitate sounds.

Characters



Ebenezer Scrooge – Scrooge is the lead protagonist of the novella. He is a miserly owner of a counting house (what would now be called an accountant’s office). Initially greedy, selfish and cold, Scrooge hates Christmas and lacks any form of Christmas spirit. He experiences a moral and psychological transformation through his visits from the Ghosts of Christmases Past, Present and Yet to Come



Jacob Marley – Joseph Marley is Scrooge’s late business partner, and Joseph Marley symbolises the limitations of a life-lived focused on greed and selfishness. After his death, Joseph Marley has been condemned to wander the world as a miserable ghost.



The Cratchits– Bob Cratchit is Scrooge’s kind, mild-mannered clerk, who is treated terribly by his employer. He is a very poor man, with a large family, including Tiny Tim. Tiny Tim is a young boy who has been born with physical disabilities that his family are too poor to have treated. Despite these hardships, the family are cheery and determined to enjoy the few positives that they can get from life.



Fred- Fred is Scrooge’s nephew. Fred’s life appears fulfilled through his perpetual joy, kindness and interactions with others.



Unit 1 A Christmas Carol

Context

Charles Dickens – Charles Dickens was born in 1812 and spent the first years of his life in Kent, England. At 9, he moved to London. At 12, his father was sent to debtors’ prison for racking up huge debts, and Charles was given a painful job labelling bottles near the prison. He found this period in his life hellish, and it doubtlessly led him to draw readers’ attention to the plight of the poor when he later found success as an author. Many of his works are about social hardships and inequalities.	The Victorian Era– The Victorian era describes the period in which Queen Victoria sat on the English throne – between 1837 and 1901 (most of Dickens’ life). Whilst this was a time of industrial revolution, it was also an extremely harsh time to live, and the differences between the lives of the richest and the poorest were exacerbated. The Victorian era was a period of great change. In this time, the population of England doubled – from 16.8 million 1851 to over 30 million in 1901.
Christmas– We now associate Christmas as being a time of seasonal goodwill, love and friendship. However, before the Victorian era, when writers such as Dickens spread these messages through their novels, there was no Santa Claus, Christmas cards, and no holidays from work! Christmas Day was a far more low-key affair. Writers such as Dickens encouraged middle-class families to share their wealth and act selflessly	Class Divides – Despite industrial changes altering the social landscape, there were still relatively distinct social classes in operation: the nobility upper class, the middle class, and the working class. Life was terrible for the poorest: Lack of money resulted in a negligible food supply. For some working families, money was so tight that they required their children to work in order to survive.
Workhouses– A workhouse was a place where a person went if they could not afford to financially support themselves and their families. Men, women and children (mostly orphans) lived and worked in the workhouses, which were very crowded – making living conditions unhealthy and unpleasant. People slept in dormitories, where disease was easily spread. In A Christmas Carol, Scrooge voices his support for workhouses.	Health and Medicine –Healthcare was more of a luxury at the time, and medicine was nowhere near as advanced today, Many diseases were rife, and childbirth and poverty were very real dangers to people living in the era. As a result, a middle class person may expect to live to 45 at the time, whereas a working class person would have been lucky to have lived half that time. In A Christmas Carol, the restrictions in healthcare are evident in Tiny Tim’s continued suffering.

Characters- The Ghosts

The Ghost of Christmas Past – This is the first spirit to visit Scrooge. He is a curious child-like figure that has an illuminated head, symbolising how shining a light on memories from the past can be used to illuminate one's thoughts and behaviours in the future. The Ghost

of Christmas Past takes Scrooge to a number of places from his childhood and early adulthood, including his old school, hometown, and the scene of his engagement being broken off



The Ghost of Christmas Present – The Ghost of Christmas Present is the second of the three ghosts to visit Scrooge. He is a majestic jolly giant, who is dressed in a green robe. His lifespan is restricted to Christmas Day, and he has 'over 1800 brothers', representative of the other Christmas Days that were once in the present. He escorts Scrooge on a tour of how his contemporaries spend Christmas day, to force him to contemplate his own solitary existence. He also shows him the need to consider 'Want' and 'Ignorance.'



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Plot Summary





Plot Summary

Stave 1	It is a foggy Christmas Eve, and Scrooge is working in his counting house. He refuses to buy another lump of coal to heat Bob Cratchit's (his clerk's) office. Scrooge's cheerful nephew, Fred, enters, inviting Scrooge to Christmas party, but he declines. After he leaves, two gentlemen enter, asking if Scrooge is willing to make a charitable donation to the poor. Scrooge again declines. He begrudgingly gives Bob Cratchit the day off. Scrooge follows his usual routine on the way home. At home, he sees the ghost of his old business partner (Jacob Marley) in the knocker. Marley is in chains as punishment for his selfishness and greed when living. He says that he seeks to save Scrooge from the same fate, and hence Scrooge will be visited by 3 ghosts over the next 3 nights.	"Marley was dead: to begin with. There is no doubt whatever about that. The register of his burial was signed by the clergyman, the clerk, the undertaker, and the chief mourner. Scrooge signed it."
Stave 2	Scrooge is confused to wake at midnight, as it was after 2am when he went to sleep. At one o'clock, Scrooge is visited by a strange child-like figure that emanates wisdom – The Ghost of Christmas Past. The spirit touches Scrooge's heart, granting the power to fly. The ghost takes Scrooge back to where he was raised – Scrooge is touched by memories of his childhood. He sees himself as a schoolboy spending Christmas alone, being visited by his sister, being at a party held by Scrooge's old boss Fezziwig, and with his old partner Belle, who is breaking off their engagement on account of his greed. He sees Belle in a more modern time, with her husband, discussing how Scrooge is now 'quite alone in the world.' Scrooge is upset by the visions, and begs with the ghost to take him back home. Scrooge finds himself back in his bedroom, where he once again falls asleep almost instantly	"But the strangest thing about it was, that from the crown of its head there sprung a bright clear jet of light, by which all this was visible; and which was doubtless the occasion of its using, in its duller moments, a great extinguisher for a cap, which it now held und



Plot Summary

Stave 3	The bell strikes one, and Scrooge is awake once more. At fifteen minutes past one, he wanders into the next room, where he finds the Ghost of Christmas Present waiting for him. He is a majestic jolly giant, and sits atop of a mountain of food. The spirit takes Scrooge to the bustling streets on Christmas morning, where passers-by joyfully greet each other. The spirit then takes Scrooge to the home of Bob Cratchit, where the family savour the Christmas that they can afford. Their visibly-ill son, Tiny Tim, is cheering despite his ailments. Scrooge begs to know whether he will survive. They also visit Fred's Christmas party, which Scrooge enjoys (though no one can see him). Eventually, Scrooge is brought to a vast expanse, where two sickly children, 'Want' and 'Ignorance' emerge. When Scrooge asks if there is anything that can be done, the spirit mocks his prior selfishness.	"Its dark brown curls were long and free; free as its genial face, its sparkling eye, its open hand, its cheery voice, its unconstrained demeanour, and its joyful air."
Stave 4	Scrooge is approached by a hooded phantom. The spirit is silent, and Scrooge is terrified by him. Scrooge pleads with him to provide his next lesson. The ghost takes him to the stock exchange, where men discuss the accounts of a rich man, a dingy pawn shop, where the rich man's stolen goods are being sold, and the Cratchit household, where the family struggles with the death of Tiny Tim. Scrooge is then taken to a freshly dug grave in a graveyard. The gravestone reveals that it is his own grave. Appalled, Scrooge begs with the spirit to give him another chance to show that he has learnt his lesson. The phantom begins to tremble and disappears, and once again Scrooge finds himself in the relative safety of his own bed.	I fear you more than any spectre I have seen. But as I know your purpose is to do me good, and as I hope to live to be another man from what I was, I am prepared to bear you company, and do it with a thankful heart"

Plot Summary

Stave 5

Scrooge realises that he has been returned to Christmas morning, and is utterly overjoyed. He pays the first boy that he meets a huge sum to deliver a great big turkey to Bob Cratchit's household. He bumps into the gentlemen collecting for charity, apologises for his prior behaviour, and promises to donate lots of money to the poor. He attends Fred's party and is so happy and kind that the other guests can barely believe his behaviour. The next morning, he pretends to scold Bob Cratchit for arriving late, before promising to give him a large raise and to care for his family. As time passes by, he stays true to his word – he helps the Cratchits and becomes like a second father to Tiny Tim, who does not die. Scrooge brings Christmas cheer to every day, and shrugs off the doubts that others have about his changed behaviour. The narrator concludes by suggesting that Scrooge's changed attitude and behaviour should be shared by everyone.

"He had no further intercourse with Spirits, but lived upon the Total Abstinence Principle, ever afterwards; and it was always said of him, that he knew how to keep Christmas well, if any man alive possessed the knowledge....God bless us all, every one!"



Key Words

Novella	A short story- A Christmas Carol only has five chapters (staves)
Apparition	A ghost or ghost-like person.
Omniscient narrator	A storyteller that knows everything – the all-knowing voice
Symbolism	The use of a symbol (image) to represent an idea
Redemption	The action of being saved from sin,error or evil
Allegory	A story or poem that can have a hidden meaning, usually a moral or political one
Social responsibility	A way of acting and thinking for the benefit of all in society not just oneself
Justice	Just behaviour or treatment
Ignorance	Lack of knowledge of information
Want	Being without something that you need
Protagonist	Main character



Themes

Greed and Selfishness – Characters such as Scrooge represent the selfish middle classes, who sought to amass, rather than share their wealth. Jacob Marley demonstrates the burden that such a selfish life will inevitably bring. Through these characters and the events of the novel, Dickens criticises how wealth had become associated with the root of happiness, at the expense of close relationships and goodwill.

Divisions– Divisions are evident throughout the novel, as those with power and money seek simply to exert and recycle their advantages over those without (rather than aiding them). The book shines a light on the plight faced by poor families such as the Cratchits, which demonises the negative attitudes towards the poor held by the rich.

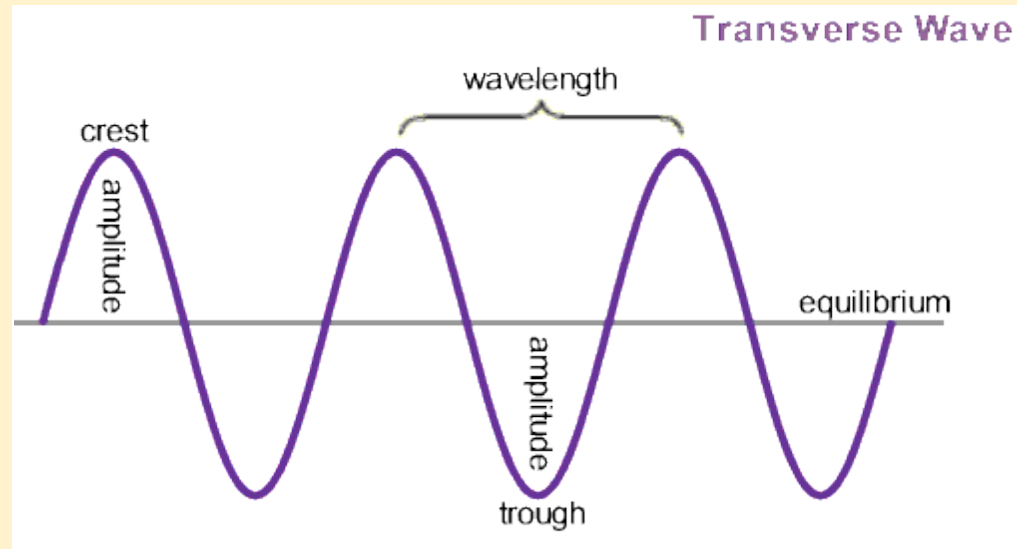
Time – Time is stretched by the ghosts – the events that Scrooge experiences appear to have taken days, and yet all takes place in the space of one night. A race against time is also taking place, as the spirits work to prevent Scrooge (and in turn, Tiny Tim) from experiencing their fateful demise. The reader is taught to value the time that we have, and use it to spread happiness to others.

Transformation – Physical transformations are evident throughout A Christmas Carol, as objects, settings, and characters appear and vanish under the manipulation of the ghosts. Spiritual transformations take place too, as the reader witnesses a lonely boy's transformation into an embittered old man, and the efforts made to transform his character to reconnect with those around him.

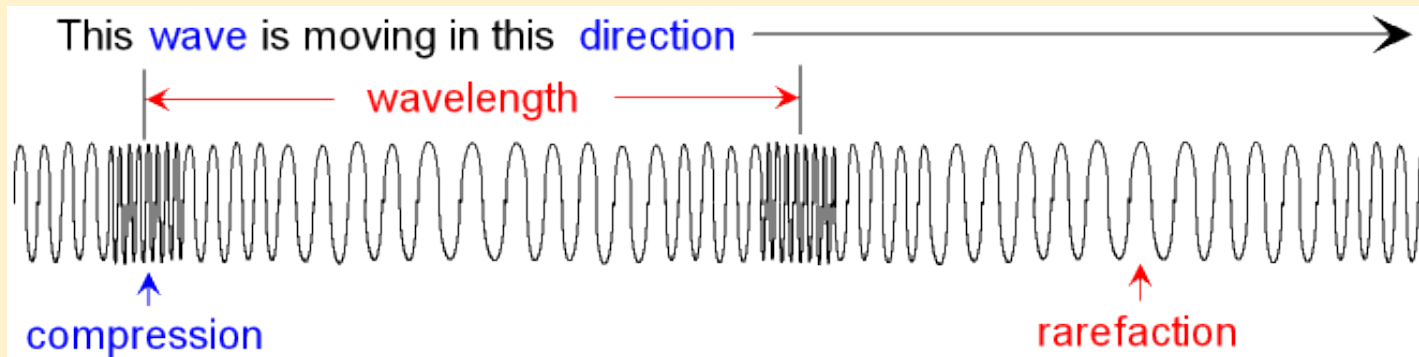
Waves transfer **energy and information** from one place to another.

There are two types of wave; **longitudinal** and **transverse**.

In **longitudinal waves**, the vibrations are parallel to the direction of wave travel.

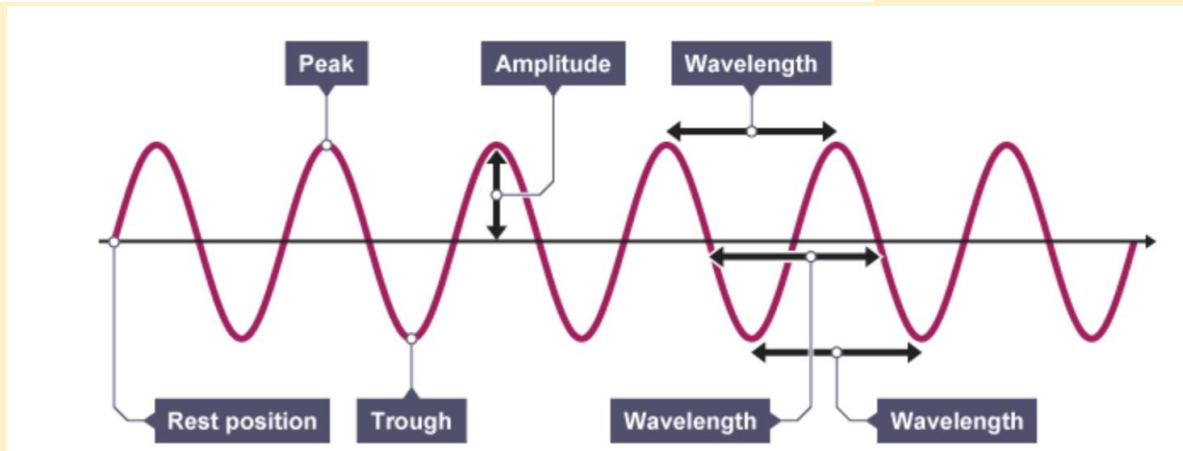


Longitudinal wave



Waves are described using the following terms:

- **rest position** - the undisturbed position of particles or fields when they are not vibrating
- **displacement** - the distance that a certain point in the medium has moved from its rest position
- **peak** - the highest point above the rest position
- **trough** - the lowest point below the rest position
- **amplitude** - the maximum displacement of a point of a wave from its rest position
- **wavelength** - distance covered by a full cycle of the wave, usually measured from peak to peak, or trough to trough
- **time period** - the time taken for a full cycle of the wave, usually measured from peak to peak, or trough to trough
- **frequency** - the number of waves passing a point each second

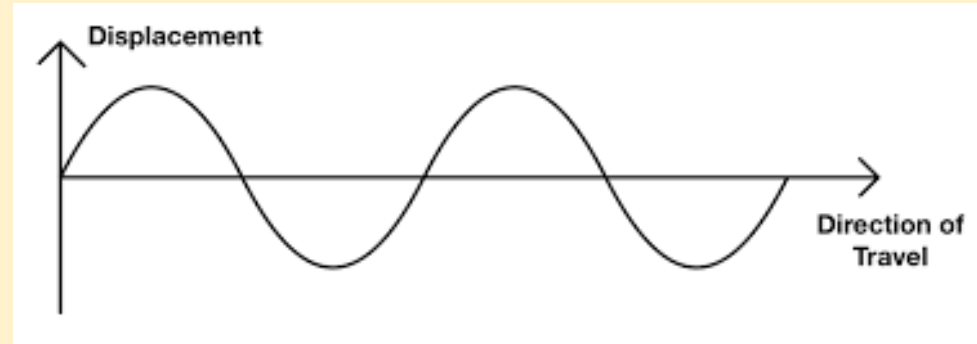


P4 Waves - Examples

In transverse waves the vibrations are at right angles to the direction of wave travel.

Examples of transverse waves include:

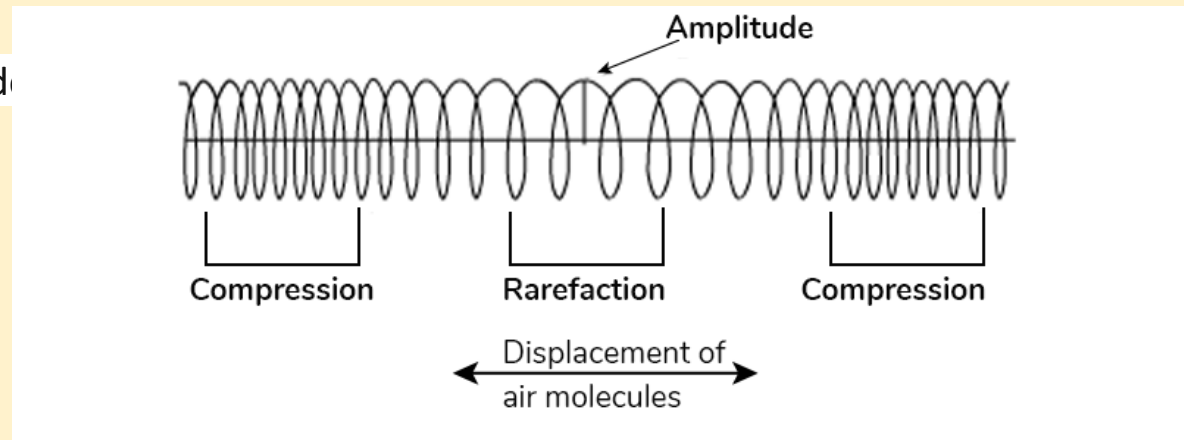
- ripples on the surface of water
- vibrations in a guitar string
- a Mexican wave in a sports stadium
- electromagnetic waves – eg light waves, microwaves, radio waves
- seismic S-waves



In longitudinal waves the vibrations are parallel to the direction of wave travel.

Examples of longitudinal waves include:

- sound waves
- ultrasound waves
- seismic P-waves



P4 Waves – Wave speed Equation

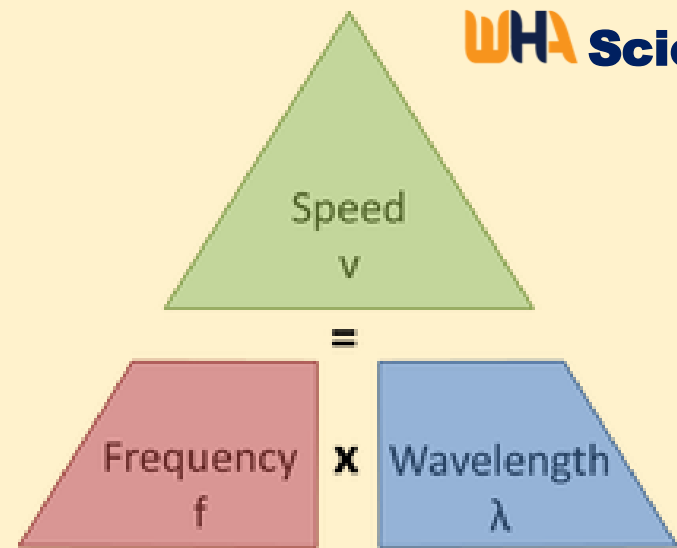
The wavelength equation says that the **velocity of a wave is equal to the frequency multiplied by the wavelength**:

$$v = f \times \lambda$$

where v is the **velocity** (m/s)

f is the **frequency** (Hz)

λ is the **wavelength** (m)



Example question: A wave has a frequency of 12 kHz and a wavelength of 20 cm. Calculate the wave speed.

Step 1: Write the equation.

$$v = f \times \lambda$$

Step 2: Write down the variables

$$f = 12 \text{ kHz} = 12,000 \text{ Hz}$$

$$v = 20 \text{ cm} = 0.2 \text{ m}$$

Step 3: Calculate the answer

$$v = 12,000 \times 0.2 = 2400 \text{ m/s}$$

In a vacuum (space)

transverse waves travel at

3×10^8 m/s that's

300,000,000 m/s (the

speed of light)

To measure the **wavelength** of a wave in a ripple tank, use a **ruler** and take a picture with a **camera**.

To measure the **frequency** count the number of waves that pass a point in 10 seconds and divide by 10. We can **record** it and play back in **slow motion**.



① Set up ripple tank to produce low frequency waves ☐

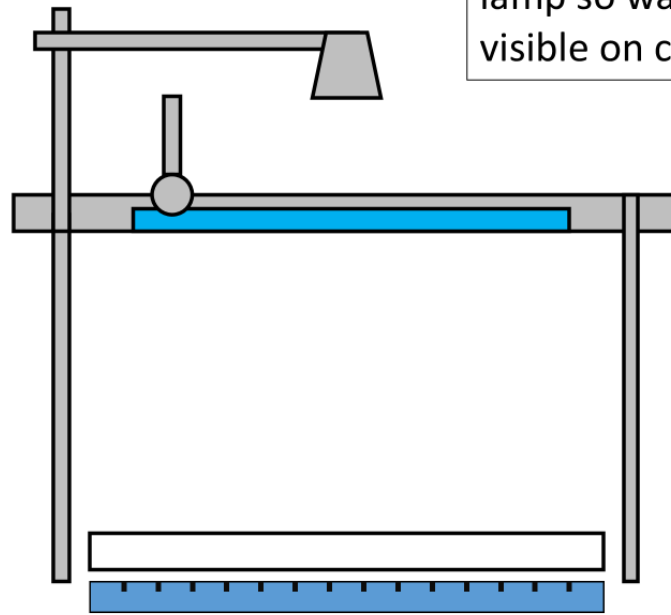
② Adjust height of lamp so waves are visible on card ☐

⑥ Calculate:
wavelength ☐
frequency ☐
wave speed ☐

⑤ Count the number of waves passing mid-point of card in 10 s ☐

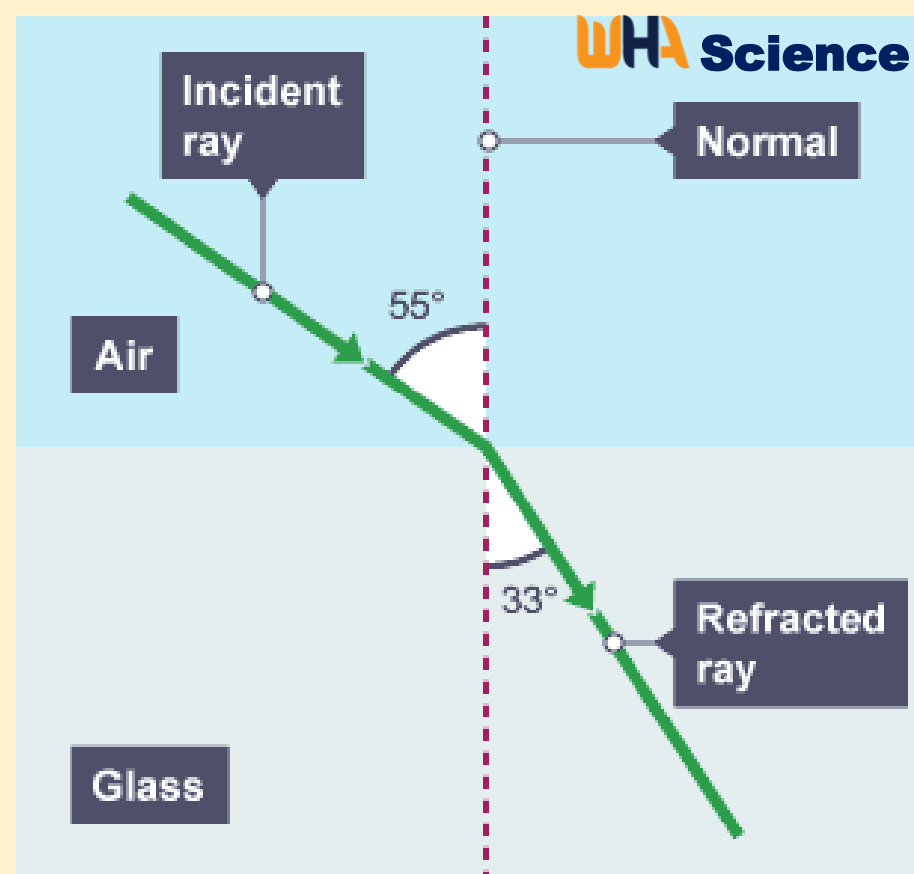
③ Ruler at right angle to waves ☐

④ Measure length of five waves on card ☐



P4 Waves – Refraction

When an EM wave (like light) travels into a material that is **more dense** (for example from air into a glass block), it refracts **towards** the normal (an imaginary line at right angles to the surface). This is because light travels **slower** in objects that are more optically dense.



Refraction can cause optical illusions as the light waves appear to come from a different position to their actual source.

All EM waves **reflect** if they hit a reflective surface.

Light is the most common example of this and it's

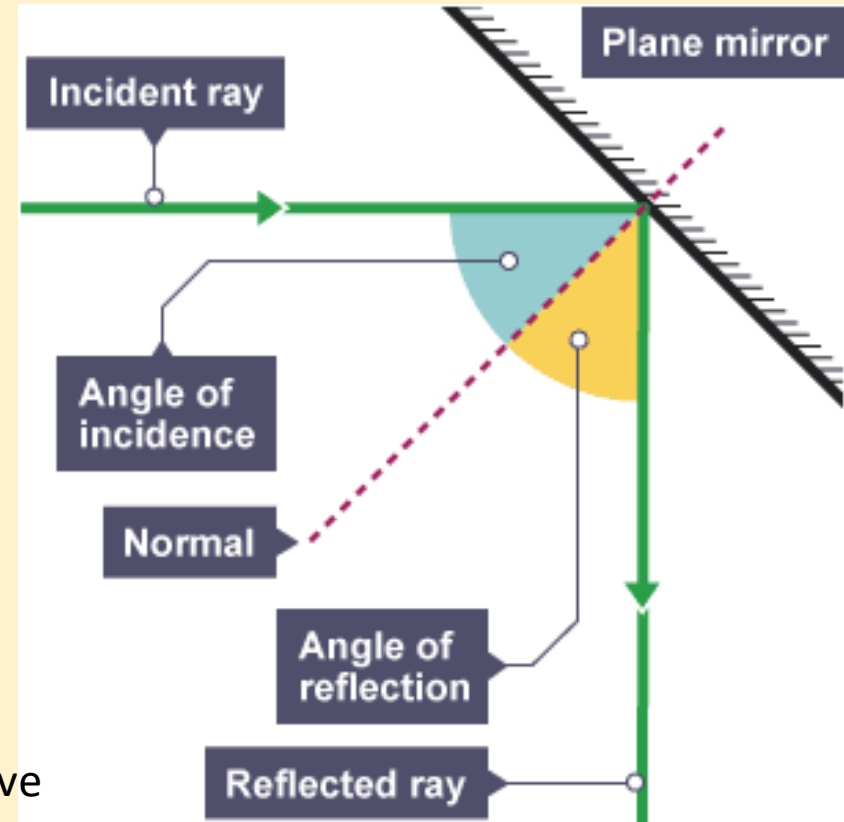
how we can see ourselves in a mirror.

Law of Reflection:

Angle of incidence (°) = angle of reflection (°)

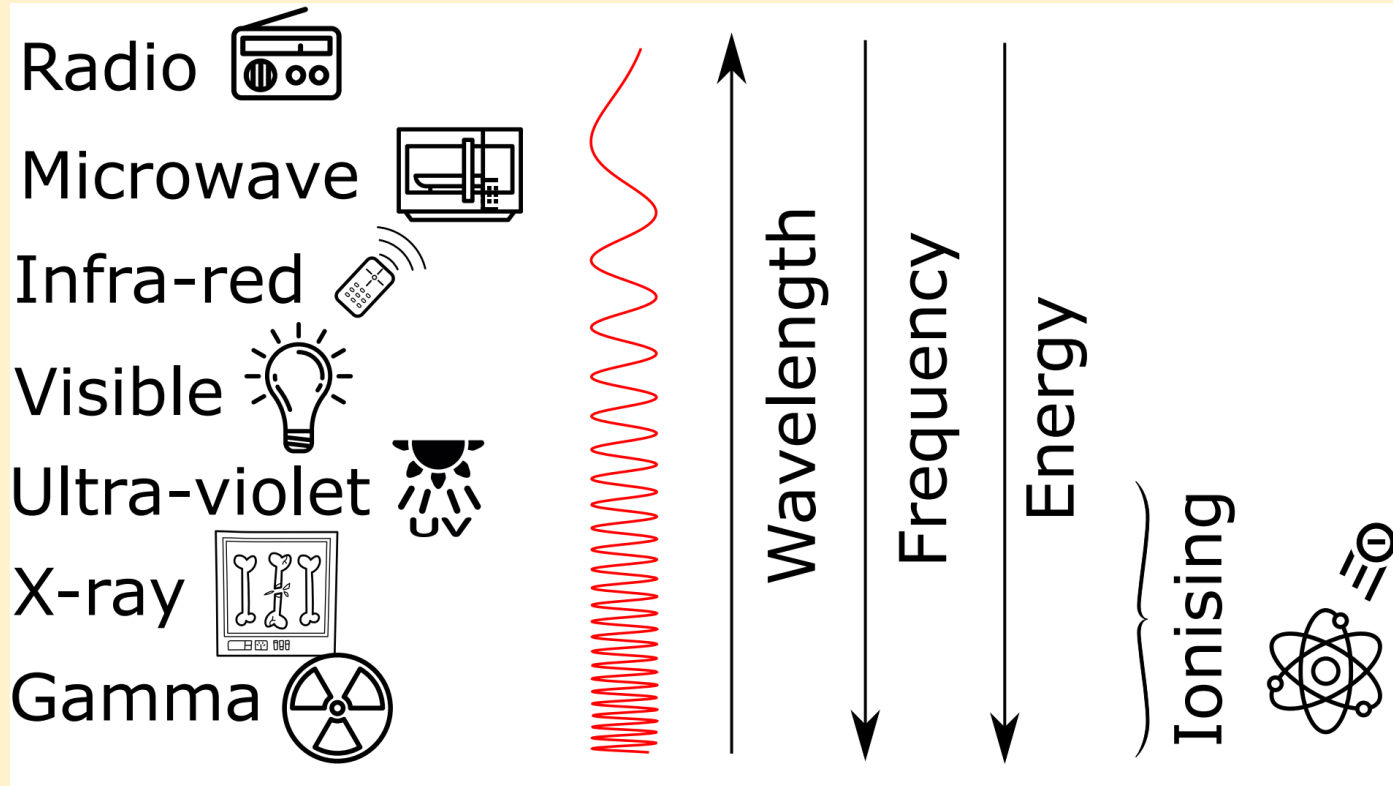
$$i (^{\circ}) = r (^{\circ})$$

The **law of reflection** is true for any type of wave being reflected from a surface.



The **electro-magnetic** (EM) spectrum is a family of 7 waves.

They are all **transverse** and travel at the **speed of light**.

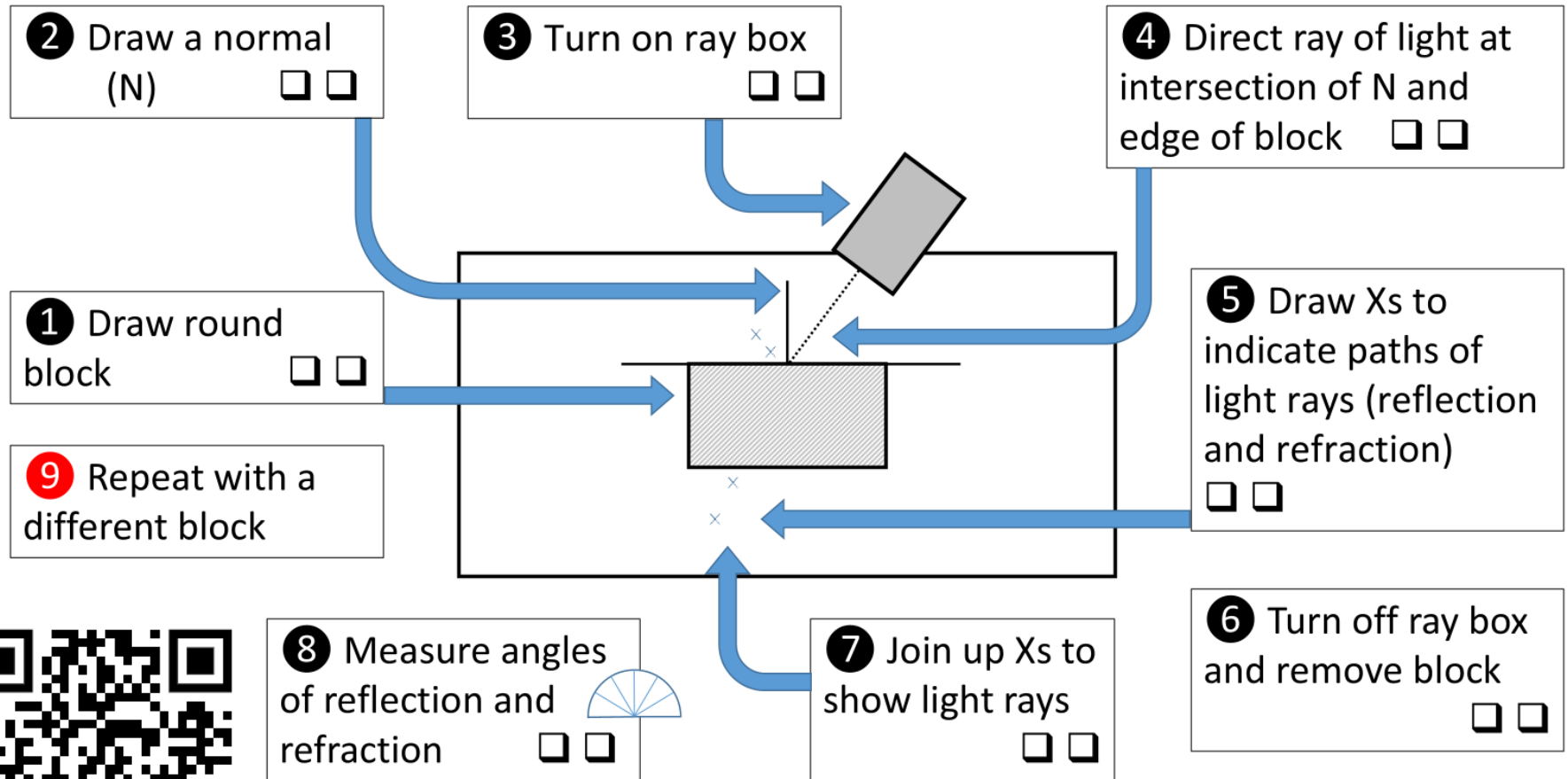


EM waves transmit energy from a source to the observe. For example, Infra-red waves transmitting heat from a fire to a person.

P5 Light and the electromagnetic spectrum – Refraction required practical

In a denser material (like glass) the wave travels more slowly. The wavelength therefore decreases.

Waves can be absorbed, transmitted, reflected or **refracted** when travelling from one object to another.



What are radio waves used for?

They are used for **television** and **radio signals**



What makes them useful for this purpose?

- they **travel long distances** through the air
- they have **long wavelengths** so they can **bend if** they are **obstructed** – this allows them to be **detected** even when they are **not in the line of sight**

P5 Light and the electromagnetic spectrum - Microwaves

Microwaves

Use: satellite communications



Suitability: pass through the Earth's atmosphere reaching satellites in space

Use: cooking food

Suitability: penetrate into food , are absorbed by water molecules in the food which heats it up

Dangers: microwaves penetrate into the body to cause internal heating

P5 Light and the electromagnetic spectrum - Infrared

Infrared

Use: **cooking food and heaters**

Suitability: transfer energy quickly to heat rooms and food

Use: **infrared cameras**

Suitability: have sensors that **detect** infrared waves emitted by warm/hot objects

Dangers: damage /kills skin cells



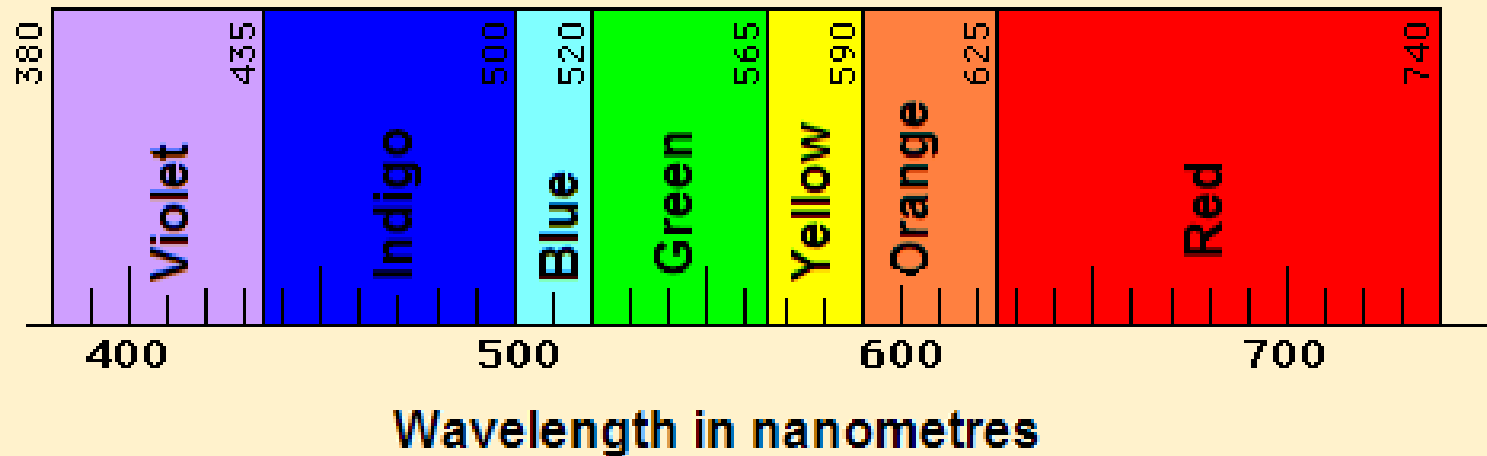
P5 Light and the electromagnetic spectrum – Visible Light

Visible Light

Use: **fibre optic communications**

Suitability: it is short wavelength – allows more information to be carried

Dangers: may cause damage to the retina of the eye



P5 Light and the electromagnetic spectrum – Ultraviolet Light

Ultraviolet Light

Use: **energy-efficient lighting**

Suitability: bulbs contain chemicals to absorb UV light and emit visible light

Use: **Tanning sunbeds**

Suitability: have more energy than visible light

Dangers: skin cell damage, premature ageing, higher risk of cancer, blindness



P5 Light and the electromagnetic spectrum – X-Rays

X-rays

Use: **medical imaging**

Suitability: can pass through soft tissue (flesh) but not dense structures such as bone – allows detection of fractures and breaks



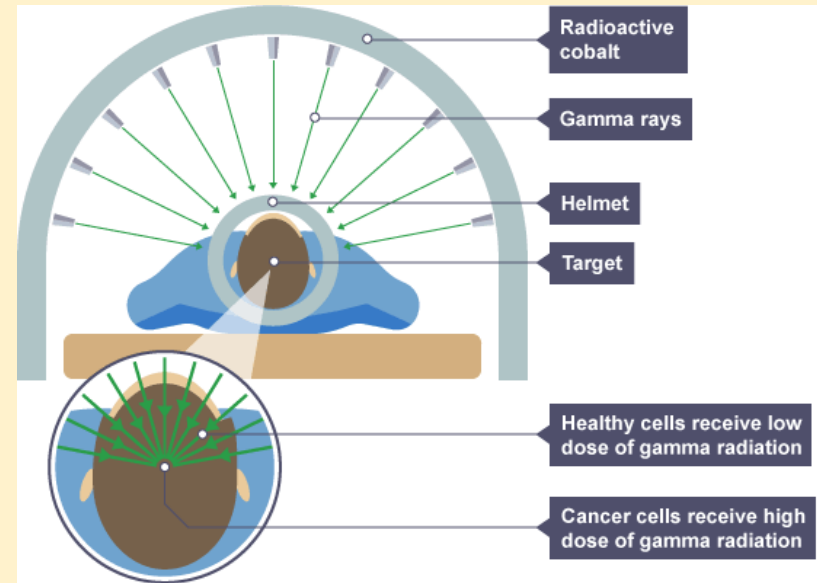
P5 Light and the electromagnetic spectrum – Gamma Rays

Gamma rays

Use: medical treatment of cancers

Suitability: high penetrating power, high doses can be used to kill living cancerous cells and also used in the sterilisation of surgical operating equipment

(kills bacteria) **Dangers:** ionising radiation may cause damage/kill cells or cause mutations in genes causing cancer.



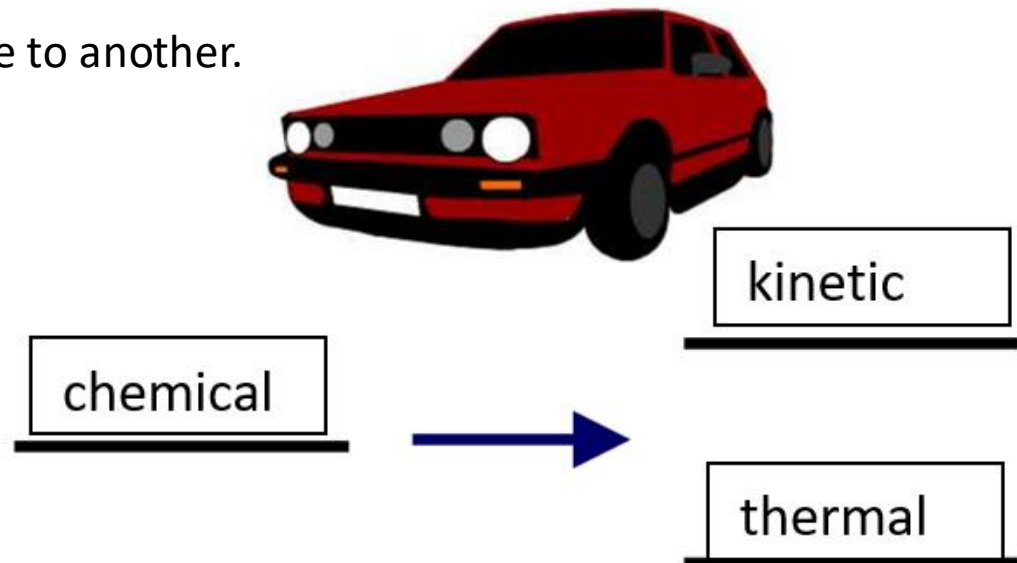
P8 Energy Stores and Systems

Whenever anything happens, energy is transferred from one **store** to another.

A **system** is an object or a group of objects.

When a system changes, the energy stored in that system changes as well, as it is transferred from one **store** to another.

The **principle of conservation of energy** says that energy cannot be created or destroyed. It can only be **transferred** from one store to another.



- **chemical** – fuels, food, batteries
- **kinetic** – moving objects
- **gravitational potential** – objects above the ground
- **elastic potential** – objects that are stretched or squashed
- **thermal energy** – due to temperature
- **magnetic** – magnets
- **electrostatic** – due to electric charges repelling or attracting
- **nuclear** – when nuclei inside atoms join or separate

P8 Energy Stores and Systems – Work Done

work done = energy transferred

This means the units for work are the same as the units for energy – **joules**. For example, if a person does 500 J of work, then 500 J of energy is transferred.

Work done can be calculated using the following equation:

$$E = F \times d$$

E is the work done (in Joules)

F is the force applied (in Newtons)

d is the distance travelled (in metres)



When the rocket's engines are fired, chemical energy in the fuel is **transferred** to kinetic energy in the rocket. This transfer of energy is called **work**.

P8 Energy Stores and Systems – Gravitational Potential Energy

Gravitational potential energy (GPE) is the energy an object has due to being raised above the ground.

The greater the height on an object above the ground, the greater the GPE it will have. The stronger the gravitational field strength, again the greater the GPE. On Earth, the gravitational field strength is **9.8 N/kg**.

$$\text{GPE} = m \times g \times h$$

Gravitational potential energy, GPE in joules (J)

Mass, m in kilograms (kg)

Gravitational field strength, g in newtons per kilogram (N/kg)

Height above the ground, h in metres (m)

P8 Energy Stores and Systems – Kinetic Energy

Any object that is moving has **kinetic energy**. The greater the mass or velocity of the object, the greater the amount of kinetic energy. It can be calculated using the following equation:

$$KE = \frac{1}{2} \times m \times v^2$$

Where KE is the kinetic energy in joules (J)

m is the mass in kilograms (kg)

v is the velocity in metres per second (m/s)

P8 Energy Stores and Systems – Power

Power is defined as **the rate at which energy is transferred**. Energy has units of joules. Power can be calculated using the formula:

$$P = E \div t$$

Where:

- P = power in watts (W)
- E = energy in joules (J)
- t = time in seconds (s)

P8 Energy Stores and Systems – Efficiency

The more energy something wastes, the less **efficient** it is. Energy is **wasted** by raising the **thermal energy store** of the surroundings.

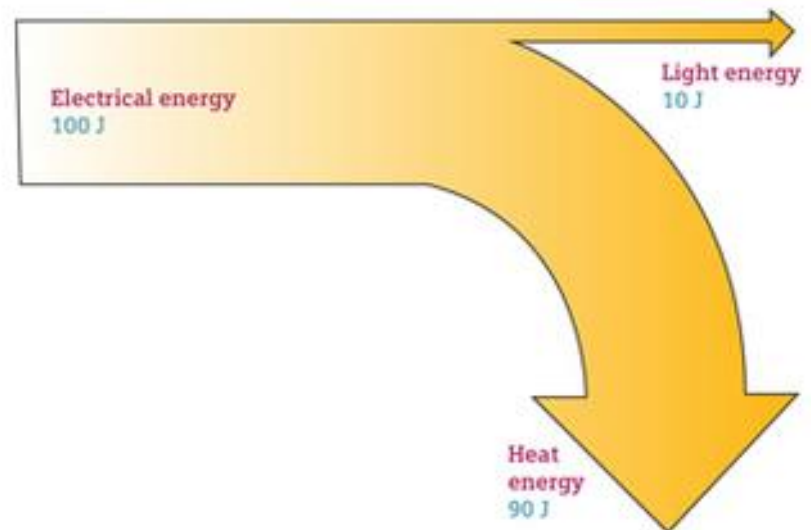
Efficiency is a measure of how good a device is at changing energy (or power) from one form to another. Efficiency can be calculated using the formula:

$$\text{Efficiency} = \frac{\text{Useful energy out}}{\text{Total energy in}}$$

$$\text{Efficiency} = \frac{\text{Useful power out}}{\text{Total power in}}$$

To then turn this into a percentage; you can multiply either equation by 100:

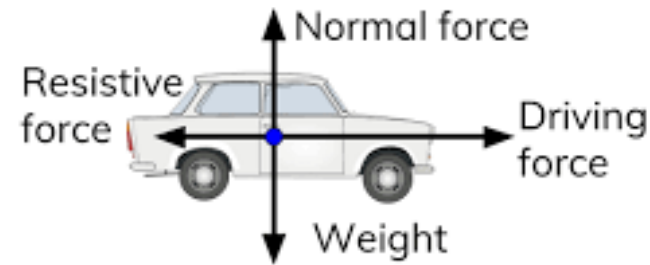
$$\text{Efficiency} = \frac{\text{Useful energy out}}{\text{Total energy in}} \times 100\%$$



P9 Forces and their effects.

The forces acting on any object can be shown using a **Free body diagram**. A force diagram uses labelled arrows to show all the forces acting on the object.

- The **direction** of each arrow shows the **direction** of each force.
- The **length** of each arrow is proportional to the **size** of the force.



The motion of the object will depend on the **resultant force**. This is calculated by adding all the forces together, taking their direction into account. When more than one force acts on an object, the forces combine to form a **resultant force**.

To draw resultant force you need to add one force onto the end of the other and draw a line from the start to the finish.

Empirical formulae

The smallest ratio of atoms in a compound

Experiment to determine empirical formulae

- A. We heat some magnesium to produce magnesium oxide.
- B. We work out the mass of oxygen that reacted
- C. We use the masses of magnesium and oxygen to work out the empirical formula of magnesium oxide

To find the **empirical formula from the molecular formula**, we divide by the highest common factor.

E.g. 1

Ethane $C_2H_6 \rightarrow CH_3$

E.g. 2:Hydrogen Peroxide

A substance has empirical formula of CH_2 and a relative formula mass (M_r) of 42. What is the **molecular formula**?

Work out the empirical mass

Divide the M_r by the empirical mass

Multiply each atom in the empirical formula by this number

Write the molecular formula

$H_2O_2 \rightarrow HO$

$C H_2$

$$12 + (1 \times 2) = 14$$

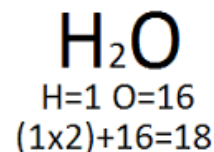
$$\frac{42}{14} = 3$$

$CH_2 \times 3 =$

$C_{(1 \times 3)}H_{(2 \times 3)}$

Relative Masses (M_r)

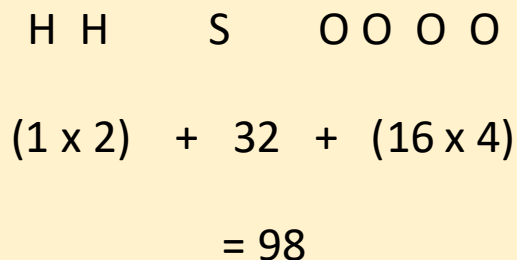
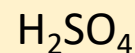
- To find M_r add the relative atomic mass (A_r) of the elements making up a compound
- E.g.



Reacting masses calculation		
Calculate the mass of magnesium oxide that can be made by completely burning 6.0 g of magnesium in oxygen.		
Step 1: Write the balanced equation and add a ✓ and a ?	$2 \text{ Mg} + \text{O}_2 \rightarrow 2 \text{ MgO}$ $\checkmark \qquad \qquad \qquad ?$	
Step 2: Write the M_r and units	$24 \text{ g} \qquad \qquad \qquad 40 \text{ g}$	
Step 3: Multiply by coefficients to get mass ratio	$2 \times 24 = 48 \text{ g} \qquad \qquad \qquad 2 \times 40 = 80 \text{ g}$	
Step 4: Find the mass of ? for 1 g of ✓	$48 \div 48 = 1 \text{ g} \qquad \qquad \qquad 80 \div 48 = 1.66 \text{ g}$	
Step 5: Scale up for the mass given in the question	$6 \text{ g} \qquad \qquad \qquad 6 \times 1.66 = 10 \text{ g}$	

Calculate the **percentage by mass** of every element in H_2SO_4 .

Step 1: calculate total Mr



Step 2: calculate Mr of one of the elements

Hydrogen:

there are two hydrogens, each with a mass of 1 so
total of $1 + 1 = 2$.

Step 3: divide M_r of the elements by total M_r and multiply by 100

$$\frac{2}{98} \times 100 = 2\%$$

Step 4: Repeat for other elements if required

Sulfur:

$$\frac{32}{98} \times 100 = 33\%$$

A_r	Relative atomic mass	Sum of the number of protons and neutrons in an atom
M_r	Relative molecular mass	Sum of the relative atomic masses of atoms in a molecule
Relative formula mass		Sum of the relative atomic masses of atoms in a formula
Empirical mass		Sum of the relative atomic masses of atoms in an empirical formula
Limiting reagent		The reactant that is used up first in a reaction
Excess reagent		The reactant that is not completely used up in a reaction
Conservation of mass		In a closed system, the total mass of the substances doesn't change in a chemical reaction
Why might mass decrease?		A gas is released into the atmosphere during a reaction
Why might mass increase?		A gas is taken in from the atmosphere during the reaction

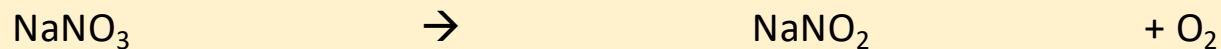
Moles

A mole	A number of particles. = 6.02×10^{23} particles
Mass of one mole	= the A_r or M_r of that substance in grams
Avogadro's number	= 6.02×10^{23}

Using masses to balance an equation

Sodium nitrate, NaNO_3 , decomposes to give sodium nitrite, NaNO_2 , and oxygen gas. When 8.5g of sodium nitrate is used, 6.9g of sodium nitrite and 1.6g of oxygen is produced. **Construct and balance an equation for this reaction.**

Step 1: write the equation



Step 2: work out the Mr

85

69

32

Step 3: work out the moles

$$8.5/85 = 0.1$$

$$6.9/69 = 0.1$$

$$32/1.6 = 0.05$$

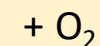
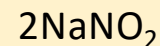
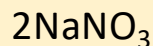
Step 4: divide by smallest number and turn to whole number ratio

$$0.1/0.05 = 2$$

$$0.1/0.05 = 2$$

$$0.05/0.05 = 1$$

Step 5: balance



Step 6: check

Correctly balanced

Antibiotics

Antibiotics kill bacteria by stopping processes in their cells, they don't affect host organisms or viruses

Non-communicable diseases

- Cannot pass between people
- Risk is affected by genes, age, gender, environment and lifestyle

Communicable	Non-communicable
rapid variation in number of cases over time	number of cases changes only gradually
cases are often localised	cases may be more widely spread
e.g. malaria, typhoid, cholera	e.g. cancer, diabetes, heart disease

Drug Testing

Preclinical testing

1. On human cells and tissues
2. On live animals (to test if it works and find out how toxic/harmful it is)

Clinical testing

3. On healthy volunteers (side-effects)
4. On people suffering from the disease (to see if it works)

2 groups used, 1 given a placebo, both blind so patient (and sometimes doctor) doesn't know if they have the medicine or placebo

Diet and Disease

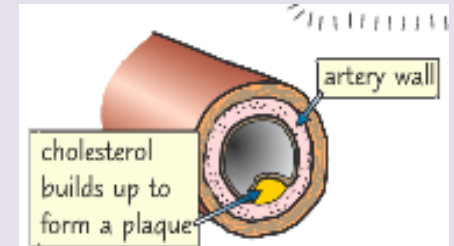
- A diet with too many or too few nutrients can lead to malnutrition e.g. obesity
- Obesity is caused by a diet high in fats and sugars

Alcohol and Disease

- Alcohol is a major risk factor for liver disease. The worst form of liver disease is cirrhosis (scarring of the liver)
- Alcohol is broken down by enzymes in the liver and produces toxic products
- This damage can be permanent

Smoking and Disease

- Smoking is a major risk factor for cardiovascular disease
- Harmful substances from tobacco smoke can damage arteries and lead to build up of fatty deposits and the development of blood clots
- These reduce blood flow and increase risk of heart attack or stroke



Measures of Obesity

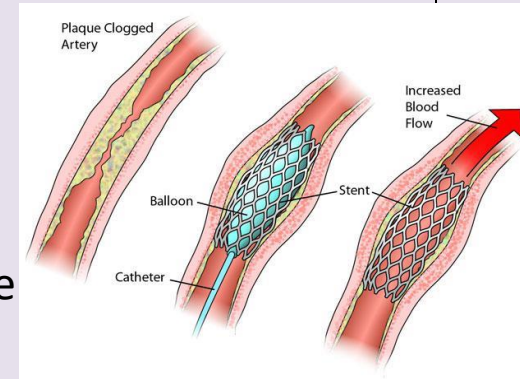
- **BMI** values are compared to tables to give a classification e.g. underweight, normal, overweight, obese
- **Waist:hip ratio.** A higher ratio = more weight around the middle, and a greater risk of health problems (should be <1)

$$\text{BMI} = \frac{\text{weight (kg)}}{(\text{height (m)})^2}$$

$$\text{waist-to-hip ratio} = \frac{\text{waist circumference}}{\text{hip circumference}}$$

Treatment of cardiovascular disease

- **Lifestyle changes** e.g. weight loss and exercise
- **Medicines** e.g. statins to reduce cholesterol, anticoagulants to reduce blood clots and antihypertensives to reduce blood pressure
- **Surgery** e.g. **stents** to keep arteries open or **heart bypass surgery**



Physics 1. Motion and Forces

$$\text{Force} = \text{mass} \times \text{acceleration}$$

$$F = m \times a$$

Vector

Scalar

A property with magnitude (size) & direction.

A property with magnitude (size) only.

Velocity

Speed

Displacement

Distance

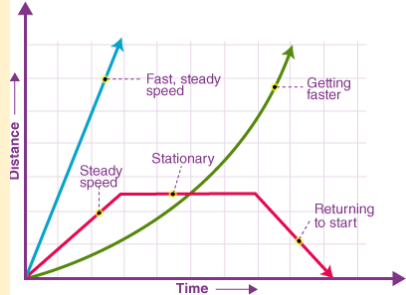
Weight

Mass

Acceleration

Force

DISTANCE - TIME GRAPH

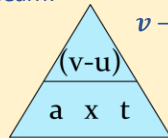


Average speed is calculated using this equation:

$$\text{Speed (m/s)} = \frac{\text{total distance (m)}}{\text{total time (s)}}$$



Acceleration: units: m/s^2 . Speeding up or slowing down. Two equations to learn:



$$v - u = a \times t$$

$a = \text{acceleration}$
 $v = \text{final velocity}$
 $u = \text{initial velocity}$
 $t = \text{time taken}$

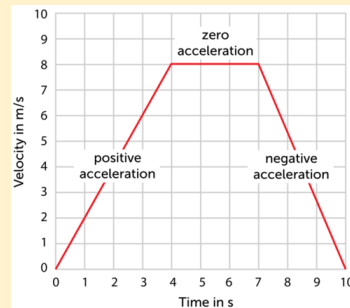
And:

$$v^2 - u^2 = 2 \times a \times s$$

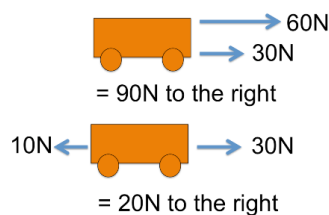
Where $s = \text{distance}$.

Slowing down is negative acceleration, **not** deceleration.

Velocity-time graph: Area under the line = distance travelled.



Resultant forces: Forces acting on an object can be added together to give the resultant force. Remember some forces are **negative** because force is a **vector**. Horizontal and vertical forces must be treated separately.

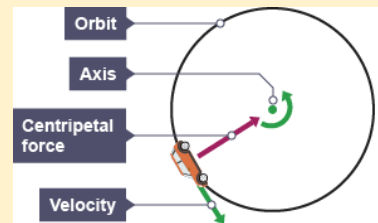


Newton's First Law: An moving object will continue to move at the same velocity (speed and direction) until acted on by a resultant force.

Or:

A stationary object will remain at rest until acted on by a resultant force.

H - Circular motion: An object moving in a circle is constantly changing direction. Change in direction means change in velocity, and therefore the object is accelerating (positive or negative) even if its speed does not change. This means a force is required to keep the object moving in a circle. This force is called the **centripetal force**.



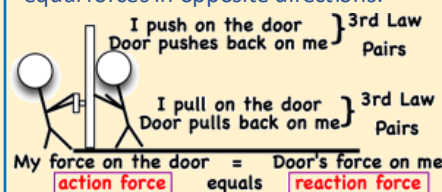
Newton's Second Law:

Force = mass x acceleration

$$F = m \times a$$



Newton's Third Law: Two objects interacting with one another experience equal forces in opposite directions.



Mass

Weight

How much matter there is.

The force of gravity acting on the mass.

Same regardless of location.

Changes depending on location (e.g., different planets).

Measured in kilograms (kg).

Measured in Newtons (N).

Scalar (size only).

Vector (size and direction).

Weight = mass x gravitational field strength

$$W = m \times g$$

On Earth, $g = 10 \text{ N/kg}$.

H - Momentum: A measure of how hard it is to stop an object moving. Vector. Units: kg.m/s .

Momentum = mass x velocity

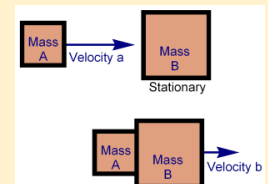
$$p = m \times v$$

To change the momentum of an object, a resultant force is needed:

$$\text{Force} = \frac{\text{Change in momentum}}{\text{time}}$$

$$F = \frac{mv - mu}{t}$$

Collision between two objects: The total momentum is conserved before and after the collision.



Abstract: Artwork in which the subject matter is simplified; little or no attempt is made to represent images realistically and objects are often distorted.



Collage: An artistic composition made of various materials (e.g. paper, cloth, or wood) glued on a surface.



Mixed media: An artwork in which more than one type of art material is used to create the finished piece.



Organic: Refers to shapes or forms having irregular edges or to surfaces or objects resembling things existing in nature.

Still life: Arrangement or artwork showing a collection of inanimate objects.



Style: A set of characteristics of the art of a culture, a period, or school of art. It is the characteristic expression of an individual artists. i.e. Pop art

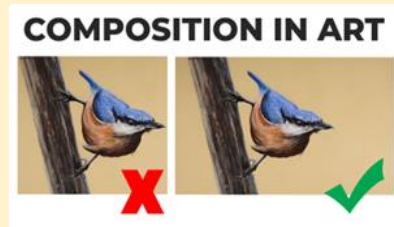
Stylized: Simplified or exaggerated in a certain way unique.



Balance: The way in which the elements in artwork are arranged to create a feeling of evenness in an artwork. The three types of balance are symmetry, asymmetry, and radial.



Composition: The organization of elements in a work of art.



Focal point: The place in a work of art at which attention becomes focused because of an element emphasized in some way.



Negative space:

Shapes or spaces that are or represent the areas unoccupied by objects.



Colour relationships: Also called colour schemes or harmonies. They to the relationships of colours on the colour wheel. Basic colour schemes include monochromatic, analogous and complementary.



Key Term	Definition
Enterprise	The act of doing business - investing and working in order to increase the value of raw materials or our actions.
Social objectives	Business objectives linked to providing positive outcomes for the community or environment.
Financial objectives	Financial aims for your business (e.g. increasing profit by increasing sales or cutting costs, increasing your market share, business survival).
Consumer	The person who <u>uses</u> goods or services.
Customer	A person or business who <u>purchases</u> a good or service.
Goods	Items that are (usually but not always) tangible, and that can be bought or sold (e.g. books, pens etc.)
Services	Activities provided by other people (e.g. architects, plumbers, car insurance etc.)
Sales revenue	The money generated through sales.
Income stream	Income generated for a business through different forms of sales.
Fixed costs	Costs to your business that do not change, no matter how much or little you sell (e.g. rent, wages).
Variable costs	Costs that will change depending on the amount you sell (e.g. pizza ingredients, takeaway boxes).
Break-even point (BEP)	The level of output at which a firm's total revenue equals its total costs. (The point when you're not making profit or losing money).
Adding value	Improving a product, so that customers are willing to pay more for it compared to a competitor's product.

The role of an entrepreneur: (TOM)

- Take risks
- Organise resources
- Make business decisions

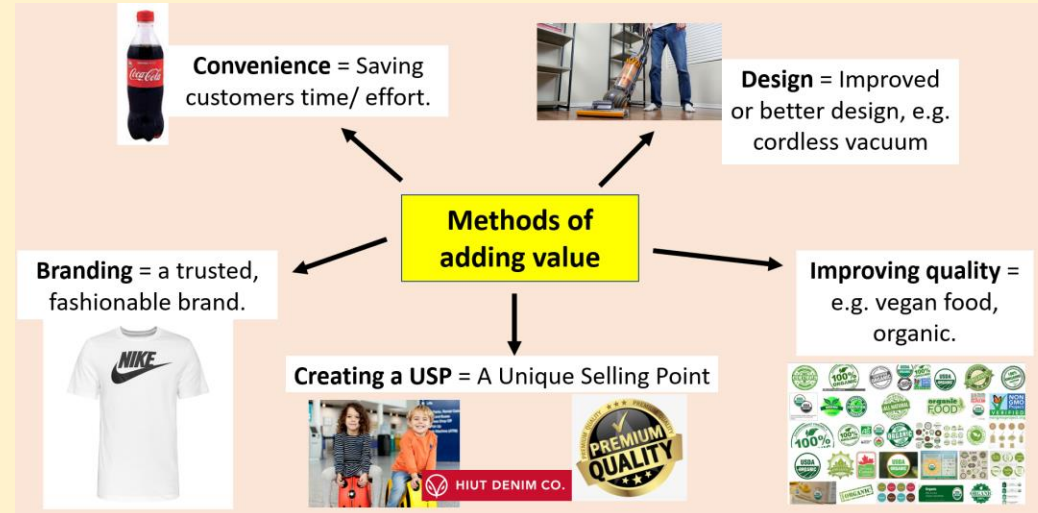
How and why do new businesses come about?



$$\text{Profit} = \text{sales revenue} - \text{total costs}$$

Price x units sold

Fixed costs + variable costs



Risks	Rewards
• Business failure • Financial loss • Lack of security	• Profit • Business success • Independence

NEEDS:	Water, clothing, food, warmth, shelter.
WANTS:	Event tickets, designer accessories, holidays.

Market:

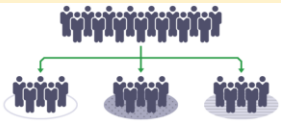
1. A place where goods are traded between customers and suppliers, e.g. a village market, an online shopping website.
2. Trade in a particular type of product, e.g. the oil market.
3. The potential customers for a product, e.g. the 18-25 market.

Market Segmentation

Segmentation is when people in a market are divided into different groups.

Knowing the needs of these segments means that you can identify a **target market** and create a **marketing strategy** specifically for them.

- Age
- Income
- Location
- Lifestyle
- Demographics.

**Quantitative data**

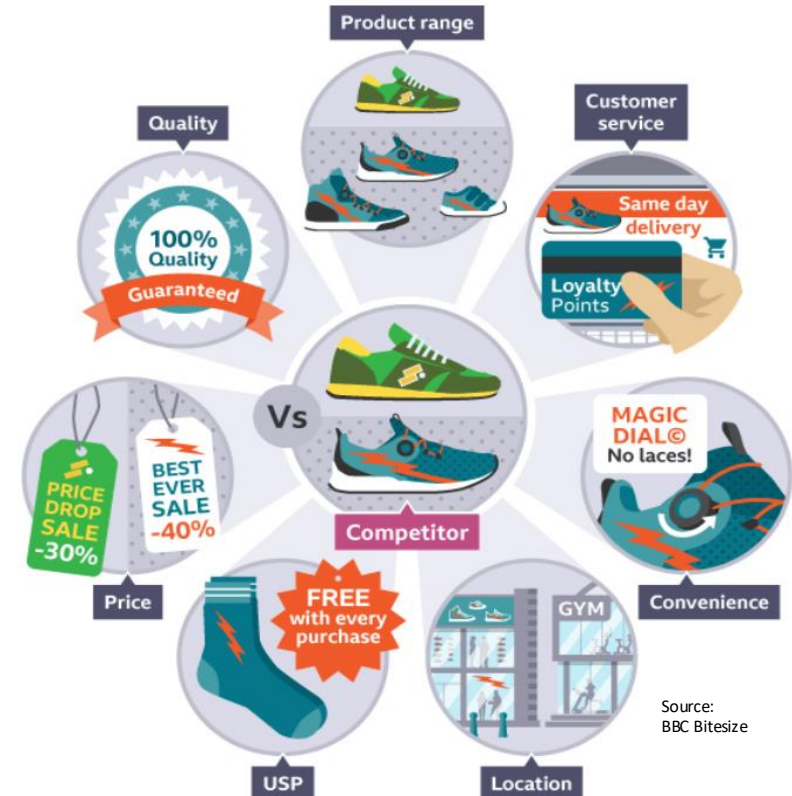
Information you can measure/count (numerical data that can be expressed in a chart/graph).

Closed questions – “how many pints of milk do you buy in a week?”

Qualitative data

Information about opinions/feelings (that cannot be expressed in a chart/graph).

Open questions – “what do you think about oat milk?”

Understanding the Competition

Source:
BBC Bitesize

MARKET RESEARCH: In order to be successful, business need to know about:

Market size

(potential buyers/
sellers)

Market share

(the proportion of total sales that is
controlled by the business)

Customer wants & needs

(to identify customers'
needs and how to satisfy them)

Primary Market Research

- Surveys (online/ paper/ telephone)
- Focus groups
- Observations
- Experiments
- Social media

PROS:

- ✓ Up-to-date information
- ✓ Relevant
- ✓ Business/product specific
- ✓ Direct customer contact

CONS:

- ✗ Expensive
- ✗ Time consuming
- ✗ Difficult to collect

Secondary Market Research

- Internet sites
- Newspapers
- Market reports
- Government reports
- Sales data

PROS:

- ✓ Cheaper/free
- ✓ Quick and easy
- ✓ Easy to analyse

CONS:

- ✗ May be biased/inaccurate
- ✗ Not specific
- ✗ Often out-of-date

Advantages of using social media for market research:



- ✓ Cheaper than other forms of research/often free
- ✓ Saves time (some online questionnaires put results in a graph for you)
- ✓ Allows businesses to spot latest trends
- ✓ Businesses can monitor behaviour of their competition
- ✓ Can look at the types of people who respond (market segments)
- ✓ Quickly post about new features/products and see interest (likes etc.)
- ✓ Clear positive responses (likes, polls etc.)

Reliable market research helps businesses to...

- ✓ Make informed decisions
- ✓ Spot a gap in the market
- ✓ Reduce risks
- ✓ Increase chances of business success

Unreliable market research could lead to...

- ✗ Unwise business decisions
- ✗ Bringing out products that don't sell
- ✗ Unnecessary costs for the business
- ✗ Business failure

Crime and punishment Knowledge Organiser. 1 Medieval period, c.1000-c.1500

	Crimes	Policing	Trials	Punishment	Key considerations
Saxons	Crimes against the person: - Assault / murder Crimes against property: - Theft Crimes against authority: - Treason Moral crimes – links to Church: - Drunkenness, adultery, etc.	Community-based - Hue and cry - Tithings	Community-based - Local courts for most cases - Local jury (knew accused) - King's Court for serious cases Religious influence - Oath to ensure honesty - Trial by ordeal: God decides.	Punishments: - Wergild; fines; - corporal punishment; maiming; - capital punishment; NOT prison Purpose - Compensation - Wergild - Retribution – severity of punishment matched crime - Deterrent – pain / public humiliation	Society: - Agricultural - small villages but also growth of towns - Importance of community in policing, trials & punishment. Institutions – government - Normans (1066-1200) 7,000 minority among 2million Saxons. Issues of control and deterrence. - Later Middle Ages: Norman / Saxon divisions faded. Institutions – Church / religion - Massive influence of Christian religion; deep belief in God - Influence on moral crimes: e.g. drunkenness, adultery - Development of heresy – crimes against Church beliefs - Sanctuary linked to mercy - Trials:

				(linked to community)	- oaths to 'prove' honesty of accused / witnesses / jury; - Trial by Ordeal – 'God decides' to 1215; - lenient Church Courts for clergy: Benefit of the Clergy; Neck verse
Normans	As above, plus: - Most Saxon laws retained - Murdrum law - control - Forest Laws: protect hunting. seen as unfair 'social crime' - Concept of the 'King's Peace' – crimes were against king.		As above, plus: Trail by Ordeal now included trial by combat.	As above, except: - Wergild abolished; fines to king - breach of 'King's Peace' - Increase in crimes punishable by death or mutilation - Retribution and deterrent main purposes	Mercy in punishment
Later	As above, except: Murdrum fine	Developments: New roles, e.g. Parish	Developments: 1194, Coroners	As above, plus: 1305, introduction	Individuals - William the Conqueror – Norman laws, harshness, personal love of hunting. Attitudes - Importance of religion 'Social crime' under Normans, e.g. Forest Laws. Science and technology - Domination by religion

r M e d i e v a l	abolished c.1350 • Forest Laws abolished 1217 • Heresy Laws from 1382 • Increased focus on treason	Constable, 1285; Parish Watch • 1400s, end of tithings	created • 1215 end of Trial by Ordeal • Assize / Circuit courts, 1190 • 1361, Justices of the Peace	of 'hung, drawn and quartered' punishment for treason.	
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Crime and punishment Knowledge Organiser. 2 Early Modern period, c.1500-c.1700.

Crimes	Policing and trials	Punishment	Key considerations
As before, and, in addition: Heresy and treason (often interlinked): • Heresy: even more important in the context of the Reformation; heresy particularly linked to Catholic Church. • Treason: threat to the state from religious and other opponents e.g. Elizabeth and James against Catholic plotters (e.g. 1605 Gunpowder Plot). Gunpowder Plot, 1605 • Catholic plot aimed to wipe out King James I and ruling class; linked to depth of Catholic / Protestant religious division; plotters	Generally as before: • Still community-based, e.g. hue and cry; Town Constables and Town Watch. • Decline in effectiveness in larger towns • Professional 'thief-takers'	Generally as before: • Fines • Corporal punishment - stocks, pillory, whipping, maiming. • Bridewell / House of Correction – including hard labour – for vagabonds. • Transportation – 50-80,000, initially to America. Linked to concepts of deterrence,	Society: • Still mainly agricultural with tight local communities. • Growth of towns continued. • Growing division between rich and poor. • Religious change, division and instability of Reformation had an effect over whole period. • Political instability and division due to the Civil Wars (1642-1651/60) had impact. Institutions – government • Led the implementation of religious change under Henry VIII, Edward VI, Elizabeth, and James I. Strongly opposed by Queen Mary. • Close links between the

included Robert Catesby and Guido Fawkes; plot discovered by Robert Cecil; plotters tortured (rack), tried and found guilty; hideous public execution – hung, drawn and quartered; great publicity – public execution, published drawings, official rejoicing (Act of Thanksgiving) and laws against Catholics (Popish Recusants Act, 1606). • The severity of punishment, publicity, thanksgiving, and repression of Catholics reflected danger of the plot. Witchcraft • Roughly 1,000 executed (usually hanged) 1542-1736. • Rise in witchcraft linked to religious, social, and political developments. Religious – massive change -	(Jonathan Wild).	retribution, removal and, to an extent, reform / rehabilitation - chance to create new life. Also helps England to populate and secure colonies. • Capital punishment – hanging. • NOT prison. Treason punishment: Gunpowder Plot • Plotters tortured using the rack. • Hideous public execution – hung, drawn, and quartered. • Great publicity –	government and the established Church of England. Gunpowder Plot an attack on both. • Use of treason laws to deal with opponents. • Low income and low involvement (e.g. absence of prisons, policing, etc.). Institutions – Church / religion • Change and instability in Reformation - causing Catholic / Protestant division - had effect over whole period. • Use of heresy laws (mainly to c.1558) to deal with religious opponents. • Links to attitudes to vagrants. • Links to attitudes to Witchcraft. • Gunpowder Plot links religion to attack on government.
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Reformation: Protestant belief that Devil active in people's lives (including 'familiar'); James I's <i>Demonologie</i>, 1597. Social – growing rich / poor divide; growing hostility to women: from 'wise women' to witches. Political – disorder of Civil War period (esp.1640s) – the 'world turned upside-down'. • Individuals – James I; Matthew Hopkins in East Anglia, 1645-1647. 300 mainly women accused and 112 executed by hanging. • Key Acts: 1542 Witchcraft Act; 1563 Act against Conjurations; 1604 Witchcraft Act • Decline in accusations of witchcraft after 1660s linked to rise in scientific ideas		including public execution, published drawings, etc. • The severity of punishment reflected extreme aims and danger of plot. Developments: • Beginning of the Bloody Code (see post), c.1688. Purpose of punishment: • Retribution – severity of punishment matched crime (treason – hanged, drawn and quartered; repeat offences	Individuals • Monarchs. • Gunpowder Plotters. • Matthew Hopkins. • Royal Society. Attitudes • Still dominated by harsh concepts such as retribution and deterrent and humiliating public punishment. • Domination of religious division and religious ideas: ○ Catholic / Protestant hostility and suspicion. ○ Belief in active involvement of Devil in society. • Decreasing respect for women (witchcraft). • Increasing social tension caused by growth in gap between rich and poor. ○ Hostility of vagabonds.
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Vagabondage: linked to social and religious developments.

Social problems – rising population, unemployment, field enclosure, homeless in search of work, belief in links to crime, role of press / pamphlets

Religion – Protestant belief in work / hostility to laziness – ‘the Devil makes work for idle hands’.

1495 Vagabonds and Beggars Act; 1547 Vagrancy Act; 1597 Act for Relief of the Poor; 1602 Poor Law Act

Others:

- Rise of smuggling / poaching, 1671 Game Act
- Puritan moral laws, 1650s. During period of Puritan political control (1649-60) when England a Republic.

maiming, etc.).

- Deterrent – painful / humiliating public punishment (linked to cost and lack of policing).
- Removal – return to parish, Houses of Correction, transportation.
- Reform / rehabilitation – to an extent in Houses of Correction and transportation.

- Links to witchcraft (poor women).
- Development of Bloody Code after c.1688.
- Concepts of ‘social crimes’ remain, e.g. smuggling / poaching.

Science and technology

- Increasing influence of science (e.g. Royal Society, 1662) challenges superstition (e.g. witchcraft).

Crime and punishment Knowledge Organiser : 3. Industrial period, c.1700 – c.1900. Part 1: extended 18th century, c.1700 to c.1820.

Crimes	Policing	Punishment	Key considerations
Generally, as before: - Treason – still most serious crime. - Witchcraft: no longer crime; end of wide belief in witches / supernatural due to growth of influence of science (e.g. 1662 Royal Society) and Enlightenment ideas; 1716 – last execution; 1735 Witchcraft Act. - Vagabondage:	Initially as before: - Community-based, unpaid. - Villages – hue and cry. - Town Constables and Town Watch. Some towns paid these people but many unpaid and ineffective. Developments	Initially as before: - Fines; corporal punishment - stocks, pillory, whipping, maiming; capital punishment – hanging (see Bloody Code, below); Transportation to America until c.1776, 1787 Australia; Houses of Correction, etc. - NOT prison, initially. Developments: Bloody Code, c.1688-1820s: - Large rise in number of capital crimes (from 50 in 1688 to 225 by 1810). Linked to increased social divisions and desire of ruling class to secure life & property. - Concept strongly linked to deterrence: harshest	Society: - Initially mainly agricultural. Increasingly urban as Industrial Revolution began to have an impact. - England generally politically and religiously stable but division between rich landowning elite and poor. - Ruling class fear of threat of crime: strong efforts to protect their lives and property, e.g. Bloody Code. - After 1789 increasing

continues to be considered a crime. Smuggling: • Generally, luxury goods, e.g. tea, wine, spirits, silk which government import duties made expensive. Import duties main source of government income. • Thousands of smugglers and some violent organised gangs (Hawkhurst Gang). • Seen as 'social crime' with cross-class	: • Continued decline in effectiveness of community-based methods due to growth of towns and cities. • Bow Street Runners, 1748 – early 1800s. Henry and John Fielding's small London-based Bow Street police	punishment / public execution (e.g. Tyburn, London). • Not very effective as victims, witnesses, juries reluctant to support prosecutions; majority of sentences commuted (changed) to other punishment (esp. transportation and prison) - by 1820 only 5% executed; additionally public executions linked to further crime and disorder. • End of Bloody Code – see below. Transportation to America, c.1620-1776: • See reasons for transportation, above. • Old punishment but increasingly an alternative to death. • After American Independence, 1776, new location needed. Transportation to Australia, 1787-1868:	political fears due to threat of repeat of the French Revolution (1789 -) in England. • After end of French / Napoleonic Wars (1792-1815) economic depression and fears of political revolution intensify into early 1820s. Institutions – government • Government generally low income (mainly customs duties) and ineffective: main focus – fighting wars. • Government explicitly linked to landowning ruling classes: only c.7% of men have the vote. • Government / parliament passed laws
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participation. • Hard for government to combat due to ineffective customs force, long coastline, support / alibis for smugglers. • Decreased after William Pitt (1780s) and Robert Peel, etc. reduced import duties. Poaching: • Long-term laws against poaching (e.g. Forest Laws, 1671 Game Act): hunting game restricted to larger landowners.	force. Sought to deter by increased likelihood of detection. Collected and shared evidence. After 1785 Runners paid by government . Similar methods used by other forces in the London / Middlesex area. • Attitudes towards a	• Transportation old punishment but increasingly used as alternative to death. 160,000 transported (1/6 women). • Initially a strong deterrent due to separation from homeland, use of hulks, long / dangerous voyage and hard / primitive conditions in Australia. • Purpose: more humane alternative to death; removal of criminals; population of new colonies; elements of rehabilitation through new chance. Sentences usually 7/14 years: convicts earned 'ticket of leave'. • Decline – see below. Prisons: • Historically prison used pre-trial / pre- execution, for debtors and vagabonds (Houses of Correction). • Rise in use in C.18th as less harsh	to protect their property, e.g. Bloody Code generally, poaching. • Government low involvement (e.g. absence of prisons, policing, etc.). Government involvement much greater from 1820s onwards, see below. Institutions – Church / religion • Decline in importance though Church still influential. • Strong Christian motivation of reformers such as Howard and Fry. Individuals • Prisons – John Howard and Elizabeth Fry – but
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• Seen as 'social crime' so poachers often protected by public. • Many poachers did so to survive / supplement meagre diet. Some gangs. • Black Act, 1723 made poaching capital crime. Repealed 1823. Highway robbery: • Rise in late 17th/C18th: most common in this period: linked to increased wealth and solitary travel, ineffective banking, availability of	professional police force: many people saw police as expensive + dangerous intrusion in people's freedoms. • 1829, Creation of Metropolitan Police, see below.	alternative to death in era of Bloody Code. • Early conditions: crowded mixed cells – violence / abuse and 'schools for crime'; corrupt gaolers; disease 'gaol fever'; rich paid for better food / conditions. • Developments to 1820s: John Howard's 1770s investigations and writings (<i>State of Prisons, 1777</i>) regarding conditions, corruption; emphasis on rehabilitation. Elizabeth Fry: Quaker; work with women and children prisoners; emphasis on Christian teaching, humane treatment and conditions, useful work, etc. Both Howard and Fry believed that prisoners were reformable. • Impact of reformers and developments after c.1820 see	real influence felt after c.1820 (e.g. Gaols Act, 1823). • Policing – John / Henry Fielding and Bow Street Runners, but small-scale. Attitudes • Class divisions strong. Ruling classes passed laws to protect their property. Mass of population saw many laws as 'social crimes' and ignored them. • Still dominated by harsh concepts such as retribution and deterrent and humiliating public punishment. • Some evidence of tenderness, e.g. under Bloody Code victims,
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horses and guns, poverty; demobilised soldiers. - Image: dashing gentlemen who robbed rich (e.g. Dick Turpin); but poor main victims. - Fall in early C19th: stagecoaches often with armed guards; increase in travel; growth of towns; controls on inns; mounted patrols around London; effective banking.		below. Purpose of punishment: - Retribution: severity of punishment partly matched crime. Although 225 capital crimes under Bloody Code, most sentences were commuted unless major crime. - Deterrent: harsh / painful / humiliating public punishment but Bloody Code arguably ineffective. Transportation / early prison conditions very unpleasant. - Removal: transportation; increasing use of prisons - Reform / rehabilitation: to an extent in transportation and, to an increasing extent in prisons through influence of Howard and Fry.	witnesses, juries, etc. would not push case and death sentences increasingly commuted to prison / transportation, etc. - Evidence of reform / rehabilitation ideas through Christian-influenced reformers, e.g. Howard and Fry. - Low involvement by government or public: Prisons uncontrolled and conditions terrible. Few effective police forces except around London (Bow Street Runners). Science and technology - Some evidence of influence of science and technology, e.g. in transport, banking, trade, etc.
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1.1F ¿Qué tipo de persona eres?

alegre	cheerful
el/la amigo/a	friend
animal	animal
artístico	artistic
bueno	good
el/la chico/a	boy/girl
las ciencias	science
cinco	five
la clase	class
cuando	when
deportivo/a	(of) sports
difícil	difficult
divertido/a	fun
especialmente	especially
estar	to be
el/la estudiante	student
fácil	easy
feliz	happy
fuerte	strong
general	general
gracioso	funny
el grupo	group
gustar	to please
hoy	today
independiente	independent
el instituto	secondary school
listo/a	clever, smart
muy	very
nervioso/a	nervous
otro/a	other, another
pensar	to think
perezoso/a	lazy
pero	but

10.1 Identity and relationship with others SPANISH



la persona	person
la personalidad	personality
poco/a	a bit, a little
porque	because
práctico/a	practical
responsable	responsible
ser	to be
serio	serious
simpático/a	nice, friendly
la situación	situation
trabajador(a)	hard-working
tranquilo/a	quiet

gris	grey
guapo/a	good-looking
hacer	to do/make
el/la hermanastro/a	step/half-brother/sister
el hombre	man
interesante	interesting
la isla	island
largo	long
llamarse	to be called
la madrastra	step-mother
la mañana	morning
marrón	brown
moreno/a	brown, dark
la mujer	woman/wife

1.1H Personalidad y aspecto físico	
al/la abuelo/a	grandmother/father
la actitud	attitude
el/la actor/actriz	actor/actress
agradable	pleasant
alto	tall
ambicioso/a	ambitious
animado/a	lively
el aspecto	aspect
azul	blue
bajo/a	short (height)
bonito/a	nice, pretty
buscar	to look for
capaz	capable
la cara	face
el carácter	character, personality
cómo	how
la confianza	trust
contento/a	happy
corto	short
de momento	at the moment
deber	must / to owe
delgado/a	slim, skinny
la diferencia	difference
distinto	different
dónde	where
enojado	angry
este/esta	this
físico/a	physical
las gafas	glasses

negro/a	black
niño/a	child, little boy/girl
nuevo/a	new
el ojo	eye
optimista/a	optimistic
orgulloso/a	proud
el padrastro	stepfather
el papel	paper / role
parecer	to appear
el pelo	hair
pequeño/a	small
el/la perro/a	dog
el personaje	character (in book/film, etc.)
popular	popular
positivo/a	positive
principal	main
el programa	programme
rubio/a	blond
Sudamérica	South America
el tatuaje	tattoo
tener	to have
triste	sad
verde	green

1.2F Los amigos

a veces	sometimes
algo	something
allí	there
el año	year
bien	well
casarse	to get married
el/la compañero/a	colleague, peer
común	common
el contacto	contact
creer	to think, to believe
la definición	definition
el día	day
diferente	different
divorciarse	to get divorced
escuchar	to listen
el estadio	stadium
fatal	awful
la frecuencia	frequency
genial	great
guardar	to keep
hablar	to talk, to speak
hoy	today
la idea	idea
levantarse	to get up
llevarse bien/mal con	to get on well/badly with
mejor	better / best
la opinión	opinion
paciente	patient
parecerse a	to look like
pasar	to pass / to spend (time) / to happen
pelearse	to fight
ponerse	to put on / to become / to position oneself
preocuparse	to worry

10.1 Identity and relationship with others

SPANISH



el problema	problem
próximo/a	next
qué	what
raramente	rarely
raro/a	rare, strange
la relación	relationship
el sábado	Saturday
el secreto	secret
siempre	always
tarde	late / afternoon, evening
temprano	early
el texto	text
el tiempo	time / weather

todo/	estricto/a	strict
	extendido/a	extended
	la familia	family
	la familia reconstituida	step-family
	familiar	(of the) family / relative
	el fin de semana	weekend
	grande	big
	el/la hijo/a	son/daughter
	juntos/as	together
	la madre	mother
	mandar	to send / to command
	el marido	husband
	mayor	old / older / main
	el mensaje	message

1.2H La familia moderna

activo/a	active
adoptado/a	adopted
ahora	now
ayudar	to help
biológico/a	biological
caer	to fall
la calle	street
el caramelo	sweet
el cariño	affection
la casa	house
claro	clear / of course
coger	to catch
la combinación	combination
la comida	food
compartir	to share
completo/a	complete
complicado/a	complicated
comprensivo/a	understanding
conocer	to know / to meet
cubano	Cuban
dar	to give
decidir	to decide
el deporte	sport
diverso/a	various
divorciado/a	divorced
el domingo	Sunday
el dormitorio	bedroom
dos	two
escoger	to choose

el miembro	member
mismo/a	same / _self
moderno/a	modern
monoparental	single parent
nosotros/as	we / us
nuclear	nuclear
numeroso/a	numerous, large
el padre	father
la pareja	partner / couple
pasarlo bien	to have a good time
el paseo	walk, stroll (noun)
poder	to be able to
poner	to put
el/la primo/a	cousin
proteger	to protect
el pueblo	village, town
querer	to want / to love
salir	to leave / to go out
separado/a	separated
el sexo	sex
sin	without
solo/a	alone
la tele	telly, tv
la tienda	shop
el/la tío/a	uncle/aunt
típico/a	typical
tradicional	traditional
traer	to bring
las vacaciones	holidays
ver	to see, to watch
la vez	time, occasion
visitar	to visit

Verbs and the present tense in Spanish

The infinitive

When you look up a verb in the dictionary, you find its original, unchanged form which is called the **infinitive** (comer, beber, jugar, visitar, vivir, ir etc.). The infinitive ends in **-ar, -er or -ir**.

To form the present tense in Spanish take off the last 2 letters of the infinitive (**-ar, -er or -ir**) and add the following endings depending on the pronoun:

*Important! There are some key irregulars to learn which don't follow this pattern – ir, ser, tener and hacer are really important!

	AR verb	ER verb	IR verb
yo (I)	-o	-o	-o
tu (you)	-as	-es	-es
él/ella (he/she)	-a	-e	-e
nosotros/as (we)	-amos	-emos	-imos
vosotros/as (you all)	-áis	-éis	-ís
ellos/ellas (they)	-an	-en	-en

Verbs and the near future tense in Spanish

You can talk about the future by using the **near future** tense.

Use part of the verb IR + a + the infinitive to say what you are **going** to do.

Este tarde **voy a jugar** al tenis. *This evening I am going to play tennis.*

Mañana Paul **va a hacer** un pastel. *Tomorrow Paul is going to make a cake.*

IR (to go)	
voy	I am going
vas	You are going
va	He /she/one is going
vamos	We are going
vais	You (lot) are going
Van	They are going

Ser y estar - In Spanish there are two verbs 'to be'

ser

- A noun – Madrid **es** una ciudad grande.
- A permanent characteristic – Mi mochila **es** roja.
- Something that won't change quickly – Mi hermana **es** pequeña.
- Nationality or origin – **Soy** irlandés.
- Time – **Son** las dos.

estar

- Location – Madrid **está** en el centro de España.
- Feelings – **Estoy** bien hoy.
- Temporary condition which could quickly change – Mi amigo **está** contento de momento.

2.1F ¿Estás en forma?	
a pie	on foot
la actividad	activity
el agua (fem.)	water
andar	to walk
el baile	dance
el beneficio	benefit
la bicicleta	bicycle
el bocadillo	sandwich
el caballo	horse
la carne	meat
caro/a	expensive
cerrar	to close
el club	club
comer	to eat
cantar	to sing
la copa	cup / wineglass / trophy
correr	to run
contar	to tell / to count
cuatro	four
el desayuno	breakfast
el diente	tooth
la dieta	diet
divertirse	to have fun
dormir(se)	to sleep
el ejercicio	exercise
empezar	to start
encantar	to love (to delight)
encontrar	to find
entender	to understand
entrenarse	to train
equilibrado/a	balanced
el equipo	team
esperar	to hope / to expect / to wait



10.2 Healthy living and lifestyle

SPANISH

el estudio	study / studio
evitar	to avoid
favorito/a	favourite
frío/a	cold
la fruta	fruit
fumar	to smoke
ganar	to win / to earn
el gimnasio	gym
la grasa	grease / fat
la hamburguesa	hamburger
el jamón	ham
joven	young
jugar	to play
el kilómetro	kilometre
llevar	to carry / to wear / to lead
malo/a	bad
mental	mental
montar	to ride / to set up
el montón	a lot, a load
mostrar	to show
la natación	swimming
normalmente	normally
nunca	never
el parque	park
el partido	match, game
las patatas fritas	chips / crisps

el tipo	type
tonto/a	silly
trabajar	to work
venir	to come
el/la veterinario/a	vet

pedir	to order, to ask for
perder	to lose
permitir	to permit
el pescado	Fish
el pollo	chicken
el precio	price
preferir	to prefer
probar	to try, to try out
rápido/a	fast
la sal	salt
la salud	health
sano/a	healthy
la semana	week
el supermercado	supermarket
tener que	to have to
terrible	terrible
la variedad	variety
vegetariano/a	vegetarian
la(s) verdura(s)	vegetables
volver	to return

2.2F Tipos de dietas	
aquí	here
el azúcar	sugar
bastante	quite
consistir	to consist
durante	during
ensalada	salad
España	Spain
Europa	Europe
la falta	lack, shortage
fresco/a	fresh / cool
frito/a	fried
el futuro	future
el/la hermano/a	brother/sister
intentar	to try
lo que	what
luego	then, later
más	more / most
el/la médico/a	doctor
el medio ambiente	environment
mediterráneo	Mediterranean
menor	younger / smaller
natural	natural
ninguno/a	none, neither
la oficina	office
el peso	weight
la planta	plant / floor (of building)
preparar	to prepare
el producto	product
la proteína	protein
la región	region
la revista	magazine
sacar	to take out
seguir	to follow / to continue
servir	to serve
el sur	south

2.1H Cuidar de tu salud	
¿a quién/quienes?	whom?
abrir	to open
acostarse	to go to bed
adaptarse	to adapt
¿adónde?	where to?
el aire	air
antes (de)	before
así	like this/that
beber	to drink
la cabeza	head
cada	every, each
la calefacción	heating
el calor	heat
la cama	bed
cambiar	to change
el cambio	change
la cena	dinner
como	as, like
¿cómo?	how?
comprar	to buy
el corazón	heart
¿cuál(es)?	which?
¿cuándo?	when?
¿cuánto/a(s)?	how much/many?
cubrir	to cover
el cuerpo	body
el cuidado	care
cuidar	to look after
¿de quién(es)?	whose?

10.2 Healthy living and lifestyle

SPANISH



descansar	to rest
diario	daily
disfrutar	to enjoy
dónde?	where?
la energía	energy
la enfermedad	illness
estar en forma	to be fit
el estrés	stress
el hambre (fem.)	hunger
hasta	until
la hora	hour / time
el huevo	egg
ideal	ideal
igual	equal, time
importante	important
ir	to go
la leche	milk
leer	to read
el libro	book
la manzana	apple
menos	less / least
necesitar	to need
la noche	night
ocho	eight
olvidar	to forget
el pan	bread
la piel	skin

por eso	therefore, so
¿por qué?	why?
primero/a	first
puro/a	pure
quedarse	to stay
¿quién(es)?	who?
el rato	a while
la razón	reason
recomendar	to recommend
recordar	to remember
el régimen	diet
relajante	relaxing
respirar	to breathe
el riesgo	risk
la sed	thirst
el sol	sun
la sombra	shadow / shade
la suerte	luck
también	also
tan...como	as...as
usar	to use
vegano/a	vegan
la ventana	window
la vida	life

2.2H La vida en España	
el aceite	oil
el/la adulto/a	adult
alemán/alemana	German
alguno/a	some
andaluz(a)	Andalusian
argentino/a	Argentinian
la bebida	drink
el café	coffee / café
caliente	hot
los cereales	cereal
cerrado/a	closed
chileno/a	Chilean
chino/a	Chinese
el chocolate	chocolate
decir	to say / to tell
declarar	to declare
demasiado	too, too much
después	after
doce	twelve
el/la dueño/a	owner
dulce	sweet
el ejemplo	example
la escuela	school
español(a)	Spanish
europeo/a	European
la fiesta	party / festival
francés/francesa	French
la gente	people
hay que	you/one must
histórico/a	historic
el horario	timetable
inglés/inglesa	English
el lunes	Monday
la manera	way

el martes	Tuesday
medio/a	half
la merienda	snack
mexicano/a	mexican
nuestro/a	our
nueve	nine
once	eleven
la paella	paella
el plato	dish, plate, course
por	for
procesado/a	processed
el puente	bridge
el queso	cheese
quince	fifteen
religioso/a	religious
la ropa	clothes
el sándwich	sandwich
seis	six
sentarse	to sit
la siesta	siesta / nap
sobre	about / on
el sofá	sofa
la sopa	soup
la tarde	afternoon, evening
todavía	still / yet
tomar	to take/have (food or drink)
el tomate	tomato
la tortilla	Spanish omelette
tostado/a	toasted
el trabajo	work / job
treinta	thirty
tres	three
el zumo	juice

THE PERFECT TENSE

HABER

he (I have)

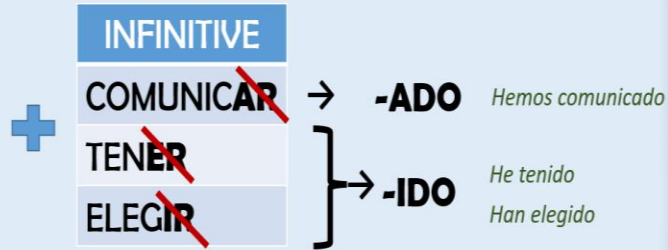
has (you have)

ha (he/she have)

hemos (we have)

habéis (you have)

han (they have)



The present continuous

- The present continuous tense is the Spanish equivalent of the English form 'I am ...ing, you are ...ing' etc. It indicates something that is happening at the time of speaking. It is formed by adding the *gerund* to the present tense of *estar*:

¿Qué **estás leyendo**? What **are you reading**?

Estoy leyendo un libro estupendo.

I'm reading a fantastic book.

The gerund

- The gerund (or present participle) is formed by replacing the infinitive verb ending *-ar* with *-ando*, and the *-er* and *-ir* verb endings with *-iendo*:

hablar > *hablando*

*Estoy **hablando**.* I am **talking**.

comer > *comiendo*

¿Qué **estás comiendo**? What are you **eating**?

salir > *saliendo*

*Ana está **saliendo**.* Ana is **going out**.

- Some irregular gerunds are:

dormir > *durmiendo*

leer > *leyendo*

oír > *oyendo*

preferir > *prefiriendo*

sentir > *sintiendo*

vestir > *vistiendo*

Note that where in English we often use the gerund of a verb in sentences like:

I love swimming. My brother prefers going on bike rides.

Spanish uses the infinitive.

*Me gusta **nadar**. Mi hermano **prefiere dar** paseos en bici.*

BTEC Tech Award Health and Social Care Component 1—Learning Aim A

Knowledge Organiser

Understand Human Growth and Development across life stages and the factors that affect it.

This knowledge organiser will help you to understand key words and concepts, as well as how to spell them and define what they mean.

A1: Growth and Development

Life Stages

Infancy 0-2

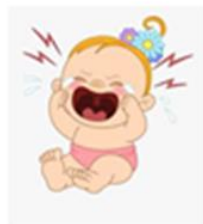
Early Childhood 3-8

Adolescence 9-18

Early Adulthood 19-45

Middle Adulthood 46-65

Later Adulthood 65+



PIES



Physical

Physical growth, muscles, strength, balance, co-ordination, illness/health.

Intellectual

Development of thinking and language skills, brain development.

Emotional

Development of feelings, emotions, sense of self and understanding of others.

Social

Forming relationships, socialising and communicating with others.

A2: Factors affecting Growth and Development



Physical Factors

Physical factors can affect growth and development such as diet and exercise. This enables a person to be healthy and means they are strong enough to fight off illness.

Economic Factors

Economic factors can affect a person's growth and development. Having a substantial (enough) income can ensure a person has successful growth and development by providing good housing and having enough money for food, water and shelter.

Social and Cultural Factors

Social and Cultural factors include relationships, influence of role models, educational experiences, religion, gender etc. These experiences will help to shape an individual.

BTEC Tech Award Health and Social Care Component 1—Learning Aim B

Knowledge Organiser

Investigate how individuals deal with life events.

This knowledge organiser will help you to understand key words and concepts, as well as how to spell them and define what they mean.

B1: Different types of Life Event

Physical Events

An event which may cause harm to the individual physically. For example an accident, injury or illness.



Relationship Changes

Relationship changes can take the form of many different types. They include entering into relationships, marriage, divorce, parenthood, bereavement.

Life Circumstances

A life circumstance can sometimes be expected or unexpected. Usually they are unexpected and have a negative impact. For example being excluded from school, being made redundant or being imprisoned.

B2: Coping with change caused by Life

Events When an individual experiences a life event, they may adapt easily or they may require support to help them. People who experience the same life event can have two different ways of coping.

Practical Help: can take the form of financial help, child care and transport. This can be offered by a range of people including informal and formal support networks.

Informal Support: friends, family and partners can offer informal support for individuals. Informal support can offer reassurance, advice and encouragement.

Formal Support: professional services can help people to cope with different types of life event. For example, an individual having a baby will rely on a midwife. A person who has experienced an accident may need the support of a medical professional to treat the injury, and a counsellor to talk through their emotions.

Definitions

Circumstance

A situation which a person may find themselves in.

Adapt

Getting used to a change, making adjustments.

Informal (support)

Casual, relaxed

Formal (support)

Offered by professionals such as GPs.

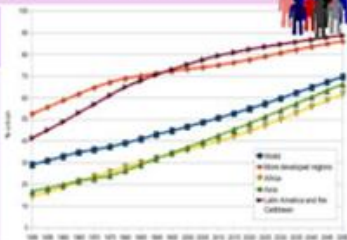


What is Urbanisation?

This is an increase in the amount of people living in urban areas such as towns or cities. In 2007, the UN announced that for the first time, more than 50 % of the world's population live in urban areas.

Where is Urbanisation happening?

Urbanisation is happening all over the world but in LICs and NEEs rates are much faster than HICs. This is mostly because of the rapid economic growth they are experiencing.



Causes of Urbanisation

Rural - urban migration (1)

The movement of people from rural to urban areas.

Push

- Natural disasters
- War and Conflict
- Mechanisation
 - Drought
- Lack of employment

Pull

- More Jobs
- Better education & healthcare
- Increased quality of life.
- Following family members.

Natural Increase (2)

When the birth rate exceeds the death rate.

Increase in birth rate (BR)

- High percentage of population are child-bearing age which leads to high fertility rate.
- Lack of contraception or education about family planning.

Lower death rate (DR)

- Higher life expectancy due to better living conditions and diet.
- Improved medical facilities helps lower infant mortality rate.

Types of Cities

Megacity

An urban area with over 10 million people living there.

More than two thirds of current megacities are located in either NEEs (Brazil) and LICs (Nigeria). The amount of megacities are predicted to increase from 28 to 41 by 2030.

Sustainable Urban Living

Sustainable urban living means being able to live in cities in ways that do not pollute the environment and using resources in ways that ensure future generations also can use them.

Water Conservation

This is about reducing the amount of water used.

- Collecting rainwater for gardens and flushing toilets.
- Installing water meters and toilets that flush less water.
- Educating people on using less water.

Energy Conservation

Using less fossil fuels can reduce the rate of climate change.

- Promoting renewable energy sources.
- Making homes more energy efficient.
- Encouraging people to use energy.

Creating Green Space

Creating green spaces in urban areas can improve places for people who want to live there.

- Provide natural cooler areas for people to relax in.
- Encourages people to exercise.
- Reduces the risk of flooding from surface runoff.

Waste Recycling

More recycling means fewer resources are used. Less waste reduces the amount that eventually goes to landfill.

- Collection of household waste.
- More local recycling facilities.
- Greater awareness of the benefits in recycling.

Unit 2a



Urban Issues & Challenges

Sustainable Urban Living Example: Freiburg

Background & Location

Freiburg is in west Germany. The city has a population of about 220,000. In 1970 it set the goal of focusing on social, economic and environmental sustainability.



Sustainable Strategies

- The city's waste water allows for rainwater to be retained.
- The use of sustainable energy such as solar and wind is becoming more important.
- 40% of the city is forested with many open spaces for recreation, clean air and reducing flood risk.

Integrated Transport System

This is the linking of different forms of public and private transport within a city and the surrounding area.

Brownfield Site

Brownfield sites is an area of land or premises that has been previously used, but has subsequently become vacant, derelict or contaminated.

Traffic Management

Urban areas are busy places with many people travelling by different modes of transport. This has caused urban areas to experience different traffic congestion that can lead to various problems.

Environmental problems

- Traffic increases air pollution which releases greenhouse gases that is leading to climate change.

Economic problems

- Congestion can make people late for work and business deliveries take longer. This can cause companies to loose money.

Social Problems

- There is a greater risk of accidents and congestion is a cause of frustration. Traffic can also lead to health issues for pedestrians.

Congestion Solutions

- Widen roads to allow more traffic to flow easily.
- Build ring roads and bypasses to keep through traffic out of city centres.
- Introduce park and ride schemes to reduce car use.
- Encourage car-sharing schemes in work places.
- Have public transport, cycle lanes & cycle hire schemes.
- Having congestion charges discourages drivers from entering the busy city centres.

Traffic Management Example: Bristol

In 2012 Bristol was the most congested city in the UK. Now the city aims to develop it's integrated transport system to encourage more people to use the public transport. The city has also invested in cycle routes and hiring schemes.

Greenbelt Area

This is a zone of land surrounding a city where new building is strictly controlled to try to prevent cities growing too much and too fast.

Urban Regeneration

The investment in the revival of old, urban areas by either improving what is there or clearing it away and rebuilding.

Urban Change in a Major UK City: Bristol Case Study



Location and Background	City's Importance
Bristol is a city in the South-West of England. The population of the city is 440,500 making it the tenth largest district in the UK. The city grew during the triangular trade 	- It holds a strategic position on the M4 corridor with good road, rail, air and ferry services. - There has been a shift in the main industries in the city, particularly financial services, defence, technology and the media. - High level of inward investment - Bristol University attracts students from all over the world.
Migration to Bristol	City's Opportunities
During the triangular trade (linking West Africa and the West Indies) Bristol became an important shipping dock. Today it still has two major docks – Avonmouth and Royal Portbury. Its accessibility, particularly with the future electrification of the rail line will reduce the journey time to London to seventy minutes. Its connectivity has attracted many companies and therefore people to relocate. More recently, refugees have arrived from Syria and Iraq. Also Bristol has attracted thousands of students from the UK & abroad. 	Social: Bristol has various cultural attractions such as the Colston Hall. Also Cabot Circus and Cribbs Causeway are very popular with shoppers. Economic: The retail sectors contribute to thousands of jobs. The Universities and development of global industries adds contribute to the city's economy. Environmental: In 2015 Bristol became the first city in the UK to be awarded the status of European Green Capital, due to a focus on sustainable transport and renewable energy.
City Challenges	Temple Quarter Regeneration
Social: House prices have increased along with greater house shortages. Derelict housing has led to issues of anti social behaviour . Economic: A lack of housing has caused an urban sprawl. Derelict industrial buildings in the city have contributed to this. Environmental: Urban sprawl has led to increased pressure and decline of greenfield sites around the city.	Aims: to regenerate brownfield sites and to create 17,000 jobs by 2037. Main features: Brownfield sites and derelict buildings regenerated, Investment in its train station to improve connections, Key projects such as the Paintworks (mixed use development) and the Engine Shed (for creative businesses)



Urban Change in a Major NEE City: RIO DE JANEIRO Case Study



Location and Background	City's Importance
Rio is a coastal city situated in the South East region of Brazil within the continent of South America. It is the second most populated city in the country (6.5 million) after Sao Paulo. 	- Has the second largest GDP in Brazil It is headquarters to many of Brazil's main companies, particularly with Oil and Gas. - Sugar Loaf mountain is one of the seven wonders of the world. - One of the most visited places in the Southern Hemisphere. - Hosted the 2014 World Cup and 2016 Summer Olympics.
Migration to Rio De Janeiro	City's Opportunities
The city began when Portuguese settlers with slaves arrived in 1502. Since then, Rio has become home to various ethnic groups. However, more recently, millions of people have migrated from rural areas that have suffered from drought, lack of services and unemployment to Rio. People do this to search for a better quality of life. This expanding population has resulted in the rapid urbanisation of Rio de Janeiro. 	Social: Standards of living are gradually improving. The Rio Carnival is an important cultural event for traditional dancing and music. Economic: Rio has one of the highest incomes per person in the country. The city has various types of employment including oil, retail and manufacturing. Environmental: The hosting of the major sporting events encouraged more investment in sewage works and public transport systems.
City Challenges	Self-help schemes - Rocinha, Bairro Project
Social: There is a severe shortage of housing, schools and healthcare centres available. Large scale social inequality, is creating tensions between the rich and poor. Economic: The rise of informal jobs with low pay and no tax contributions. There is high employment in shanty towns called Favelas Environmental: Shanty towns called Favelas are established around the city, typically on unfavourable land, such as hills.	- The authorities have provided basic materials to improve peoples homes with safe electricity and sewage pipes. - Government has demolished houses and created new estates. - Community policing has been established, along with a tougher stance on gangs with military backed police. - Greater investment in new road and rail network to reduce pollution and increase connections between rich and poor areas.



What is an Ecosystem?

An ecosystem is a system in which organisms interact with each other and with their environment.

Ecosystem's Components

Abiotic These are **non-living**, such as air, water, heat and rock.

Biotic These are **living**, such as plants, insects, and animals.

Flora Plant life occurring in a particular region or time.

Fauna Animal life of any particular region or time.



Food Web and Chains

Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. **Food webs** however consists of a network of many food chains interconnected together.

Nutrient cycle

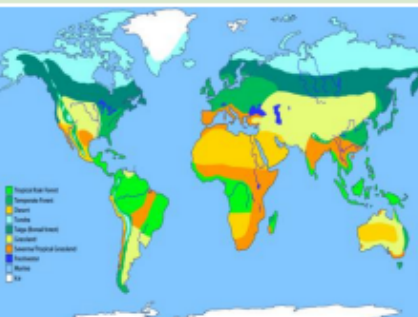
Plants take in **nutrients** to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by **decomposers** like earthworms

Litter This is the **surface layer** of vegetation, which over time breaks down to become **humus**.

Biomass The total mass of **living organisms** per unit area.

Biomes

A biome is a **large geographical area** of **distinctive plant and animal groups**, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.



The **most productive biomes** – which have the greatest biomass- grow in climates that are **hot and wet**.

Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
Tropical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate deciduous forest	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500mm/year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

Unit 1b

AQA

The Living World

Tropical Rainforest Biome

Tropical rainforest cover about **2 per cent** of the Earth's surface yet they are home to **over half** of the world's plant and animals.

Interdependence in the rainforest

A rainforest works through **interdependence**. This is where the plants and animals **depend on each other** for survival. If one component changes, there can be **serious knock-up effects** for the entire ecosystem.



Distribution of Tropical Rainforests

Tropical rainforests are **centred along the Equator** between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. **The Amazon** is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.

Rainforest nutrient cycle (soils)

The **hot, damp conditions** on the forest floor allow for the **rapid decomposition** of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become **infertile**.

Climate of Tropical Rainforests

- Evening temperatures rarely fall below **22°C**.
- Due to the **presence of clouds**, temperatures rarely rise above **32°C**.
- Most afternoons have heavy showers.
- At night with no clouds insulating, temperature drops.



Example: UK Ecosystem – Silk Mills Nature Reserve, Taunton

Local nature reserve opened in 2010. to the west of the town. 10ha in size. Grassland, pond, hedgerows and woodland

Components & Interrelationships	How ecosystem can change
Producers	Grass, blackberry bush, algae
Consumers	Rabbits, Midge Larva
Top predators	Kingfishers, Herons
	Human: Fertiliser or pesticides can enter the pond from run off (water from farms). People can fish in the pond
	Physical: Snow, heat. Killing off species of insects

Layers of the Rainforest

Emergent	Highest layer with trees reaching 50 metres .
Canopy	Most life is found here as it receives 70% of the sunlight and 80% of the life .
U-Canopy	Consists of trees that reach 20 metres high .
Shrub Layer	Lowest layer with small trees that have adapted to living in the shade .



Tropical Rainforests: Case Study Malaysia



Malaysia is a LIC country in south-east Asia. 67% of Malaysia is a tropical rainforest with 18% of it not being interfered with. However, Malaysia has the fastest rate of deforestation compared to anywhere in the world.

Adaptations to the rainforest

Orangutans	Large arms to swing & support in the tree canopy.
Drip Tips	Allows heavy rain to run off leaves easily.
Lianas & Vines	Climbs trees to reach sunlight at canopy.

Rainforest inhabitants

Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with...

- Food through hunting and gathering.
- Natural medicines from forest plants.
- Homes and boats from forest wood.

Issues related to biodiversity

Why are there high rates of biodiversity?

- Warm and wet climate encourages a wide range of vegetation to grow.
- There is rapid recycling of nutrients to speed plant growth.
- Most of the rainforest is untouched.

Main issues with biodiversity decline

- Keystone species (a species that are important of other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components.
- Dedine in species could cause tribes being unable to survive.
- Plants & animals may become extinct.
- Key medical plants may become extinct.

Impacts of deforestation

Economic development

- + Mining, farming and logging creates employment and tax income for government.
- + Products such as palm oil provide valuable income for countries.
- The loss of biodiversity will reduce tourism.

Soil erosion

- Once the land is exposed by deforestation, the soil is more vulnerable to rain.
- With no roots to bind soil together, soil can easily wash away.

Climate Change

- When rainforests are cut down, the climate becomes drier.
- Trees are carbon 'sinks'. With greater deforestation comes more greenhouse emissions in the atmosphere.
- When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect.

What are the causes of deforestation?

Logging

- Most widely reported cause of destructions to biodiversity.
- Timber is harvested to create commercial items such as furniture and paper.
- Violent confrontation between indigenous tribes and logging companies.

Mineral Extraction

- Precious metals are found in the rainforest.
- Areas mined can experience soil and water contamination.
- Indigenous people are becoming displaced from their land due to roads being built to transport products.

Energy Development

- The high rainfall creates ideal conditions for hydro-electric power (HEP).
- The Bakun Dam in Malaysia is key for creating energy in this developing country, however, both people and environment have suffered.

Sustainability for the Rainforest

Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change.

Possible strategies include:

- Agro-forestry - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients.
- Selective logging - Trees are only felled when they reach a particular height.
- Education - Ensuring those people understand the consequences of deforestation
- Afforestation - If trees are cut down, they are replaced.
- Forest reserves - Areas protected from exploitation.
- Ecotourism - tourism that promotes conservation

Agriculture

- Large scale 'slash and burn' of land for ranches and palm oil.
- Increases carbon emission.
- River saltation and soil erosion increasing due to the large areas of exposed land.
- Increase in palm oil is making the soil infertile.

Tourism

- Mass tourism is resulting in the building of hotels in extremely vulnerable areas.
- Lead to negative relationship between the government and indigenous tribes
- Tourism has exposed animals to human diseases.

Road Building

- Roads are needed to bring supplies and provide access to new mining areas, settlements and energy projects.
- In Malaysia, logging companies use an extensive network of roads for heavy machinery and to transport wood.

Hot Desert: Case Study Thar Desert – India/Pakistan



The Thar Desert is located on the border between India and Pakistan in Southern Asia. With India soon becoming the most populated country in the world in the next five years. With this, more people will plan to live in the desert.

Distribution of the world's hot deserts

Most of the world's hot deserts are found in the subtropics between 20 degrees and 30 degrees north & south of the Equator. The Tropics of Cancer and Capricorn run through most of the world's major deserts.



Major characteristics of hot deserts

- Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm.
- Heat – hot deserts rise over 40 degrees.
- Landscapes – Some places have dunes, but most are rocky with thorny bushes.

Hot Deserts inhabitants

- People often live in large open tents to keep cool.
- Food is often cooked slowly in the warm sandy soil.
- Head scarves are worn by men to provide protection from the Sun.

Climate of Hot Deserts

- Very little rainfall with less than 250 mm per year.
- It might only rain once every two to three years.
- Temperatures are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C).
- In winter, deserts can sometimes receive occasional frost and snow.



Adaptations to the desert

- | Cactus | Camels |
|--|--|
| <ul style="list-style-type: none"> Shallow roots to absorb water soon after rainfall. Fleshy stems – high water content Needles instead of leaves to reduce surface area and therefore transpiration. | <ul style="list-style-type: none"> Hump for storing fat (NOT water). Wide feet for walking on sand. Long eyelashes to protect from dust storms etc. |

Desert interdependence

Different parts of the hot desert ecosystem are closely linked together and depend on each other, especially in a such a harsh environment.

Opportunities and challenges in Thar Desert

Opportunities:

- Fossil Fuels: Coal and Oil. A thermal energy plant has been constructed at Giral (Coal powered) and a large oilfield at Barmer.
- Renewable Energy: Wind power at Jaisalmer Wind Park (created 2001), India's largest wind farm. Solar power is being generated at Bhaleri for water treatment
- Mineral extraction: Gypsum – for making plaster / cement. Feldspar – for making ceramics. Kaolin – whitener in paper
- There is the "desert festival" to increase tourism

Challenges:

- Heat exhaustion for workers
- High evaporation rates from irrigation canals and farmland.
- Water supplies are limited, creating problems for the increasing number of people moving into area. Gandhi Canal in 1958 has enabled irrigation (watering) to occur therefore the area successfully grows cotton and wheat.
- Limited roads due to high temperatures which can melt tarmac.
- Sand can also be blown over the roads. Camel is the only form of transport for some areas.

Causes of desertification

- Climate change
- Population growth causing
 - Overgrazing by livestock
 - Over cultivation of soil
 - More firewood needed



Strategies to reduce Desertification

Thar Desert:

- Grow drought tolerant crops
- National Parks to protect the area by law. Desert National Park was made in 1992 to protect 3000km² of land.
- Tree planting – the Prosopis Cineraria species has foliage (leaves) for shade, good quality firewood and good root network to stabilise sand dunes.
- Appropriate Technology: Magic Stones (or bunds) are lines of rocks to reduce soil erosion
- Education of farmers to reduce overgrazing and over cultivation.

Christianity – Jesus Christ

Jesus Christ:

- Incarnation of Jesus
- Crucifixion
- Salvation and Atonement
- Resurrection
- Ascension

Key Terms:

Bethlehem	Place of Jesus' birth	Jerusalem	Place of Jesus' death
Gospels	The gospels of Matthew and Luke record the birth of Jesus	Good Friday	The name given to the day on which Jesus was crucified
Virgin Mary	Name given by Christians to the mother of Jesus	Golgotha	The place where Jesus was crucified
Ascension	Belief Jesus ascended to Heaven forty days after Easter	Disciples	The twelve chosen followers of Jesus

Exam Practice:

- What do Christians mean by incarnation? (2)
- Describe the crucifixion of Jesus. (5)
- Explain why Christians believe the Resurrection of Jesus is important. (8)

Key Sources of Authority:

- John 1: 14
- Matthew 27: 28-50
- Luke 24:1-9
- Luke 24: 50-53
- Luke 1: 28-33
- Leviticus 16: 20-22
- 1 Corinthians 12-14
- Matthew 26: 26-29
- Isaiah 53: 3-9
- 1 Corinthians 15: 3-8

Key Beliefs:

Incarnation	Incarnation is the belief that God was made ' flesh ' or truly human in the person of Jesus Christ on earth. Christians believe Jesus was born of the Virgin Mary and conceived by the Holy Spirit . For Christians, this belief is a miracle which demonstrates the power of God and the divinity of Jesus.
Crucifixion	Jesus was arrested in the Garden of Gethsemane and sentenced to death by Pontius Pilate, a Roman governor. He was crucified on Good Friday . During the crucifixion he spoke seven times. After his death, he was taken down from the cross before the beginning of the Jewish Sabbath and buried in the tomb of Joseph of Arimathea.
Salvation and Atonement	Christians believe salvation from sin is possible because Jesus died on the cross to atone for the sins of all of humankind. His death is considered an act of atonement to bridge the rift, caused by sin, between humans and God.
Resurrection	Resurrection means rising from the dead and Christians believe Jesus rose from the dead on Easter Sunday , 'I am the resurrection and the life'.
Ascension	Christians believe Jesus ascended to Heaven forty days after the resurrection.

Key Connections:

Bible narrative *Celebration of Christmas* *Celebration of Easter*
Sacraments: Eucharist *Worship* *Prayers* *Liturgical Prayers*
Afterlife

Christianity – Nature of God

The Nature of God:

- God's qualities: Omnipotent and Omnibenevolent
- Evil and Suffering
- Trinity

Key Sources of Authority:

- Exodus 7-11
- Exodus 14: 21
- Book of Job 1: 8-12
- Psalm 86: 15
- John 3: 16
- Romans 8: 37-39
- John 10: 30
- John 14: 6-11

Key Concepts:

Omnipotent	Characteristic of God – all powerful, almighty and unlimited nature of God	Atonement	Belief Jesus' death healed the rift between humans and God
Omnibenevolent	Characteristic of God – all loving and infinitely good	Resurrection	Belief Jesus rose from the dead on Easter Sunday, conquering death
Trinity	Three persons of God; the Father, Son and Holy Spirit	Sacraments	Outward sign of an inward and invisible blessing by God
Incarnation	God becoming man in the form of Jesus	Evangelism	Preaching of the gospel to others with the intention of converting others to the Christian faith

Key Beliefs:

Nature of God 'omni'	Christians believe in one God (monotheism). The teaching of the Bible is that God is all powerful (omnipotent) and all-good (omnibenevolent). Christians believe God is the creator of all things and is eternal . These beliefs are found in the Bible , one of the most important sacred sources of authority for all Christians.
Evil and Suffering	Christians believe suffering is a result of human sin and a turning away from God. It becomes a test of faith and suffering is often a result of the misuse of free will . Many people find it difficult to believe in a kind and all powerful God who allows so much suffering and the existence of evil .
The Trinity	The belief that God is one and that there are three persons of God: Father, Son and Holy Spirit.
Father, Son and Holy Spirit	God the Father, God the Son Jesus Christ and God the Holy Spirit; the three persons of God are one. The belief in the Trinity is expressed in the Apostles' Creed , where God the Father is in heaven , Jesus Christ is the Son of God in human form on earth and the Holy Spirit , or the Paraclete , is at work in the world.

Key Connections:

How does beliefs about the nature of God relate to other areas of your study?

Our Father prayer worship creation Apostles' Creed

Exam Practice:

- What do Christians mean by the Trinity? (2)
- 'Jesus was just an ordinary man.' Discuss this statement showing that you have considered more than one point of view (you must refer to religion and belief in your answer). (15)

Pilgrimage and Celebrations:

- Walsingham
- Taize
- Christmas
- Easter
- Protestant

Key Terms:

Pilgrim	The name given to a person who undertakes a pilgrimage	Miracle	An unexplained event in some way connected to the power of God
Relic	An object which is revered by religious believers	Worship	To give 'worth' to God and the ways in which Christians show devotion to God
Sacred	Connected in some way to God	Bible	A sacred source of authority for Christians
Monastic community	Monks who have taken vows of chastity, poverty and obedience	A church	A building where Christians gather in community to worship God

Exam Practice:

- Explain why pilgrimage to Taize is important to Christians. (8)
- Create a mind map for the topic 'Christmas – Beliefs and Practices' describing how Christians celebrate Christmas and explaining the most important beliefs about the birth of Jesus.

Key Sources of Authority:

- The gospel accounts of the birth, death and resurrection of Jesus.

Key Beliefs:

Pilgrimage	Pilgrimage is a journey taken with a religious purpose and often to a sacred place or shrine associated with an event or holy person . It may involve the practice of devotions or special actions during the journey and is often carried out in a communal way with other pilgrims.
Celebrations	Celebrations are festivals which commemorate an important event in Christianity and allow Christians to focus their worship , often with special practices and church services . Christmas and Easter are the two most important annual festivals in the Christian calendar .
Walsingham	Walsingham is a place of pilgrimage for Anglicans and Catholics who visit the shrine of ' Our Lady of Walsingham ' in Norfolk.
Taize	Taize is the name of a monastic community in the village of Taize in France. It is a place of pilgrimage for thousands of people each year, particularly young people, who participate in the daily life of prayer with the religious community in the Church of the Reconciliation.
Christmas	Christmas, which means ' Christ's Mass ', is an annual celebration to remember the events of the birth of Jesus in Bethlehem .
Easter	Easter is the most important Christian celebration as it remembers the events in the last week of the life of Jesus. The main focus of the celebration is on the miraculous resurrection of Jesus on Easter Sunday .

Key Connections:

Prayer Worship Incarnation Atonement Resurrection

Sacraments:

- Diversity of beliefs
- Baptism
- Eucharist
- Catholic
- Protestant

Key Terms:

Eucharist	'Thanksgiving' – an example of liturgical worship in the Catholic and Anglican traditions	Baptists	A Christian denomination who practice believer's baptism
Holy Communion	Receiving bread and wine during the Eucharist	Lord's Supper	Communion services in some denominations
Rites of Passage	Important stages in the life of a Christian	Denomination	Term used for different Christian churches
Baptism	A church service which welcomes a baby or adult into the Christian faith	Mass	Communion service in Catholic Church

Key Sources of Authority:

- John 3: 3-6

Key Beliefs:

Diversity	Christian traditions have diverse or different views on some beliefs and practices . There are three main Christian traditions; Catholic, Orthodox and Protestant, with many different denominations .
Baptism	This is the first rite of passage and some Christians believe it is a sacrament . Many Christians use the practice of infant baptism but others use the practice of believer's baptism . Baptism is a mark of entry to the Christian religion and is performed by a Christian minister and witnessed by the family and church community .
Eucharist	Eucharist means ' thanksgiving ' and is an important part of liturgical Christian worship. Christians have diverse beliefs about ' Holy Communion ', which is part of the Eucharist, and the meaning and significance of Holy Communion.
Catholic	Catholics believe in infant baptism and in the ' Real Presence ' of Jesus in Holy Communion at the Mass . Catholics believe baptism and the Eucharist are regarded as sacraments . Catholics must be baptised in order to receive Holy Communion at the Mass and are expected to attend Mass weekly.
Protestant	Protestants have different views about the nature of the sacraments . Different denominations have different practices for baptism and the celebration of the Eucharist. Baptists use 'believers' baptism' and the 'Lord's Supper' as a communion service.

Key Connections:

Sacraments Mission and Evangelism Ecumenical Movement
Role of the local church as a place of worship Nature of worship

Exam Practice:

- Describe a celebration of baptism. (5)
- Create a venn diagram to show the similarities and differences in belief and practice of the Eucharist between two Christian traditions.

Christianity – The Afterlife

The Afterlife:

- Eschatological beliefs
- Judgement
- Resurrection
- Traditional beliefs about Heaven and Hell
- Contemporary beliefs about Heaven and Hell

Key Terms:

Heaven	In the presence of God in the afterlife	Hell	Place of punishment and suffering
Afterlife	Religious beliefs about human life after death	Soul	The spiritual part of a person made in the image of God
Purgatory	Catholic belief in a place where souls are prepared for heaven	Spiritual	Connected to the spirit or soul of a person
Physical Resurrection	Physical resurrection on the Day of Judgement	Parousia	The second coming of Jesus to the earth and Judgement Day

Exam Practice:

- Explain why Christians believe Heaven is important. (8)
- 'Christian beliefs about hell are out of date.' Discuss this statement showing that you have considered more than one point of view (you must refer to religion and belief in your answer). (15)

Key Sources of Authority:

- John 11: 25-26
- John 14: 2-7
- Matthew 25: 31-46
- Luke 16: 19-31
- 1 Corinthians 15: 42-55

Key Beliefs:

Eschatological beliefs	Eschatological beliefs mean ' beliefs about the last things '; for Christians this involves ideas about the afterlife , including death, judgement, Heaven, Hell and the Parousia , or the return of Jesus to the earth.
Judgement	Christians believe all humans have a soul which is immortal and at death the soul may go to Heaven or Hell in the afterlife .
Resurrection	Christians believe the soul of a person is able to be with God in Heaven after death because the soul is believed to be made in the image of God and the spiritual part of a person; and that there will be a physical resurrection . Christians believe death was defeated by the Resurrection of Jesus .
Heaven	Some Christians believe there is a physical Heaven and others it is a spiritual dimension . Catholic also believe in purgatory.
Hell	Some Christians believe there is a physical Hell and others it is a spiritual dimension . It is a place of punishment and suffering.

Key Connections:

Prayer *Liturgical worship* *Informal and individual worship*
Lord's Prayer *Sacraments* *Nature of God* *Salvation* *Sin* *Grace*

Travel and Tourism BTEC Tech Award

Travel and Tourism Organisations

Tour Operators work with different organisations such as hotels and ground transport. They contract large numbers of hotel rooms and flights at discount prices and sell them to customers through travel agents.

E.g. TUI, Jet2holidays, Virgin Holidays.

Accommodation

Tourists need somewhere to stay, whether taking a trip for leisure or business, to visit a conference or event. Each accommodation type offers different options, services and facilities.

- Hotels
- Hostels
- B&B's
- Self-catering apartment
- Caravan/campsite

Travel Agents have specific roles including:

- Booking flights
- Booking package holidays
- Arranging trips and excursions
- Booking car hire and travel insurance
- Providing foreign exchange



Jet2.com
Friendly low fares

Business Travel Agents

Provide the same service as Retail Travel Agents but for the business market.

This might involve booking for employees to attend meetings, conferences and events. They manage all of the travel booking services for a large business, including flights, rail bookings. Hotels, transfers, meeting venues and spaces. They may also arrange chauffeur driven cars and airport parking.

Hotel Facilities and services

- Restaurants and bars
- Conference and meeting rooms
- Concierge service
- Business centre
- 24-hour reception
- Fitness and leisure facilities
- Parking
- Entertainment

Retail Travel Agents

Offer products and services to customers looking for holidays.

They are found on the main high street in a town or city or in supermarkets.

They can be accessed via telephone through call centres or as web based agents online.



Conference and Events Management Companies

These organisations book, or provide venues and locations for conferences and different types of events. They can also arrange equipment hire, audio-visual facilities and catering options.

Travel and Tourism BTEC Tech Award

Regulators

Help to protect customers and ensure that organisations meet industry standards.

Maritime and Coastguard Agency (MCA)

Provides legislation and guidance on maritime (sea) matters.

Responsible for inspections including;

- Safety of passengers and crew on boats
- Making sure all equipment is fit for purpose on boats



Civil Aviation Authority (CAA)

Helps to ensure that the aviation (airline) industry meets strict and safety standards and ensure that customers are protected.

Runs and manages the Air Travel Organiser's Licence (ATOL) holiday protection scheme which gives customers a full refund if the company they book their holiday with closes down.



Office of Rail and Road (ORR)

- Regulates railways and roads
- Provides advice and guidance to passengers on station and platform safety
- Monitors serious railway incidents
- Monitor Highways England who operate, maintain and improve England's motorways.

ABTA

Represent travel agents and tour operators
Customers who book with ABTA registered travel agents are protected under its financial protection scheme which would give them a full refund if the travel agency closed.



Travel and Tourism BTEC Tech Award

Types of Holiday

- Package
- All-inclusive
- Independent tailor-made
- Multicentre
- Fly or self-drive
- Short breaks
- Touring holidays
- Specialist/niche
- Voluntary work
- Holiday parks

Package holiday

Where different services are put together by the travel company and offered to customers at a single price.

All-inclusive holidays

These are package holidays but also include all food, selected drinks and activities for one set price.

Fly-drive

Involves air travel to a new destination, followed by car hire to allow visitors to explore further afield for themselves.

Independent and tailor-made holidays

A selection of different travel services chosen and booked independently, often using the internet and online booking sites so customers can build the holiday experience that they want.

Multicentre

Where travellers visit two or more destinations or resorts as part of one trip.

Voluntary work

Often popular with young travellers who want to gain experience or those with more time to spare to improve the lives of others. E.g. construction projects, teaching English, animal care, sports coaching.

Self-drive

Include car or motorhome hire and pre-booked accommodation for visitors following a specific route or tour.

short breaks

A trip between one and three nights. City breaks, spa breaks and activity breaks.

Holiday parks

Holidays that provide families with a range of indoor and outdoor entertainment and accommodation, including live shows, swimming pools, rides and competitions. e.g. Butlins, Haven etc.

Touring holidays

Offer travellers the chance to see different places in one trip, fully organised by a travel company. Such as ocean or river cruises and rail or coach tours.

Specialist and niche holidays

For travellers looking for something a bit different such as attending a major sporting event, experiencing different cultures or taking time out to focus on health and wellbeing.

Component of Fitness	Definition	Sporting Examples	Test
Cardiovascular Endurance	The ability of the cardiorespiratory system to work efficiently supplying nutrients and oxygen to working muscles during sustained PA.	Football (Kevin De Bruyne) → Needs good CV endurance to run over 90 mins	Multistage Fitness Test (Bleep Test)
Muscular Endurance	The ability of the muscular system to work efficiently, where a muscle can continue contracting over a period of time against a light or moderate fixed resistance load.	Rowing (James Cracknell) → Various muscles (legs, arms, core) need to be able to work against the current of the water	One-Minute Press-ups Test
Speed	Distance divided by time.	100m Sprinter (Usain Bolt) → Needs speed to run 9.58 100m	30m Sprint test
Strength	The extent to which a muscle or muscle groups can contract against a resistance.	Rugby (Ellis Genge) → Needs strength to be powerful in the scrum	Hand Grip Dynamometer Test
Power	The product of speed and strength.	Basketball (Michael Jordan) → Needs power to spring up for a rebound by the basket	Standing Vertical Jump Test
Agility	The ability of a sports performer to quickly and precisely move or change direction at speed.	Netball (Helen Housby) → Needs agility to dodge away from defending player to receive the ball	Illinois Agility Test
Balance	The ability to maintain the centre of mass of the body above the base of support.	Static and Dynamic Balance – Gymnastics → (Simone Biles)	Stork Stand
Flexibility	The ability to move a joint fluidly through its complete range of movement.	Gymnastics (Simone Biles) → Needs flexibility around joints to perform skills such as the splits.	Sit and Reach Test
Coordination	The smooth flow of movement needed to perform a motor task efficiently and accurately.	Tennis (Novak Djokovic) → Needs good hand-eye coordination to hit ball with racket.	Alternate-Hand Wall Toss Test
Reaction Time	The time that it takes for a sports performer to respond to a stimulus and initiate a response.	F1 (Lewis Hamilton) → Reacting to the lights going out at the start of the race.	Ruler Drop Test

Interpreting the Results of Fitness Tests

Reliability – The conditions of the test must always be identical so that it is more likely the same results will be reproduced. (e.g., The Multistage Fitness Test was done inside in a controlled climate instead of outside where the weather and temperatures always vary)

Validity – Refers to the degree to which the test actually measures what it claims to measure (e.g., A speed test using shuttle runs may actually test a person's ability to turn – which is more about agility than speed)



Component 1: Learning Aim A

Explore types and provision of sport and physical activity for different types of participant

Provision

Needs/Barriers

Sport

Sports are organised competitive activities that involve physical exertion and are bound by a set of rules and regulations and overseen by a National Governing Body (NGB).

Benefits of taking part include: improved fitness, and skill development, resilience, self confidence, meet new people, develop leadership skills.

Outdoor Activities

Outdoor activity refers to recreation engaged within the natural environment and commonly involves adventure, for example rock climbing.

Benefits of taking part include: improved confidence, meet new people, improved teamwork, learn new skills, reduce stress and time away from electronic devices.

Physical fitness activities

Physical fitness activities are activities undertaken to increase fitness, for example Zumba, CrossFit, HITT, spinning classes and yoga/pilates.

Benefits of taking part include: meet new people, set fitness goals, improve confidence, improve body composition and improved physical and mental health.

Public

The public sector facilities are usually owned by the local council or local authority. They include swimming pools and play parks. The public sector fund sport and physical activity and don't aim to make profit.

Advantages: low cost, accessible

Disadvantages: poor quality, poor choice of classes

Private

The private sector facilities are usually for private members only. They aim to provide an excellent service to people who pay a joining fee and then a monthly membership fee i.e. fitness gym such as David Lloyd. They aim to make a profit for owners.

Advantages: bespoke, range of classes

Disadvantages: cost, less facilities available

Volunteer

The voluntary sector has the largest number of people involved who volunteer their time and do it for free. Volunteers who enjoy sport, develop clubs and teams. People pay as they go or pay a subscription fee for the year.

Advantages: Range of opportunities in local areas

Disadvantages: low expertise, high turnover

Needs of participants

Participants of different ages need different needs e.g. a child and elite athlete.

Participants with disabilities will need adapted equipment and support.

Participants with long term health conditions will need to adapt activities to be able to take part.

Physical, social and mental health needs to be considered before a session is planned for a participant.

Barriers to participation

When participating in sport and physical activity some people may experience barriers which stop them from participating fully. For example:

- Cost of clothing, equipment and transport.
- Access to facilities, sessions and resources
- Time with other things such as work
- Personal barriers: lack of self confidence, body image and parents
- Cultural barriers: clothing, and lack of single sex sessions

There are however solutions to these issues. For example hiring equipment, ramps for wheelchairs, crèche facilities/extended opening hours, campaigns to promote benefits of participation, staff training in cultural awareness.



Component 1: Learning Aim B

Examine equipment and technology required for participants to use when taking part in sport and physical activity

Clothing and Footwear

Compression training clothing: Good for cyclists, benefits include; increased blood flow to muscles

Moisture control/waterproofing: Good for tennis players, benefits include; dry and light clothing

Studs: Good for rugby players, benefits include; better grip and lower chance of injury

Trainers: Good for runners, benefits include; shock absorbing, supportive, better grip

Breathable/waterproof materials: Good for hikers, benefits include; keep feet dry

Insoles: Good for cross country runners, benefits include; reduced chance of injury, improved gait

Protection, Flooring and Officials

Head protection: Helmets are light and strong. Benefits include; reduced injury

Mouth protection: Can be custom fit. Benefits include; low cost and reduced severity of injury

Eye protection: Some sports this is mandatory. Benefits include; lower injury risk

Body protection: Protect against an implement or another person. Benefits include; reduced chance of injury

Flooring: Different flooring for each sport to maximise performance. Benefits include; high level of grip, durable and increased level of performance

Officials: are responsible to ensure sport is fair and managed in a safe way, equipment not helps support them further. Benefits include: increased safety for players, play is fair

Equipment

Rackets: Lighter and creates more power. Benefits include; lower chance of injury

Bats/clubs: Make performances faster, easier to use. Benefits include: more variety

Balls: Lighter and have goal line technology. Benefits include; use in all weather

Goalposts: Rounded posts with a net. Benefits include; reduced chance of injury

Strengthening equipment: more variety. Benefits include; reduced boredom

Floatation devices: Prevent drowning

First aid: packs for injuries and defibrillator for heart issues. Benefits include; faster treatment

Assistive technology: wheelchairs/hand cycles. Benefits include; more participation

Prosthetics: designed for individual events. Benefits include: more comfortable

Hearing/visually impaired: focus on sound of ball/equipment or feel a guide/teammate. Benefits include: more accessible

Sports clothing
and equipment
types and
benefits to
participation

Technology

Hawk eye: Used in tennis and cricket to track path of the ball. Benefits include; fair decisions, support umpires

Goal line technology: Used in football to check if the ball has gone over the goal line. Benefits include: accurate decisions, fair play

Smartwatches: Provide data from players and officials such as HR and speed. Benefits include; fast analysis, lots of data, improve performance

Applications: Type of computer programme that is developed with a specific focus. Benefits include; easy analysis of lots of data, trends are shown, progress is clear.

Benefits and Limitations of using technology

Benefits

GPS: Satellites are used to track the location of an object or person. Data can suggest a player's ideal position.

Use of apps: Track physiological and psychological progress of athletes.

Video Analysis: Footage of training replayed to spot areas for development.

Match analysis: Analyse statistics and footage during and after a match to make improvements in tactics and overall performance.

Player analysis: Video software will capture individual skills executed by performers.

Limitations

Cost: It is expensive and not all tiers of sport have the income to obtain this.

Breakdown/repair cost: Once in place technology must be maintained.

Time consuming: The set-up, training and use within a team is a full-time position.

Developments: Updates and changes to software take a lot of time and energy to stay up to date with latest developments.

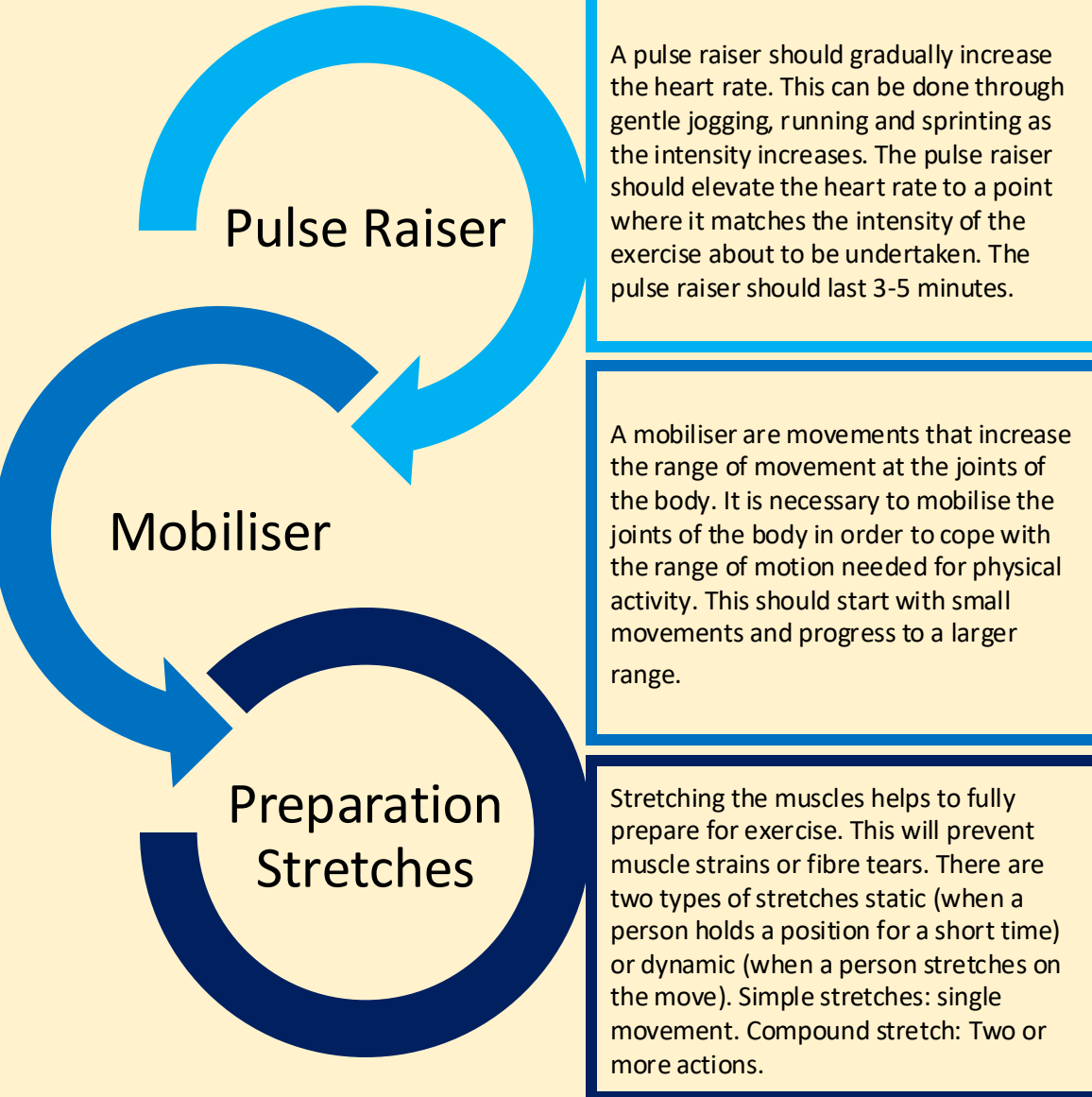
Data from technology: Data could show players have a poor fitness and therefore affect squad selection or positional play.

Technology availability: Some technology is only available at elite level

Usability: Only training and experienced personnel should interpret the data

Component 1: Learning Aim C

Be able to prepare participants to take part in physical activity



A pulse raiser should gradually increase the heart rate. This can be done through gentle jogging, running and sprinting as the intensity increases. The pulse raiser should elevate the heart rate to a point where it matches the intensity of the exercise about to be undertaken. The pulse raiser should last 3-5 minutes.

A mobiliser are movements that increase the range of movement at the joints of the body. It is necessary to mobilise the joints of the body in order to cope with the range of motion needed for physical activity. This should start with small movements and progress to a larger range.

Stretching the muscles helps to fully prepare for exercise. This will prevent muscle strains or fibre tears. There are two types of stretches static (when a person holds a position for a short time) or dynamic (when a person stretches on the move). Simple stretches: single movement. Compound stretch: Two or more actions.

Delivering a Warm Up

When you deliver a warm up to a group you must consider the best way to support the participants.

Space: The coach must consider what space is available and the best way they can make use of it.

Equipment: The coach should make sure any equipment they want to use in the warm up is available.

Organisation of participants: The organisation of participants should be thought about before, during and after a session.

Timing: A coach must consider the length of time the session will last and whether this is appropriate for the participants.

Demonstrations: A visual demonstration can help an explanation.

Observing participants: Watching performers closely will allow an opportunity for the coach to provide feedback.

Providing instructions: Clear instructions will ensure all participants know what is expected of them.

Providing teaching points: A coach should give participants teaching points to help them understand how to complete a skill.

Providing feedback to participants: A coach will be able to give feedback on what went well and what needs to be improved in a participants performance.

Paper and Boards (Core)

Papers and boards

Papers and boards are generally available by the sheet, roll, or ply.

Sheets come in standard sizes, largest A0, halving in size each time, down to A10 (smallest).

Papers and boards come in different weights, measured in gsm (grams per square metre).

The thickness of paper is measured in microns.

Books, leaflets and magazines can be printed and bound in different ways. Leaflets can be printed and folded into a smaller form. Booklets are several pages bound, bonded or stitched together.

Paper and board fittings

Components used with papers and boards that are standardised include:

- drawing pins
- velcro (pads/dots) for mounting
- treasury tags
- staples
- fasteners
- book bindings.

Wastage/addition

Cutting and removing material from stock forms, such as a sheet, is called wastage.

Additive processes, like 3D printing, build up the desired shape from an additional source without waste.

Finishing processes applied to paper, card and board products

Sometimes, a finishing process when manufacturing a paper, card or board product can be:

- stamping the shape out of a sheet (die cutting)
- a specialist finishing process like UV varnishing e.g. on a business card
- a texturing process like embossing or debossing, which creates a raised or lowered surface finish e.g. in a greeting card or wedding invitation.

Papers and boards are very recyclable and made in different thicknesses, with specific surfaces depending on the intended use. They can be folded, creased, glued, easily cut, and waxed for water resistance. Finishes include printing and embossing.

Folding process

Some paper, card or board products, such as greetings cards, menus, or invitations need to be folded in order to be posted, delivered or to stand up once in use.

To fold a paper, card or board, normally a crease would be applied so that the material bends without breaking, tearing or weakening. Sometimes a perforated line or score is applied so that the material bends or folds in exactly the right place.

Binding products

When a book or pamphlet is bound, it needs to open without any of the separate pages falling out or becoming removed. Hand stitching is a skilled and time-consuming process that fixes pages together, but comb binding is a less specialist and more common method. This is when holes are punched so that a plastic bind can hold the pages in order.

Other finishing processes to bind products include stapling and using split pins.

Producing products in papers, cards and boards

Pre-press printing – creates a print layout, a digital pre-press machine then transforms electronic files onto paper.

On-press printing – a plate is covered in ink before paper is pressed against the plate then released.

Die cutting – metal cutters stamp out the desired shape from the material - like cookie cutters!

UV varnishing – parts of a graphic design can be finished with ultraviolet varnish to create a vivid, luxurious or tactile finish.

Embossing /debossing – embossing is stamping a feature into a card, paper or board to raise it above the surface. Debossing is the same but this time the feature is below the surface.

Laminating – adding layers to card or board to protect items packaged inside.

Timbers (Core)

Stock forms of timber

Natural timber is available in:

- different sectional forms
- various standard sizes (lengths)
- sawn or planed
- PSE (planed with squared edge)
- a range of shaped mouldings such as Torus skirting board.

Manufactured boards

Manufactured boards are available in sheet form and in standard sizes and thicknesses.

- Sheets are usually 2440mm x 1220mm, or sometimes half of this at 1220mm x 610mm.
- MDF is available in thicknesses typically 4mm, 6mm, 9mm, 12mm, 15mm, 18mm, 22mm, and 25mm.
- Hardboard sheet is available in 3.2mm thickness.
- Plywood sheets are typically 4mm, 6mm, 9mm, 12mm, 15mm, 18mm, and 24mm thick.

Aesthetics

Aesthetic properties are how a material or components looks.

This includes shape, colour, texture, form, reflection, gloss, style etc.

Function

Functional properties refer to how a material or component works for the intended use.

Function includes performance, efficiency, reliability and operation.

Oak is a mid-brown colour with prominent grain. Very strong and durable, it is perfect for furniture and doors, skirtings and cabinets.

Pine is a soft pale white or yellow timber with straight grain. It is quite lightweight and resists shrinking and swelling. Popular for country furniture, knotty pine is also common.

Plywood is a manufactured board of veneer layers glued at an angle of 90 degrees, for added strength and rigidity. Edges can look unsightly. Plywood is often improved with a veneer of high-quality wood.

MDF is a cheap, man-made board with no grain. It is very versatile but will require a finish. It is available in various thicknesses.

Wastage/addition

Cutting and removing material from stock forms, such as a sheet, is called wastage.

Additive processes, like 3D printing, build up the desired shape from an additional source without waste.

Surface treatment of timbers

Timbers are finished with both functional and aesthetic applications, depending on the location of the product/timber and the desired outcome. Timber finishes are varied and include:

- varnishes
- wood stains
- oils
- polishes
- preservative finishes
- paints.

Applying finishes to timbers

Painting provides a colourful finish but also protects the timber. Glossy, matt or silk paints can be applied with a brush, roller or sprayer. Some include a primer too.

Wood stain is applied to enhance the appearance of the wood. Stains can also provide some protection but normally a coat of varnish is used to seal the stain.

Oil and wax soak into the timber and can enhance its appearance, whilst repelling moisture and water.

Varnish provides a shiny coat, usually applied in layers to make it more durable. Glossy and matt style varnishes are common.

Dip-treating timber protects the surface of the material, but outdoor timber fences tend to be made from pressure treated timber, which is far more long-lasting.

Timbers (Core)

Wood joining

Joining similar or different woods can be done in a temporary or permanent way. Temporary methods include screws and nuts and bolts, permanent methods include wood joints and adhesives like PVA (Polyvinyl acetate), epoxy resins and contact adhesives.

Joints

There are two categories of joints:

Box joints

Butt – a simple (but weak) join where the edges of the two pieces are glued together.

Housing – one edge slots into a groove or slot cut in the other.

Lap – a stronger joint where one piece fits into an L-shaped shoulder cut in the other.

Dovetail – very strong and looks good. A flared 'finger' fits into the same shape removed from the other piece. This is complex to achieve.

Comb – also known as a finger joint, where straight lengths on one piece slot into gaps on the other piece.

Frame joints

Dowel – a short length of round board inserted into holes in both pieces to reinforce joints.

Mortise and tenon – a very strong joint, a square 'lug' slots into a square channel and is glued.

Mitre – two 45-degree angle cuts are made to form a 90-degree angle corner.

Bridle – like a mortise and tenon joint but cut into the full width of the board.

Knockdown (KD) fittings

Standard components that are used to assemble products also come in standard forms and sizes. These include:

- screws
- nails
- nuts and bolts
- hinges
- handles
- cam lock fittings
- corner blocks
- brackets
- scan fittings
- dowels.

Screws come with different types of heads. They can be flat or round headed, with slots, crosses or square holes for different screwdriver fittings. Threads on screws vary; woodscrew threads tend to be wider than on a self-tapping screw. Machine threads are also available e.g. M3, M4, M5 etc, which are fine standard threads.

Marking out – this is a process where the required shape is marked onto the stock material. There are many tools to help mark out accurately, including a try square, tape measure, or steel rule. Materials need to be **held** or **clamped** before being cut. This could be done using a vice or clamp. **Cutting** can occur using a hand tool like a coping saw, tenon saw or hacksaw, or using machinery such as a bandsaw.

Drilling is a process used when a hole is required in a material. Drilling can be done using a **hand drill**, or **drill press/pillar drill**. **Jigs and formers** can help ensure that holes are drilled in the correct positions.

Pilot hole – a small diameter hole to guide a screw, preventing splitting.

Clearance hole – a hole large enough for a screw to fit through without the thread engaging.

Countersunk hole – the top surface of the hole is flared to receive the screwhead flush.

Counterbore hole – a flat-bottomed hole that enlarges another hole.

Calculating costs

When estimating price costs, designers and manufacturers must consider:

- the design
- the features included in the product
- the processes used to manufacture the product.

Computer aided manufacture (CAM)

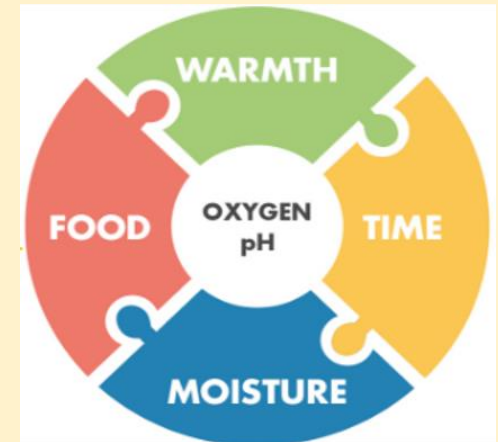
CAM machines can be used to create features that allow parts to be joined to another part.

The benefit of the CAM machine is that all cuts will be accurate and exact. Laser cutters can be used to cut a variety of materials, although the correct settings are essential to avoid burning.

CAM machines can also be used to engrave materials and mark out where holes, joins and other fixings may fit.

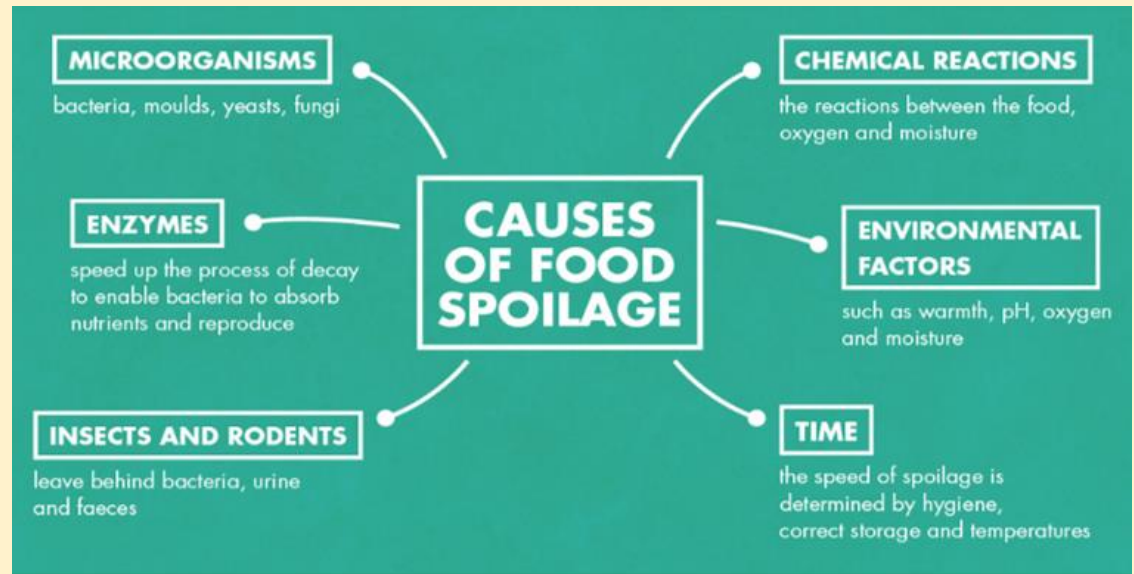
Food Spoilage

- Food spoilage is mainly **caused by microorganisms including moulds, yeasts, bacteria and fungi**.
- These microorganisms need: oxygen, time, a food source, warmth and moisture to grow.** Removing any of these slows, sometimes prevents their growth.
- Food preservation is the extending of a foods natural life by removing any of the factors needed by microorganisms to grow** e.g., removing oxygen when canning.



Signs of Food Spoilage

- Discoloration** - Mould on bread, peppers going black.
- Changes in texture** - Wrinkly, slimy, lumpy, hard, sloppy (mushy strawberries and hard cheese).
- Visible mould** - Mould on cheese and bread.
- Unpleasant odour** - Often sour, bitter, sharp
- Changes in flavour** – Sour, rancid, acidic, unpleasant (old milk).
- Blown cans or jars** (due to the release of gas from microorganisms).



Food Preservation

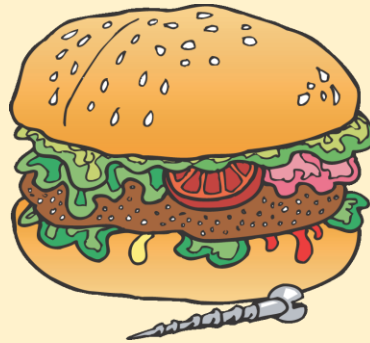
If we store food correctly and safely then we can slow down and reduce food spoilage. This is important as it saves waste and loss of money for manufacturers retailers and consumers.

We can do this by minimising the activity of bacteria, yeasts and enzymes. Most of the time this can be done by removing moisture and/or oxygen, reducing temperature or changing pH levels. **This is known as food preservation.**

METHOD OF PRESERVATION	SIMPLE EXPLANATION	EXAMPLES	METHOD OF PRESERVATION	SIMPLE EXPLANATION	EXAMPLES
HEAT 	Heat kills most microorganisms and it stops any enzyme activity. All foods should be cooked above 75°C	Pasteurisation of milk, all cooked foods, canned foods	REMOVING AIR (O₂) 	Most microorganisms need oxygen to reproduce. Food items are sealed in cans, jars, MAP, vacuum packaging.	Foods in cans and jars, meat, cheese, fish, sandwiches, crisps
FREEZING 	The microorganisms become inactive at very cold temperatures but will start reproducing during defrosting. Frozen food should be stored in a freezer on at -18°C. It should be sealed to prevent freezer burn.	Frozen meat, fish, readymade meals, desserts	CHEMICALS – SALT, SUGAR, VINEGAR, SMOKE 	The pH levels needed for bacterial growth and enzymic action are changed.	Salted meat and fish, pickles, chutneys, jams, smoked fish
DRYING 	Microorganisms need moisture to reproduce.	Pot noodles, coffee, milk, soups, gravy granules, pulses	IRRADIATION 	Food is exposed to low doses of radiation which kills all microorganisms.	Herbs, spices, some vegetables and fruit

Ambient foods (room temperature) which are stored on shelves or cupboards must be sealed or in air-tight contains. They should not be next to radiators or direct sunlight. And should be off the floor.

Physical



Examples:

Hair, jewellery, buttons, plasters, packaging.

Chemical



Examples:

Cleaning chemicals, oil, pesticides.

Microbial



Examples:

Bacteria, viruses, moulds, yeasts and parasites.

Food poisoning is an acute illness caused by consumption of contaminated or poisonous food.

Food which is contaminated with food poisoning bacteria SMELLS, LOOKS and TASTES normal

- Food poisoning bacteria are pathogens (micro-organisms/bacteria that cause infections) that release toxins in food to poison you. These micro-organisms multiply in the intestine.

ORGANISM	COMMON NAME OF ILLNESS	ONSET TIME AFTER INGESTING	SIGNS & SYMPTOMS	DURATION	FOOD SOURCES
<i>Bacillus cereus</i>	<i>B. cereus</i> food poisoning	10-16 hrs	Abdominal cramps, watery diarrhea, nausea	24-48 hours	Meats, stews, gravies, vanilla sauce
<i>Campylobacter jejuni</i>	Campylobacteriosis	2-5 days	Diarrhea, cramps, fever, and vomiting; diarrhea may be bloody	2-10 days	Raw and undercooked poultry, unpasteurized milk, contaminated water
<i>Clostridium botulinum</i>	Botulism	12-72 hours	Vomiting, diarrhea, blurred vision, double vision, difficulty in swallowing, muscle weakness. Can result in respiratory failure and death	Variable	Improperly canned foods, especially home-canned vegetables, fermented fish, baked potatoes in aluminum foil
<i>Clostridium perfringens</i>	Perfringens food poisoning	8-16 hours	Intense abdominal cramps, watery diarrhea	Usually 24 hours	Meats, poultry, gravy, dried or precooked foods, time and/or temperature-abused foods
<i>Cryptosporidium</i>	Intestinal cryptosporidiosis	2-10 days	Diarrhea (usually watery), stomach cramps, upset stomach, slight fever	May be remitting and relapsing over weeks to months	Uncooked food or food contaminated by an ill food handler after cooking, contaminated drinking water
<i>Cyclospora cayetanensis</i>	Cyclosporiasis	1-14 days, usually at least 1 week	Diarrhea (usually watery), loss of appetite, substantial loss of weight, stomach cramps, nausea, vomiting, fatigue	May be remitting and relapsing over weeks to months	Various types of fresh produce (imported berries, lettuce, basil)
<i>E. coli</i> (Escherichia coli) producing toxin	<i>E. coli</i> infection (common cause of "travelers' diarrhea")	1-3 days	Watery diarrhea, abdominal cramps, some vomiting	3-7 or more days	Water or food contaminated with human feces
<i>E. coli</i> O157:H7	Hemorrhagic colitis or <i>E. coli</i> O157:H7 infection	1-8 days	Severe (often bloody) diarrhea, abdominal pain and vomiting. Usually, little or no fever is present. More common in children 4 years or younger. Can lead to kidney failure	5-10 days	Undercooked beef (especially hamburger), unpasteurized milk and juice, raw fruits and vegetables (e.g. sprouts), and contaminated water

BTEC Dance Knowledge Organiser Component 1

Physical/Technical Skills	
Focus & control	Concentrating on executing the movement accurately with full control of the body
Expression	How much emotion and feeling you apply to the movement
Posture	The way the body is held
Balance and Coordination	The ability to hold a steady position and to use a combination of parts of the body together efficiently
Extension	The lengthening of body parts outwards. E.g. Straight arms and pointed toes
Energy	How much physical effort you put into the dance
Dynamic range	Noticing and applying the correct quality to each movement. For example: sharp, soft, fluid etc.
Accuracy	Performing the movements in the correct order with technical accuracy
Alignment	Correct placement of body parts in relation to each other
Flexibility	Projecting your movements outwards into the space with appropriate energy.
Rhythm	A strong, regular repeated pattern of movement
Facial expression	Animating the face to engage with your audience/communicate the theme of your performance.
Relationship	The way a dancer interacts with another on stage, for example; contact, accumulation, lead and follow
Stamina	Ability to maintain physical and mental energy over periods of time.
Spatial Awareness	Being aware of the space around you as well as the shape, size, level and direction of the movement.
Movement memory	Your ability to remember movement

Performance/Interpretative Skills	
Interaction with other performers	How effectively you communicate with others on stage
Focus	Use of the eyes to enhance performance or interpretative qualities
Confidence	Being certain of your abilities and evidencing this in your performance
Energy and Stamina	Performing to the best of your physical ability and keeping this consistent throughout
Awareness and appreciation of sound / musicality	The ability to make the unique qualities of the music evident in performance. Having an awareness of the beats and highlights within the music and complimenting/contrasting this with your movement.
Rhythm and timing	Performing the correct movements at the correct time to compliment the music.
Emphasis	The accents provided by the dancer at different moments throughout the dance
Stage Presence	The ability to command the attention of a theatre audience
Facial expression	Animating the face to engage with your audience/communicate the theme of your performance.
Use of space	How much space you use when dancing.
Awareness of the performance space and audience	Showing effective consideration of the space you are performing in as well as the target audience and where they are situated.
Projection	The energy a dancer uses to connect with and draw in the audience.
Energy and commitment	Committing your full mental and physical ability to the dance consistently for the whole performance.

Choreographic approaches:

Choreographer's sometimes create all of the movement before the rehearsals and then teach it to the dancers. Other choreographer's choose to work more collaboratively and set the dancers tasks to create some of the movement. Most choreography is created through improvisation. Improvisation is the process of generating movement spontaneously and the refining it to develop motifs. To create a piece of choreography choreographers usually follow a process of finding and researching appropriate stimuli, improvising to generate movement, refining and developing motifs, selecting and discarding material, choosing a choreographic structure and performing the final choreography.

Constituent Features: Constituent features refer to anything that you see in the performance space. These include the characteristics of choreography, the physical and the aural setting. Constituent features are used to enhance a performance and to communicate the stimulus/choreographic intention with the audience.

Characteristics of choreography	Dance style, stimulus, subject matter, number/gender of dancers, action content, choreographic principles, form and structure.
Lighting	The use of light in a performance, this can include coloured washes, spotlights, blackouts and natural light.
Sound/Aural Setting	Aural setting includes the music, sound, any spoken words, any audible aspects of the dance and silence.
Set/Physical Setting/Performance Environment	The set for a performance includes the type of stage, use of props, any raised platforms, backdrops and special effects.
Costume	What the dancers wear when they perform. This can include jewellery or accessories depending on the piece.

Roles and Responsibilities within the Performing Arts industry

<u>Role</u>	<u>Responsibilities</u>	<u>Skills</u>
Choreographer	A choreographer's responsibility is to develop ideas from the stimulus or brief and use this to create movement. They have to develop the movement using choreographic devices and then teach it to the dancers. Choreographers choose the dance style for the piece and give feedback to the dancers throughout the rehearsal process.	• Choreography skills • Creativity • Communication skills • Organisation skills • Leadership skills • Technical & performance skills
Dancer	A dancer's responsibility is to continuously develop their performance and technical skills so that they are able to learn and perform new movements. They should learn and remember the choreography as well as contributing to any choreography tasks that are set. They must attend all rehearsals and apply any feedback given by the choreographer.	• Creativity • Communication skills • Organisation skills • Time management skills • Technical & performance skills
Lighting Design	Lighting designer's responsibility is to design the lighting for the show. To do this they must communicate with the director/choreographer to ensure the lighting communicates their intentions. They must communicate with the dancers to understand the timing of the piece and to light all of the formations and operate the lighting on the evening of the performance. Understand the dance to know when to cue each light.	• Organisation skills • Creativity • Communication skills • Technical skills • Timing
Sound Technician	Sound technician's responsibility is to produce/ arrange all sound for the performance working with the artist or the conductor if the music is to be played live. They must communicate with the choreographer to produce and maintain the required sound for the performance.	• Timing for cues • Communication skills • Team work • Technical skills • Creativity • Knowledge of music/ composition.
Costume Designer	A costume designer's responsibility is to design the costume based on the choreographer's intentions. They must design a costume for all performers in the show. They sometimes also create the costumes and have fittings with the dancers to ensure the sizes are correct and that the movement can be performed successfully in the costume.	• Timing for cues • Communication skills • Team work • Technical skills • Creativity

Genres			Music Technology Terms			Key terms for analysing music		
1	60's to 70's	Folk revival, Psychedelic, Heavy Metal, Soul, Motown, Disco, Punk, Reggae	1	Multi-tracking	Recording several parts one at a time and layering them using a DAW	1	Dynamics	How loud or quiet the music is. Does it change in certain sections and why?
2	80's to 90's	Synth pop, Post punk, Thrash Metal, Grunge, Britpop, Hip hop, House, Rave	2	Overdubbing	Doubling up the recording of a part to make it sound bigger / Thicker in texture	2	Rhythm	The pattern of notes used. Does the instrument play a repetitive rhythm or a complex one?
3	00's to present day	Pop Punk, EDM, Dubstep, K-pop, Reggaeton, Grime, Trap	3	Sampling	Taking a small section of an existing audio recording and using it in own work	3	Structure	The sections of the music. Intro, Verse, Chorus, Bridge, Outro. How the music is put together
4	World music and Fusion	African drum music, Indian Raga, Afrobeat, Jazz fusion	4	Synthesiser	Computer created instrument or sound		Melody	The main tune. Think about if it moves in steps or leaps.
5	Music for Media	Film, TV, Computer games, Ambient music, Foley	5	Sequencing	Composing music using MIDI		Instrumentation	The instruments used
6	Western Classical	Romantic, Orchestral, Minimalism	6	MIDI	Musical notation for DAW	4	Texture	The layers of instruments / Sound
7	Jazz and Blues	Bebop, Big band, Blue note, Country blues, Delta blues	7	Looping	Continuous playback of musical phrase / sound	5	Timbre	Describes the characteristics of the sound. Eg. Bright or Gritty.
Industry Products			8	Turntablism	Manipulating sounds and beats using DJ equipment	6	Harmony	The Key the music is written in. Major or Minor.
			9	Phasing and distortion	Guitar effects used to manipulate audio	7	Syncopation	A rhythm the used the off beat (beats 2 and 4)
			10	DAW	Digital Audio Workstation. Software used to create music	8	BPM	Beats per minute, used to measure the tempo (speed)
			11	Quantise	Automated movement of performed notes			
			12	Analogue	Recording onto a physical format. Before digital age			
1	Live Performance	Performing to a live audience (video)						
2	Audio recording	Audio recording of your piece						
3	Composition for media	Own composition for TV, Film or game						
4	DAW Project	Project using sequencing, synthesis and sampling						
5	Original song	Own song / composition idea						

Component 1 – Exploring Music Styles and Products

Elements of Music

Pitch	The pitch is how high or low the sounds/notes are. For example: A scale of notes rises in pitch by step.
Tempo	The tempo is the speed of the music. For example: how fast or slow the music is being played.
Dynamics	The volume of the music. For example: how loudly or quietly the music is being played.
Duration	The length of notes. For example: a minim lasts for two beats.
Texture	The layers within a piece of music. For example: how thick or thin the music is and how the parts within the music relate to each other.
Timbre	The quality and type of sound produced by an instrument. For example: string, brass, percussion, woodwind, voice.
Silence	The absence of music sounds. For example: in music, rests are written to show where the player should be silent.

Personal and professional skills for the music industry

Time management	The ability to manage your time well in all processes involved within the music industry.
Self-discipline	The ability to stick to your plan and commit to your rehearsal/practise session.
Working with others	The ability to communicate well with your peers and to work together well to create the final music product.
Correct and safe use of equipment	The ability to maintain and correctly use musical equipment, including musical instruments, and electrical equipment.
Maintaining a development plan	Keeping a log of your journey, always referring back to the skills you are developing with regular check-in points.

Composition Skills

Creating chord sequences	Using major and minor triads from within a key to create patterns of chords.
Using musical starting points	Using a musical/visual stimuli to inspire continuation of an initial idea.
Exploring musical structures	Taking inspiration from other pieces of music or songs to create a structure that suits your idea. E.g. ABABA, popular song, variations on a theme.
Using rhythmic and melodic rhythms	Exploring and creating patterns of notes in certain orders to create playable rhythms for both accompaniment and for melodies (tunes)

Key Performance & Rehearsal Skills

Rhythm and timing	Being able to play rhythms accurately and stay in time with other musicians, keeping the music together.
Accuracy of pitch	Being able to sing or play the correct notes, ideally from sheet music.
Intonation/tuning	Being able to stay in tune and not go sharp or flat when playing or singing.
Phrasing & breath control	Controlling your breathing so that you can sing or play through a phrase showing musical shape.
Learning repertoire & following an accompaniment	Being able to tackle a new song/piece of music and the ability to follow a live or pre-recorded accompaniment part.
Instrumental or vocal technique & Musical skills exercises	Breathing exercises, scales, and technical exercises specific to your instrument/voice in order to develop a good technique.
Creating a practise routine	Organising your practise sessions and keeping a log to ensure development in all areas of performance.
Stage presence	Having confidence to command the audience and allowing them to engage in your performance.
Expression & musicality	Having the ability to connect with a song/piece of music and put your own stamp on it, showing emotion.
Health and safety in the use of equipment	Learning and maintaining high standards of looking after musical equipment of all varieties.

Music Production Skills

Recording and editing audio (voice and instruments)	Exploring how to record using music technology musical instruments and voices. Also how to edit out errors and record multiple layers.
Exploring digital recording software and tools	Exploring how to use music technology equipment and computer software to create a music recording.
Using effects	Exploring the use of reverb, echo, delay, distortion and other vocal and instrumental effects.

How you will communicate your music skills development

Methods of capturing musical development:

Digital or written portfolio – including production notes, rehearsal diaries, annotated photographs/screenshots, milestone performances and reviews, recorded audition, compositional sketches and ideas.

Keeping a clear and organised approach:

Key points in the process need to be referenced clearly and in chronological order. Your written commentaries must match the quality of your practical work to show your full understanding.

Melody – Knowledge Organiser

Pitch



How high or low a note is

Interval



The distance between any two notes.

Motif



A fragment of a melody.

Range



The difference between the lowest and highest notes

Phrase

A longer melodic idea. Musical “sentences” are constructed from phrases.



Hook/riff

A memorable repeated melodic idea designed to catch the ear of the listener.



Melodic movement

Steps – movement between notes that are next to each other in the scale

Skips – movement equal to two steps. You “skip” over a note in the scale

Leaps – any movement that is larger than a skip

Scalar – when a section of a melody moves along using notes in scale order

Chromatic – movement using steps including notes that are not in the key

Passing note – notes which link chord tones

Scale/mode

A group of notes which a melody is based on
e.g. major, minor, blues, chromatic, dorian

Counter melody



Compositional devices

Repetition – repeat a melodic idea

Sequence – repeat a melodic idea but starting on a different note

Imitation – repeat a melodic idea in another instrument

Variation – change the melodic idea slightly

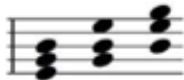
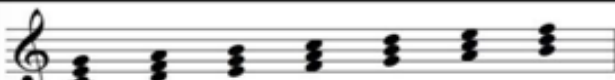
Ostinato – constant repetition of a melodic idea

Inversion – turn the melodic idea upside down

Retrograde – play the melodic idea backwards

Harmony – Knowledge Organiser

HARMONY – how chords are used in a piece of music.

Triad  A basic type of chord made up of three notes	Inversion  Rearranging the order of the individual notes of a chord	Power Chord  A chord using only the 1 st and 5 th scale degrees; no 3 rd	Arpeggio – playing the individual notes of a chord one after another Cadence – a movement between two chords at the end of a phrase Chromatic – music that uses chords that are not naturally found in the key Diatonic – music that use only chords that belong to the key Dominant – the fifth chord (V) of a key Harmonic rhythm – the rate at which the chords change in a piece Modulation – when the harmony shifts to a new key Primary triads – chords I IV and V in a key Progression – a sequence of chords put together Seventh – adding the 7 th degree of the scale to a triad Tonic – the first chord (I) in a key	
Chord Functions in a Key – Roman Numeral System			Building Chords Using Scale Degrees	
 C Dm Em F G Am Bdim I ii iii IV V vi vii°			C D E F G A B 1 2 3 4 5 6 7 Example: Minor triads are built using the 1 b3 and 5 degrees of a scale so a C minor triad contains the notes C Eb G	
Major Triad 1 3 5	Minor Triad 1 b3 5	Major 7th chord 1 3 5 7	Minor 7th chord 1 b3 5 b7	Dominant 7th chord 1 3 5 b7
Perfect Cadence “The strongest one”	Plagal Cadence “The Amen one”	Imperfect Cadence “The cliffhanger one”	Interrupted Cadence “The hidden twist one”	Chord Symbol
 V I	 IV I	 I V	 V vi	 C Fm G7

Dynamics – Knowledge Organiser

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DYNAMICS refer to how loud or soft music is played. It is an important part of performing music **EXPRESSIVELY**.

Fortissimo	<i>ff</i>	VERY LOUD
Forte	<i>f</i>	LOUD
Mezzo-forte	<i>mf</i>	Fairly Loud
Mezzo-piano	<i>mp</i>	Fairly Soft
Piano	<i>p</i>	Soft
Pianissimo	<i>pp</i>	Very Soft



On a musical score the dynamic markings are always placed **UNDERNEATH** the stave.

Sometimes composers place extreme dynamic markings on a score to express that they want the music to be played as loud or as soft as is humanly possible!

ffff
pppp

Crescendo


Gradually getting louder

Diminuendo


Gradually getting softer

Articulation – Knowledge Organiser

ARTICULATION means *how* you play or sing a note. It is an important part of performing music **EXPRESSIVELY**.

Staccato



Performed short and briefly. Notes sound detached from each other.

Accent



Emphasise a note so that it sounds louder than others.

Legato



Perform the notes smoothly. Notes sound connected to each other.
A smooth articulation between two notes is called a **SLUR**.

Orchestral Strings

Pizzicato



Perform the notes by plucking them with the fingers.

Arco



Perform the notes by using the bow.

Tremolo



Continuously play the note with the bow rapidly to produce a trembling effect.

Other Articulations

Vibrato – a slight “wobbling” of the pitch of a note for expression. An important vocal technique as well as for instruments.

Tonguing – the technique used by brass and wind players. Faster rhythms often require the technique of double or triple tonguing.

Bend – guitarists can use their fingers to bend the string from one note to another. Brass and wind players can also do this with different mouth shape and air pressure.

Sforzando



A sforzando is a type of accent. The note should be played with a sudden, strong emphasis.

Slides

Glissando – a dramatic slide between a wide range of notes. For example, running the fingers along the strings of a harp.

Portamento – a smooth slide between two notes. Used frequently by singers.

Structure and Form – Knowledge Organiser

STRUCTURE - the different sections of a piece or music and how they are ordered.

Typical Pop Song Structure

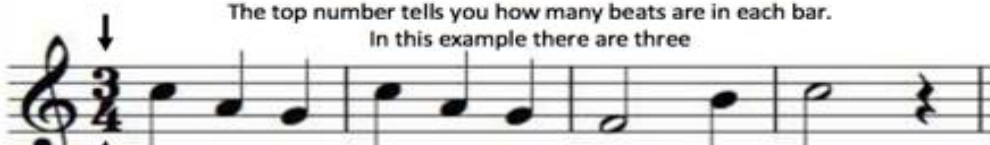
Intro – Verse 1 – Verse 2 – Chorus – Verse 3 – Middle 8/Bridge – Verse 4 – Chorus – Outro

Intro	Binary Form	Ternary Form	Rondo Form
The introduction sets the mood of a song. It is often instrumental but can occasionally start with lyrics.	Music that has two sections. These are labelled A and B.	Music that has three sections. The A section is heard again after B.	A recurring theme (A) contrasted by different sections.
Verses	A B	A B A	A B A C A D A E
Verses introduce the song theme. There are usually new lyrics for each verse which helps to develop the song's narrative			
Choruses	Theme & Variation		
All the choruses usually have the same lyrics. This section relays the main message of the song.	A composition can be developed using the VARIATION technique. A main theme is composed then the following sections vary this theme in some way, by altering for example:		
Middle 8/Bridge	MELODY – RHYTHMS – CHORDS – TEMPO – INSTRUMENTATION – KEY		
This section adds some contrast to the verses and choruses by using a different melody and chord progression.			
Instrumental Solo	Strophic Form	Through Composed	
Solos are designed to show off an instrumentalists skills. Rock, jazz and blues often feature solos on instruments such as piano, sax, guitar and drums	When all of the verses are sung to the same music.	When each section has different music. No section is repeated.	

Time Signature – Knowledge Organiser

A **TIME SIGNATURE** gives you information on how the beats are arranged in a piece of music. It is also known as **METRE**

The top number tells you how many beats are in each bar.
In this example there are three

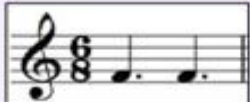
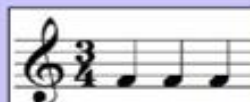


The bottom number tells you that each beat is worth a crotchet (a crotchet is also known as a quarter note hence the number 4 used to denote it)

Number **2** on the bottom = **MINIMS**

Number **4** on the bottom = **CROTCHETS**

Number **8** on the bottom = **QUAVERS**

Simple Metre	Compound Metre
	
	
	

There are two main types of metre: **SIMPLE** and **COMPOUND**

Simple time signatures have beats that can be broken down into two notes

Compound time signatures have beats that can be broken down into three notes.

In compound time signatures each beat is represented by a dotted crotchet which can be broken down into three quavers



The vast majority of music is written with a 4/4 time signature.

This is so common it is known as **COMMON TIME** and can be denoted using a letter C instead of using numbers



IRREGULAR METRE

Sometimes music is written in a metre containing odd numbers of beats in each bar



Rhythm – Knowledge Organiser

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When you combine any two or more notes or rests you create a **RHYTHM**.

Basic Note and Rest Lengths

Semibreve
4 Beats

Note



Rest


Minim
2 Beats

Crotchet
1 Beat

Quaver
 $\frac{1}{2}$ Beat


Adjacent quavers can be joined together with a **BEAM**

Semiquaver
 $\frac{1}{4}$ Beat

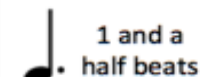

Adjacent semiquavers can be joined together with a **BEAM**

Dotted Notes and Rests

A dot placed after a note or rest tells you to increase the note or rest by **HALF ITS ORIGINAL VALUE**



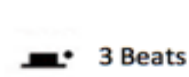
1 Beat



1 and a half beats



2 Beats



3 Beats

Types of Rhythms

This bass line would be described as having a **CROTCHET** rhythm



DOTTED MINIM and SEMIQUAVER rhythm



CROSS RHYTHM

Two or more rhythms played at the same time but with conflicting **ACCENTS** often in different **METRES**



POLYRHYTHM

Two or more different rhythms with the same **METRE** played at the same time



Ties

A **TIE** joins two notes of different values



Here you would play the first note and hold it for 3 beats (2+1)

Triplets

A **TRIPLET** is 3 notes played where there is usually only space for 2



Tempo – Knowledge Organiser

TEMPO means how fast or slow a piece of music is – it is the speed of music

The **TEMPO** of a piece of music is most commonly indicated in two ways – an Italian word and beats per minute (**B.P.M.**)

Italian term	English meaning	B.P.M.
Largo	Slowly and broadly	40 - 60
Adagio	Slowly (but not as slow as largo)	60 - 75
Andante	At a walking pace	75 - 105
Moderato	At a moderate pace	105 - 120
Allegro	Quite fast	120 - 155
Vivace	Quick and lively	155 - 175
Presto	Very fast	175 - 200

Tempo markings are placed at the start of the score above the stave



There are also some terms which indicate a change in tempo during a piece

Italian term	English meaning
Accelerando	Gradually speeding up
Ritardando/Rallentando	Gradually slowing down
Ritenuto	A sudden slowing down
Rubato	A highly expressive technique where a performer plays with flexible tempo

Texture – Knowledge Organiser

TEXTURE is what we call the different layers and parts of a musical piece and how they fit together.

Monophonic



A single melodic voice or instrument

Polyphonic



Different musical lines that interweave with each other

Homophonic



A texture based on chords

Examples of THIN texture

Solo instrument
Acoustic guitar and vocal
Piano and cello

Examples of THICK texture

An orchestra
A rock band
A samba ensemble



Counterpoint

Two or more different melodies playing together.

Unison

When two or more voices or instruments sing/play exactly the same thing at the same time

Melody and accompaniment



Parallel Motion

Notes moving in the same direction keeping the same interval.



Contrary motion



Notes moving in opposite directions; one up, the other down.

Instrumentation (Rock and Pop) – Knowledge Organiser

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Electric Guitar



Acoustic Guitar



Bass Guitar



Drum Kit



Lead Vocals



Backing Vocals



Brass Section



String Section



Piano



Electric Piano



Organ

Technology



Synthesizer



Guitar Effects



Sampling/
Looping



MIDI Sequencing/Recording
Software



Effects Processors

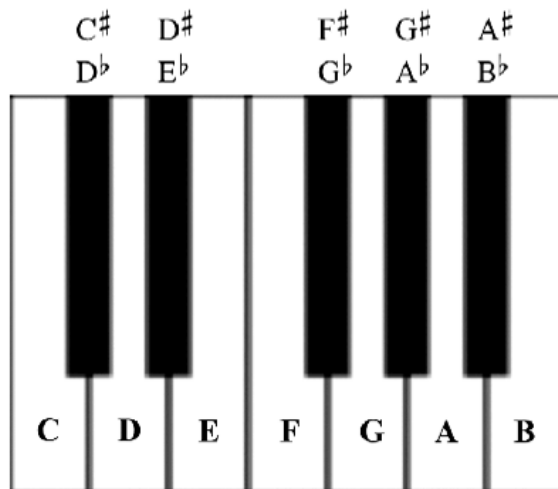


Amplifier

Treble Clef notes



Bass Clef notes



♯ - Sharps - black notes to the **right** (sharp things point up!)

♭ - Flats - black notes to the **left** (flat tyres go down!)

Note

Quaver  or  (in pairs)

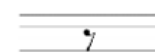
Crotchet 

Minim 

Dotted Minim 

Semibreve 

Rest



Value

1/2 each

1

2

$2 + (1/2 \times 2) = 3$

4