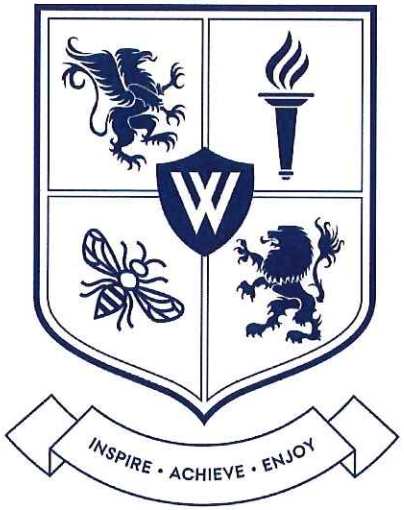


Year 11
Knowledge Organiser
Section A

Autumn Term 2016

Chapter	Plot
1 The Story of the Door	*Passing a strange-looking door whilst out for a walk, Enfield tells Utterson about incident involving a man (Hyde) trampling on a young girl. The man paid the girl compensation. Enfield says the man had a key to the door (which leads to Dr Jekyll's laboratory)*
2 Search for Hyde	*Utterson looks at Dr Jekyll's will and discovers that he has left his possessions to Mr Hyde in the event of his disappearance. Utterson watches the door and sees Hyde unlock it, then goes to warn Jekyll. Jekyll isn't in, but Poole tells him that the servants have been told to obey Hyde.*
3 Dr Jekyll was Quite at Ease	*Two weeks later, Utterson goes to a dinner porty at Jekyll's house and tells him about his concerns. Jekyll laughs off his worries.*
4 The Carew Murder Case	*Nearly a year later, an elderly gentleman is murdered in the street by Hyde. A letter to Utterson is found on the body. Utterson recognises the murder weapon has a broken walking cane of Jekyll's. He takes the police to Jekyll's house to find Hyde, but are told he hasn't been there for two months. They find the other half of the cane and signs of a quick exit.*
5 Incident of the Letter	*Utterson goes to Jekyll's house and finds him 'looking deadly sick'. He asks about Hyde but Jekyll shows him a letter that says he won't be back. Utterson believes the letter has been forged by Jekyll to cover for Hyde.*
6 Remarkable Incident of Dr Lanyon	*Hyde has disappeared and Jekyll seems more happy and sociable until a sudden depression strikes him. Utterson visits Dr Lanyon on his death-bed, who hints that Jekyll is the cause of his illness. Utterson writes to Jekyll and receives a reply that suggests he is has fallen 'under a dark influence'. Lanyon dies and leaves a note for Utterson to open after the death or disappearance of Jekyll. Utterson tries to revisit Jekyll but is told by Poole that he is living in isolation.*
7 Incident at the Window	*Utterson and Enfield are out for walk and pass Jekyll's window, where they see him confined like a prisoner. Utterson calls out and Jekyll's face has a look of 'abject terror and despair'. Shocked, Utterson and Enfield leave.*
8 The Last Night	*Poole visits Utterson and asks him to come to Jekyll's house. The door to the laboratory is locked and the voice inside sounds like Hyde. Poole says that the voice has been asking for days for a chemical to be brought, but has rejected it each time as it is not pure. They break down the door and find a twitching body with a vial in its hands. There is also a will which leaves everything to Utterson and a package containing Jekyll's confession and a letter asking Utterson to read Lanyon's letter.*
9 Dr Lanyon's Narrative	*The contents of Lanyon's letter tells of how he received a letter from Jekyll asking him to collect chemicals, a vial and notebook from Jekyll's laboratory and give it to a man who would call at midnight. A grotesque man arrives and drinks the potion which transforms him into Jekyll, causing Lanyon to fall ill.*
10 Henry Jekyll's Full Statement of the Case	*Jekyll tells the story of how he turned into Hyde. It began as a scientific investigation into the duality of human nature and an attempt to destroy his 'darker self'. Eventually he became addicted to being Hyde, who increasingly took over and destroyed him.*

Character	
Dr Henry Jekyll	*A doctor and experimental scientist who is both wealthy and respectable.*
Mr Edward Hyde	*A small, violent and unpleasant-looking man; an unrepentant criminal.*
Gabriel Utterson	*A calm and rational lawyer and friend of Jekyll.*
Dr Hastie Lanyon	*A conventional and respectable doctor and former friend of Jekyll.*
Richard Enfield	*A distant relative of Utterson and well-known man about town.*
Poole	*Jekyll's manservant.*
Sir Danvers Carew	*A distinguished gentlemen who is beaten to death by Hyde.*
Mr Guest	*Utterson's secretary and handwriting expert.*

Themes

- The duality of human nature
- Science and the unexplained
- The supernatural
- Reputation
- Rationality
- Urban terror
- Secrecy and silence

Vocabulary

- aberration
- abhorrent
- allegory
- allusion
- anxiety
- atavism
- consciousness
- debased
- degenerate
- depraved
- duality
- duplicity
- epistolary
- ethics
- eugenics
- feral
- genre
- metamorphosis
- perversion
- professional
- respectability
- restraint
- savage
- subconscious
- suppression
- supernatural
- unorthodox
- Victorian

Context

Fin-de-siècle fears – at the end of the 19th century, there were growing fears about: migration and the threats of disease; sexuality and promiscuity; moral degeneration and decadence.

Victorian values – from the 1850s to the turn of the century, British society outwardly displayed values of sexual restraint, low tolerance of crime, religious morality and a strict social code of conduct.

The implications of ***Darwinism and evolution*** haunted Victorian society. The idea that humans evolved from apes and amphibians led to worries about our lineage and about humanity's reversion to these primitive states.

Physiognomy – Italian criminologist Cesare Lombroso (1835-1909) theorised that the 'born criminal' could be recognised by physical characteristics, such as asymmetrical facial features, long arms or a sloping forehead.

Victorian London – the population of 1 million in 1800 to 6.7 million in 1900, with a huge numbers migrating from Europe. It became the biggest city in the world and a global capital for politics, finance and trade. The city grew wealthy.

Urban terror – as London grew wealthy, so poverty in the city also grew. The overcrowded city became rife with crime. The crowd as something that could hide sinister individuals became a trope of Gothic and detective literature.

Robert Louis Stevenson was born and raised in Edinburgh, giving him the dual identity of being both Scottish and British. Edinburgh was a city of two sides - he was raised in the wealthy New Town area, but spent his youth exploring the darker, more sinister side of town.

Deacon Brodie – a respectable member of Edinburgh's society and town councilor, William Brodie lead a secret life as a burglar, womaniser and gambler. He was hanged in 1788 for his crimes. As a youth, Stevenson wrote a play about him.

Writing accurately is a valuable skill and helps you express your ideas clearly and creatively across all subjects. Below are some of the important features of accurate writing for you to master. Remember: once you have mastered the rules, you can break them for your own creative effects.

Verb	A word used to describe an action, state or occurrence	Capital Letter	An upper case letter used to after a full stop to begin a sentence or to indicate a proper noun.
Auxiliary Verb	A verb used to form tenses, moods and voices of other verbs: be, do, have, can, could, may, might, must, shall, should, will would	Full Stop	. Used to mark the end of a sentence.
Finite Verbs	The main verb of the sentence which must change if one of tense, person or number changes.	Exclamation Mark	! Used at the end of an exclamatory sentence to show strong emotion.
Non-Finite Verbs	A secondary verb in a sentence that can always be used even if the tense, person or number in the sentence changes.	Question Mark	? Used to indicate an interrogative sentence or rhetorical question.
Past Participle	A word formed of a verb ending in 'ED' used as an adjective to describe a noun e.g. 'The scared man jumped forward.'	Interrobang	?! Informally used to indicate disbelief.
Present Participle	A word formed of a verb ending in 'ING' used as an adjective to describe a noun e.g. 'The laughing man jumped forward.'	Semi-Colon	; Used to join two related independent clauses.
Gerund	A verb that functions as a noun e.g. 'Swimming is my favourite sport'	Colon	: Used to precede lists, expansions or explanations.
Common Noun	A word that is used to identify a class of people, places or things e.g. children, countryside, chairs	Dash	- Used to separate information from an independent clause or parenthetically.
Proper Noun	A word use to name a particular people, place or thing e.g. Chris, East Anglia, Nimbus3000	Comma – Lists	, Used to separate items in a list.
Adverb	A word that is used to modify a verb e.g. 'He ran quickly.'	Comma – Separating Dependent and Independent Clauses	, Used to separate dependent clauses from independent clauses.
Adjective	A word that is used to modify a noun e.g. 'The tall teacher talked to the class.'	Brackets	() Used to indicate an afterthought which if omitted leaves a grammatically complete sentence.
Subject	The person, place or thing that is carrying out an action or being something e.g. 'The boy shouted loudly.'	Apostrophe – Possessive	' Used to indicate ownership.
Object	The person, place or thing that is having an action done to it e.g. 'The boy shouted loudly into the megaphone.'	Apostrophe – Omission	' Used to indicate a missing letter.
Independent Clause	A clause that can stand alone as a sentence e.g. 'The cat sat on the mat'.	Ellipsis	... Used to indicate a sudden change in topic, omitted words or a long pause.
Dependent Clause	A clause that depends on an independent clause to make sense e.g. 'Without turning around, the cat sat on the mat'.		
Embedded Clause	A dependent clause that is embedded within an independent clause e.g. 'The man, who appeared from nowhere, sat next to the cat'.	Fragments	Sentences that do not contain an independent clause.
Declarative	A sentence that makes a declaration e.g. 'She sells sea shells.'	Comma Splices	Two or more independent clauses separated by a comma.
Interrogative	A sentence that asks a question (not rhetorical questions). 'How much is that doggie in the window?'	Verb Agreements	The use of a form of the verb that does not link to the subject e.g. 'We was running.'
Exclamatory	A sentence that shows great emotions e.g. 'I am appalled by your behaviour!'	Homophone	Words that sound the same but have different spellings and meanings.
Imperative	A sentence that gives commands e.g. 'Get out!'	There	Indicating place.
Pronoun	A word that can replace a noun: I, You, He, She, It, They, Them, We	Their	Indicating possession.
Noun Phrase	A group of words that can be replaced by a pronoun e.g. 'I've met the last remaining native'	They're	Contraction of 'they are'.
Adverbial Phrase	Two or more words which play the role of an adverb e.g. 'I sit in silence.'	To	A preposition.
Adverbial Clause	A dependent clause that functions as an adverb e.g. 'Looking around desperately for an escape, I ran for dear life.'	Too	An Adverb indicating addition or excess.
Preposition Time	A word that indicates when something happens in time e.g. 'During lesson one, the fire alarm rang.'	Two	A number.
Preposition Place	A word that indicates where something happens in place e.g. 'A fire broke out in Room 51.'	Where	Usually used as an adverb.
Co-coordinating Conjunctions	A conjunction placed between clauses of equal importance: For, And, But, Or, Yet, So (FANBOYS).	Wear	A verb or noun indicating clothing.
Subordinating Conjunctions	A conjunction used to link dependent and independent clause to establish a time, place, reason, condition, concession or a comparison for the main clause: As, Because, Although, Though, Even Though, Whereas, If	Which	Usually used as a pronoun indicating choice.
		Witch	Flies on a broom stick with a black cat.
		Buy	A verb meaning to purchase.
		By	Usually used as a preposition.

MACBETH- WILLIAM SHAKESPEARE

ACT	PLOT
Act 1	M and Banquo meet witches, Cawdor executed, Lady M reads letter, taunts M, Duncan arrives
Act 2	M kills Duncan, Malcolm flees, M crowned
Act 3	Banquo suspects M, murder of B, Fleance escapes, M haunted by B's ghost at a banquet
Act 4	Witches show M future kings – sons of Banquo, Macduff's family murdered, Malcolm says he is dishonest to test Macduff's loyalty
Act 5	Lady M sleepwalks, dies, Macduff kills M, Malcolm restored as King

DRAMATIC/ STYLISTIC DEVICES

Soliloquy	One character speaking to audience; M uses to make audience complicit
Dramatic irony	Audience knows more than characters; audience knows D will die
Hamartia	Tragic flaw; M's could be easily influenced/ambition
Hubris	Pride; M could be said to have this or Lady M
Catharsis	Purgation of pity and fear; happens at the end
Anagnorisis	Recognition or the tragedy to come
Peripeteia	Sudden reversal of fortune
Rhyme	Used by the witches to create chant like, supernatural atmosphere

CHARACTERS

Macbeth	Eponymous protagonist, ambitious and ruthless
Lady Macbeth	Defies expectations, strong and ambitious, but goes mad
Witches	Supernatural beings, prophesy, could represent conscience
Banquo	M's friend, sons prophesied to rule, killed and returns as ghost
Duncan	Good king, praises M at start, murdered in Act 2
Macduff	Wife and children killed; kill M; born by caesarian
Malcolm	Heir to throne, good man, finally crowned
Fleance	Banquo's son, represent innocence and justice

GOTHIC LINKS

Madness- Lady M and M driven to madness

Transgression- Against natural order/ divine right of kings/ sexuality

Supernatural- Witches; ghost; hallucinations

Setting- Darkness; castle; set in the past

Violence and blood- Starts with battle; Cawdor's execution; King's & Banquo's murders; final battle

Desrie- Unnatural desires

Exploitation- Witches exploit Macbeth and trick him

Fear- Constant uncertainty and risk

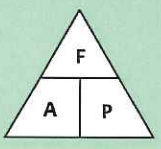
Inevitability- Doomed from the start; tragic?

KEY QUOTES

Appearance/ reality	Witches: Fair is foul and foul is fair (1.1)
M plots his crime	Macbeth: Stars, hide your fires/Let not light see my black and deep desires (1.4)
Unnatural	Lady M: Come, you spirits... Unsex me here (1.5)
Hallucination	Macbeth: Is this a dagger I see before me? (2.1)
Lady M is braver	Lady M: My hands are of your colour but I shame to wear a heart so white (2.2)
Paranoid	Macbeth: To be thus is nothing but to be safely thus (3.1)
Guilt	Macbeth: Full of scorpions is my mind dear wife (3.2)
M hides info	Macbeth: Be innocent of the knowledge, dearest chuck (3.2)
Cyclical	Macbeth: Blood will have blood (3.4)
Tragic hero	Malcolm: This tyrant whose sole name blisters our tongue was once thought honest (4.3)
Guilt/anxiety	Lady M: All the perfumes of Arabia will not sweeten this little hand (5.1)
Existential crisis	Macbeth: Life's but a walking shadow, a poor player (5.5)
Betrayal of prophecy	Macbeth: I bear a charmed life (5.8)

Compound measures

Force Area Pressure



$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

$$\text{Area} = \frac{\text{Force}}{\text{Pressure}}$$

$$\text{Force} = \text{Area} \times \text{Pressure}$$

Examples

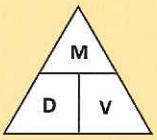
A force of 20N acted over an area of $2m^2$. What is the pressure?

$$\text{Pressure} = \frac{\text{force}}{\text{Area}} = \frac{20N}{2m^2} = 10N/cm^2$$

What is the force exerted on an area of $10m^2$ that is under a pressure of $2.3N/m^2$?

Force = Area x Pressure = $10m^2 \times 2.3N/m^2 = 23N$

Mass Density Volume



$$\text{Volume} = \frac{\text{Mass}}{\text{Density}}$$

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

$$\text{Mass} = \text{Density} \times \text{Volume}$$

Examples

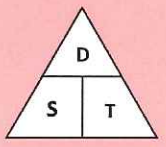
A piece of metal weighing 30g has a volume of $4cm^3$. What is it's density?

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{30g}{4cm^3} = 7.5g/cm^3$$

What is the mass of a piece of rock which has a volume of $34cm^3$ and a density of $2.25g/cm^3$?

Mass = volume x density = $34cm^3 \times 2.25g/cm^3 = 76.5g$

Speed Distance Time



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

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

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

Examples

What is the average speed of a car that travels 400km in 5 hours?

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{400km}{5} = 80km/h$$

What is the distance covered by a train that travels at an average speed of 150mph for three and a half hours?

Distance = speed x time = 150 x 3.5 = 525miles

Inequalities

> means 'Greater than' ≥ means 'Greater than or equal to'
< means 'Less than' ≤ means 'Less than or equal to'

...Solving

EXAMPLES:

1. x is an integer such that $-4 < x \leq 3$.
Find all the possible values of x.

Work out what each bit of the inequality is telling you:

$-4 < x$ means 'x is greater than -4',
$x \leq 3$ means 'x is less than or equal to 3'.

Now just write down all the values that x can take.
(Remember, integers are just +ve or −ve whole numbers)

$-3, -2, -1, 0, 1, 2, 3$

2. Solve $6x + 7 > x + 22$.

Just solve it like an equation:

(-7) $6x + 7 - 7 > x + 22 - 7$
$6x > x + 15$
$(-x)$ $6x - x > x + 15 - x$
$5x > 15$
$(\div 5)$ $5x \div 5 > 15 \div 5$
$x > 3$

3. Solve $-2 \leq \frac{x}{4} + 3 \leq 5$.

Don't be put off because there are two inequality signs — just do the same thing to each bit of the inequality:

(-3) $-2 - 3 \leq \frac{x}{4} + 3 - 3 \leq 5 - 3$
$-5 \leq \frac{x}{4} \leq 2$
$(\times 4)$ $4 \times -5 \leq \frac{4 \times x}{4} \leq 4 \times 2$
$-20 \leq x \leq 8$

4. Solve $9 - 2x > 15$.

Again, solve it like an equation:

(-9) $9 - 2x - 9 > 15 - 9$
$-2x > 6$
$(\div -2)$ $-2x \div -2 < 6 \div -2$
$x < -3$

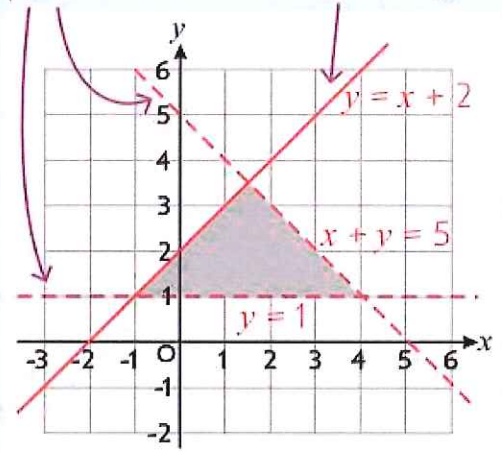
The > has turned into a <, because we divided by a negative number.

...On Graphs

Shade the region that satisfies all three of the following inequalities:
$x + y < 5$ $y \leq x + 2$ $y > 1$.

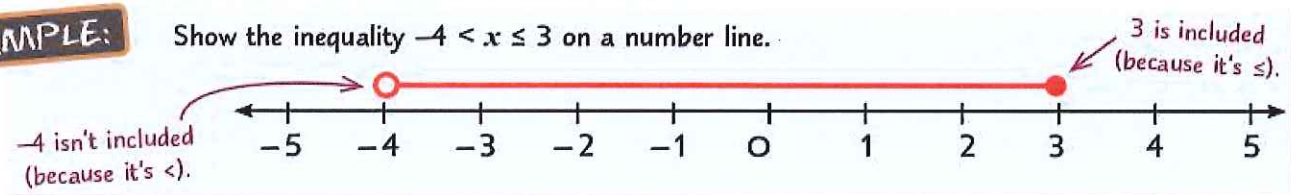
Dotted lines mean the region doesn't include the points on the line.

A solid line means the region does include the points on the line



...On a Number Line

EXAMPLE: Show the inequality $-4 < x \leq 3$ on a number line.



Basic Probability

EXAMPLE: **Work out the probability of randomly picking a letter 'P' from the tiles below.**

APPLE PIE

1) There are 3 P's — so there are 3 different ways to 'pick a letter P'.
2) And there are 8 tiles altogether — each of these is a possible outcome.

$$\text{Probability} = \frac{\text{number of ways to pick a P}}{\text{total number of possible outcomes}} = \frac{3}{8} \text{ (or 0.375)}$$

Probabilities Add up to One

P(event happens) + P(event doesn't happen) = 1

EXAMPLE: **A spinner has different numbers of red, blue and green sections. Work out the value of x and use it to find the probability of spinning red or blue.**

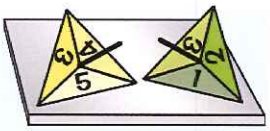
Colour	red	blue	green
Probability	$3x$	$2x$	$5x$

1) The probabilities add up to 1. $3x + 2x + 5x = 1$ so $10x = 1$ and so $x = 0.1$
2) Spinning red or blue is the same as not spinning green. P(red or blue) = 1 − P(green) = 1 − (5 × 0.1) = 0.5

'P(result)' just means the probability of that result.

For Two Events...

EXAMPLE: **The spinners on the right are spun, and the scores added together.**



a) Make a sample space diagram showing all the possible outcomes.

1) All the scores from one spinner go along the top. All the scores from the other spinner go down the side.
2) Add the two scores together to get the different possible totals (the outcomes).

+	3	4	5
1	4	5	6
2	5	6	7
3	6	7	8

There are 9 outcomes here — even though some of the actual totals are repeated.

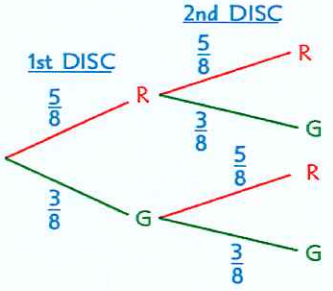
b) Find the probability of spinning a total of 6.

There are 9 possible outcomes altogether, and 3 ways to score 6.

$$P(\text{total} = 6) = \frac{\text{number of ways to score 6}}{\text{total number of possible outcomes}} = \frac{3}{9} = \frac{1}{3}$$

Probability Trees

A box contains 5 red discs and 3 green discs. One disc is taken at random and its colour noted before being replaced. A second disc is then taken. Find the probability that both discs are the same colour.



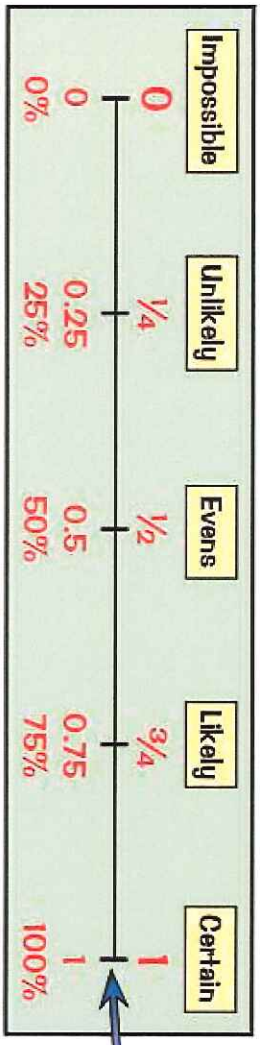
The probabilities for the 1st and 2nd discs are the same. This is because the 1st disc is replaced — so the events are independent.

$$P(\text{both discs are red}) = P(\text{R and R}) = \frac{5}{8} \times \frac{5}{8} = \frac{25}{64}$$

$$P(\text{both discs are green}) = P(\text{G and G}) = \frac{3}{8} \times \frac{3}{8} = \frac{9}{64}$$

$$P(\text{both discs are same colour}) = P(\text{R and R or G and G}) = \frac{25}{64} + \frac{9}{64} = \frac{34}{64} = \frac{17}{32}$$

Probability



Probabilities can be given as fractions, decimals or percentages.

There are 6 rules you need to learn for dealing with surds...

1. $\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$ e.g. $\sqrt{2} \times \sqrt{3} = \sqrt{2 \times 3} = \sqrt{6}$ — also $(\sqrt{b})^2 = \sqrt{b} \times \sqrt{b} = \sqrt{b \times b} = b$

2. $\dfrac{\sqrt{a}}{\sqrt{b}} = \sqrt{\dfrac{a}{b}}$ e.g. $\dfrac{\sqrt{8}}{\sqrt{2}} = \sqrt{\dfrac{8}{2}} = \sqrt{4} = 2$

3. $\sqrt{a} + \sqrt{b}$ — DO NOTHING — in other words it is definitely NOT $\sqrt{a + b}$

4. $(a + \sqrt{b})^2 = (a + \sqrt{b})(a + \sqrt{b}) = a^2 + 2a\sqrt{b} + b$ — NOT just $a^2 + (\sqrt{b})^2$

5. $(a + \sqrt{b})(a - \sqrt{b}) = a^2 + a\sqrt{b} - a\sqrt{b} - (\sqrt{b})^2 = a^2 - b$

6. $\dfrac{a}{\sqrt{b}} = \dfrac{a}{\sqrt{b}} \times \dfrac{\sqrt{b}}{\sqrt{b}} = \dfrac{a\sqrt{b}}{b}$ This is known as 'RATIONALISING the denominator' — it's where you get rid of the $\sqrt{\ }$ on the bottom of the fraction.

Surds

EXAMPLES:

1. Write $\sqrt{300} + \sqrt{48} - 2\sqrt{75}$ in the form $a\sqrt{3}$, where a is an integer.

Write each surd in terms of $\sqrt{3}$:

$\sqrt{300} = \sqrt{100 \times 3} = \sqrt{100} \times \sqrt{3} = 10\sqrt{3}$

$\sqrt{48} = \sqrt{16 \times 3} = \sqrt{16} \times \sqrt{3} = 4\sqrt{3}$

$2\sqrt{75} = 2\sqrt{25 \times 3} = 2 \times \sqrt{25} \times \sqrt{3} = 10\sqrt{3}$

Then do the sum (leaving your answer in terms of $\sqrt{3}$):

$\sqrt{300} + \sqrt{48} - 2\sqrt{75} = 10\sqrt{3} + 4\sqrt{3} - 10\sqrt{3} = 4\sqrt{3}$

2. A rectangle with length $4x$ cm and width x cm has an area of 32 cm^2. Find the exact value of x, giving your answer in its simplest form.

Area of rectangle = length × width = $4x \times x = 4x^2$

So $4x^2 = 32$

$x^2 = 8$

$x = \pm\sqrt{8}$

You can ignore the negative square root (see p.22) as length must be positive.

'Exact value' means you have to leave your answer in surd form, so get $\sqrt{8}$ into its simplest form:

$\sqrt{8} = \sqrt{4 \times 2} = \sqrt{4}\sqrt{2}$

$= 2\sqrt{2}$ So $x = 2\sqrt{2}$

3. Write $\dfrac{3}{2 + \sqrt{5}}$ in the form $a + b\sqrt{5}$, where a and b are integers.

To rationalise the denominator, multiply top and bottom by $2 - \sqrt{5}$:

$$\frac{3}{2 + \sqrt{5}} = \frac{3(2 - \sqrt{5})}{(2 + \sqrt{5})(2 - \sqrt{5})}$$

$$= \frac{6 - 3\sqrt{5}}{2^2 - 2\sqrt{5} + 2\sqrt{5} - (\sqrt{5})^2}$$

$$= \frac{6 - 3\sqrt{5}}{4 - 5} = \frac{6 - 3\sqrt{5}}{-1} = -6 + 3\sqrt{5}$$

(so $a = -6$ and $b = 3$)

Learn the 6 rules for manipulating surds, then give these Exam Practice Questions a go...

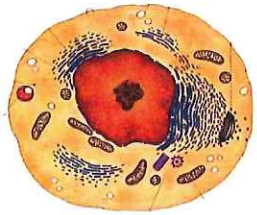
Q1 Simplify $\sqrt{180} + \sqrt{20} + (\sqrt{5})^3$ [3 marks]

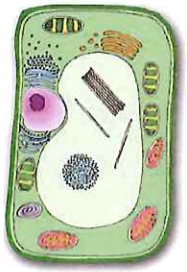
Q2 Write $\dfrac{2}{2 + \sqrt{3}}$ in the form $a + b\sqrt{3}$, where a and b are integers. [3 marks]

Q1 $13\sqrt{5}$ Q2 $4 - 2\sqrt{3}$

Year 11 Knowledge organiser B2 Topic 1

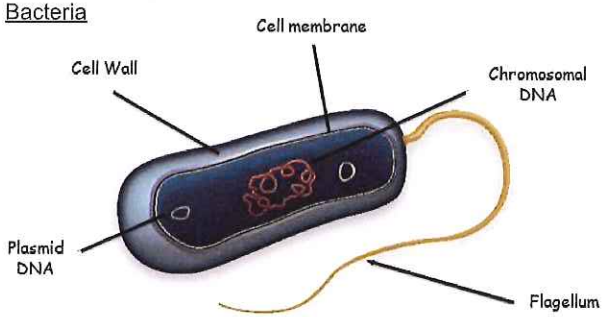
Plant and animal cells





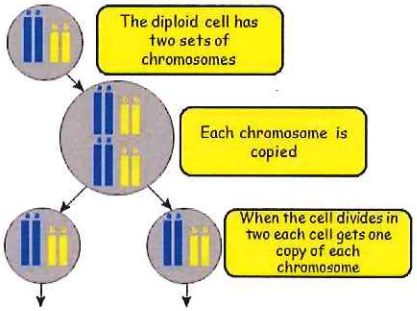
Nucleus	Nucleus
Cytoplasm	Cytoplasm
Cell membrane	Cell membrane
Mitochondria	Mitochondria
	Vacuole
	Cell Wall
	Chloroplasts

Bacteria



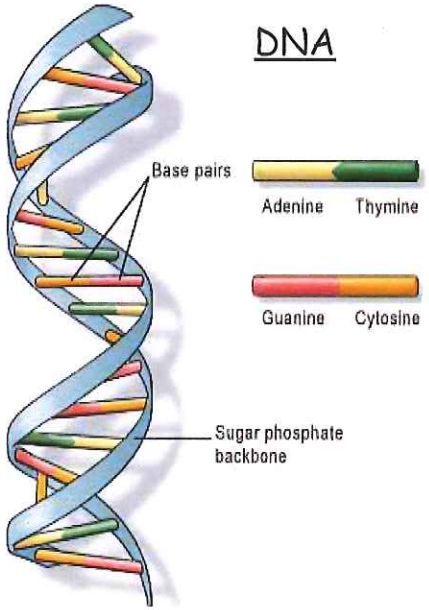
Feature	Animal Cell	Plant/ Algal Cell	Bacterial Cell
Cell Membrane	✓	✓	✓
Nucleus	✓	✓	✗
Plasmids	✗	✗	✓
Chloroplasts	✗	✓	✗
Cell Wall	✗	✓	✓
Cytoplasm	✓	✓	✓

Mitosis



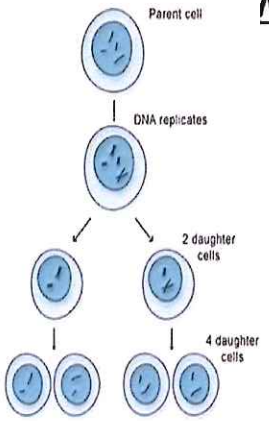
The nuclei contain two copies of each chromosome.
They are **diploid cells!**

DNA



Double helix structure. 4 complementary bases pair together through hydrogen bonds.
Adenine and Thymine pair together with 2 hydrogen bonds.
Guanine and Cytosine pair together with 3 hydrogen bonds.

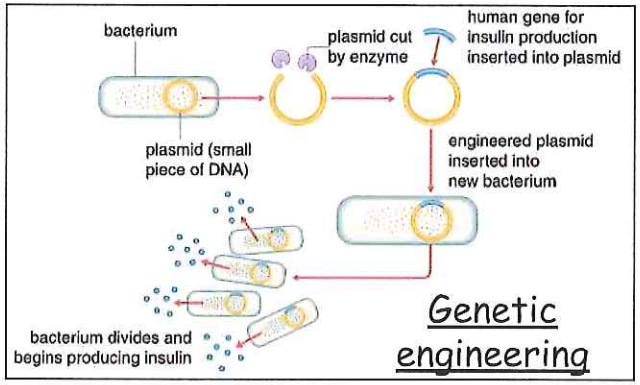
Meiosis



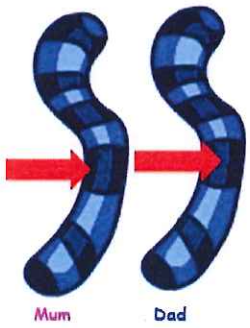
This occurs in the sexual organs to produce gametes.

The chromosome number is reduced by half.

Each of the 4 gametes produced are slightly different from each other.

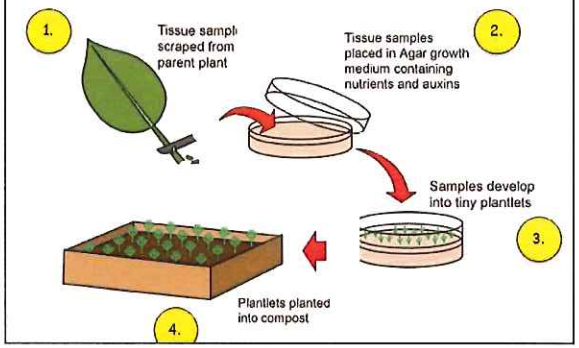


Genes



- Are sections of DNA (shown on the chromosome)...
- Genes code for a specific characteristics (e.g. Eye colour).
- Genes are inherited from our parents.
- Genes come in different forms, these are known as alleles.

Cloning Plants 2 – Tissue Culture



Enzymes inside cells

During DNA replication one enzyme is needed to split apart the two strands of DNA

Another enzyme is needed to join together the bases again to make new strands of DNA

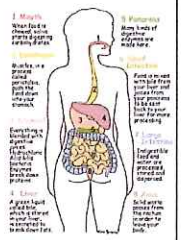
Enzymes outside cells

Microorganisms on food also release digestive enzymes

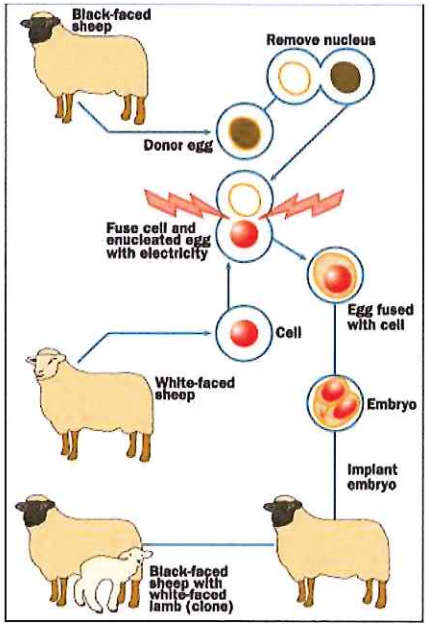
This fungi is releasing the enzymes to break down the food molecules into smaller pieces so it can be absorbed through the cell wall of the fungi

Enzymes outside cells

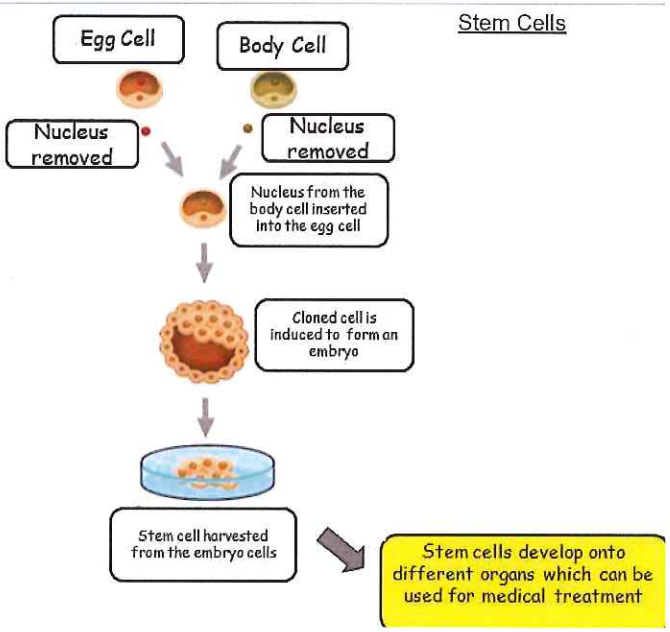
- There are various enzymes found around your body to help break down large food molecules into smaller ones
- For example the enzyme amylase in your mouth breaks down carbohydrates in the mouth as you chew



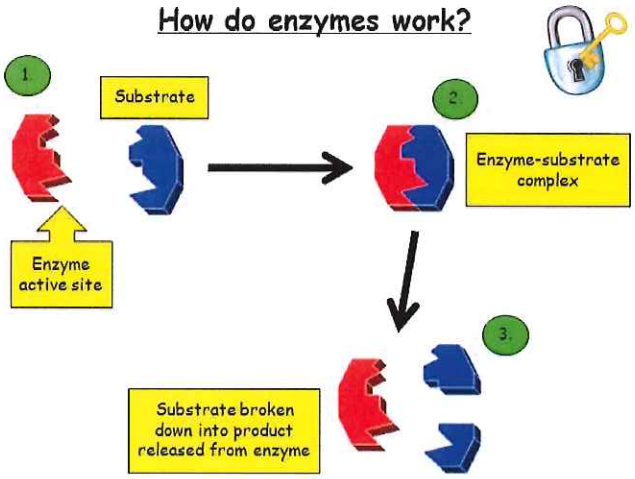
Cloning

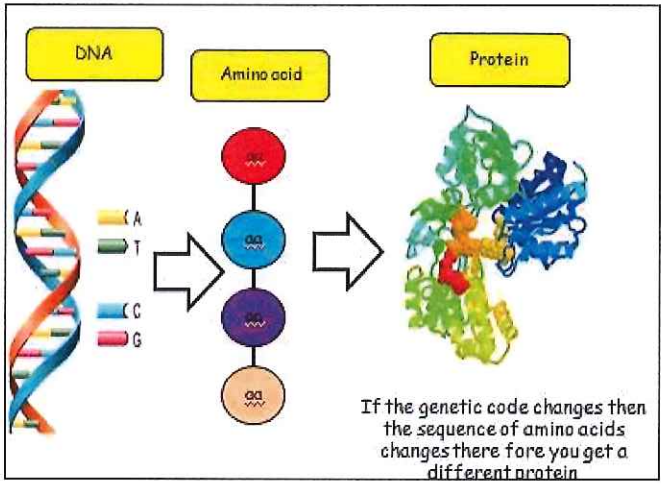


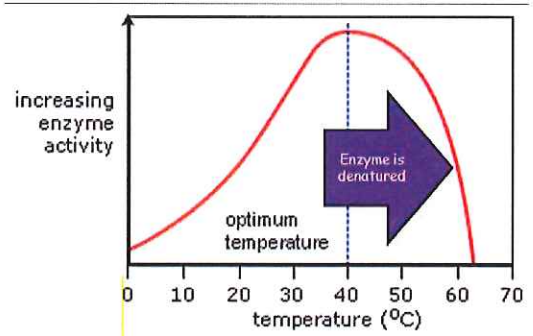
Stem Cells

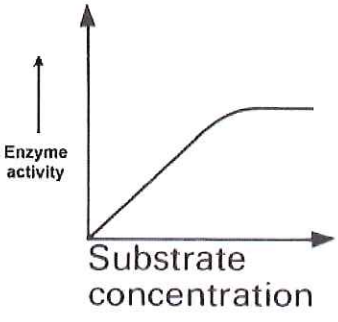


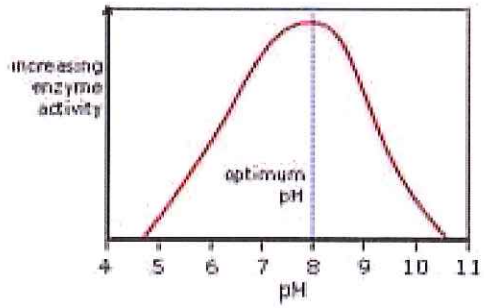
How do enzymes work?









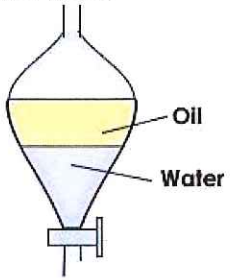


Year 11 Additional Science Knowledge Organiser

C2 Topic 3 and 4

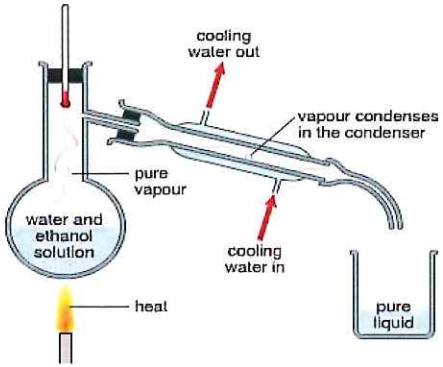
Separating techniques

"Immiscible" means "two liquids that can't be dissolved", e.g. oil and water

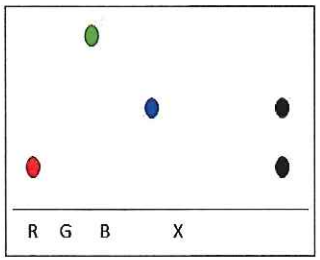


Separating these liquids is fairly easy – you simply allow them to settle and then "tap off" the heavier liquid at the bottom using a separating funnel.

Miscible liquids are liquids that have dissolved together, so separating them is much harder



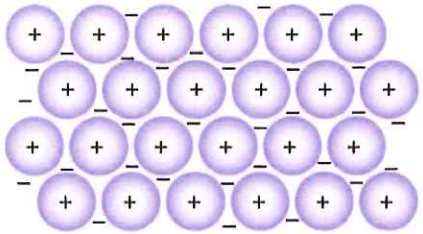
Distillation: This apparatus can be used to separate water and ethanol because they have different boiling points. The ethanol will evaporate first, turn back into a liquid in the condenser and collect in the beaker. The water remains in the round flask, as long a the temperature doe not exceed 100°C.



Chromatography can be used to separate a mixture of different inks.

$$R_f \text{ value} = \frac{\text{Distance travelled by substance}}{\text{Distance travelled by solvent}}$$

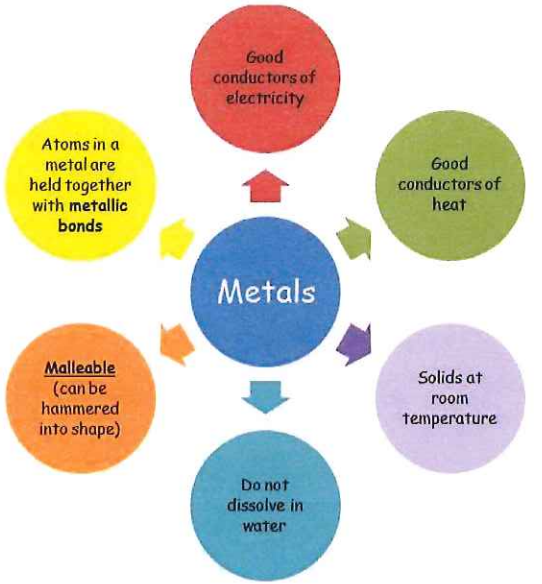
Metallic bonding



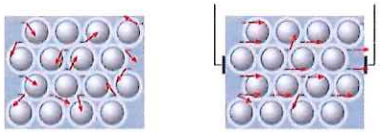
All metals have a few electrons in their outer shell of their atoms.

The outer electrons are free to move about through the structure (we call this a sea of electrons)

The electrons are not located to any specific atom so we call them delocalised electrons



How do metals conduct electricity?

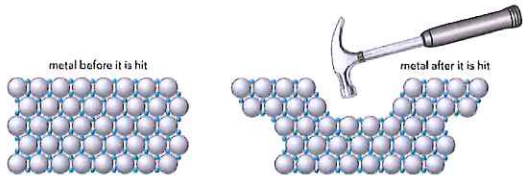


If a potential difference is applied across a piece of metal then the electrons start to drift in one direction

This movement of electrons is called an electrical current

Most conduct electricity because the delocalised electrons can move

Why are metal malleable

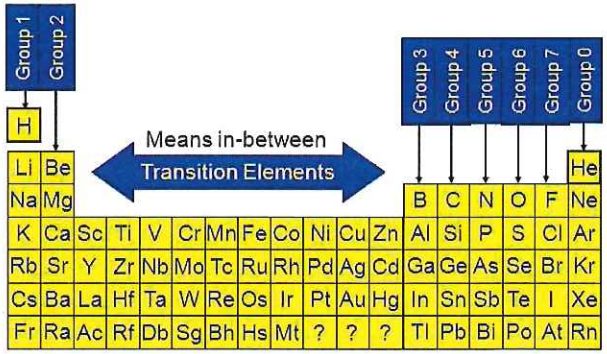


Because the positive ions can slide over each other if a large force is applied to the metal

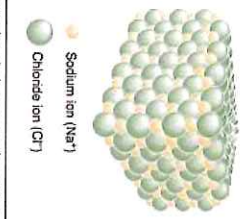
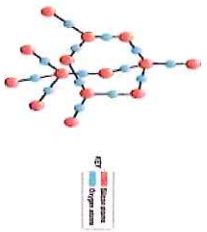
The ions are still held together by the sea of electrons so the metal spreads out instead of breaking.

Most metals are transition metals. These are in the central block of the periodic table

Most transition metals have high melting and boiling points and form coloured compounds (Properties!)



Year 11 C2 – Discovering Chemistry Topic 4

	Ionic	Simple Molecular Covalent	Giant Molecular Covalent
How the Bonds form	The metal (Na+ in this case) lose electrons to form positive ions (Cations) The non metal (Cl- in this case) gain electrons to form negative ions (anions)	The atoms share electrons to get a full outer shell	The atoms share electrons to get a full outer shell
Examples			
Strength of bonds	Strong bonds between the atoms	Strong bonds between the atoms in each molecule Weak forces holding the separate molecules together	Strong bonds extending across all atoms in the structure
Melting and Boiling points	All ionic compounds have high melting and boiling points	Low – Mostly liquid or gases and room temperature	Very high – solids at room temperature
Solubility	Soluble – Many dissolve in water	Some dissolve in water	Insoluble in water
Do They conduct electricity?	Will conduct electricity when molten or in a solution. Do not conduct when a solid	The do NOT conduct electricity Don't contain ions	No – Except graphite which is a conductor

Ionic Bonding	Covalent bonding
Happens between a metal and a non metal	Happens between non metals
Take electrons from one another	Share electrons
High melting point and boiling point	Low melting and boiling point
Strong force of attraction between molecules (Strong Bonds)	Weak force of attraction between molecules

Simple molecular covalent

Giant molecular covalent

The type of covalent bonding will determine the properties.

Group 0 – The Noble gases

09/05/2013

He
Ne
Ar
Kr
Xe
Rn

1) These elements have 8 electrons in their outer shell

2) This means they are unreactive

Group 7 – The halogens

09/05/201

F
Cl
Br
I
At

Each molecule has a strong force holding the atoms together, but the forces between molecules are very weak so chlorine is a gas at room temperature and is pale yellow.

The forces between molecules are slightly stronger so bromine is a liquid at room temperature. It is reddish-brown in colour.

Iodine is a solid at room temperature but with gentle heating it will melt. The atoms will remain in pairs (diatomic). In solid form iodine is grey like metal but gaseous iodine is purple.

Group 1 – The alkali metals

Li
Na
K
Rb
Cs
Fr

1) These metals all have one electron in their outer shell.

2) Density increases as you go down the group, while melting point decreases

3) Reactivity increases as you go down the group. This is because the electrons are further away from the nucleus every time a shell is added, so they are given up more easily.

4) They all react with water to form an alkali (hence their name) and hydrogen

Potassium + water ⟶ potassium hydroxide + hydrogen

$2K_{(s)} + 2H_2O_{(l)} \longrightarrow 2KOH_{(aq)} + H_{2(g)}$

All of the noble gases have a full outer shell, so they are very stable

They all have low melting and boiling points and are inflammable

They exist as single atoms rather then diatomic molecu

Helium is lighter then air and is used in balloons and airships (as well as for talking in a silly voice)

Argon is used in light bulbs (because it is so unreactive) and argon , krypton and neon are used in fancy lights

F
Cl
Br
I

Decreasing reactivity

Displacement Reactions

	Potassium chloride $KCl_{(aq)}$	Potassium bromide $KBr_{(aq)}$	Potassium iodide $KI_{(aq)}$
Chlorine Cl_2			
Bromine Br_2			
Iodine I_2			

Keywords: Current, ammeter, in series, series circuit, parallel circuit, voltmeter

P2 Topic 2: Controlling and using electric currents

This topic looks at:

- How we measure current and voltage
- The relationship between voltage, current and resistance
- How the resistance of a circuit be changed
- How energy is transferred

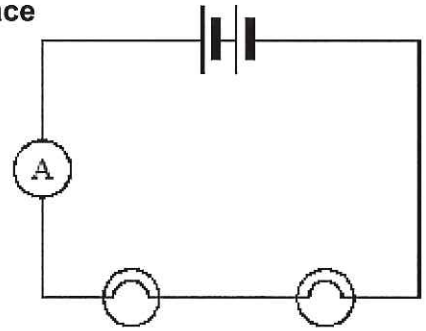
V = I × R

This is the equation for calculating voltage-
V is voltage measured in volts.
I is current measured in amps.
R is resistance measured in amps.

P = I × V

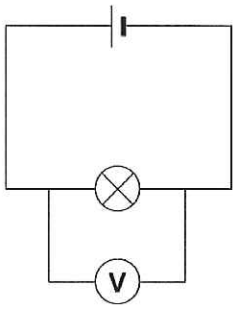
This is the equation for calculating power.
V is voltage measured in volts.
I is current measured in amps.
P is power measured in watts.

A series circuit with an ammeter in place



An ammeter is placed in series into the cicruit

A circuit with a voltmeter connected



An ammeter is placed in parallel into the cicruit

Current in a **series** circuit is the same all the way round. Current in a **parallel** circuit splits up and then adds together at the end.

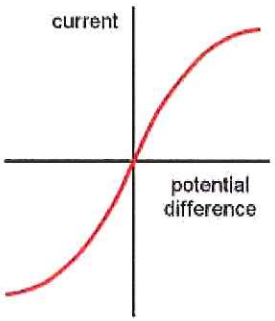
Potential Difference

This is the difference in energy before and after a component. This is otherwise known as voltage and is measured in volts.

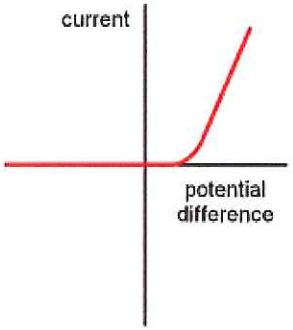
Ohms Law

The current flowing **through** a *resistor* at a constant temperature is directly proportional to the voltage **across** the resistor. So, if you double the voltage, the current also doubles. This is called Ohm's Law. The graph shows what happens to the current and voltage when a resistor follows Ohm's Law.

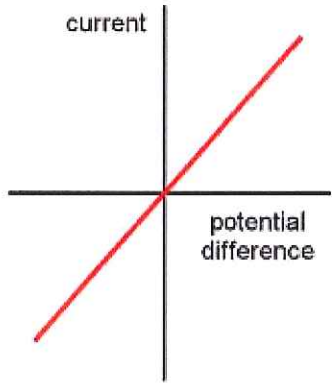
Current varies with potential difference filament lamps



Current varies with potential difference diodes



Current varies with potential difference for fixed resistors



Keywords: potential difference, resistance, ohms, filament lamps, diodes, thermistors, LDR's, power

Keywords: Current, ammeter, in series, series circuit, parallel circuit, voltmeter

P2 Topic 3:Motion and Forces

This topic looks at:

- Velocity
- Acceleration
- Distance-time graphs and Velocity-time graphs
- Action-reaction pairs
- Resultant Force

Definition of forces

- **Displacement** is the **distance** travelled in a **straight** line. It has both a direction and a size.
- The **velocity** of an object is its **speed** in one particular **direction**.
- The **acceleration** of an object is calculated from its change in **velocity** and the **time** taken.
- The **force** of an object is also a vector as it has a size (measured in Newtons) and a direction.

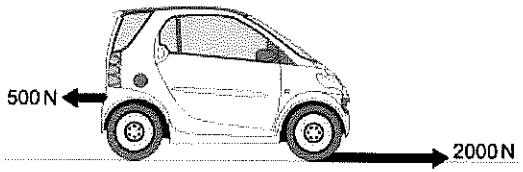
Three stages of falling object:

- When an object is dropped, we can identify three stages before it hits the ground:
- At the start, the object accelerates downwards because of its weight. There is no air resistance. There is a resultant force acting downwards.
- As it gains speed, the object's weight stays the same, but the air resistance on it increases. There is a resultant force acting downwards.
- Eventually, the object's weight is balanced by the air resistance. There is no resultant force and the object reaches a steady speed, called the **terminal velocity**.

- An object may have several different forces acting on it, which can have different strengths and directions. They can be added together to give the **resultant force**. This is a single force that has the same effect on the object as all the individual forces acting together.
When an object is stationary the resultant force is zero

Calculating Resultant Force

The force is 500N backwards and 2000N forces. The resultant force is 2000-500= 1500N in a forward direction



The relationship between resultant force, mass and acceleration, and be able to use it.
The equation
Resultant force (newton, N) = mass (kg) × acceleration (m/s^2).
You can see from this equation that 1 N is the force needed to give 1 kg an acceleration of 1 m/s^2.
For example, the force needed to accelerate a 10 kg mass by 5 m/s^2 is:
10 x 5 = 50 N
The same force could accelerate a 1 kg mass by 50 m/s^2 or a 100 kg mass by 0.5 m/s^2.

Mass and weight
Mass is a measurement of the amount of matter something contains measured in Kg.
Weight is the measurement of the pull of gravity on an object measured in N.

The value of gravitation strength on earth is 10 N/kg (ten newtons per kilogram). This means an object with a mass of 1kg would be attracted towards the centre of the **Earth** by a **force** of 10N.

On the moon in 1971, astronaut David Scott dropped a feather and a hammer at the same time this happened because the Moon's gravity is too weak for it to hold onto an atmosphere, so there is no air resistance. When the hammer and feather were dropped, they fell together with the same acceleration.

Keywords: potential difference, resistance, ohms, filament lamps, diodes, thermistors, LDR's, power

Biology Topic 1

Core Science (11Y3 and 11Y3)

KNOWLEDGE ORGANISER- YEAR 11 AUTUMN TERM 1

Keyword	Definition
Adaptation	Features that allow organisms to adapt to a specific habitat.
Binomial	A system of naming a species of living things. The name is in two parts a common and specific term.
Chordata	This is the animal phylum.
Hybridisation	Breeding two different species.
Hybrid	The offspring of two different species. A hybrid will be infertile.
Mutation	The change to a DNA base which can result in the production of a different protein.
Thermoregulation	The regulation of body temperature.
Viruses	A small infectious living thing that invades an lives in animal cells.
Evolution	A change to a living thing over time, possibly due to environmental and genetic changes.
Fertilisation	The meeting of the sperm and an egg.
Recessive	An allele that does not have an effect on the phenotype of a species.
Dominant	An allele that has an effect on the phenotype of a species.
Unicellular	A living thing that is just one cell.
Vertebrates	A living thing with a backbone.

Keyword	Definition
Five Kingdoms	The first division of living things. Animals, Plants, Fungus, Prokaryotes, Protoctists.
Species	The largest group of any living organism.
Family	The division of a species in classification.
Genus	The division of a family in classification.
Order	The division of a genus in classification.
Class	The division of a order classification.
Phylum	The division of class in classification.
Animalia	All animals that are multicellular
Plantae	All green plants that are multicellular.
Fungi	Different from plants and animals , they can be unicellular and multicellular often producing fruit or mould.
Protoctists	Unicellular with a nucleus
Prokaryotae	A kingdom with no true nucleus.

Core Science (11Y3 and 11Y3) **KNOWLEDGE ORGANISER- YEAR 11 AUTUMN TERM 1**

Chemistry (Topic 1/2)

Keyword	Definition
Condense	Change from a gas or vapour to a liquid (e.g. water vapour to liquid water)
Water vapour	Water in its gaseous state (steam)
Photosynthesis	Process by which plants convert carbon dioxide and water into glucose and oxygen
Carbon sink	Natural systems that remove carbon dioxide from the atmosphere (e.g. the ocean)
Dissolve	To become incorporated into a liquid
Deforestation	The removal of areas of forest
Atmosphere	Consists of 78% nitrogen, 21% oxygen, small amounts of carbon dioxide, water and other gases.
Igneous rock	Rock formed through cooling and solidification of magma or lava
Sedimentary rock	Rock formed from sediments that have settled at the bottom of a lake or ocean and been compressed over millions of years
Metamorphic rock	Rock formed from either igneous or sedimentary rock due to heat and pressure
Solidify	Harden into a solid
Soluble	Able to be dissolved

Physics Topic 1

Keyword	Definition
Geocentric Model	A model explaining the earth is at the centre of the solar system
Heliocentric Model	A model explaining the sun is at the centre of the solar system.
Refractive Telescope	Use lenses to gather light.
Reflective Telescope	Use mirrors to gather light.
Eyepiece lens	Magnifies an image (make the image bigger).
Objective lens	Gathers light from an object and focusses the light.
Frequency	The number of waves in 1 second. This is measured in hertz (Hz).
Wavelength	The length of a wave from peak to peak measured in metres.
Amplitude	The height of a wave measured in metres.
Wave speed	How quickly a wave moves and is related to frequency and wavelength measured in m/s.
Transverse Wave	Waves where the vibrations are at right angles to the direction of travel. Examples are water and S waves.
Longitudinal Wave	These are waves where vibrations are along the same direction that a wave travels. Examples are sound waves and P waves.

Biology Topic 2

Core Science (11Y3 and 11Y3)

KNOWLEDGE ORGANISER- YEAR 11 AUTUMN TERM 2

Keyword	Definition
Glands	Release hormones
Hormones	A chemical produced in the body that controls cells and organs.
Nerves	
Insulin	A hormone that lowers blood sugar levels.
Glycogen	A hormone that raises blood sugar levels.
Organs	The part of the body that does a job eg. Heart and lungs.
Receptors	Specialised cells that detect a stimulus eg. Pin prick
Regulation	Controlling a body system eg. Temperature
Relay	Carry electrical impulses from one part of the nervous system to the next.
Neurone	A nerve cell that carries an electrical impulse.
glucose	The scientific name for sugar.
Central Nervous System.	The brain and spinal cord involved in the nervous system.
Stimuli	Detected by receptors eg. Touching a hot pan.
Response	The movement controlled by the nervous system.

Keyword	Definition
Effector	Part of the nervous system which help create a response. An effector is usually a muscle.
Rooting powder	Powder used to produce cutting of plants. It contain plant growth hormones.
Seedless fruit	A fruit that does not contain a seed.
Auxin	The plant hormone that controls growth.
Phototropism	The growth of a plant towards the light.
Electrical impulse	Electricity transferred between nerve cells.
Internal	Inside a living organism.
Diet	The food and drink taken in by a living organism.
Brain	An organ that controls the nervous system.
Blood Vessels	A network of tubes that carry blood around the body.
Homeostasis	Maintaining a constant internal environment.

Chemistry (Topic 2) **Core Science (11Y3 and 11Y3)** **KNOWLEDGE ORGANISER- YEAR 11 AUTUMN TERM 2**

Keyword	Definition
Magma	Molten (melted) rock stored in the Earth's crust
Lava	Magma that has reached the Earth's surface through a volcano
Limestone	A sedimentary rock also known as calcium carbonate ($CaCO_3$). Used as a building material
Calcium Carbonate	($CaCO_3$) A white insoluble solid that occurs naturally as chalk, limestone and marble
Thermal Decomposition	A reaction in which a substance is broken down into at least 2 other substances by heat
Calcium Oxide	(CaO). A white/grey solid formed with carbon dioxide when calcium carbonate is thermally decomposed
Cement	Produced when limestone is heated with clay
Mortar	Cement and sand added together (with water)
Concrete	Cement, sand and aggregate added together (with water)
Precipitation Reaction	A mixture of two solutions (soluble salts) to form an insoluble solid.
Conservation of Mass	The total mass of products at the end of a reaction is equal to the total mass of reactants at the beginning. Mass is never lost or gained in chemical reactions.
Limewater	The common name for calcium hydroxide ($Ca(OH)_2$)

Physics (Topic 2)

Keyword	Definition
Electromagnetic spectrum (EM)	Radiation in order of frequency and wavelength.
Radio waves	Long wavelength used of long distance communication.
Microwaves	Used for mobile phone communication and heating food.
Infra-red	Used in wireless internet cables and remote controls.
Visible Light	Used to see things
Ultra- Violet	Used to test for forged bank notes and to sterilise water.
X rays	Used for medical imaging.
Gamma rays	Used to sterilise medical equipment and treat cancer.
Cancer	A uncontrollable growth of cells.
Ionising	Radiation that can changes particles by knocking electrons off atoms.
Source	An object which releases radiation.

How a fossil is formed

The carcass is quickly submerged by flooding. The river carries sediment which begins to bury the carcass

The flesh decomposes and the skeleton is left buried in a layer of sediment

A Dinosaur dies at a stream's edge

Over millions of years the bones are slowly replaced by minerals

Eventually the rocks above the skeleton are worn away and the fossil is exposed

Red blood cells

- Red blood cells contain the red pigment **haemoglobin**.
- Haemoglobin combines with oxygen to form **oxyhaemoglobin**:

haemoglobin + oxygen → oxyhaemoglobin

What is the oxyhaemoglobin then used for?

Plasma

- Plasma is a yellow liquid.
- It transports dissolves substances like carbon dioxide, food substances and hormones.

Examiners Tip

Students often only give one reason for gaps in the fossil record. I have mentioned 3

1.Soft tissue decays so doesn't form a fossil

2.The fossil hasn't been found yet

3.Dead animal bones where destroyed before a fossil could be formed

The easiest way to observe growth is to measure an increase in size, length or mass.

Does a balloon grow when you blow it up?

You have to be careful when you measure growth

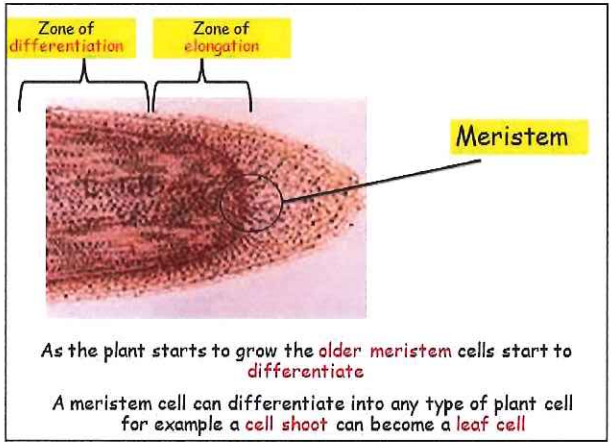
When you blow up a balloon it gets bigger but the amount of balloon material stays the same so this IS NOT GROWTH

Red blood cells

Red blood cells have a biconcave disc shape.

This allows for a large surface area to volume ratio for oxygen to diffuse into/out of the cell.

A red blood cell has no nucleus, giving it more room for haemoglobin.

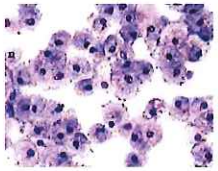


As the plant starts to grow the older meristem cells start to differentiate

A meristem cell can differentiate into any type of plant cell for example a cell shoot can become a leaf cell

White blood cells

- White blood cells help defend against disease.
- Some make antibodies- these are proteins that bind to micro-organisms and destroy them.
- Other white blood cells surround and destroy foreign cells that get into the body.

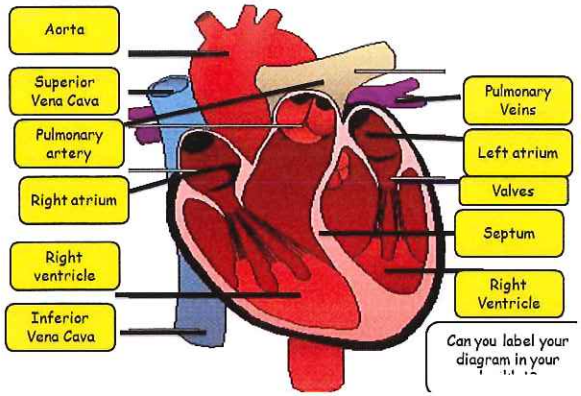


Platelets

- Platelets are tiny fragments of cells (so no nuclei).
- They are important in making blood clot if you cut yourself.
- The clot dries out and forms a scab to protect from microbes.

People with thrombocytopenia do not have enough platelets- suggest the symptoms of the disease and explain your reasoning.

Cross section diagram of the heart



Digesting carbohydrates

Simple carbohydrates are sugars- these can be built into more complex carbohydrates like starch.

Carbohydrases break down carbohydrates.

Example: - Amylase is produced in the saliva and in the pancreas- it breaks starch down

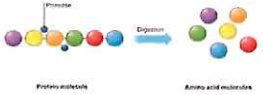
Digesting proteins

Proteases break proteins into amino acids.

Example: - Pepsin is a protease made in the stomach.

Protease has an optimum pH of 2-3, hence the stomach makes acid.

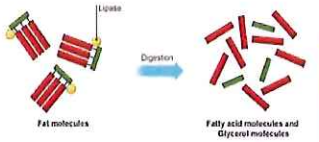
Proteases released in the small intestine work best at pH8



Digesting fats

Lipases break fats into fatty acids and glycerol.

Found in the stomach or small intestine



An example would be pancreatic lipase which breaks down fats in the pancreas

Remember fats are called lipids so this might help you remember that a lipase breaks down fat

Blood from body tissues

↓

Enters heart via vena cava

↓

Enters right atrium

↓

Pumped into right ventricle (through valves)

↓

Blood pumped to lungs via pulmonary artery

↓

Blood in lungs picks up oxygen

↓

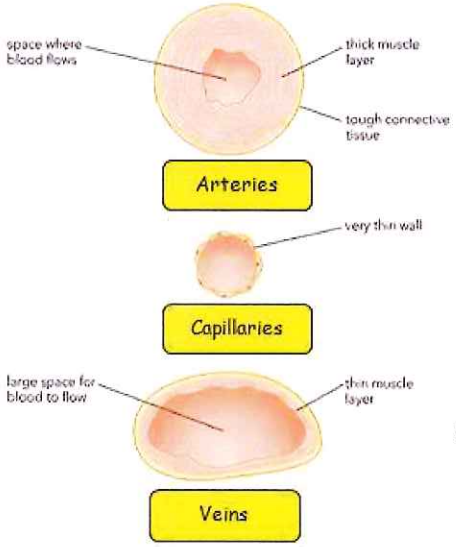
Blood returns to left atrium via pulmonary vein

↓

Blood pumped into left ventricle

↓

Blood pumped into aorta to be transported to body



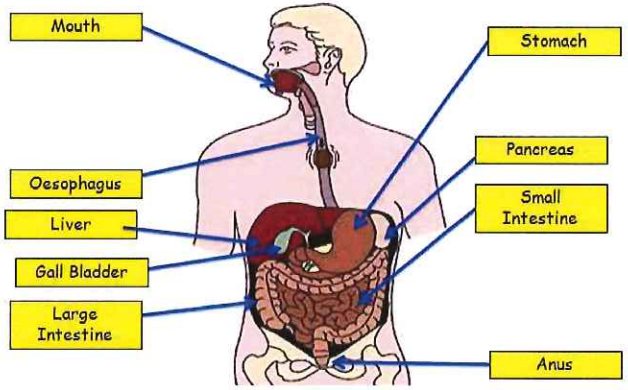
Summary

Arteries
Carry blood away
Thick walls to cope with high pressure

Veins
Carry blood to the heart
Thin wall as they are under low pressure

Capillaries
Allow substances to diffuse into organs and tissues
Very thin walls

Positions of organs in the digestive system



You need to know the order of the digestive organs and where food travels to and from

The digestive system is made up of the alimentary canal, a muscular tube running through the body from mouth to anus and several other organs that make chemicals needed for digestion (including enzymes!)

Plant stanol esters

These are oily substances found in plants.

Scientists have discovered that these can prevent the small intestine from absorbing cholesterol.

High cholesterol levels have been linked to increased risk of heart disease.

There is clear evidence that these do have an effect.

Prebiotics

Prebiotics act as food for beneficial gut bacteria.

We can't digest prebiotics.

Tomatoes, bananas and asparagus all contain oligosaccharides- a common form of prebiotic.

Prebiotics may also be found in pre made diary products or capsules.

Probiotics

Probiotics contain 'friendly' bacteria- usually *Lactobacillus* and *Bifidobacteria*.

They contain live bacteria!

These produce lactic acid in the gut.

Keywords: seat belt, airbag, crumple zones, gravitational potential, kinetic

P2 Topic 4: Momentum, energy, work and power

This topic looks at:

- Stopping distances
- Momentum
- Vehicle Safety
- Work and Power
- Potential and Kinetic energy

momentum (kg m/s) = mass (kg) × velocity (m/s)

$$\text{force} = \frac{\text{change in momentum}}{\text{time taken for change}}$$

kinetic energy = ½ x mass x velcoity²

Momentum is

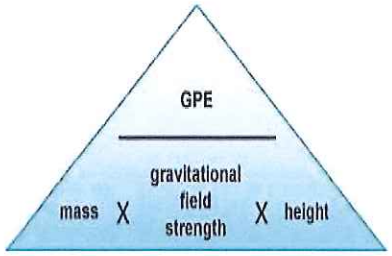
This is the tendency of the object to keep moving in the same direction. It is difficult to change the direction of movement of an object with a lot of momentum.

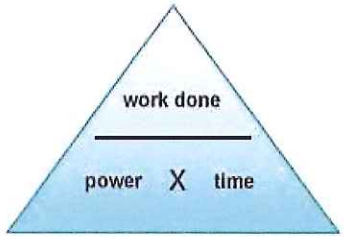
Type of energy

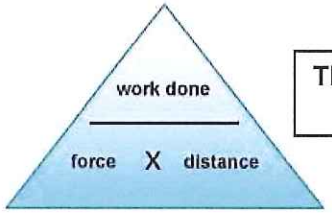
Light, sound, electrical, chemical, gravitational, elastical, Heat, kinetic

The law of conservation of energy

Energy is always transferred it is never destroyed.







The unit of energy is joules.

Definitions

- **A change in momentum happens when a force is applied to an object that is moving or is able to move. The total momentum in an explosion or collision stays the same.**
- To be a **safe driver** you need to understand the factors that affect a car's **stopping distance**.
- The stopping distance depends on two factors:
- **Thinking distance** - It takes **time** for a driver to **react** to a situation. During this reaction time the car carries on moving. The **thinking distance**is the distance travelled in between the driver **realising** he needs to brake and actually braking.
- **Braking distance** - The braking distance is the distance taken to **stop** once the brakes are applied.

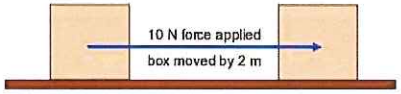
Whenever 'work' is done energy is transferred from one place to another. The amount of work done is expressed in the equation: work done = force x distance.

Power is a measure of how quickly work is being done. Power is expressed in the equation: power = work done / time taken.

Work and force

Work done

Work is done whenever a force moves something.



Everyday examples of work include walking up stairs, or lifting heavy objects. Whenever work is done **energy** is transferred from one place to another. Both energy and work are measured in **joules, J.**

Work done (joules, J) = energy transferred (joules, J)

The amount of work done depends on:

- The size of the **force** on the object
- The **distance** the object moves

How a pendulum work

When the pendulum bob is at the start of its swing it has no kinetic energy because it is not moving. If however, its *gravitational potential energy (GPE)* is at a maximum, because it is at the highest point.

As the bob swings downwards it loses height. Its gravitational potential energy (GPE) decreases. The work done on the bob by the gravitational force (weight) pulling it downwards increases its kinetic energy. The loss of GPE = the gain in KE.

At the bottom of its swing, the bob's kinetic energy is at a maximum and its gravitational potential energy is at a minimum - because it is at its lowest point.

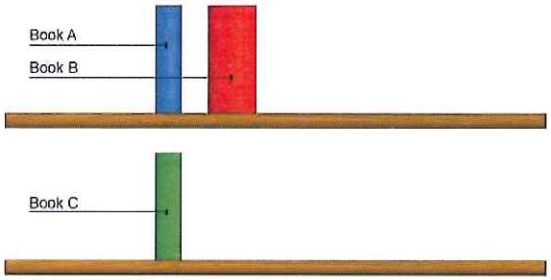
As the bob swings upwards it slows down. Its kinetic energy decreases as work is done against its weight. As it gains height the gravitational potential energy increases again.

At the very top of its swing it stops for a moment. It once again has no kinetic energy, but its gravitational potential energy is at a maximum.

Gravitational potential energy (GPE)

On Earth we always have the force of **gravity** acting on us. When we're above the Earth's surface we have **potential** (stored) energy. This is called **gravitational potential energy**. The amount of gravitational potential energy an object on Earth has depends on its:

- Mass
- Height above the ground



Books on a shelf have gravitational potential energy.

Book A has more than book C as it's **higher.**

Book B has more than book A because it has a greater **mass.**

Examples of Exothermic Reactions

Fuels burning (Combustion)

When a fuel burns in oxygen, energy is transferred to the surroundings

Fuel (Methane) + Oxygen ⟶ Carbon Dioxide + Water + Energy

Respiration

A special kind of burning - reacting sugar with oxygen inside cells

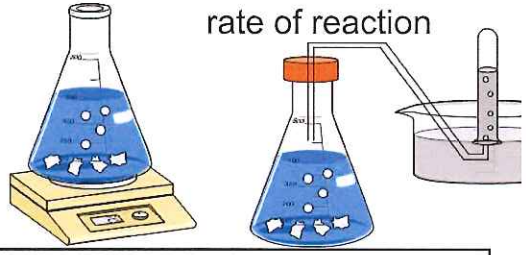
Glucose + Oxygen ⟶ Carbon Dioxide + Water + Energy

Examiners Tip

Many students lose marks in exams by stating that energy is released when bonds are broken. This is wrong
When bonds are broken in the reactants, energy is needed!.

Remember breaking bonds means taking energy

Common methods to measure rate of reaction



Chemical reactions occur when different atoms or molecules collide with each other but they HAVE to collide with enough energy.

Year 11 C2 – Discovering Chemistry

Topic 5

A reaction is EXOTHERMIC if more energy is RELEASED then SUPPLIED. If more energy is SUPPLIED then is RELEASED then the reaction is ENDOTHERMIC

Rate of Reaction

The rate of a chemical reaction is the speed at which it takes place.

Magnesium reacting with acid

Magnesium reacting with acid has a fast rate of reaction

This is because the reactants are used up quickly to make products!

Magnesium + Hydrochloric Acid → Magnesium Chloride + Hydrogen

Reactants → Products

They are sensitive to pH changes and Temperature

They increase the rate of production of products

Speed up a chemical reaction

A catalysts

They are not used up in a reaction

When the reaction has finished, you would have exactly the same mass of catalyst as you had at the beginning.

Examples of Endothermic Reactions

Much less common than exothermic!

- Photosynthesis

Plants turn carbon dioxide and water into sugar and oxygen using energy from the sun

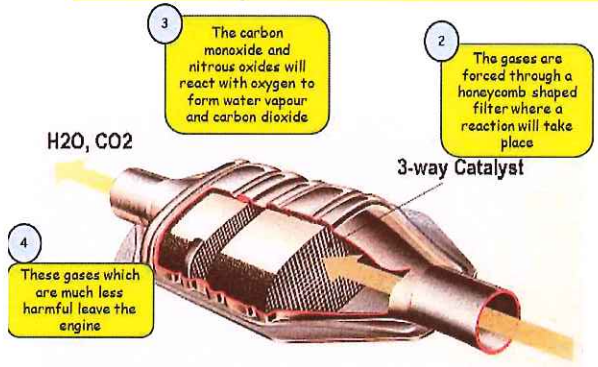
Carbon Dioxide + Water + Energy ⟶ Glucose + Oxygen

- Thermal decomposition of calcium carbonate to form calcium oxide and carbon dioxide

It takes a great deal of energy from its surroundings

Basically, the more collisions we get and the more energetic they are the faster the reaction goes. The rate at which the reaction happens depends on four things:

1) The temperature of the reactants,
2) Their concentration
3) Their surface area
4) The pressure the reactants are



They have a large surface area due to the honey comb structure and work best at high temperatures due to metals like palladium

Year 11 C2 – Discovering Chemistry

Topic 6

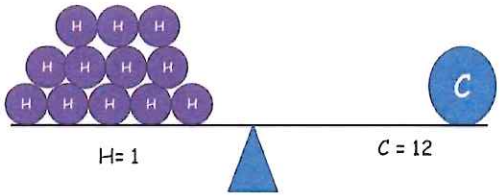
Relative formula mass

Relative atomic mass

The mass of an atom is so tiny would be impossible to use it in calculations

Instead of working with the real masses of atoms we just focus on the relative atomic masses (A_r)

The relative atomic mass is calculated by comparing all elements with a carbon atom

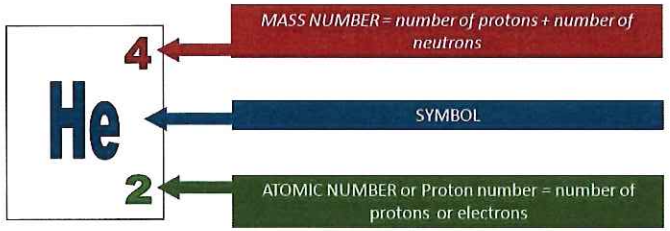


Hydrogen atoms are 12 time lighter than carbon atoms so the have a relative atomic mass of 1

We can use A_r of the various elements to work out the relative formula mass (M_r) of chemical compounds

Na	+	Cl	=	NaCl
Ar		Ar		Mr
23		35.5		58.5

We simply add the relative atomic mass of the elements together to get the relative formula mass



Empirical Formula

The empirical formula shows the simplest whole number ratio of atoms or ions of each element

Symbol for element	S	O
Mass in g	0.4	0.6
Relative atomic mass	32	16
Divide the mass of each element by its relative atomic mass	0.4/32 = 0.0125	0.6/16 = 0.0375
Divide the answers by the smallest number to find the simplest ratio	0.0125/0.0125 = 1	0.0375/0.0125 = 3
Empirical formula	SO_3	

Percentage by mass

You can use the relative masses (Ar and Mr) to calculate the percentage by mass)

$$\text{Percentage by mass of an element in a compound} = \text{The number of atoms in an element} \times \frac{Ar}{Mr} \times 100$$

Yield

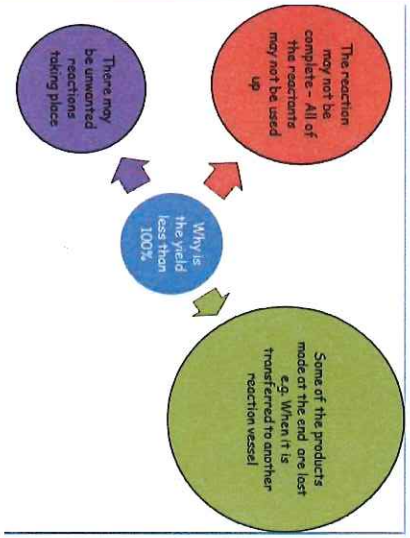
You can calculate the yield of a reaction (so you can calculate how much useful product is being made)

For example

If you react 4g of hydrogen with 32g of oxygen you get 36g of water (4g + 32g)

However this is the theoretical yield – in practice you often do not get this much

$$\text{Percentage yield} = \frac{\text{Actual yield}}{\text{Theoretical yield}} \times 100$$



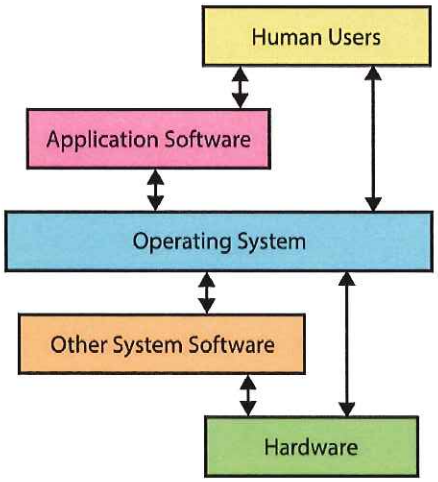
Possible problems with making chemicals:

1) Reactions often produce chemicals that aren't commercially useful or that can't be sold
2) Reactions can also produce chemicals that present environmental and social problems.

GCSE Computer Science | **Software**| Required knowledge

Software
- System
- Application
- Utility

System software
- **Software that controls the hardware.**
  - Operating system



User interface software
- Allow user to control and interact with a computer.
- **Command line interface**
- **Graphical user interface (GUI)**
- **Touch screens**
- **Natural language and speech**
  - **E.g. Siri**

Memory management software
- Virtual memory
- Peripheral memory
- Fragmentation & defragmentation
- Device drivers
- Multitasking

File and directories
- **File systems.**
  - Files stored in directories
  - Directories can include sub-directories
- **File extensions.**
  - Part of file name that indicate the type of file:
    - .doc
    - .pdf
    - .html
    - .mp3
    - .jpg
- **Attributes**
  - Provide extra information about files:
    - Who created the file
    - View or edit it
    - Read-only
    - Size of file
    - Date of last access
    - Date last changed

Security
- Viruses
- Authentication
- Privileges
- Encryption

Programming software
- Editors
- Interpreters
  - Compilers
  - Translators

Application and utilities
- Applications
  - Word processors
  - Hotel booking system
- Utilities
  - Antivirus
  - System clean up
  - Defragmentation

Software procurement
- Custom written software
- Off the shelf software
- Open source software
- Proprietary software

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

GCSE Computer Science | **Computer systems** | Required knowledge

Computer systems.

- Inputs
- Processes
- Outputs
- Importance of computer systems.
- Examples of computer systems.

Types of computer systems.

Advantages / disadvantages of each.

- General-purpose systems
- Dedicated systems
- Control systems
- Embedded systems
- Expert systems
- Management information systems

Reliability of computer systems.

- The need for reliable systems.
    - Examples.
- Data integrity.
- Reliability and testing.

Standards of computer systems.

- Importance of standards.

Definition & examples of the following:

- De facto standards.
- De jure standards.
- Proprietary standards.
- Industry standards.
- Open standards.

Ethical & legal issues.

- Definition of ethical
- Definition of legal.
- Issues:
    - Privacy
    - Data security
    - Fair charging of services
    - Copyright
    - Access to data
- Data protection Act.

Environmental issues.

- **Waste** – obsolete computers need to be disposed of.
- **Energy** – computers use lots of energy.
    - Methods for reducing energy consumption.

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

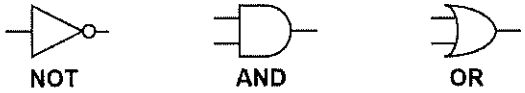
GCSE Computer Science | **Hardware**| Required knowledge

Hardware
- Definition.
- Components
  - Input
  - Process
  - Storage
  - Output
- Computer architecture
  - Von Neumann

Central processing unit (CPU)
- Arithmetic & logic unit
- Control unit.
- Fetch-execute cycle
  - Fetch
  - De-code
  - Execute
- The boot sequence
- Clock speed
  - Processor speeds (MHz, GHz)
- Cache memory
- Multiple processor cores
  - Advantages / disadvantages.

Memory
- Random Access Memory (RAM)
  - Volatile
- Read Only Memory (ROM)
  - Non-volatile
- Virtual memory
- Flash memory

Binary logic
- Why do computers use binary values?
- Logic gates



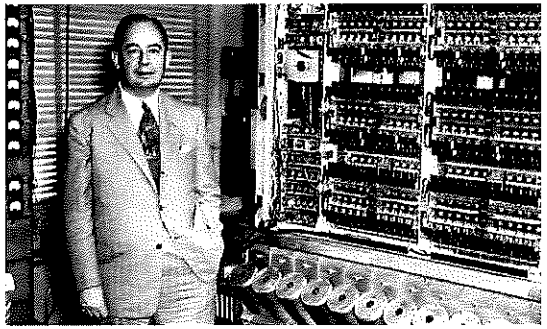
- Truth tables

A	B	Out
0	0	0
0	1	1
1	0	1
1	1	0

Input devices
- Keyboard
- Mouse
- Touch screen
- Microphone
- Camera
- Sensor
- Bar code scanner
- Eye-typer
- Foot mouse
- Puff-suck switch
- Braille keyboard

Output devices
- Monitor
- Printer
- Plotter
- Speakers
- Actuators

Secondary storage
- Magnetic hard disk
- Optical disk
- Flash memory
- Considerations for selecting storage:
  - Capacity
  - Speed
  - Portability
  - Durability
  - Reliability



John Von Neumann

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

GCSE Computer Science | **Data representation**| Required knowledge

Numbers
- Binary – base 2.
- Denary – base 10.
- Converting from binary to denary.
- Converting from denary to binary.
- Adding binary numbers.
  - Overflow error
- Units.
  - Nibble
  - Byte
  - Kilobyte
  - Megabyte
  - Gigabyte
  - Terabyte

Hexadecimal (hex) numbers
- Hex – base 16
- Converting between hex and denary.
- Converting between hex and binary.

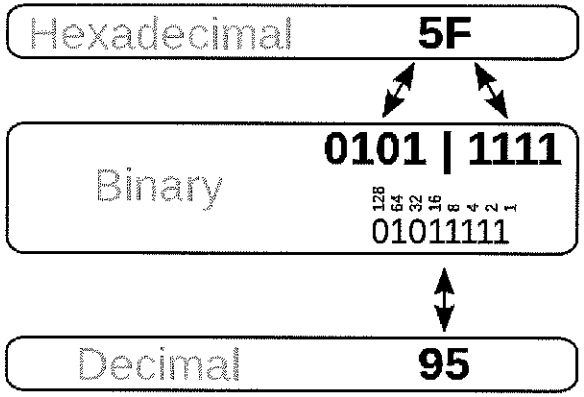
Characters
- Character set.
  - Definition
  - ASCII
  - Unicode

Images
- Stored in binary on a computer.
- Metadata
- Pixel
- Colour depth
- Resolution
- Bitmap images
- Vector images

Sound
- Metadata
- Sample rate
  - Quality of sound
  - File size
- Sample interval
- Bit rate

Instructions
- Fetch-Execute cycle
- Op-code
- Operand
- Accumulator

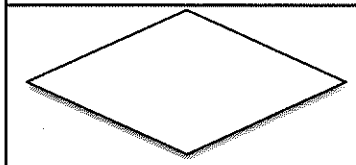
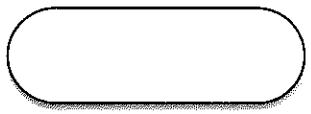
Binary	Hex	Decimal
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	A	10
1011	B	11
1100	C	12
1101	D	13
1110	E	14
1111	F	15



It is your responsibility to make sure you regularly revisit this knowledge outside of class.

Programming and Development

Flow charts like Pseudocode are informal but the most common flow chart shapes :

	Line	An arrow represents control passing between the connected shapes
	Process	This shape represents something being performed or done.
	Sub Routine	This shape represents a subroutine call that will related to a separate, non-linked flow chart
	Input/Output	This shape represents the input or output of something into or out of the flow chart
	Decision	This shape represents a decision (Yes/No or True/False) that results in two lines representing the different possible outcomes
	Terminal	This shape represents the 'Start' and 'End' of the process

Data types

- **Integer** e.g. 23
- **Float** e.g. 23.7
- **Character** e.g. A or 5
- **String** e.g. A546TH
- **Boolean** e.g. TRUE or FALSE.

Comments

- # used to start a comment
- Always in red
- Used to help users understand the program

Comparison operators

Comparison operator	Meaning
==	Is equal to
>	Is greater than
<	Is less than
!=	Is not equal to
>=	Greater than or equal to
<=	Less than or equal to

- Operator priority: **BIDMAS**

Arithmetic operators

+	Addition e.g. x = 6 + 5 gives 11
-	Subtraction e.g. x = 6 - 5 gives 1
*	Multiplication e.g. x = 12 * 2 gives 24
/	Division e.g. x = 12/2 gives 6
MOD	Modulus e.g. 12MOD5 gives 2
DIV	Quotient e.g. 17DIV5 gives 3
^	Exponentiation e.g. 3 ^4 gives 81

Variables and constants

Variables and constants are assigned using the = operator

X = 3
Name = "Bob"

Variables and constants are declared the first time a value is assigned. They assume the data type of the value they are given.

Variables in the main program can be made global with the keyword global

Global userid = 123

Variables in the main program can be made constant with the keyword const

Const vat = 20

Sequencing – arranging instructions for algorithms and programs in a particular order

Repetition – repeating the execution of certain instructions (creating loops)

Selection – is when a computer executes instructions if a particular condition is met or not

Sequencing – arranging instructions for algorithms and programs in a particular order

Algorithms – a precise sequence of instructions, or set of rules, for performing a task

Decomposition - - breaking a problem or system down into parts

Patterns – spotting and using similarities

Errors

- Syntax
  - With how you write the code e.g. missing a bracket or a speech mark or using the wrong case
- Logical
  - Not obvious as the program will still run
  - But when run it will give the wrong answers/will not run as expected
  - Occur when your program is telling the computer to do something in the wrong order

Programming languages.

- **Low level languages:**
  - Machine language
    - Op-code
    - Operand
  - Assembly language
    - Mnemonics
- **High level languages:**
  - Source code
  - Assembler
  - Compiler
  - Interpreter

Control flow

- Sequence
- Selection
  - IF... ELSE...
- Iteration
  - For
  - While

GCSE Computer Sicence | **Networks** | Required knowledge

Networks
- Collection of connected computers.
  - LAN
  - WAN

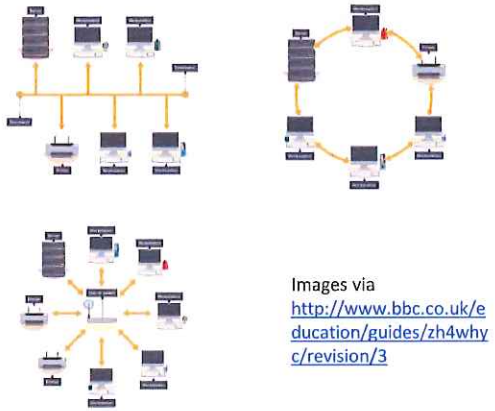
Network hardware
- Network interface card (NIC).
- Cables
  - Unshielded twisted pair (UTP)
  - Fibre-optic
- Hub
- Switch
- Wireless access point
- Router

Types of network
- Client-server network.
- Peer-to-peer network.

Network topologies
Diagram, advantages and disadvantages of the following:
- Bus
- Ring
- Star

Network technicalities.
- Protocols
  - TCP/IP
  - Data packets
  - Domain Name System (DNS)
  - File Transfer Protocol (FTP)
  - Hypertext Transfer Protocol (HTTP)
- Packet switching
- IP addressing
- MAC addressing

Network security
- Backups
- Archives
- Failover
- Disaster recovery
- Authentication
- Acceptable use policies



Images via http://www.bbc.co.uk/education/guides/zh4whyc/revision/3

The internet.
- The internet vs. World Wide Web
- Hardware
  - Modem
  - Router
- Addressing
  - Uniform Resource Locator (URL)
  - IP address
  - Domain name System (DNS)
- Hypertext markup language (HTML).
  - Cascading style sheets (CSS)

Internet file standards.
- Meaning and uses for each of the following:
  - JPG
  - GIF
  - PDF
  - MP3
  - MPEG
- Compression
  - Lossy
  - Lossless.

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

Yr 11 French – AU1 AQA context: Work and education

This term I will learn:

Talking about part-time jobs and money,

saying what you would like to do using 'je voudrais'

making telephone calls,

talking about work experience.

Key vocabulary I will learn:

JOBS

l'acteur/l'actrice actor/actress
bien payé well paid
le boucher butcher
le boulot job/work
le candidat candidate
le certificat certificate
le/la collègue colleague
décider to decide
distribuer hand out/distribute
l'électricien (m) electrician
l'entreprise (f) company
l'épiciergrocer
le fermier farmer
l'hôtesse de l'air air hostess
l'ingénieur (m) engineer
livrer to deliver
le mécanicien mechanic
le paquet packet
le plombier plumber
le programmeur programmer
(se) rappeler to call back/remind (remember)
le salaire salary
le serveur/la serveuse waiter/waitress
le technicien technician
le travail work/job/task
le vendeur/la vendeuse sales assistant

à l'avenir in the future
à temps partiel part-time
année year
apres-demain the day after tomorrow
aujourd'hui today
avant before
bientôt soon
dans une minute in a minute
de bonne heure early
demain tomorrow
de temps en temps from time to time
de nouveau again
en avance early/ahead of
être en train de to be in the process of
encore une fois again/once more
fin end
il y a there is/are

EMPLOYMENT

l'avenir future
la boîte aux lettres postbox
le boulanger baker
le caissier/la caissière cashier
certainement certainly
le chef boss/manager
la conférence conference
devenir to become
le docteur doctor
l'emploi job/employment
l'enveloppe (f) envelope
le facteur postman
le formulaire form

Key grammar points I will learn:

Using indirect object pronouns. me, te, lui

The partitive article. Du/de la/ des/ de l'

Asking formal and informal questions. Using tu and vous

NB:

Second speaking Controlled assessment for all students will be prepared throughout this half term, to be completed at the start of AU2.

EMPLOYMENT

l'infirmier/l'infirmière nurse
la lettre letter
mal payé badly paid
le musicien musician
le patron boss
le policier police officer
le/la propriétaire owner
le rêve dream
le/la secrétaire secretary
le stage (en enterprise) work experience
le timbre stamp
varié varied

WORK EXPERIENCE

améliorer to improve
assurer to reassure
l'avertissement (m) warning
le cadre middle manager/executive
le contrat contract
la demande d'emploi job application
enrichissant enriching/rewarding
l'épreuve (f) test
la foire d'exposition trade show ?
l'informaticien (m) IT engineer
le jardinier gardener
la loi law
le mannequin model (fashion)
l'ouvrier (m) labourer
soigner to care for/treat/tend
le/la vétérinaire vet

journée day(time)
longtemps a long time/while
matin morning
en ce moment at the moment
nuit night
passé before/past/gone
plus tard later
prochain next

FUTURE PLANS

l'annuaire (m) telephone book
l'auteur author
l'avocat lawyer
le comptable accountant
le cours professionnel professional course
l'écrivain (m) writer
l'entretien (m) interview

Using qui and que

Using the perfect tense with avoir and être.

Using the imperfect tense: -ais, -ais, -ait,-ions, -iez, -aient

Yr 11 French – Au2 AQA context: Work and education

This term I will learn:

Talking about school subjects,

Describing my uniform

telling the time,

talking about your daily routine,

Key vocabulary I will learn:

alemán, el = German
arte dramático, el = drama
asignatura, la = subject
bachillerato, el = =A level
biología, la = biology
ciencias económicas, las = economics
ciencias, las = science
clase, la = class
cocina, la = food technology
comercio, el = business studies
dibujo, el = art
educación física, la = PE
español, el = Spanish
física, la = physics
francés, el = French
geografía, la = geography
gimnasia, la = gymnastics
historia, la = history / story
idioma, el = language
informática, la = ICT
inglés, el = English
lengua, la = language
literatura, la = literature
matemáticas, las = maths
opción, la = option
optar = to opt
optativo = otional
química, la = chemistry
religión, la = RS
tecnología, la = technology
trabajos manuales, los = technology/craft

apoyar = to support
aprender = to learn
aprobar = to pass (exam)
atacar = to attack
callar(se) = to be quiet
castigar = to punish
charlar = to chat
comenzar = to begin
comprender = to understand
contestar = to answer
dibujar = to draw
diseñar = to design
empezar = to start/begin
enseñar = to teach
entender = to understand
escribir = to write
estudiar = to study
faltar = to be absent
fracasar = to fail
golpear = to hit
insultar = to insult
intimidar = to intimidate
levantar la mano = to put your hand up
mirar = to look (at)
molestar = to annoy
olvidar = to forget
pasar = to pass (not an exam)
pedir permiso = to ask permission
preguntar = to ask
prometer = to promise
repasar = to revise
respetar = to respect

Key grammar points I will learn:

The present tense

cognates

adjective agreements

using the infinitive

Using compratives:
más ...que
menos...que
mejor...que
peor...que
tan...como

comparing schools in England and France,

using reflexive verbs to say what you do.

Describing my school day

NB:

An *additional* Controlled Assessment to be completed for those pupils identified.

me despierto – I wake up
me levanto – I get up
me ducho – I have a shower
me visto – I get dressed
desayuno – I have breakfast
me lavo los dientes – I clean my teeth
me peino – I do my hair
voy al colegio – I go to school
almuerzo – I have lunch
vuelvo a casa – I go back home
ceno – I have dinner
hago los deberes – I do my homework
voy al gimnasio – I go to the gym
veo la tele – I watch TV
me acuesto – I go to bed
leo – I read
me duermo – I go to sleep

de la mañana - in the morning
de la tarde - in the afternoon
de la noche - in the evening
y = and
o = or
luego = then
pero = but
después = afterwards
más tarde = later
ayer - yesterday
mañana – tomorrow
ahora - now
este fin de semana – this weekend
hoy – today
el año pasado – last year
la semana que viene – next week
la semana pasada – last week
el año que viene – next year

Llevar	to wear
Sería	it would be
Llevarían	they would wear
No tendrían que llevar	they wouldn't have to wear
Podrían llevar	they could wear
No estoy de acuerdo con...	I don't agree with...
Una falda	a skirt
Una blusa	a blouse

Using superlatives:
el/la más
el/la menos
el/la mejor
el/la peor

The future tense
+é, +ás, +á,
+emos, +eis, +án

Year 11 Autumn Term History Knowledge Organiser – Paper 1 Mock Examination Preparation/Reflection

THE INFORMATION IN THIS KNOWLEDGE ORGANISER GIVES AN OVERALL PICTURE OF PAPER 1 CONTENT. THIS IS THE MINIMUM REQUIRED FOR SUCCESS IN YOUR MOCK EXAM (AND FUTURE REAL EXAM). FOR COMPREHENSIVE KNOWLEDGE, CONSULT THE RANGE OF MORE IN DEPTH REVISION MATERIALS AVAILABLE. LESSONS THIS TERM WILL FOCUS ON CONROLEED ASSESSMENT PREPARATION (NO REVISION REQUIRED) AND EXAM PREPARATION USING THIS KNOWLEDGE ORGANISER.

Treaty of Versailles - In 1919, **Lloyd George** of England, **Clemenceau** of France and Woodrow **Wilson** from the US met to discuss how Germany should pay for the damage world war one had caused. Woodrow Wilson wanted a treaty based on his 14-point plan which he believed would bring peace to Europe. Georges Clemenceau wanted revenge. He wanted to be sure that Germany could never start another war again. Lloyd George personally agreed with Wilson but knew that the British public agreed with Clemenceau. He tried to find a compromise between Wilson and Clemenceau. Germany had been expecting a treaty based on Wilson's 14 points and were not happy with the terms of the Treaty of Versailles. However, they had no choice but to sign the document. **The main terms of the Treaty of Versailles were: War Guilt Clause** - Germany should accept the blame for starting World War One. **Reparations** - Germany had to pay £6,600 million for the damage caused by the war. **Disarmament** - Germany was only allowed to have a small army and six naval ships. No tanks, no air force and no submarines were allowed. The Rhineland area was to be de-militarised. **Territorial Clauses** - Land was taken away from Germany and given to other countries. Anschluss (union with Austria) was forbidden. **The German people were very unhappy about the treaty and thought that it was too harsh**. Germany could not afford to pay the money and during the 1920s the people in Germany were very poor. There were not many jobs and the price of food and basic goods was high. People were dissatisfied with the government and voted to power a man who promised to rip up the Treaty of Versailles. His name was Adolf Hitler.

The League of Nations - Was an international organisation set up in 1919 to help keep world peace. It was intended that all countries would be members of the League and that if there were disputes between countries they could be settled by negotiation rather than by force. If this failed then countries would stop trading with the aggressive country and if that failed then countries would use their armies to fight. In theory the League of Nations was a good idea and did have some early successes. But ultimately it was a failure. The whole world was hit by a depression in the late 1920s. In **1931**, Japan was hit badly by the depression. People lost faith in the government and turned to the army to find a solution. The army invaded **Manchuria** in China, an area rich in minerals and resources. China appealed to the League for help. The Japanese government were told to order the army to leave Manchuria immediately. However, the army took no notice of the government and continued its conquest of Manchuria. The League then made a further call for Japan to withdraw from Manchuria but Japan's response was to leave the League of Nations. In **October 1935**, Italy invaded **Abyssinia**. The Abyssinians did not have the strength to withstand an attack by Italy and appealed to the League of Nations for help. The League condemned the attack and called on member states to impose trade restrictions with Italy. However, the trade restrictions were not carried out because they would have little effect. Italy would be able to trade with non-member states, particularly America. Furthermore, Britain and France did not want to risk Italy making an attack on them. In order to stop Italy's aggression, the leaders of Britain and France held a meeting and decided that Italy could have two areas of land in Abyssinia provided that there were no further attacks on the African country. Although Mussolini accepted the plan, there was a public outcry in Britain and the plan was dropped.

Hitler's Actions - From 1933, he immediately he began secretly building up Germany's army and weapons. In 1936 Hitler ordered German troops to enter the **Rhineland**. At this point the German army was not very strong and could have been easily defeated. Yet neither France nor Britain was prepared to start another war. Hitler's next step was to begin taking back the land that had been taken away from Germany. In March 1938, German troops marched into **Austria**. The Austrian leader was forced to hold a vote asking the people whether they wanted to be part of Germany. The results of the vote were fixed and showed that 99% of Austrian people wanted Anschluss (union with Germany). Six months later demanded that the **Sudetenland** region of Czechoslovakia be

handed over to Germany. Neville Chamberlain, Prime Minister of Britain, met with Hitler three times during September 1938 to try to reach an agreement that would prevent war. The **Munich Agreement** stated that Hitler could have the Sudetenland region of Czechoslovakia provided that he promised not to invade the rest of Czechoslovakia. In March 1939 he invaded the rest of **Czechoslovakia**. Believing that **Poland** would be Hitler's next target, both Britain and France promised that they would take military action against Hitler if he invaded Poland. Chamberlain believed that, faced with the prospect of war against Britain and France, Hitler would stop his aggression. In August 1939, Germany made sure to avoid a two front war by making a pact of non-aggression with the Soviet Union (**Nazi-Soviet Pact**), promising to divide Poland. German troops invaded Poland on 1st September 1939.

The Red Scare: List the four events between 1945 and 1955 outside of the USA that led people to think that communism was spreading very quickly: ***1948 Czechoslovakia became Communist; The Berlin Blockade of 1948 – 49 (the Russians cut off access to West Berlin, showing that Stalin was prepared to risk war with the Americans); Russia developed their first atom bomb in 1949; China became communist in 1949.*** Truman tried to stop the spread of communism in TWO main ways: ***Marshall Plan and Truman Doctrine.*** What was the Alger Hiss Trial about? ***Alger Hiss was a government official charged with being a communist. He was sent to prison for 5 years.*** Who were the Rosenbergs? ***Julius and Ethel Rosenberg were accused of giving atomic secrets to the Soviet Union. Eventually executed in 1953.*** What does HUAC stand for? ***House of Un-American Activities Committee.*** What was the role of HUAC? ***Investigated the film industry, education and the government to find out if there were any communists.*** What happened to the 'Hollywood Ten'? ***1947: HUAC investigated the film industry to see if films were being used to put over a communist message. Ten writers and directors were sacked and sent to prison for 1 year. They became known as "The Hollywood Ten".*** Who was Senator Joe McCarthy? ***Joseph McCarthy was a very ambitious politician. He was Chairman of HUAC and had a lot of power and influence in Washington.*** How was McCarthy involved in the Red Scare? ***McCarthy claimed he had a list of people who were communists, including 205 people who worked in the government. McCarthy appeared on radio and TV – he was an extremely strong and convincing speaker. He claimed that people who didn't believe him were being "soft" on communism. Many ordinary people believed McCarthy and saw him as a crusader against communism. Politicians often didn't like him but were too afraid to speak out against him as they were scared of being labelled as communists themselves.*** Give four reasons why McCarthy lost support: ***McCarthy didn't actually have any hard evidence to support his claims. He was shown on TV to be a bully and a liar. He began accusing his own party members. He accused army officers of being spies - no-one believed this.*** List four effects of McCarthyism: ***Many people lost their jobs. Just being accused of being a communist was enough in many cases to be entirely discredited. 400 people were sent to prison. Many people with left wing or liberal views were labelled as being un-American. America's reputation as being "the land of the free" was severely damaged.***

African American Civil Rights -1950s: What were the key features of the Brown vs Topeka case? ***Linda Brown wanted to attend her local school but was not allowed to because it was a white only school. Oliver Brown and the NAACP took the case to the Supreme Court, helped by the black lawyer, Thurgood Marshall. In 1954, the Supreme Court ruled that segregation in schools was illegal and that all schools should be integrated. However, for a long time, many of the southern states simply ignored the ruling and schools remained segregated.*** What were the Key features of the Montgomery Bus Boycott? ***In 1955, Rosa Parks refused to give up her seat to a white man. Martin Luther King organised a boycott of buses that lasted for 13 months until the bus company gave in. In 1956 the Supreme Court ruled that segregation on buses was illegal.*** What were the key features of the events at Little Rock High School? ***Nine black students tried to attend their local all white school (including Elizabeth Eckford). Orval Faubus (the State Governor) stopped them by surrounding the school with state troops. Faubus was forced to remove the troops, but they were replaced by a violent mob of about 1000 white people. President Eisenhower sent in federal troops to protect the students. Governor Faubus was***

so against integration that he closed down all the schools in Little Rock (1958). However, one year later, the Supreme Court ordered him to re-open them and the federal troops stayed with the students to protect them. Give four reasons why Martin Luther-King was so important? *Martin Luther King believed strongly in peaceful protest. He used methods such as giving speeches, marches and sit-ins in order to try and change things for Black Americans. He was also very good at dealing with politicians and so was able to successfully raise awareness of the Civil Rights Movement within Congress. Because he insisted on remaining peaceful, he was better able to persuade Presidents and Congress to go along with him.*

African American Civil Rights -1960s

Who were the Freedom Riders? *1960s – made journeys on interstate buses to draw attention to the fact that the southern states were ignoring the laws that said interstate buses and bus stations should no longer be segregated. They faced violence and some were arrested. One bus was even bombed. Once again, they gained a lot of publicity.* What were Sit-Ins? *1960 – black students "Sat in' whites only cafes. The violence often used against these peaceful protestors was seen on television and helped to increase support for Civil Rights.*
What was the March on Washington? *August 1963 – More than 250,000 people, including 60,000 whites marched to demand civil rights for all. They heard Martin Luther King's famous "I have a dream" speech.* What happened at the Birmingham Peace March? *1963 – Birmingham decided to close all of its parks, playgrounds, swimming pools and golf courses in order to avoid de- segregating them. Many peaceful protests, such as sit-ins, were staged against these measures. The peaceful protesters – including children - were attacked by police dogs and fire hoses. They were sent by the police chief, Bull Connor.* Outline the Voting Rights Act of 1965. *Voting Rights Act was passed, which set up a national literacy tests for black and white people registering to vote. However, due to Previous Education discrimination, many of the black people failed the test and were therefore not given the full right to vote.* What do we mean by Black Power? *The slogan Black Power became popular from 1966 onwards. It is a phrase that came to mean different things to different people, but they key ideas were: Blacks should take more responsibility, power and control in their own communities (e.g. set up their own businesses). They should not rely on white to give them rights, but take control themselves. A rejection of the non-violent tactics of the main Civil Rights Movement. More focus on social and economic issues (e.g. poverty) rather than political issues (e.g. Jim Crow laws). Blacks should study their own history and culture and that they should feel proud of being black. Slogans Like "black is beautiful" formed a part of this. Some people believed in separatism – the idea that blacks should set up their own state without any white people. (N.B. this is very different to segregation)!* Why did the Black Power Movement develop in the 1960's? *Many blacks felt that the pace of change was too slow. Young blacks in particular were frustrated that things were not changing fast enough. Even though Martin Luther King's campaigns had achieved some great things, most blacks still faced poverty, discrimination and racism as part of their everyday lives. Many in the north saw King as irrelevant – he had focussed on ending segregation, but there had never been any segregation in the northern states. The issues there were different – e.g. poverty in the slums of the major cities. Many grew frustrated with the non-violent campaigns. They felt it was humiliating black people and was not bringing enough change fast enough.* Who was involved in the Black Power Movement? Give details of 3 groups or individuals. *The Nation of Islam - a group of black Muslims. They wanted a more militant approach and a totally separate state for blacks in the USA. Eventually blacks would return to Africa. Their leader was Elijah Muhammad. Malcolm X- He was a brilliant speaker who attracted a lot of publicity. He did a lot to encourage blacks to take responsibility for themselves and to be proud of being black. At first, he wanted nothing to do with white people but, after going on Hajj, he changed his views and then accepted that whites could play a useful role in helping blacks to achieve civil rights. The Black Panthers had the most violent reputation. Huey Newton and Bobby Searle set it up in 1966. The Panthers never had more than around 5 000 members but they attracted a huge amount of publicity. This was because of the way they looked, their ideas and their use of violence. They wore*

black berets, black leather jackets, sunglasses, etc and they carried guns. They used armed patrols to protect black people from police brutality. Stokely Carmichael – probably the first person to use the phrase "Black Power" and leader of the SNCC, which started off as a non-violent group, but later became more radical. In what ways did Martin Luther King's campaign change by the late 1960s? ***He began to concentrate on trying to improve living conditions, wages and jobs for the poor, focusing more on the northern cities than before. He opposed the Vietnam War because it cost so much money - money he thought could be spent on black people. This lost him the support of some people. However, people in the north thought Martin Luther King (a southerner) did not understand their problems and were reluctant to follow him. This focus on social and economic issues was also more difficult to solve – mainly because they would cost so much money to solve. As a result of all this, Martin Luther King became far less influential after 1965.***

Civil Rights of Alternative Groups in USA: What were the reasons for the Woman's Movement in the 1960's & 1970's? Give 6 reasons. ***World War 2 gave women new roles and new opportunities: they wanted more of this. The contraceptive pill became available in the 1960s, giving women much more freedom over their lives. Many women began to react against 1950s ideas of women as wives and mothers. Many were influenced by the 'swinging sixties'. By now, women were better educated and wanted to use this education to pursue a career. They did not all want to devote their whole lives to their husband and family. Betty Friedan's book "The Feminine Mystique" was published in 1963; it said that married women should be able to have careers as well and that husbands and wives should have an equal partnership. This inspired many women. The National Organisation of Women (NOW) was started in 1966 by Betty Friedan.*** How did women protest? Give 5 examples. ***Most Women in the Women's movement wanted: equal pay with men, opportunities to get top jobs, child care for working parents and action against male sexism. They went on marches and organised petitions, appeals to the Supreme Court, demonstrations, etc. Other women were more radical and even believed that not wearing make-up was an act of protest against male supremacy. These women – often known as feminists – burned their bras because they saw them as a symbol of male domination. Some women wanted to make abortion legal – they believed women should have the right to choose whether or not to have a baby.*** Name someone who opposed the Womens' Movement. ***Phyllis Schafly.*** List 4 achievements of the Womens' Movement. ***The Equal Pay Act (1963) said that men and women should have the same pay for the same job. The Civil Rights Act (1964) banned discrimination on the basis of gender. NOW won lots of court cases in the late 1960s, which gave money back to women who had not been paid equally to men. The Education Amendment Act (1972) said that girls could follow exactly the same curriculum in schools and boys. In the famous case of Roe vs Wade (1973), the Supreme Court ruled that abortion was legal.*** Why did immigration of Hispanic Americans increase after the Second World War? ***To work as agricultural labourers under the Bracero programme. Mexico was poor compared to the USA, and thousands came to work, then sent their wages home to support families.*** What did the Hispanic Americans achieve in their campaign for better rights and conditions? ***A Mexican American, Cesar Chavez became the best known Latino American civil rights activist, and was strongly promoted by the American labour movement, which was eager to enroll Hispanic members. His public-relations approach to unionism and aggressive but nonviolent tactics made the farm workers' struggle a moral cause with nationwide support.*** What were the issues faced by Native Americans in the 1970s? ***The American Indian Movement (AIM) was primarily urban Indians who believed that direct and militant confrontation with the US government was the only way to redress historical grievances and to gain contemporary civil rights. After a violent confrontation in 1972, tribal President Richard Wilson condemned AIM and banned it from the reservation. In February 1973, AIM leaders and about 200 activists took over the village of Wounded Knee, announced the creation of the Oglala Sioux Nation, declared themselves independent from the US. The siege lasted 71 days, during which time federal marshals, FBI agents, and armoured vehicles surrounded the village. AIM members agreed to end their occupation under one condition: that the federal government convene a full investigation into their demands and grievances.***

GCSE Geography: Coasts Knowledge Organiser AU1

How does weathering, erosion and deposition alter our coastlines?

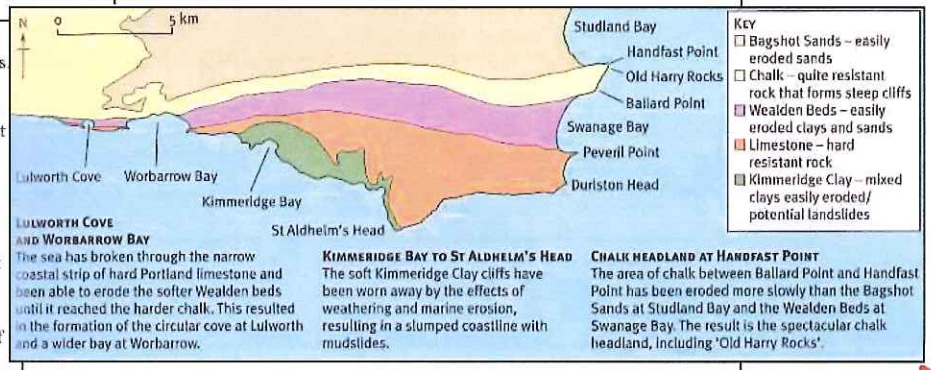
Weathering in coastal areas

The main types of coastal weathering are as follows

Solution
Sea water is very corrosive and can slowly dissolve chalk and limestone. Salt crystals are formed as salt water evaporates. These crystals can grow in size, forcing rocks to break.

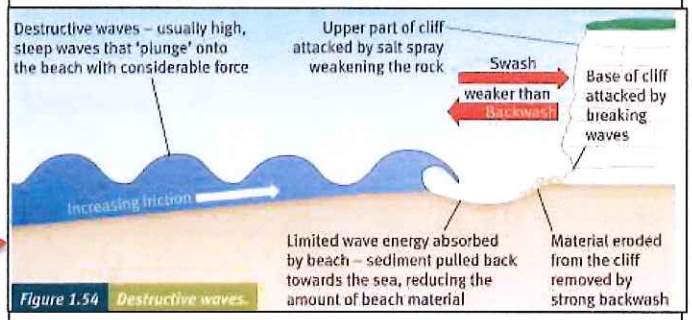
Wetting/drying
Softer rocks such as clay expand and contract as they become wet and then dry out. This causes weaknesses in the rock that can then be picked out by the processes of erosion.

Mass movement
Rock falls, mudslides and landslides are all types of mass movement and are common features of cliff coastlines, often occurring because of a combination of waves weakening the base of the cliff and **sub-aeriel processes** (erosion and weathering) attacking the upper part of the cliff.

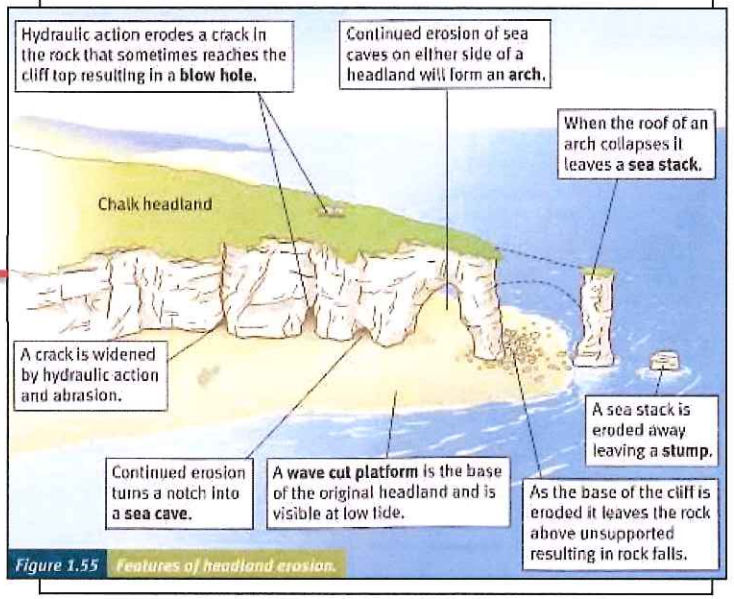


How are the following features formed along our coastlines? This includes: cliffs, headlands, bays, cave, arch, stack, beach and spit.

Wave Formation:



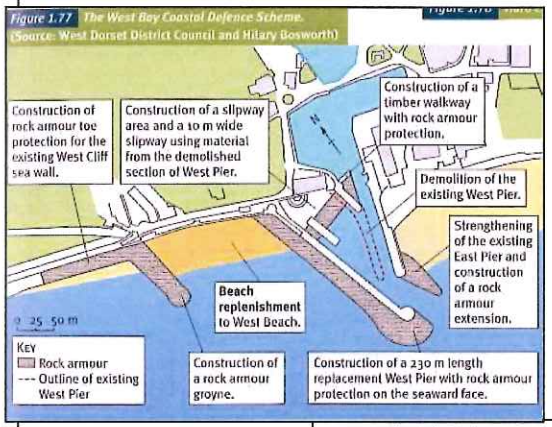
Coastal Landforms:



How can we protect our coastlines?

Photograph	Facts
	**Sea walls** There are many different types of sea walls: sloping, curved, stepped and vertical. They are made of concrete or stone. They stop the sea reaching the cliff base and reflect wave energy.
	**Groynes (wooden)** These reduce longshore drift by trapping sediment on one side. This builds up the beach, which acts as a natural barrier to erosion by absorbing the wave energy.
	**Groynes (rock)** These reduce longshore drift by trapping sediment on one side. They are made of granite or other hard igneous or metamorphic rocks and so last up to three times longer than wood.
	**Rip-rap** is made from huge boulders of granite or other hard igneous or metamorphic rocks. They are placed at the base of cliffs to absorb the energy of the waves but let the water drain through them.

Why do we need to protect our coastlines?

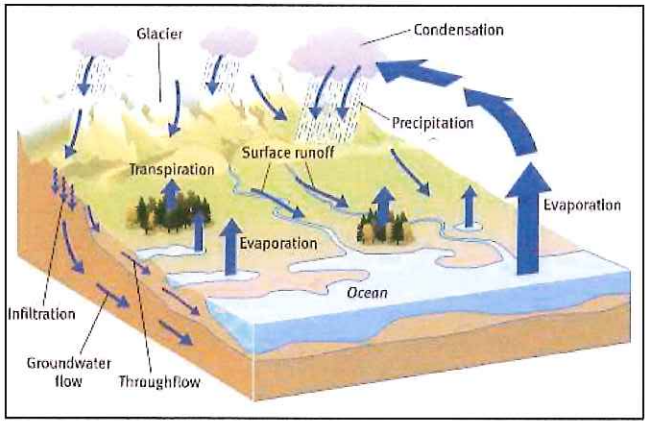


It was decided that a new hard engineering coastal defence scheme should be built. The aims of the new scheme were to:

- provide flood protection for homes, businesses and a caravan site
- improve the existing harbour for commercial and pleasure boats
- develop the beach to the west of the harbour
- prepare for higher sea levels.

GCSE Geography: Rivers Knowledge Organiser AU2

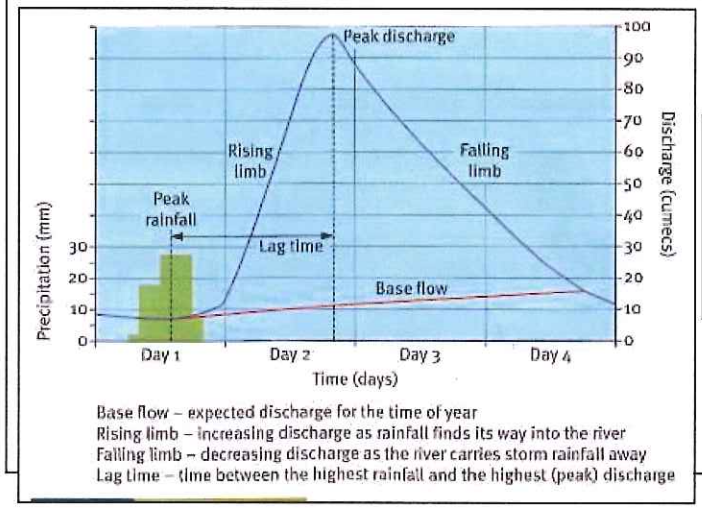
What is the hydrological cycle and how does it work?



KEY TERMS

Evaporation – water turning into water vapour.
Evapotranspiration – the sum of evaporation from the Earth's surface together with the transpiration of plants.
Groundwater flow – movement of water underground through rocks.
Infiltration – seeping of water into soil.
Interception – collection of water by vegetation.
Precipitation – moisture that falls from the atmosphere in any form.
Surface runoff – all water flowing on the Earth's surface.
Sustainable – capable of existing in the long term.
Through-flow – movement of water through the soil.
Transpiration – loss of moisture from plants.
Water table – the upper level of underground water.

What is a storm hydrograph and how does it respond to change?



Base flow – expected discharge for the time of year
Rising limb – increasing discharge as rainfall finds its way into the river
Falling limb – decreasing discharge as the river carries storm rainfall away
Lag time – time between the highest rainfall and the highest (peak) discharge

What is a hydrograph?

A hydrograph is used to show how the **discharge** of a river changes over time at a particular point on the river. A flood (or storm) hydrograph is usually drawn for a particular period of time when rainfall is unusually high. It shows how river discharge responds to short-term storm conditions (Figure 1.20).

The Physical Causes of River Flooding:

-Intense Rainfall
-Thin Soil
-Impermeable Geology
-Steep Valleys
-Confluence of a River

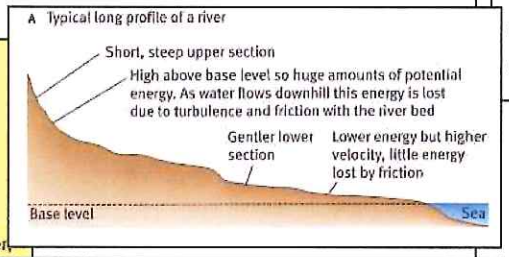
The Human Causes of River Flooding:

-Deforestation
-Urbanisation
-Climate Change

How does weathering, erosion, transportation and deposition operate in a drainage basin?

KEY TERMS

Bedload – larger particles moved along a river bed.
Erosion – the wearing away and removal of rocks by the action of water, wind or ice.
Freeze–thaw – the continued freezing and thawing of moisture in rocks that will eventually cause them to break.
Weathering – breaking up of rocks by the action of weather, plants, animals and chemical processes.



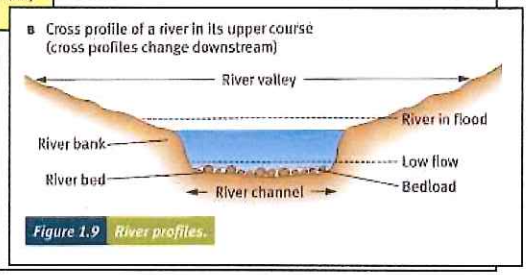


Figure 1.9 River profiles.

Transportation

A river transports material in the following three ways:

- **as bedload:** larger fragments rolled along the river bed (traction) or bounced along the river bed (saltation)
- **as suspended load:** smaller fragments carried in the flow of the river
- **in solution:** dissolved minerals carried in the water.

The formation of fluvial landforms.

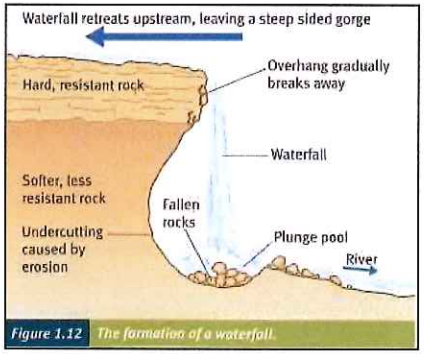


Figure 1.12 The formation of a waterfall.

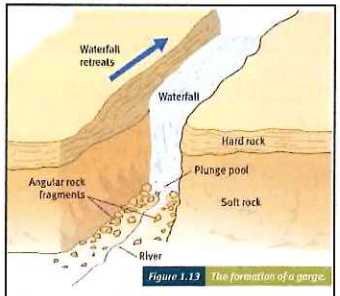


Figure 1.13 The formation of a gorge.

KEY TERMS

Hydro-electricity – electricity produced by flowing water.
Lateral erosion – erosion of the sides of a valley.
Vertical erosion – downward erosion of a river bed.

Year 11 AU1 - The existence of God

KEYTERMS	
Theist	A person who believes that there is a God who is directly involved in creation.
Atheist	A person who believes that there is no God.
Agnostic	A person who does know if there is s God or not.
Proof	Evidence that guarantees the truth of something.
First Cause argument	Also known as the cosmological argument. A proof for the existence of God based on the idea that there had to be an uncaused cause that made everything else happen otherwise there would be nothing now.
Cosmological	To do with the nature of the universe and used in particular with the cosmological argument that says there has to be a God to explain the existence of all things
Argument from design	A proof for the existence of God based on the idea that there is so much design and purpose in the universe that it could not have happened by accident; there has to have been a designer God. Otherwise called the teleological argument.
Teleological	To do with design or order, particularly the attempt to prove the existence of God by showing that there is design and order in the universe.
Creation	Everything in the Universe, especially when seen as a specific work of God.
Evolution	The process made popular by Charles Darwin that describes how simpler life forms gradually changed and adapted to more complex life forms.
Faith	A commitment to something that goes beyond proof and knowledge , especially used about God and religion.

The learning journey

- Belief in God is a very personal belief. You will learn the key vocabulary and consider whether we can prove the existence of God.
- The first cause argument is an attempt to prove the existence of God. It argues that there had to be an uncaused cause that made everything else happen, otherwise there would be nothing now. You will also look at the counter arguments.
- The design argument is based on the understanding that there is a design in creation and if there is a design there must be a designer and this designer is God. You will also look at the counter arguments.
- A religious experience is an experience that leads you to believe that God exists. They are experiences that come from outside the physical world and are difficult to put into words, as you cannot explain why they have happened people then believe God caused it to happen. You will look at examples of religious experiences and assess validity of the argument from religious experience for the existence of God.
- Religion is based on faith is something that cannot be proven. You will look at examples of people having faith in God.

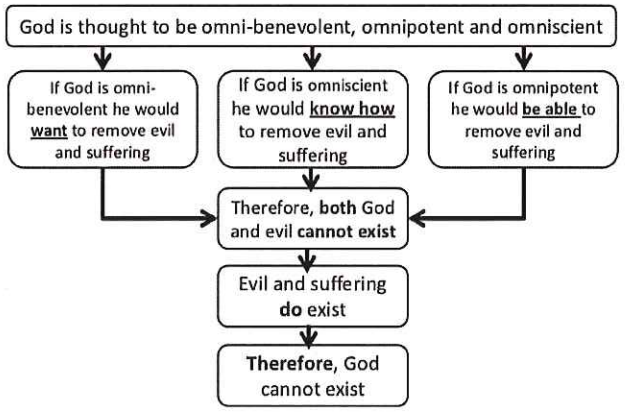
Year 11 AU2 - The problem of evil

KEYTERMS	
Evil	The opposite of good. A force or a negative power that is seen in many traditions as destructive and against God.
Suffering	The experience of something bad or painful.
Free will	Having the ability to choose or determine one's own actions.
Natural Evil	The harm or damage that is done to people and creation as a result of the forces of nature and the structure of the earth.
Moral Evil	The harm that results from a bad choice made by human beings misusing their free will.
Omnipotent	The belief that God is all-powerful. God can do anything that can be done; there is nothing outside God's ability.
Benevolent	The belief that God is all-loving. God creates all things in his loving and caring nature so there is nothing outside concern.
Omniscient	The belief that God is all-knowing. God knows everything that there is to be known.
Soul-making	The belief that suffering makes it possible for people to 'grow' into more mature individuals.
Free will defence	An argument to justify both the existence of a loving God and the existence of evil. It is based on the idea that what makes humans special is their ability to choose. For this to happen they have to live in a world in which things can, and do, go wrong.
Karma	A belief in Hinduism and Buddhism that a person's good and bad actions in this life and in previous lives contribute to the quality of future lives.

The learning journey

- You will examine the philosophical argument that an omnipotent, omniscient and benevolent God as evil and suffering exist. During this you will look at case studies of natural and moral evil.
- Religious people have put forward many explanations to explain how evil came into the world. You will look at the fall of man the story of Iblis in the Qur'an.
- Over the centuries philosophers and theologians have developed arguments in an attempt to prove that evil and God can co-exist . These are known as theodicies. You will be loking at the following theodicies:
  - Humans need a contrast. If good exists then evil must too.
  - Suffering makes you a better person and allows you to grow (soul-making)
  - Free will defence, evil exists because God created us with the ability to choose between right and wrong.
  - Evil and suffering allows religious people to carry out their duty and help those in need.
  - Evil and suffering are necessary as good may come from suffering.

The 'problem of evil' recap

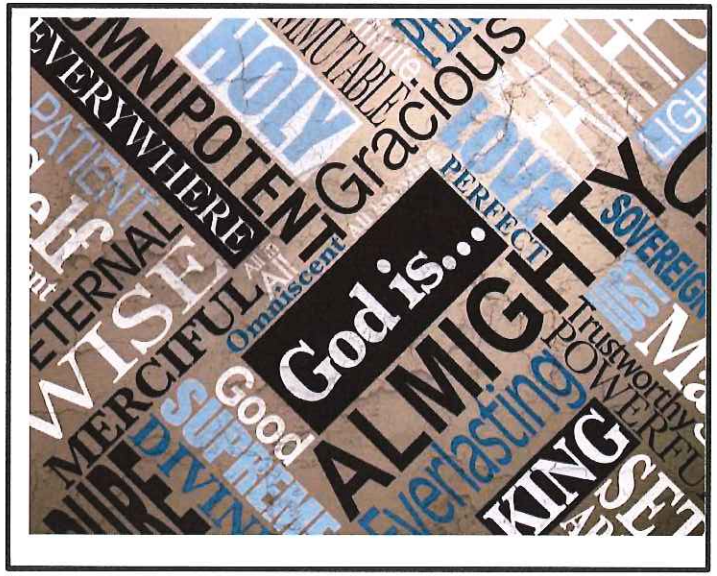


Year 11 AU2 - The nature of God

KEYTERMS	
Nature of God	The qualities that combine to make up what God is.
Forms	The different ways in which people picture God.
Eternal	Without limits in time, outside time.
All-powerful	God can do anything that can be done; there is nothing outside Gods ability.
All-loving	God creates all things in his loving and caring nature so there is nothing outside concern.
All-compassionate	One of the qualities of God, showing concern for the suffering of others; literally 'suffering with'.
All-knowing	God knows everything that there is to be known.
All-merciful	A quality of God that stresses God's willingness to forgive the wrongdoer.
Transcendent	The belief that God is beyond space and time, and that there are no limitations on what he can do.
Immanent	The idea that God is very close and is involved in what goes on in the world. He is not distant or uncaring.
Personal	When used about God. The idea that God cares about the individual and is involved in the individual's life.
Impersonal	The idea that God is a force or abstract idea, and cannot be described in human terms.

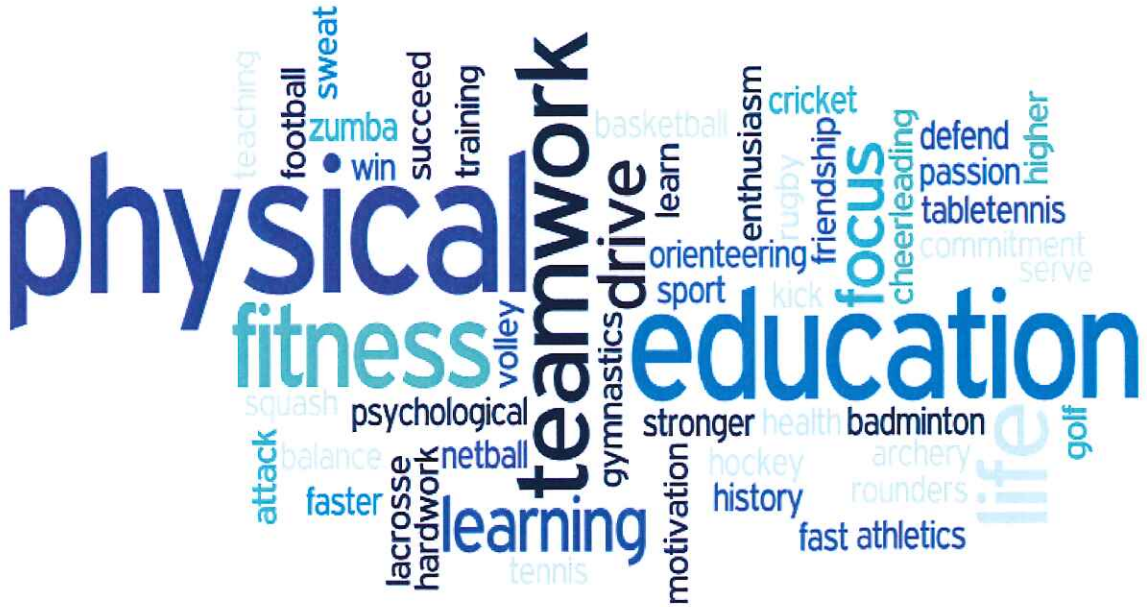
The learning journey

- Words cannot express much about the Unlimited God, but words are all humans have to use about God. Some prefer to use images but these can be limited and mis-leading.
- Many religions stress the absolute nature of God by insisting that God is one. You will look at the concept of God in the Abrahamic religions; Judaism, Christianity and Islam.
- However, other religions, such as Hinduism, portray God in many forms as it is easier for them to deal with what is unlimited. You examine the Hindu belief about Brahman.
- Why do we call God He, Father and King? You will investigate why this is and evaluate whether we should use more inclusive words to describe God.
- Islam does not allow images to be drawn of God, they use 99 beautiful names to try and express some understanding of the fullness of the nature of Allah. You will explore some of these names.
- In our vocabulary we have some words that we only use to describe God such as all-powerful, all-loving, all-knowing, all-compassionate, all-knowing and The truth. You will explore what they mean.
- Some words we use show the closeness and distance and God. You will explore words such as transcendent, Immanent, personal and impersonal.



A Glover

GCSE PE



Factual Revision Booklet

A Glover

GCSE PE Revision

Factual Recall

Roles of the active participant

Player/performer	Developing the ability to make effective plans to improve performance	Usain Bolt – in 100m and 200m
Organiser	Bringing together all the main ingredients at the right time, in the right place, in order to maximise promotion, participation and high quality performance	Club secretary or team manager in Rugby
Leader/Coach	A specialist in an activity, responsible for preparing a performer in skill acquisition, correct technique, correct physical state or correct mental state	Jose Mourinho – a football coach or manager
Official	Someone who controls the activity; interprets the rules or regulations of the activity including checking the equipment	A referee or umpire

Individual differences affecting participation and performance

Age	How old somebody is and how physically mature or developed they are	Physical maturity makes individuals suitable for certain activities at certain times. Some like Gymnastics are more suited before maturity. Other sports are lifelong sports and can be followed into retirement such as golf and bowls
Disability	A Physical, mental, temporary or permanent disability	These can affect the participation choices we make. We can adapt sports to play, have specific disability clubs and competition whilst also integrating with able bodied. Bocchia is an example of a disability sport with adapted visually impaired football also being an example
Gender	The physical sex of an individual	Physique, metabolism and hormones can all affect performance. Competition between genders can be imbalanced due to physical differences depending upon the activity.
Culture	The ethnic background or beliefs that an individual may be accustomed to	How do some cultures' opinions differ on sports participation and when they should be played eg Christianity play on weekends, Muslims often on Friday night. Different cultures have different opinions on female participation e.g. Muslim females and their dress code and how this can affect sports participation

A Glover

Physique	Which somoatype an individual is e.g. Mesomorph, Endomorph or ectomorph. Remembering that it is a 3 point scale and that individuals are never 100% of either	Different body types suit specific positions and sports. Understand the characteristics of each and why they are suited for example an endomorph is suited to a prop forward in Rugby Union.
Environment	How the weather, altitude, humidity, terrain and access to facilities can affect participation	The predominant sports in specific regions eg low impact such as cricket in hot countries such as India and Caribbean, access to outdoor activities in the rural areas in comparison to cities
Risk and challenge	How the amount of risk can affect participation after a risk assessment and control	Some individuals are attracted to the activities due to the amount of risk such as rock climbing etc
Activity levels	The effects and needs of different Activities' activity levels	Some sports require greater levels of fitness and commitment to compete at a level which means that participation can be affected by the amount of free time eg swimmers tend to train every morning
Training	How funds and the time available to train affect participation levels	To compete at any level requires training, in some sports eg football this can be cheap however examples such as tennis or golf are quite expensive and therefore become exclusive

<u>The demands of performance</u>

Personality type	Whether a performer is introvert of extrovert can affect the sports choice and performance	Socially motivated individuals such as extroverts tend to choose team games over self-motivated introverts who tend to choose individual sports
Anxiety	The state of being over-aroused	This can affect concentration levels and creates either worry or aggression depending upon the personality type. Experienced performers are better equipped to deal with this.
Tension	The build-up of arousal prior to an event	This can lead to worry and anxiety during the performance
Aggression	How arousal is portrayed externally to others	This can be direct aggression e.g. striking an opponent or indirect aggression e.g. striking a ball etc.
Motivation	The desire or determination to want to perform and to improve your performance	Can be intrinsic or extrinsic motivation. Intrinsic is a desire from within for its own sake where extrinsic needs an external reward either winning something,

A Glover

Arousal	The intensity to which you are motivated	Inverted U theory is important to this, achieving maximum arousal and it's impact upon performance
Boredom/Tedium	Variation in training methods, competition and delivery all prevent repetitive training which causes boredom	If training leads to boredom then it will reduce motivation and performance
Feedback/criticism	Feedback is information about the outcome of a performance and it can greatly affect future performances	Can come from self – feel, coach – tell or result - see

Injury

Precautions to prevent injury	• Warm up and cool down • Correct technique of the activity • Protective or correct clothing an d equipment • Following the rules and/or code of conduct

Types of Injury

Internally caused	Overuse injuries – caused by overtraining or overperforming Sudden injuries – caused by sudden movement or stress by twisting or turning etc	Examples include tennis elbow (tendonitis) or stress fractures Examples include hamstring strains or other muscular/connective tissue over stretching
Externally caused	Foul play or incorrect actions – this includes poor technique or incorrect technique of others Impact injuries – contact is inevitable in some sports such as football, rugby and hockey. There can also be contact with equipment or the playing surface.	Dislocations or fractures are common as are ligament tears of the ankle or knee.

The difference between aerobic and anaerobic respiration

Aerobic respiration – in the presence of oxygen **Glucose + Oxygen → energy + CO2 + water** Activities include exercise for prolonged periods of time (longer than 30 seconds) such as jogging, walking, cycling etc	Anaerobic respiration in the absence of oxygen **Glucose → energy + lactic acid** Activities include short and sharp bouts of high intensity exercise such as sprints, jumping, punching.

A Glover

- Transport of Oxygen, Glucose and waste products – to muscles for energy and CO2 to lungs to be expired
- Body temperature control – when cold blood concentrates on the key organs and leaves extremities, when hot blood comes to the skin surface to be cooled by air.
- Protection and fighting of disease – white blood cells engulf and destroy bacteria

The Functions of the blood

Oxygen debt

- Occurs as a result of muscles working anaerobically
- Body runs out of Oxygen to use as energy source
- Use Glycogen stores to fill the energy gap
- 60 seconds maximum
- We then replace the Glycogen stores used by 'catching our breath' – breathing heavily
- This removes lactic acid build up – which is poisonous and causes cramp

Recovery Period – post exercise

Expiration of breath	Removes CO2 and other waste products from lungs
Perspiration	Reduces body temperature and removes excess water. Heat needs to be cooled to prevent us from overheating
Excretion through urine and faeces	Removes excess water and other waste products from the lactic acid

Leisure and recreation

Leisure	**Free time** when you can **choose** to take part in activities when work and chores are complete.
Recreation	Time to relax, undertake an activity in leisure time
Physical recreation	Playing for intrinsic (self) rather than extrinsic (external) rewards.
Outdoor recreation	Activities associated with challenge in the natural environment
Lifetime/Lifelong sports	Activities which can be carried on throughout life at all ages

Health, Fitness and a healthy active lifestyle

Health	A state of **physical, mental and social** well-being, not merely the **absence of disease** or infirmity	Physical contribution to health through exercise and diet. Mental contribution to health through

A Glover

		happiness and emotional stability. Social contribution to health ensures a feeling of worth in society including friendship groups.
General Fitness	A state of general good health and to be able to carry out every day activities at a relatively low level.	Links to ease of doing every day activities such as running for the bus ,carrying the shopping etc.
Specific Fitness	Capabilities in terms of the components of fitness required for certain sports	Can be fit but not healthy – think about all three aspects of the definition

Contributions to a healthy and active lifestyle

- Jobs involving manual labour
- Jobs where you are on your feet all day
- An outdoor job
- Walking to cycling to work
- Practical or leisure pursuits in leisure time

Components of Fitness

Strength • Dynamic • Explosive • Static	• Strength needed to support own body weight over a prolonged period of time, or to be able to apply force overtime on a type of object • Strength used in a short, sharp, burst of movement • The greatest amount of strength that can be applied to an immoveable object
Speed	The ability to move all or body parts as quickly as possible
Power	The combination of the maximum amount of speed with the maximum amount of strength
Cardiovascular endurance/stamina	The ability of the heart and lungs to keep operating efficiently during an endurance event
Muscular endurance/stamina	is the ability to use voluntary muscles many times without becoming tired.
Flexibility/suppleness	The range of movement around a joint
Agility	The ability to move quickly, changing direction and speed whenever possible
Balance	The ability to maintain a given posture in static and dynamic situations and to be able to stay level and stable
Co-ordination	The ability to link all the parts of a movement into one efficient, smooth movement and is the ability to control the body during physical activity
Reaction Time	The time taken for the body, or part of the body, to respond to a stimulus
Timing	The ability to coincide movements in relation to external factors. It combines decision making, reaction time and co-ordination.

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Training Methods

		Advantages	Disadvantages
Weight training	Lifting weight/resistance in sets and reps so that muscles are stressed	Improves strength, size, tone and recovery after injury	Requires specialist equipment and a range of weights
Circuit Training	A variety of different exercises known as stations	Little or no equipment. Can be made specific to needs	Takes time to set up
Interval Training	Training that has periods of work and periods of rest, with variations of the two.	Good method for games and middle distance athletes as the recovery and work elements can be changed.	Challenging yourself alone is difficult as the temptation is there to rest until recovered. This depends upon motivation levels.
Fartlek Training	Swedish word for speed play. Interval training which includes walking, jogging and running. Changes of pace and no rest.	Suits games players as it reflect the intensity of the game	Requires a lot of space
Continuous training	Any type of training that keeps the heart rate high over a sustained period of time.	Can be a variety such as cycling, jogging, swimming and aerobics.	Can be repetitive and therefore boring, also takes a long time.

Principles of Training

Specificity	Training that is particularly suited to a particular sport or activity
Progression	Where training is increased gradually as the body adjusts to the increased demands made on it
Overload	Making the body work harder than normal in order to improve it
Reversibility	If training stops then the effects gained can be lost too

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Aspects of training

Altitude training	Training which takes place high above sea level	This is beneficial to endurance athletes as the body adapts to less oxygen being present in the air and becomes more efficient at using what is available. Competition at ground level is therefore less of a challenge
Warm Weather	Training which takes place at higher temperatures than would normally be the case for training or competition	This is beneficial as the body adapts to working with less water and reduces the amount of water loss. Therefore competition in normal conditions is more efficient due to reduced water loss, preventing dehydration
Pre-season	Training before the season begins when foundations of fitness are built for the forthcoming season	This is usually really intense training. Some professional athletes or teams will undertake altitude and warm weather training during this time
Competition	Training during the season which is meant to maintain levels of fitness and work on specific aspects where needed	Usually training is very skills based however specific areas of fitness may be addressed in response to performances throughout the season
Closed Season	Training once the season has finished to ensure reversibility does not occur and to ensure weight is maintained ahead of preseason	This is when injuries are rehabilitated and the body gets an opportunity to rest.

Diet

Diet links to the physical element of health and ensures a long and healthy life if balanced as it supplies the energy for effective exercise and recovery.

Carbohydrate	Can be simple or complex. Simple are sugars such as Glucose whereas Complex are starches such as pasta bread and rice	These supply our energy
Fat	There are three types of fat and they are commonly found in meat, cooking oils, margarine and butter.	They provide some energy and insulate the body
Protein	The smallest unit is called an amino acid. Main sources are animal products such as meat and plant foods such as beans, lentils, nuts and seeds	These are used for growth and repair

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Vitamins	Essential to maintain good health with various roles. Required in small quantities	A – repairs skin C – growth and repair tissue D – good for the blood cells E – reduces ageing K – Blood clotting
Minerals	Only required in very small amounts and fulfil a variety of functions	Iron – helps transport oxygen in red blood cells Calcium – supports bone growth and development Potassium – regulates blood pressure Magnesium – energy for cell level reactions Zinc – fights infection
Water	This is absolutely essential. Failure to replace water can result in dehydration. Can be gained from all fluids not just water.	Important in most processes within the body
Fibre	Aids the digestive system and can be found in cereals, wholegrain bread and oats	

Obesity	This is a condition of being extremely fat or overweight, which frequently results in health problems
Anorexia	This is an eating disorder related to a fear of gaining weight, self-starvation and a distorted body image

<u>Specialist diet examples</u>

Endurance Event	Low fat and high carbohydrate for weight maintenance and energy. Carbohydrate loading close to an event
Weightlifter	High Protein and high fat for energy and repair
Gymnast	Balanced diet with high protein and high carbohydrate for energy and repair. Low fat to maintain body weight

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National Curriculum requirements

National Curriculum introduced in 2008	Six groups of activities for schools to deliver. 2 hours statutory PE per student per week
Group 1	Outwitting opponents, as in game activities
Group 2	Accurate replication of actions, phrases and sequences as in gymnastic activities
Group 3	Exploring and communicating ideas, concepts and emotions, as in dance activities
Group 4	Performing at maximum levels in relation to speed, height, distance, strength or accuracy, as in athletic activities
Group 5	Identifying and solving problems to overcome challenges of an outdoor nature, as in lifesaving, personal survival in swimming and outdoor and adventurous activities
Group 6	Exercising safely and effectively to improve health and wellbeing, as in fitness and health activities

Healthy Schools Programme

Introduced as a long term initiative to make a significant difference to the health and achievement of children and young people. Has four strands

Personal, social and health education	• Incorporates sex and relationship education and drug education • Contributes to the five national curriculum outcomes for children and young people of being healthy, staying safe, enjoying and achieving making a positive contribution and economic well-being • Provides children and young people with knowledge, understanding, skills and attitudes to make informed decisions about their lives
Healthy eating	• Contributes to the five national curriculum outcomes for children and young people • Gives confidence, skills and knowledge to make healthy food choices • Healthy and nutritious food available during the school day
Physical activity	• Contributes to the five national curriculum outcomes for children and young people • Children are provided with a range of opportunities to be physically active • Children understand how physical activity can help them be more healthy and improve everyday life
Emotional health and well-being	• Contributes to the five national curriculum outcomes for children and young people • Supports vulnerable individuals and groups • Establishes a clear bullying policy

	• Establishes behaviour and rewards policies • Sets up a confidential pastoral support system for all pupils

Sport Development organisations

Sport England	Government agency that provides funding and facilities, measures participation and identifies priority groups
National Governing Bodies	Provide and support coaching, officiating, talent development and competition at different levels
Youth Sport Trust	Manages national school sport competitions, leadership and volunteering programmes to engage young people in PE and School Sport
The Dame Kelly Holmes Legacy Trust	Utilises elite sport role models to inspire participation and mentor young people

Physical Activity in schools

Schools should have a physical activity policy in place.	Schools should have statutory 2 hours physical activity per week per student	The range of extra-curricular sporting activities should be wide and varied to cater for all needs but will be restricted by the staff specialisms and willingness to give up their own time

Extra- Curricular Activities – take place outside of lesson time

Attitude of staff affect these in both a positive and negative way – enthusiasm and relationship with students	Facilities – this determines the type of activity that can be offered.
Local providers such as ski slopes etc public or private determine the outside visits available	Extra-curricular isn't limited to teams etc like traditional schools but also health and recreational activities

Cultural and social factors

Leisure Time	The time when you can choose what you do. When work and chores are finished	Leisure time increased due to greater unemployment, shorter working week, technological advancements and labour saving devices.
Active Leisure	Taking part in activities during leisure time that require the exertion of physical or mental energy and are often but not always low impact.	Eg yoga, walking or high impact such as aerobics or kickboxing
Passive Leisure	Where the activities are when an individual does not exert	Such as going to the cinema, watching TV or playing video

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	any significant physical or mental energy	games

Private sector	Privately owned business whose goal is to make money
Public sector	Publically owned (government) whose goal is to ensure that the public are engaged in their leisure time

Etiquette	Where an unwritten rule is followed	Eg. Batsman in cricket walking when he knows he is out, Footballer kicking the ball out of play for an injury
Sportsmanship	Following of the rules to the letter of the law	Good sportsmanship – owning up when you know you have infringed. Eg. Letting the referee know when not a penalty etc

Social Groupings

Peers	Your friends, colleagues, work mates or people in a similar position to yourself
Family	The people who you are closest to and may live with
Gender	How gender can affect participation and society's stereotyping
Ethnicity/Culture	How ethnicity or culture can affect participation and society's stereotyping around dress, activity choice etc

Professional	Plays sports for a job. They are paid and full time. They are usually highly skilled.
Amateur	Play sport for fun. They tend to pay to play and are lesser skilled
Shamateur	Play at an amateur level but receive payment or gift to play and compete. They tend to stand out as being more skilled than those around them

Forms of the media

- The Press
- TV
- The internet
- Radio
- Apps
- CD-ROM

Positive influence of the media	• Demonstrates the high level performance and therefore can educate the audience • Increases revenue through attracting sponsorship, TV subscription fees and bidding for the rights to show • Provides variety in the viewing/reading media
Negative influence of the media	• Intrusion on an event – too many photographers etc • Changing of rules to make more media suitable eg 100m sprint start and football back pass • Edited highlights providing bias reporting • Altered event timings to meet with the needs of the media audience • Undermining officials – demonstrating errors • Reduction in attendance – due to media being more obtainable coverage • Biased popularity – some sports given favourable viewing and therefore growing faster than others

<u>Sponsorship</u>

What can be sponsored?	• Individuals • Teams/Clubs • Sports • Events • Stadia	• Wayne Rooney • Manchester City • Barclays Premier League • BUPA London Marathon • Emirates Stadium
Benefits to Sponsor	• Increased revenue through advertising • Image reflected onto the company • Tax relief	
Types of Sponsorship	• Equipment • Clothing • Accessories • Transport and Travel • Training • Entry Fees and Expenses	<u>Unacceptable Sponsorship</u> • Tobacco and alcohol • Unhealthy options • Negative role model for young people • Age restrictive

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Types of competition

Knock-out Ladders Combination events which involve qualifying criteria	FA Cup Squash or Badminton club Olympic trials with qualifying times etc

Olympic Games

Advantages of hosting games	• Raises profile of host city • Improved facilities that can be used once Olympics has finished • Improved infrastructure such as roads, trains etc • Increased interest in the host country leading to raised participation • Increased revenue for local businesses through tourism
Disadvantages of hosting games	• Potential overcrowding • Hooligansim • Terrorist threats • Potential loss of earnings if costs escalate