The Trafalgar School at Downton

Knowledge Organiser

Year 11: Terms 3 and 4

2024/2025

Contents

Name……House……

Being Trafalgar

At the end of your time at the school your knowledge organisers will provide you with lots of help and support when your prepare for your GCSE exams.

To help yourself you should:

- Keep your Knowledge Organisers as tidy as possible
- Highlight parts of them as you go through learning lessons or add in post-it notes etc. to help you learn key knowledge
- Keep your used Knowledge Organisers safe at home. If you have used them since Year 7 you will end up at the end of Year 11 with 14 Knowledge Organisers. Line them up on your shelf at home and keep coming back to them for your revision, homework and learning
- Show them to your parents and talk through with them the facts and knowledge you have learned about in lessons – help them to learn new things too!
- Take your Knowledge Organiser for the term you are in to school every day and use it in every lesson you can!

Using a Knowledge Organiser well

What is a Knowledge Organiser?
A Knowledge Organiser is a document that sets out the key information you need to understand, learn and memorise in each of the subjects you study this term.

Why do I have to carry my Knowledge Organiser around with me?
Your teachers will want you to use your Knowledge Organisers in lessons. They are yours forever and you may want to annotate or highlight on them when your teacher talks about things in them. They will certainly be used in lessons when you have a cover teacher and you can use them whenever you find yourself with some spare time.

How should I use my Knowledge Organiser?
You should use your Knowledge Organiser to learn this key information and commit it to memory. Your teachers will often quiz you on the information on the Knowledge Organiser in your lessons. The best way of using it is to use the look, cover, write, check method which you will have been introduced to in your Knowledge Organiser launch assemblies.

What do I do with my Knowledge Organiser at the end of the term?
You don't have to carry your Knowledge Organiser around with you anymore but you should keep it somewhere safe where you can easily get it out and use it. Remember that the information on the Knowledge Organiser includes things you will need to remember for your GCSE exams, so your teachers will continue to quiz you on it.

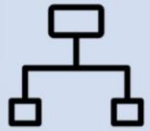
Why is a Knowledge Organiser important?
GCSE specifications require students to memorise more facts, equations, quotations and information than ever before and there are things you will learn right from the start of year 7 that you will need to know in year 11 when you sit your GCSE exams – the Knowledge Organiser helps you to identify the things that you need to try and commit to your long term memory and return to over and over again during your time at secondary school. There are also things that we think it is important you learn about and remember that might not be in a GCSE exam but represent useful knowledge for life.

Your Knowledge Organiser is a vital document. It contains all the key things from your lessons that you will need to work on committing to your long-term memory.

Here are some useful methods to use that will help commit the information to your long-term memory

The Trafalgar School AT DOWNTON

How to use a knowledge organiser – step by step guide

	Look, Cover, Write, Check	Definitions to Key Words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	Look at and study a specific area of your knowledge organiser 	Write down the key words and definitions 	Use your knowledge organiser to condense and write down the facts and or information on flash cards 	Use your knowledge organiser to create a mini quiz. 	Create a mind map with all the information you can remember from your knowledge organiser. 	Ask a partner or family member to have the knowledge organiser in their hands, read out what you remember. 
Step 2	Cover or flip the knowledge organiser over and write down everything you remember. 	Try not to use your knowledge organiser to help you 	Add pictures to help support. Then quiz yourself using the flash cards. You can write questions on one side and answers on the other. 	Answer the questions and remember to use full sentences 	Check your knowledge organiser to see if there were any mistakes with the information you have made. 	They can test you by asking you questions on different sections of your knowledge organiser. 
Step 3	Check what you have written down. Correct any mistakes in green pen and add anything you missed. Repeat. 	Use a different coloured pen to check and correct your work. 	Use a parent/carer or friend to help quiz you on the knowledge. 	You can also use family to quiz you. Keep self-quizzing until you get all questions correct. 	Try to make connections that link information together. 	Write down your answers. 

Language Methods to Practise in your Fortnightly Writing Challenge and Examine in your Reading

alliteration:	the repetition of a consonant sound to begin a series of words.
anecdote:	a short story to prove a point e.g. a dad, talking to his children about the dangers of running in the house, a dad might include an anecdote about falling in his home as a boy and breaking his arm.
antithesis:	putting two opposite ideas together to highlight contrasts.
emotive language:	words and phrases that are used to make the reader feel a particular emotion.
extended metaphor:	a version of metaphor that extends over the course of multiple lines, paragraphs, or stanzas of prose or poetry.
foreshadowing:	the writer hints at an event that will happen later in his story/poem/play/writing.
imperative verbs:	instructional/command words that give the action the speaker/writer wants you to do.
metaphor:	like a simile, but instead of using 'like' or 'as' it compares two things by suggesting that something is something else.
modal verbs:	help show the level of possibility, ability, obligation or permission of the main verb/action e.g. might, can, must, may ...
pathetic fallacy:	the projection of human emotions/mood onto non-human objects found in nature e.g. the weather.
sensory description:	employing the five senses in writing to evoke a mental image and/or sensation for the reader.
simile:	a comparison which finds similar characteristics in two objects and compares them, always by using the words 'like' or 'as'.
statistics:	factual data used in a persuasive way.
superlative:	an adjective or adverb that shows the highest or lowest degree of comparison e.g. best, worst, finest, most, etc.
onomatopoeia:	using words that sound like the noise they represent.
personification:	a type of figurative language that gives an object human characteristics (emotions, sensations, speech, physical movements).
rhetorical question:	a question asked for a purpose other than to obtain the information the question asks e.g. create a dramatic effect; emphasise a point; make you think about/eager to learn the answer.

'I' versus 'me'

Use 'I' when the people named are the subjects of the sentence:

Rishi Sunak and I shook hands.

Use 'me' when the people named are the objects of a verb:

The press took pictures of Rishi and me shaking hands.

Check: Will it still make sense if you remove the name/s?

~~Rishi Sunak and~~ I shook hands. ✓
~~Rishi Sunak and~~ me shook hands ✗

The press took pictures of ~~Rishi and~~ I shaking hands. ✗
The press took pictures of ~~Rishi and~~ me shaking hands. ✓

People can't lick their elbows. **their** (shows ownership)

"Their" is like "our."

She is there already. **there** (a place)

"There" is like "here."

They're all crazy! **they're** (short for "they are")

"They're" = "they are"

Fortnightly Writing Challenge Year 11

Use fronted adverbials:

Rather slowly, (manner)
During the night, (time/temporal)
Every minute or two, (frequency)
At the end of the corridor, (spatial)

Just beyond the stairwell on his left, he opened the door.

Use a two and then three word sentence:

It hurt. I was dying!

Snow fell. Flakes floated precariously.

Use anaphora:

Now is the time for action. **Now is the time** to take up arms. **Now is the time** to fight for your country.

Use epiphora (epistrophe)

I can't believe I was robbed. Everything is **gone**. My television and electronics are **gone**. The money I left on my nightstand is **gone**.

Use a range of sentence structures:

The spotted green frog jumped into the pond.
(simple)

The spotted green frog jumped into the pond **and** he splashed water on me.
(compound – coordinating conjunction: for, and, nor, but, or, yet, so)

The spotted green frog jumped into the pond **when** the hawk flew overhead.
(complex – subordinating conjunction: if, although, as, before, because, when, after, since, until, so that, while etc.)

When the hawk flew overhead, the spotted green frog jumped into the pond.
(subordinate/dependent clause start)

The frog, **which had been lurking underwater,** jumped on the lily pad.
(embedded clause)

Use a past participle - 'ed' start:
Glazed with barbecue sauce, the rack of ribs lay nestled next to a pile of sweet coleslaw.

Use a present participle - 'ing' start:
Whistling to himself, he walked down the road.

Use a tricolon (tripartite list):

'I stand here today **humbled** by the task before us, **grateful** for the trust you have bestowed, **mindful** of the sacrifices borne by our ancestors.'

Snap! Crackle! Pop! **(Rice Krispies slogan)**

Use a conditional sentence:

When people smoke cigarettes, their health suffers.

If I had cleaned the house, I could have gone to the cinema.

Use paired adjectives to describe a noun:

Take a look at this bright red spider.

Luckily, it isn't a wild, dangerous one.

Use anadiplosis (yoked sentence):

Building the new motorway would be **disastrous, disastrous** because many houses would need to be destroyed.

'Fear leads to **anger**. **Anger** leads to **hate**. **Hate** leads to suffering.'
Yoda, *Star Wars*.

Use different sentence types:
The wind is blowing. **(declarative)**

Put your pen down. **(imperative)**

Who do you trust most in the world? **(interrogative)**

Pollution is killing us! **(exclamation)**

Use discourse markers to begin paragraphs and start/link some sentences:
First of all, To begin with, Firstly,

Therefore, Consequently, Hence, As a result,

Furthermore, In addition, Additionally, Moreover,

Meanwhile, Later that day, Seconds later, Subsequently, That afternoon,

On the whole, Interestingly, Basically, In short, Broadly speaking,

Alternatively, Conversely, Similarly, On the other hand, Despite this, Likewise, However,

To conclude, Finally, In conclusion, Eventually, In the end,

PUNCTUATION PIT STOP

Full Stop

Full stops are used to:

1) **mark the end of a sentence.**

Carefully, he kicked the ball into the goal.

2) show when a word has been abbreviated.

Saint Peter's Road is on the High Street.

→ St. Peter's Road is on the High Street.

COMMAS

Commas are used to separate:

1) items in a list .

Bert, Ernie and Elmo are my three pet rats.

2) dependent clauses and phrases.

While I was in the bath, the cat scratched at the door. That meant, because I was on my own in the house, I had to get out to let him in. Thankfully, I had a towel handy!

Quotation Marks

Quotation marks show exact words that are spoken or written by someone.

'Don't be late!' shouted Mrs Smith.

'I will be,' Molly said, and added, 'so don't expect me before 11.'

Question Mark

Question marks are used at the end of direct questions instead of a full stop.

What is your favourite food?

How do you feel today?

An indirect question ends with a full stop, rather than a question mark:

I'd like to know what you've been doing all this time. I wonder what happened.

Exclamation Mark

Exclamation marks express strong emotions: forcefulness, commands, anger, excitement, surprise etc.

Don't buy that car! Stop telling me what to do! I'm free! You're late! She actually won!

They're also used for most interjections:

'Hi! What's new?' 'Ouch! That hurt.'

'Oh! When are you going?'

Semi-colon

Semi-colons are used to separate two sentences that are closely related:

It was winter; the snow was falling heavily.

They can also be used to separate items in a list made of longer phrases. I have been to Newcastle, Carlisle, and York in the North; Bristol, Exeter, and Portsmouth in the South; and Cromer, Norwich, and Lincoln in the East.

Colon

Colons are used to:

1) **begin a list.**

I have three pet rats: Bert, Ernie and Elmo.

2) **indicate that what follows it is an explanation or elaboration of what precedes it.**

Unfortunately, the weather forecast was wrong: it rained all day!

Apostrophe

An apostrophe is used to show:

1) **omission - where a letter or letters has been missed out.**

does not → doesn't I am →I'm

2) possession – when some thing/one owns something. Thankfully, they played Susan's game. Interestingly, David's house has no garden, but Susan's ~~house~~ does.

Dash –

Dashes are used for parenthesis: a word or phrase inserted as an explanation or afterthought into a passage which is grammatically complete without it. E.g.

Last year, they roasted the winning brisket — the size of a pillow — in a mighty clay oven. Paul felt hungry – more hungry than he'd ever been.

Brackets

Brackets are used in pairs for parenthesis: a word or phrase inserted as an explanation or afterthought into a passage which is grammatically complete without it. E.g.

Andrew Jacklin (last year's losing finalist) is expected to win this heat.

Tigers are carnivores (meat eaters)!

Ellipsis ...

Ellipsis is used to:

1) **show a pause or hesitation in someone's speech or thought.**

I don't know … I'm not sure.

2) build tension or show that something is unfinished.

Looking up, Paul couldn't believe what he saw …

Writing the text for a Leaflet/Guide

Stay Safe and Sound Online — clear/apt/original title

Manage your online reputation — subtitles

Anything that you upload, email or message could stay online forever. Therefore, before you post anything online, consider whether or not you would want your parents, teacher or a future employer seeing it. If the answer is no, don't post it! Your privacy is key here.

Privacy Matters

Make sure you set high privacy settings on social networks. Regularly you should change passwords and never share or put online any of your personal details like a phone number, address or your school details. Make sure your safety and privacy settings are activated on your mobile devices too, so you aren't sharing private information. Be aware that using public WiFi might not filter inappropriate content, so look for friendly WiFi symbols when you're out and about.

effectively/fluently sequenced paragraphs

....

Remember:

- make sure you know how to block abusive comments and report worrying content;
- don't arrange to meet people in real life that you've only talked to online;
- use secure and legal sites to download music and games;
- when using the internet for homework, use information appropriately and explain things in your own words rather than copying.

bullet points

Text for a Speech/Talk

'Address to Nation on the Challenger' by Ronald Regan (28th January, 1986)

Ladies and Gentlemen, I'd planned to speak to you tonight to report on the state of the Union, but the events of earlier today have led me to change those plans. Today is a day for mourning and remembering. Nancy and I are pained to the core by the tragedy of the shuttle Challenger. We know we share this pain with all of the people of our country. This is truly a national loss.

a clear address to an audience

...

For the families of the seven, we cannot bear, as you do, the full impact of this tragedy. But we feel the loss, and we're thinking about you so very much. Your loved ones were daring and brave, and they had that special grace, that special spirit that says, 'Give me a challenge and I'll meet it with joy.' They had a hunger to explore the universe and discover its truths. They wished to serve, and they did. They served all of us.

rhetorical indicators that an audience is being addressed throughout

...

The crew of the space shuttle Challenger honoured us by the manner in which they lived their lives. We will never forget them, nor the last time we saw them, this morning, as they prepared for the journey and waved goodbye and 'slipped the surly bonds of earth' to 'touch the face of God.'

Thank you.

a clear sign off e.g. 'Thank you for listening'.

Writing Forms

Article

Andy Murray's Appliance of Science — clear/apt/original title

By Jim White — by-line

If the Caledonian superman wins Wimbledon this year, it will be thanks to [illegible] pieces of sushi a day, a magic potion and a battalion of experts. — strapline

If you want to know what it is about Andy Murray that makes him stand out from the rest of us – apart from that fizzing backhand return and the huge-mouthed celebratory yodel – it is summed up in one word: science!

Sample Check — sub-headings

Today, before he even steps out on to the Centre Court for his Wimbledon semi-final against the huge-hitting Pole Jerzy Janowicz, Murray will [illegible] have been subject to several of these. He does [illegible] time he pops to the lavatory. The osmolality check is conducted by one of his staff, its purpose to gauge the percentage of water and minerals in his urine, to show whether his body is correctly hydrated. The fact is, if Murray wins [illegible] may be thanks to the bloke who inspects his wee.

introductory (overview) paragraph

fluently sequenced paragraphs

fluently sequenced paragraphs

Daily Diet

At 7.30 this morning, while many of [illegible] arriving at Wimbledon's press restaurant will have begun their day assaulting a tottering Himalaya of fried starch, Murray will have eaten yogurt, fruit and a bagel smeared in peanut butter ...

Writing to Review

clear, engaging title

Feeling Icy About Frozen?

effective introduction

Last weekend I **was forced to endure** a new DVD that has been added to **my little sister's** ever-growing Disney collection: Frozen 2. For those of you who have been living on a different planet for the last few years, the Frozen franchise is particularly big business for girls under the age of around 7 or 8.

At first, **I have to be honest**, I was pretty reluctant to watch it. The first version of Frozen followed the usual Disney drama of: boy meets girl, dramas occur, friends are made, and annoyingly catchy songs are sung. There were the conventional talking animals too and (**I have to admit it**), a cute little snowman. In hope of reacquainting myself with the humour of this cold, carrot-nosed cutie – **I gave up the fight**, and decided **I'd try to grin and bear it** through the sequel...!

use topic specific language

use your tone to make the reader feel like you are sharing personal information and advice.

Surprisingly, having sat through the whole of the movie, **I'm willing to confess**: it actually wasn't too bad. The music is slightly better than the first one. In Frozen 2, there are some instrumental versions of songs and the riffs are well pitched and engaging. This was a definite **positive for me**, although I was a little annoyed when **I started humming the tune** on the school bus yesterday morning!

...

effectively/fluently linked paragraphs to sequence a range of ideas (no room to produce the other paragraphs/conclusion here).

As for the characters... Elsa and Anna are still the leading ladies, with Sven, Olaf, and the talking reindeer, (whose name I can't actually remember). Elsa is still a little too overly heroic as she constantly runs off to try and fix things with the customary 'we know it's going to end badly' music tinkering away in the background...

Writing a formal letter

writer's address

35 Hibiscus Crescent
Andover
Hants
SP10 3WE

221B Bakers Street
London
NW1 6XE

reader's address

date

20th February, 2020

Dear Sir or Madam

Formal Salutation: Sir/Madam/Mr Roderick/Mrs Roderick

I am writing because you chair a committee in charge of the compulsory wearing of school uniforms. I am a student at Brinsley High School, a friendly and successful school where uniforms are not worn.

Of course, that students won't spend all morning choosing what to wear or beg parents for clothes th ere is another side to this case: uniforms breed uniformity. We are a culturally diverse nation a all dress the same, this encourages us to be the same. At Brinsley High, we are encouraged to expr individuality, yet this seems to be in contradiction of the message enforced uniform sends to us.

fluently sequenc paragraphs

fluently sequenced paragraphs

Furthermore, …

Yours faithfully
Boris Johnson

formal sign off: Yours faithfully (Sir/Madam = Faithfully) (Mr/Mrs = Sincerely)

Writing a Report

Fundraising at Frecklewood

clear title

The Frecklewood Donkey Sanctuary is a charity that cares for rescued and unwanted donkeys. The sanctuary is based a mile away from Frecklewood Academy and the school has a long history of partnership, having sent many year 10 students there for work experience week. The charity is currently in need of funds, having seen a 12% dip in charitable giving during the past few years….

introductory paragraph outlining aims

subheadings

Benefits of fundraising

As part of this investigation we have spoken with school leaders at the five state secondary schools in the Dansh area about the fundraising activities that they undertake. Collectively they raise funds for numerous causes, including Shelter (a charity that tackles homelessness), Stonewall (a charity that promotes equality for lesbian, gay, bi and trans people) and Young Dementia UK (who provide support for people whose lives are affected by young onset dementia).

…

formal tone

One team leader said 'Some of our students have pursued careers in the charity sector as a result of their fundraising work at school.' …

subheadings

Suggestions for activities

As Frecklewood has a student …

clear conclusion addressing task and recommendations

Ultimately the benefits of fundraising events are huge. Whichever approach Frecklewood Academy takes, the charity, students and staff are all set to benefit.

Dystopian Narrative: *The Machine Stops* by E.M. Forster

Above her, beneath her, and around her, the Machine hummed eternally; she did not notice the noise, for she had been born with it in her ears. The earth, carrying her, hummed as it sped through silence, turning her now to the invisible sun, now to the invisible stars. She awoke and made the room light.

"Kuno!"

"I will not talk to you," he answered, "until you visit me."

"Have you been on the surface of the earth since we spoke last?"

His image faded.

Again she consulted the book. She became very nervous and lay back in her chair palpitating. She directed the chair to the wall, and pressed an unfamiliar button. The wall swung apart slowly. Through the opening she saw a tunnel that curved slightly, so that its goal was not visible. Should she go to see her son, this would be the beginning of the journey.

Of course she knew all about the communication-system. There was nothing mysterious in it. She would summon a car and it would fly with her down the tunnel until it reached the lift that communicated with the air-ship station: the system had been in use for many, many years, long before the universal establishment of the Machine. Those funny old days, when men went for change of air instead of changing the air in their rooms! And yet — she was frightened of the tunnel: she had not seen it since her last child was born.

Writing a Narrative: extract is from The Silent Land, by Graham Joyce.

It was snowing again. Gentle six-pointed flakes from a picture book were settling on her jacket sleeve. The mountain air prickled with ice and the smell of pine resin. Several hundred metres below lay the dark outline of Saint-Bernard-en-Haut, their Pyrenean resort village; across to the west, the irregular peaks of the mountain range.

…

If there are few moments in life that come as clear and as pure as ice, when the mountain breathed back at her, Zoe knew that she had trapped one such moment and that it could never be taken away. Everywhere was snow and silence. Snow and silence; the complete arrest of life; a rehearsal and a pre-echo of death. She pointed her skis down the hill. They looked like weird talons of brilliant red and gold in the powder snow as she waited, ready to swoop. I am alive. I am an eagle.

…

The noise itself filled her ears and muffled everything, and then there was silence, and the total whiteness faded to grey, and then to black!

Climax (turning point, height of action/problem at its worst):

- use exciting adverbs and verbs;
- accelerate pace and heighten tension using lots of shorter sentences.

Fail to Plan
Plan to Fail!

Rising Action (build towards conflict):

- build on character, setting, plot;
- introduce a complication/problem;
- build tension/ excitement;
- use interesting adjectives, sensory description, figurative language etc.

Freytag's Pyramid/ the Story Mountain is the best for planning narratives (stories).

Falling action (turning point, height of action/problem at its worst):

- what events happen to solve the problem?

Exposition (Introduction):

- use an opening hook to grab attention e.g. mysterious atmosphere, in medias res, etc.
- use descriptive vocabulary to set the scene and describe the main character/setting;
- foreshadow what is to come.

Dénouement/Resolution (ending):

- link back to the start (circular);
- what has the character learned?
- how are things different now?
- is there an exciting twist or cliff-hanger ending?

Conclusion: To conclude, repeat RQ, Quite simply, yes!

Yours Sincerely

Intro: My address right hand side, + date, school address left,
Dear Mr Cole
Should we consider discontinuing wearing a school uniform, you've asked? Quite simply, yes! Within this letter, you will find several arguments setting out precisely why we should make this change.

Counter reason: old-fashioned tradition, so easier to continue
Argument reason: other traditions - burnt witches, slept on straw, walked barefoot – now discontinued so …
Supporting example: anecdote, use experts

P1

Form: Letter
Audience: Headmaster
Purpose: Argue change uniform

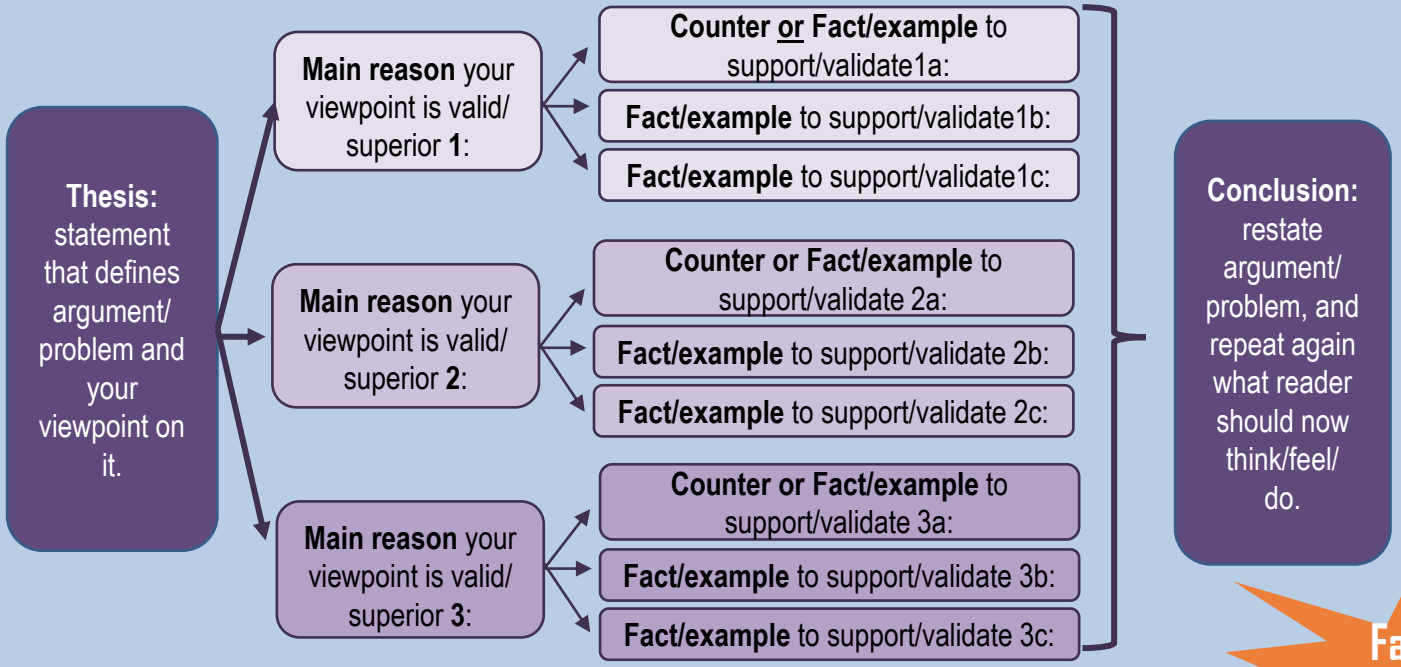
Counter reason: all look same so no prejudice/bullying over clothes,
Argument reason: no individualism, learning who we are
Supporting example: RQ +triple
Isn't part of our learning at school about learning how to dress appropriately, learning who we are, learning how to judge people on what is inside, not what wear?

P2

P3

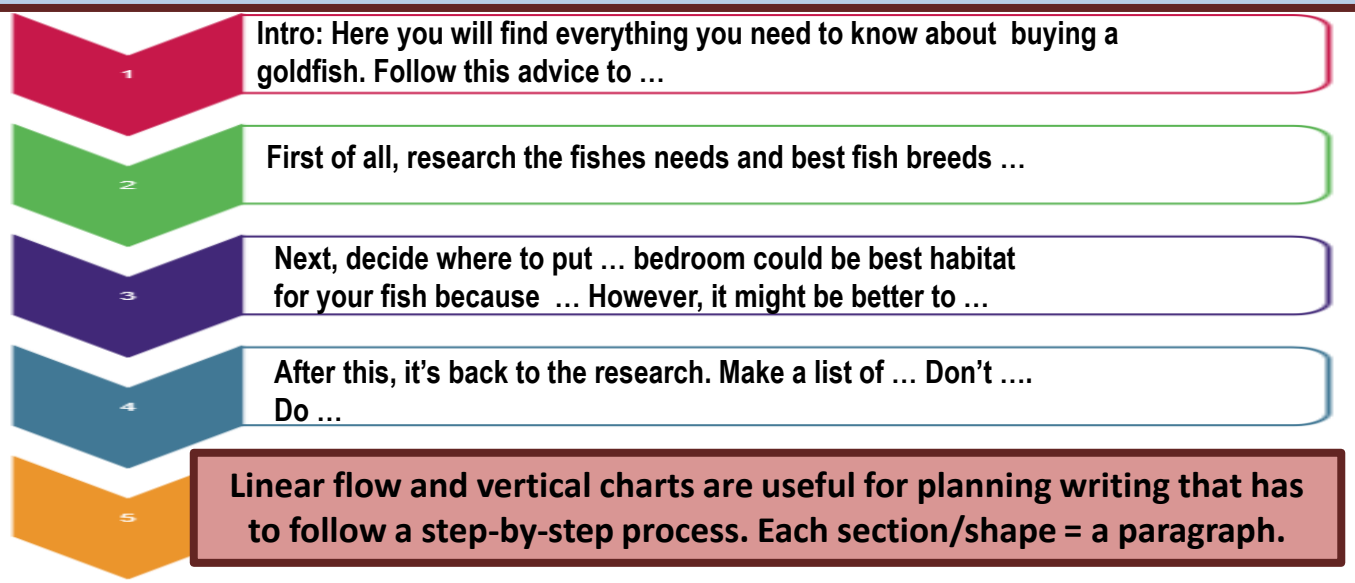
Counter reason: cost cheaper as not designer or from shops making huge profit
Argument reason: cost of blazers, trousers and skirts from school uni shop expensive as no competition, own clothes mix 'n' match so fewer outfits needed, wear weekends so more use,
Supporting example: emotive language: force poorer families to go without, statistics

Mind maps/spider diagrams, allow you to jot down content ideas in no particular order and then decide on the best order to write them up in – so they're ideal for non-fiction writing. Each leg = a paragraph



Plan non-fiction writing (include a counter-argument for writing to argue) using a graphic organiser.

Fail to Plan
Plan to Fail!



Linear flow and vertical charts are useful for planning writing that has to follow a step-by-step process. Each section/shape = a paragraph.

The Grid Plan is good for making sure you include lots of different methods, or to compare two/more things side-by-side. Each row/column = a paragraph.

Paragraph content/ topic	Language method/vocab	Sent structures	Punc
1: waves engulfing and devouring the sea side town - noisy and disruptive, movement	onomatopoeia crash, whip, smash personify so violent/threatening	'ing' start verbs (pres part)	! ;
2: train victim moving across railway line past houses towards destination	personify - victim, alliteration, metaphor: A caterpillar, the train sways and pitches precariously along the track to its daily destination. Snatching bites, the sea salt nips at its metal skin as it passes, eating away at it, killing it. Rattles. Will it survive?	Chain/ tricolon Question	? - -
3: zoom in on one carriage window, motion sick	Windows hit by spray that 'like a tamed ca' has 'turned savage' today. Passenger pitched side-to-side; bubbling sickness rising bile from stomach!	Anadiplosis (yoked)	' ' ; !
4: houses	Like soldiers standing to attention they are defending their inhabitants. Diff pastel colours of a seaside town: prawn pink, salmon peach, oyster grey, seaweed green, cracking paintwork	Fronted spatial adverbials	( ) :
5: canopy of sky above threatening	Adjectives for mood: grey sky, stuffed clouds full of cold, sharp rain, Verb: beating down, attacking,	Two then three word sentences	… ;

Writing Purposes	Key Language/Structural methods	Chocolate Model!
Inform: tell the reader what they want/need to know.	➢ **Use interesting facts details;** ➢ **use brackets to explain technical terms.**	**Interestingly, chocolate** is actually made from the seeds of a cacao tree. After fermentation, the beans are dried, cleaned, and roasted. The shell is then removed to produce cacao nibs **(unadulterated chocolate in rough form).**
Explain: tell the reader how and why.	➢ **Use connectives: 'as a result', 'because', 'so that', when;** ➢ **use sequence discourse markers: Eventually, Another, Furthermore.**	**Often, when** in need of comfort or reassurance, or in stressful situations, people crave chocolate. Primarily, this is **because** dopamine is released into your brain **when** you eat chocolate, and **as a result** it can lower levels of anxiety ...
Describe: help the reader to picture it and imagine the experience.	➢ **Use similes, metaphors, personification, interesting adjectives/verbs, sensory description.**	**Enticingly,** the **dome** of **dark** chocolate**, flecked sporadically** with **lime slivers, remained encased** in its **fluted carapace. Around** the outside of it **cleaved** the **diminutive remains** of its **neighbour:** a **praline** long ago eaten**! Velvety smooth,** this **solitary bead** of **ganache glistened, revelling** in its **escape**, yet **mourning** its **rejection.**
Narrate: tell the reader a tale that will have them hanging on your every word.	➢ **Use the mountain/ pyramid structure;** ➢ **use some description;** ➢ **use a few lines of direct speech.**	**Suddenly**, she was aware she had arrived at her destination! On the door in front of her, a **scarlet square of shiny plastic printed** with the words 'Chocolate Laboratory' stood out on its **splintering wood**. **Why she was standing on this doorstep, though, and what, or who, had led her here in the first place?**
Persuade: try to get the reader to do as you ask/agree with you.	➢ **Use APE FOR REST: anecdote, personal pronouns, emotive language, fact, opinion, rhetorical questions, repetition, experts, statistics, triples.**	**One of** the **world's greatest comfort** foods, Chocolate, is **the unrivalled 'go-to'** when **life takes a bad turn**, an **easy gift** to **thrill** just about **everyone,** and a **tasty treat** that will **uplift even the most melancholy of moods.**
Argue: present two sides, but ensure your side appears strongest so reader agrees with you.	➢ **Use sequence discourse markers;** ➢ **use 'Some believe ..', 'However, most people would agree that';** ➢ **use APE FOR REST (above).**	**First of all, some believe that as chocolate** is high in calories, it is bad for you. **However, scientific experts have proven** that chocolate, as it contains high levels of antioxidants, could **lower cholesterol levels, improve mood and prevent memory decline**!
Advise: help warn and guide reader, but reassure with carefully considered advice.	➢ **Use imperative verbs (stop, do, don't, wait etc.), and modal verbs (if, could, might, should).** ➢ **use second person (you, your).**	**Most importantly, if you** are feeling bored and craving chocolate, **don't** give in to your yearning. Instead, **you could go** for a walk, **run** errands, **call** a friend or **read** a book. **If you** can take your mind off food for a short time, the craving **may** pass.

Most Often Misspelled words

accidentally	leisure
accommodate	maintenance
allude/allusion	mischievous
believe	necessary
business	occurrence
caesura	pastime
calendar	privilege
disappoint	recommend
experience	referred
foreign	restaurant
generally	rhythm
hierarchy	separate
ignorance	tyranny
illusion	vacuum
independent	vicious

Comparison: **Assessment Objective (A03):** *Compare writers' ideas and perspectives, as well as how these are conveyed, across two or more texts.*

Comparison questions test a reader's ability to:

- compare two texts
- consider the similarities and differences between the texts
- sustain a focus on the question and stated area for comparison.

Before answering:

1. This is the final reading question. Make sure you have left yourself enough **time**. Practise this!
2. Underline the key words in the question. You are likely to be asked to compare with a **specific** focus in mind – what is it?
3. Be sure that you understand the **focus** of the question.
4. Go through the different texts and highlight any evidence that you will use in your answer.
5. **Revisit** the question. Make sure your evidence and points will provide a clear answer to **focus**.

Useful compare and contrast connectives:

on the other hand
similarly
both
unlike
whereas
instead
however
conversely
like
yet
although
in contrast
likewise
as well as
alternatively
while

When writing your answer:

- be clear about which text you are referring to;
- support all points with evidence from the text;
- keep the **focus** of the question firmly in mind – reuse the words of the question to frame your answer if you need something to help you stay on track;
- keep an eye on your timing – this will be a higher tariff question so make sure you have left enough time for completion;
- you may not have the same amount to say about each text but make sure you try to give reasonably even consideration to both texts.

TOP TIP: Use the Question

1. Use the **bullet points**. These are deliberately given to help you. **Organise** your answer with these in mind.
2. The second bullet point tells you to look at **how** the writers get their ideas across. You must compare the ways the writers do this.

Checklist for improving your answer:

- Have you used evidence to support your answer?
- Have you responded to the focus of the question?
- Have you considered points from both texts?
- Have you made it clear which text you are referring to?

Some examples of previous comparison questions

Both of these texts are about **tightrope walkers crossing Niagara Falls**. Compare:

- **what** Blondin and Nik Wallenda **did** during their crossings of Niagara Falls;
- **how** the writers try to convey the **dangers** of crossing Niagara Falls. [10]

Both of these texts are about **volcanoes that have erupted**. Compare:

- **what** the writers **could see and hear** of the erupting volcanoes;
- **how** they get their experiences across to their readers. [10]

Both of these texts give an account **of a mining rescue**.
Compare:

- **what** the writers tell us about what happened on the **day** when the miners were rescued;
- **how** the writers try to show the **drama** of the **day** of the rescues. [10]

These questions are usually accompanied by an instruction such as:

You must use the text to support your comments and make it clear which text you are referring to.

This information is intended to help you so ensure you read it carefully.

Evaluation: **Assessment Objective (A04):** *Evaluate texts critically and support this with appropriate textual references.*

Evaluation questions test a reader's ability to:

- give considered personal judgement
- use the text wisely to support judgements given
- demonstrate clear focus on the question
- provide critical overview of what has been read.

Before answering:

1. Read the statement/view in the question carefully.
2. Underline the part of the statement/view that shows the **focus** of the question.
3. Think about whether you agree/partly agree/ disagree with the statement/view. You might find that you agree and disagree for different reasons.
4. Highlight the text to show which evidence you are going to use to support your opinions.
5. **Look again** at the question. Make sure your evidence and points will provide a clear focused answer.

Timing is key:

This question is worth **10 marks**.

You need to leave yourself around **15 minutes** to answer it.

Useful Sentence Openings and Key Vocabulary:

I agree/disagree with this view/statement... This is reinforced by...
To some extent... Furthermore...

This...
suggests... creates... demonstrates... uses... reiterates... reinforces... implies... indicates... convinces... highlights...

When writing your answer:

- keep the focus of the question firmly in mind – reuse the words of the question to show that your opinions are on task;
- make sure you are offering clear opinions in response to the statement/view given in the question and take a coherent stance;
- support all points with precisely chosen evidence from the text;
- track through the text to gain a clear range of evidence and help you to organise yourself in a coherent way;
- think about how the writer has shaped your opinion (what methods/techniques/ language have been used).

TOP TIP: Use evidence wisely

1. Any opinions you offer must be supported with evidence.
2. Avoid unsupported opinions or assertions – make your opinions relevant using what you have read to prove them.
3. Look at the text and pinpoint what it is that a writer says that makes you think as you do. Use that evidence to accompany your points.

Checklist for improving your answer:

- ☑ Have you responded to the focus of the question?
- ☑ Have you used specific and precise evidence to support your opinions?
- ☑ Have you made a range of points?
- ☑ Have you drawn upon evidence from the whole of the text?
- ☑ Have you given consideration to HOW the writer shaped your opinions?
- ☑ Have you given an overview statement to respond to the question?

Some examples of previous evaluation questions

Component 1: Q5

"The writer shows that life for immigrants such as the Hamiltons was very hard."
How far do you agree with this view?
You should write about:

- your thoughts and feelings about how the life of the Hamiltons is presented in the passage as a whole;
- how the writer has created these thoughts and feelings. [10]

"The writer uses the walk to Wreck Island to show a change in both Emma and Robbie."
How far do you agree with this view?
You should write about:

- your thoughts and feelings about how Emma and Robbie are presented in these lines and in the passage as a whole;
- how the writer has created these thoughts and feelings. [10]

"The writer presents Jonathan as a failure as a father and a husband."
How far do you agree with this view?
You should write about:

- your thoughts and feelings about Jonathan and how he is presented in these lines and in the passage as a whole;
- how the writer has created these thoughts and feelings. [10]

Component 2: Q4

"In the first three paragraphs of the account, the writer gives the impression that the accident was **so serious that the trapped miners would not be found alive**." How far do you agree with this statement?
You should comment on:

- what he says;
- how he says it. [10]

"In this extract, George Banks presents Blondin in **a very positive way**." How far do you agree with this view?
You should comment on:

- what he says;
- how he says it. [10]

"Pieter Sandrick gets across his feelings **of increasing terror really well**." How far do you agree with this statement?
You should comment on:

- what he says;
- how he says it. [10]

These questions are accompanied by the instruction:
You must use the text to support your comments.
This states you MUST use evidence to support your answer.

Non-fiction Writing:

Assessment Objectives:

AO5 Communicate clearly and imaginatively, selecting and adapting tone, style and register for different forms, purposes and audiences.

Organise information and ideas, using structural and grammatical features to support coherence and cohesion of texts.

AO6 Use a range of vocabulary and sentence structure for clarity, purpose and effect, with accurate spelling and punctuation.

Component 2 Exam facts:

- Two writing tasks
- 20 marks each
- 5 minutes to plan
- 25 minutes to write
- Write 300-400 words per task

Before Starting:

1. Read each task carefully (remember you *have to* do both).
2. Highlight the keywords in the task that suggest audience, content, purpose, style, structure and so on.
3. Try to step back from the task – sometimes you are asked to give your views – try to consider how you feel or what your immediate reaction is.
4. Use the planning time to form a clear plan.

Planning:

Why plan?

Planning helps you to capture your immediate reactions and views about a task.

- Planning allows you to jot down useful vocabulary.
- Planning allows you to consider the structure of your work.
- Planning will save you time in the long run.

Things to consider:

- The content of your writing – what angle will allow you to write in sufficient detail?
- Words, phrases and ideas that are suited to the topic and will enhance your writing.
- Structure – how will you present your work. Have you been asked for a specific structure (e.g. a formal letter)?
- Remember to write in full sentences and paragraphs.
- How will you begin your work, how will your ideas develop and how will you conclude your work?
- Once you have written down your ideas in a plan, remember to give some consideration to the order that you will write.

Work out in advance what kind of planning works best for you. Do you prefer to plan using a mind map, a spider diagram, a flow chart or a different style?

Top tips:

- Remember to use a range of appropriate and well selected details to develop and support your points
- Always leave enough time to proofread your work.

Examples of previous Component 2 Writing questions:

Write a lively article for your school/college magazine with the heading:
A Teenager's Guide to Managing Parents.

Write your article.

You have been asked to give a talk to your class with the title:
The person I'd most like to spend a day with.

Write down what you would say in your talk.

Write a review for a teenage magazine of a book, film or TV programme/series you have enjoyed in the last year and why it might appeal to others of your age.

Write your review.

Your headteacher has decided that there should not be an end of year celebration such as a school prom or party. The headteacher believes it would just be an excuse for students to show off in an expensive way.

Write a letter to your headteacher giving your opinions on this.

How will my work be marked?:

Your writing in both Component 1 and Component 2 is marked using very specific criteria. You are awarded marks for AO5 Communication and organisation and AO6 Vocabulary, sentence structure, spelling and punctuation.

In Component 2, AO5 is marked out of 12 and AO6 is marked out of 8. During your revision, you should have a look at the mark scheme that the examiners will use, this will help you to see exactly what they are looking for.

Remember, getting the basics (full stops and capital letters) is just as important as trying to include some more complex sentences. Aim to include an accurate range of sentence types and vocabulary.

Checklist for improving your writing:

- ☑ Have you planned your work carefully?
- ☑ Have you included sufficient detail?
- ☑ Have you considered the language you use?
- ☑ Have you structured your work carefully?
- ☑ Have you varied your punctuation for effect?
- ☑ Have you proof-read your work for errors?

Retrieval of explicit and implicit information:

Assessment Objective (A01 Strand 1): *Identify and interpret explicit and implicit information and ideas.*

Information retrieval questions test a reader's ability to:

- identify the explicit information or ideas needed to answer the question
- isolate key details
- interpret the meaning of implicit ideas and information
- clearly refer to evidence in the text.

Before answering:

1. Make sure you are looking at the **correct** text and the **right** part of the text.
2. Be aware of how many marks the question is worth. E.g. if it is a 5-mark question you will probably be asked for 5 details.
3. Read the question **at least twice** to make sure you know exactly what you are looking for.
4. Use skimming and scanning techniques to find the detail(s) you need quickly.
5. Think about how much time you should dedicate to the question – don't be tempted to spend too long on this question and reduce the time you have available elsewhere.

When writing your answer:

- double check that you have read and understood the question and the instructions at the start of the question;
- identify relevant words or phrases from the text to answer the question – be specific.
- your answer may be brief but make sure you have provided enough detail to answer the question;
- track through the section of the text carefully – reading chronologically will help to make sure you don't miss anything.

Bullet points are fine for information retrieval questions but make sure your answer makes sense!

Skimming

This is when you do not read every word but try to take in the overall meaning of a piece of writing by moving your eyes throughout the text. Headings and opening sentences are useful for directing this technique...

Scanning

This is useful if you are looking for a particular word or piece of information. For example, in the second C2 Q1 example below you could begin by scanning the text for the word 'crater'.

Checklist for improving your answer:

- Have you answered the question?
- Have you retrieved sufficient information?
- Have you checked that you copied the information down correctly?
- Have you checked how many marks the question is worth?

TOP TIPS:

1. Use **short** relevant quotations.
2. **Check** the details of the question carefully.
3. If you are told to look at **specific lines** use your pen and **mark them** off on the exam paper so that you don't lose focus.

Some examples of previous information retrieval questions:

Component 1: Q1

Read lines 1-6.

List **five** things you learn about Emma in these lines. [5]

List **five** things you learn about Jonathan in lines 1–17. [5]

Read lines 1-16.

List **five** things you learn about Brian Faulkner in these lines. [5]

Component 2: Q1

Read the newspaper article 'Miners Rescued from Chilean Mine' in the separate Resource Material.

a. What was the nickname of the rescue capsule? [1]
b. How did the miners let the rescuers know they were still alive? [1]
c. Where were the men taken once they had been brought to the surface? [1]

Read the newspaper article 'Iceland's erupting volcano' in the separate Resource Material

a. When did the Eyjakull volcano last erupt? [1]
b. How close did Tom Robbins get to the crater of Eyjakull? [1]
c. How wide is the crater of Katia? [1]

Read the newspaper article 'Inside America's Toughest Prison' in the separate Resource Material.

a. Give one example from the article of how the worst prisoners were punished in the past? [1]
b. At the time the article was written, how many prisoners were in Florence Prison? [1]
c. Give one example of the privileges that prisoners may earn for good behaviour? [1]

Component 2: Q3

To answer the following questions you will need to read the account in 'The Penny Review' magazine.

a. What caused the coal mine to collapse? [1]
b. What detail does the writer give that shows the rescue attempt never slowed or stopped? [1]
c. What gave the rescuers hope that the miners were still alive? [1]

To answer the following questions you will need to read Pieter Sandrick's account of the Krakatoa volcano explosion on the opposite page.

a. On which day of the week did the Krakatoa volcano start to erupt? [1]
b. How far away was Krakatoa from the town of Anjer? [1]
c. How did Pieter Sandrick survive when the 'wall of water' hit the coast? [1]

To answer the following questions you will need to read the extract on the opposite page by Charles Dickens.

a. When Charles Dickens visited the Eastern Penitentiary prison, what did he describe as awful? [1]
b. Give two details from the text that suggest prisoners are in the Eastern Penitentiary prison for a long time. [2]

Synthesising information:

Assessment Objective (A01):

Select and synthesise evidence from different texts.

This question will be found in your Component 2 examination.

Synthesis questions aim to test a reader's ability to:

- show their understanding of key information, themes or ideas
- effectively collate key details from two texts
- identify common areas/ themes or ideas across two texts.

Before answering:

1. Read the question carefully. It is vital that you understand what you are being asked to synthesise.
2. Think about the focus of the question by stepping back from the texts. Try to get a clear understanding of the texts and task before you start to write.
3. Underline a couple of relevant key words from each text as these will help you to remain focused.

Definition:

Synthesis is the skill of bringing together materials from more than one text to create new material. The skill of summary is useful here as it encourages a brief and focused response.

When synthesising two texts:

consider the following:

- Re-read the question.
- Look at the words or phrases you have highlighted.
- Consider how you will collate the ideas from across both texts (do any of the points link up or are the points all different?) How will you present your response?
- Always refer to both texts in your responses or you will *only* be awarded a mark in Band 1.
- Check the mark tariff – this question is worth 4 marks and will only need 4 brief points.

Examples of previous synthesis questions:

The following questions all had the following introduction:
To answer the following questions, you must use both texts.

Using information from both texts, explain briefly in your own words what happened when news of the mining accidents became known. [4]

Using information from both texts, explain briefly in your own words what happened as a result of the volcanoes erupting in Anjer and Iceland. [4]

Using information from both texts, explain briefly in your own words, how the spectators reacted to Blondin and Wallenda. [4]

Using information from both texts, explain briefly in your own words how whales were hunted in 1850 and are now hunted in the Faroe Islands. [4]

TOP TIP: things you NEVER do in a synthesis response:

- **Never** give extra details or reasons, a synthesis does not require you to include these.
- **Never** try to expand on the details you have been given from the text. This should be a brief and focused answer.
- Quotation is acceptable but you should **never** copy large, unselective chunks directly from the text.
- **Never** spend much more than around 5 minutes on this type of question.

Checklist for improving your answers:

- A synthesis checks understanding – is your answer clear?
- Does your synthesis response reflect the focus of the question?
- Have you included sufficient different points to access ALL marks?
- While there is no preferred style when completing a synthesis, most candidates perform best when dealing with one text at a time.
- Have you made it clear which text you are referring to?

A CHRISTMAS CAROL - YR 11

Key events (AO1)	Associated quotes
A miserly old man called Ebenezer Scrooge is mean, selfish and cruel to all around him. One night when returning home he is visited by the ghost of his old friend and business partner Jacob Marley. Marley tells Scrooge he must change his ways and live a life of generosity or he will be punished and forced to walk the earth forever more. Scrooge is visited by three spirits (The Ghosts of Christmas Past, Present and Yet-to-Come) who all show him visions of his life and how his life will be if he doesn't change. Filled with regret, sorrow but a determination to change, Scrooge is returned to his home on Christmas Day where he sets out to change his life and use his wealth to help others. He goes on to embody the Christmas spirit better than anyone else.	
Stave 1: Marley's Ghost	
We discover Jacob Marley, who was Ebenezer Scrooge's business partner, died seven years ago. Scrooge is working in his counter-house, along with his clerk - Bob Cratchit. Scrooge's nephew Fred arrives and wishes him a Merry Christmas, but Scrooge dislikes his enthusiasm for the festive and answers: "Bah! Humbug!" Scrooge argues that Christmas is like any other day when there is money to be paid through bills. Fred has a different attitude, proclaiming Christmas to be a "as a good time: a kind, forgiving, charitable, pleasant time: the only time I know of, in the long calendar of the year, when men and women seem by one consent to open their shut-up hearts freely." Fred invites his uncle to visit him and his friends for Christmas, but Scrooge refuses. Two portly gentlemen then come into Scrooge's counter house and ask Scrooge if he would donate money for the poor. Scrooge asks them if the prisons and workhouses are still open and dismisses them - saying he wishes to donate nothing and to be left alone. The weather is getting colder and colder. Outside, a Christmas caroler tries to sing a song through the keyhole of Scrooge's office door but Scrooge scares him off. After closing up the counting office and before he goes home, Scrooge tells his clerk Bob Cratchit that he wants him to work on Christmas Day, but eventually he is persuaded to allow him to have the day off - but Cratchit must turn up all the earlier the next day. Scrooge continues his usual routine of having dinner in a tavern and then returns home through awful, foggy London streets. As he arrives at his front door he thinks he sees Marley's face on the door knocker until it turns back into an ordinary knocker. He is surprised but refuses to accept what he has seen. Scrooge thinks he sees a hearse going up the stairs in front of him. He rushes into his room and locks the door behind him, putting on his dressing grown as well. He eats gruel by the fire, but suddenly the carvings on the mantelpiece change into pictures of Jacob Marley's face. Again, Scrooge is reluctant to accept what he has seen. All of the bells and in the room start ringing and Scrooge hears footsteps coming up the stairs. A ghost floats through the door - it is Jacob Marley - see-through and covered up in chains, cash-boxes, keys, padlocks, ledgers, deeds and heavy purses wrought in steel. Scrooge tries to deny Marley's Ghost exists, claiming he is just a symptom of food poisoning. The ghost explains to Scrooge that he has spent seven years wandering the world in his chains as a form of punishment for the way he lived his life. Marley's Ghost tells Scrooge he has come back to save Scrooge from the same fate he has suffered. He informs Scrooge that he will be visited by three different spirits over the next three nights. The first one will come at one o'clock, the next the same time and the final one will be there on the last stroke of midnight. The ghost moves towards Scrooge's window which opens by itself. Scrooge is terrified and full of fear. The ghost tells Scrooge to look out of the window and he sees many spirits, all covered in chains. They are all shouting about how they did not lead caring and honourable lives and did not help others. Marley disappears and Scrooge goes back to bed and falls asleep.	"Scrooge was his sole executor, his sole administrator, his sole assign, his sole residuary legatee, his sole friend and sole mourner." "Bah! Humbug!" "Are there no prisons?" asked Scrooge. "Plenty of prisons," said the gentleman, laying down the pen again. "As a good time: a kind, forgiving, charitable, pleasant time" Fred on Christmas

A CHRISTMAS CAROL – THE STORY

Stave 2: The First of the Three Spirits	
Scrooge wakes up at midnight and is confused. When he went to sleep it was 2am! To begin with he believes he must have slept through an entire day or it's noon and the sun isn't out. He remembers that Marley's Ghost told him the first spirit will arrive at 1am. Terrified and anxious, Scrooge waits. At one o'clock Scrooge's curtains on his bed are blown away by an unusual, child-like character who exudes wisdom and experience. The spirit has a cap to cover the light that comes from its head. Scrooge is taken to the rural countryside where he was born and raised. He visits his old school, sees his young friends and remembers many parts of his childhood. The effect of seeing these memories makes Scrooge cry. The ghost moves Scrooge into the school where a lonely little boy - Scrooge as a youngster - is all alone at Christmas time. Scrooge and the ghost continue to visit different Christmases of the past and eventually we see a little girl - Scrooge's sister Fan - who runs into the room and tells Scrooge she has come to take him home. She says their father has allowed Ebenezer Scrooge to come home. Young Scrooge hugs his sister. Scrooge reveals to the ghost that Fan died years ago and she is the mother of his nephew Fred. The Ghost of Christmas Past and Scrooge visit other Christmases and see a party being held by Fezziwig, a merchant who had Scrooge as an apprentice when Ebenezer was younger. Scrooge sees an older version of himself in conversation with Belle - his fiancée. She tells Scrooge she is ending their engagement as his love of capital gain and greed has ruined their love that used to be everything to Scrooge. Scrooge is taken to see a more recent Christmas where an older Belle talks to her new husband about her former fiancé Scrooge. Her husband says that Scrooge is alone in the world. Scrooge is struggling to deal with these scenes and begs the ghost to allow him to go back home. Full of anger, sadness and loss, Scrooge grabs the ghost's cap and pulls it over the child's head, and the light begins to diminish. By the time he gets to the ground, Scrooge finds himself back in his bedroom, where he goes to bed again and falls asleep straight away.	"A solitary child, neglected by his friends, is left there still." Scrooge said he knew it. And he sobbed. "Scrooge […] wept to see his poor forgotten self as he used to be." "Spirit!" said Scrooge in a broken voice, "remove me from this place."
Stave 3: The Second of the Three Spirits	
In the distance the church clock strikes one and Scrooge wakes up in shock. He is glad to be awake and is waiting for the second spirit to arrive, but none seems to come. Scrooge waits 15 minutes and then suddenly a bright light beams down onto him. Scrooge moves into his other room where he finds the second spirit waiting for him. The Ghost of Christmas Present is very different to the first spirit. He is a giant, covered in green robes and sits on top of a throne made of a huge Christmas feast. He has a booming, loud voice and tells Scrooge he has more than 1800 brothers (one for each Christmas). He lives for only a single day. The spirit tells Scrooge to touch his robe, and when he does so the feast and room disappear. Scrooge finds himself in the middle of London on Christmas morning. It is very busy and full of life. He sees all sights of a joyful Christmas day as people shovel snow, take presents to each other and say to each other: "Merry Christmas!" The ghost and Scrooge then move on to visiting Bob Cratchit's family - remember that Cratchit is Scrooge's clerk. Mrs Cratchit prepares a Christmas meal of goose and all the trimmings. They are poor and this meal is one of the few treats they set money aside for. The eldest daughter Martha comes back from her job at the milliner's. Peter, the eldest son, wears a stiff-collared shirt which he received from his father. Bob arrives carrying his young son Tiny Tim on his shoulders. Tiny Tim has a debilitating condition that makes him very weak. The family is happy even though they have little food to celebrate Christmas with. Scrooge begs the Ghost to know whether Tiny Tim will survive. The spirit replies that given the current conditions in the Cratchit house, there will be an empty chair at next year's Christmas dinner. They move on to other people celebrating Christmas, including an isolated community of miners, lighthouse workers celebrating, and a crew on board a ship. Next they move on to Fred's Christmas party, where Scrooge enjoys watching the many party games, although none of the party guests can actually see him. As the night carries on, the Ghost of Christmas Present grows older. Lastly they come to a huge expanse of emptiness. Scrooge sees a pair of starving children who travel with the Ghost beneath his robes; their names are Ignorance and Want. Scrooge inquires if nothing can be done to help them. Mockingly, the ghost echoes Scrooge's own words from Stave 1: "Are there no prisons? Are there no workhouses?" The spirit vanishes as the clock strikes midnight and Scrooge sees a strange hooded ghost moving towards him.	"Oh, a wonderful pudding! " Fred on Scrooge: "I mean to give him the same chance every year, whether he likes it or not, for I pity him." "Are there no prisons?" said the Spirit, turning on him for the last time with his own words. "Are there no workhouses?"

A CHRISTMAS CAROL – THE STORY

Stave 4: The Last of the Three Spirits	
This new phantom is very different to the other spirits. He wears a black hooded robe and moves towards Scrooge. Scrooge cannot help but kneel before him and asks if he is The Ghost of Christmas Yet to Come. The phantom says nothing and Scrooge feels terrified. Scrooge is still hugely affected by the visits of the last two spirits and asks the phantom to share his lesson so he can avoid the fate of Jacob Marley. The ghost takes Scrooge to the London Stock Exchange, where he overhears a group of businessmen discussing the death of a wealthy man. Next they see a pawn shop in a poor part of London, where a group of low-lives sell personal items taken from a dead man. Scrooge sees the body of the dead man all alone and demands to be shown someone who feels sorry for this man who has died. The ghost shows the dinner table of a poor family, where a husband and wife express relief at the death of a man to whom they owe money. They move on to the Cratchit household again, where the family struggles to cope with the death of Tiny Tim. Scrooge is desperate to know the identity of the dead man, struggling to understand what point or lesson the ghost is trying to make. Suddenly, he finds himself in a rundown churchyard where the spirit points him toward a freshly dug grave. Scrooge approaches the grave and reads the inscription on the headstone: EBENEEZER SCROOGE. Stunned, Scrooge grabs at the spirit and begs him to stop the events of his nightmarish vision. He promises to honour Christmas within his heart and to live by the lessons of Past, Present, and Future. The spirit's hand begins to tremble, and, as Scrooge continues to ask for mercy, the phantom's robe shrinks and collapses. Scrooge finds himself returned to his bed.	"He felt that […] its mysterious presence filled him with a solemn dread." "I will honour Christmas in my heart, and try to keep it all the year." "My little, little child!" cried Bob. "My little child!"

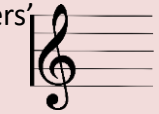
Stave 5: The End of It	
Scrooge realises he has a chance to live the rest of life in a way that will make him truly happy. He praises of the three spirits and the ghost of Jacob Marley. When he realises he hs been returned back to Christmas morning, he begins shouting "Merry Christmas!" as loud as he can. Full of energy and excitement, Scrooge struggles to dress properly and dances while he shaves. As quickly as he can, Scrooge runs into the street and offers to pay the first boy he meets a colossal sum to deliver a great Christmas turkey to Bob Cratchit's family. He meets one of the portly gentlemen who in Stave 1 asked for donations to the poor. Scrooge apologises for his rudeness, and whispers into the man's ear the massive sums of money he promises to give to charity. Scrooge moves on to Fred's Christmas party and shows such joy and enthusiasm that the other guests cannot understand Scrooge's sea change in behaviour. The next morning, Scrooge arrives at the office early and decides to put on his usual stern and serious expression when Bob Cratchit enters eighteen and a half minutes late. Scrooge, pretending to be disgusted, begins to criticize Bob, before suddenly telling Bob he will give him a large raise and will assist his family as much as he can. Bob cannot believe it, but Scrooge promises to keep his word. We are told by the narrator that Scrooge is as good as his word: He helps the Cratchits and becomes a second father to Tiny Tim who does not die as predicted in the ghost's dreadful vision. Many people in London are puzzled by Scrooge's new behaviour, but Scrooge merely laughs at them. Scrooge brings the Christmas spirit into every day, respecting the lessons of Christmas more than any man alive. The narrator finishes the story by saying that Scrooge's words and thoughts should be shared by of all of us ... "and so, as Tiny Tim observed, God bless us, Every one!"	"I don't know how long I've been among the Spirits. I don't know anything. I'm quite a baby." "I'll send it to Bob Cratchit's!" whispered Scrooge, rubbing his hands, and splitting with a laugh.

THE CHARACTERS

	Character summary	Key Quotes	Associated themes or ideas:
The Ghost of Christmas Past	The first of the three spirits to visit Scrooge, The Ghost of Christmas Past takes Scrooge on a journey through his memories – ones he enjoys remembering and others that bring up emotions that he has long since buried. We see his absolute joy at seeing Fan and Fezziwig again, but his immense sorrow and regret for what happened between him and Belle. The Ghost is presented as very unusual looking and re-reading and re-analysing the use of description of the character would be very useful to you as part of your revision.	"It wore a tunic of the purest white, and round its waist was bound a lustrous belt, the sheen of which was beautiful." “Why did his cold eye glisten, and his heart leap up as they went past? Why was he filled with gladness when he heard them give each other Merry Christmas, as they parted at cross-roads and-bye ways, for their several homes? What was merry Christmas to Scrooge? Out upon merry Christmas! What good had it ever done to him?”	Supernatural Memory and the Past Compassion and Forgiveness Regret Sorrow Guilt and Blame Choice Isolation Christmas Spirit Family Emotional Warmth Time
The Ghost of Christmas Present	The second of the three spirits that is presented a giant representing all that is great and good about Christmas Day. He is more dominating than the previous spirit and mocks Scrooge’s own words from Stave 1 when Scrooge previously asked about prisons and workhouses being in operation. This spirit shows to Scrooge how everyone across society takes joy from Christmas and celebrate together, they do not isolate themselves like Scrooge has done. In particular, the visit to the Cratchits and Scrooge seeing the love for Tiny Tim hits him hard.	"I am the Ghost of Christmas Present," said the Spirit. "Look upon me." “[Tiny Tim] told me, coming home, that he hoped the people saw him in the church, because he was a cripple, and it might be pleasant to them to remember upon Christmas Day, who made lame beggars walk, and blind men see.”	Christmas Spirit Family Compassion and Forgiveness Isolation Emotional Warmth Supernatural Choice Guilt and Blame Time Self-awareness
The Ghost of Christmas Yet-to-Come	The final spirit is a dark, silent phantom that terrifies Scrooge and in some ways resembles the Grim Reaper, a classical symbol of death. This spirit shows Scrooge how the death of an isolated and friendless man sees vagabonds still his personal items, people celebrating his death and others suffering at his lack of compassion in life. Finally, the Ghost shows Scrooge his own gravestone and it is as this point that Scrooge has his epiphany.	“He lay, in the dark empty house, with not a man, a woman, or a child, to say that he was kind to me in this or that, and for the memory of one kind word I will be kind to him.” “We may sleep to-night with light hearts, Caroline."	Supernatural Regret Sorrow Choice Time Guilt and Blame Transformation Emotional Coldness Isolation Death Family

	Character summary	Key Quotes	Associated themes or ideas:
Jacob Marley	Scrooge's former business associate and friend. Marley passed away seven years ago on Christmas Eve. Marley inspired Scrooge to be selfish, greedy and utterly ruthless when dealing with other people. However, it is Marley that comes back to Scrooge as a ghost to tell him to change his ways or end up with the same fate as him, cursed to forever travel the world filled with regret and sorrow.	"It is required of every man," the Ghost returned, "that the spirit within him should walk abroad among his fellowmen, and travel far and wide; and if that spirit goes not forth in life, it is condemned to do so after death. It is doomed to wander through the world -- oh, woe is me! -- and witness what it cannot share, but might have shared on earth, and turned to happiness!"	Christmas Spirit Regret Sorrow Greed Supernatural Choice Time Guilt and Blame Emotional Coldness Memory and the Past Compassion and Forgiveness
Ebenezer Scrooge	The central protagonist (main character) of the novella, Scrooge is a selfish, greedy but ultimately isolated elderly man that has spent much of his life hoarding his wealth away from others despite being surrounded by poverty and suffering. He is initial cruel and callous to everyone else before the visits of Marley's Ghost and the Three Spirits bring about his epiphany and the change in his character. Through the help of the narrator we follow Scrooge on his journey through his own past, present and potential future and celebrate his embracing of the Christmas spirit at the end.	"Bah! Humbug!" "Since you ask me what I wish, gentlemen, that is my answer. I don't make merry myself at Christmas and I can't afford to make idle people merry." "I will honour Christmas in my heart, and try to keep it all the year. I will live in the Past, the Present, and the Future."	Isolation Christmas Spirit Regret Sorrow Greed Choice Guilt and Blame Emotional Coldness Emotional Warmth Catharsis Transformation Memory and the Past Compassion and Forgiveness
Fred	Scrooge's nephew and the son of Ebenezer's sister Fan. Fred embodies everything good about Christmas and is filled with joy and happiness everywhere he goes. He is the antithesis of Ebenezer Scrooge. When Scrooge sees Fred spending Christmas with his friends Fred refuses to criticise Scrooge, only saying he pities him. Fred is delighted to see his uncle in Stave 5.	"He had so heated himself with rapid walking in the fog and frost, this nephew of Scrooge's, that he was all in a glow"	Family Christmas Spirit Memory and the Past
Other characters	Bob Cratchit – An honourable man and a wonderful father. Scrooge comes to respect him very much. He is part of the Cratchit family including his wife, Martha, Belinder and Peter. Tiny Tim - Bob's crippled son who everyone loves and everyone pities. Dickens was arguably trying to evoke immense sympathy from his readers for this weak but wonderful young boy. Tiny Tim survives his illness thanks to Scrooge's financial help. Fan and Belle – Scrooge's sister and former fiancée. They represent Scrooge's past and his regrets. Fezziwig – Scrooge's old boss who represents the Christmas Spirit. The portly gentlemen – Scrooge is rude to them but apologizes to one of them in Stave 5. They raise money for charity.	"I have come to bring you home, dear brother!" said the child, clapping her tiny hands, and bending down to laugh. Fan (Stave 3) "God bless us every one!" said Tiny Tim, the last of all. (Stave 3)	Christmas Spirit Family Memory and the Past Guilt and Blame Emotional Warmth Isolation Regret Sorrow Transformation Charity

A CHRISTMAS CAROL - LANGUAGE

Form (AO2)	Why is this significant?
Allegory	An allegory is a type of story that has a hidden meaning, where characters represent bigger themes and ideas. A Christmas Carol represents turning away from greed, selfishness and an obsession with money and turning towards helping others and using your wealth to good for friends, family and society.
Frame Story 	A Christmas Carol begins with a narrator introducing the story and finishes with the narrator summing it up and ending it, this is known as a 'frame story'. At the beginning Scrooge's character is established by the narrator and at the end his dramatic shift in personality is explained by the narrator as well. In between these two parts of the plot we find out other stories from Scrooge's past, present and future in order for him to have his epiphany and change.
Cyclical Structure 	A cyclical structure to a text is where it begins and ends in the same way. In Stave 1 Scrooge is rude and unkind to Bob Cratchit, two portly gentleman raising money for charity, and his nephew Fred. In the final stave he sees all these people again and is able to apologise and show them his transformation. It's a structure that works very well for emphasising Scrooge's change in personality.
'Staves' instead of 'Chapters' 	A stave could refer to a wooden plank used to help in construction (a bit like scaffolding). It can also refer to a musical staff or symbol - used with sheet music. Whilst Dickens most likely used 'staves' instead of chapters in A Christmas Carol because he wanted to associate the plot with a literal 'Christmas Carol' or song, it could be said that each chapter helps in the construction of Scrooge as a transformed man.

Linguistic devices (AO2)	Why is this significant?
Pathetic fallacy 	This is where a writer gives human feelings to non-human objects or places to get across a tone or emotion to readers. For instance, the weather is very foggy and dingy as Scrooge walks through London in Stave 1, indicating mystery and a lack of harmony in Scrooge's world. In Stave 1 he is surrounded by the "Piercing, searching, biting cold'", echoing Scrooge's cold heart and lack of human warmth. By Stave 5 after Scrooge has transformed into a joyful human being the weather has also changed: "'No fog, no mist; clear, bright, jovial, stirring, cold; cold, piping for the blood to dance to'".
Epiphany 	An epiphany is a sudden realisation of something. Scrooge has an epiphany as he reveals after seeing his own gravestone that he must love with Christmas in his heart (Stave 5). Because of this epiphany he is then able to go out at the end of the text and share his wealth with others and actually feel happy.
Symbols 	Each of the ghosts acts as a symbol for something much greater. The Ghost of Christmas Past embodies Scrooge's regrets that he changed so much from his past, that he did not make the most of his family and that he has lost his fiancée Belle. The Ghost of Christmas Present is a symbol of the happiness and joy all people feel at Christmas despite their often harsh and deprived conditions. The Ghost of Christmas Yet-to-Come symbolises what will happen to Scrooge and his friends and family if he does not change.
Metaphors and Similes, Personification, Parallelism, and Descriptive Language 	Dickens needs to use a lot of descriptive language to get across not only the Christmas London settings but also the unusual spirits that visit Scrooge. Marley's Ghost needs to be terrifying, the Ghosts of Christmas Past and Present are not human but supernatural. He uses numerous metaphors and similes to get across both characters and setting to his readers. Dickens was a master of description and this shines through in A Christmas Carol. Metaphor example: "But he [Scrooge] was a tight-fisted hand at the grindstone" Simile example: "It was a strange figure -- like a child: yet not so like a child as like an old man..."

A CHRISTMAS CAROL - CONTEXT

Context key idea (AO3)	Why is this significant?
Philanthropy and Dickens' Sense of Social Justice 	Although now in Britain we have what is known as the welfare state (which includes support for the neediest including the NHS, social housing, unemployment benefits and more), there is was little government support for the poorest in society during the Victorian era. Many wealthy Victorians who were socially conscious (meaning they felt a responsibility to help those who could not help themselves) became heavily involved in philanthropy. They used their own money to give to charities and to set up their own charities to help those that needed help. Charles Dickens was one such person and he used his own money to help others, as well as working with wealthy benefactors to make changes in society, too. Dickens was philanthropic advisor to Angela Burdett-Coutts (1814-1906), known as 'the richest heiress in all England'. Dickens used her wealth to give to social causes as well. In 1847 her money was used to create Urania Cottage for homeless women. Under his guidance she also supported the Ragged School Union, which was founded in 1844 to provide free education to poor children by Lord Shaftesbury. Moreover, Dickens used his writing to act as a social commentator – bringing to the attentions of his middle and upper class readers the need for social upheaval. Some of his characters play a positive philanthropic role, such as Mr Brownlow in Oliver Twist, the Cheeryble brothers in Nicholas Nickleby, and Mr and Mrs Garland in The Old Curiosity Shop.
Victorian Deprivation  	Workhouses existed well before the Victorian era, but the 1834 Poor Law Amendment Act meant it a legal requirement for all able-bodied people to work in workhouses to get their 'poor relief' (financial support). Before this time the poorest in society had to rely on charity and hand outs to survive. However, Victorians saw poverty as a kind of illness or disease in society that needed to be eradicated. Governments were keen to move the poorest indoors, away from everyone. However, those in charge of the country made workhouses places to be feared in order to prevent 'lazy' citizens thinking it was an easy option instead of going out to find work. Workhouses meant the poorest would work for food and a place to sleep, but many people saw it as a form of slavery. Workhouses also took in orphans, abandoned children, the mentally ill, the disabled, unmarried mothers and the elderly. Despite their age or abilities, all were required to work long and demanding hours. Whenever someone entered a workhouse they were stripped, bathed whilst being supervised and then provided with a uniform. This uniform separated them from the rest of society. If those from workhouses were out in the streets everyone else would instantly know they were in a workhouse. Often children were 'hired out' to wealthy business men and made to work in awful places such as mines. You were not allowed to try to contact your family and doing so could result in being punished. The standard of education provided was awful and would not help those within the workhouses get out of them. The food given to those in the workhouses was of a poor quality, simple and the same every day. Food was seen as a tool to keep you working, not as something to be enjoyed.

'A Christmas Carol' Sample Exam Question

A Christmas Carol

You are advised to spend about 45 minutes on this question.

You should us the extract below and you knowledge of the whole novel to answer the question.

Write about the some members of the Cratchit family and how they are important to the novel as a whole.

In your response you should:

- refer to the extract and the novel as a whole.
- show your understanding of characters and events in the novel.
- refer to contexts of the novel. [40]

The children drank the toast after her. It was the first of their proceedings which had no heartiness in it. Tiny Tim drank it last of all, but he didn't care twopence for it. Scrooge was the ogre of the family. The mention of his name cast a dark shadow on the party, which was not dispelled for a full five minutes.

After it had passed away they were ten times merrier than before, from the mere relief of Scrooge the Baleful been done with. Bob Cratchit told them how he had a situation in his eye for Master Peter, which would bring in, if obtained, full five-and-sixpence weekly. The two young Cratchits laughed tremendously at the idea of Peter's being a man of business; and Peter himself looked thoughfully at the fire from between his collars, as if they where deliberating what particular investments he should favour when he came into receipt of that bewildering income. Martha, who was a poor apprentice at a milliner's, then told them what kind of work she had to do, and how many hours she worked at a stretch, and how she meant to lie a-bed tomorrow morning for a good long rest; tomorrow being a holiday she passed at home. Also how she had
seen a countess and a lord some days before, and how the lord "was much about as tall as Peter"; at which Peter pulled up his collars so high that you couldn't have seen his head if you had been there. All this time the chestnuts and the jug went round and round; and by and by they had a song, about a lost child travelling in the snow, from Tiny Tim, who had a plaintive little voice, and it very well indeed.

There was nothing of high mark in this. They were not a handsome family; they were not well dressed; their shoes were far from being waterproof; their clothes were scanty; and Peter might have known, and very likely he did, the inside of a pawnbroker's. But they were very happy, grateful, pleased with one another, and contented with the time; and when they faded, and looked happier yet in the bright sprinklings of the Spirit's torch at parting, Scrooge had his eye on them, and especially Tiny Tim, until the last.

Exemplar response

The Cratchit family are a very important to 'A Christmas Carol' because they play a big part in the central story of Scrooge's redemption. They are also important because Dickens wanted to portray the poor of Victorian London in the 19th century in a positive way and they help him do achieve his aims.

We first encounter the father of the Cratchits, Bob, in the first chapter. He is not named by Dickens here - we only discover his name later in the book - and this is perhaps deliberate to show his lowly status - Scrooge only cares of him as a "clerk" and not a human being. Bob is one of the first 'victims' we see of Scrooge's miserly ways - he only has "one piece of coal" and has to "warm himself on a candle" so he is important in establishing Scrooge's meanness and penny-pinching ways. Moreover, Bob reinforces the message of Christmas by "applauding" Fred when he speaks on the benefits of Christmas. Scrooge doesn't
want to give Bob Christmas Day off. This was not uncommon at the time and Bob is important in showing the audience how poorly employees were often treated. In the extract, Bob "toasts" Scrooge with his family which shows how grateful he is to Scrooge, despite being so badly treated by him. This was important for Dickens to show how grateful and humble the poor are and weren't the monsters they were thought of.

In Stave three, we see the rest of the Cratchit family. They are obviously poor (Mrs Cratchit is in her "twice turned gown") and they have a small "goose" for dinner. However, they are grateful and make the best of it. Mrs Cratchit and Belinda are "brave in ribbons" and it is said that the goose was treated like a "feathered phenomenon" or a "black swan". This shows how grateful they are and was central to the theme. They are also a loving family and the day is full of fun (they "laughed tremendously").

Tiny Tim is a "cripple" but is selfless and kind-hearted and cares about others as can be seen when he says "God bless us everyone" and thinks of others when he goes to church. He is important because Scrooge has a face to put to his Malthusian comment of "decrease the surplus population" and changes his mind. In fact, Tiny Tim's death shows a stark contrast to Scrooge's - the boy is mourned and will live on, whereas Scrooge will not. Therefore, Tiny Tim plays a hugely important role in Scrooge's redemption.

Finally, the Cratchits are important at the end of the novel - Scrooge buys them a "turkey" and it is the "biggest one in the shop". This shows just how much Scrooge has changed.

Overall, the Cratchits are essential in showing the 'grateful poor' as was Dickens' intention and also play a huge part in showing Scrooge's transformation.

Commentary

The opening sentence shows a clear focus on the question and addresses the 'importance'. The candidate then brings in contextual points and discusses Dickens' intentions in writing the novel. The second paragraph keeps the focus firmly
on why Bob is important in the novel. It also brings in some AO2 points about technique as well as some context – discussing how employees were treated.

The candidate also uses the extract here.
There are appropriate direct references from the extract and other parts of the text, used to support the candidate's astute points. Overall this response shows assured understanding of the demands of the task and covers all the Assessment Objectives in a sustained, integrated way.

Year 11 Maths

Command Words in Maths questions

These words are the clue to what the examiner expects you to do. Remember to always show your workings. You can get marks for it, even if you get the final answer wrong.

Simplify
Simplify the given expression.

Simplify fully
Simplify the given expression. Answer must be given in its simplest form.

Factorise
Insert brackets by taking out common factors.

Factorise fully
Insert brackets by taking out **all** the common factors.

Expand
Remove brackets.

Expand and simplify
Remove brackets and then collect like terms.

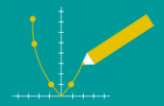
Solve
Find the solution of an equation or inequality.

Solve algebraically
Find the solution of an equation or inequality; algebraic manipulation **must** be shown.

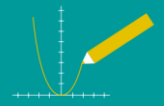
Prove
More formal than 'show', all steps must be present. In the case of a geometrical proof, reasons must be given.

Prove algebraically
Use algebra in the proof.

Draw
Produce an accurate drawing (unless a sketch is being drawn).



Draw a sketch of...
Sketch
Produce a drawing that does not have to be drawn to scale or a graph that is drawn without working out each coordinate.



Change
Usually convert from one unit to another; either using known metric unit conversions or the use of a conversion graph.

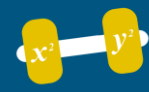
Show
All working needed to get to a given answer **or** complete a diagram to show given information.

TECHNICAL VOCABULARY	
Factor	A number which divides exactly into another.
Multiple	A multiple is a number made by multiplying two other numbers.
Prime	A prime number has exactly two factors.
Integer	The positive and negative whole numbers.
Estimate	Usually a calculation where the numbers have been rounded before the operation is performed.
Index (indices plural)	An index is a power or exponent.
Square root	Is the number that was multiplied by itself to get the square number.
Square number	Is a number that has been multiplied by itself.
Cube number	Is a number that is multiplied by itself then again by the original number.
Cube root	Is the number that was multiplied by itself and itself again to get the cube number
Numerator	The number on the top of the fraction. Shows how many part there are.
Denominator	The number on the bottom of the fraction. Shows how many equal parts the item is divided into.
Common denominator	When two or more fractions have the same denominator.
Equivalent	Having the same value
Inverse	The opposite mathematical operation.
Reciprocal	The number produced by dividing 1 by a given number
Odd	An integer that cannot be divided exactly by two.
Even	An integer that can be divided exactly by two.

Calculate
A calculator and some working will be needed.

Find
Some working will be needed to get to the final answer.

Work out
Some working will be needed in order to get the answer.



Explain
Write a sentence or a mathematical statement to show how you got to your answer or reached your conclusion.

Describe
Write a sentence that gives the features of the situation.

Complete
Fill in missing values.

x	y
	-3
-1	
0	1
	3
2	5

Give a reason
Must be clear and accurate reasons. If the reasons are geometrical then make sure you:

- provide a reason for each stage of working (if required)
- use correct geometric terminolcgy.

Express
Re-write in another form, some working may be needed.

Justify
Show all working and/or give a written explanation.

Websites to help you with understanding and revision

- SparxMaths.com
- CorbettMaths.com
- Trafalgar Maths Site
- Mathsgenie.co.uk
- Maths Bot

Geometry and Measures - Foundation

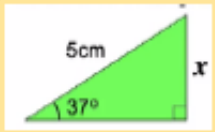
Year 11 Maths Foundation

Trigonometry

$$S\frac{O}{H}C\frac{A}{H}T\frac{O}{A}$$

Example – finding a side:

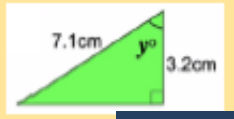
$\sin 37 = \frac{x}{5}$



$x = 5 \times \sin 37^0$

Example – finding a side:

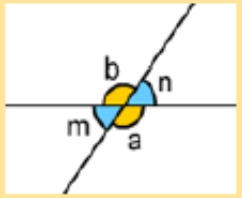
$\tan y = \frac{3.2}{7.1}$



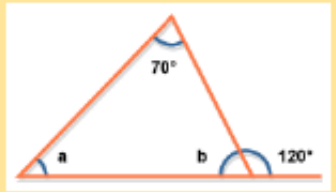
$y = tan^{-1}\left(\frac{3.2}{7.1}\right)$.

Sparx Maths: U605 U283, U545

Angle Facts



Vertically opposite angles are equal: a=b and m=n



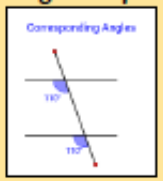
Angles in a triangle sum to 180^0.

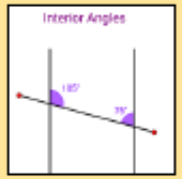
Angles on a straight line sum to 180^0.

E.G: b=60^0 so a = 50^0

Sparx Maths: U730, U628

Angles in parallel lines





Corresponding angles are equal

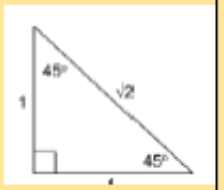
Alternate angles are equal

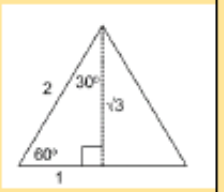
Co-interior angles are equal

Sparx Maths: U826

Exact Trig values

Angle (θ)	sin(θ)	cos(θ)	tan(θ)
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45°	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	undefined





Simple vector notation

$$\begin{pmatrix} a \\ b \end{pmatrix}$$

a: movement along the x-axis (left or right)

b: movement along the y-axis (up or down)

$-a$: movement left $-b$: movement down

Operations with vectors

$\begin{pmatrix} 2 \\ 6 \end{pmatrix} + \begin{pmatrix} 7 \\ -2 \end{pmatrix} = \begin{pmatrix} 9 \\ 4 \end{pmatrix}$

If $b = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$, then $3b = \begin{pmatrix} 12 \\ -6 \end{pmatrix}$

Sparx Maths: U632,U903

Volume & surface area

Volume = area of cross section x length

Surface area = area of all the faces of a 3D shape

Learn the cylinder

$$V = \pi r^2 h$$

$$SA = 2\pi r^2 + \pi dl$$

Sparx Maths: U915 , U464

Types of triangles

Right angled
Isosceles
Equilateral
Scalene

Types of quadrilaterals

Square
Rectangle
Parallelogram
Rhombus
Trapezium
Kite

Sparx Maths: U121

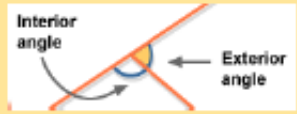
Area of key shapes

Triangle : $A = \frac{b \times h}{2}$ (h = perpendicular height)

Parallelogram: $A = b \times h$ (h = perpendicular height)

Trapezium: $A = \left(\frac{a+b}{2}\right) \times h$ (add together the parallel sides, divide the total by 2, and then multiply by the perpendicular height between the parallel sides)

Angles in regular polygons



$n = number\ of\ sides$

Interior angle + exterior angle = 180^0

Exterior angle = $\frac{360}{n}$

$$n = \frac{360}{Exterior\ angle}$$

Sparx Maths: U427

Number Ratio and Proportion - Foundation 1

Year 11 Maths Foundation

Estimate
Round each value to one significant figure

Standard form
$a \times 10^n$, where $1 \leq a < 10$

Reciprocal
Reciprocal of 7 is $\frac{1}{7}$, reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$ etc

Sequences
Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21

Geometric Sequence: each term is multiplied but he same constant to get the next number.

E.g. 3, 12, 48, 191, …. (x by 4 each time)

Squares and Cubes
Square numbers: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225 etc

Cube numbers: 1, 8, 27, 64, 125, 216, 343, 512, etc

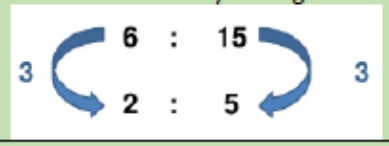
Sharing in a given Ratio
A Add the ratio parts
D Divide the amount by the total parts
A and
M Multiply the ratio by the value of one part

e.g. share £420 in the ratio 2:5

2 + 5 = 7
420 ÷ 7 = £60
2: 5
(x60) (x60)
£120 : £300

Sparx Maths: M525, U753

Simplifying Ratio
Divide both sides by the highest common factor



Sparx Maths: M885

Simplifying Ratio 1:n
Divide both sides by the highest factor of the left hand side

2m: 180cm
200cm: 180cm
2:1.8
1: 0.9

Sparx Maths: M543

Fractions

Add and Subtract – ensure the fractions have the same denominator before adding numerators

$$\frac{4}{5} - \frac{1}{3} = \frac{12}{15} - \frac{5}{15} = \frac{7}{15}$$

Multiply – multiply numerators and denominators

$$\frac{4}{5} \times \frac{1}{3} = \frac{4}{15}$$

Divide – take reciprocal of the second fraction and then multiply the new numerators and denominators

$$\frac{4}{5} \div \frac{1}{3} = \frac{4}{5} \times \frac{3}{1} = \frac{12}{5} = 2\frac{2}{5}$$

Sparx Maths: M835, M931, U793

Percentages

Finding percentages of an amount

1%	÷100
5%	÷20
20%	÷5
25%	÷4
50%	÷2

Sparx Maths: M437, U554

Multipliers:
To find the multiplier for a percentage, divide by 100

Use multipliers on a calculator paper
e.g. 35% of 370 = 0.35 x 370

Increasing and decreasing a given amount
Calculator:

$$Orginal\ Amount\ x\ mutiplier = new\ amount$$

Non-calculator: find the increase or decrease and add to the original amount

Finding percentage increase or decrease (profit/loss)

$$\frac{value\ of\ increase/decrease}{Original} \times 100$$

Writing an amount as a percentage of the original

$$\frac{Amount}{Original} \times 100$$

Reverse Percentage – finding the original amount

$$Orginal\ Amount = \frac{New\ Amount}{multiplier}$$

Sparx Maths: U554, U439, U671, U773

Number Ratio and Proportion - Foundation 2

Year 11 Maths Foundation

Growth & Decay / Compound interest

$$original\ amount \times multiplier^{time}$$

Where the multiplier is the percentage, increase or decrease from 100%, converted to a decimal.
e.g.
30% decrease is 70% = 0.7
30% increase is 130% = 1.3

Sparx Maths: U332

Dividing by decimals:

1. Write the calculation as a fraction
2. Form an equivalent fraction to makes integers (multiply by powers of 10)
3. Use short division (bus stop) to calculate

e.g. $460 \div 0.4 = \frac{460}{0.4} = \frac{4600}{4} = 1150$

Sparx Maths: U868

Conversions

10 millimetres = 1 centimetre	15 minutes = 0.25 hours
100 centimetres = 1 metre	30 minutes = 0.5 hours
1000 metres = 1 kilometre	45 minutes = 0.75 hours
$1000cm^3$ = 1 litre	1000g = 1 kilogram
1000ml = 1 litre	1000kg = 1 tonne

Compound Units

Sparx Maths: U527, U910

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

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

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

Error Intervals

least possible value $\leq x <$ greatest possible value

e.g. A fence is 30 m long to the nearest 10 m.

$$25\ \text{m} \leq l < 35\ \text{m}$$

Truncation

Truncation is a method of approximating a decimal number by dropping all decimal places past a certain point without rounding.

e.g. Truncate 3.14159265 to 4 decimal places.
= 3.1415

Negative numbers

Adding and subtracting: (vertical number lines help)

-3 – 5 = - 8
-3 + 5 = 2
-3 - - 5 = -3 + 5 = 2
-3 - + 5 = -3 – 5 = -8
-3 + - 5 = -3 – 5 = -8

Multiplying and dividing:

Different signs – answer will be negative
+ x - = -, - x + = -
Same signs – answer will be positive
- x - = +

Ordering fractions

Calc: use division to write each fraction as a decimal
Non-calc: write fractions with common denominators

Sparx Maths: U746

Order of operations

Sparx Maths: U976, U206

Bracket
Indices
Division and Multiplication
Addition and Subtraction

Rounding to significant figures

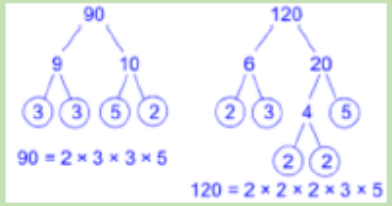
Start from the first **non-zero** number and round as normal, but ensure the place value is correct
e.g. 345,635 to 2SF = 350,000
0.0060821 to 3SF = 0.0608

Index Laws

$$a^n \times a^m = a^{n+m}$$
$$a^n \div a^m = a^{n-m}$$
$$(a^n)^m = a^{nm}$$
$$a^0 = 1$$
$$a^{-n} = \frac{1}{a^n}$$
$$a^{\frac{n}{m}} = \sqrt[m]{a^n}$$

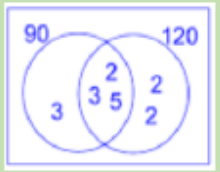
Sparx Maths: U662

Prime Factorisation



HCF and LCM of 90 and 120 (Factor Tree & Venn Diagram)

HCF is the product of common factors
LCM is the product of common factors and remaining factors.



HCF: 2x3x5
LCM: 2^3x3^2x5

Sparx Maths: U739, U529, U250

Probability and Statistics - Foundation

Year 11 Maths Foundation

Averages

Sparx Maths: U260, U526

Mode: most common piece of data

Mean: Sum of the data ÷ total frequency

Median: order the data and find the middle value

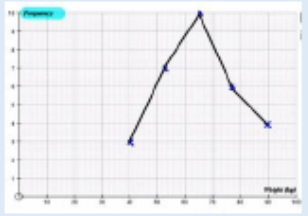
Range: Highest value – lowest value

Frequency Polygons

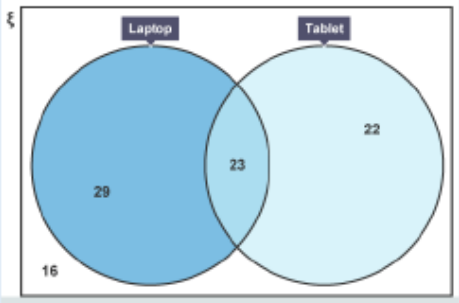
Sparx Maths: U840

1. Plot frequency at the mid-point
2. Join with straight lines

Weight w (kg)	Frequency
$30 \leq w < 50$	3
$50 \leq w < 55$	7
$55 \leq w < 75$	10
$75 \leq w < 80$	6
$80 \leq w < 100$	4



Venn Diagrams



Information given:
90 pupils were surveyed
52 said they owned a laptop.
45 said they owned a tablet.
23 said they owned both.

Probability Definitions

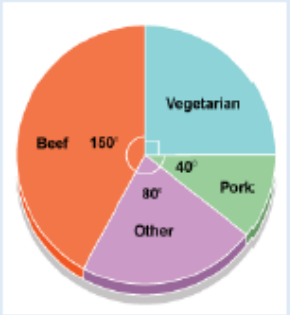
Sparx Maths: U405, U510, U683

Total probability: adds to 1

Relative frequency: $frequency \div total\ trials$

Independent events: one event doesn't impact the other

Reading and Drawing Pie Charts



Find the fraction of the total

1000 people were surveyed

Beef: $\frac{150}{360} \times 1000$

Vegetarian: $\frac{90}{360} \times 1000$

Sparx Maths: U508, U172, U854

Hair colour	People
Blonde	8
Brown	12
Red	3
Grey	2
Black	6

Find the fraction of the full circle.

Size of Blonde sector: $\frac{8}{31} \times 360°$

Expected outcomes

Expected outcome = probability x number of trials

E.g. A biased spinner is spun 800 times. The probabilities is lands on each colour is below. The probability of it landing on red is the same as the probability of it landing on green. How many times would you expect yellow to come up.

Result	Red	Green	Brown	Yellow
Probability		0.48	0.2	

$P(Y) = (1 - 0.48 - 0.2) \div 2 = 0.32 \div 2 = 0.16$

Expected yellow = 0.16 x 800 = 128

Sparx Maths: U166 , U580

Averages from a frequency table

Mean: $\frac{\Sigma fw}{\Sigma f}$; where, w is the midpoint of the group.

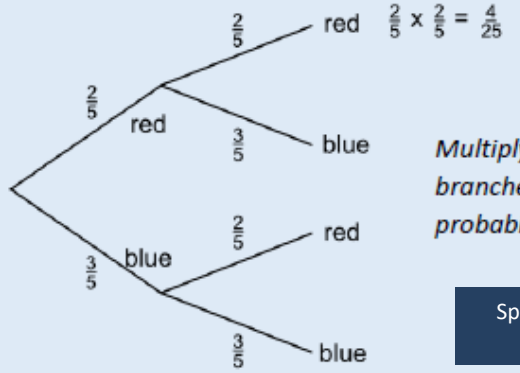
Median group: find which group the $\frac{n+1}{2}th$, value lies. Where, n is the total frequency.

E.G. in this table 51.5th value which lies in group $8 < w \leq 12$ (using the cumulative frequency

Weight of box (w kg)	Frequency
$0 < w \leq 4$	11
$4 < w \leq 8$	16
$8 < w \leq 12$	29
$12 < w \leq 16$	26
$16 < w \leq 20$	20

Sparx Maths: U569, U877

Tree diagrams



Multiply along the branches to find each probability.

Sparx Maths: U558

1. Probability that a red counter is picked both times $P(RR) = \frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$
2. Probability that the counters are different colours = $P(RB) + P(BR) = \frac{2}{5} \times \frac{3}{5} + \frac{3}{5} \times \frac{2}{5} = \frac{12}{25}$

Algebra - Foundation

Year 11 Maths Foundation

Notation

ab = a x b

a^2 = a x a

$(2a)^3$ = 2a x 2a x 2a

$(a + b)^2$ = (a + b)(a + b)

Sparx Maths: U613

Definitions

Expression – no equal signs e.g. 2x + 3, 2y, $(3x - 2)^2$

Equations – equal signs, can be solved, e.g. y + 4 = 10

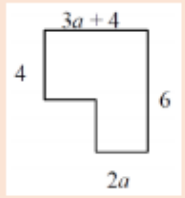
Identities – identical/equivalent to e.g. 2(y + 4) ≡ 2y + 8

Formulae – equal signs, more than one unknown e.g. A= ½bh

Simplifying expressions by collecting like terms

Always circle the sign IN FRONT of the term to avoid errors.

$$3x - 7b - x + 9b \equiv 2x + 2b$$



Typical Exam Q: Create an expression for the perimeter of the shape by adding and collecting like terms.

If the perimeter is given as 20cm, for example, you can create an equation:

$$4 + 3a + 4 + 6 + 2a = 20$$

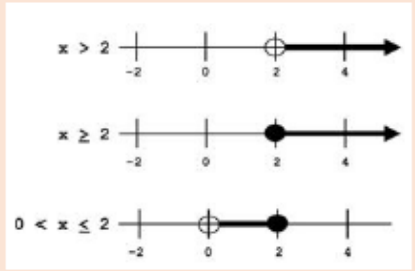
$$5a + 14 = 20$$

Simplifying expressions multiplication and division

$2ma^2 \times 7ma = 14m^2a^3$

$\frac{18b^6}{3ab^2} = \frac{6b^4}{a}$

Inequalities



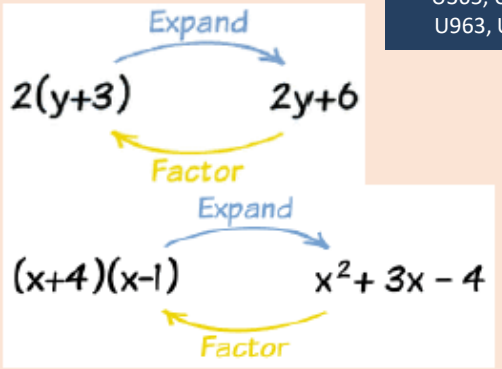
Open circle: < / >

Closed circle: ≤ / ≥

Sparx Maths: U509, U759, U738, U145

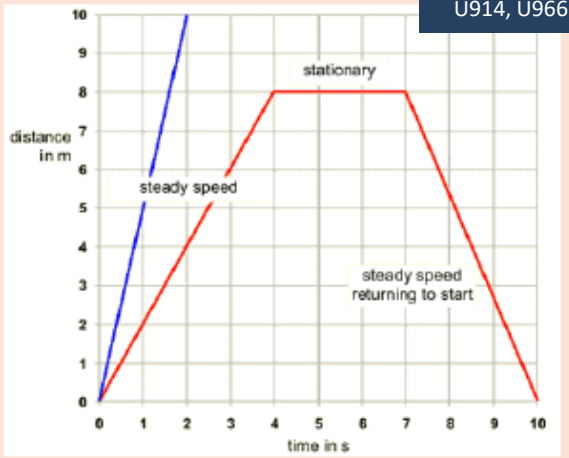
Factorising and expanding

Sparx Maths: U365, U178, U963, U858



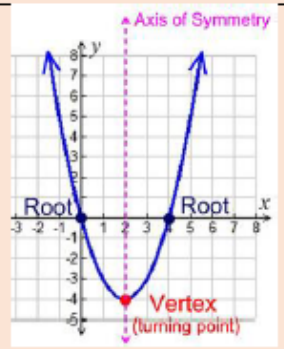
Distance / Time Graphs

Sparx Maths: U914, U966



Turning point and roots of a quadratic equation

Sparx Maths: U667



Straight line graphs

Sparx Maths: U741, U351, U669, U477, U848, U377, U898

$y = mx + c$

$m = gradient$

$c = y - intercept$

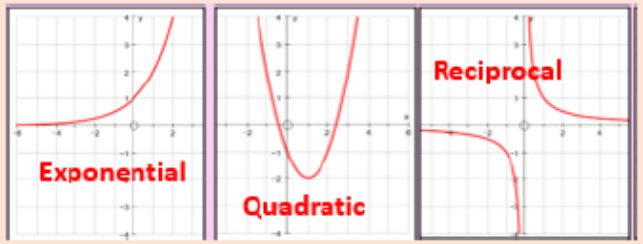
positive gradient

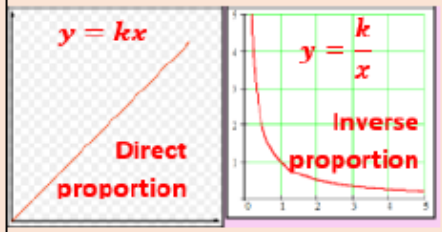
negative gradient

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{change\ in\ y}{change\ in\ x}$$

Parallel lines – have equal gradients

Graphs that need to be recognised





Finding the nth term of a linear sequence

5, 7, 9, 11, 13, ….

1. Find the common difference: 2
2. This is the coefficient of n: 2n
3. Find the difference between the coefficient of n and the first term 5 – 2 = 3
4. Add this to the amount of n

2n + 3

Sparx Maths: U213, U498

Geometry and measure - Higher 1

Year 11 Maths Higher

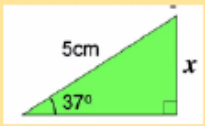
Trigonometry

$$S\frac{O}{H}\,C\frac{A}{H}\,T\frac{O}{A}$$

Sparx Maths: U605, U283, U545, U967, U627

Example – finding a side:

$\sin 37 = \frac{x}{5}$



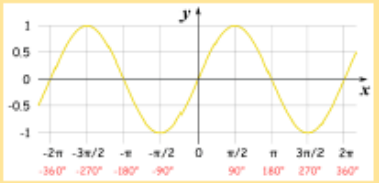
$x = 5 \times \sin 37^0$

Example – finding a side:

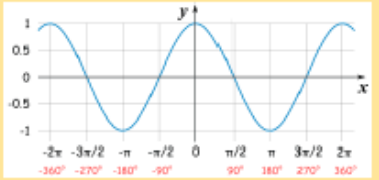
$\tan y = \frac{3.2}{7.1}$

$y = tan^{-1}\left(\frac{3.2}{7.1}\right)$.

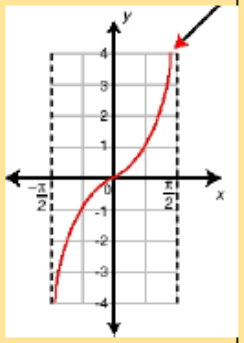
Sine Curve



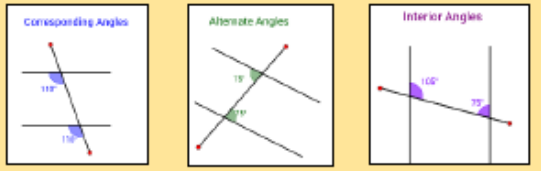
Cosine Curve



Tangent Curve



Angles in parallel lines



Corresponding angles are equal

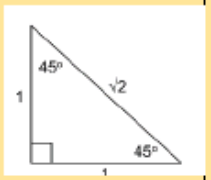
Alternate angles are equal

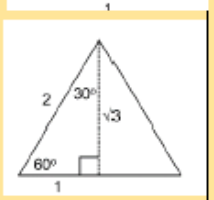
Co-interior angles are equal

Sparx Maths: U826

Exact Trig values

Angle (θ)	sin(θ)	cos(θ)	tan(θ)
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45°	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	undefined





Sparx Maths: U450, U627

Simple vector notation

$$\begin{pmatrix} a \\ b \end{pmatrix}$$

a: movement along the x-axis (left or right)

b: movement along the y-axis (up or down)

$-a$: movement left $\quad$ $-b$: movement down

Operations with vectors

$\begin{pmatrix} 2 \\ 6 \end{pmatrix} + \begin{pmatrix} 7 \\ -3 \end{pmatrix} = \begin{pmatrix} 9 \\ 3 \end{pmatrix}$

Sparx Maths: U632, U903, U564

If $b = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$, then $3b = \begin{pmatrix} 12 \\ -6 \end{pmatrix}$

Volume & surface area

Learn the cylinder

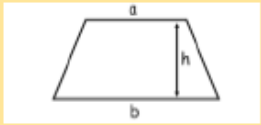
$$V = \pi r^2 h$$

$$SA = 2\pi r^2 + \pi dl$$

Sparx Maths: U915, U464

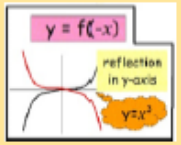
Area of a trapezium

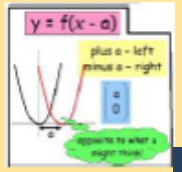
$$A = \frac{1}{2}(a+b)h$$

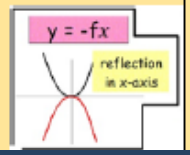


Sparx Maths: U265

Transformation of a graph





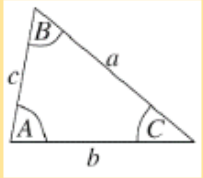


Sparx Maths: U450, U627

Sine rule

angles: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

sides: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



Cosine rule

$$a^2 = b^2 + c^2 - 2bc\cos A$$

Area of a triangle

$$\frac{1}{2}ab\sin C$$

Sparx Maths: U592, U952, U591

Angles in regular polygons

$n = number\ of\ sides$

Interior angle + exterior angle = 180°

Exterior angle = $\frac{360}{n}$

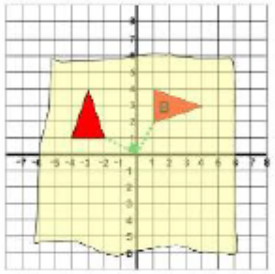
$$n = \frac{360}{Exterior\ angle}$$

Sparx Maths: U427

Geometry and measure - Higher 2

Year 11 Maths Higher

Transformations – rotation – describing:



Always use tracing paper.
Describe:

1. It's a rotation
2. Size of rotation in degrees
3. Orientations: clockwise or anticlockwise
4. Centre of rotation given as a coordinate (x,y)

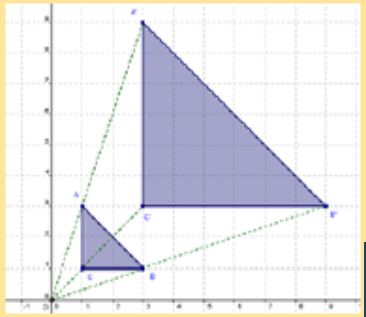
Transformation – translation

Vector $\begin{pmatrix} 6 \\ -4 \end{pmatrix}$ 6 right, 4 down

Sparx Maths: U351, U993

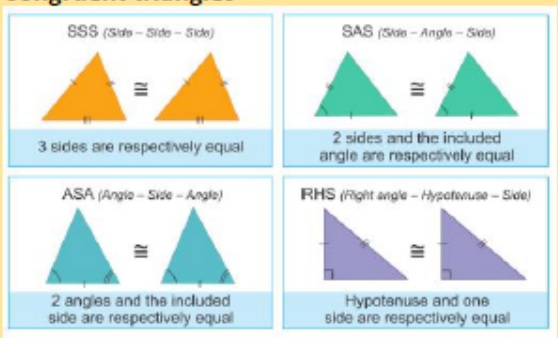
Transformations – enlargement - describing:

1. It's an enlargement
2. The scale factor (if the image is smaller than the object the scale factor is fractional e.g. ½)
3. The centre of enlargement given as a coordinate

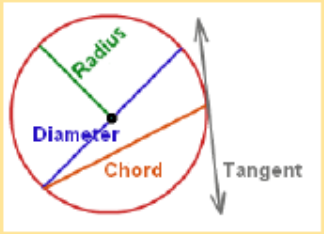


Sparx Maths: U519, U135

Congruent triangles



Circles



$Area = \pi r^2$

$Circumference = \pi d$

Sector $Area = \frac{\theta}{360}\pi r^2$

Arc length $= \frac{\theta}{360}\pi d$

Similar shapes

Same shape, different sides

The ratio of the lengths of corresponding sides are equal

Length scale factor = x

Area scale factor = x^2

Volume scale factor = x^3

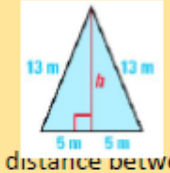
Sparx Maths: U578, U630, U110

Pythagoras' Theorem

$$a^2 + b^2 = c^2$$

Only applies to right angled triangles.

Can be used to find the height of an isosceles triangle

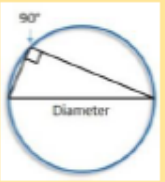


Can be used to find the length distance between two coordinates

Sparx Maths: U385, U541

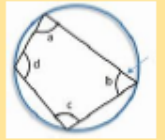
Circle Theorems

Angle at the centre is twice the angle at the circumference

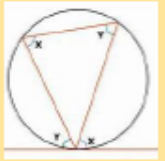


Angles in a semicircle are 90°.

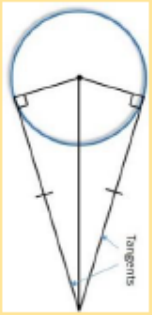
Angles in the same segment are equal.



Opposite angles of a cyclic quadrilateral add up to 180).



Alternate segment theorem.



Tangents from an external point are equal in length.

The tangent to a circle is perpendicular (90°) to the radius

Sparx Maths: U459, U251, U130, U489, U807

Number Ratio and Proportion - Higher

Year 11 Maths Higher

Estimate
Round each value to one significant figure

Standard form
$a \times 10^n$, where $1 \leq a < 10$

Sparx Maths: U330, U534, U264

Reciprocal
Reciprocal of 7 is $\frac{1}{7}$, reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$ etc

Sequences
Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21
Geometric Sequence: each term is multiplied but he same constant to get the next number.
E.g. 3, 12, 48, 191, …. (x by 4 each time)

Simplifying Surds
Find a factor that is a square number

$$\sqrt{96} = \sqrt{16 \times 6} = 4\sqrt{6}$$

Manipulating surds

$$\sqrt{ab} = \sqrt{a} \times \sqrt{b}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

Rationalising Surds
Rationalise by removing any surds from the denominator
E.G with surd.

$$\frac{2\sqrt{3}}{\sqrt{5}} = \frac{2\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{2\sqrt{3 \times 5}}{\sqrt{5 \times 5}} = \frac{2\sqrt{15}}{\sqrt{25}} = \frac{2\sqrt{15}}{5}$$

E.G with surd expressions multiply by top and bottom by the denominator with the opposite sign.

$$\frac{5}{3+\sqrt{2}} = \frac{5 \times (3-\sqrt{2})}{(3+\sqrt{2}) \times (3-\sqrt{2})} = \frac{5(3-\sqrt{2})}{9-\sqrt{4}}$$

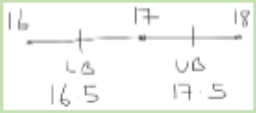
$$= \frac{5(3-\sqrt{2})}{7}$$

Sparx Maths: U338, U299, U633

Recurring Decimals
Form two equations where the digits following the decimal point are the same, and therefore can be cancelled

Upper and lower bounds
Look at the value above and below for the same place value. LB and UB will be half way between these points

e.g. 17 rounded to the nearest integer



Sparx Maths: U657, U587

e.g. 24.6 roudned to one decimal place.
LB = 24.55, UB = 24.65

Fractions

Add and Subtract – ensure the fractions have the same denominator before adding numerators

$$\frac{4}{5} - \frac{1}{3} = \frac{12}{15} - \frac{5}{15} = \frac{7}{15}$$

Multiply – multiply numerators and denominators

$$\frac{4}{5} \times \frac{1}{3} = \frac{4}{15}$$

Divide – take reciprocal of the second fraction and then multiply the new numerators and denominators

$$\frac{4}{5} \div \frac{1}{3} = \frac{4}{5} \times \frac{3}{1} = \frac{12}{5} = 2\frac{2}{5}$$

Sparx Maths: U736, U793, U475, U224, U544, U538

Percentages

Finding percentages of an amount

1%	÷100
5%	÷20
20%	÷5
25%	÷4
50%	÷2

Multipliers:
To find the multiplier for a percentage, divide by 100

Use multipliers on a calculator paper
e.g. 35% of 370 = 0.35 x 370

Increasing and decreasing a given amount
Calculator:

$$Orginal\ Amount\ x\ mutiplier = new\ amount$$

Non-calculator: find the increase or decrease and add to the original amount

Finding percentage increase or decrease (profit/loss)

$$\frac{value\ of\ increase/decrease}{Original} \times 100$$

Writing an amount as a percentage of the original

$$\frac{Amount}{Original} \times 100$$

Reverse Percentage – finding the original amount

$$Orginal\ Amount = \frac{New\ Amount}{multiplier}$$

Sparx Maths: U554, U773, U349, U671, U286, U278

Number Ratio and Proportion - Higher 2

Year 11 Maths Higher

Growth & Decay / Compound interest

$$original\ amount \times multiplier^{time}$$

Where the multiplier is the percentage, increase or decrease from 100%, converted to a decimal.
e.g.
30% decrease is 70% = 0.7
30% increase is 130% = 1.3

Sparx Maths: U332

Dividing by decimals:

1. Write the calculation as a fraction
2. Form an equivalent fraction to makes integers (multiply by powers of 10)
3. Use short division (bus stop) to calculate

e.g. $460 \div 0.4 = \frac{460}{0.4} = \frac{4600}{4} = 1150$

Sparx Maths: U868, U293

Conversions

10 millimetres = 1 centimetre	15 minutes = 0.25 hours
100 centimetres = 1 metre	30 minutes = 0.5 hours
1000 metres = 1 kilometre	45 minutes = 0.75 hours
$1000cm^3$ = 1 litre	1000g = 1 kilogram
1000ml = 1 litre	1000kg = 1 tonne

Compound Units (rearrange as necessary)

Sparx Maths: U151, U910

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

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

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

Error Intervals

least possible value $\leq x <$ greatest possible value

e.g. A fence is 30 m long to the nearest 10 m.

$25\ m \leq l < 35\ m$

Truncation

Truncation is a method of approximating a decimal number by dropping all decimal places past a certain point **without** rounding.

e.g. Truncate 3.14159265 to 4 decimal places.
= 3.1415

Negative numbers

Adding and subtracting: (vertical number lines help)

-3 – 5 = - 8
-3 + 5 = 2
-3 - - 5 = -3 + 5 = 2
-3 - + 5 = -3 – 5 = -8
-3 + - 5 = -3 – 5 = -8

Multiplying and dividing:

Different signs – answer will be negative
+ x - = -, - x + = -
Same signs – answer will be positive
- x - = +

Product rule

If there are m ways to do one thing and n ways to do another, then there are m x n ways to do *both*

Sparx Maths: U639

Order of operations

Sparx Maths: U976,U206

Bracket
Indices
Division and Multiplication
Addition and Subtraction

Rounding to significant figures

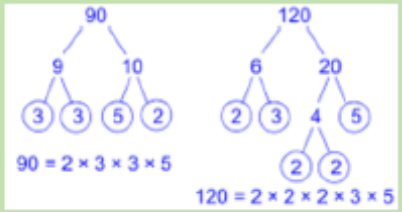
Start from the first **non-zero** number and round as normal, but ensure the place value is correct
e.g. 345,635 to 2SF = 350,000
0.0060821 to 3SF = 0.0608

Index Laws

$$a^n \times a^m = a^{n+m}$$
$$a^n \div a^m = a^{n-m}$$
$$(a^n)^m = a^{nm}$$
$$a^0 = 1$$
$$a^{-n} = \frac{1}{a^n}$$
$$a^{\frac{n}{m}} = \sqrt[m]{a^n}$$

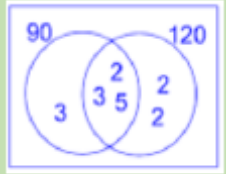
Sparx Maths: U662

Prime Factorisation



HCF and LCM of 90 and 120 (Factor Tree & Venn Diagram)

HCF is the product of common factors
LCM is the product of common factors and remaining factors.



HCF: 2x3x5
LCM: 2^3x3^2x5

Sparx Maths: U739,U529,U250

Probability and Statistics - Higher

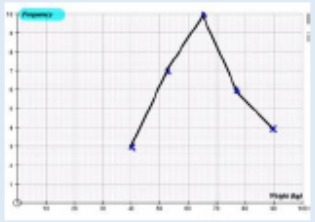
Year 11 Maths Higher

Frequency Polygons

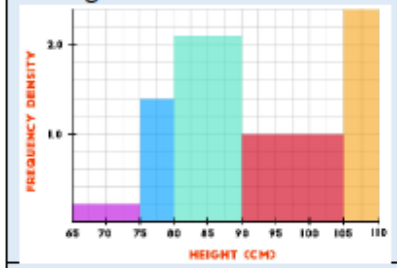
Sparx Maths: U840

1. Plot frequency at the mid-point
2. Join with straight lines

Weight w (kg)	Frequency
$30 \leq w < 50$	3
$50 \leq w < 55$	7
$55 \leq w < 75$	10
$75 \leq w < 80$	6
$80 \leq w < 100$	4



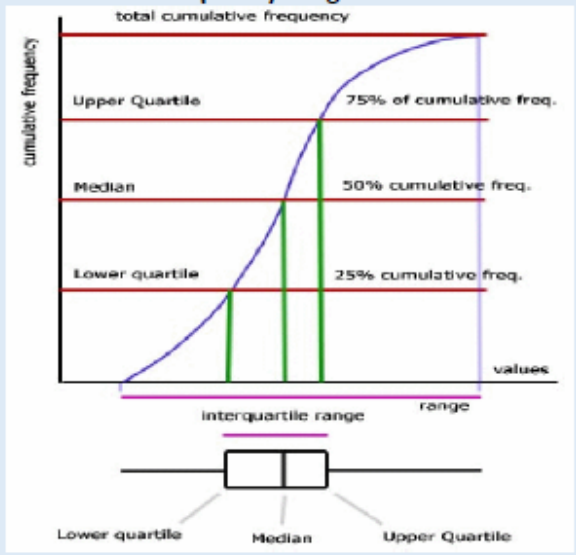
Histograms



FD = Frequency density

$$FD = \frac{Frequency}{Class\ Width}$$

Cumulative Frequency Diagrams and Box Plots



Sparx Maths: U983

Averages from a frequency table

Mean: $\frac{\Sigma fw}{\Sigma f}$; where, w is the midpoint of the group.

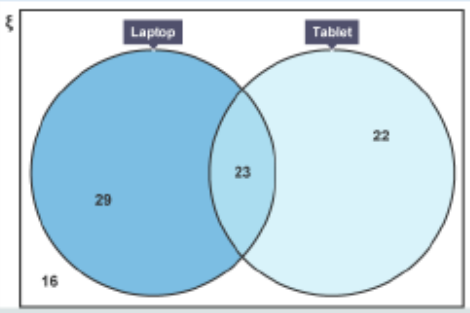
Median group: find which group the $\frac{n+1}{2}th$, value lies.
Where, n is the total frequency.

E.G. in this table 51.5^{th} value which lies in group $8 < w \leq 12$ (using the cumulative frequency

Weight of box (w kg)	Frequency
$0 < w \leq 4$	11
$4 < w \leq 8$	16
$8 < w \leq 12$	29
$12 < w \leq 16$	26
$16 < w \leq 20$	20

Sparx Maths: U877

Venn Diagrams



Information given:
90 pupils were surveyed
52 said they owned a laptop.
45 said they owned a tablet.
23 said they owned both.

Notation

Sparx Maths: U476, U748

A – all elements **in A**
A' – all elements **not in A**
B – all elements **in B**
B' – all elements **not in B**
A ∪ B – all the elements **in A or B or both**
A ∩ B – all the elements **in both A and B**

Expected outcomes

Relative frequency: $frequency \div total\ trials$

Expected outcome = probability x number of trials

E.g. A biased spinner is spun 800 times. The probabilities is lands on each colour is below. The probability of it landing on red is the same as the probability of it landing on green. How many times would you expect yellow to come up.

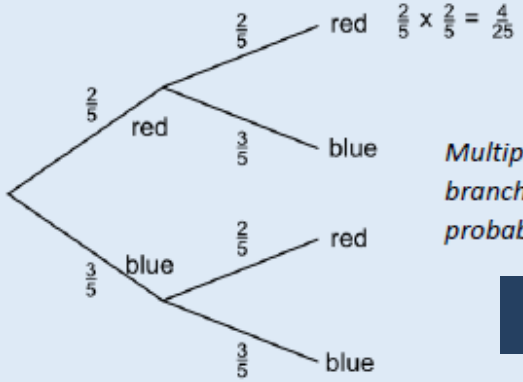
Result	Red	Green	Brown	Yellow
Probability		0.48	0.2	

P(Y) = (1 – 0.48 – 0.2) ÷ 2 = 0.32 ÷ 2 = 0.16

Expected yellow = 0.16 x 800 = 128

Sparx Maths: U166,U580

Tree diagrams



Multiply along the branches to find each probability.

Sparx Maths: U558,U729

1. Probability that a red counter is picked both times $P(RR) = \frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$
2. Probability that the counters are different colours = $P(RB) + P(BR) = \frac{2}{5} \times \frac{3}{5} + \frac{3}{5} \times \frac{2}{5} = \frac{12}{25}$

Algebra - Higher

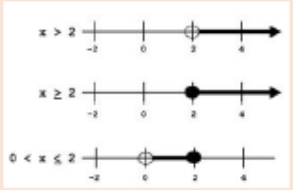
Year 11 Maths Higher

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sparx Maths: U665

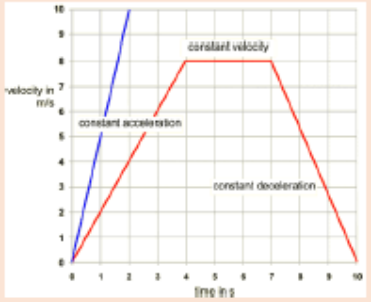
Linear Inequalities



Open circle: $< / >$

Closed circle: $\leq / \geq$

Velocity / Time Graphs



Gradient = acceleration

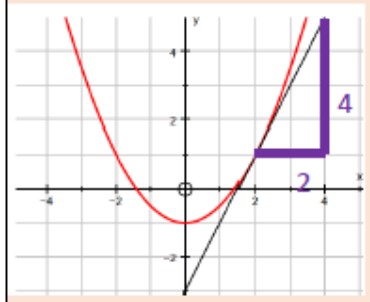
Area = distance travelled

Sparx Maths: U562

Iteration – showing a root lies between 2 points:

If there is **a change in sign** for y for two particular values of x then we can say there is **a root** between these values of x and we can say that the equation $f(x) = 0$ will have a solution between these two values of x.

Gradients of curves



Gradient of a curve at a point = gradient of the tangent at the point

Sparx Maths: U800

Algebraic proof – toolkit

Even numbers: 2n, 2n+2, 2n+4,...
Odd numbers: 2n+1, 2n+3, 2n+5,...
Sum: add
Product: multiply
Difference: subtract
Show it's a multiple: factorise
Show it's even: show it's a multiple of 2
Show it's odd: show it's a multiple of 2, plus 1

Completing the square

Sparx Maths: U397

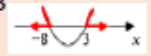
Quadratic expression factorised by completing the square:

$$(x + a)^2 + b$$

Turning point of graph occurs at $(-a, b)$

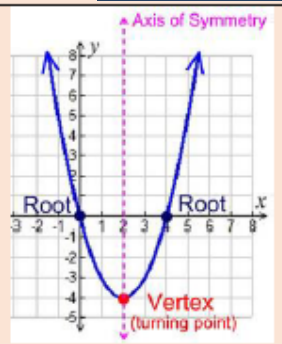
Solve quadratic inequalities

e.g solve $x^2 + 5x - 24 \geq 0$

1. Factorise: $(x + 8)(x - 3) \geq 0$
2. Solve: $x = -8$, $x = 3$
3. Sketch the graph 
4. Values that satisfy the inequality $x \leq -8$, $x \geq 3$

Sparx Maths: U133

Turning point and roots of a quadratic equation



Sparx Maths: U667

Straight line graphs

Sparx Maths: U741, U315, U669

$y = mx + c$

$m = gradient$

$c = y - intercept$

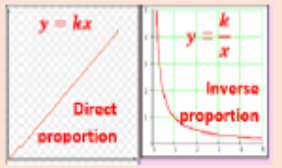
positive gradient / negative gradient

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{change\ in\ y}{change\ in\ x}$$

Parallel lines – have equal gradients

Perpendicular lines – If L_1 and L_2 are perpendicular then $m_2 = -\frac{1}{m_1}$

Graphs that need to be recognised:



Sparx Maths: U980, U593, U229

Equation of a circle centre (0, 0)

$x^2 + y^2 = r^2$

Functions

$f(4)$: *Substitute 4 into the function*

$f(g(x))$: *Substitute $g(x)$ into $f(x)$* i.e. replace all values of x in $f(x)$ with the entire function $g(x)$

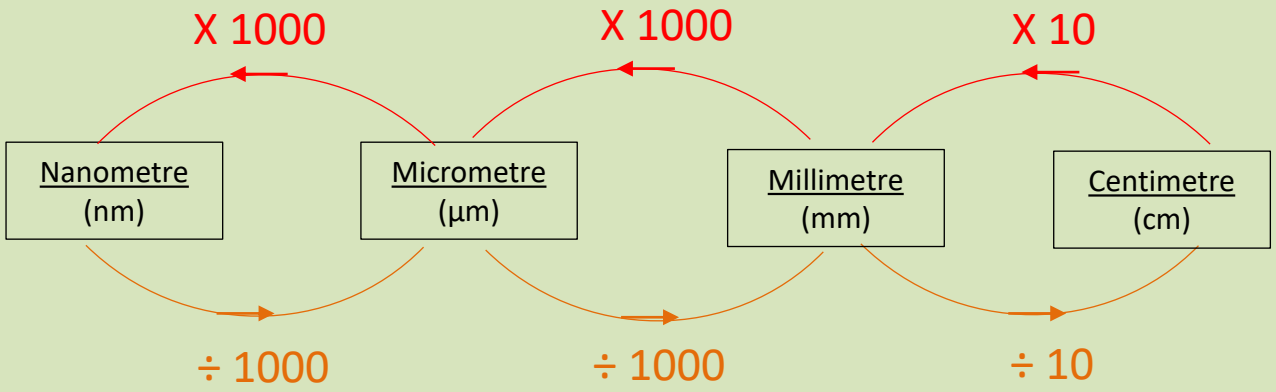
e.g. $f(x) = 2x + 3$, $g(x) = x - 3$, $fg(x) = 2(x-3) + 3$

Science: Useful Information

Key Word / Term	Definition
Accuracy	Results are close to the true value
Precision	Results are similar to each other but not necessarily close to the true value
Repeatable	Similar results are obtained if the investigation is done again by the same person
Reproducible	Similar results are obtained if it is repeated by a different person
Resolution	Is the smallest change a measuring instrument can detect
Validity	A measure of how correct the results of an experiment are

Prefix	Number	Standard Form	e.g. metres
Giga	1,000,000,000	$1x10^{9}$	Gm
Mega	1,000,000	$1x10^{6}$	Mm
kilo	1,000	$1x10^{3}$	km
----------	1	1	m
milli	0.001	$1x10^{-3}$	mm
micro	0.000001	$1x10^{-6}$	µm
nano	0.000000001	$1x10^{-9}$	nm

Converting units of measure:



Variables:

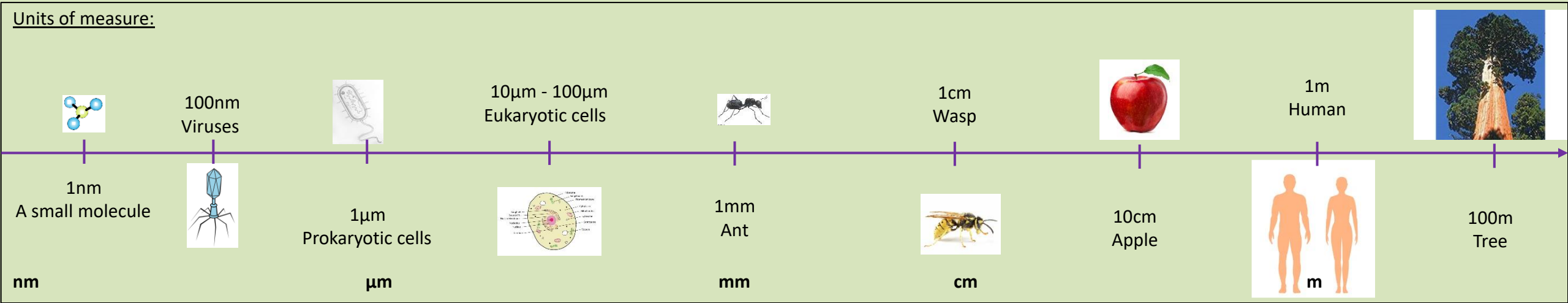
Independent: the variable that is being changed during the experiment

Dependent: the variable being tested or measured during the experiment

The independent variable affects the dependent variable, the others must be controlled

Control: Keep the same (there can be more than one control variable) so that they do not affect the independent variable

Units of measure:



The Periodic Table of Elements

1	2											3	4	5	6	7	0
							1 **H** hydrogen 1										4 **He** helium 2
7 **Li** lithium 3	9 **Be** beryllium 4											11 **B** boron 5	12 **C** carbon 6	14 **N** nitrogen 7	16 **O** oxygen 8	19 **F** fluorine 9	20 **Ne** neon 10
23 **Na** sodium 11	24 **Mg** magnesium 12											27 **Al** aluminium 13	28 **Si** silicon 14	31 **P** phosphorus 15	32 **S** sulfur 16	35.5 **Cl** chlorine 17	40 **Ar** argon 18
39 **K** potassium 19	40 **Ca** calcium 20	45 **Sc** scandium 21	48 **Ti** titanium 22	51 **V** vanadium 23	52 **Cr** chromium 24	55 **Mn** manganese 25	56 **Fe** iron 26	59 **Co** cobalt 27	59 **Ni** nickel 28	63.5 **Cu** copper 29	65 **Zn** zinc 30	70 **Ga** gallium 31	73 **Ge** germanium 32	75 **As** arsenic 33	79 **Se** selenium 34	80 **Br** bromine 35	84 **Kr** krypton 36
85 **Rb** rubidium 37	88 **Sr** strontium 38	89 **Y** yttrium 39	91 **Zr** zirconium 40	93 **Nb** niobium 41	96 **Mo** molybdenum 42	[98] **Tc** technetium 43	101 **Ru** ruthenium 44	103 **Rh** rhodium 45	106 **Pd** palladium 46	108 **Ag** silver 47	112 **Cd** cadmium 48	115 **In** indium 49	119 **Sn** tin 50	122 **Sb** antimony 51	128 **Te** tellurium 52	127 **I** iodine 53	131 **Xe** xenon 54
133 **Cs** caesium 55	137 **Ba** barium 56	139 **La*** lanthanum 57	178 **Hf** hafnium 72	181 **Ta** tantalum 73	184 **W** tungsten 74	186 **Re** rhenium 75	190 **Os** osmium 76	192 **Ir** iridium 77	195 **Pt** platinum 78	197 **Au** gold 79	201 **Hg** mercury 80	204 **Tl** thallium 81	207 **Pb** lead 82	209 **Bi** bismuth 83	[209] **Po** polonium 84	[210] **At** astatine 85	[222] **Rn** radon 86
[223] **Fr** francium 87	[226] **Ra** radium 88	[227] **Ac*** actinium 89	[261] **Rf** rutherfordium 104	[262] **Db** dubnium 105	[266] **Sg** seaborgium 106	[264] **Bh** bohrium 107	[277] **Hs** hassium 108	[268] **Mt** meitnerium 109	[271] **Ds** darmstadtium 110	[272] **Rg** roentgenium 111	[285] **Cn** copernicium 112	[286] **Nh** nihonium 113	[289] **Fl** flerovium 114	[289] **Mc** moscovium 115	[293] **Lv** livermorium 116	[294] **Ts** tennessine 117	[294] **Og** oganesson 118

Key

relative atomic mass
atomic symbol
name
atomic (proton) number

* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

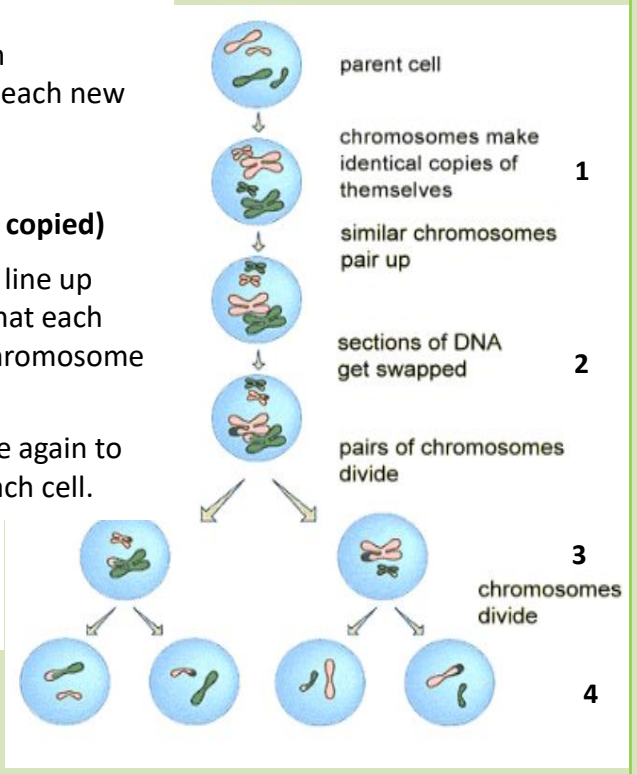
KS4 Biology: B13 Reproduction

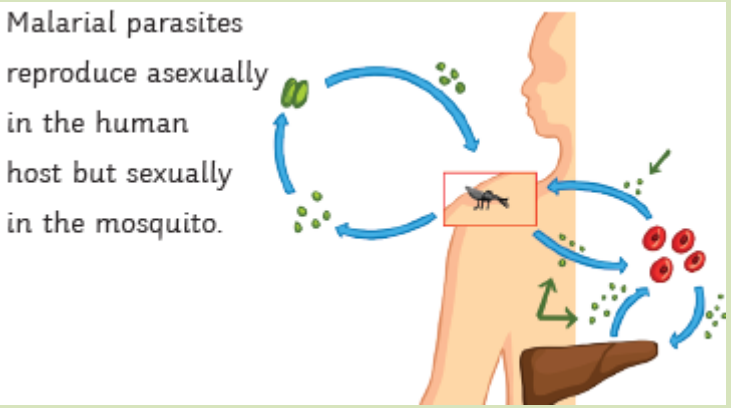
Key word	Definition
Sexual reproduction	Two parents, mixing of genetic information which leads to variety in the offspring. Involves the formation of **gametes** by **meiosis.**
Asexual reproduction	One parent, no fusion of **gametes.** No mixing of genetic information. Genetically identical offspring **(clones). Only mitosis involved.**
Gamete	Sex cells, sperm and eggs (animals) pollen and ovule (egg cell) (flowering plants). Formed by **meiosis**.
Meiosis	Cell division to make 4 non-identical cells with half the number of chromosomes (to make gametes).
Mitosis	Cell division to make 2 genetically identical cells (clones) to make all cells except gametes). Cells are needed for growth, repair and replace old cells.
Fertilisation	Fusion of gametes to restore the full number of chromosomes. After fertilisation, **mitosis** occurs and cells **differentiate** to form an embryo
Differentiate	The process in which cells become specialised for a particular function.

Meiosis → produces gametes ONLY
Causes genetic variation because random chromosomes from each gamete go into each new cell

1. **DNA replicates (genetic information copied)**
2. **First division**: The chromosome pairs line up RANDOMLY and are pulled apart so that each new cell only has one copy of each chromosome from the mother and father
3. **Second division** Chromosomes divide again to get a single set of chromosomes in each cell.

4. Four genetically different daughter cells will be produced with only 23 chromosomes each





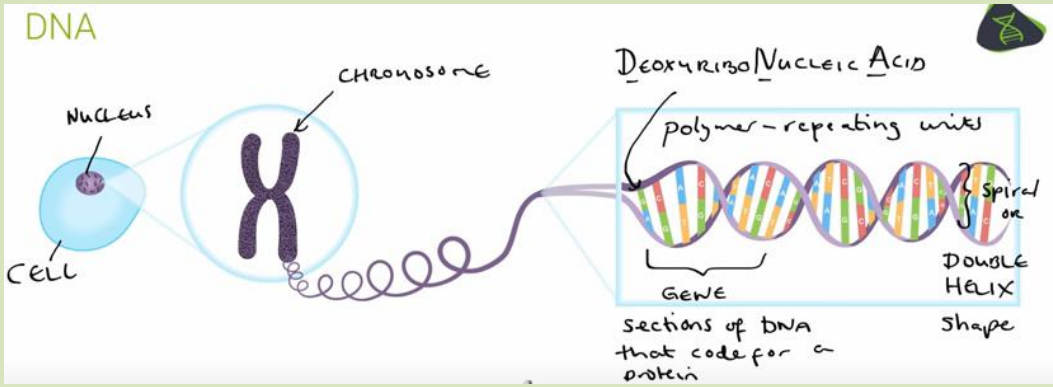
Strawberry plants can reproduce sexually and send off runners to reproduce asexually.

Daffodils can reproduce sexually or by bulb division (asexual).

Many fungi reproduce asexually by spores but also reproduce sexually to give variation.

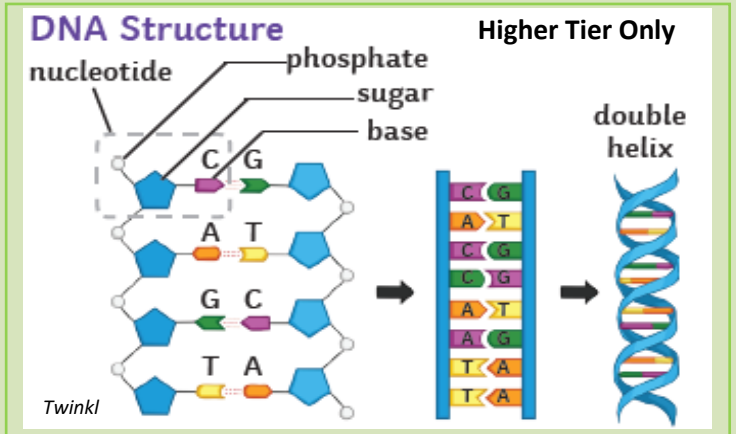
Advantages of sexual reproduction	Advantages of asexual reproduction
Produces variation is offspring.	Only one parent needed.
If the environment changes, variation gives survival advantage by natural selection.	More time and energy efficient as do not need to find a mate.
Natural selection can be speeded up by humans in **selective breeding** to increase food production. (See topic B14 KO).	Many identical offspring can be produced when conditions are favourable.
	Faster than sexual reproduction.

KS4 Biology: B13 Reproduction



The human **genome** was sequenced in a world wide collaboration in 2003. It is available for all scientists to use to study:

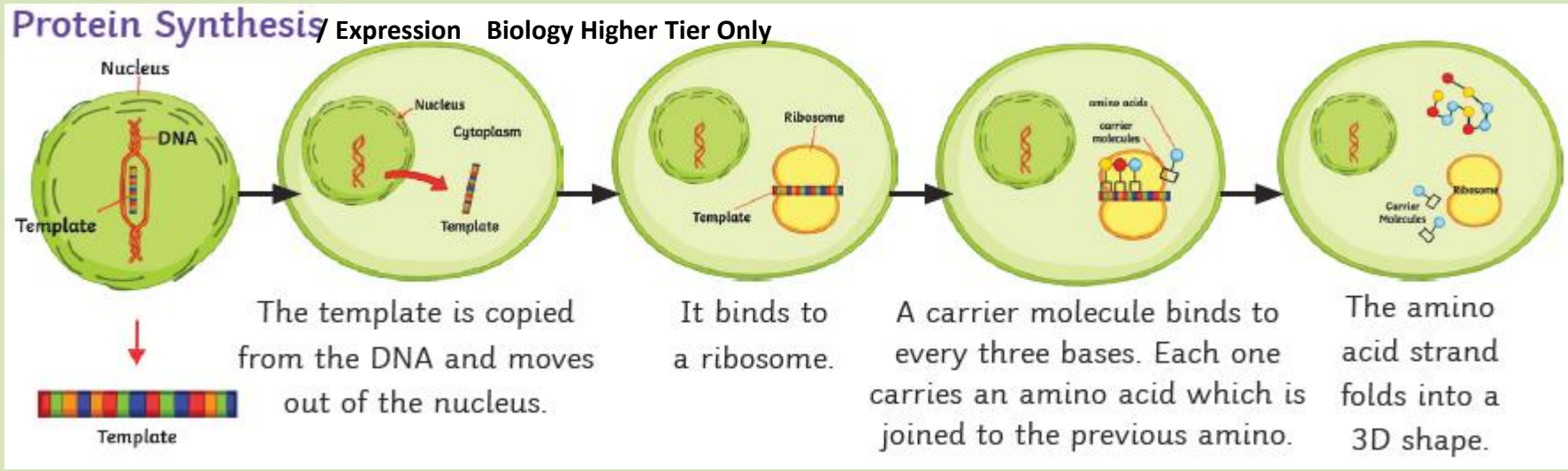
- The genes linked to different types of disease
- Understanding the treatment of inherited disorders
- Use in tracing human migration patterns from the past



- DNA has a double helix shape and has a sugar phosphate backbone and complimentary bases, C matches to G and A matches T.
- The bases are adenine, thymine, cytosine and guanine.
- The two strands are held together by weak hydrogen bonds

Key word	Definition
DNA	The molecule of inheritance. A polymer made up of two strands forming a double helix. **DNA** is contained in structures called **chromosomes.**
Gene	A small section of **DNA** on a **chromosome**. Each **gene codes** for a particular sequence of **amino acids** to make a specific **protein**. The gene gives the organisms their characteristics like eye colour
Chromosome	Found in pairs, one inherited from biological father and one from biological mother. Humans should have 46 chromosomes in each body cell and 23 chromosomes in each gamete (sperm and egg cell)
Genome	The entire genetic material of that organism.
Nucleotide	A molecule made up a sugar, a phosphate group and one of four different **bases**.
Bases	Bases make up part of a **nucleotide** which make up **DNA** and **RNA.** They are represented by the letters A, T, G and C.
Amino acid	The monomers for proteins. Three bases code for one amino acid.
Protein	Molecules that contain carbon, hydrogen, oxygen and nitrogen and are made of long chains of **amino acids**. They are used for building cells and tissues of the body eg collagen and to form enzymes.

Twinkl



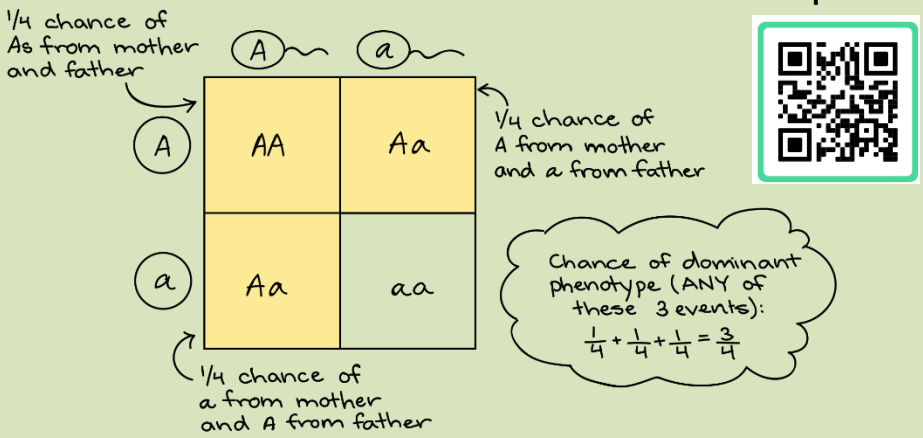
KS4 Biology: B13 Reproduction

Higher Tier Only

- **Mutations** occur continuously. Most do not alter the **protein** only alter it slightly so that its appearance or function is not changed.
- A few **mutations** code for an altered **protein** with a different shape. An **enzyme** may no longer fit the substrate in its active site or a structural protein may lose its strength.
- Not all parts of **DNA** code for **proteins.** Non-coding parts of DNA can switch genes on and off, so variations in these areas may affect how genes are expressed.
- A change in coding DNA can alter the activity of a protein and in non-coding DNA by altering how genes are expressed.

Most characteristics are controlled by more than one gene, you only need to know about single gene inheritance.

Punnet squares



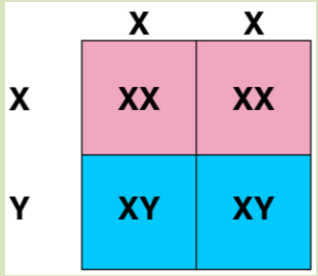
You must also write the **phenotypes** in each box

Sex determination: Male or female?

Ordinary human body cells contain 46 chromosomes (23 pairs).

22 pairs control characteristics only, but one pair carries the genes that determine sex.

- Females the sex chromosomes are XX
- Males the sex chromosomes are XY



Key word	Definition
Mutation	A change in the genetic material / gene of an organism.
Enzyme	A biological catalysts which speed up chemical reactions.
Allele	Different forms of the same gene, can be **dominant** eg A or **recessive** eg a
Dominant allele	The **phenotype** will be apparent in the offspring even if only one copy is inherited. Eg AA or Aa
Recessive allele	A phenotype that will only show up in the offspring if both **alleles** coding for that characteristic are inherited eg aa
Homozygous	Two identical **alleles** for a characteristic eg AA or aa
Heterozygous	Two different **alleles** for a characteristic eg Aa
Genotype	The genetic makeup of an individual for a particular characteristic, eg eye colour **alleles** Bb or BB
Phenotype	The physical appearance/biochemistry of an individual for a particular characteristic eg eye colour brown eyes

Inherited disorders

- Polydactyly (having extra fingers or toes) is caused by a **dominant allele.**
- Cystic fibrosis (a disorder of a cell membrane protein) is caused by a **recessive allele.**

Embryo screening – cells are harvested from the embryo and screened for genetic diseases.

PROS:

Parents are informed of any diseases so can make a choice to terminate.

Costly to society to support a disabled person so screening may help prevent these costs.

CONS:

The harvesting risks miscarriage, so in some rare cases a healthy fetus can be terminated.

Screening is expensive.

Difficult emotional/religious choices to terminate.

KS4 Biology: B14 Variation and evolution

Key word	Definition
Phenotype	The physical appearance/biochemistry of an individual for a particular characteristic e.g. eye colour - brown eyes
Gene	A small section of **DNA** on a **chromosome**. Each **gene codes** for a particular sequence of **amino acids** to make a specific **protein**.
Genome	The entire genetic material of that organism.
Species	Organisms that have similar characteristics that can breed together and produce fertile offspring.
Mutation	A change in the genetic material of an organism.
Variation	Differences in the characteristics of individuals in a population.
Genetic variation	When living organisms have inherited different DNA sequences or genes from the parents and results in variation, such as blood groups and eye colour.
Environmental variation	Causes changes to characteristics due to their surroundings and results in variation, such as different accents. These are not inherited.
Evolution	A change in the inherited characteristics of a population over time through a process of **natural selection.**
Theory of evolution by natural selection	States that all species of living things have evolved from simple life forms that first developed **three billion years ago.** Developed by Charles Darwin.
Selective breeding	The process where humans breed plants and animals for particular genetic characteristics from a mixed population. They are bred together. From the offspring those with desired characteristics are bred together. This is done over many generations until all offspring have desired characteristics.

Variation in a population may be due to differences in:

- The **genes** they have inherited e.g. eye colour
- **Environmental** conditions e.g. scars from accidents
- A combination of **genes and environment** e.g. skin colour

There is usually extensive genetic variation within a population species. Variation arises from **mutations:** most **mutations** have no effect on the **phenotype**; some influence the **phenotype**; very few change the **phenotype.** Mutations occur continuously.

If a mutation changes the phenotype and the phenotype is suited to an environment change it can change the population of a species rapidly.

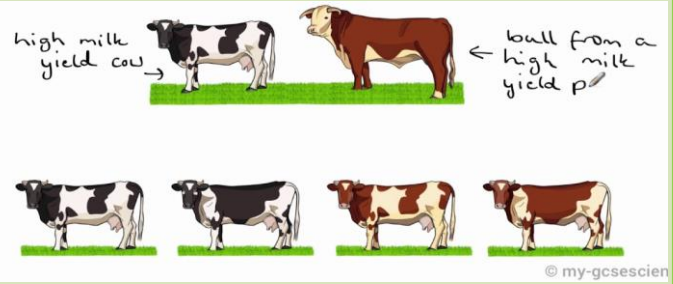
<u>Theory of evolution by natural selection:</u>

- Variation in the population due to mutation.
- Those individuals best adapted to the environment are more likely to **survive, reproduce and pass on their genes.**

<u>Selective breeding</u>

- Has been done for thousands of years to breed food crops and domesticated animals with the most desirable characteristics
- Choose characteristics for:
  - Disease resistance in food crops / Larger food
  - Animals that produce more meat or milk
  - Domestic dogs with a gentle nature
  - Large or unusual flowers

A negative of selective breeding can lead to 'inbreeding' where some breeds are particularly prone to disease or inherited defects e.g. brain swelling in pugs



Genetic engineering

Genes 'cut out' from chromosomes of other organisms and transferred to cells of other organisms.

- Genetic engineering is different to selective breeding, selective breeding can only occur within a species whereas genetic engineering can mix genes from very different organisms.

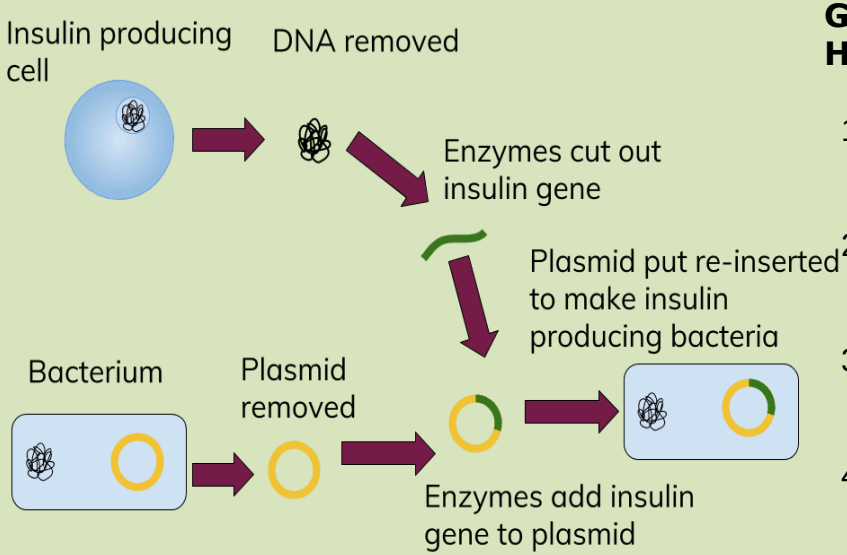
Advantage of Genetic engineering	Disadvantage Genetic engineering
• Food can be modified to contain added vitamins • Less weed killer needs to be used on plants as they are not affected by chemical • Animals can be modified to have diseases to help research (e.g. cancer) • Increased yield of crops/ plants • Illnesses can be removed before birth	• Changing organisms on a cellular level with unknown side affects • Can't predict the effect of mutations on GM organisms • Effect of GM food on humans has not been explored • Genetically modified crops might reproduce with wild plants, unknown side effects • Playing god when moving genes to different species

Cloning plants

Tissue culture: Used for preserving rare plant species or commercially in plant nurseries.

Cuttings: an older, but simple, method used by gardeners to produce many identical new plants from a parent plant.

Plant hormones can be used in both of these processes (see B11 KO)

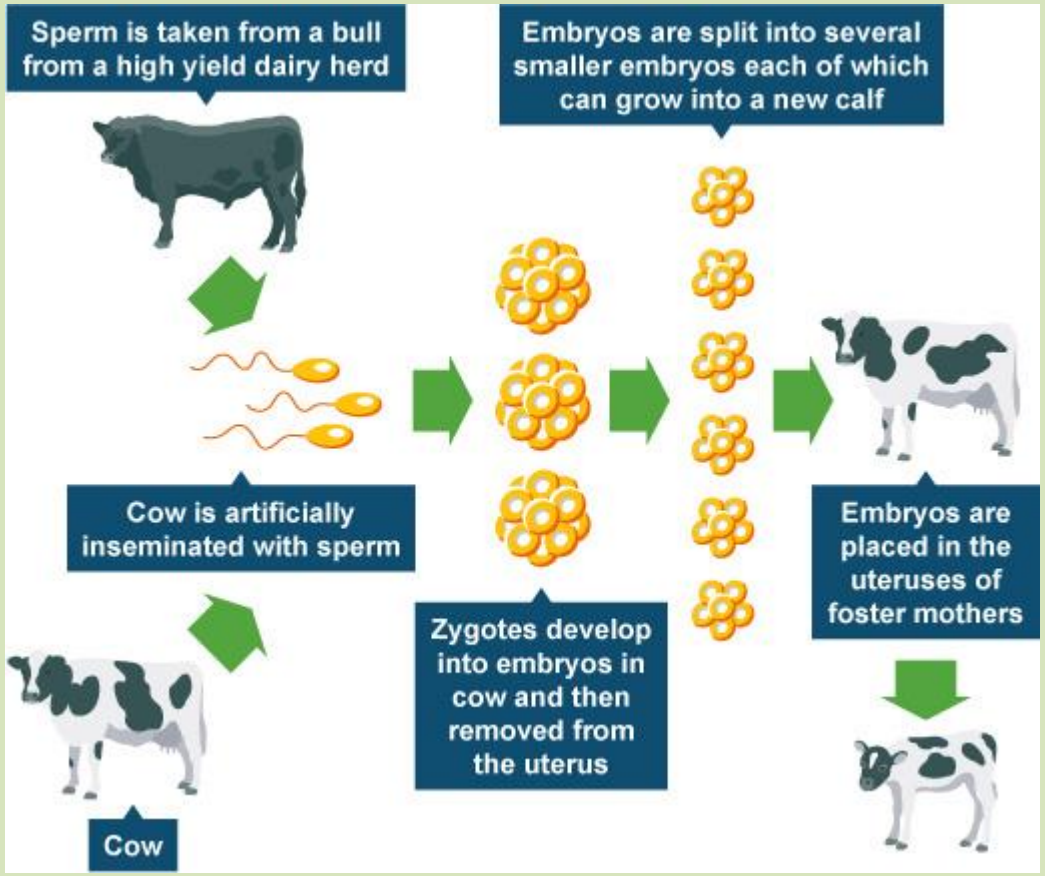


Genetic engineering process Higher Tier Only

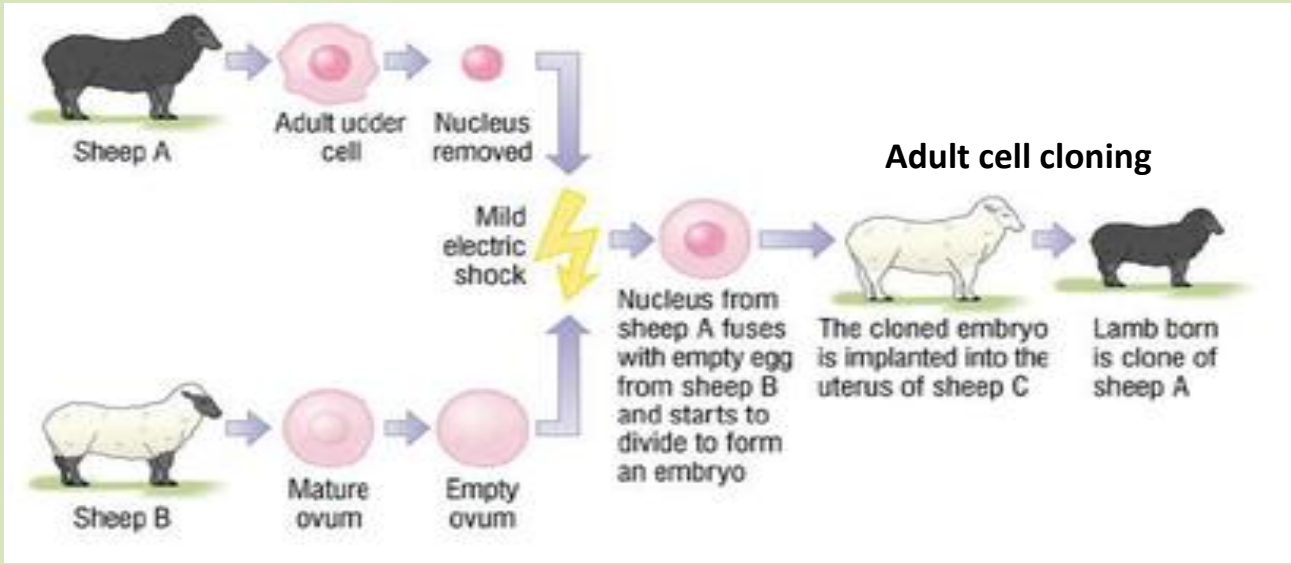
1. Specific enzymes isolate and cut out the desired gene from an organisms chromosome
2. Gene is inserted into a vector (usually a bacterial plasmid or virus), which has been cut by the same enzymes
3. Vector is used to transfer the gene into the other organism's cell at an early stage of development
4. The organism develops with the required characteristics

Key word	Definition
Genetic engineering	Modifying the **genome** of an organism by introducing a **gene** from another organism to give a desired characteristic.
GM crops	Genetically modified crops that have generally increased **yield** as they can be resistant to insect attack or to herbicides.
Yield	How much product that is made usually in terms of being sold for profit.
Tissue culture	Using small groups of cells from a plant to grow identical new plants
Clone	An individual that has been produced **asexually** (see B13 KO) and is genetically identical to the parent.
Embryo cloning	Splitting apart cells from a developing animal embryo before they become specialised, then transplanting the identical embryos into host mothers (surrogates).
Adult cell cloning	Using adult cell nuclei and donor egg cells with the nucleus removed to generate embryos ready to implant into a host mother.

Embryo cloning



Offspring are clones of each other, not the parents.
Cloning cattle embryos is expensive and skilled work but it is worth it because a top quality cow may only produce 8-10 calves naturally in her life. Using embryo cloning the same cow can produce the embryos for 30 or more calves in a single year.
High quality embryos can be transported around the world to breed high milk and meat production into local populations.



- The nucleus is removed from an unfertilised egg cell.
- The nucleus from an adult body cell, such as a skin cell, is inserted into the egg cell.
- An electric shock stimulate the egg cell to divide to form an embryo.
- These embryo cells contain the same genetic information as the adult skin cell.
- When the embryo has developed into a ball of cells, it is inserted into the uterus of an adult female to continue its development.

PROS: possibly clone genetically modified animals with beneficial characteristics.
- Could save animals from extinction.

CONS: Fears that some people may want to clone themselves.
- Cloning reduces variety in the population so the population is less able to survive changes in the environment in the future.

KS4 Biology: B15 Genetics and evolution
Separate Science Only

Key word	Definition
Species	A group of organisms which can breed to produce fertile offspring.
Inheritance	Passing characteristics from one generation to another.
Genes	'Units' of inheritance – parts of a chromosome that code for a protein.
Fossil	The 'remains' of organisms from millions of years ago, which are found in rocks.
Extinction	When there are no remaining individuals of a species still alive.
Mutation	Change in DNA.
Antibiotic Resistance	Bacteria that have evolved and mutated so they are no longer killed by antibiotics.
Classification	Placing organisms in groups based on structure, characteristics, and biochemistry.

Speciation : is the formation of two or more species from the original species.

1. Organisms of the same species are <u>isolated</u> by a <u>geographical barrier</u>
2. <u>There was genetic variation</u> (mutations) in the isolated populations.
3. <u>Different environmental conditions,</u> like weather and predators occurred in each of the locations.
4. <u>Natural selection</u> acted on the species and the best adapted survived and passed on their genes in each isolated populations.
5. <u>Eventually two species evolved</u> which could not interbreed successfully

Speciation

The idea behind the theory of evolution through the process of natural selection is that all species of living things have evolved from simple life forms over a period of time.

The accepted theory of evolution explains that it happens by natural selection. Natural selection is a process where organisms that are better adapted to an environment will survive and have more offspring. This means their genes are passed on to the future generations.

<u>Evidence for evolution</u>

1. Characteristics passed on in genes.
2. Fossil record.
3. Evolution of antibiotic resistance in bacteria.

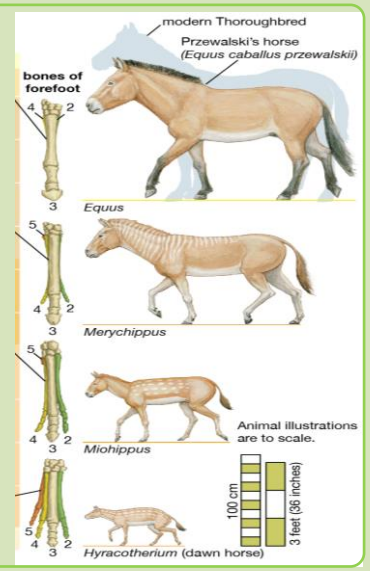
Fossils and evolution

<u>Fossils</u> could be:

- The actual remains of an organism that has not decayed.
- **Mineralised** forms of the harder parts of an organism, such as bone.
- **Traces** of organisms such as footprints or burrows.

Many early life forms were soft-bodied so have left few traces behind as they have decayed.

We can learn fro the fossil record how much or little organisms have changed over time e.g. evolution of the modern horse.



Extinction: When there are no remaining individuals of a species still alive.

Biological factors for extinction: New predators; New diseases; New competition.

Environmental factors for extinction: Climate change e.g. ice age

Large scale extinction: Colossal volcanic eruption; collision of giant asteroids with Earth – fires, dust clouds, tsunamis, earthquakes.

Charles Darwin: **theory of evolution due to natural selection.**

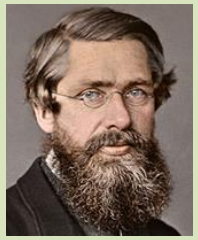
- Variation in a population due to mutation.
- Those with characteristics best suited to the environment are more likely to **survive, reproduce and pass on their genes.**

Darwin published his ideas in 1859 but they weren't accepted straight away:

- Challenged the idea that God made all organisms on Earth.
- Not enough evidence.
- The mechanism of inheritance was not known until 50 years after Darwin published his theory.

Lamark theory

Darwin theory



Alfred Wallace also developed the theory of natural selection and worked with Darwin in 1858, but Darwin published first.

Wallace went on to collect evidence for evolution around the world, he worked on **speciation:**

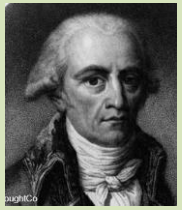
- Two populations of a species become separated e.g. mountain, river etc.
- There is variation in the populations due to mutation.
- Those with characteristics best suited to the environment are more likely to survive, reproduce and pass on their genes.
- If the new environments are different the populations may change enough to become new **species** – can no longer breed to make fertile offspring.

Lamarck gave a different theory – changes occurred to an organism during its lifetime which can then be inherited. This theory is incorrect.

Lamarck's theory of evolution is that every type of animal evolved from primitive worms.

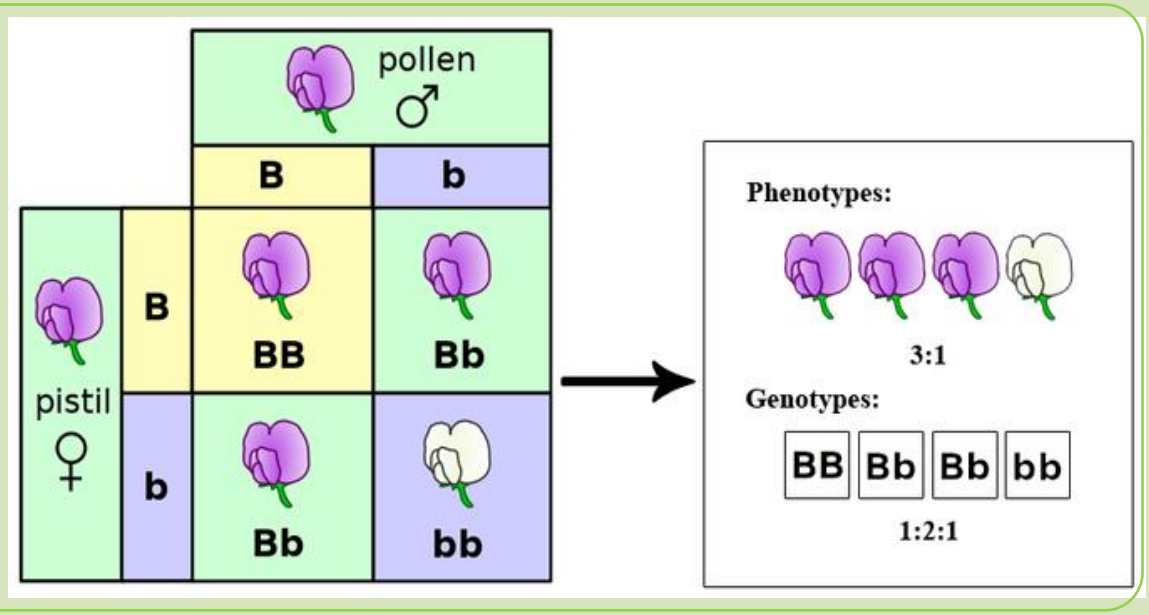
The way organisms behaved affected the features of their body. Any useful changes that took place would be passed on from parent to offspring.

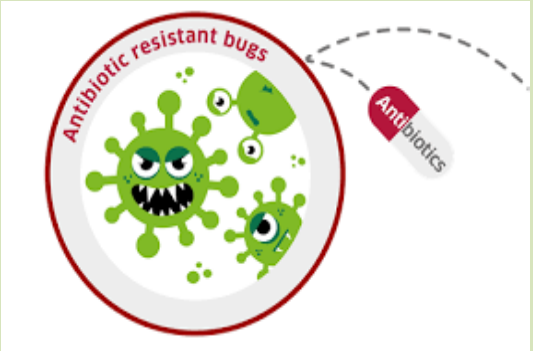
For example the neck of a giraffe is due to the giraffe stretching for food and elongating the neck.



1850s Gregor Mendel was breeding pea plants. He observed that the inheritance of each characteristic is determined by 'units' in regular ratio patterns we now call these genes and understand there are dominant and recessive alleles.

Finally in 1953 Watson, Crick and Franklin discovered the structure of DNA so Mendel, Darwin and Wallace finally had a mechanism!





THIS IS JUST THE EVOLUTION ANSWER AGAIN!!!

Variation in the population of bacteria due to mutation.
Some mutations may lead to antibiotic resistance so they are not killed.

They survive, reproduce and pass on the antibiotic resistance.
The resistance strain will spread as people are not immune to it and there is no treatment.

MRSA is resistant to antibiotics.
To reduce the rate of development of antibiotic resistance strains:

- Doctors should not prescribe antibiotics for non-serious or viral infections.
- Patients should complete the course of antibiotics so all bacteria are killed and none survive to mutate.
- The restrict the use of antibiotics in agriculture.

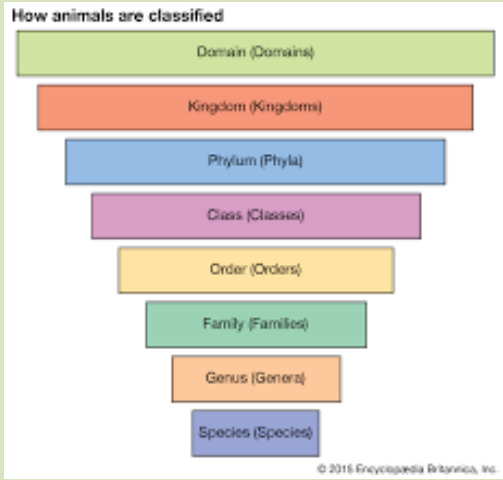
It's expensive and slow to produce now antibiotics.

Classification

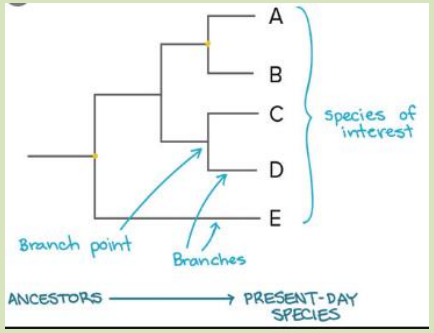
Linneaus classified living things into:
Kingdom, phylum, class, order, family, genus and species.
King Philip came over for grilled steak

Organisms are named by the binomial system of *Genus and species* e.g.
Felis domesticus (house cat).

Carl Woese used new evidence from biochemistry and microscopy to develop the 'three domain system'



DOMAIN	Bacteria	Arachea	Eukaryote			
KINGDOM	Eubacteria	Archaebacteria	Protista	Fungi	Plant	Animal



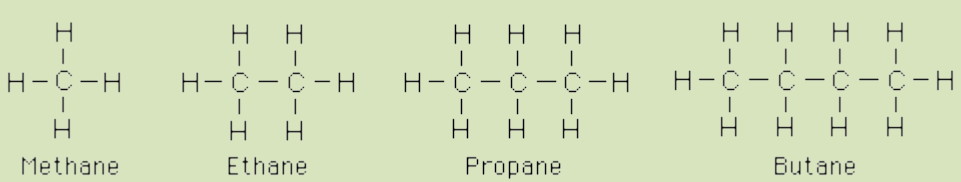
Evolutionary trees:
Evolutionary trees are used to represent the relationships between organisms. Branches show places where speciation has occurred, and a new species has evolved.

Each branch point is **speciation of a population.**
If a branch doesn't make it to the present day, the organism is extinct.

KS4 Science – C9 Crude Oil and Fuels

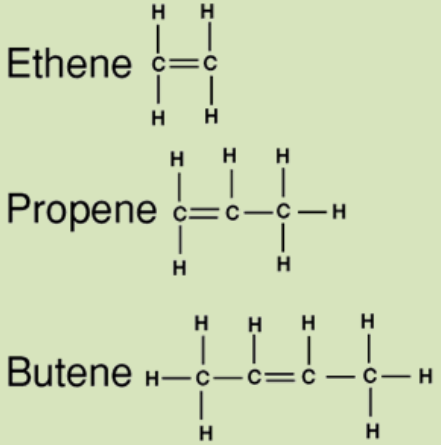
Crude oil is a mixture of hydrocarbon fractions with different boiling points.

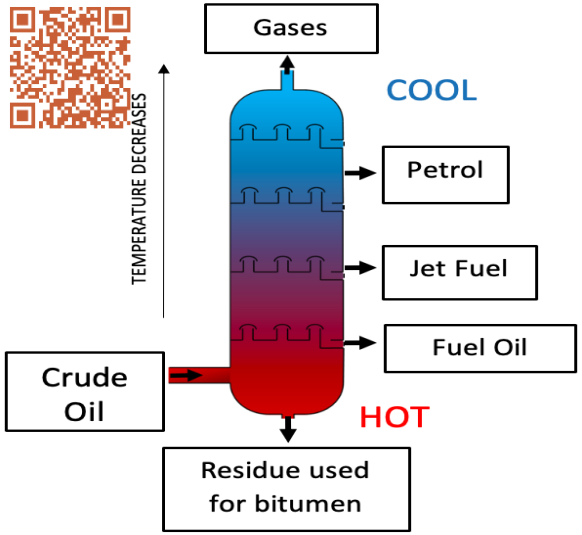
The first 4 alkanes look like this:



You need to learn their names..

The alkenes all have a double bond between 2 carbon atoms.

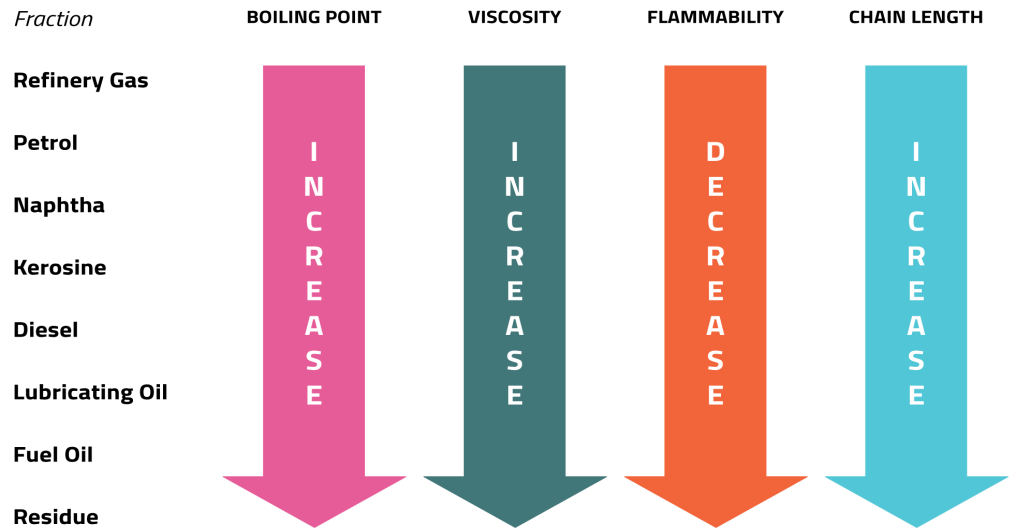




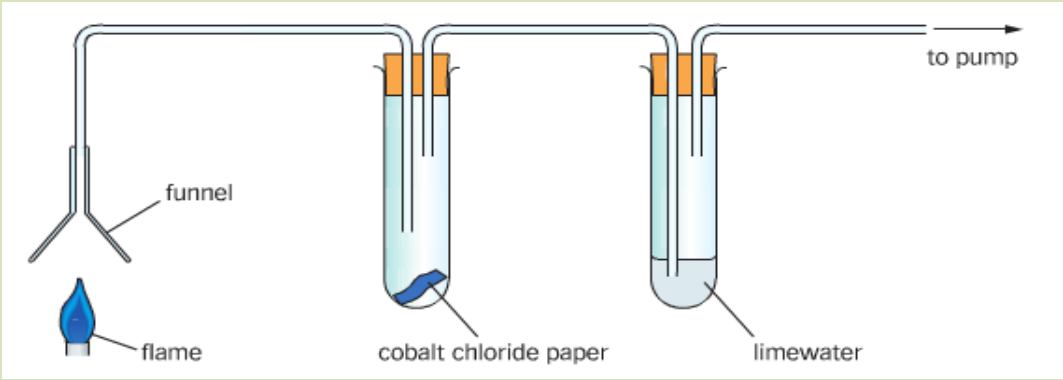
The fractions are separated using the process of FRACTIONAL DISTILLATION. Each fraction has a different boiling point. The crude oil is heated until all the fractions are vaporised. Then each fraction CONDENSES at its boiling point. It is cooler at the top of the column.

The smaller molecules are MORE VOLATILE and have lower boiling points: they condense at the top of the column or come out as gases. The larger molecules are MORE VISCOUS and have higher boiling points. They condense at the bottom of the column.

Key Word	Definition
Mixture	Made of two or more substances not chemically bonded together.
Hydrocarbon	A compound containing only hydrogen and carbon.
Fraction	Hydrocarbons with similar boiling points separated from crude oil.
Distillation	Separation of 2 or more liquids with different boiling points.
Fractional Distillation	Using evaporation and condensation to separate liquids from a mixture.
Alkane	Saturated hydrocarbon with the general formula C_nH_{2n+2}
Alkene	Unsaturated hydrocarbon containing a double C=C bond with the general formula C_nH_{2n}
Flammable	Easily ignited and capable of burning rapidly.
Viscous	A liquid resistant to flow or pouring (or 'thick').
Volatile	A liquid with a low boiling point.
Oxidised	Describes a substance that has had oxygen added to it, or has lost electrons.
Complete combustion	The reaction that occurs when fuels are burnt in plenty of air (oxygen), producing carbon dioxide and water as products.
Incomplete combustion	The reaction that occurs when fuels are burnt in not enough oxygen, producing carbon monoxide and water as products.
Cracking	The reaction that breaks down long hydrocarbons into smaller, more useful ones.
Saturated	A hydrocarbon with only single bonds between its carbon atoms.
Unsaturated	A hydrocarbon whose molecules contain at least one carbon-carbon double bond.
Thermal decomposition	The breakdown of a compound by heating it.
Bromine Water	An orange liquid that turns colourless in the presence of alkenes.



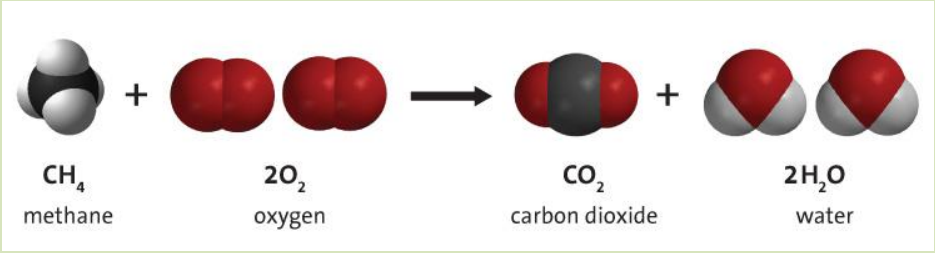
You can test for the **products of combustion** using the apparatus below:



Limewater changes from colourless to milky in the presence of carbon dioxide.
Blue cobalt chloride paper turns pink in the presence of water.
You can also use white anhydrous copper sulfate powder to test for water; it turns bright blue when it is hydrated.

Complete Combustion

When there is sufficient oxygen, hydrocarbons burn to release water and carbon dioxide. The carbon and water are completely oxidised.
This is the balanced equation for the complete combustion of methane.



Incomplete Combustion

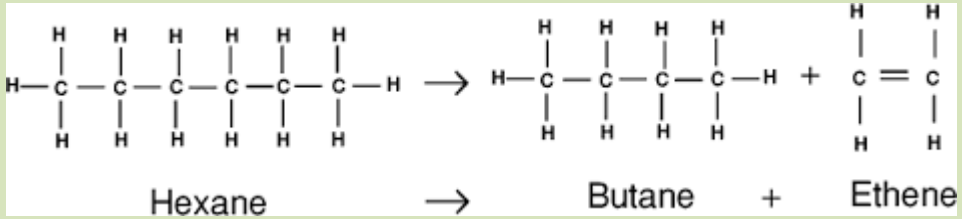
When there is not enough oxygen, carbon monoxide (CO) is produced instead of CO_2. CO is a toxic, colourless and odourless gas.
This is the balanced equation for the incomplete combustion of methane.

$$4CH_4 + 5H_2O \longrightarrow 2CO + 8H_2O + 2C$$

Cracking

This is the process used to break large hydrocarbon molecules into smaller, more useful ones.
Thermal decomposition is used in an oil refinery to split the large molecules into smaller ones.
A heavy fraction is heated and vaporised. It is then either:
1 – Passed over a hot catalyst OR
2 – Mixed with steam and heated to a very high temperature.

Cracking produces saturated hydrocarbons, used as fuels, and unsaturated hydrocarbons (alkenes)
For example hexane could be cracked to produce butane and ethene.
TIP: The total number of Carbon and Hydrogen atoms on each side of the arrow must be the same.



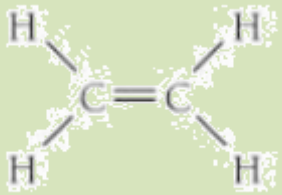
Bromine water (an orange liquid) turns colourless in the presence of ALKENES

KS4 Chemistry: Separate Science
C10 Organic Reactions

Key word	Definition
Alkene	Unsaturated hydrocarbon which contains a carbon-carbon double bond. Its general formula is C_nH_{2n}.
Fermentation	The reaction in which the enzymes in yeast turn glucose into ethanol and carbon dioxide.
Functional group	An atom or group of atoms that give organic compounds their characteristic.
Homologous series	A group of related organic compounds that have the same functional group.
Hydrocarbon	A compound containing only hydrogen and carbon.
Hydration	Where water is used to chemically change a substance- (where water is bonded to the substance)
Condensation reaction	Where a bond is formed from the removal of hydrogen and oxygen to form water

Reactions of alkenes

Alkenes contain a C=C functional group. This functional group makes the alkenes much more reactive than alkanes.



Combustion of alkenes

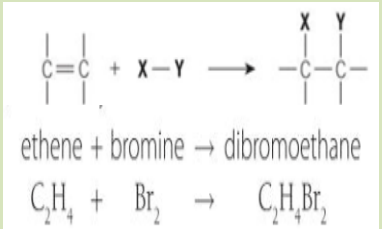
Alkenes burn with a smokier, yellow flame compared to alkanes due to incomplete combustion. This means they release less energy and are not as useful as fuels. The products however still remain the same – carbon dioxide and water

ethene + oxygen → carbon dioxide + water

$C_2H_4 + 3O_2 \rightarrow 2CO_2 + 2H_2O$

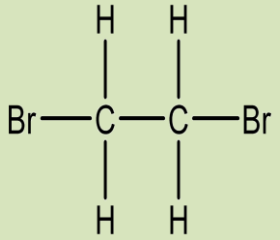
Reaction with halogens

When an alkene reacts with any halogen (Cl_2, Br_2, I_2) the C=C double bond breaks and the halogen atoms are added to the alkane chain. As the halogen is now incorporated into the hydrocarbon, coloured water such as bromine water would turn colourless



ethene + bromine → dibromoethane

$C_2H_4 + Br_2 \rightarrow C_2H_4Br_2$



Reaction with hydrogen

Alkenes do not contain the maximum number of hydrogen atoms possible. When a hydrogen molecule, H_2 is added the C=C double bond breaks to form the corresponding alkane. Typically a nickel catalyst is used.

pentene + hydrogen $\xrightarrow{\text{catalyst}}$ pentane

$C_5H_{10} + H_2 \longrightarrow C_5H_{12}$

Reaction with water (steam)

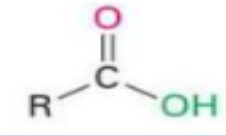
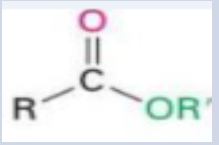
Alcohols such as ethanol can be made from ethene gas when reacted with steam. This is known as an hydration reaction

The reaction requires energy to heat the gases and a high pressure (hence why steam is used instead of liquid water).

ethene + steam $\rightleftharpoons$ ethanol

$C_2H_4 + H_2O \rightleftharpoons C_2H_5OH$

Functional groups

Homologous series	Functional group	diagram	suffix
Alcohol	-OH		-ol
Carboxylic acid	-COOH		-oic acid
Ester	-COO-		-ate

Alcohols and their reactions

Alcohols are made by removing one hydrogen atom from an alkane molecule and replacing it with the -OH group. They are used as solvents, fuels and in alcoholic drinks.

Ethanol can be made by the fermentation of glucose with yeast:

glucose $\xrightarrow{\text{yeast}}$ ethanol + carbon dioxide

$C_6H_{12}O_6(aq) \rightarrow 2C_2H_5OH(aq) + 2CO_2(g)$

When reacted with sodium metal, hydrogen gas, is released. This reaction is less vigorous than the reactions with water. And produces as strong alkali solution (from the sodium alkoxide salt formed).

sodium + ethanol → sodium ethoxide + hydrogen

$2Na + 2C_2H_5OH \rightarrow 2C_2H_5ONa + H_2$

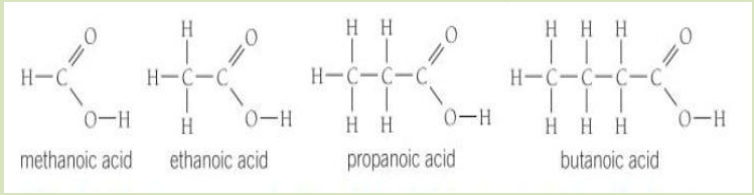
Alcohols can be oxidised to a carboxylic acid when boiled with an acidified oxidising agent which is shown in reactions as [O], for instance ethanol will oxidise to ethanoic acid (which is the main component in vinegar).

ethanol + oxygen atoms from oxidising agent → ethanoic acid + water

$C_2H_5OH + 2[O] \rightarrow CH_3COOH + H_2O$

Carboxylic acids

Carboxylic acids contain the functional group **-COOH**.



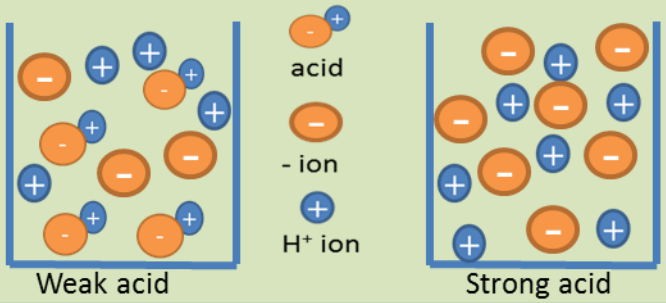
All carboxylic acids are weak acids and will react with carbonates an bases in a similar manner- producing a salt, water and carbon dioxide.

ethanoic acid	+	sodium carbonate	→	sodium ethanoate	+	water	+	carbon dioxide
$2CH_3COOH(aq)$	+	$Na_2CO_3(s)$	→	$2CH_3COONa(aq)$	+	$H_2O(l)$	+	$CO_2(g)$

HT only

Carboxylic acids are weak acids as they do not fully ionise (split into its constituent positive H^+ and negative ions), as pH is a measure of the concentration of H^+ ions a low concentration of these would equate to a acidic pH closer to 7

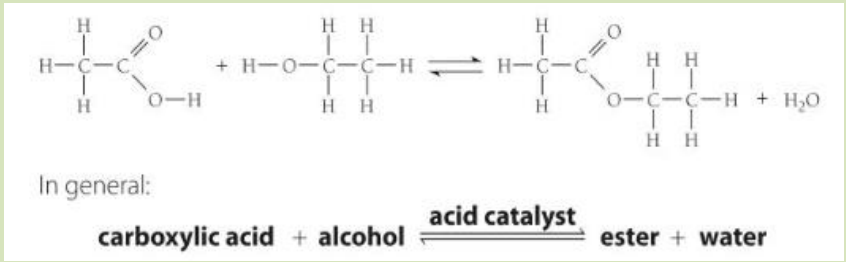
$$\underset{\text{ethanoic acid (high proportion)}}{CH_3COOH(aq)} \overset{\text{water}}{\rightleftharpoons} \underset{\text{ethanoate ions (low proportion)}}{CH_3COO^-(aq)} + \underset{\text{hydrogen ions}}{H^+(aq)}$$



Esters

Esters contain the functional group **-COO-**.

An ester is made by reacting together a carboxylic acid and an alcohol, along with a sulfuric acid catalyst.



Esters have a distinctive fruity smell and are volatile (evaporate easily). They are mainly used in perfumes and flavourings.

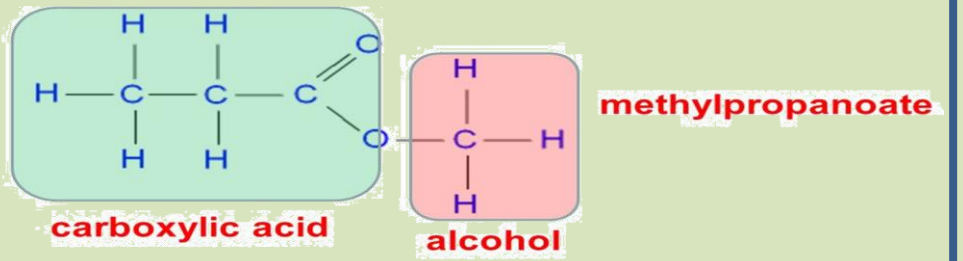
The first part of the ester name comes from the alcohol (ethyl) and the second part from the carboxylic acid (ethanoate).

(alcohol) (acid-anoate)

Drop –anol, replace with "yl"

Change from "-oic acid" to "-oate"

Example:



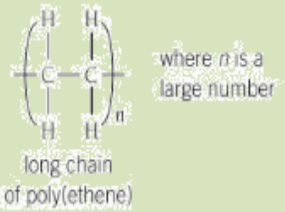
KS4 Chemistry: C11 Polymers

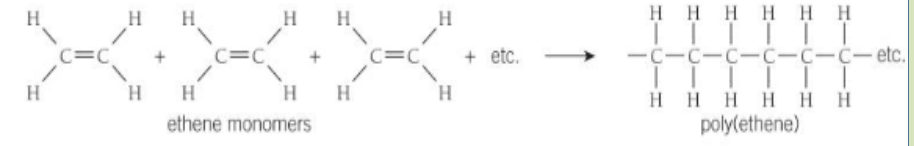
Further reading
https://www.bbc.co.uk/bitesize/guides/z3v4xfr/revision/3
https://www.youtube.com/watch?v=zS_RK8Hniaw&safe=active

Key word	Definition
Polymer	A substance that is composed of many repeating subunits.
Monomer	The small repeating molecules that make up polymers
Addition polymerisation	A form of polymerisation reaction where two substances react together to form one new substance
Condensation polymerisation	A form of polymerisation reaction which forms two products – the now extended polymer and a small molecule of either water or HCl
Polyester	Where a reaction between an alcohol and a carboxylic acid react to form a longer ester which can further polymerise via "ester link"
Polysaccharides	A polymer made of smaller simple sugars as monomers.
Proteins	Where water is used to chemically change a substance- (where water is bonded to the substance)
Natural polymer	A polymer that can be made naturally such as silk, wool and DNA
Nucleotide	The organic monomer that makes up DNA

Polymers

Polymers are typically long chain molecules that are made up of up to thousands of smaller molecules called monomers. These polymers take the name of the monomers with poly- as the prefix

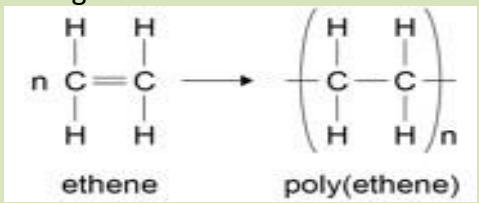




Addition Polymerisation

Alkenes are great to make polymers such as poly(ethene) (durable and transparent for drinks bottles) and poly(propene) (strong and is used to make ropes) by addition polymerisation.

This reaction takes multiple reactants to make one product, the double bond in the monomer "opens up"/ is broken allowing new bonds to be made to extend the polymer. The repeating unit in the polymer is then shown in brackets with a single bond leaving each end.

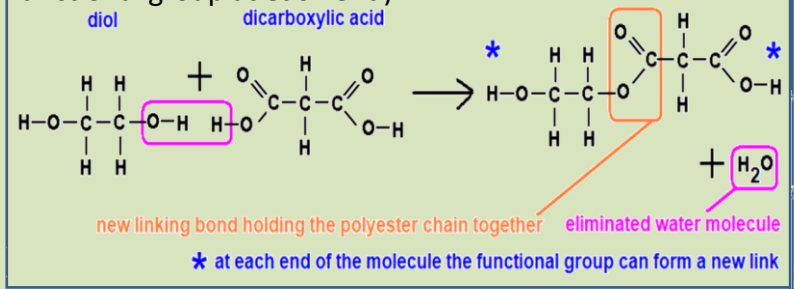


Higher Tier only- Condensation Polymerisation

Another form of polymerisation reaction is condensation polymerisation, as the name suggests- water is usually formed in this process.

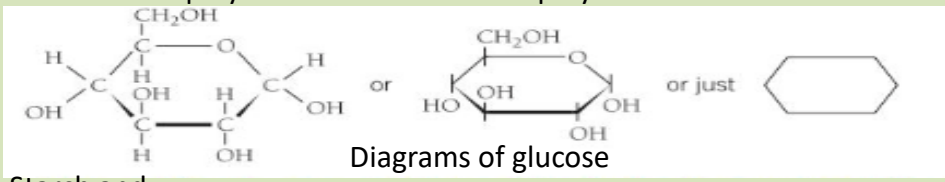
addition polymerisation →	the addition polymer
condensation polymerisation →	the condensation polymer + a small molecule

For this reaction, we do not need a C=C bond, instead we use a diol (molecule with a alcohol functional group at each end) and a dicarboxylic acid (molecule with a carboxylic acid functional group at each end)



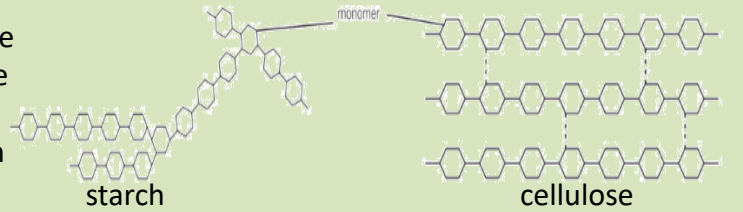
Natural Polymers

Natural polymers are found in all living things, we specifically need to know about the polymers that make up starch, cellulose and proteins. Glucose is a simple sugar found in foods, and is a monomer called a monosaccharide. These monosaccharides are polymerised via condensation polymerisation. This forms polysaccharides such as starch



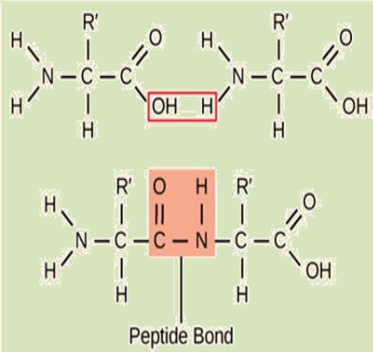
Diagrams of glucose

Starch and cellulose can be used as storage for glucose to later be broken down



HT only- Making polypeptides from amino acids

Polypeptides are the building blocks for protein and the monomers for polypeptides are called amino acids. They are named as such as they have a amine (NH_2) group at one end and a carboxylic acid group (-COOH) at the other end, meaning both an acid an base are in the same molecule. This reaction is a condensation polymerisation reaction, but the bond that extends the polymer is called a peptide bond as a peptide is made



DNA

DNA is another example of a natural polymer made of monomers called nucleotides (made of sugars bonded to phosphate groups and 1 of 4 different bases)

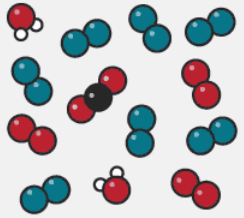
Nucleotides bond together via **condensation polymerisation**

KS4 Chemistry:
C12 Chemical analysis

Pure substances

The word **pure** is used in chemistry in a different way from its everyday meaning.
For example, cartons are often labelled as 'pure' orange juice. The label means that the contents are just orange juice, with no other substances added.
However, the juice is not pure in the chemical sense, because it contains different substances mixed together

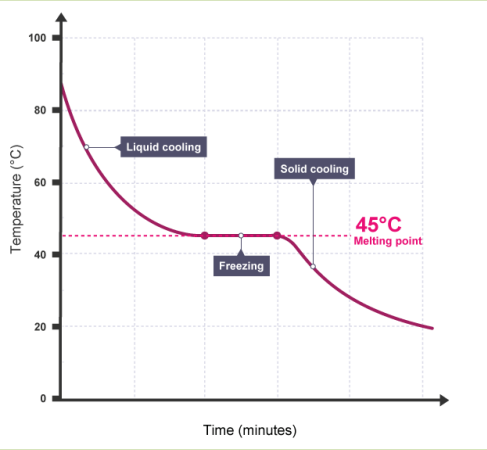
Examples of pure and impure substances:

Description	Example	Diagram
Pure element	Oxygen	
Pure compound	Carbon dioxide	
Mixture of elements	Oxygen and helium	
Mixture of compounds	Alcohol and water	
Mixture of elements and compounds	Air	

Distinguishing between pure substances and mixtures;

Pure substances have a clear melting point, where as mixtures melt over a range of temperatures – this is clearly seen on a graph showing a cooling curve;

The horizontal part of the graph shows that the salol has a sharp melting point, so it is pure.

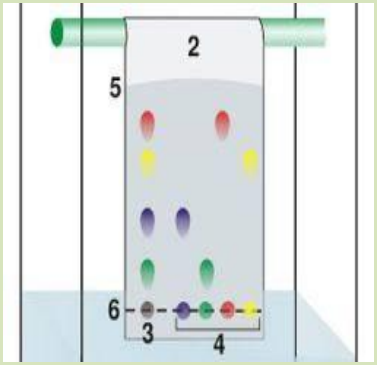


Formulations: Many consumer products are made up of complex mixtures, paints (contain pigment, binder and solvent), and cleaning agents (surfactant, water and colouring).

Paper chromatography

Technique used to separate mixtures of soluble substances and to provide information on the possible identity of the substances present in the mixture.

These are often coloured substances such as food colourings, inks, dyes or plant pigments.

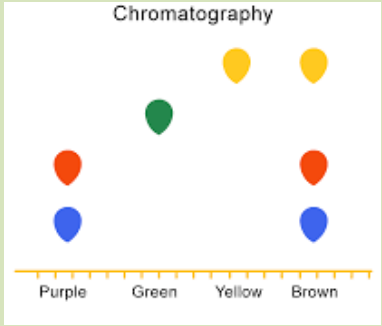


Keyword	Definition
Pure substance	Consists of only one element or one compound
Mixture	Consists of two or more different substances, not chemically joined together
Formulation	Is a mixture which has been designed as a useful product, e.g. medicines, fuels and foods
Soluble	A substance able to dissolve in a solvent
Solvent	A liquid that dissolves a solute to form a solution
Solute	The substance that dissolves to make a solution
Solution	Mixture formed by a solute and a solvent.
R_f (retention factor)	A measurement from chromatography: it is the distance a spot of substance has been carried above the baseline divided by the distance of the solvent front
Mobile phase	Phase in chromatography that moves, usually a solvent or mixture of solvents.
Stationary phase	Phase in chromatography that does not move, for instance, the paper.

Interpreting a chromatogram

You might be asked to determine the number of substances contained in a pigment or ink.

A chromatogram can be used to distinguish between **pure** and **impure** substances



- Pure substances will produce one spot on a chromatogram
- Impure substances will produce more than one spot on a chromatogram

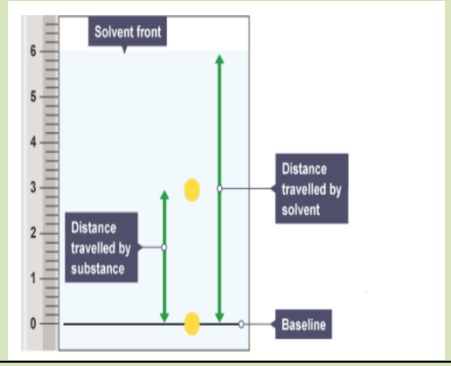
R_f values

R_f values can be used to identify unknown chemicals if they can be compared to a range of reference substances.

The R_f value is always the same for a particular substance if run in the same solvent system.

The R_f value of a spot is calculated using:

$$R_f = \frac{distance\ travelled\ by\ substance}{distance\ travelled\ by\ solvent}$$



Testing for Gases:

Hydrogen:

Collect a test tube of the product; place a lit splint in the gas and if positive a squeaky pop goes off.

Safety: wear eye protection

Oxygen:

Collect a test tube of the product; place a glowing splint in the gas and if positive it will relight.

Safety: wear eye protection

Required practical – investigating the composition of inks

Aim

To investigate how paper **chromatography** can be used to separate and tell the difference between coloured substances.

Method

1. Draw a pencil line across the chromatography paper, 1 - 2 cm from the bottom of the chromatography paper – Use pencil as this will not run and blend with the ink samples
2. Use a pipette or capillary tube to add small spots of each ink to the line on the paper
3. Place the paper into a container with a suitable solvent in the bottom
allow the solvent to move through the paper, make sure the solvent does not start above the pencil line, remove the **chromatogram** before the solvent reaches the top
4. Allow the chromatogram to dry, then measure the distance travelled by each spot of pigment and by the solvent, use mm not cm as this gives you a more precise measurement
5. Calculate the R_f value for each spot

Risks, Hazards and precautions

As with all practicals in science it is important that you use correct apparatus and methods and can talk about why these were used and how you carried out the experiment safely.

Example risk assessment;

Hazard	Possible harm	Possible precaution
Harmful solvent	Skin irritation	Avoid skin contact, eg wear gloves
Harmful solvent	Breathing difficulties	Ensure adequate ventilation or use a fume cupboard

Testing for Gases:

Carbon dioxide:

Bubble the product through limewater; if positive the lime water turns cloudy.

Safety: wear eye protection

Chlorine:

Collect the product; if positive blue litmus paper turns white (it is bleached)

Safety: chlorine gas is toxic gas must be collected in a fume cupboard

Separate Science Only:

Test for Negative Ions (Anions)

Carbonates:
Add dilute acid to a carbonate, it fizzes producing carbon dioxide gas.
Most carbonates do not dissolve in water, but Group 1 are soluble in water.

Halides:
Add dilute nitric acid and then silver nitrate solution.
If a precipitate forms there are halides present.

Iodide ions I^- = yellow precipitate
Bromide ions Br^- = cream precipitate
Chloride ions Cl^- = white precipitate

Sulfates:
Add dilute hydrochloric acid followed by barium chloride solution.
A white precipitate tells you sulfate ions are present.

Instrumental Analysis

Important in the work of environmental agencies fighting pollution.

Advantages:
Highly accurate and sensitive
Quicker
Enable small samples to be analysed

Disadvantages:
Very expensive
Special training
Results need comparing

Test for Positive Ions (Cations)

Some metal ions, produce flames with characteristics colour:

Method:
1. Nichrome wire loop should be dipped in concentrated hydrochloric acid and then heated (clean it)
2. Dip in acid again before dipping into metal compound to be tested
3. Hold the loop in the roaring blue flame
4. The Bunsen flame will change colour depending on the metal ion compound
5. If there is a mixture of metal ions, then some flame colours can be masked.

Results:

Metal Ion	Flame Colour
Lithium, Li^+	Crimson
Sodium, Na^+	Yellow
Potassium, K^+	Lilac
Calcium, Ca^{2+}	Orange-red
Copper, Cu^{2+}	Green

Flame emission spectroscopy

Used for analysing samples of metal ions, the sample is heated in a flame. The energy provided excites electrons in the metal ions, making them jump into a higher energy levels, when they fall back, the energy is released as light energy.

In the spectrometer, the wavelength of the light can be analysed.

Provide an accurate way to monitor water for metal ions.

KS4 Chemistry C14 – The Earth's Resources

Humans use the Earth's natural resources for a number of purposes, including:

- energy and fuels for warmth
- building materials for shelter
- food through farming
- fuels for transport
- materials for clothing

The human population is growing very quickly and many people argue that humans are using up the Earth's finite resources at a rate which is too fast and therefore unsustainable

Making water Safe to Drink

Potable water must have low levels of SALTS and MICROBES (it isn't PURE water)

Rainwater in lakes, rivers and reservoirs

Filter

Sterilise – chlorine, ozone, or UV light

Why? To kill microbes

Sewage

Screening and grit removal

Why? To remove insoluble solids

Sedimentation

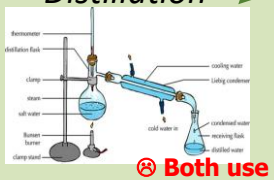
Anaerobic digestion of sludge

Aerobic treatment of effluent

Industrial and agricultural waste water – remove organic matter and harmful chemicals

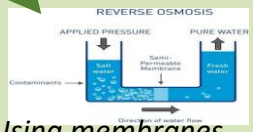
Salt water

Distillation



☹ **Both use a lot of energy**

Desalination



Using membranes e.g. Reverse osmosis

Finite and Renewable Resources

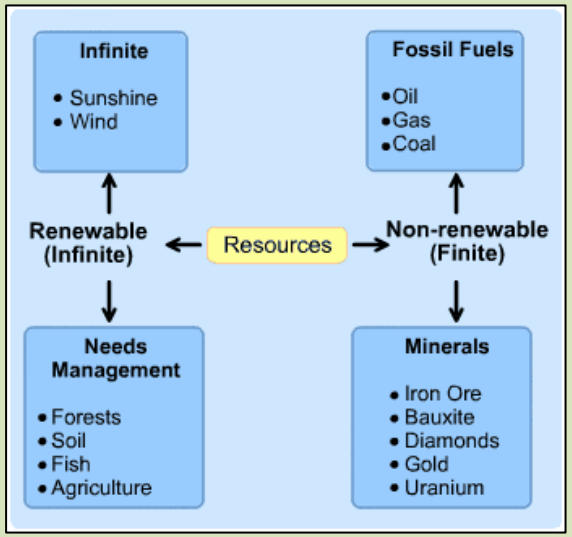
Finite resources from the Earth's crust, oceans and atmosphere will one day run out. They can be processed to provide energy and useful materials. Renewable resources are those which will not run out in the foreseeable future.

Finite resources are processed to get us
- Energy
- materials

e.g. Coal, oil and gas are used for energy.
e.g. metal ores are mined to get metals.

'Natural resources' + agriculture provides:
- Food
- Timber
- Clothes

e.g. Cotton is natural and we grow cotton plants. OR we can use synthetic materials e.g. nylon



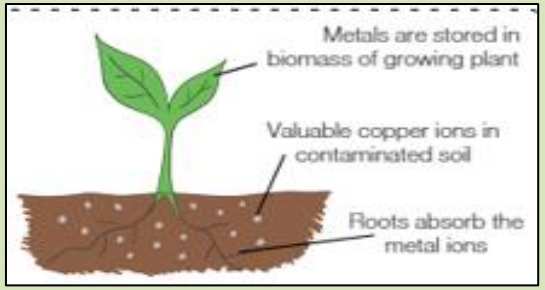
Key Term	Definition
Finite	Will run out eventually
Renewable	We can replace them as we use them
Sustainable	meets the needs of the current generation without compromising the ability of future generations to meet their needs.
Potable	Safe to drink, Drinkable
Pure	a pure substance consists of only one element or one compound
Distillation	A method of purifying a liquid by first heating it then cooling it.
Reverse Osmosis	A water purification process that uses a partially permeable membrane to remove ions, unwanted molecules and larger particles from drinking water
Sewage	Waste water and excrement transported in sewers
Aerobic	In the presence of oxygen
Anaerobic	Without oxygen being present
Bioleaching	A method of extracting copper from low-grade copper ores using bacteria
Phytomining	A method of extracting copper from low-grade copper ores using plants that absorb the copper ions
Life Cycle Assessment	A process that assesses the impact of a product, process or service on the environment
Recycling	The process in which waste materials are processed to be used again
Blast Furnace	The huge reaction vessels used in industry to extract iron from its ore

Alternative Metal Extraction

Why bother? Running out of high grade metal ores

Phytomining

1. Plants are grown in soils rich in metals.
2. Plants take in copper.
3. BURN plants
4. Metal is then extracted from the ASH



Bioleaching

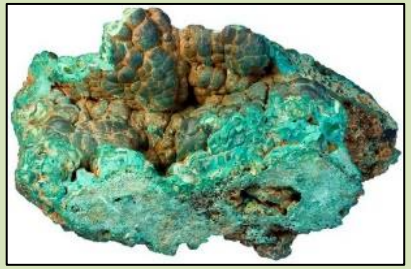
→ 'leachate solution' contains copper compounds

How to get the copper from the compound

↓ Displacement using scrap iron

↓ Electrolysis

Copper comes from a rock called malachite



Electrolysis only works on molten or dissolved ions

Copper sulphate solution (aq)

Life Cycle Assessments

LCA's are carried out in order to find the impact of a product on the environment.

Reducing use of resources

Reduce…use of limited resources

Reduce…use of energy resources

Reduce…waste and environmental impacts

HOW IS ALUMINIUM RECYCLED?

1. Aluminium is collected along with other metals from your recycling bin
2. Recycling is collected and delivered to a special processing plant
3. Using the latest technology all material streams are separated
4. Metal elements are melted and treated to make new raw materials
5. The recycled aluminium is now used in the production of new products

The aluminium is back on the shelf for you to buy in as little as sixty days

KS4 Chemistry: C15 Using Our Resources

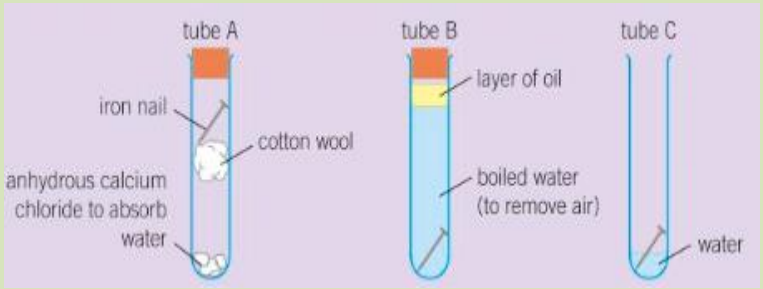
Key word	Definition
Rusting	The corrosion of iron.
Alloy	A mixture of two or more elements one of which is a metal.
Polymer	A (plastic) substance made from lots of small monomers.
Sacrificial protection	A more reactive metal is coated onto an object to prevent rusting.
Neutralisation	A chemical reaction involving an acid and a base where a salt and water is formed.
Galvanising	Where iron is protected by being coated in a protective later of zinc.
Carbon steels	Iron that has either a high or low carbon content. Low carbon steel is soft and malleable whereas high carbon steel is hard and brittle.
Stainless steel	A steel and chromium alloy that is resistant to rusting.
Ceramic	Materials that are made from clay and fired in a furnace to increase the bonding/strength of the clay.
Composite	When two or more materials with different properties are combined to produce a different material with different properties

Rusting

Rusting is an **oxidation** process (addition of oxygen)
Rust is hydrated **iron oxide, Fe_2O_3.**
Water is loosely bonded to the iron.

The reaction can be summarised as:

Iron + oxygen + water → hydrated iron(III) oxide



The rusting reaction has ideal conditions to take place- both oxygen (found in the air) and water are needed to completely rust the iron nail.

To protect iron from rusting- it can be coated in :

- Paint (to prevent oxygen reaching the iron)
- Oil and grease
- Plastic

Iron can also be galvanized in zinc (a more reactive metal) so that the zinc is oxidised instead and acts as a sacrificial coating.

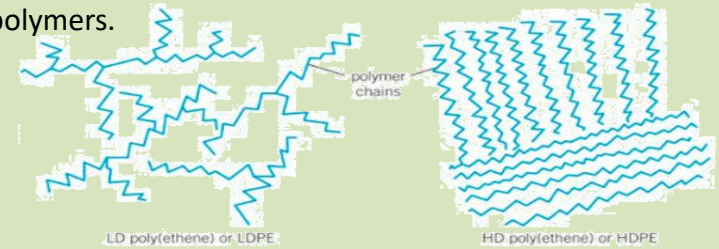
Polymers

Polymers are derived from crude oil. The properties of polymers depend on:
- The monomers used to make it.
- The conditions chosen to carry out the reaction.

Poly means more than one and the suffix is the name of the monomer, so poly(ethene) is more than one ethene monomer covalently bonded together.

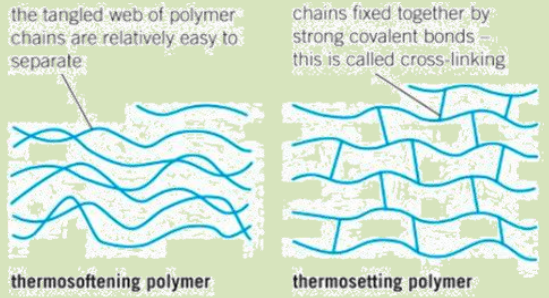
There are 2 types of polyethene: high density (HD) and low density (LD) as they are formed under different conditions.
LD – made under very high pressure with O_2 = randomly branched → low density

HD – made with a catalyst and slight pressure = straight-chain → pack close together → high density. Stronger than LD polymers.



You can also sort polymers based on what happens to them when heated. Polymers that melt easily and set when cool are called **Thermosoftening polymers.**

Whereas polymers that have strong covalent cross links do not melt when heated and are called **thermosetting polymers**

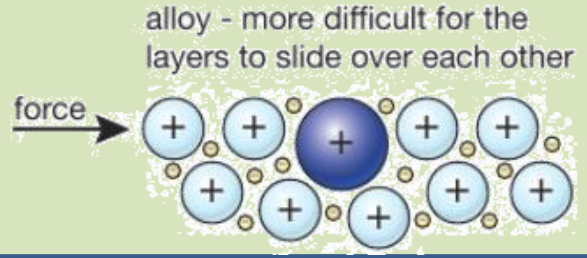


Alloys

Whilst pure metals are valuable, mixing them with other metals to make alloys can give them more useful properties, the main examples and uses are shown below.

	Copper alloys	Aluminium alloys	Gold alloys	Carbon steels	Alloy steels
Made from…	Brass = 70% copper 30% zinc Bronze = 88% copper 12% tin	Aluminium and a variety of other metals (up to 300)	Gold and copper	Iron + 0.03-4% of carbon	Iron + 1-5% of other metals Such as chromium, nickel and tungsten
Properties	Harder than copper but malleable too Tough and corrosion resistant	Lightweight and stronger than Aluminium alone.	Produces different shades, hard-wearing, lasts longer than pure gold	Low carbon steel: softer and easily shaped High carbon steel: very hard, but brittle	Resistant to corrosion, high strength and hardness
Uses	Musical instruments Ships, statues	Aircraft machinery and military vehicles	Jewellery	Car bodies, ships, machinery	Cooking utensils, cutlery, drill bits

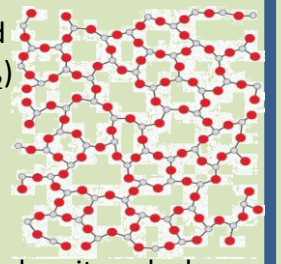
Alloys are often harder than pure metals as the mixture of different sized atoms distorts the usually regular layers in metal, making it harder for the atoms to slide over each other.



Glass, ceramics and composites

Different materials have different properties, this determines what we use them for, for real world applications. You need to be able to compare the properties of glass, metals, composites and ceramics

Glass



Glass is typically made up of sand that contains silicon dioxide (SiO_2) in combination with materials such as limestone ($CaCO_3$) and soda (Na_2CO_3). When heated together to about 1500°C the mixture will melt and form glass when it cools down. Its solid structure at the atomic level gives an irregular pattern, giving it a smoother surface and contributing to its transparency. You can also add Boron trioxide to get borosilicate glass that has high melting points (used for test tubes).

Ceramics

Ceramics are typically made with clay and baked at high temperatures in a kiln to strengthen them. Examples are bricks, tiles, sinks and crockery. The properties of ceramics are that they are brittle will break with a hard sharp blow, they are also good electrical insulators and are resistant to chemicals (inert).

Ceramics have a mixture of ionic and covalent compounds in its structure. These help form layers when it is wet. When fired in the furnace- the water is driven out, strengthening the bonds between layers.

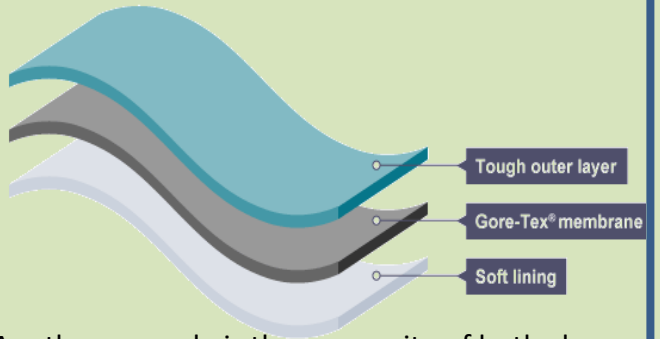
Sharp blows distort these layers so ions of the same charge begin to repel each other- breaking the ceramic

Composites

Composites use multiple materials and combines their properties to make a product with improve properties for a specific use. Typically a binding material (also called a matrix) that binds fragments/fibres of another material.

For example waterproof jackets combine a tough outer layer, with a gore-tex membrane and a soft lining.

Combining these materials makes the jacket rip resistant, waterproof/breathable and soft to wear- it would not have these properties without using all three materials.



Another example is the composite of both glass and ceramics. Both are brittle and will shatter when struck but when they are heated together to get a ceramic-glass composite. The glass melts between the layers of the ceramic to prevent cracks from spreading. Ceramic-glass is no longer brittle and can even be used for false teeth in dentistry!

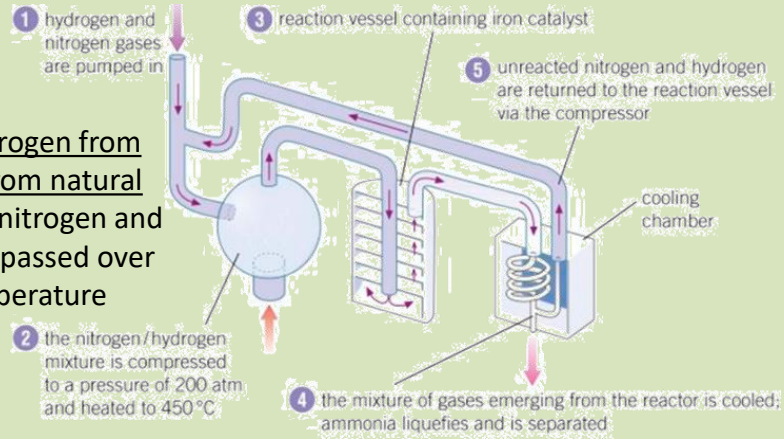
Making ammonia-the Haber process

To help grow plants to meet an increased demand, farmers have to use fertilisers to help plant growth. Natural fertiliser such as manure can be used, however most opt for reliable chemical fertilisers that are made from ammonia, such as ammonium nitrate (NH_4NO_3).

Ammonia contains nitrogen and hydrogen (NH_3), the nitrogen is used by plants for growth as it is used to make amino acids (the building blocks of proteins). The atmosphere is ~78% nitrogen but only a select few plants can make use of this by a process call nitrogen fixation. To overcome this the artificial fertilisers allow nitrogen to be taken in as soluble NO_3^- ions in the soil.

The Haber process

The Haber process takes nitrogen from the air and uses hydrogen from natural gas (such as methane). The nitrogen and hydrogen are purified, then passed over an **iron catalyst** at high temperature (~450°C) and high pressure (~200 atmospheres).

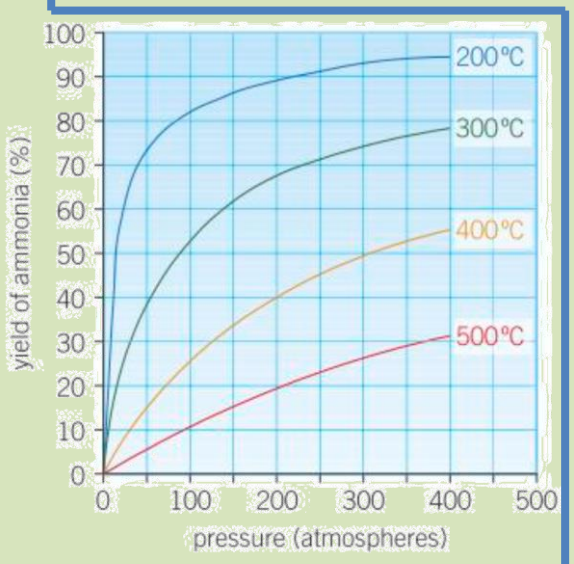


The high temperature and pressure enable a good yield from the reaction as it is a reversable reaction (ammonia can decompose to form its constituent gases). Once the ammonia is formed it is quickly cooled so that the ammonia condenses (separating it from the hydrogen/nitrogen which are reused).

$$\underset{N_2(g)}{\text{nitrogen}} + \underset{3H_2(g)}{\text{hydrogen}} \rightleftharpoons[\text{iron catalyst}] \underset{2NH_3(g)}{\text{ammonia}}$$

The conditions needed for the Haber process are a compromise, a higher yield could be achieved but increasing the pressure (as there are more gas molecules on the reactants than products- think Le Chatelier's Principle) but this is too costly to do.

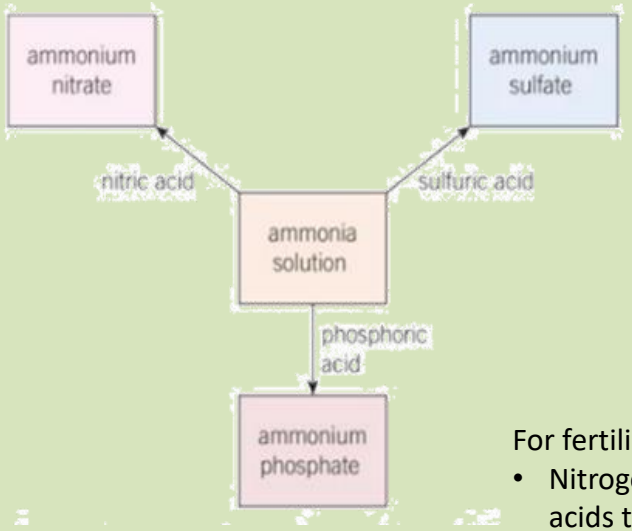
The forward reaction is exothermic so decreasing the temperature would increase yield **however** the rate at which the reaction would happen would decrease the rate at which ammonia is formed- so a higher temperature of ~450°C is chosen.



Making fertilisers

Fertilisers contain nitrogen, potassium and phosphorus needed for healthy growth, we call fertilisers that are made with compounds containing the 3 elements NPK fertilisers.

Most of the ammonia is reacted with an acid to make an ammonium salt fertilizer (in a neutralisation reaction).



$$\underset{NH_3(aq)}{\text{ammonia}} + \underset{HNO_3(aq)}{\text{nitric acid}} \rightarrow \underset{NH_4NO_3(aq)}{\text{ammonium nitrate}}$$

$$\underset{3NH_3(aq)}{\text{ammonia}} + \underset{H_3PO_4(aq)}{\text{phosphoric acid}} \rightarrow \underset{(NH_4)_3PO_4(aq)}{\text{ammonium phosphate}}$$

$$\underset{2NH_3(aq)}{\text{ammonia}} + \underset{H_2SO_4(aq)}{\text{sulfuric acid}} \rightarrow \underset{(NH_4)_2SO_4(aq)}{\text{ammonium sulfate}}$$

For fertilisers the NPK components are obtained as follows:

- Nitrogen, (N) comes from the ammonia and is reacted with acids to form ammonium containing compounds.
- Phosphorus, (P) is mined from phosphate rock and treated with acids to form fertilisers (such as calcium phosphate).
- Potassium, (K) comes from potassium salts mined from the ground and is also treated with acids to form fertilisers such as potassium chloride/sulfate.

KS4 Science
P13 Electromagnetic waves

Key facts
- Electromagnetic waves are transverse waves
- They transfer energy from the source of the waves to an absorber e.g. from the sun to our skin
- They all travel at the same velocity (speed of light) through a vacuum (space) or air
- They form a continuous spectrum, with different wavelengths and frequencies

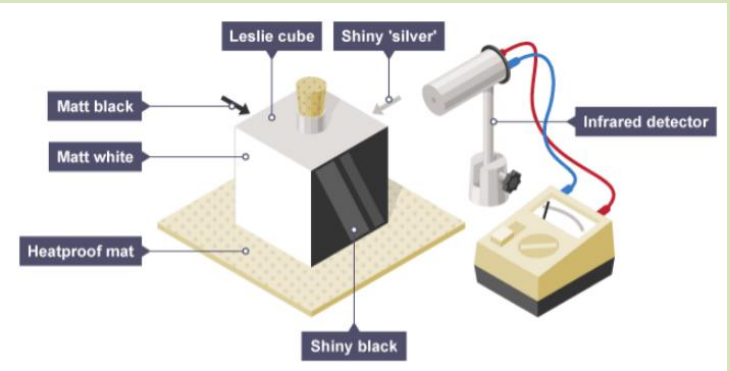
The speed of electromagnetic waves is 3.0×10^8m/s (300million m/s) through space and a vacuum.

Wave Speed equation

Wave speed = frequency x wavelength

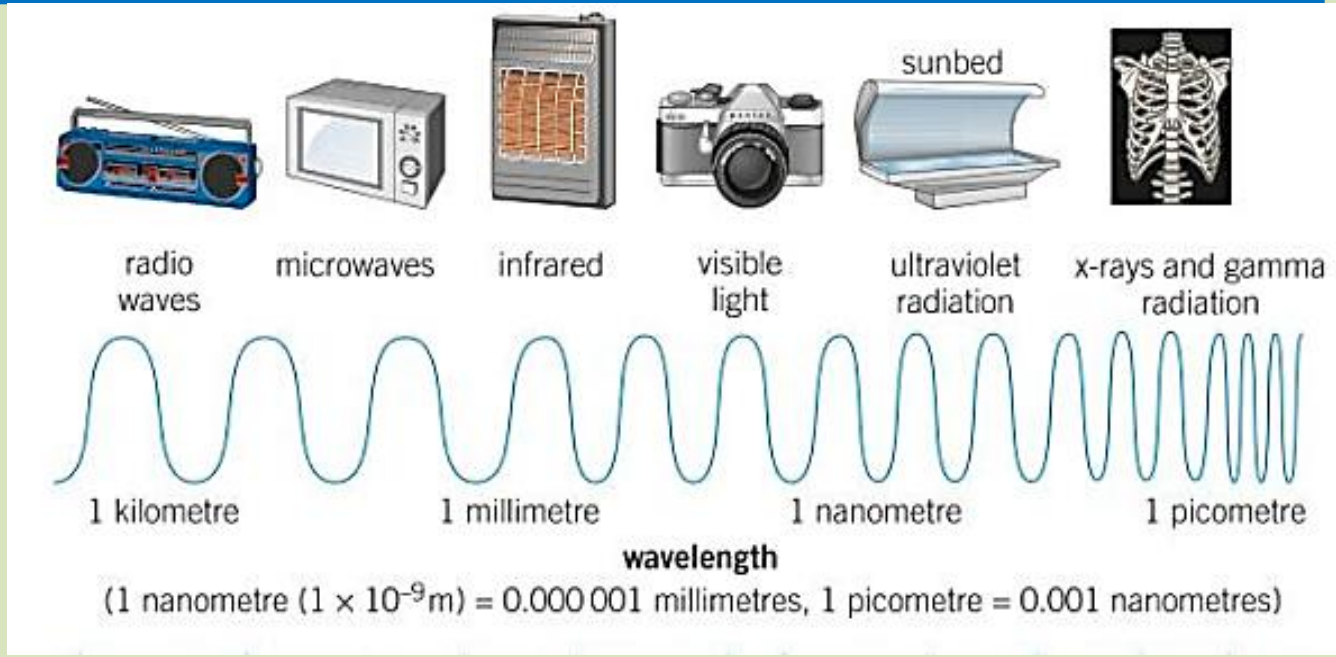
v (m/s) = f (Hz) x λ (m)

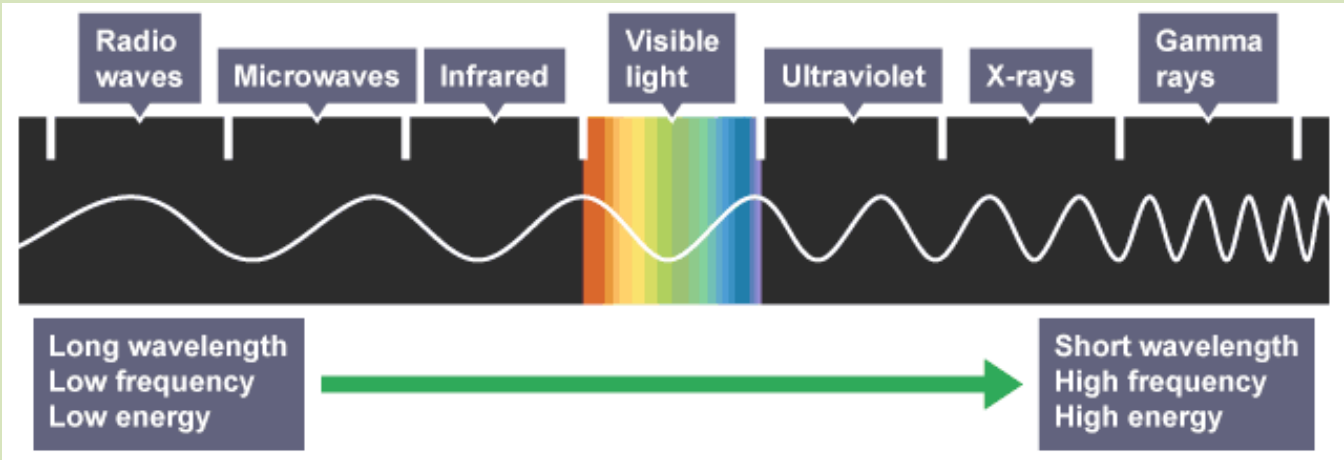
The human eye can only see visible light. The wavelength range is 400nm to just over 700nm.



To measure **infrared** emission rates put hot water in a Leslie Cube and measure the intensity of infrared radiation emitted from each surface. Dull, black surfaces will **emit** more radiation than shiny, light coloured surfaces.

To measure **infrared** absorption rates, place two different coloured cans next to an IR lamp. Time how long water in the two cans takes to reach a certain temperature. Dull, black surfaces **absorb** more radiation than shiny, light coloured surfaces so they will have a greater increase in temperature

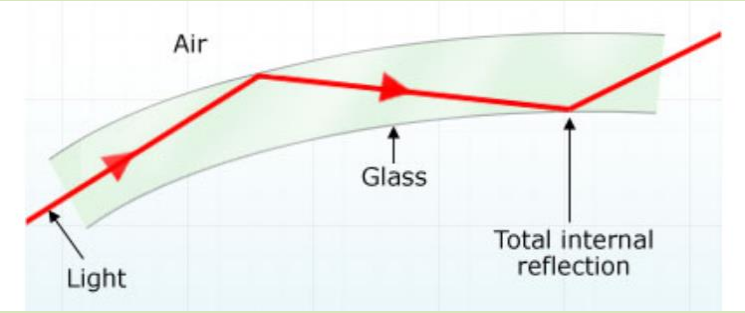




EM wave	Uses	Explanation
Radio waves	Television, radio	Low energy, not harmful Radio waves are transmitted at the same frequency as the a.c. current which produced it. When it reaches another antennae (e.g. aerial on a radio) the radio wave produces oscillations in the wire and so an alternating current of the same frequency as the radio signal.
Microwaves	Satellite TV signals, cooking food	Travel in straight lines through the atmosphere to reach satellites Microwaves are absorbed by water molecules in food, causing it to heat up
Infrared	Electrical heaters, cooking food, infrared cameras, remote controls	Electrical heaters give off infrared radiation that is absorbed by the food Infrared cameras detect the infrared radiation given off by objects because of their temperature
Visible light	Fibre optic communications	Visible light travels down electrical fibres from one end to the other without being lost through the sides, total internal reflection
Ultraviolet	Energy efficient lamps, sun tanning	UV waves produced by the gas in the bulb when excited by the current. UV waves absorbed by the coating of the bulb, which gives off visible light. Have a shorter wavelength than visible light.
X-rays	Medical imaging and treatments Airport security	X-rays are produced when high speed moving electrons are stopped and can penetrate soft tissues, but not bone. X-rays are ionising radiation and so can damage tissues as they pass though them.
Gamma rays	Medical imaging, treatment, kill harmful bacteria and sterilise food and equipment and kill cancer cells	Gamma rays are produced by radioactive substances when unstable nuclei produce energy.

KS4 Science
P13 Electromagnetic waves

Optical fibres
Very thin transparent fibres used to transmit communication signals using light and infrared radiation.



HT Carrier waves
Waves that are used to carry information by varying their amplitude.

HT X-rays
X-rays used for therapy, such as destroying tumours, carry more energy than the X-rays used for imaging.

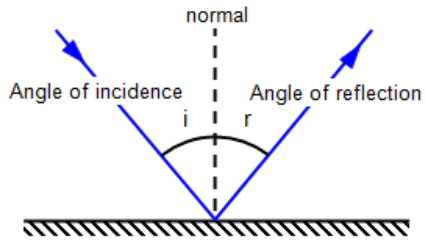
Dangers

- Ultraviolet waves, X-rays and gamma rays have enough energy to have hazardous effects on the human body.
- The effects depend on the size of the dose.
- Radiation dose (measured in sieverts (Sv)) is a measure of the risk of harm resulting from exposure to radiation.
- Ultraviolet waves can cause skin to age prematurely and increase the risk of skin cancer.
- X-rays and gamma rays are ionising radiation that can cause mutation of genes and cancer.

P14 Light Separate Science only

Word	Definition
plane mirror	flat mirror
real image	an image that <u>can</u> be formed on a screen
virtual image	an image that <u>cannot</u> be formed on a screen (because the rays of light do not actually meet at that point)
transparent	an object that transmits all the light that enters it e.g. piece of glass
translucent	an object that lets light pass through it but scatters the light inside it e.g. tracing paper (light is scattered or refracted)
opaque	an object that absorbs all the light that reaches it e.g. brick wall

The law of reflection



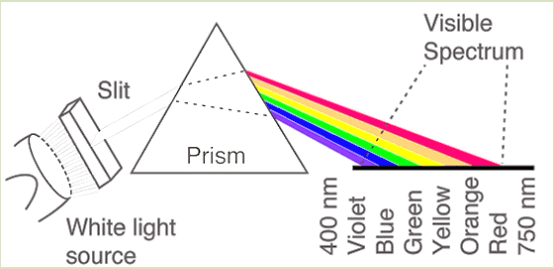
Angle of incidence: the angle between incident ray and Normal line
Angle of reflection: the angle between reflected ray and Normal line

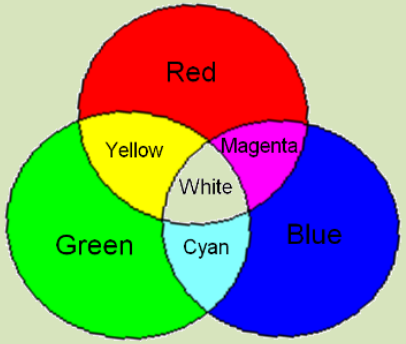
<u>Specular reflection</u>: reflection in a single direction from a smooth surface e.g. a mirror

<u>Diffuse reflection</u>: reflection in different directions from a rough surface

Colour

White light can be split into its spectrum (the colours of the rainbow), each with a different wavelength
Red light has the **longest** wavelength
Violet light has the **shortest** wavelength

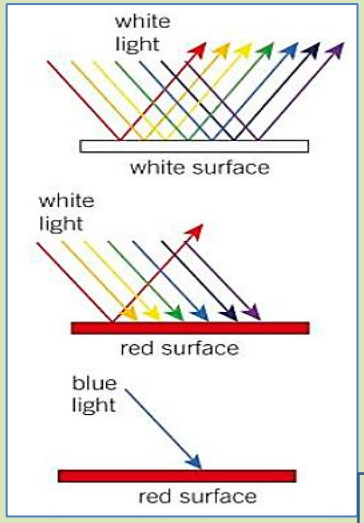




- Stars and filament lamps emit a continuous spectrum of light (all wavelengths)
- Neon lights and lasers only emit a narrow range of wavelengths

<u>Primary and secondary colours of light</u>

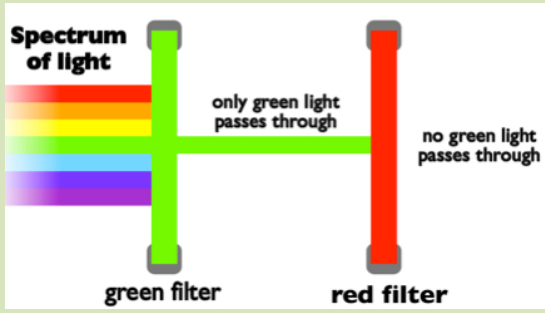
Red + yellow = green
Green + blue = cyan
Blue + red = magenta
Green + blue + red = white



A <u>white</u> object looks white because it **reflects** all the wavelengths of visible light that reach it.

A <u>red</u> object looks red because it **absorbs** all the wavelengths of light except red. Only red light is **reflected**.

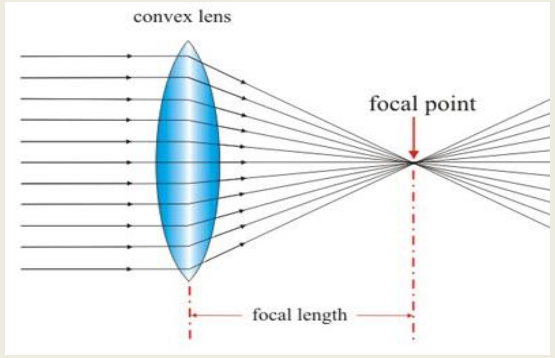
If only <u>blue</u> light is shone on a red surface it is **absorbed**, and <u>no</u> light is **reflected**, so the surface looks black



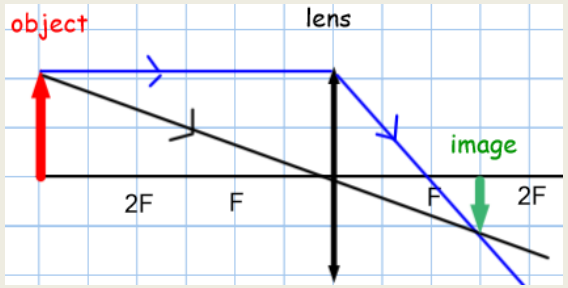
A <u>green</u> **filter absorbs** all colours except green, and **transmits** only green light

P14 Light Separate Science only

Convex (converging) lens

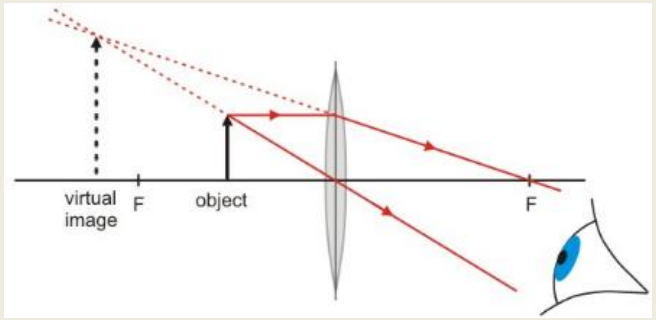


makes parallel rays of light converge to meet at the principal focus.
Focal length = distance from centre of lens to principal focus



To draw a ray diagram:
Draw two rays from the top of the object
a)ray parallel to the principal axis, which is refracted through the principal focus
b)Ray through the centre of the lens, which does not change direction
To create the image, draw an arrow from the principal axis to the point where the rays meet.

The image above is **inverted** (upside down), **diminished** (smaller than the object) and **real** (the rays of light pass through it).

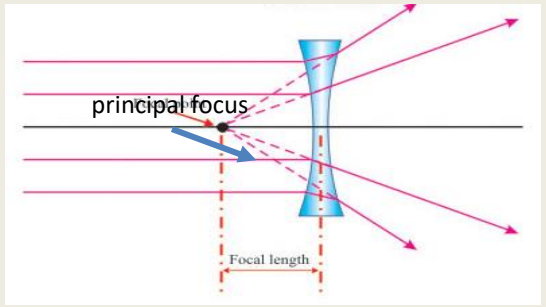


This image is
- **upright** (right way up),
- **magnified** (larger than the object)
- **virtual** (rays of light don't pass through it); represented by dotted lines

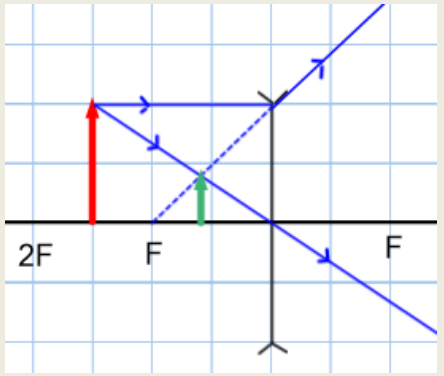
$$\text{magnification} = \frac{\text{image height}}{\text{object height}}$$

Convex lenses can produce **real** or **virtual** images.
Concave lenses always produce **virtual** images.

Concave (diverging) lens



A concave lens makes parallel rays of light diverge
(spread out), as if they have come from the principal focus of the lens

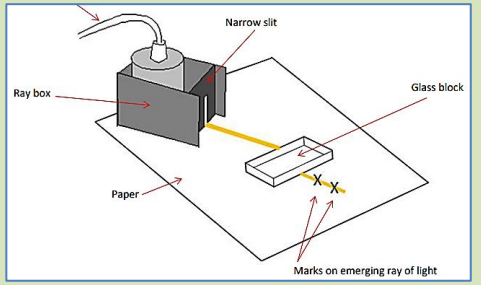


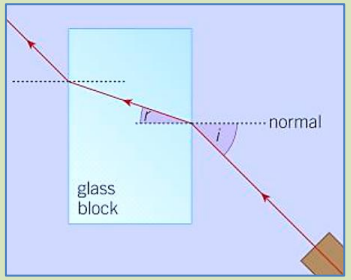
To draw a ray diagram:
Draw two rays from the top of the object
a)ray parallel to the principal axis, which is refracted as if it came from the principal focus on the same side of the lens
b)Ray through the centre of the lens, which does not change direction
To create the image, draw an arrow from the principal axis to the point where these rays appear to meet.

Required Practical: use different substances and surfaces to investigate refraction and reflection of light

Refraction: Draw around your block, direct your light ray at the block. Mark the ray entering and leaving the block with crosses. Join up all the light rays with a ruler. Finally draw the normal line at 90 degrees to the block at the point at which the incident ray hits the block. Measure the angle of incidence and angle of refraction

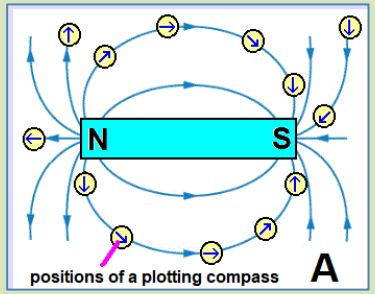
Reflection: direct the light ray at the mirror, mark crosses, join with a ruler. Mark on the normal line 90 degrees to the mirror and measure the angle of incidence and angle of reflection.





P15 Electromagnetism

Word	Definition
Permanent magnet	Magnet which produces its own magnetic field
Induced magnet	Object which becomes a magnet when placed in a magnetic field. When removed from the magnetic field it loses its magnetism quickly
Magnetic field	Region around a magnet where a force acts on another magnet
Solenoid	a wire shaped into a cylindrical coil
Electromagnet	A solenoid with an iron core
Motor effect	When a conductor carrying a current is placed in a magnetic field, the magnet and the conductor exert a force on each other
Magnetic flux density	Density of magnetic field lines (measured in Tesla (T))



A plotting compass can be used to plot the shape of the magnetic field around a bar magnet.
The arrows point from north to south.
The closer the field lines the stronger the field.

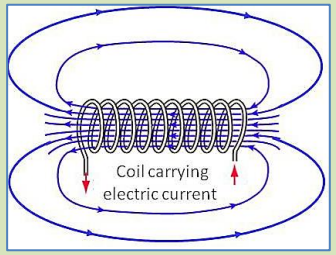
Motor Effect HT only

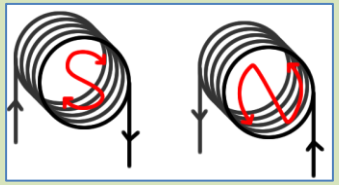
When a conductor carrying a current is placed in a magnetic field, it experiences a force. The size of the force can be increased by increasing:

- Size of current
- Length of conductor in magnetic field
- Magnetic flux density

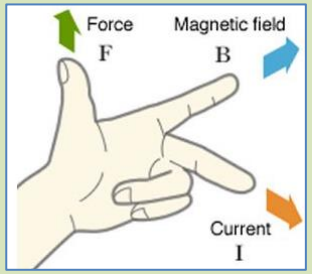
Force(N) = magnetic (T) x current (A) x length of wire (m)
flux density

F=BIL





The magnetic field inside a solenoid is strong and uniform.
The magnetic field around a solenoid has a similar shape to that of a bar magnet.
A larger current produces a stronger magnetic field.
The diagrams show which ends of the coil are south and north poles.

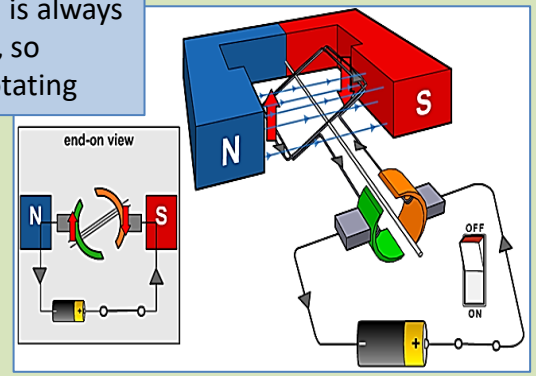


Fleming's left hand rule is used to find the direction of the force

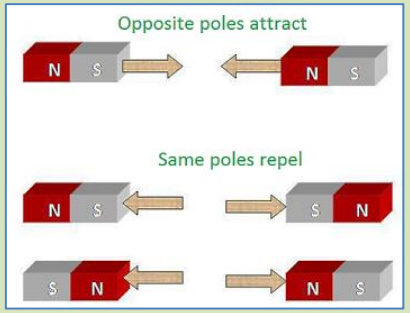
Electric motor

A current-carrying coil in a magnetic field will rotate.
On the left of the coil, current flows out of the page, so force is upwards. On the right of the coil, current flows into the page, so force is downwards.

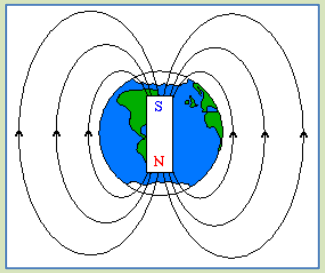
Split-ring commutator ensures the current direction in the coil is always the same direction, so motor continues rotating



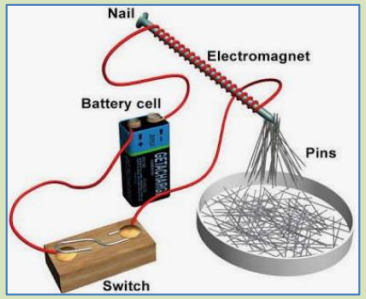
Magnetic materials
Iron **Steel**
Cobalt **Nickel**



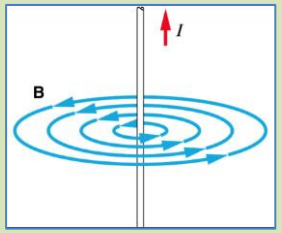
Opposite poles attract
Like poles repel

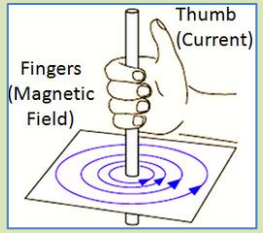


A compass needle always points **north** because the earth has a magnetic field.

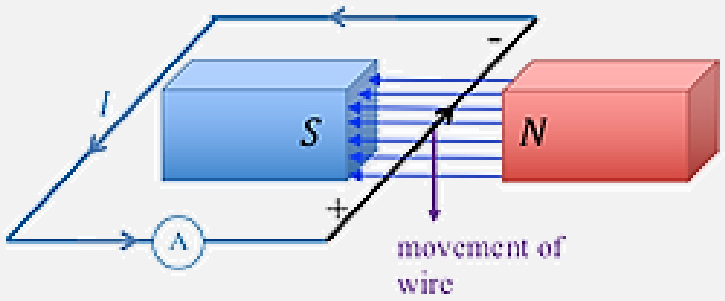


Adding an iron core increases the strength of the magnetic field. An electromagnet is a solenoid with an iron core.





The magnetic field lines around a wire carrying a current are shaped as concentric circles. The circles are closer together near the wire, where the field is strongest.
A larger current produces a stronger magnetic field.
The right hand grip method shows the direction of the field lines.

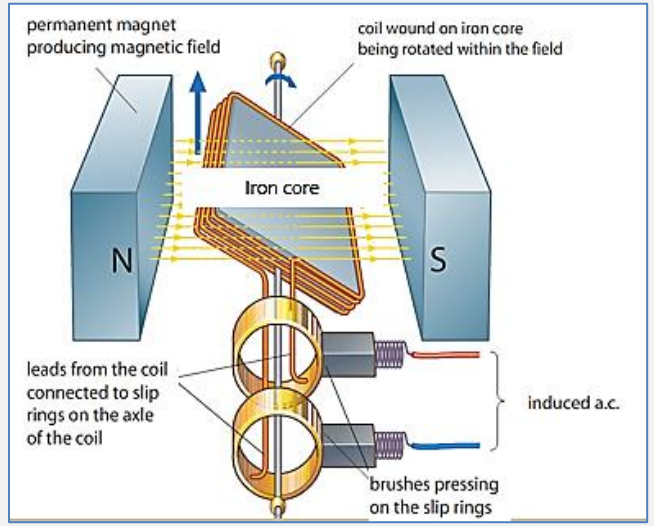


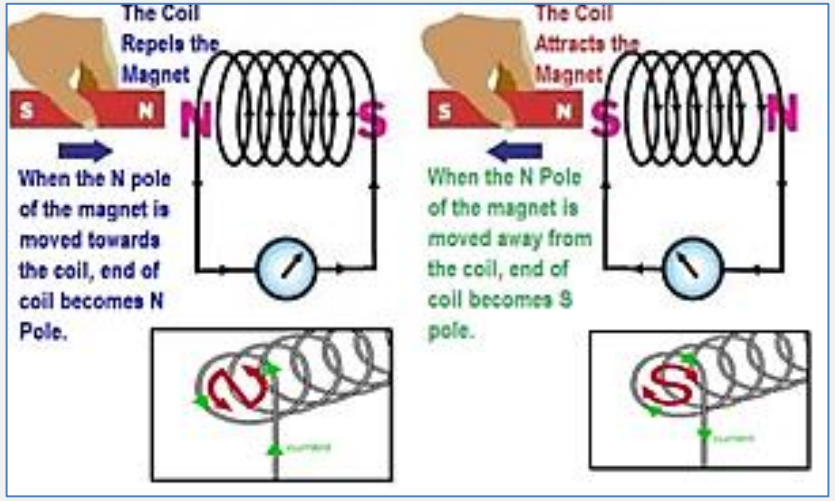
Electromagnetic induction

If a conductor moves relative to a magnetic field (cuts through magnetic field lines) or if there is a change in the magnetic field around a conductor, a potential difference is induced across the ends of the conductor. If this is part of a complete circuit, a current is induced. Also known as the **Generator effect.**

The generator effect is used to make alternating current (using an alternator)

Slip rings connect the coil to the carbon brushes
The direction of the induced potential difference reverses every half turn – so current reverses.

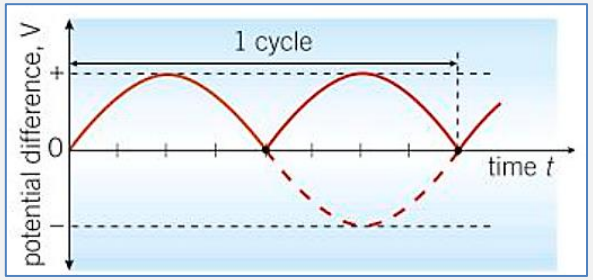


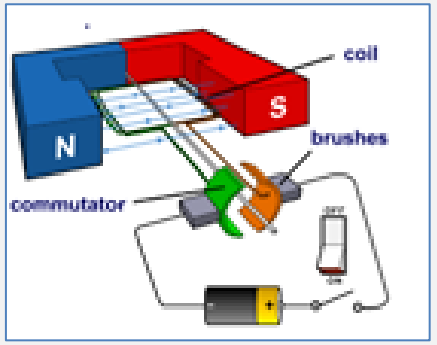


Lenz's law

The induced current flows in a direction such that it generates a magnetic field that opposes the change which produced it.

Direct current (using a dynamo)

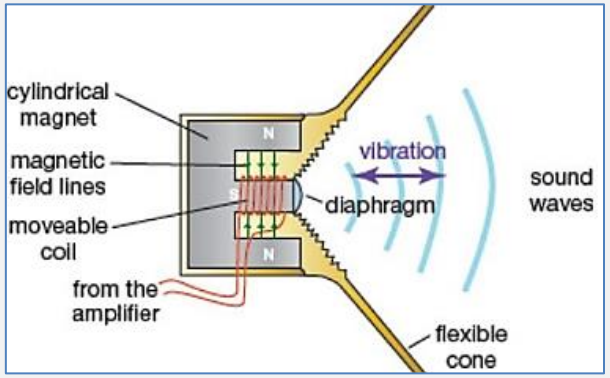




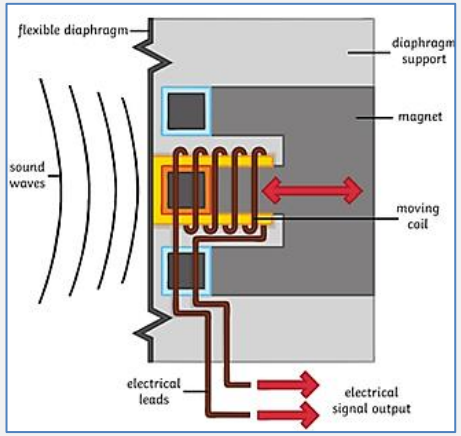
Split-ring commutator reverses the connections to the coil every half turn.
So induced potential difference never changes direction – current always flows in same direction.

P15 Electromagnetism

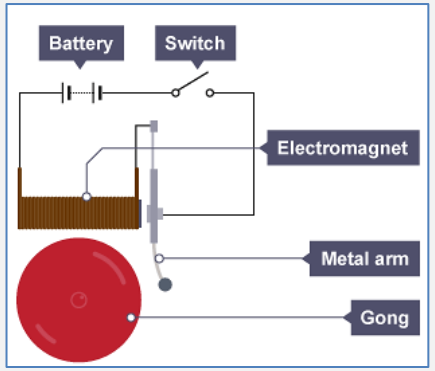
Physics – Separate Science only **HT only**



Loudspeakers and headphones convert electrical signals (AC) to sound waves using the motor effect. As current flows through the coil, the coil experiences a force (due to the motor effect). Because the current is alternating, the direction of the force alternates and the coil vibrates. This makes the speaker cone vibrate. This makes the air molecules move, which causes the pressure variations in the air needed for a sound wave.

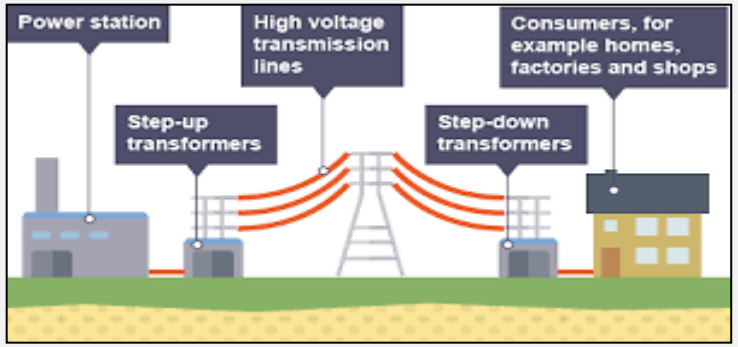


A **moving coil microphone** uses the generator effect to convert sound waves into electrical signals (AC). Sound waves hit a diaphragm and cause it to vibrate. The diaphragm and the coil vibrate in the magnetic field, so an alternating potential difference and current are induced in the coil.



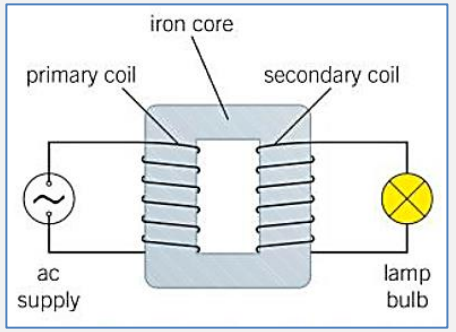
Devices like **electric bells** use electromagnets.
When the switch is closed, the electromagnet is magnetised.
The electromagnet attracts the armature (metal arm).
The hammer strikes the gong and breaks the circuit.
The armature springs back, completing the circuit again and remagnetising the electromagnet.
Cycle repeats for as long as the switch is closed.

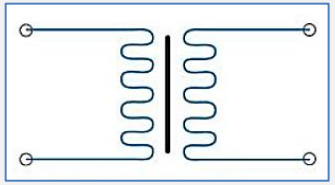
Step-up and step down transformers are used in the **National Grid** to increase and decrease alternating potential difference.



Transformers work by **electromagnetic induction**.

- The core is made of soft iron because this is easily magnetised.
- An alternating current flows through the primary coil.
- This produces an alternating magnetic field in the core.
- This induces an alternating potential difference in the secondary coil.
- If the secondary coil is part of a complete circuit, alternating current flows in secondary coil.





Because transformers are close to 100% efficient.

$$\frac{\text{Primary potential difference}}{\text{Secondary potential difference}} = \frac{\text{No. of turns on Primary coil}}{\text{No. of turns on Secondary coil}}$$

power input = power output

as P = I V

$$V_p \times I_p = V_s \times I_s$$

$$\frac{V_p}{V_s} = \frac{N_p}{N_s}$$

P16 Space

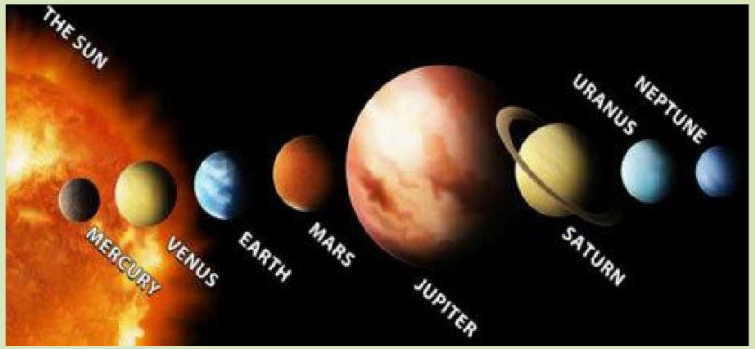
Physics – Separate Science only

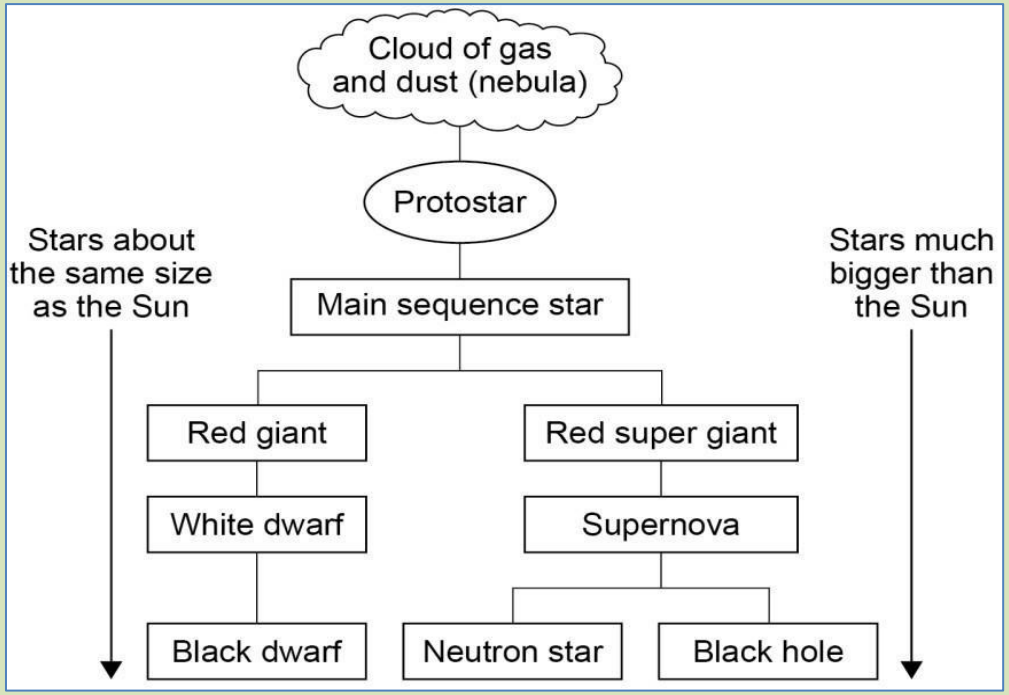
Our solar system

Our solar system consists of:

- One star: the Sun;
- Eight planets, which orbit the Sun;
- Dwarf planets, such as Pluto, which also orbit the Sun;
- Natural satellites: the moons that orbit some of the planets (including our moon);
- Other objects like asteroids and comets.

Our solar system is a very small part of the **Milky Way** galaxy. Galaxies consist of millions of stars, held together by their gravitational attraction to one another.





<u>Stars and their life cycle</u>

Stars form when a huge cloud of gas and dust (a nebula) comes together thanks to the gravitational attraction between the particles from which it is made. The diagram outlines the stages a star goes through during its life cycle. The stages of the life cycle depend on the initial mass of the star.

Lower mass stars (like the Sun) end more discreetly than others with much larger masses.

Fusion processes in stars produce all of the naturally occurring elements.

Elements heavier than iron are produced in a supernova. The explosion of a massive star (supernova) distributes the elements throughout the universe.

Key Terms	Definitions
Star	A huge (compared to Earth) sphere of superhot gas (plasma) undergoing nuclear fusion reactions.
Planet	A spherical object much smaller than a star, made of rocky or gaseous material (or a combination), which orbits a star.
Dwarf planet	Small planets that have not cleared their orbit of other material. Like planets, they orbit a star.
Satellites	Object that orbit a planet. Natural satellites are not launched by humans – so moons are natural satellites. Ones that we launch are called artificial satellites.
Orbit	To follow a path around another object due to the gravitational attraction between the objects, while being physically separated. Orbits can be circular, or elliptical (oval shaped).
Galaxy	A giant cluster of stars held together by their gravitational attraction to one another. Our galaxy is called the Milky Way.
Nebula	A cloud of gas and dust in space.
Nuclear fusion	A nuclear (not chemical) reaction in which the nuclei of atoms are joined together to make larger nuclei, releasing energy. For example, hydrogen nuclei are fused to helium nuclei in the Sun and other stars. Thus, fusion processes cause the formation of new elements. This can only happen at immense pressures and temperatures, when gases have ionised to become plasma. Nuclear fusion allows nucleosynthesis - making new nuclei.

P16 Space

Physics – Separate Science only

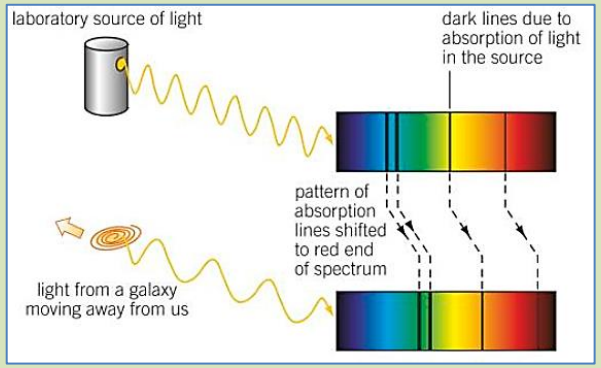
Key Terms	Definitions
Protostar	An early star – basically a big dense part of a nebula that is gathering mass but hasn't started nuclear fusion yet.
Main sequence	The stable stage of a star's life cycle, where inward and outward forces are in equilibrium.
Plasma	The 'fourth state of matter' – a superhot gas, where electrons are stripped from nuclei, leaving a sea of positive nuclei and negative electrons.
Red giant	The stage after the main sequence for stars with a similar mass to the Sun.
Red supergiant	The stage after the main sequence for stars much more massive than the Sun.
White dwarf	The collapsed core of a star like the Sun. Very dense (about 200 000 times more dense than Earth), but not as dense as neutron stars or black holes.
Black dwarf	When a white dwarf has fully cooled down, it no longer emits any radiation so it is a black dwarf. So in the universe, there aren't any black dwarves because it isn't old enough for white dwarves to have cooled off yet!
Supernova	The enormous explosion resulting from the collapse and resulting shock wave of a star much more massive than the Sun.
Neutron star	The collapsed core of a star after a supernova (but not of a star large enough to form a black hole).
Black hole	The collapsed core of really massive stars – about five or more times the mass of the Sun.

The Big Bang Theory states that all space time and matter were created in 'The Big Bang; a rapid expansion from a single point that happened 13.8 billion years ago.

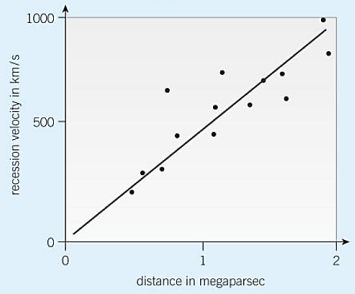
Evidence for the Big bang include the **red shift** of distant galaxies and the **CMBR** (Cosmic microwave background radiation)

Red shift:
When a light emitting object moves towards you its wavelength compresses resulting in it appearing to have a shorter wavelength, this is called blue shift. When a light emitting object is moving away from you its wavelength gets stretched out resulting in it appearing to have a **longer wavelength**, this is called **red shift.**

All distant galaxies show red shift in their line spectra meaning they are all moving away from us and one another. This would suggest they must at one point started from a single point.



The greater the galaxy's distance from Earth, the greater the recession velocity



Cosmic microwave background radiation CMBR:
The Big Bang should have resulted in the release of high energy radiation. However this radiation will have been stretched out in the expanding universe and become lower energy radiation.

In 1965 scientists discovered microwave radiation coming from every part of space. This **Cosmic microwave background radiation** could only be explained by the Big Bang theory

Key Terms	Definitions
Instantaneous velocity	Velocity at a single moment (remember it is vector quantity, with both direction and magnitude).
Red shift	The observed increase in wavelength of light emitted by objects moving away (receding) from an observer.
Big Bang theory	The theory, which is by far the dominant scientific theory for the origin of the universe, that states that the whole universe originated from a tiny and very hot and dense.
Recessional velocity	How fast something (like a galaxy) is moving away from an observer.
Dark matter	Aka dark mass. A mysterious type of matter that is known to exist (from observations of other galaxies), but no-one knows what it is made of.
Dark energy	The name given to the mysterious energy driving the acceleration in the expansion of the universe.

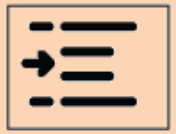
2.3 PRODUCE ROBUST PROGRAMS

2.3.1 Defensive design

Maintainability

COMMENT

These explain the purpose of the program, or a section of code. They may also explain any unusual approaches or temporary 'fixes'



INDENTATION

Mandatory in Python but use indentation to show the flow of the program

E.G.

UpperCamelCase	FirstName
lowerCamelCase	firstLineAddress
Kebab-case	Marital-status
lowercase_underscore	school_year

NAMING CONVENTIONS

SUBPROGRAMS

Use Procedures and functions to structure the code and eliminate duplicating portions of it

Use sensible variable names that have some meaning as to what they are being used for

Input validation

```
user_input = input("Enter a week of the year: ")
week = int(user_input)

if week > 0 and week <= 52:
    print(f"You have chosen week {week}")
else:
    print("The week must be between 1 and 52")
```

RANGE CHECK

```
valid_booking = False
booking = input("Enter your booking reference: ")

if len(booking) == 8:
    valid_booking = True
```

LENGTH CHECK

```
first_name = input("Please enter the first name: ")

while first_name == "":
    print("Error: First name is required")
    first_name = input("Please enter the first name: ")
```

PRESENCE CHECK

```
email = input("Enter your email address: ")
verify_email = input("Re-type your email address: ")

if email == verify_email:
    print("The emails match")
else:
    print("Error: the email addresses did not match")
```

FORMAT CHECK/ VERIFICATION

```
print("Enter a number")
try:
    user_input = input()
    number = int(user_input)
except ValueError:
    print("You must enter a numeric value")
```

TYPE CHECK/ EXCEPTION HANDLING

Syntax Errors

```
user_name = input("Please enter your name: "
print(user_name)
```

- Spelling or typing errors
- Missing parentheses, ( ) or { }
- Missing colons, :, or semicolons, ;, in statements in which they are required by the language
- Missing or unexpected indentation in Python
- Printing a value without declaring it

Logic Errors

```
def add_vat (amount):
    RATE = 20
    vat = amount * RATE
    with_vat = amount * vat
    return with_vat
```

- Not correctly understanding what the program needed to do
- Using the incorrect logical operator in a selection statement
- Missing or incorrect positioning of brackets in mathematical
- calculations, which means that the incorrect result is returned
- Loops that execute more or fewer times than intended

2.3.2 Testing

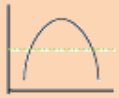
- To ensure there are no errors (bugs) in the code.
- To check that the program has an acceptable performance and usability.
- To ensure that unauthorised access is prevented.
- To check the program meets the requirements

Types

Final or **terminal testing** is carried out once the program or system is considered to be completely finished, and is the last phase of testing. Includes:
- Testing that all modules work together (integration testing)
- Testing the program produces the require results with normal, boundary, invalid and erroneous data.
- Checking the program meetings the requirements with real data.

Iterative testing, sometimes also referred to as module or unit testing, is carried out at every stage of development. Includes:
- Each new module is tested as it is written and program branches are checked for functionality.
- Checking new modules do not introduce new errors
- Tests to ensure the program handles erroneous data and exceptional situations.

Test data



Normal/Typical/Valid
Data which should be accepted by a program without causing errors

Boundary/Extreme
Data of correct type on the edge of accepted validation boundaries

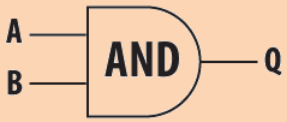
Invalid
Data of the correct type but outside accepted validation checks

Erroneous
Data of the incorrect type which should be rejected by a computer system. This includes no input being given when one is expected.

Refining Algorithms	
What do we mean by refining?	• Code should anticipate all inputs and it should deal with 'bad' data, or missing data, and not crash. • It should ensure prompts to the user are helpful and that the input can only be of the correct type
How to refine	Many languages have exception handling commands

2.4 BOOLEAN LOGIC

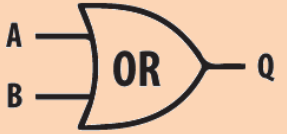
AND Gate



Q = A AND B

A	B	Q
0	0	0
1	0	0
0	1	0
1	1	1

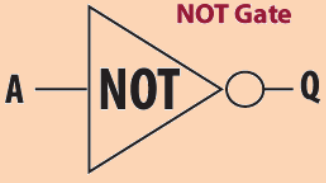
OR Gate



Q = A OR B

A	B	Q
0	0	0
1	0	1
0	1	1
1	1	1

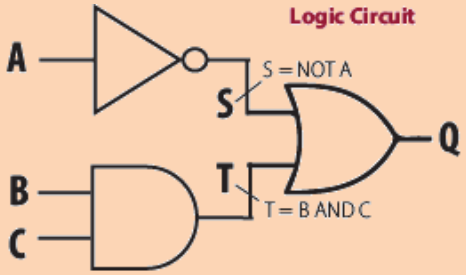
NOT Gate



Q = NOT A

A	Q
0	1
1	0

Logic Circuit

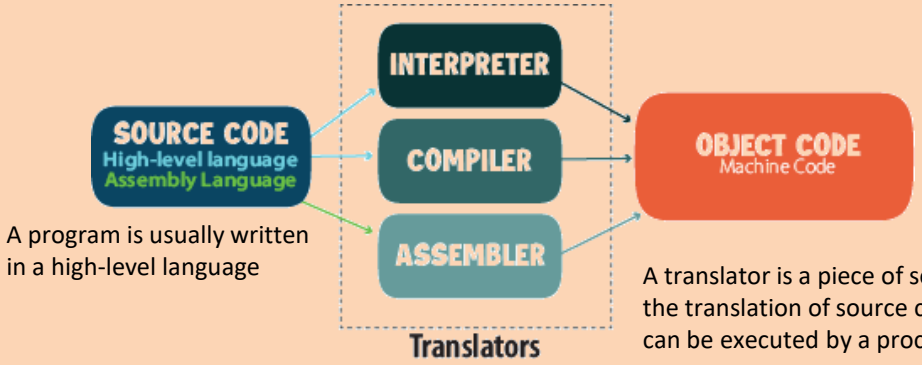


Q = NOT A OR (B AND C)

A	B	C	S = NOT A	T = B AND C	Q
0	0	0	1	0	1
0	0	1	1	0	1
0	1	0	1	0	1
0	1	1	1	1	1
1	0	0	0	0	0
1	0	1	0	0	0
1	1	0	0	0	0
1	1	1	0	1	1

2.5 PROGRAMMING LANGUAGES AND IDEs

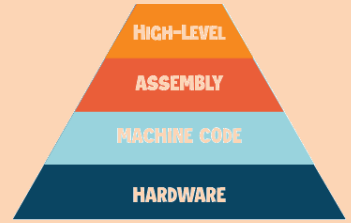
LOWEST: Machine Code (Binary Instructions): e.g. 101011001001
LOW: Assembly Language (Pneumonics): e.g. LDA 51
HIGH: High Levels (English/Maths like statements): e.g. area = (base*height)/2



A program is usually written in a high-level language

A translator is a piece of software that handles the translation of source code into a form that can be executed by a processor

2.5.1 Languages



Machine code is the 1/0s needed by the computer to run

Compiler	Interpreter
Translates the whole program to produce object code	Translates and executes one line at a time
A compiled program executes faster as it is already in machine code	Takes more time to execute as each instruction is translated before execution
No need for the compiler to be present when the object code is run	The interpreter must be installed to run the program
Customers who have bought commercial software cannot see the code when they buy it so they can't adapt it	Customers can see the source code to adapt it or see how it works

2.5.2 The Integrated Development Environment (IDE)

Feature	Description
Text Editor	Allows you to add and edit code as well as to insert comments.
Runtime environment	Runs your program by converting your source code into machine code in order for it to be executed by the CPU.
Syntax checking	Checks for any potential syntax errors in line with the rules of the language you are writing in. This helps to avoid common syntax errors appearing at the point when code is executed.
Keyword highlighting	Customers can see the source code to adapt it or see how it works
Debugging tools	Tools that help you to detect and locate errors so you can fix them.
Break point	A debugging tool that enables you to stop the program execution at a specific point to enable you to see the values of the variables. Some IDEs also allow you to step through the code line by line to trace the values of the variables.

TOPIC AREA 1: THE MEDIA INDUSTRY

1.1 Media industry sectors and products

- Know the different sectors that form the media industry and how these are evolving.
- Know the types of products produced by, and used in, different sectors.
- Know that the same product can be used by different sectors

Traditional media

- Television
- Print publishing
- Radio
- Film

New media

- Computer games
- Interactive media
- Internet
- Digital publishing

All media will go through production phases. These are typically:

1. **Pre-production**
   - Products are researched
   - Ideas and concepts are developed, planned, and designed (concept design)
2. **Production**
   - Product parts are created from designs by producers or creatives (workers within organisations)
3. **Post-Production**
   - All parts are brought together
   - Parts are edited to form a final product
4. **Distribution**
   - Products are sent out in different ways for audiences to access on a range of platforms.

Products in the media industry

- Video
- Audio
- Music
- Animation
- Special Effects
- Digital imaging and graphics
- Social media platforms/apps
- Digital games
- Comics and graphic novels
- Websites
- Multimedia
- EBooks
- AR/VR

1.2 Job roles in the media industry

How each role contributes to the creation of media products.
Know the main responsibilities of each role in the creation of media products.
Know that some job roles are specific to preproduction, production or post-production phases.
Know that some job roles span multiple production phases.
Why the size and scale of projects/productions means that individuals may perform more than one role.
Does not include: Specific skills required for job roles.

CREATIVE

content creator, animator, copy writer, script writer, web designer, graphic designer, photographer, illustrator/ graphic artist

Jobs which involve overseeing the creation and development of products and projects. Supports and manages some or all of the technical and creative roles. Required at all phases.

Responsibilities include:

• Prepare drafts and models of products • Communicate ideas to members of creative team • Tailor ideas to ensure target audience needs are met • Research target audience • Create visually appealing ore interesting media content • Liaise with client about production of products and action feedback • Produce professional, original media content to meet client requirements.

SENIOR

director, editor, campaign manager, production manager, creative director

Jobs which are focussed on coming up with and developing ideas to help create a product for a target audience. Predominantly works in the pre-production and production phases.

Responsibilities include:

• Communicate with lighting and sound Specialists • Work with creatives to produce the media content • Test and check equipment • Use equipment to create content • Assemble and set up equipment before Use • Find solutions through problem solving • Use software to create media content • Follow planning documents to produce media content.

TECHNICAL

web developer, video editor, sound editor, audio technician, games programmer /developer, camera operator

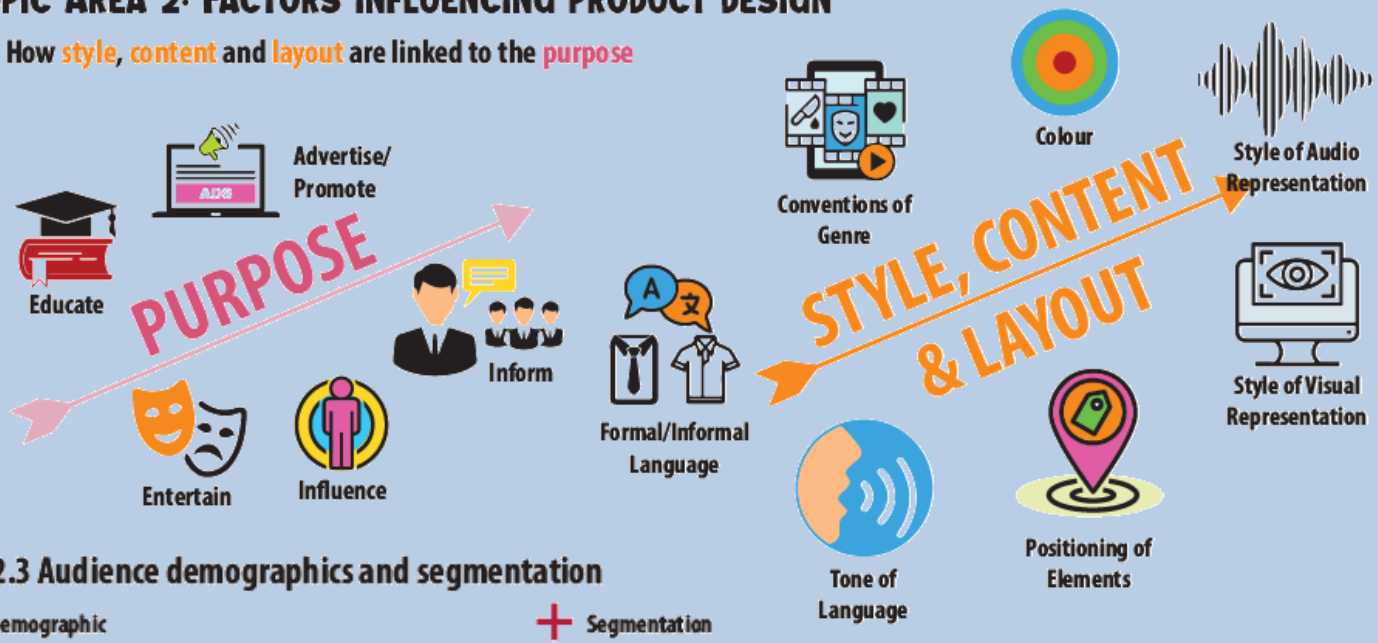
Jobs which involve the use of technology and operating equipment to develop, improve and finalise media products. Needed in the production and post-production phases.

Responsibilities include:

• Quality control • Advise and guide creative & technical Colleagues • Evaluate success of projects • Formulae and run projects • Understand the target audience • Decide how to promote and market media products • Check final product against original client Brief • Hire and brief colleagues • Ensure health and safety is met.

TOPIC AREA 2: FACTORS INFLUENCING PRODUCT DESIGN

2.1 How style, content and layout are linked to the purpose



2.3 Audience demographics and segmentation

Demographic
The characteristics of a population. Including age, income, gender, race, ethnicity, marital status, education & employment.

+

Segmentation
The ways in which audiences can be broken down based on their characteristics

TARGET AUDIENCE

Benefits of Segmentation (STICAMS)

Specific	The message is focussed to the correct group of people who would respond to a product or service.
Tailored	Message is clear to the audience it has been aimed at.
Identifiable	The audience can be accessed and used for research purposes to make the best product possible.
Content matches	Does the content match the likes/dislikes of an audience?
Achievable	Making a production as likely to make success as it can.
Meeting needs	Research can identify when the product is meering original client brief.
Success is measured	A clear target audience is more easily measurable through gaining feedback form them.

2.2 Client requirements and how they are defined

Client Brief Formats

Client Requirements

Purpose	The reason for a products creation. Each product created may have multiple purposes.
Audience	The group(s) of people that a product is to be aimed at.
Client Ethos	The way through which a client wishes to be portrayed to the audience. Including reputation and values within the organisation.
Content	Could be provided by the client or generated by the designer.
Genre	A theme may be needed behind a media production.
Style	The colours, fonts used and overall look and feel of a product.
Theme	The main subject or idea which exists behind a media product. Links closely to the purpose.
Timescale	The reason for a products creation. Each product created may have multiple purposes.
Type of Product	The product itself will obviously be a significant factor in the requirements capture. Do they want a website? A game?

To be successful in this area, candidates need to understand that there are many different influences that need to be considered when designing a media product. This includes:

- Know the different purposes of media products
- How style, content and layout are adapted to meet each purpose
- How to recognise keywords and information in client briefs
- Know the requirements in client briefs that inform planning
- Why requirements in client briefs can constrain planning and production
- How to interpret requirements in client briefs to generate ideas and plan
- Know the different ways that client briefs are communicated
- Know the different categories of audience segmentation
- Know examples of the way audiences are grouped for each segmentation type
- The reasons for, and benefits of, audience segmentation
- How audience characteristics influence the design and production of media products

2.4 Research methods, sources and types of data

Methods and sources

Focus groups, Interviews, Surveys, Questionnaires

PRIMARY

- Up to date
- Unique and relevant
- Data is not available to others
- Detailed responses

- Participants may not be truthful
- Expensive
- May not be representative of a population

SECONDARY

Books & Journals
Internet Searches
Magazines and newspapers
TV

- Convenient and easy to access
- Cheaper
- Less time consuming to gather information

- Could be outdated
- May lack detail required or be incomplete
- Inaccurate data

Types of data

QUANTITATIVE

Data which involves the use of numbers and figures which can be analysed in a mathematical way.

- Gives a wide picture from a wide audience
- Quicker/easier to analyse if designed well
- Easier to identify patterns

- Lacks depth and detail
- May not give the detail behind answers.
- Does not give a reason behind choices.

QUALITATIVE

Data which is not based on numbers, can involve the use of yes/no or multiple choice questions.

- Produces key details which may be missed.
- Provides researchers with useful quotes.

- Can be difficult and time consuming to analyse due to having to compare the words of other people.

Camera Movements

ANGLE

- Eye level
- Dutch
- High angle/ Top angle
- Low angle
- Over the shoulder

SHOT SIZE

- Extreme close up
- Medium shot
- Long shot, extreme
- single, two, three shot
- POV

MOTION

360° | Zoom | Pan, tilt | Dolly, crane | Random

Media Codes

TECHNICAL CODES

The ways in which equipment can be used to tell a story, create meaning or feeling.

SYMBOLIC CODES

Codes which are based on societal, cultural, and real life, they relate to meanings we give to objects, locations and actions.

WRITTEN CODES

The words and phrases which are used to create a certain meaning or feeling.

To be successful in this area, candidates need to understand that there are many different influences that need to be considered when designing a media product. This includes:

- The reasons for, and benefits of, conducting research
- The advantages and disadvantages of primary and secondary research and data
- How research is carried out using different methods and/or sources
- The advantages and disadvantages of each primary research method and secondary research source
- The differences between qualitative and quantitative data/information
- Know the different technical, symbolic and written codes used to convey meaning, create impact and/ or engage audiences
- How codes are used to convey meaning, create impact and/or engage audiences

2.5 Media codes used to convey meaning, create impact and/or engage audiences

Ways that meaning, impact and/or engagement are created using...

Animations	Used to enhance a message or meaning for an audience.
Audio	The sounds which are used when recording or broadcasting media. For example: dialogue, music genre, silence, sound effects and vocal intonation.
Camera Techniques	Used to place the audience in a certain position to affect how they perceive a certain scene. These include angles, shot types and movements.
Colour	Certain colours can be used to provoke certain emotions or feelings amongst an audience.
Graphics	Visual images used to enhance a message being portrayed. This could include diagrams, logs, patterns, cartoons, or shapes.
Interactivity	Audiences can control a media product in some way, for example websites, kiosks and aps use interactivity.
Lighting	The use of natural, indoor or specialist lights in a shot. This includes: intensity/levels, key light. and positioning.
Mise-en-scène	Positioning of objects in a scene to create audience engagement and understanding. For example,: Props; Costumes, hair, and make-up; Scenery; and Actors
Movement	How characters move around a scene to provide engagement with the audience.
Transitions	Techniques used to move from one scene to another. Including cuts, fades, wipes, dissolves.
Typography	The style of text used to make text clear and readable. This includes: emphasis, font size and font types.

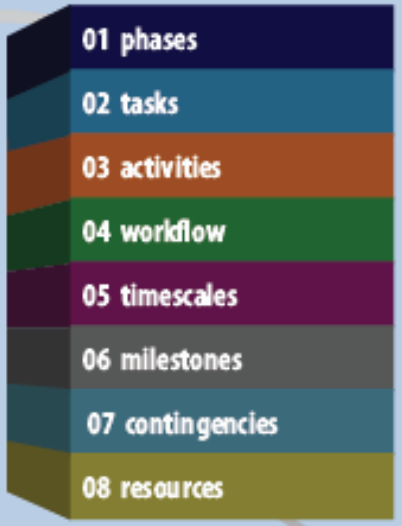
- How the codes used relate to audience, purpose and context
- How the combination of content and codes work together to convey meaning, create impact and engagement

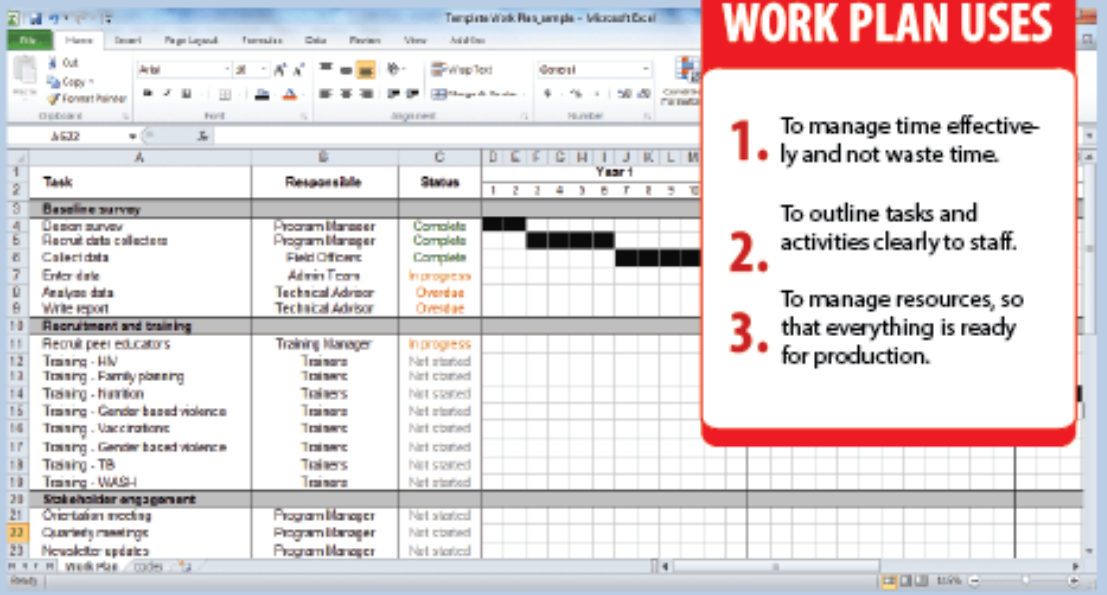
TOPIC AREA 3: PRE-PRODUCTION PLANNING

3.1 Work planning

The purpose of work planning
Know the components of workplans
The role of workplan components in work planning
The advantages of using workplans
How workplans are used to manage time, tasks, activities and resources for individuals and large teams☒

Components of workplans





WORK PLAN USES

1. To manage time effectively and not waste time.
2. To outline tasks and activities clearly to staff.
3. To manage resources, so that everything is ready for production.

Uses of work plans:
If you're preparing to launch a new product or coordinate a long-term project, a work plan can help you organise the details into one document. Creating a written work plan encourages you to think through what you want to achieve and break the project into smaller tasks.

You will have undertaken two projects and would have some idea about the tasks and what you needed to perform in each one.

resources include...

Hardware People Software

Advantages of Workplans

- People know what is expected of them
- People know when they are needed
- Managers can see an overview of the whole project
- Progress can be tracked and evaluated easily
- Goals and deadlines are defined
- Resources and budgets can be used accurately
- Contingency plans can be made to alleviate stress and wasted time should something not go to plan.

Purposes of Workplans

A work plan is a document used to plan and track the progress of a project throughout its development. Reasons why it is useful include:

- It makes stages of a project become clear.
- You can use it to book the correct people, equipment, locations, props.
- Everyone knows their responsibilities.
- Each person knows their role and who they are working with.
- Contingency plans can be developed (back-up plans)
- Deadlines are made clear to all involved.

Key Terminology:
Activities: Small actions to be carried out to complete a task.
Resources: Hardware, people and software required to run a project.
Timescales: The length of time available to complete a project.
Contingencies: "What-if" scenarios that predict potential issues and identify ways to work around them.

Phases: Pre-production, production, and postproduction.
Tasks: Larger pieces of work.
Workflow: Activities required in the order they need to be completed.
Milestones: Key parts of in a project which can be used to monitor progress.

3.2 Documents used to support ideas generation

To aid the generation of ideas by collecting a wide range of material that will give a 'feel' for what is desired.
To stimulate creative and innovative approaches

ELEMENTS:
Images; Colours; Text; Physical Materials; Sound & Video

USES:
Starting point in any Media project
A place to collect samples, materials, and relevant content
As a reminder of possible styling for a production
To share thoughts, ideas, and styles among the creative team

To record thoughts & ideas in a structured way.
To develop & show links between different ideas, aspects & processes of a project.
To support the generation of ideas.

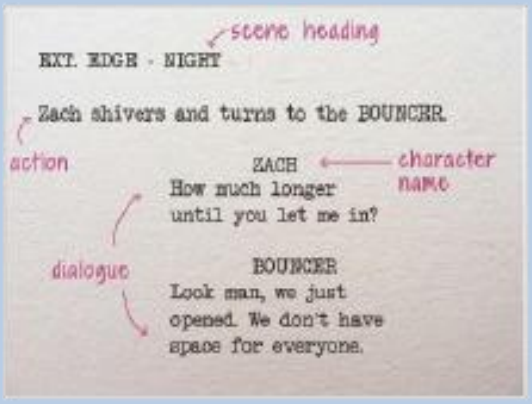
ELEMENTS:
Central node (Main Theme); Subnodes with connecting lines/branches to different parts; Text at each sub-node for key-points, activities, requirements etc; Images

USES: Any project with many ideas and connections, and to help form a work plan

3.3 Documents used to design and plan media products

Script

In a script, a screenwriter or playwright lays out their vision and provides the director, designers, and actors with a roadmap for a film .



Storyboard

Provide a viewer with a visual representation of what the final product will look like along a timeline.
To provide guidance on what scenes to film or create (for production crew).
To provide guidance on how to edit the scenes into a story.

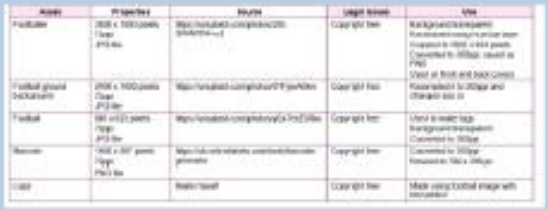
You will have produced documents like these when producing your NEAs for R094, and R097. Your task is to match up the relevant document with its associated task and you should be familiar with the components for each one.

Visualisation Diagram

To plan the layout of a static (non-moving) media product.
To show how a finished media product might look
To provide a graphic designer with enough information to create a product

Asset Log

A document used to monitor the assets that have been collected from other sources to be used in a digital media product. This will include information about the file name, type, source, copyright holder of any illustrations, photos, diagrams, fonts, videos and sounds which are used.



Flowchart

A diagram which illustrates a process to be followed during a project. It shows how a project flows from one task to another.

Wireframe Layout

To plan the layout and functionality of a dynamic (moving) media product.
To show how a finished media product might look
To provide a graphic designer with enough information to create a product.

3.4 The legal issues that affect media

3.4.1 Legal considerations to protect individuals

The purpose of, and reasons for, each legal consideration
What is required of media producers to comply with each legal consideration
The impact on individuals and media producers of media producers using and publishing inaccurate personal information
Does not include: Specific Acts of legislation

Privacy & Permissions

Privacy law is designed to protect people's private lives. Permission should be sought and given by other people if you wish to use their work.

Filming in a public place is legal, but you cannot control what others do.
Filming on private property requires permission. They may appear to be public but may in fact be owned by an organisation.
Permissions for publishing and commercial use of images taken.
Agreements may be required with actors or models using a model release form.
Harassment and invasion of privacy. Footage taken should not invade personal space or people's rights to privacy.

Defamation

A statement which is false and designed to damage the reputation of a person.

Two types of defamation exist:
Libel – False and hurtful comments about people are written and published damaging their reputation.
Slander – Comments which are spoken and designed to expose a person to ridicule or disrespect.

Data Protection

Each person has the right to know how their data is stored, used, shared and protected.

Individuals own any information about them ultimately under the Data Protection Act (DPA) of 2018.
Data protection is a growing concern due to the growth in accessibility and availability of social media.
Owners of data have the right to know about the collection, use and storage of their data.
Companies cannot keep data that is excessive or no-longer required, they must also protect this using appropriate security measures such as encryption

3.4.2 Intellectual property rights

Know what is meant by intellectual property
The purpose of, and reasons for, legislation to protect intellectual property
What is required of media producers to respect intellectual property rights
How and when intellectual property can be protected
The implications for media producers of using copyrighted

Intellectual property

Anything that has been created, like designs, inventions, brand names, and literary works by a person.

Copyright ©

A law which gives creators of media the rights to it. Meaning others cannot use, distribute, or edit it without permission.
Watermarks may be used to prevent others from using something without referencing the copyright owner.

Fair dealing

Copyrighted material can be used for certain research, private study or educational purposes if the source is quoted and referenced.

Patent

A license which gives rights to a creator of an idea, process, or invention so that others cannot copy it.

Trademark

A phrase, words, logo, or symbol which is protected for use by a certain business or organisation. Owners can use the ® symbol after the word or phrase which has been registered and ™ after any unregistered words or phrases.

This section covers all of the differing laws and regulations that must be considered when producing a media product.

Candidates would be expected to know all of the relevant legislation and regulations and be able to apply them to a given scenario.

Media law can differ from country to country and will be made in line with the societal and cultural views of that respective country. This means that international distributers will need to be mindful of the laws pertaining to each country that it seeks to release its product into.

3.4.3 Regulation, certification, and classification

Know the types of products covered by regulation, certification and classification
The purpose of, and reasons for regulation, certification and classification
Know the roles of regulatory bodies and areas of responsibility
Know examples of the way media products are classified
The impacts of regulation, certification and classification on media production

Regulation

The rules which are enforced by the law to restrict, develop or shape the way in which media works.
There are 2 main regulators:
Advertising Standards Authority (ASA) – who ensure that advertisers follow rules designed to protect viewers. EG protecting children.
The Office for Communications (OFCOM) – who ensure that television, online and radio broadcasts follow a series of rules designed to protect viewers.

Certification & Classification

The process of assigning age ratings to media products to advise which audiences' the product may be appropriate for based upon its content. This is performed by a range of organisations:
British Board of Film Classification (BBFC) – for classification of films, video content in video games, music videos, tv shows, digital content.
Pan European Game Information (PEGI) – for classification of games

Issues affecting certification & classification

BBFC Ratings

PEGI Ratings

3.4.4 Health and safety

Know common risks and hazards in media production
What is required of media producers to mitigate health and safety risks and hazards
What risk assessments are and the purpose of risk assessments
What location recces are and the purpose of location recces

Mitigation

A measure taken to reduce risk faced by people.

Health & Safety Policy

A document which outlines risks, hazards and ways of dealing with them.

Risk assessment

A document which outlines the risks and hazards in a particular situation (such as working at height) and mitigations which can be put in place to reduce risk.

Training

Ensuring that all workers understand how to keep themselves safe when working.

Call sheets

May include health and safety warnings and information.

Inspections

Of sites and equipment to ensure that they are safe before use.

First Aid/Medic

A person who is trained to deal with incidents should they occur.

A visit to a site to assess risks and identify mitigations before filming takes place.

Common Health & Safety Issues

Heavy equipment, Set/location, Spillages, Trailing cables, Electrical equipment, Cables and plug sockets, Props and costumes, Weather, Vehicles, Heights

TOPIC AREA 4: DISTRIBUTION CONSIDERATIONS

4.1 Distribution platforms and media to reach audiences

PHYSICAL PLATFORMS

Methods which require a device to distribute media to another person with. EG: CD, DVD, USB memory stick.

User
No recurring subscriptions
No need for internet connection to download.

Distributor
Better control over who views a product and when

ONLINE PLATFORMS

Media can be distributed without the need for physical devices using methods of downloading content.

User
Quicker to access media
Better for the environment (less travel/delivery)
Can access updates easily

Distributor
Cheaper
Less equipment required
Better for the environment (less waste)

To be successful in this area, candidates need to understand that planning forms an important part of project delivery and that a strategic overview of projects can be obtained using documents such as workplans. This includes:

- • Know the characteristics of the types of platform and media used to deliver products to audiences
- The advantages and disadvantages of types of platform and media
- How the characteristics of platforms affect the selection of final product file formats in given scenarios

4.2 Properties and formats of media files

Images

KEY TERMINOLOGY:

Pixel	Picture element - most basic block of colour on screen
Resolution	The amount of pixels in a given area
DPI/PPI	Dots/Pixels Per Inch - a measurement of resolution
Pixel Dimensions	The number of pixels in height and width
Height in Inches,	US use imperial measurements
Native File Format	.psd (Photoshop), addesign (Affinity Designer), .xcf (GIMP)
Standard File Format	.JPG, .bmp, .png, .gif, .pdf
Bitmap/Raster Image	An image made up of pixels/convert a vector to bitmap
Vector Images	Images made up using vectors (x/y coordinates)

Video

KEY TERMINOLOGY:

Standard Definition	SD/N720px
High Defintion	HD 720px-2080px
Full HD	1080+ - industry standard
4K	Ultra HD 3800+ film makers
8K	7600+ zoom

FILE TYPES:

MP4 (Video/Animation - lossy), MOV (Video/Animation - lossy), WMV (Video/-Animation - lossy) AVI (Video/Animation - Variable)
Animated GIF (Animation - losssless)

Images:

- Know what is meant by DPI/PPI
- How DPI/PPI relates to resolution and image quality
- The relationship between pixel dimensions and quality for different image uses
- Know examples of raster/bitmap and vector image files
- The properties and limitations of uncompressed and compressed (lossy, lossless) file formats
- The properties and limitations of raster/bitmap and vector static image file formats
- How file format choice relates to use and context

Sound:

- Know what is meant by sample rate and bit depth
- How sample rate and bit depth relate to sound quality
- What audio compression is and how it affects quality
- The properties and limitations of uncompressed and compressed (lossy, lossless) file formats
- How file format choice relates to use and context

Online Platforms

App — Mobile phone apps & computer software.

Multimedia — Podcasts, blogs, many types of content can be included.

Web — Adverts included in a webpage.

Physical Platforms

Computer — A cinema may play a film on a computer and connect a projector.

Interactive TV — Disney+, Netflix, BBC iPlayer

Kiosks — A museum may use a tablet device to display information to a customer.

Mobile devices — Downloading an eBook to a mobile device through an app or as a PDF file.

Physical Media

CD/DVD — Distributing a film via DVD.

Memory Stick — Apple TV/NOW TV/Amazon Firestick connects to a TV and can stream content.

Paper Based — Magazines being distributed to customers direct-ly or to shops.

Moving Image Files:

- Know what is meant by frame rate
- Know what is meant by SD, HD, UHD, 4K, 8K
- How frame rate affects the quality of a product
- Know examples of digital video and animation files
- The properties and limitations of video and animation file formats
- The properties and limitations of uncompressed and compressed (lossy, lossless) file formats
- How file format choice relates to use and context

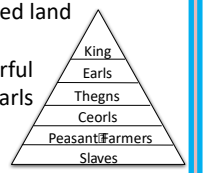
File Compression:

- Know what is meant by lossy compression
- Know what is meant by lossless compression
- Why lossy and lossless compression are used

Anglo Saxon Society

Anglo Saxon Society

- Population – 2 million, 90% peasants who farmed land and there were about 6000 Thegns
- Church controlled by Bishops, who were powerful
- Society was in a social hierarchy; King at top, earls ruling the 5 earldoms, Thegns (local lords) in charge of shires, and military figures
- Ceorls (free peasants), Peasants and Slaves worked the land



Anglo Saxon England

- 5 Earldoms: Mercia, Wessex, East Anglia, Kent and Northumbria
- Parts of the North were still ruled by descendants of the Vikings/Danish, called the the **Danelaw with own culture**
- The biggest cities were London and York but the capital was Winchester where the Royal Mint was (where money is made)
- Earldoms were split into shires, shires were split into hides (100 families) and 10 families was a tithing
- 10% of people lived in towns (burhs), which were fortified

Anglo Saxon Government

- King most powerful but took advice from the Witan (royal council) made up of earls and bishops, who provided advice on foreign threats, religious affairs and land disputes. King did not have to listen to advice and did pick the members
- Earls very powerful, with key roles: collecting taxes (they kept 1/3 themselves), oversaw law and order, military generals with considerable power over thegns and housecarls. This made Earls like the Godwin's powerful, almost rivalling Edward himself
- Earls power based on King and thegns, depending on how weak King was and the support of their thegens
- Each shire had a shire reeve (sheriff) who followed kings writ: keep law and order, collect taxes and raise the fyrd (army)

The Economy

- England was a wealth country, trading wool, farming in East and international trading with Denmark with North and Flanders.
- Trading was based around Burhs, which the king taxed, biggest towns were London and Lincoln. Efficient tax system

Legal system

- Collective responsibility, whole tithing had to keep own order
- Wergild, compensation for killing family, to avoid blood feud
- Hue and Cry, community join together to track down criminals

Edward the Confessor and The Succession Crisis of 1066

The King/Edward the Confessor

- The King was the most powerful person in England, chosen by God and all had to swear an oath to him.
- Edward was King from 1042 to 1066, his powers as king included:
- Economic: controlled mint and coin distribution, decided geld tax
- Military: He had the power over army, and could raise for war
- Law: made all laws, owned all land and could give/take it
- Edward was a respected but weak king (not a warrior an spent too long in church), he relied too heavily on the Godwin's who became strong (militarily and economically) and a influence.

The Godwin family

- Earl Godwin was made Earl of Wessex in 1018
- Godwin helped Edward to become King and Edward was married to Godwin's daughter Edith, giving royal connections
- The Godwins were very powerful – they ruled 4/5 earldoms, they were lords to hundreds of Thegns, they had limited military rivals, they convinced Edward to appoint Bishops to the church and had great wealth and influence over England
- Tostig, Earl of Northumbria, Harold, Earl of Wessex
- Edward needed Godwins to protect from Danish threat, whilst Harold and Tostig put down threat of Welsh prince Llwelyn, 1062

The Embassy to Normandy, 1064

- In 1064 Harold Godwinson was sent on an embassy to Normandy by Ed, Anglo Saxons claim it was to recover hostages
- Normans claim Harold came to confirm William to get throne
- He was taken prisoner by Count Guy of Ponthieu – William of Normandy rescued him and then Harold spent time in Normandy with many military victories, William have him sword
- Harold then swore an oath , upon the bible and relics, that he would support William's claim to the throne (William uses later)

Uprising against Earl Tostig, 1065

- In 1065 there was uprising against Earl Tostig in Northumbria

1. Northumbrians didn't like Tostig as he was from the south and stayed there too much, he didn't understand Danelaw culture
2. People thought he abused his power by imposing new laws, raising the geld tax and taking land from people for himself.
3. He didn't defend Northumbria against Malcom II of Scotland
4. He ordered murder of popular Thegn Gospatric, triggered riot

- Edward tried to raise an army to defeat the rebels but Harold refused so he had to give in to the rebels, by replacing Tostig with Morcar and exiling Tostig. Edward seen as a weak king
- Harold possibly betrayed brother so he could get the throne

The Succession Crisis, 1066

Edward the Confessor died on 6th January 1066, leaving no heir starting the succession crisis (who should be king!)
The Witan always had to choose the new King, they had options and were certainly worried of threat from William and the Danes

Reasons for the crisis

1. No Heir

- Edward has no son, therefore not having an heir to the throne
- His nephew, Edgar the Aethling was his natural born heir, as he was Edwards nephew and had royal blood.
- However, as he was sonly 16 at the time, he had no support of the Anglo Saxon Earls or Witan, who wanted a strong king to face the threats to England.

2. Harold's Embassy to Normandy

- William, duke of Normandy, claims that he made an agreement with Edward in 1051 that he would become king if Edward had no child, which was confirmed by Harold in 1061 during the embassy to Normandy. William had the support of the Pope
- Normans claim Harold Godwinson swore an oath on the bible to support Williams claim to the throne, but this is rumour!

3. Promises

- **Harold Godwinson** claimed that Edward had chosen him to be next king on his deathbed. Harold was Edwards deputy, was experienced and had family connections to the king
  He had the support of the Earls, Thegns and military power
- **Harald Hardrada** – Harald was king of Norway and a fearsome warrior, he claimed that his relatives had been promised the throne in a secret deal that started when Viking Cnut ruled England until 1035. Hardrada claims the throne was his to claim after he took over from Magnus in 1047.
  No strong claim, but felt could gain support from Danelaw, had 15,00 warriors and also had support from Tostig Godwinson

Harold Crowned

- The same day as Edwards death, Harold gets himself crowned by the Witan on 6th January. This looks like he seized the throne!
- The witan certainly knew William would plan to invade to claim the throne, so historians believe they crowned Harold quickly so they he could prepare the defences for an invasion.
- Soon as he is crowned, Harold goes to York, to ensure North does not protest and raises the largest army England had ever seen
- He places his army and fleet along the coast, waiting for the inevitable invasion from William
- William claims Harold has 'broken' his oath, causing his invasion

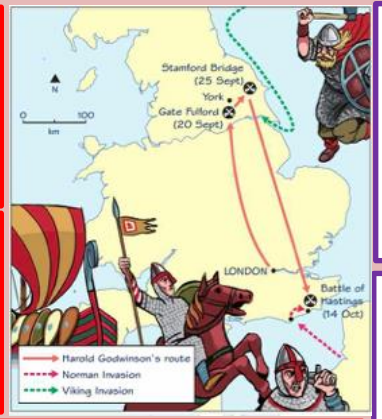
The Three Battles of 1066

Battles of Fulford Gate, 20th Sept 1066

- Harald Hardrada and Tostig invade with 10,000 warriors
- They fight Earls Edwin and Morcar just outside York (foolishly not defending the city), they are defeated by the invaders.
- Hardrada outflanks the English, many killed & hostages taken
- Harold Godwinson is now forced to come north himself

Stamford Bridge – 25th September 1066

- Harold surprises Hardrada and Tostig at Stamford Bridge, they had left their armour and some of their troops at their boats
- Harold was victorious, killing Tostig and Hardrada because their armies were tired from Fulford Gate, the surprised arrival of Harold and that his men broke the Viking shield wall



How significant were these battles?

- Distracted Harold from the South; William arrived whilst Harold was in the North
- Harold's troops were tired; some had fought at both Fulford Gate and Stamford Bridge, 400km march

The Norman invasion

- Williams fleet was delayed leaving Normandy, but they left on 27th Sept, arriving 28th at Pevensey where William built a pre made castle, had a feast, harried the local area and began to prepare.
- Harold had to rush down from York, gathering troops/visiting London and arriving as Hastings first

The Two Armies

- Normans: Cavalry (trained, well armoured, cavalry charge devastating) Archers and footsoldiers
- Anglo Saxons: Fyrd (Untrained soldiers with poor weapons and Housecarls (trained, axe wielding)

The Battle of Hastings, 14th October 1066

1. William launches attack at 9:00am with arrows, followed by footsolders and cavalry attacks against the English shield wall, but this fails and by 12:00 English hold strong on Senlac hill
2. Rumour William is dead, panic in Normans but William removed helmet and increases morale
3. William ordered feigned retreat, he Norman cavalry pretend to flee (run away) and the English housecarls leave the shield wall to chase them. This happens 3 times, breaking the shield wall
4. In chaos, Harold is shot in the eye, many of the Fyrd flee and Housecarls are cut to shreds
5. By 6:00 William has won the battle

Why did William win?

1. William's tactic and leadership

- Feigned Retreat Tactic, worked 3 times and broke English shield wall: hugely significant
- William changed tactics and used his variety of troops well (archers, footsoldiers, cavalry)
- William delayed invasion until Harold was in North
- The Normans prepared well, brought castle and first ever cavalry to England

2. Harold's leadership and bad luck

- Harold's had disbanded fyrd just before invasion
- He rushed south to fight William. He could have stayed in London and fought a better better
- His men were poorly disciplined as left shield wall
- Harold's men were tired from fighting up north and then marching back down South.
- Bad luck Harold died and caused panic

Establishing Control

The submission of the Earls & Williams Coronation

- After Hastings, the Witan immediately elected Edgar as King and William sent troops to seize Winchester (the royal treasure) and marched towards London, he 'harried' the South by destroying homes and farms to intimidate the Anglo Saxons. The tactics work against the weak English
- At Berkhamstead Edgar, Archbishops Ealdred and Stigand, Edwin and Morcar and the Witan submitted to William. They swore an oath to obey him, and he swore to be a fair and just king.
- William was crowned king on Christmas Day 1066.

Rewarding Followers & New Oaths

- **William rewarded his Norman followers**: gifts sent to the pope, a heavy geld tax allowed him to pay off hid mercenaries (professional soldiers) and he gave out land to his followers as he declared he owned it all, for example Bishop Odo was given Kent and kept 20% for himself.
- **To encourage Anglo Saxon loyalty**, William allowed Earls Edwin and Morcar to keep their earldoms but they were smaller than before, he promised Edwin could marry his daughter (this did not happen) and he allowed some archbishops to keep their positions.
- However, all those who fought against William at Hastings lost their land.

Securing the Welsh Marches

- William created new marcher earldoms (on the Welsh border) Chester, Shrewsbury and Hereford, given to people like William FitzOsbern for a number of reasons:

1. **Protection from the Welsh** who had been a threat to Edward, he allowed the Marcher Lords build castles (80 in Hereford) and did not pay tax so could spend on defence of their lands,
2. **To reward loyal Normans: Each Marcher** Earl was given independence to run their own earldom, with own sheriffs and powers to set up towns, to encourage settlement in England
3. **To increase his power & loyalty:** He broke up earldoms to create, Earls more loyal & less threat

Williams use of Motte and Bailey Castles

- Castles were an essential part of William's rule over England and it is estimated **William built over 500** during his reign. 'Motte and Bailey' castles were quick/easy to build, taken less than 2 weeks.
- William even brought a 'pre made' Motte and Bailey with him during his invasion in 1066.

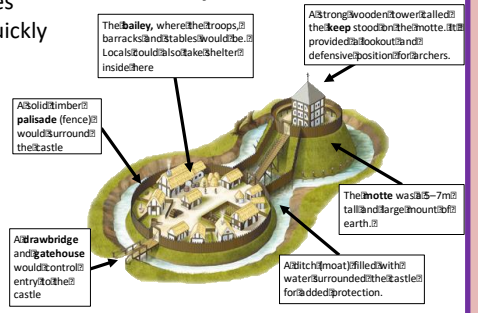
There were multiple benefits for William:

1. **Control**: Bases for Norman knights in rebel areas like Midlands/North to stop rebellions of 1069/75. Castles were often built 32km apart, making it easy to act quickly
2. **Symbols of power**: Size showed domination and used to put Norman 'stamp' on areas e.g. York
3. **Protection**: Built along Marcher Earldoms to protect from Wales (70 built in Shropshire), whilst others built on border of Scotland and on Coast

Castles were essential in stopping the rebellions, but were just one method & could be destroyed as they were in York

The building of castles angered Saxons as many were built by destroying Anglo Saxon houses

Key Features



Anglo Saxon and Norman Resistance

Edwin and Morcar 1068

Why did they rebel?

- Edwins Earldom of Mercia was made smaller & he never got to marry Williams daughter
- Regents Odo and William FitzOsbern stole Anglo Saxon lands allowed looting whilst in charge, triggering rebellion
- Many Anglo Saxons had lost land
- William ordered a heavy Geld Tax 1066
- Morcar's Earldom (Northumbria) reduced

Events

- Edwin and Morcar flee North and gather rebels, including Edgar the Atheling, Waltheof and Welsh prince Belddyn
- William marches north, attacks Edwin and Morcar's earldoms (Wessex and Northumbria) and builds castles in cities like Warwick and Nottingham to prevent more
- William reaches Northumbria and builds a new castle in York, Edwin and Morcar surrender whilst others flee to Scotland

Results

- Edwin & Morcar imprisoned (but escape to cause another rebellion in 1069)
- The building of castles to prevent rebellions
- William had defeated a weak rebellion, which showed his power but he had failed to prevent a further one in 1069.

Why were there rebellions?

- **Norman rule:** Hatred of Williams rule (high geld tax) and actions of his regents in rule
- **Loss of Land**: Normans took Saxon lands, earldoms were reduced in size
- **Danish**: Invade three times, for gold?
- **Opportunity**: Whilst William away in 1075

How did William deal with rebellions?

- **Castles**: Used to stop 68/69/75 rebellions and launch attacks against rebel areas
- **Bribery:** Paid off the Danish three times, possibly not successful as they kept returning
- **Violence:** Harrying of the North & William openly leading the attacks on rebels
- **Landholding:** Changed who owned lands, forfeited lands

The Anglo-Danish Rebellion 1069

Why did they rebel?

- Hatred of Williams rule and Normans
- January 1069, Robert Cumin (Earl of Northumbria) allowed looting of villages, caused rebellion in York and his death.
- Small rebellion put down and second castle built in York, however much larger rebellion starts in September 1069

Events

- King Sweyn sends 240 ships to invade, where they join with Edgar the Atheling, Edwin Morcar and an Anglo Saxon army
- They attack York, destroy both castles killed 3000 Normans
- Rebellions in North spread around England; Cheshire, Welsh Marchers and in Devon. A serious threat to William
- William heads north but rebels scatter as they are too weak to fight him. William recaptures York
- As Danish are hiding in the marshlands, William pays them off to leave. Shows Danish had no aim to overthrow William

Results

- The rebels had failed, Edgar flees and William regains control of England. Shows how weak rebels are, not united
- William does the Harrying of the North in winter of 1070/71

Harrying of the North, 1070/71

Causes

- **Triggered by 1069 rebellion**: William wanted revenge for attacks and killing of Normans/Robert Cumin
- **Tactics**: One of Williams tactics, used before in 1066 to send message. William was merciless if did not obey him and used fear/terror as a method to get what he wanted
- **Ending rebellion**: Wiping out rebels in North and allies of the Danish in the Danelaw. Harrying would mean no men or resources left for further rebellion, and there was not!

Events

- "Devastation" of the North, 60% of Yorkshire wasteland homes destroyed, crops salted, animals kills, seeds burnt.
- Thousands killed, rebels and innocent, over 100,000 dead.
- Many die of starvation, thousands flee to the Midlands.

Results:

- William builds more castles (Newcastle) to stop rebellions
- From 1071, there were no more rebellions in north, northern rebels and Danish allies had been removed
- 60% of North destroyed, 80,000 less people, 20 years later, Domesday Book, called the area a 'wasteland' and William could not take any tax from the area.
- William changes strategy, begins to replace Anglo Saxon earls with Normans and take lands to reduce rebellion

Hereward the Wake and the rebellion at Ely – 1070-71

Why did he rebel?

- Hereward, an English Thegn, returns from exile to find lands had been given to a Norman and joins with King Sweyn who has returned to England to raid

Events

- Hereward's rebels and the Danish set up on the island of Ely (in the marshlands as it's easy to defend). They began a campaign of guerrilla war
- They raid local areas like Peterborough Abbey and the Danish take all the gold
- Between 1070-71, the Normans struggle to stop as they can't get cavalry across the marshlands
- In 1071, they are joined by Morcar
- William decided to bribe the Danish (again) to leave and they can keep treasures, they leave
- Surrounds Ely, builds a bridge across to send his cavalry and defeats the rebels

Results

- Hereward escaped, Morcar imprisoned and rebels had either hands or feet amputated
- This was the last Anglo Saxon rebellion

Revolt of the Norman Earls, 1075

Why did they rebel?

- Norman Earls Ralph De Gael and Robert De Breteuil and last Anglo Saxon Earl, Waltheof. Met at a wedding
- The men were angry about loss of land, loss of privileges and loss of power e.g. Roger's Marcher Earldom was smaller than his father (FitzOsbern) owned, whilst new sheriffs reduced his power
- Waltheof promised support of Danish
- Planned to takeover when William was in Normandy and split the country in 3

Events

- Waltheof told Lanfranc of the plans
- Lanfranc urges Roger to not rebel, but he ignores so he is excommunicated from church
- Lanfranc and Odo raise a combined Norman and Anglo Saxons army and defeat the rebels. The people support William, first time Anglo Saxons join
- William arrives back when the Danish do, they flee after just raiding York.

Results

- William did now have to be careful of his own earls – Waltheof was executed and Ralph escaped and Roger imprisoned.
- There were no more rebellions at all

Maintaining Royal Power

- Military power, new oaths taken by all men, travelling around the country, using power of ruling land, control of mints/coinage, royal ceremonies and wearing crown

Changes to land ownership

- William owned all land, and gave out as part of the Feudal System, all based on loyalty to him and could be taken (forfeit) if they disobeyed.
- He broke up the big earldoms (Wessex), which reduced Earls power and made them all dependent on him for their land
- William increased his power: to inherit land you had to pay William and if you had no heir, the land went to William.
- William began to take land using forfeit, set up new earldoms (Marcher Earldoms) to help his rule and simply land grabs (taking it!)

- By 1087 less than 5% of the land was held by Anglo Saxon Nobles, majority owned by 10 Norman barons (William personally owned 20%, worth £12,000) & church held 25%
- Tenants in chief given power to take rebellion thegn land and give out for loyalty

Norman England

Between 1066 and 1088, William I ruled over 'Norman England' and as a result Anglo Saxon England was 'Normanised', changing large parts of the government, church & society

The Feudal System

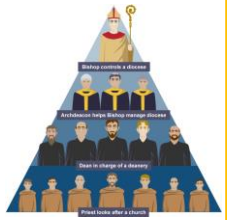
- To help his rule of England, William introduced the **Feudal System,** which was a hierarchy with William at the top. Simply, he have out land in return for loyalty (homage)
- **Tenants in chief**: These were earls and lords who were give huge areas of land (fiefs) in return for military service, raising tax and dealing with law and order. Many worked in the Witan as advisors, or ran local courts. They got to keep share of tax collected
- Gave out portions of land to knights **Under Tenants**: These were knights who had to provide up to 40 days 'knights service' a year for the king. The ruled a small area, collecting tax and keeping order. They replaced Thegns, there were roughly 6000 of them. William needed these knights for his military power This was important as gave William a private army, loyal to him
- **Peasants**: Lived on land but did not own it. They had to do 2-3 days labour service for the knight, farming the land
- **Landholding:** When a landholder died, the heir had to pay a relief (money) to William to claim the land, this increased loyalty. William could raise or reduce relief price for most loyal followers
- **How did it help William?** William had ultimate control as all land was based on allegiance/loyalty to him, those who failed to do their duty would have their lands 'forfeit', or the threat of it System helped William's governance; he had taxes collected, could raise an army loyal to him and law and order was kept He also used landholding as a method of control, taking the land from Edwin and Morcar, or reducing the size of land to stop threats e.g. Roger and Ralph, but this led to rebellion in 1075

Norman Government

- **William centralised power around himself**, he had total control over feudal system, land/forest, economy (the mint, geld tax), shire reeves (answered to him) & the church (Lanfranc/Bishops).
- Kept Anglo Saxon government of witan for advice and shires/hides/tithings for administration and geld tax of England
- **Reduced Power of Earls**: Earldoms now smaller, removed Wessex/Mercia, increased power of sheriffs and Earls had to make new oaths to him. Used Marcher Earls as powerful leaders
- **Increased power of Regents**: Trusted followers in charge whilst William in Normandy, had power to rule England. Bishop Odo provoked Anglo Saxon rebellions in 1068, so replaced by Lanfranc, who overcame the Revolt of the Earls in 1075

Normanisation of the Church

- Church in Anglo Saxon England was powerful, under the rule of Archbishop Stigand, however William thought it was corrupt and needed to be controlled.
- **Stigand was replaced by William for the following**: he gave out jobs for money (simony), he gave posts to friends (nepotism) and had already being excommunicated by the pope for being a bishop in two different areas (pluralism)
- **In 1070 Lanfranc became Archbishop of Canterbury** and was made head of the Church of England and began to use his council of bishops (who met 10 times) to force the following reforms (changes) to England's church:



1. More control:

- A **new hierarchy** with Lanfranc at the top was enforced, with Norman bishops and Archdeacons given power over priests
- **Strict laws** for priests such as celibacy (no sex) or marriage to be more spiritual
- Independent **church courts** set up for church crimes, giving the church its own place in the legal system, ran by archdeacons

2.Replacing Anglo Saxon Power

- All but one Anglo Saxon bishops were replaced by 1070
- Within 50 years, every English church was replaced by larger Norman ones, usually in city centres like Norwich to increase a Norman bishops power and influence over the areas.
- Development of new monasteries to spread Christian values

Lanfrancs power: Lanfranc and the church were very powerful, only 25% of the land, however William had complete control as Lanfranc swore an oath of allegiance to William and not the Pope, whilst William who controlled all decisions, oversaw the church council and had power to appoint/remove/forfeit Bishops..

The Domesday Book

- In December 1085, William ordered a survey of England, called **Domesday Book** and completed 1086, surveyed 12,0000 villages
- England had 1,000 tenants in chief, almost 2 million people
- There were a number of benefits for William
  - **Financial:** Valued England's land and wealth (animals, crops etc.) so, William could now tax effectively, immediately set a high Geld Tax in 1086 allowed him to see who was underpaying from his tenants and rule effectively.
  - **Military:** Allowed him to know many men he could raise in an army and what supplies he could get. He used this information to raise an army for a potential Danish invasion 1086
  - **Legal:** William knew who held the land and could deal with any disputes between landholders & later that year got all landholders to swear a new oath of loyalty, solidifying his rule.

Norman Culture and Aristocracy

- Many Norman aristocrats came over, they only spoke Norman-French using interpreters, showed off wealth with buildings (Westminster), feasts and hunting in royal forest
- **Chivalry:** Moral code ruling aristocracy, combined Christianity warriors to dictate actions, e.g. showing mercy in battle
- **Penance:** Highly Christian and believed should 'pay' for conquest of England by building churches and prayer, e.g. Battle Abbey
- **Landholding:** Norman culture passed land to single heir, this caused a succession crisis after William's death ib 1087

Changes to Anglo Saxon Society

- Slaves free under Noman rule
- Number of free peasants (Ceorls) reduced as all peasants now tied to their lord as part of Feudal System. Life remained hard
- Thegns completely replaced by under tenants (knights)
- Norman earls replaced AS, less powerful with oath to William

Shire Reeves and The Forest Laws

- Sheriff (Shire Reeve) replaced by Normans and had powers increased: only answered to the king, raised fyrd, managed castles, kept law and order and managed the Kings lands/forest (demense).
- As they were entitled to a share of the taxes, some misused this to raised taxes whilst others took land from Anglo Saxons
- William liked hunting and he made new 'Royal Forests, simply by taking land from wherever
- He was able to make money by charging nobles to hunt their and it showed of his power
- There were harsh punishments (eye gouging) for breaking forest laws (e.g. poaching).
- William seen as unfair by simply taking and it encouraged others to take land too

Who was most powerful?

- **William**: Certainly most powerful, had complete rule and all others depended on him

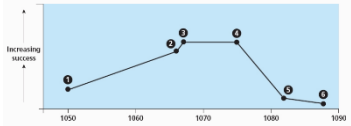
Others did increase power:

- **Lanfranc/Church:** Role in Church
- **Sheriffs:** More independent power
- **Regents:** Ruled as King

But, all these answered to William and he could remove, as he did earls

William and his family

The life of Bishop Odo



- Odo was Williams half brother, he was Bishop of Bayeux in Normandy a
- 1066, Odo contributed 100 ships to Williams invasion fleet of England and fought at Hastings
- Odo made Earl of Kent and given many other estates (22 counties!), 2nd largest landholder.
- Made regent of England, but causes AS rebellions by allowing the theft of lands and rape of women to go unpunished.
- 1082, Odo is investigated for taking church lands, misruling his earldom and planning to make himself pope: he is imprisoned
- 1088, Odo is released from prison after the death of William, but leads a rebellion against William II. He is eventually exiled.

Who was William I?

- William had 9 children with Matilda, his wife, who was he devoted too and trusted as his regent in Normandy.
- His personality: very religious, would use extreme brutality, wanted to be acknowledge as legitimate King, experienced leader
- The three main children in this topic are: Robert, William Rufus and Henry

William and Robert

- William had a very strained relationship with his son Robert, who he nicknamed 'Curthose', a.k.a. 'Dumpy Legs'
- Robert was a good warrior but lazy and weak willed, meaning William had little respect for him and wouldn't let him rule Normandy, trusting his wife Matilda instead. This infuriated Robert
- In 1077, William did not punish William and Henry for a prank on Robert, so he went into **rebellion against William**
- Robert captured Rouen Castle, but fled and then gained support from the King Phillip of France who gave him a castle close to Normandy which allowed him to raid his fathers lands.
- William raised an army to stop Robert, but Robert beats him in personal battle, humiliating William.
- Matilda organised a reconciliation between William and Robert, where William makes Robert his heir to Normandy

The Succession Crisis of 1087

- In 1087, William fell off his horse and he soon died, leaving a crisis over who claimed his Kingdom, but why?

1. On his deathbed **William did not announce who would be king of England**. He preferred William Rufus, but said he would leave it in 'God's hands' to decide, this sparked the crisis as it was unclear
2. **William did not like his son Robert**, especially after his rebellion, and did not want to leave England to his eldest son. However, this would break Norman inheritance traditions as he was only left Normandy, with Robert feeling England was also rightfully his. William had promised Normandy would be Roberts after his defeat against Robert.
3. **Robert had support of many Norman barons**, who wanted him to rule England & Normandy, as they hoped to manipulate him
4. **William wanted his son William Rufus to have the throne**, and wrote a letter to give to Lanfranc, saying to crown him

- Before William died, Rufus went to England and took a letter to Lanfranc, who supported his claim and crowned him William II in 1087. This caused another rebellion led by Bishop Odo and Robert.

Odo and Roberts Rebellion, 1088

- In 1087, Bishop Odo was released from prison and in 1088 he started a rebellion against William Rufus alongside Robert Curthose. Odo thought Robert would be a better ruler of a united England and Normandy kingdom.
- Many Norman nobles were divided because they had two lords, as they had lands in both Normandy and England but most lords, Norman bishops and the Anglo Saxon population supported William II,
- Rebellions spread across England: In Norwich, Somerset and Wiltshire, these were put down by William Rufus
- Bishop Odo and Robert of Mortain controlled large parts of southern England, they took refuge in Pevensey Castle, William Rufus and the local fyrd, lay siege to the castle for 6 weeks and eventually capture Odo and Roger who surrendered
- Robert Curthose never came to England to support the rebellion, Odo is stripped of his titles, land and exiled. Rebellion failed.

How to answer each exam question

4 Mark Features Question: 5 minutes

Identify and give 1 feature with one specific detail (x2)

12 Mark Explain Question: 15 minutes

3 paragraphs that focuses on changes, causes, factors in a period. Usually '*Explain why' or 'Explain how'*

Three separate points, that explain using specific detail and always link back to the question *'This was important as….'*

16 Mark Judgement Question: 25 minutes

Agree Disagree and Conclusion (Can give 2 agree or disagree, you choose)

Must stay focused on how far you agree or disagree and always link back to the question throughout. Include specific detail

For L4 (13+), make sure you balance your point 'However' 'Despite this..'

4 Mark Questions

- Describe one feature of Lanfranc's reforms of the English Church
- Describe one feature of the Forest Laws
- Describe one feature of the Witan.
- Describe one feature of the Battle of Stamford Bridge.
- Describe one feature of Hereward the Wake's rebellion I 1070-71.
- Describe one feature of the changes in landownership by William
- Describe one feature of the career of Bishop Odo.
- Describe one feature of Robert's Rebellion, 1087 to 80

12 Mark Questions

- Explain the changes to the Norman Church made by Lanfranc
- Explain why motte and bailey castles were built throughout England.
- Explain why the English rebellions against William the Conqueror failed.
- Explain why Robert of Normandy rebelled against his father in 1077-80.
- Explain how William controlled England
- Explain why Earl Harold of Wessex became king of England in 1066.

16 Mark Questions

- *The main consequence of the Normanisation of England was that the king became more powerful'*. How far do you agree? (16 Marks)
- *'The main reason for the failure of the Revolt of the Earls in 1075 was Waltheof's warning to Lanfranc'.* How far do you agree?
- *'It was changes in landholding that did the most to secure Norman control of England*'. How far do you agree?
- *'The main consequence of William I's decisions about the succession was that William Rufus inherited the English crown*'. How far do you agree?
- *'The main reason why there was rivalry over the throne in 1066 was because Edward the Confessor did not have a son'*. Do you agree?

GCSE History Exam Skills

Bullet Point Questions
12 mark explain & 16 mark statement
- You may want to **expand** bullet points into factors
- You **must** go beyond bullet points
- You **don't have** to use them. Ignore if not helpful!

IDEAL Paragraph
Identity –*What paragraph is about*
Describe – *Add specific evidence*
Explain – *Impact of evidence*
Analyse – *Consider significance/wider impact*
Link – *back to the question*

Paper 1 – Medicine
1hr 20mins. Includes **source booklet**

Medicine Questions
Section A: (WWI Medicine)
Q1 – One feature of…. (x2)
Q2 – Source Utility
Section B: 1250-Modern
Q3- Similarity/Difference
Q4 – Explain why…
Q5 – [Statement] How far do you agree…. (choice of 2)

Describe one Feature of (x2)
Appears on: **Medicine, Normans**
4 marks, spend 5 mins
How To Answer:
1. **Identify** Feature
2. Add supporting **detail**

Similarity/Difference about X between X and X.
Appears on: **Medicine**
4 marks, spend 5 mins
How To Answer:
1. **Identify** similarity
2. Add **example** from time period 1
3. Add **example** from time period 2

How useful are sources A + B for an Enquiry into….
Appears on: **Medicine, Germany**
8 marks
Spend 15 mins
How To Answer:
2 COPL paragraphs (one per source and a conclusion)
- **C**ontent – *What does the source show*
- **O**w Knowledge – *Is it accurate? Add specific facts/detail*
- **P**rovenance – *Nature, Origin, Purpose and the impact of this*
- **L**ink – *Give criteria why source is useful*

Paper 2 – Cold War & Normans
1hr 50mins (spend 55mins per section)

Questions: Anglo-Saxons and Normans
Q1 – One feature of …. (x2)
Q2 – Explain why….
Q3– [Statement] How far do you agree…. (choice of 2)

Explain Why…..
Appears on: **Medicine, Normans, Germany**
12 marks, Spend 20 mins
How To Answer:
- 3 x IDEAL paragraphs
- Ensure you fully **explain** evidence and link to question focus

[Statement] How far do you agree?
Appears on: **Medicine, Normans,**
16 marks, Spend 30 mins
How To Answer:
1. **Intro** – state overall argument
2. **3 IDEAL paragraphs** (Agree, Disagree, Agree/disagree again for different reason)
3. **Conclusion** – must make **overall judgment**

Questions: Cold War
Q1 – One Consequence of…. (x2)
Q2 – Narrative Account
Q3 – Explain Importance of (x2 out of choice of 3)

Explain one consequence of …. (x2)
Appears on: **Cold War**
4 marks, spend 5 mins
How To Answer:
1. **Identify** outcome
2. Add supporting **detail**
3. **Explain** impact and link to question

Write a narrative account analysing
Appears on: **Cold War**
8 marks, spend 15 mins
How To Answer:
1. Causes
2. Events
3. Outcomes
Must show how events **link**

Explain the importance of X for….
Appears on: **Cold War**
8 Marks, spend 15 mins
How To Answer:
- 2 IDEAL paragraphs
- 2 different reasons (long vs short term, impact on 2 places,)

Paper 3 – Germany
1hr 30mins, Includes **source booklet**

Germany Questions
Q1 – Source Inferences
Q2 – Explain why….
Q3a – Source Utility
Q3b – Interpretations what is different
Q3c – Interpretations why different
Q3d – How far do you agree with interpretation 2

Give two things you can infer from Source A about…
Appears on: **Germany**
4 marks, spend 5 mins
How To Answer:
- An inference is what you can learn
- Ensure your inferences are **different**

What is different about interpretations
Appears on **Germany**
4 marks, 5 minutes
How to answer
1. **Identify** difference
2. Give **example** from each

How far do you agree with interpretation 2
Appears on **Germany**
16 marks, spend 35 mins
How to answer
1. **Intro** – state overall argument
2. **3 IDEAL paragraphs** (Agree, Disagree, Agree/disagree for different reason)

Use the sources/interpretations
1. **Conclusion** – must make **overall judgment**

Why are interpretations different
Appears on **Germany**
4 marks, 5 minutes
How to answer
1. Learn the phrase ***"they are different as they have emphasised different evidence"***
2. Then **match** interpretations to sources

Development Indicators

Development indicators are used to illustrate progress of a country meeting a range of : economic, social, and environmental goals.

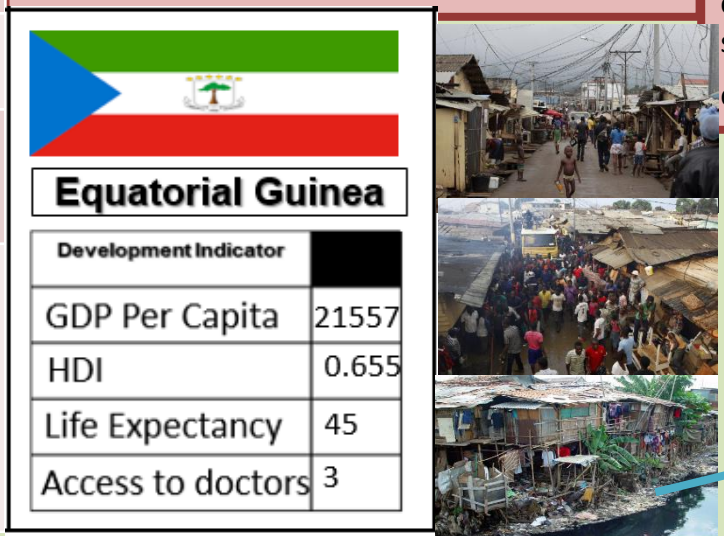
Development Indicator	Definition
People per doctor-	The average number of people for each doctor.
Gross Domestic Product (GDP)	The total value of goods and services a country produces in a year.
GDP per Head	The GDP divided by the population of a country, sometimes referred to as GDP per capita.
Life Expectancy	the average age a person is expected to live to.
Infant Mortality Rate	The number of babies who die under 1 year old per thousand babies born.
Literacy Rate	The percentage of adults that can read and write.
Death Rate	The number of deaths per 1000.
Birth Rate	The number of births per year per 1000 people.
Access to safe water	The percentage of people who get access to clean water drinking water .
Human Development Index (HDI)	this number is calculated using life expectancy, literacy rate , educational level (e.g. average years of schooling) and income per head . Every country has a value between 0-1.

Is money the best indicator?

We live in a money orientated world, so doesn't it seems fair to judge how developed a country is money? However, using economic indicators to judge development can actually mislead people for the following reasons:

- Hides **inequality** of distribution
- Ignores all aspects of quality of life, eg well-being, education, life expectancy etc
- Does not acknowledge the cultural quality of life
- Does not count externalities - costs passed to others eg a polluting factory

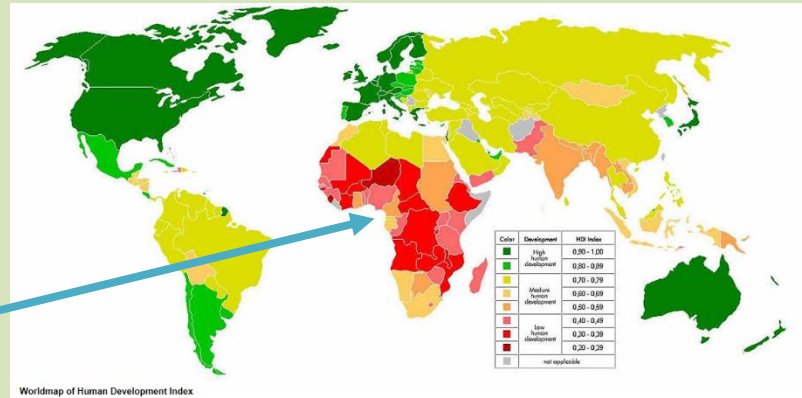
Instead its recommended that we use a mixture of both economic indicators and social indicators to get a fair representation of **development**. One indicators that is considered to be more representative is called **Human Development Index (HDI).**



Why is HDI a better indicator?

According to **GDP per capita,** Equatorial Guinea (which is located in western Africa) has a value of $21,557 which would make it a reasonably rich nation. However, we only need to look at the photos to see that is not true. This is because Equatorial Guinea has oil which is exported to different nations. However, the money made from selling oil is not shared equally and is shared between a few very wealthy people. This means that many people are in fact very poor. By using **HDI**, it takes into account the life expectancy, literacy rate and **GDP** per capita to create a more accurate number between 0 and 1 to show development. With a value of 0.655, Equatorial Guinea has a very low **HDI** compared to the UK of 0.95. Although Equatorial Guinea might make money from oil, most people still do not have access to decent education and healthcare and are therefore in **poverty**.

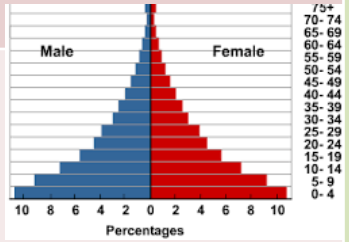
This map shows the **HDI** value for every country. Countries with a greener shade represent a higher HDI value and can be associated with **HICs**, whereas countries with a red shade have a lower **HDI** and can be associated with **LICs**. Nations in the middle normally share similarities with **NEEs (newly emerging economies**). From this we can see that Equatorial Guineas has a much lower **HDI.**



STAGE 1

Current example : Ethiopia

Birth Rate : ***HIGH***
- Cultural or religious beliefs
- Lack of contraception
- Compensation of high infant mortality
- Children needed to work on the land



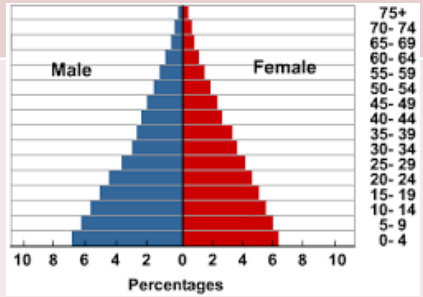
Death rate :***HIGH***
- Prolific disease Famine, and malnutrition
- Poor hygiene
- Lack of healthcare and medical science

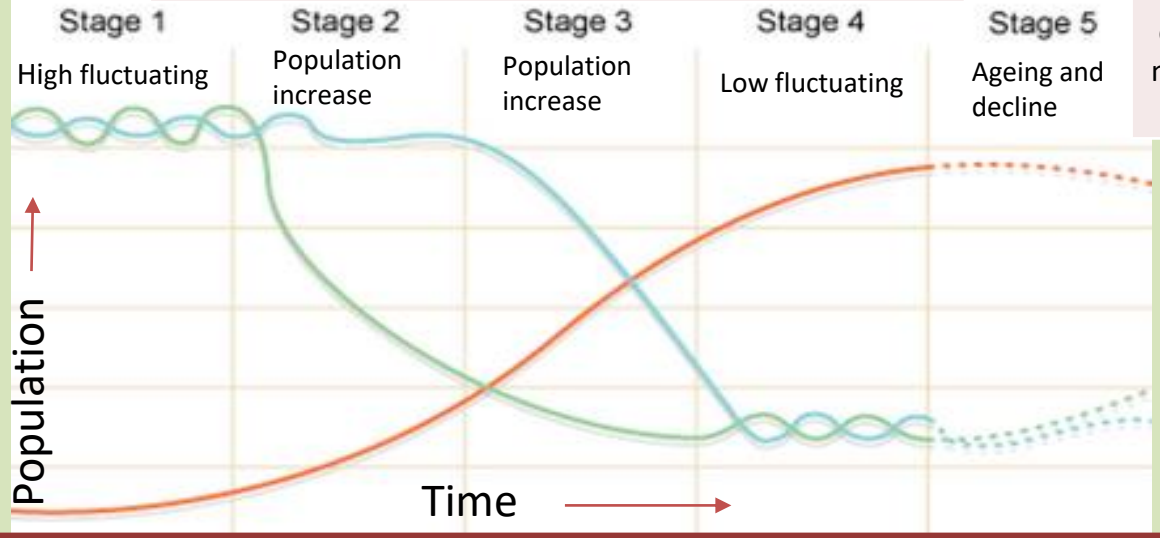
STAGE 2

Current example : Bolivia

Birth Rate : ***HIGH***
- Same as stage 1

Death rate: ***DECLINING***
- improvements in healthcare, sanitation, and clean water
- E.g doctors per people indicator.



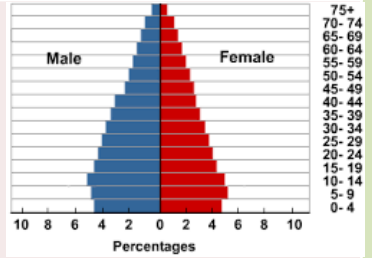


STAGE 3

Current example China

Birth Rate: ***DECLINING***
- Increased access to contraception and education
- Improved healthcare means infant mortality rate falls
- Industrialization & mechanisation
- Wealth increases; want less children

Death rate:***DECLINING***
- Developments such as underground sewers,
- medical advancements e.g penicillin, malaria tablets vaccines etc.

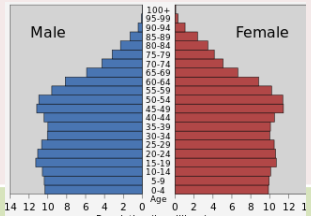


STAGE 4

Current example Canada, USA

Birth Rate: ***LOW***
- This is due to continued decline of reasons explained in stage 3.

Death rate-:***LOW***
- Remains low

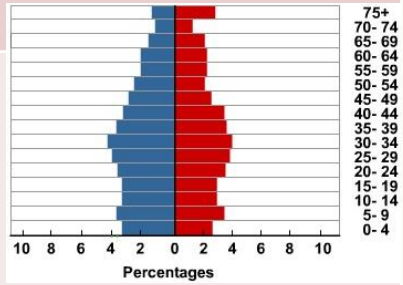


STAGE 5

Current example UK, Germany, Japan

Birth Rate :***VERY LOW***
- Emancipation of women, means women focussing on careers, women want children later or less in general.
- Increased education and women's right.

Death rate: ***RISE***
- Begins to rise very slightly due to ageing populations reaching the end stages of their life.



The Demographic Transition Model

The word demographic simply means population, and transition relates to change. Therefore this model proposes what should happen to a population over time and how it should change. The Demographic Transition Model graphs birth rate, death rate and population over 5 stages and was actually based on the United Kingdom and how it developed. If birth rate is greater than death rate the population will increase. If the death rate is greater than birth rate the population will naturally decrease. The greater the difference the greater the rate of Natural Increase. The rate of Natural Increase is much higher in developing countries (LICs and NEEs) of the world and many countries in HICs are actually experiencing population decline

Causes of Uneven Development

Physical Causes

- Lack of rainfall
- Reliance of subsistence farming results in food shortages due to extreme, changing climate
- Countries with natural disasters have to spend their money rebuilding
- Few raw materials to export (coal, oil, etc)
- Steep land/poor soil so not much to grow.

Economic Causes

- Over-reliance on exporting primary products (e.g. crops, and other raw materials)
- More wealthy countries can manipulate the prices paid for raw materials
- Poor trade links
- Some countries have too much debt to pay back

Historical Causes

- Deaths as a direct result of fighting/war or disease/malnutrition
- Political instability leading to coups
- European colonisation during the 19th century removed slaves and raw materials
- During civil wars, money is spent on weapons instead of development. Infrastructure is also destroyed

Reducing the Global Development Gap

Microfinance Loans

This involves people in LICs receiving smalls loans from traditional banks.
+ Loans enable people to begin their own businesses
- Its not clear they can reduce poverty at a large scale.

Foreign-direct investment

This is when one country buys property or infrastructure in another country.
+ Leads to better access to finance, technology & expertise.
- Investment can come with strings attached that country's will need to comply with.

Aid

This is given by one country to another as money or resources.
+ Improve literacy rates, building dams, improving agriculture.
- Can be wasted by corrupt governments or they can become too reliant on aid.

Debt Relief

This is when a country's debt is cancelled or interest rates are lowered.
+ Means more money can be spent on development.
- Locals might not always get a say. Some aid can be tied under condition from donor country.

Fair trade

This is a movement where farmers get a fair price for the goods produced.
+ Paid fairly so they can develop schools & health centres.
- Only a tiny proportion of the extra money reaches producers.

Technology

Includes tools, machines and affordable equipment that improve quality of life.
+ Renewable energy is less expensive and polluting.
- Requires initial investment and skills in operating technology

Consequences of Uneven Development

Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and migration.

Wealth	People in more developed countries have higher incomes than less developed countries.
Health	Better healthcare means that people in more developed countries live longer than those in less developed countries.
Migration	If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living.

Case Study: Economic Development in Nigeria

Location & Importance

Nigeria is a newly emerging economy in West Africa. Nigeria is just north of the Equator and experiences a range of social, political economic environments.
Nigeria is the most populous and economically powerful country in Africa.
Economic growth has been based primarily on oil exports.

Influences upon Nigeria's development

Political

Suffered **instability** with a **civil war** between 1967-1970.
From 1999, the country became **stable** with **free and fair elections**.
Stability has **encouraged global investment** from China and USA.

Social

Nigeria is a **multi-cultural, multi-faith society**.
Although mostly a strength, diversity has caused **regional conflicts** from groups such as the Boko Haram terrorists.

Cultural

Nigeria's **diversity** has created rich and varied **artistic culture**.
The country has **a rich music, literacy and film industry** (i.e. Nollywood).
A successful national football side.

The role of TNCs

TNCs such as **Shell** have played an important role in its economy.
+ Investment has **increased employment and income**.
- **Profits move to HICs**.
- Many **oil spills** have **damaged fragile environments**.

Changing Relationships

Nigeria plays a leading role with the **African Union** and **UN**.
Growing links with **China** with huge **investment in infrastructure**.
Main import includes petrol from the EU, cars from Brazil and phones from China.

Industrial Structures

Once mainly based on agriculture, **50% of its economy is now manufacturing and services**.
A thriving manufacturing industry is **increasing foreign investment** and **employment opportunities**.

Environmental Impacts

The 2008/09 **oil spills devastated swamps** and its **ecosystems.**
Industry has caused **toxic chemicals** to be discharged in open sewers - r**isking human health**.
80% of forest have been **cut down**. This also increases **CO^2 emissions**.

Aid & Debt relief

+ Receives $5billion per year in aid.
+ Aid groups (ActionAid) have improved health centres, provided anti-mosquito nets and helped to protect people against AIDS/HIV.
- Some aid fails to reach the people who need it due to corruption.

Effects of economic development

Life expectancy has increased from 46 to 53 years. 64% have access to safe water. Typical schooling years has increased from 7 to 9.

How has the UK's economic structure changed and why?

The industrial or economic structure (the type of work people do) of the UK is always changing. In 1841, at the height of the ***industrial revolution***, there was a substantial change in the UK's industrial structure, due to the increase in the use of machinery in farming and factories being built and resulting in **urbanisation**.

During the twentieth century, another significant change in the UK's employment structure happened, as **mechanisation** (introduction of robots etc.) occurred in factories, along with increased competition from abroad. In turn, the introduction of public services, the growth of financial services and an increase in leisure time and disposable income led to growth ***in tertiary (service) industries***. Since the 1980s, the research and development sector has become increasingly important, particularly in South East England.

What impact does globalisation have on the UK economy?

The UK economy, like all the others around the world, have been affected by ***globalisation***. Business, ideas and lifestyles now spread rapidly across the globe due to improvements in travel, the introduction of the internet and the development of trading blocs such as the EU. This has led to more businesses in the UK owned by companies based in other countries. In the same way, UK companies now own more businesses in other countries. For the UK economy to be prosperous, we need to be part of the global economy. The main impacts of globalisation in the UK include:

Migration	Migrants fill jobs where there is a shortage of skilled workers in the UK, such as in healthcare and construction
Less manufacturing	Fewer goods are manufactured in the UK because they can be imported more cheaply in countries such as China where wages are lower.
Inequality	The gap between the best-paid and lowest-paid jobs is increasing
Outsourcing	Jobs are outsourced to other countries where wages are lower, such as HSBC call centres to India.
Economic growth	In most cases, the UK economy increases by 1-2 per cent each year. This is mainly down to trade with other countries, helping the country to become wealthier over time
Foreign investment	Foreign companies invest in the UK, bringing new ways of working and technology. This provides jobs and skills development to people living in the UK.
Cheaper goods and services	Wages and production have become more competitive, leading to lower-priced products and services

How have traditional industries declined in the UK?

De-industrialisation is the reduction of industrial activity in a region or economy, especially of heavy industry or manufacturing industries. De-industrialisation is one of the most significant (ever) economic processes to occur in the UK and has involved the decline of heavy industries such as coal mining, shipbuilding and steel manufacturing.

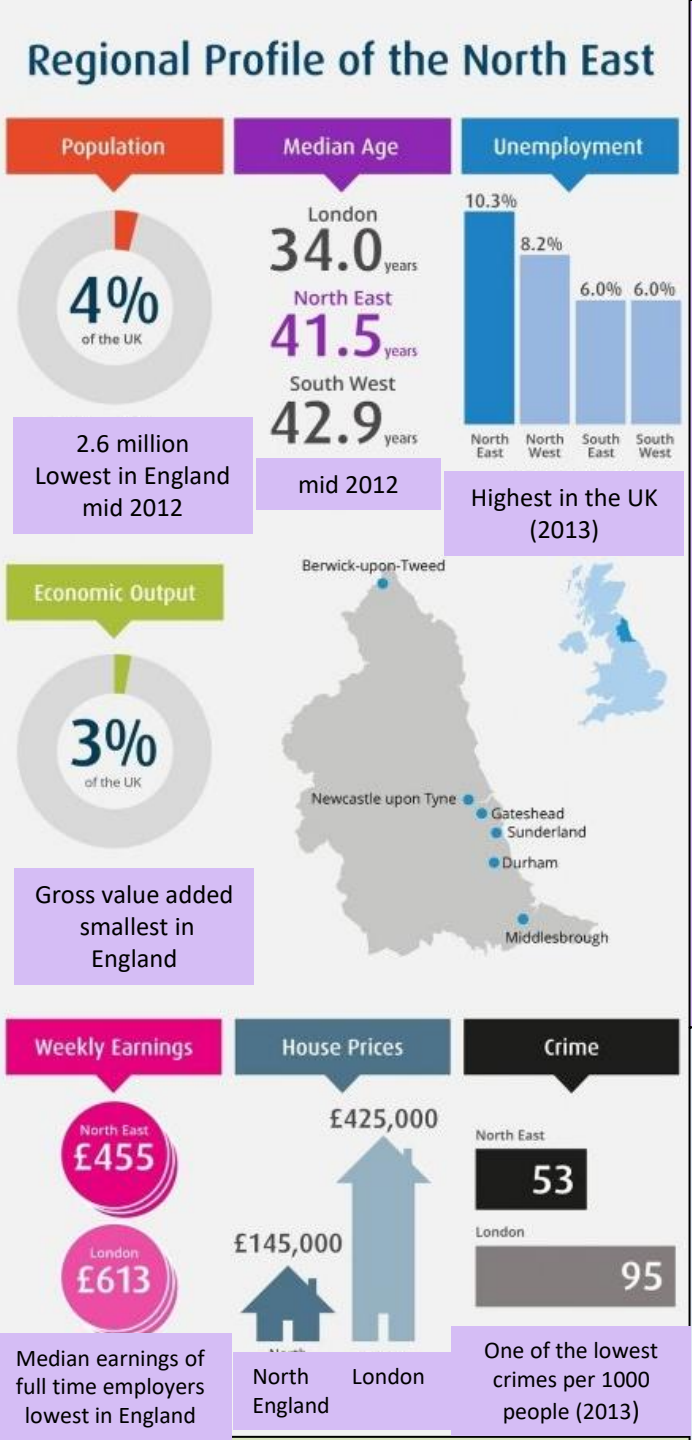
During the twentieth century, the UK went from over 3000 coal mines to just 30. The last working deep coal mine in the UK closed in December 2015. This was due to ***mechanisation***, increasing costs of extraction and growing availability of cheap imports. Following this, and a move towards more ***sustainable energy production***, there has been a rapid decline of imports as our reliance on coal has dropped. Currently in the UK there a handful of surface mines for coal, which produce just enough to support the house coal and heritage steam industries. An industry that once employed 1.2 million people, now employs fewer than 600.

North East England was one of the first ***industrialised*** regions in the UK. Tens of thousands of people were employed in heavy industry including coal mining and shipbuilding. However, it was also one of the first regions to be affected by ***de-industrialisation*** with the closure of coal mines and shipyards. This also led to a negative multiplier effect. Many smaller businesses that supplied and supported heavy industries closed, a ***knock-on effect*** affecting thousands more people. It has suffered huge job losses and a rise in unemployment as factories and industrial sites closed.

How has the government responded to de-industrialisation?

Successive UK governments have tried a range of strategies to re-energise economic opportunities in North East England, including:

- investing in new ***infrastructure*** such as roads and industrial parks
- encouraging ***foreign investment*** e.g. Nissan opened a car plant near Sunderland in 1986 which now employs 7000 people
- setting up a ***regional development agency*** in 1999, which was replaced by a local enterprise partnership in 2012 which supports businesses, plans for economic growth and training



The UK's post-industrial economy

A ***post-industrial economy*** is one that replaces manufacturing with service industries (also known as ***tertiary industries***). A new sector, the ***quaternary industry***, is now developing in the twenty-first century UK. The quaternary industry is sometimes referred to as the '**knowledge *economy***' because it involves research and development. This sector includes IT, new creative industries and ***biotechnology***. Estimates suggest 10-15% of the UK workforce is employed in quaternary sectors.

The development of information technology has transformed lives in the UK and has encouraged economic growth.
Examples of the impact of information technology on lives and economic development include:

- The UK is viewed as one of the top IT countries in the world and receives **overseas investment** as a result. Investment in technology companies totalled £6.3bn during 2018. 1.3 million people are employed in IT
- Homeworking and self-employment due to the development of the internet because information can be accessed anywhere
- Technological developments have led to the growth of specialist manufacturing services along with service and research
- Already, the UK represents a global centre of technology talent, accounting for 5 per cent of all high-growth technology workers employed globally. Only Germany, amongst the UK's European rivals, employs more people in the technology sector.

Services provide support rather than manufacturing products. The service industry is the largest sector in the UK economy both in terms of the number of people employed and **economic output**. Financial services employ over 2 million people and account for 10% of the UK's ***GDP***. The UK is a leading financial centre, with London at its centre. Financial services are the most significant contributor to job creation in the service industry, with insurance technology and financial technology employers accounting for 24 per cent and 18 per cent of the high-growth **workforce,** respectively.

Research and development is part of the rapidly expanding **quaternary sector**. It contributes over £3 billion to the UK economy and employs over 60,000 educated people. Research and development involve biomedical, computer and environmental sectors and are linked to UK universities. Research is conducted by the UK government and private companies. Cyber, artificial intelligence and clean-tech businesses are now employing substantial numbers. All three sectors are attracting growing amounts of **investment**, suggesting they may generate even more jobs in the coming months and years.

Science and business parks in the UK

The development and growth of science and business parks have been an important aspect of developing the UK's ***post-industrial policy.*** ***Science parks*** are typically located on the edge of university cities. They can be found in cities such as Cambridge, Oxford and Southampton. They have good transport links and usually have attractive environments. Sometimes, science parks are located close to, or within, university grounds. Graduates are often employed to apply their knowledge and experience to innovative businesses. Businesses often have close links to local universities and tap into their research and development. There are over 100 science parks in the UK, employing around 75,000.

Business parks are areas with a small group of businesses in the same area of land. There are hundreds of business parks across the UK. Business parks are often located on the edge of major ***urban areas*** where there are good communications and the land is cheap. Although there is a broad mix of businesses found here, they can benefit from supplying goods and services to each other.

Developments in infrastructure in the UK

The UK's transport **infrastructure** is increasingly under pressure as car ownership continues to increase and economic development puts pressure on rail, port and airport capacity.

Road

The UK government launched a £15bn road improvement strategy in 2014. The purpose of the plan was to improve the condition and capacity of the UK's roads. The programme has involved:

- The introduction of smart motorways on busy stretches of roads to improve the flow of traffic and reduce congestion.
- Over **100 new road schemes** before 2020.
- Constructing additional lanes on busy motorways and major roads such as the **A1**. Over 1**600km of new lanes** will be added.

Rail

The government is also attempting to improve the UK's ageing rail infrastructure and help encourage economic growth, particularly in the north of England. Developments include:

- **Trans-Pennine Rail – Plans** are in place to electrify lines between Manchester and York and Liverpool and Newcastle.
- **London's Crossrail** - a new underground line to improve east-west connections across London.
- **High Speed 2 (HS2)** – This project involves the construction of a high-speed rail network**, linking London to Birmingham** and one to northern cities such as Manchester, Leeds and Sheffield. HS2 has been **very controversial** due to its cost, environmental impact and its likely economic impact.

Ports

The future of the United Kingdom's ports is at the centre of a new government program, **Maritime 2050**, which will create a road map of measures needed to guarantee the country's continued prominence in the global shipping trade. While the government works on the details of the Maritime 2050 plan, the country's **privatised ports** have already started making a series of infrastructure investments, with spending **totalling £1.7 billion by late 2019.** One of the most important projects will involve Bristol, where **£400 million** is being spent to **enlarge the docks** so that the port can be used by the world's largest container ships.

Airport

3.6 per cent of the UK's **GPD** comes from airports. They are essential to the UK's economic development.

Over **750000 flights depart the UK each year** carrying 200 million passengers and **2 million tonnes of freight** pass through airports. Heathrow is the UK's largest airport. It handles **over 70 million passengers** every year.

The government proposed a **third runway** for Heathrow in 2016. The additional runway aims to reduce congestion and increase capacity. The proposal is **very controversial** due to its social and environmental impact. However, it will create thousands of jobs and boost the local economy.

What are the impacts of industry on the physical environment?

In the past, industrial growth has had a significant impact on the environment. Coal mining led to the creation of spoil heaps, vast mounds of waste material removed during extraction. Burning coal, to generate electricity, led to considerable air pollution in cities across the UK. Toxic waste materials from heavy industry have polluted the land and water supplies. **Slate mining** in North Wales turned beautiful mountains inside out and created unsightly, dangerous spoil mountains, most of which, people still don't know what to do with it.

Due to changing attitudes and strict environmental laws, modern industries must be more considerate of their ecological impacts. The majority of industries nowadays develop based on sustainable principles, for example:

Nissan Car Plant, Sunderland

Car manufacturing was not **sustainable** in the past due to inefficient engines producing toxic pollutants, parts that were difficult to recycle and the energy-intensive production processes. However, the situation is very different today. **Over 7000 people are employed by Nissan** at its car manufacturing plant in Sunderland. The factory has become efficient in a number of ways:

- The site has **10 wind turbines** generating 6.6MW and 19,000 photo-voltaic panels (solar panels) generating 4.75MW of energy. This equates to 7% of the plant's electrical requirements, enough to build 31,374 vehicles.
- Nissan is developing **electric and hybrid cars.** CO2 levels have been reduced by 22.4% since 2005.
- **The Skills Academy for Sustainable Manufacturing and Innovation (SASMI)** supports the industry's future through specialist training. Based at Nissan's Sunderland plant, SASMI provides a training infrastructure for sustainable manufacturing and the low carbon vehicle industry, and a learning facility for employers, apprentices and students, providing new skills for new jobs.

How are rural areas changing?

Rural landscapes in the UK are experiencing significant change. Although the majority of people live in urban environments, 18% of the population live in rural areas. Despite rural areas not appearing crowded, the population in most rural areas is growing due to **Counter-urbanisation** People are migrating from urban to rural areas for a better quality of life.

Major cities in the UK are generally surrounded by an area of green, open space where development is restricted. Within, and just beyond this, are desirable towns and villages from which commuters can travel to work. Urban areas would have experienced much more significant growth if it was not for the protection of these areas. There is increasing pressure on the UK government to allow development within greenbelts – full of greenfield sites - due to the housing shortage the country is facing. Even rural areas furthest from urban areas are becoming popular with tourists and second homeowners. This is the case in places that are national parks, such as the Lake District and North Norfolk. House prices in rural areas have increased significantly due to the increased demand for housing. The rising cost of properties in rural areas has made homes for local people unaffordable in some areas. This has led to more people having to rent or move to another area where they are more likely to afford to buy a property.

What happens in an area of population decline?
The Outer Hebrides are a group of islands off the northwest coast of Scotland. Since 1901 it has experienced a 50 per cent decline in its population, mainly due to young people moving away. They have migrated to the mainland in search of jobs. The current community is around 27,000, and most inhabitants live on the islands of Lewis.

Social impacts:
School closures could result from fewer children
An ageing population, caused by the migration of young people, will require higher amounts of social care, which will have social and economic impacts
A further decline in the fishing and farming industry due to the ageing population

Economic impacts:
Maintaining transport services such as ferries and other services is very costly
There has been a significant decline in traditional fishing for lobsters and prawns
Tourism has become an essential source of income. However, the infrastructure is struggling to cope with this
Shellfish catches have increased, due to more foreign boats

What is the impact of increasing populations in rural areas ?

Southeast England experiences the most significant pressure on rural areas in England. This is because people with jobs in London want to live in a more attractive environment which brings a range of benefits and problems.

BENEFITS

- An increased population leads to a higher demand for goods and services. This helps ensure the future of rural shops, schools and businesses.
- It provides balance to rural-urban migration, particularly as young people move away in search for better opportunities.
- New people are more likely to invest in new, local businesses and new developments in rural areas provide jobs

PROBLEMS

- Rural areas can lose shops as commuters buy products in supermarkets in urban areas on their way home from work.
- Older people tend to move to rural areas, which raises the average age.
- House prices often increase rapidly due to wealthy newcomers, pushing out local people.
- Car owning commuters do not require public transport, so services may be reduced, affecting local people.
- Modern developments in rural areas cause tensions with the local community, especially when the sale of agricultural land in rural areas can lead to unemployment in the local community

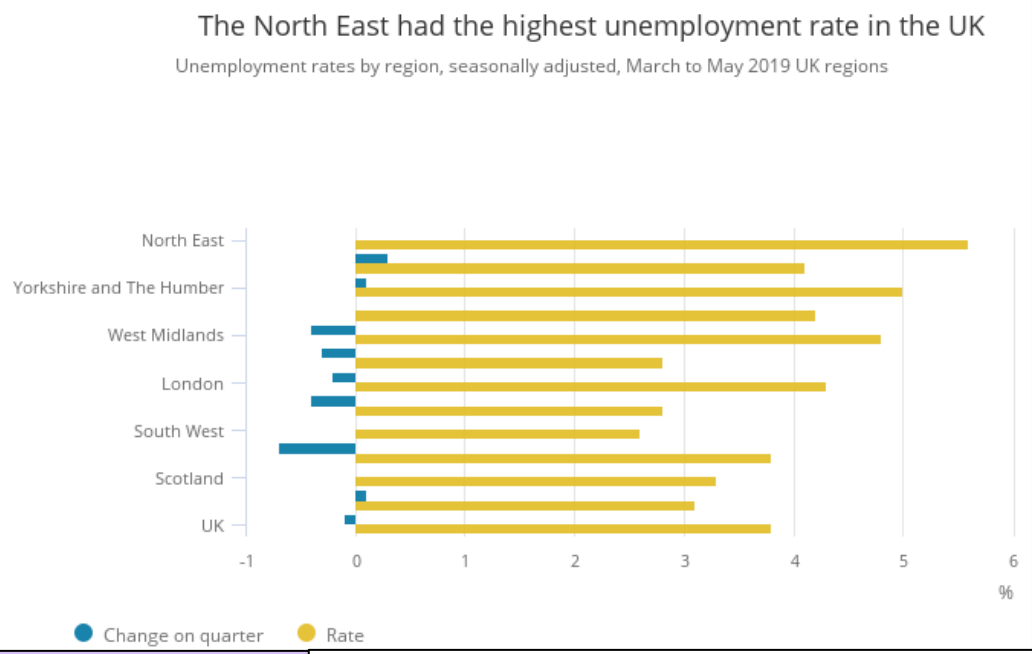
Key terms

Industrial revolution: a rapid major change in the UK economy in the late 18th century marked by the general introduction of power-driven machinery and coal production.
Tertiary jobs : Jobs providing a service such as Doctors, teachers, Civil servants, police
Quaternary jobs: consists of those industries providing information services, such as computing, ICT (information and **communication** technologies), consultancy (offering advice to businesses) and R&D (research, particularly in scientific fields)
Mechanisation: the introduction of machines or automatic devices into a process, activity, or place, often replaces a human workforce for a machine workforce.
Counter urbanisation: is a process contributing to social and demographic change in rural settlements. Changes include outward-migration of those seeking education/employment elsewhere; inward-migration of middles class families increasing house prices.

What is the North-South divide?

The north-south divide is a term used to describe the social, economic and cultural **disparities** between the London and the south-east of England and the rest of the UK.

People living in the south-east typically have a longer **life expectancy, higher income** and better **standard of living** than those living in the north. **House prices** in the south-east are higher due to high demand. Rates of **unemployment** are higher in the north as regions continue to adjust to de-industrialisation. The main cause of the north-south divide is **de-industrialisation**, as manufacturing industries, traditionally located in the north have closed. Manufacturing continues to be very important in the north whereas in the south it is not so much. Any changes in manufacturing have a considerable impact on the north. As the northern economy declined the south-east became increasingly prosperous in response to the growth of the financial and service sector and the dominance of London. The growth in incomes led to increased house prices in the south-east. For several decades the UK government and the EU have attempted to reduce the north-south divide by investing in the north. **Assisted area status** has been assigned to areas that are less economically advantaged. New businesses setting up on these areas are eligible for financial assistance. There is likely to be a significant impact resulting from Brexit in areas supported by these schemes.



What is the place of the UK in the wider world?

The UK was once one of the world's most powerful political and trading nations. The British Empire covered almost one-third of the Earth's land surface, with colonies all over the world. Many of the former colonial countries gained independence in the twentieth century. The Commonwealth is one of the world's oldest political associations of states. Its roots go back to the British Empire when some countries were ruled directly or indirectly by Britain. Some of these countries became self-governing while retaining Britain's monarch as Head of State. They formed the **British Commonwealth of Nations.** Besides the Commonwealth, the UK also has political, economic and cultural influence through organisations such as the **UN, NATO** and the **G8** group of nations. The UK remains one of the world's major economies and is a **global financial centre**. The UK is also highly regarded for its democratic values, legal system, rich cultural heritage, values and fairness.

The UK's main trading partners are the EU, USA and China. Germany is the primary source for **imports** and the USA the leading destination for **exports**. Following Brexit, the UK is likely to develop stronger trading links with India, China and the USA. The internet is becoming increasingly important to UK businesses in the creative and financial sectors.

The UK is an important hub, for the global network of submarine telecommunications cables, linking Europe to the USA.

What are the UK's political and economic links with the European Union (EU)?

The UK joined the EU in 1973. Today, the EU consists of 27 countries. It is one of the world's largest trading blocs and has considerable political and economic influence. In 2016 the UK opted to leave the EU (Brexit).

Top 10 UK trading partners (2017)

TOTAL TRADE RANK

	Country	Total trade £bn (% of total trade)	% change since 2016	UK exports £bn, to (% of total exports)	% change since 2016	UK imports £bn, from (% of total exports)	% change since 2016
1	United States*	183.2 (14.6%)	↑ 9.9%	113.8 (18.4%)	↑ 11.2%	69.5 (10.8%)	↑ 7.9%
2	Germany	134.9 (10.7%)	↑ 10.5%	56.4 (9.1%)	↑ 13.1%	78.6 (12.3%)	↑ 8.7%
3	Netherlands	85.7 (6.8%)	↑ 13.9%	38.6 (6.2%)	↑ 13.4%	47.1 (7.3%)	↑ 14.2%
4	France	81.4 (6.5%)	↑ 12.1%	41.0 (6.6%)	↑ 16.3%	40.4 (6.3%)	↑ 8.0%
5	China	67.0 (5.3%)	↑ 13.8%	22.1 (3.6%)	↑ 25.5%	44.9 (7.0%)	↑ 8.8%
6	Ireland	58.7 (4.7%)	↑ 18.1%	36.7 (6.0%)	↑ 25.1%	21.9 (3.4%)	↑ 7.9%
7	Spain	48.6 (3.9%)	↑ 5.6%	17.3 (2.8%)	↑ 8.1%	31.3 (4.9%)	↑ 4.3%
8	Belgium	47.1 (3.7%)	↑ 11.6%	19.3 (3.1%)	↑ 20.5%	27.9 (4.3%)	↑ 6.2%
9	Italy	43.1 (3.4%)	↑ 4.6%	19.3 (3.1%)	↑ 2.8%	23.8 (3.7%)	↑ 6.2%
10	Switzerland	32.1 (2.6%)	↓ -7.1%	20.0 (3.2%)	↓ -2.2%	12.1 (1.9%)	↓ -14.1%

BVT: Crime and Punishment

There are 3 aims or types of punishment:

Reformation - To help the criminal reform their behaviour so they do not commit crime again – links with **reconciliation and forgiveness.**

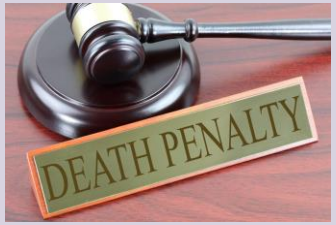
Deterrence – to show / warn others not to commit crime otherwise they will be punished

Retribution –to seek justice for the behaviour of the criminal

Electronic tagging as a punishment

- This is used when inmates are released from prison and they can be tracked were they go
- It is used so the remainder of a sentence can be served at home
- The inmate can be monitored and they are not allowed out at night.
- This system can be used for between 1 month and 1 year of the last part of a sentence.
- Electronic tagging frees up space in prisons

Reformation Deterrence Retribution

Christianity	Buddhism	Islam
For Reformation: Forgiveness of crimes – *"We forgive those that trespass against us"* **Lord's Prayer.** Parable of the **Prodigal Son** The law has the right to punish and care for a criminals while trying to reform them	**For Reformation:** Buddhists believe that criminals need to understand the impact of their crime on others and to help criminals to adjust their ways. **Against Reformation:** Buddhists encourage forgiveness, however understand that sometimes it can be too hard, in some circumstances. If **suffering** is too great, forgiveness can be hard.	**For Reformation:** Islam also talks about forgiveness. *"Those who pardon… are rewarded by Allah"* Qur'an 
		**For Deterrence**: Some Islamic countries use corporal punishment as part of **Shari'ah law** to deter others, such as lashings.
Against Retribution: Jesus taught to *"turn the other cheek"* to avoid revenge Christians are against corporal punishment. Jesus was flogged before going on the cross. **For Retribution:** However, some Christians may believe in retribution - the old testament *"An eye for an eye and tooth for a tooth"*	**Against Retribution:** Buddhists are against corporal punishment as it goes against the **5 precepts** (harming others) 	**Against Retribution:** *"The greatest sin is to take another man's life"* Qur'an **For Retribution:** The Qur'an states a punishment for a thief is having their hands cut off. Islam teaches *"A life for a life"* In Iraq stoning to death is used as a capital punishment for adultery and homosexuality *"If your lusts on men in preference to women.... we rain down on them a shower of stones"* Qur'an *"Stand up for justice"* Qur'an

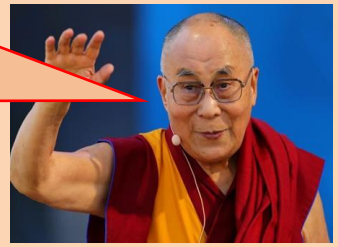
Community Service or payback

- Community service is also known as payback because criminals are giving back to the community.
- It consists of working in the community for **40-300 hours** (could be 3-4 days a week)
- Cleaning is often used as community service
- Crimes for which this is a punishment are often damage to property or drink driving

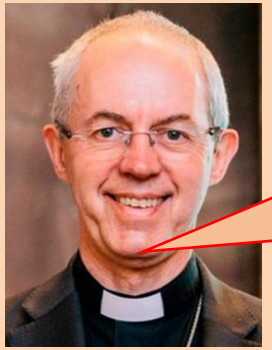
Corporal Punishment

- Corporal punishment is physical punishment e.g. flogging or beating
- Christians see this as unjust and unnecessary and reminds them of how **Jesus was whipped and tormented before his death** by the Romans
- In the UK corporal punishment has been banned since 1980's in school, though it is still legal for parents to hit their own children.
- However the **Human Rights Act of 1998** bans corporal punishment
- Examples of corporal punishment are in Islamic countries such as Iran where stoning is legal and practiced

- Prison is a fair punishment
- Prison life needs to be acceptable – no suffering or harm to prisoners
- Addicts have strayed from the Middle path and need support and guidance



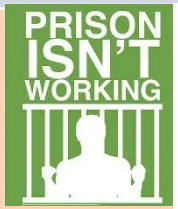
- Prisons may not go far enough as a deterrence, because in the UK 29% reoffend
- Retribution punishments serve as justice
- Harsh punishment are needed for a deterrence – we have Shar'iah Law showing this

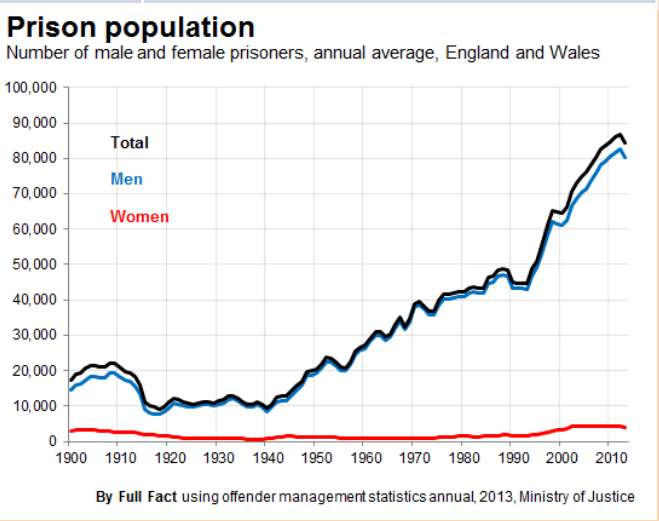


- Prisons work well as reformation.
- Providing the opportunities to reform with education and work based schemes to allow second chances and stop reoffending

UK Prisons

Benefits of UK prisons	Problems in UK prisons
• Acts as deterrent to others • Prisoners can be reformed before their release • It protects society • Education and paid work programs provide opportunities for prisoners • Support for mental health / counselling available • **Prison reform Trust:** is a charity which helps by improving treatment and conditions for prisoners and their families	• Self-harming of inmates has increased • Assault between prisoners has increased – tripled since 2013 • **Staffing** – over a third of officers have less than 2 years experience • **Drug use** has increased since 2015 after years of it declining • **Overcrowding** – Over 80,000 prisoners in England and Wales in 2019 (increase from 35,000 from 1970). Result: **Early Release program 2024**





Impacts of Punishment:

Reformation:

- In prisons systems in place to support reform: Jobs, counselling, education
- Community service so criminals can see the errors of their ways and **give back to their community**
- Criminals have time to reflect on their crimes
- **This all leads to forgiveness**
- Community service – Criminals can give back to the community in a positive way. For small crimes is good, so that small time criminals **do not mix and get caught up with worse criminals at prison**

Deterrence:

- Long prison sentences issued; however now shorter sentences and electronic tagging is used more to **free up space in prisons** because of overcrowded.
- Corporal and capital punishment used frequently to deter in some countries
- Community service does not work as a deterrent as its punishment is **too soft.**

Retribution:

- **Shari'ah Law** show retribution as stated in the Qur'an: A thief's hand is cut off
- Capital and Corporal punishment gets justice for the victims. This can also serve as **humiliation as part of retribution** e.g. stoning / honour violence/abuse. This may lead to **prejudice** against religious belief
- Religious groups will **campaign against retribution** crimes e.g. death penalty
- However some argue it cannot bring a loved one back to life if murdered.

Support for victims of crime

- Counselling for emotional support, support of rape and abuse victims
- Practical support – how to report crimes, what will happen at court etc
- Rights support – what rights do victims have?
- Support for younger victims
- Support for those that don't speak the language
- **It important that victims forgive their perpetrators so they can move on and let go of their anger. Not forgiving can lead to resentment and also fear.**
- **Religious believers may feel that suffering as part of being a victim is a test from God: Like the story of JOB**

Story of Job

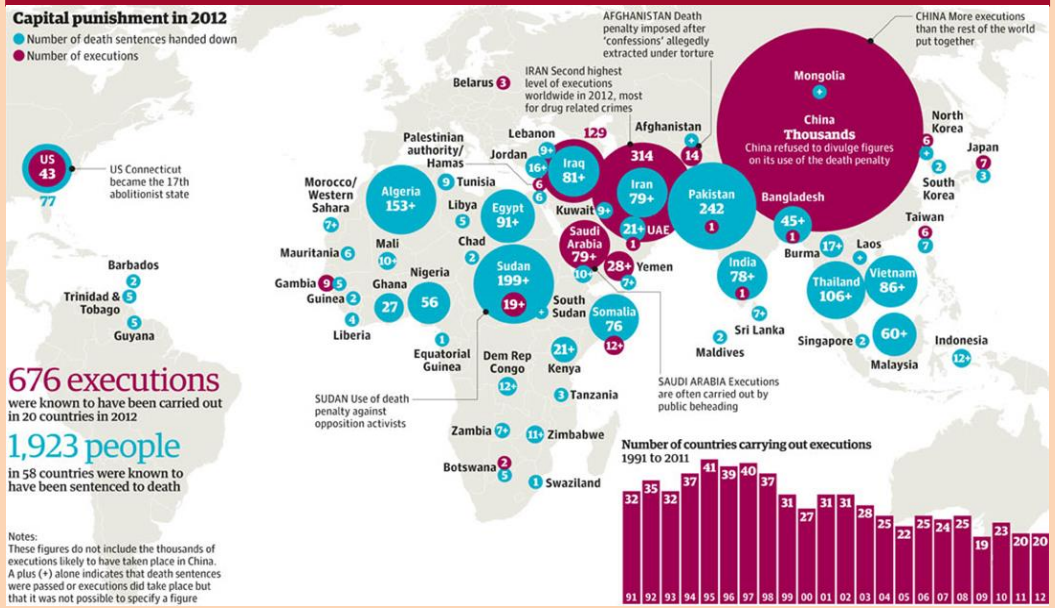
JOB's faith was tested as he suffered the death of his children, his cattle and farm was destroyed and he became very ill.
He remained faithful through this suffering and God rewarded and saved him.

Death penalty

Where has the death penalty?

Saudi Arabia, Iran – though **China** has more executions than all the countries put together in 2012.

In the USA most states (32) have the death penalty. Texas has executed more than any other state.



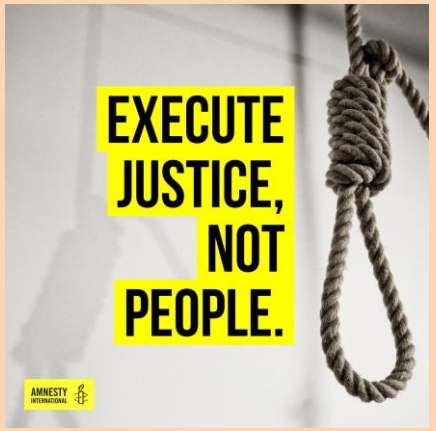
Impacts

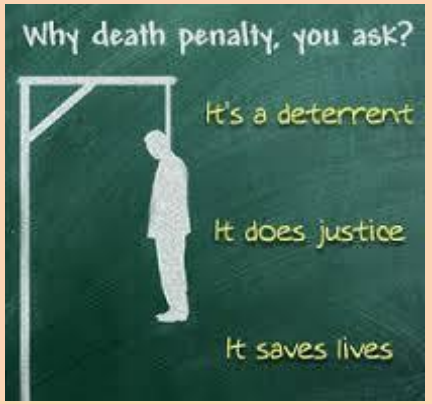
This can result in fear, hatred and anger of those in charge – in communities or the government

The death penalty can show injustice when issued to crimes such as adultery or homosexuality. This can isolate and force unacceptance and persecution of groups such as homosexuals

Countries can be divided over their beliefs e.g. USA States – and forced to operate different laws

Campaigns can protest against such laws e.g. Amnesty International speak out against these laws





Scan the QR code to read about the **Rodney Reed** case:

SCAN ME

FOR the death penalty	AGAINST the Death penalty
➢ **Retribution** – murders should pay for the life they took away ➢ Some argue it is a good **deterrent** of crime ➢ Some argue it brings **justice** for the families who are grieving ➢ **Prisons** are overcrowded and costly ➢ **Life sentences** do not mean life! Murders walk free on average after 16 years ➢ It totally **protects** society from that person	➢ It is **cruel, barbaric and uncivilised** for the modern world ➢ Killing someone for murder is a **contradiction** ➢ What if **new evidence** comes to the case, the person will already be dead ➢ Rehabilitation in prisons are better punishments in the long term ➢ Reformation and forgiveness allow second chances to criminals mistakes

Religious ideas FOR the death penalty	Religious ideas AGAINST the death penalty
➢ *"A life for a life" and "Stand up firmly for justice"* – Islam ➢ Shari'ah Law punishes breaking the law of murder, homosexuality and adultery with the death penalty. In Islam this is disrespecting the community and Islamic laws. ➢ *"An eye for an eye, a tooth for a tooth"* Old Testament ➢ God is just and justice must be served e.g. **original Sin** – God punishes sin	➢ Christians should be given the opportunity to repent and ask for **forgiveness** ➢ Forgiveness brings justice – Lord's prayer ➢ *"Pray for those that persecute you"* Jesus ➢ Ten Commandments – *"Thou shall not kill"* ➢ *"I your God give life, and I take it away" Bible* ➢ *"The greatest sin is to take another man's life" Qur'an* ➢ Buddhists: Dali Lama said "Hatred with not cease with hatred, but by love alone" ➢ Buddhists do not harm other living things – **5 Precepts**

The Five Pillars

Shahadah

This is the first pillar **means the Declaration of faith.** Muslims repeat the words of the Shahadah to show their faith and commitment to Allah. The first line is:
"There is no God but Allah, Muhammad is the messenger of Allah".
The Shahadah is also a dismissal to all other Gods/idols and to show devotion to Allah and Muhammad. It is spoken at very **important** times: it is the call to prayer, spoken to new born babies and to Muslims just before they die.

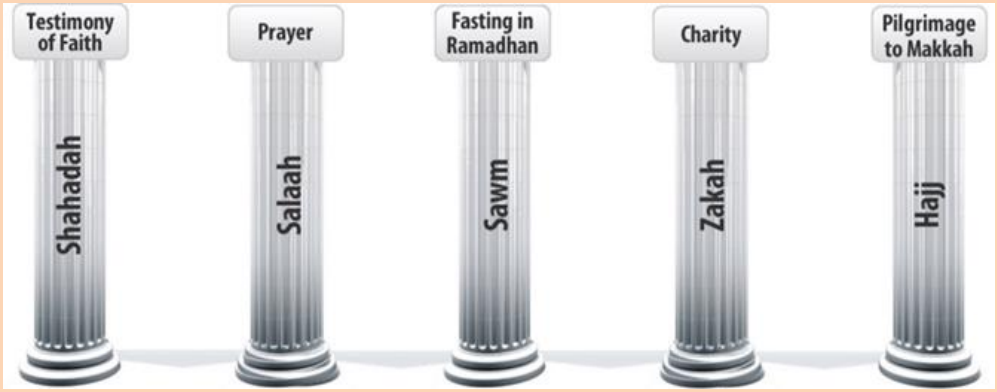
Salah – Prayer

Muslims pray 5 times a day, the **importance** of this is:
- To seek forgiveness and repent sins
- To avoid temptation
- Rewarded by Allah in Heaven

Muslims also pray in a large group at Mosque. Men gather at the mosque, women often pray at home. This strengthens the idea of **Ummah** (which translates as Brotherhood) or community.

Islamic Practices

Key vocabulary
Shahadah
Salah
Adhan
Wudu
Rak'ah



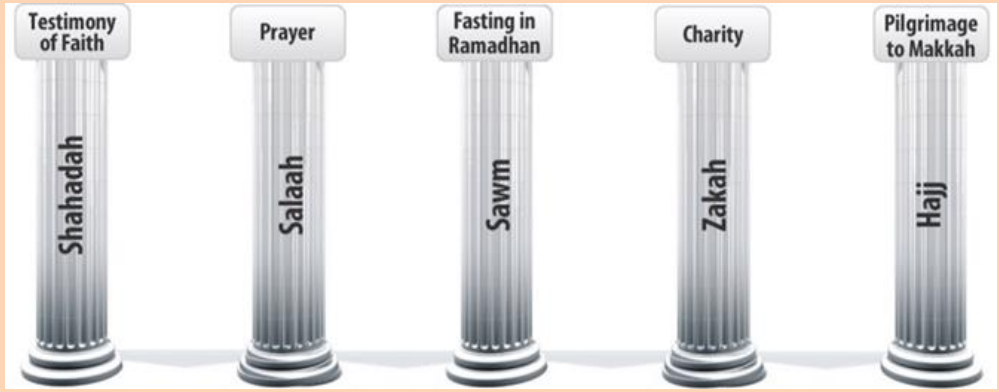
How do Muslims pray?

Muslims are called to prayer (this is called **Adhan**). The call is called out from the Mosque, it uses the words of the Shahadah.
Before prayer Muslims perform **Wudu**. This is to wash before prayer. This is be physically and spiritually clean before praying to God.
Muslims pray using the movements of **Rak'ah.**
These are special movements with set words. This is a set routine that is used every time a Muslim prays.
The **importance** of this is:
- A Connection to Allah – this is shown in the Qur'an quote "Prostrate and draw near to Allah"
- Strengthens faith and dedication and Muslims can praise Allah

Friday night Prayer – called Jumu'ah	Regular daily Prayer
This happens only once a week Adhan - call to Prayer given Wudu performed The Imam gives a sermon (called Khutbah- teachings from the Qur'an and Sunnah) The congregation are given direct spiritual guidance as part of the sermon The sermon may be about local or global issues It finishes with Rak'ah	Daily prayer is conducted 5 times a day Adhan - call to Prayer given Wudu performed Rak'ah is performed It is a set prayer of words and movements, with no sermon

Islamic Practices

The Five Pillars



Sawm

Sawm means fasting. It happens during the Islamic calendar month of **Ramadan.**
It is a celebration of a past event. The past event being the Night of the power. This is the night that Muhammad was visited in the cave by Jibril and chosen as prophet.
"Ramadan is the month in which the Qur'an was sent down as a guide to humanity" Qur'an

Key vocabulary
Sawm
Fasting
Ramadan
Zakah
Alms

What happens during Sawm?

- Fasting from sunrise to sunset
- Reframe from sexual activity
- Consider behaviour to others
- Time should be spend reflecting praying not wasted on material things e.g. watching TV
- Get up before dusk and eat something. Then after sunset have a meal with their family.
- Many Muslims go to mosque in the evening for prayers.

Zakah

Zakah is giving **Alms** – this means giving to charity. Giving Zakah is a duty for Muslims – as part of the 5 pillars.
Muslims give **2.5%** of their annual income and savings as adult. It is paid by all Muslims after debts, expenses are taken out and of those Muslims who have money left over. Therefore if you have nothing left after rent, food etc it is not paid. For this reason it is not a tax as you only pay if you can.
The Qur'an promotes Zakah as it says "Be steadfast in prayer and giving".

Importance of Zakah
- Purifies Muslims by showing they have no greed – they are blessed by Allah for this giving
- By giving they will be rewarded by their actions on judgement day
- Zakah can be given to charities to support poverty in Muslim communities but also in other world wide communities.

Why is Sawm **important**?

- Sawm remembers the importance of Muhammad and therefore his teachings. (see quote above)
- Swam develops Muslims determination, faith, resilience; it stops cravings and desires and allows Muslims to reflect and focus on their religion.
- Swam also brings Muslims closer to Allah, showing them the right path for their life, it is also a month for forgiveness.
- Zakah given this month demonstrating what Muslims have (e.g. money, possessions, food) and what others do not. That they should not to take things for granted.

Watch this clip about Ramadan and Sawm:

The Five Pillars

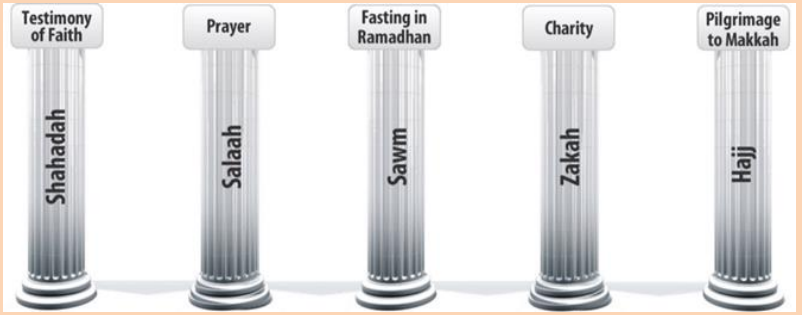
Hajj – Pilgrimage

- All Muslims are expected to take part in Hajj at least once in their lives. It happens once a year for a 10 day period.
- Everything that happens at Hajj has meaning and **Significance in its actions or the Places** where it is set, hence why the pilgrimage has a **set route**, around the cities of Makkah (Mecca).
- Muslims wear **Ihram** – white robes – showing they are all equal and one under Allah

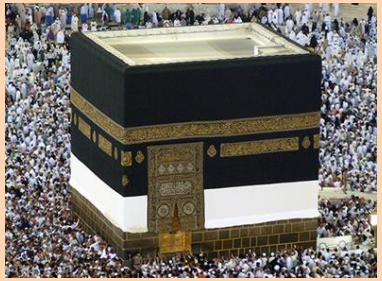
Islamic Practices

Key vocabulary

Hajj
Makkah
Ka'aba
Zam Zam, Jamarat
Mount Arafat
Ihram
Al-Safa and Al-Marwa



Zamzam



Jamarat pillars

Mount Arafat

Below are some of the KEY places and their significance that are visited during Hajj

Place	What happens here?	Why is it important? Significant?
Ka'aba and the black stone.	The Ka'aba shrine is covered each year in black cloth embroidered in gold. Muslims perform **Tawaf** – walking around the ka'aba 7 times.	The black stone in said to have been given by Jibril to Adam. The Ka'aba was built around the sacred black stone (first by Adam, them Ibrahim). These are the **oldest shrines to Allah on earth.** The circling re-enacts Muhammad smashing idols to convert Makkah to Islam.
Zamzam well	Muslims drink water from the well	The well was given to Ibrahim by Allah for his wife and step son Ismail, when they were searching for water. It **represents for Muslims how water is essential for life and Allah is also essential for life**. It shows how **Allah will provide for them**.
Mount Arafat (Also called mercy mountain)	A hill Muslims climb up. Muslims pray for forgiveness for their sins here.	Muhammad gave his final sermon here. It is believed that **all sins can be forgiven** here.
Al-Safa and Al-Marwa	Muslims walk between the 2 hills	This re-enacts Hajar's search for water to save Ismail in the desert. Allah provided Hajar with the Zamzam well for her and her son. This represents **tests** from God.
Jamarat Pillars	Muslims throw pebbles at 3 large concrete pillars	Pebbles are to **reject evil**. This represents rejecting evil as Ibrahim did to Shaytan (Satan) at the sacrifice

Festivals of Islam

Eid Ul-Fitr

What is Eid Ul-Fitr and how is it celebrated?

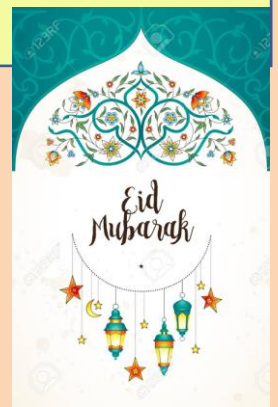
- ❑ This is the festival at the **end of Swam / Ramadan**
- ❑ Muslims are allowed the day off school and work
- ❑ The fast is broken by eating dates
- ❑ At mosque morning and evening Eid prayers are said and the importance of Zakah is explained
- ❑ Families meet up and celebrate: Cards and presents are exchanged, new clothes and a special evening meal.

Why is Eid Ul-Fitr important?

"You shall complete the set number of days, and you shall be thankful and glorify God" Quran

Eid Ul-Fitr is the celebration of completing Swam through Ramadan and the giving of Zakah. Therefore its importance is…

- ❑ In giving Zakah to needy /helping others, sharing Allah's wealth
- ❑ A celebration that Muslims have completed Ramadan.
  - ➢ That Muslims have given up material things and focused on their faith and family
  - ➢ Showing good behaviour - respectful, kind and humble to others.
  - ➢ Focused truly on Allah for the month.



Islamic Practices

Key vocabulary

Eid Ul-Fitr
Sawm
Ramadan
Zakah
Eid Ul-Adha
Ashura
Musa
Israelites

Look at these news stories / photos to show celebrations of Eid Ul-Fitr:

Eid Ul-Adha

This translates as Festival of the sacrifice and relates to the story of Ibrahim. It is celebrated at the end of Hajj.

"I have seen in a dream I must sacrifice you" Quran

How is it celebrated?

The Sacrifice of a Lamb is split 3 ways:

1. 1/3 for family
2. 1/3 for relatives, friends, neighbours
3. 1/3 for the poor

Though more families now give money to charity instead of a slaughter
New clothes are brought and Muslims go to Mosque. Eid prayers are read and Muslims are reminded of Ibrahim's sacrifice for Allah.

Why is it important?

Muslims observe this Festival in respect and remembrance of Ibrahim, who showed devotion and faith to Allah
It shows Muslims that they should be able to **submit to Allah** for their faith and you shall be rewarded; just like Ibrahim.

Festival of Ashura

This Festival is a celebration which recognises how **Allah helped prophet Musa (Moses) escape the persecution of the Egyptians**. The Israelites escaped with Musa (Moses) on the **10th** day (Ashura means 10th).
On this day the Israelites and Musa fasted in the desert. For this Festival Muslims also fast on this day in recognition of Prophet Musa and for forgiveness.

How do Shi'a Practices differ?

10 obligations of Shi'a Islam

These are the **Shi'a equivalent of the Sunni 5 pillars**.
10 obligations have 4 of the 5 pillars in – Salah, Hajj, Sawm and Zakah.
The 10 Obligations DO NOT have the Shahadah

The 10 Obligations also have some other duties:

- Khums – a different charity / alms giving
- Showing **Maroof** – is guiding others towards good. E.g. encouraging charity, helping others, fighting against injustice.
- **Munkar** is forbidding evil e.g. rejecting Shaytan (Satan)
- **Tawalla** is expressing and showing love to others
- **Tabarra** is showing hatred to those that oppose Allah. Some may argue that this links with Lesser Jihad and Holy war. Fighting against others in the name of Allah.
- **Greater Jihad** = inner struggle against evil and temptation.
- **Lesser Jihad** = outer struggle to preserve and defend Islam

Islamic Practices

Key vocabulary
10 Obligations
Khums
Maroof
Munkar
Tawalla
Tabarra
Jihad

Salah – How is pray different for Shi'a Muslims?

1. Shi'a Muslims pray **3 times**. However – they do the same amount of pray / Rak'ah, but fit it into 3 sessions.

2. A wooden block is touched by the head when praying

3. Shia Muslims when standing during rak'ah, have their arms by their sides.

4. The imams (of the 12) taught that Wudu was a ritual directed by Allah, therefore holds more importance that just a preparation for prayer.

How is Sawm different?

For Shi'a Muslims: Swam is about giving generously at Ramadan, but also to think about **Judgement day.**
Fasting will help Muslims **complete Munkar** (rejecting evil: focus on Allah during Ramadan) and **Maroof** (doing good: Giving Zakah)

Khums

Shia Muslims pay **20%** on their annual wealth after expenses/debts are paid.
Khums are split 6 ways:

- Allah
- Muhammad (now this section goes to religious teachers)
- Relatives of Muhammad
- Orphans
- The poor
- Anyone who is away from their home and in need

Festival of Ashura

Its importance:
This festival is a **remembrance festival for the Death of Hussein**:
Therefore it is a mourning Festival, one of sadness.
It remembers Hussein (Grandson of Muhammad) who was a Shi'a Imam. Yazid seized power from Hussain which led to the battle of Karbala on the 10th day of the month (Ashura means 10th).
Hussein and his family tried to flee, but were captured and murdered by Yazid.

What happens?

- Muslims wear black and Mosques are covered with black cloth
- The story of the Hussein's murder is told
- Many Muslims will find it very upsetting and will cry, Some Shi'a Muslims will whip themselves in sorrow / empathy (though this is now less common)

GCSE SPANISH YEAR 11: SOCIAL / WORLD ISSUES; ROLE PLAYS; EXAM PREPARATION

la pobreza (poverty)
la guerra (war)
la sequía (drought)
la desigualdad (inequality)
las inundaciones (flood)
la violencia
la extinción
la deforestación (deforestation)
el desempleo (unemployment)
el calentamiento global (global warming)
el efecto invernadero (greenhouse effect)
el mundo (the world)
los sin techos (homeless)
el acoso (bullying / intimidation)
los refugiados/as (refugees)
la pesadilla (the nightmare)
la preocupación (worry / concern)
la demostración (demonstration)

pienso que / creo que... (I think / believe that)
en mi opinión (in my opinion)
más...que / menos...que (more than / less than)
el / la más (the most)
el principal problema (the biggest problem)
severo/a (severe / strict)
serio/a (serious)
grave (serious)
la contaminación del agua me preocupa (water pollution worries me)

R* – *range
O* – *opinions
T* – *tenses
A* – *adjectives
T* – *tie together
E* - *extend

hoy (today)
hoy en día (these days)

deberíamos (we should)
podríamos (we could)
organizar (to organise)
escribir (to write)
votar (to vote)
participar (to participate)
educar (to educate)
apprender (to learn)
enseñar (to teach)
mejorar (to improve)
aumentar (to increase)
soportar (to put up with)
suprimir (to suppress)
evitar (to avoid)

TRANSACTIONAL SITUATIONS

GENERAL PHRASES
quisiera *(I would like)*
¿tiene Usted… ? *(Do you have… ?)*
dame… por favor (*Please give me…)*
¿cuanto cuesta ? *(How much is it ?)*
¿dónde está… ? *(Where is… ?)*
¿por dónde se va a … (*How do I / does one get to… ?)*
¿hay...? *(is / are there...)*
¿a qué hora... ? *(At what time / when ?)*
comienza / empieza / termina *(start / finish)*
cerra / abierta *(close / open)*
sale / llega *(leave / arrive)*
reclamar *(to complain)*
quisiera reclamar *(I would like to complain*)

EL HOTEL
un dormitorio *(a room)*
con ducha *(with a shower)*
con balcón *(with balcony)*
para una noche *(for one night)*
la cama *(the bed)*
una cama doble *(a double bed)*
la llave *(the key)*
el piso *(the floor)*
el ascensor *(the lift)*
no funciona *(doesn't work)*

LA ESTACTIÓN DE TREN / AUTOBUS
el andén *(platform)*
el próximo tren / bus / autocar *(the next train / bus / coach)*
el billete de ida *(one-way ticket)*
el billete de ida y vuelta *(a return ticket)*
el billete *(a ticket)*
una tarifa para los estudiantes *(prices for students)*
la rebaja *(reduction)*
el precio *(price)*

Role-play advice…

AUX MAGASINS
un kilo de... *(a kilo of)*
un trozo de *(a slice of)*
un paquete de *(a packet of)*
una botella de *(a bottle of)*
algunos/algunas (*a few)*
algo de más grande *(something bigger*)
¿qué talla? *(what size)*
¿qué número? *(what size [shoe])*
en algodón *(in cotton)*
en lana *(in wool)*
en verde *(in green)*
un regalo *(a gift / present)*

AL RESTAURANTE
la entrada *(starter)*
el plato principal *(the main course)*
el postre *(dessert)*
la bebida *(drink)*
la propina*(tip)*
pedir *(to order)*
demasiádo frío *(too cold)*
demasiádo caliente *(too hot)*
no tengo... *(I don't have)*
puedo tener... *(can I have)*

EN LA CIUDAD
el ayuntamiento *(the town hall)*
el centro comercial *(shopping centre)*
a la izquierda *(on the left)*
a la derecha *(on the right)*
todo recto *(straight on)*
la primera / segunda *(the first / second*)
está enfrente / cerca de / detrás (de)/ delante (de) *(it's opposite / near / behind / in front of)*

AU SYNDICAT D'INITIATIVE / AU BUREAU D'INFORMATION
una mapa de la ciudad *(a plan of the town)*
una fiesta *(a festival)*

COMMON QUESTIONS
¿a qué hora? *at what time?*
¿cuánto cuesta(n)? *how much does it/do they cost?*
¿cuánto es? *how much is it?*
¿cuánto vale(n)? *how much does it/do they cost?*
¿cuántos años tiene(s)? *how old are you?*
¿de qué color? *what colour?*
¿para/por cuánto tiempo? *for how long?*
¿qué día? *what day?*
¿qué fecha? *what date?*
¿qué hora es? *what time is it?*

COMMON ABBREVIATIONS
Sr (señor) *Mr*
Sra (señora) *Mrs*
Srta (señorita) *Miss*
Sta (santa) *St*
c/ (calle) *street*
1°/primero (2°, 3° etc) *1st (2nd, 3rd etc)*
1ª/primera (2ª, 3ª etc) *1st (2nd, 3rd etc*)
Dr (doctor) *Dr*
Dra (doctora) *Dr*
AVE, el *high-speed train*
Renfe/RENFE *Spanish railways*
IVA *VAT*
Avda (avenida) *avenue*
EEUU (Estados Unidos) *USA*

Completa/Rellena la tabla/el texto/el espacio
blanco en español.
Complete/Fill in the table/the text/the blank space in Spanish.
Completa la frase/las frases… ***Complete the phrase(s)/sentence(s)...***
Contesta a las preguntas en español. ***Answer the questions in Spanish.***
Da (dos) detalles... ***Give (two) details...***
Empareja… ***Match…***
Escribe la(s) letra(s) correcta(s) en cada casilla. ***Write the correct letter(s) in each box.***
Escribe la letra correcta/el número correcto en la casilla.
Write the correct letter/number in the box.
Escribe todos los detalles. ***Write all the details/Give full details.***
Escoge... ***Choose…***
Escucha la descripción/la opinión/la entrevista/ las noticias…
Listen to the description/the opinion/the interview/the news…
Indica… ***Indicate…***
Indica las…frases verdaderas. ***Indicate the …true phrases/sentences.***
Lee el texto / el artículo / la lista de actividades /
la lista de instrucciones / la información.
Read the text/the article/the list of activities/the list of instructions/the information.
Lee lo que dicen… Re***ad what they say…***
Menciona una ventaja/desventaja… ***Mention one advantage/disadvantage…***
No es necesario escribir con frases completas. ***It is not necessary to write in full sentences.***

Escribe:
P si la opinión es positiva
N si la opinión es negativa
P+N si la opinión es positiva y negativa
Write :
P if the opinion is positive
N if the opinion is negative
P+N if the opinion is positive and negative
Puedes escribir la misma letra más de una vez. ***You can use the same letter more than once.***
¿Quién…? ***Who…?***
Responde a las dos partes de la pregunta. ***Answer both parts of the question.***
Selecciona/Escoge el párrafo… ***Select/Choose the paragraph…***
Escribe aproximadamente 90 palabras en español. Responde a todos los aspectos de la pregunta.
Write approximately 90 words in Spanish. Write something about each bullet point.
Escribe aproximadamente 150 palabras en español. Responde a los dos aspectos de la pregunta.
Write approximately 150 words in Spanish. Write something about both bullet points.
Escribe cuatro frases en español que describan la foto.
Write four sentences in Spanish about the photo.
Escríbele sobre… ***Write to him/her about…***
Escríbele una carta/un email. ***Write a letter/email***

Paper 1: Listening

What's assessed?
Understanding and responding to different types of spoken language
How it's assessed
•• Written exam: 35 minutes (Foundation Tier),
45 minutes (Higher Tier)
•• 40 marks (Foundation Tier), 50 marks (Higher Tier)
•• **25% of GCSE**
(Each exam includes 5 minutes' reading time of the question paper before the listening stimulus is played.)
Questions
Foundation Tier and Higher Tier
•• Section A – questions in English, to be answered in English or non-verbally
•• Section B – questions in French, to be answered in French or non-verbally

Higher Tier
•• Question 1 – structured writing task (student responds to four compulsory detailed bullet points, producing approximately 90 words in total) – there is a choice from two questions – 16 marks
•• Question 2 – open-ended writing task (student responds to two compulsory detailed bullet points, producing approximately 150 words in total) – there is a choice from two questions – 32 marks
•• Question 3 – translation from English into Spanish (minimum 50 words) – 12 marks

Paper 2: Speaking

What's assessed?
Communicating and interacting effectively in speech for a variety of purposes
How it's assessed
•• **Non-exam assessment**
•• 7–9 minutes (Foundation Tier) + preparation time
•• 10–12 minutes (Higher Tier) + preparation time
•• 60 marks (for each of Foundation Tier and Higher Tier)
•• **25% of GCSE**
Questions
Foundation Tier and Higher Tier
The format is the same at Foundation Tier and Higher Tier, but with different stimulus questions for the Photo card and different stimulus materials for the Role-play. The timings are different too:
•• Role-play – 15 marks (2 minutes at Foundation Tier; 2 minutes at Higher Tier)
•• Photo card – 15 marks (2 minutes at Foundation Tier; 3 minutes at Higher Tier)
•• General conversation – 30 marks (3–5 minutes at Foundation Tier; 5–7 minutes at Higher Tier)

Guide to listening / reading exams… (Higher)

Paper 3: Reading

What's assessed?
Understanding and responding to different types of written language
How it's assessed
•• Written exam: 45 minutes (Foundation Tier),
1 hour (Higher Tier)
•• 60 marks (for each of Foundation Tier and Higher Tier)
•• **25% of GCSE**
Questions
Foundation Tier and Higher Tier
•• Section A – questions in English, to be answered in English or non-verbally
•• Section B – questions in Spanish, to be answered in French or non-verbally
•• Section C – translation from Spanish into English (a minimum of 35 words for Foundation Tier and 50 words for Higher Tier)

Paper 4: Writing

What's assessed?
Communicating effectively in writing for a variety of purposes
How it's assessed
•• Written exam: 1 hour (Foundation Tier),
1 hour 15 minutes (Higher Tier)
•• 50 marks at Foundation Tier and 60 marks at Higher Tier
•• **25% of GCSE**
Questions
Foundation Tier
•• Question 1 – message (student produces four sentences in response to a photo) – 8 marks
•• Question 2 – short passage (student writes a piece of continuous text in response to four brief bullet points, approximately 40 words in total) – 16 marks
•• Question 3 – translation from English into Spanish (minimum 35 words) – 10 marks
•• Question 4 – structured writing task (student responds to four compulsory detailed bullet points, producing approximately 90 words in total) – there is a choice from two questions – 16 marks

GCSE Business Studies (Edexcel)

BUSINESS: *Creating informed, discerning employees, consumers and future leaders*

Topic 2.2.5 Marketing Mix & Decision Making

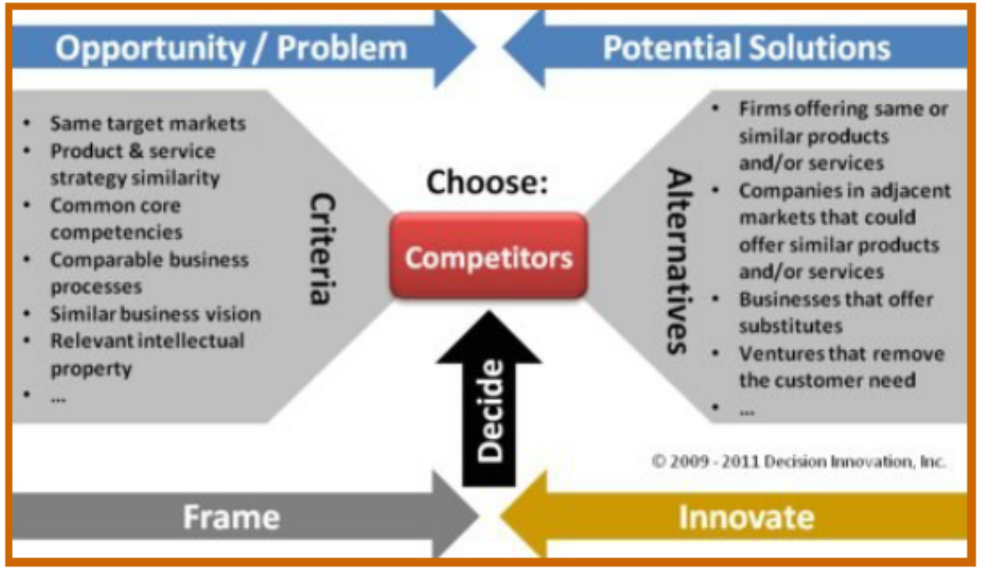
Core Knowledge

Each element of the marketing mix can influence another

- **Product** design can influence the **price** charged, especially if costs increase
- The type of **product** will affect the distribution channel (**place**) used; if e-tailing is to be used, the **product** will need to be designed so that posting is easy
- If the business wishes to charge a premium **price**, it will need to use premium retailers (**place**) and use **promotion** strategies that enhance this message of quality
- **Promotional** offers may lower **price**
- A **distribution channel** that uses wholesalers and retailers will increase the **price**

Building competitive advantage:

- **Product** – unique features, quality, design
- **Price** – selling at the cheapest price in a market
- **Promotion** – creating a memorable or catchy campaign can make a product stand out
- **Place** – more stores that rivals, effective websites



Topic 2.2.5 Marketing Mix & the Competitive Environment

Core Knowledge

The term *competitive environment* refers to the pressure placed on a business by its competitors. Businesses that operate in a *mass market* have a tough competitive environment as there are many other businesses offering very similar products and services. This means that if a business charges too much then its customers will go elsewhere. An example of a business that operates in a mass market is the fast food industry.

Businesses adapt their *marketing mix* to try to convince customers that their product is better than the products of their competition. The aim of these adaptations is to gain a *competitive advantage*. They can do this by:

- offering a product or service that fills a *gap in the market*
- offering better sales promotions, such as buy one get one free (BOGOFF), online discount codes or *cashback*
- creating a *unique selling point (USP)*
- developing relationships with existing customers to make them more likely to buy again

Topic 2.2.5 Marketing Mix & Changing Consumer Needs

Core Knowledge

Consumer needs change over time – this can be the result of technological improvements or of changes in people's knowledge and priorities, such as new information about eating healthily. This means a business must adapt its *marketing mix* to continue to be effective at meeting its customers' needs. For example, companies may announce they are reducing the amount of plastic in their packaging to show they are thinking about their impact on the planet. Another example is the increase in popularity of vegan diets and cruelty-free products.

One common trend is the need for *convenience*. Businesses have had to alter their marketing mix by developing or adapting new or existing products to suit this consumer need. An example of convenience is a restaurant chain offering ready-made versions of its meals in supermarkets, allowing consumers to eat the food they enjoy, but at home.

Some ways businesses adapt to changing consumer needs are:

- **introducing new products**, eg releasing smoothies to replace the need for people to eat individual pieces of fruit
- by **changing the selling price of products** or bringing out budget products to match the state of the economy - eg during a *recession, customers will spend less money and businesses may need to reduce their prices or develop a budget range to encourage customers to continue to purchase*
- **opening new retail outlets** to provide greater convenience to customers
- introducing *m-commerce and e-commerce to the business to meet customer expectations*

GCSE Business Studies (Edexcel)

BUSINESS: *Creating informed, discerning employees, consumers and future leaders*

Topic 2.3.1 Business Operations

Core Knowledge

The purpose of production is to create **goods** and **services**

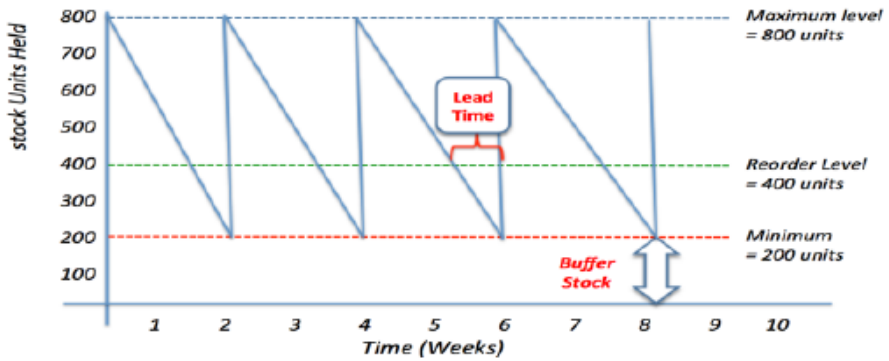
Production Method	Advantages	Disadvantages	Examples
Job	Unique products High quality Higher prices	Need highly skilled workers Lengthy process Higher cost per unit	Tailoring, bridg-es, Olympic Stadium
Batch	Variety and choice for customers Materials purchased in bulk, lowering production costs	Work is repetitive Equipment must be cleaned after each batch	Bread, clothing
Flow	Bulk buyer leads to lower unit costs Production 24/7	High capital investment Less flexibility to adapt products Very repetitive work	Canned food, bottled drinks

Impact of technology:
Lower costs in long term due to lower labour costs; improved quality so less wastage
Increased productivity due to no breaks or holidays
Improved quality / consistency
Lower costs can lead to competitive prices

Topic 2.3.2 Working with Suppliers

The operations department has a role to ensure that there is enough stock to meet demand, so they must work closely with suppliers as well as managing the stock that is in the business effectively.

The amount of stock held is shown in a bar gate graph:



Benefits of JIT	Limitations of JIT
Less storage space needed saving costs Fresher produce due to more frequent deliveries Less capital tied up in stock	Greater risk of running out and disappointing customers No bulk-buying discounts

Topic 2.3.3 Managing Quality

Core Knowledge

Quality is about meeting a minimum standard to satisfy customer expectations

Quality control

Finished goods are inspected
Checks for defects rather than preventing them
Costly as it can lead to a high level of wastage
Workers less involved in process so may be less motivated

Quality assurance

Quality is checked at every stage in the production process – more time consuming, but defective products are dismissed before being completed
Aims to prevent defects
Staff need training – costly in short term; more motivating in long term

Importance

Lowers costs through less wastage
As production costs lower, profit margins increase
Quality can improve reputation and build brand loyalty leading to a competitive advantage

Topic 2.3.4 Sales Process

Core Knowledge

To succeed in the sales process the following need to be provided:

- Strong **product knowledge** and therefore helpful advice from staff
- Speedy and efficient service
- Customer **engagement**
- Responses to **customer feedback**
- Excellent **post-sales service**

Benefits of good customer service:

- Customers feel valued, are loyal and more likely to repeat purchased
- Harder for competitors to steal customers if they are loyal
- Satisfied customers tell others – this could attract more customers to the business
- Satisfied customers can create a positive working environment and make a business a reputable employer
- Developing a reputation for good customer service can develop into a competitive advantage

Topic 2.4.1 Business Calculations

Core Knowledge

Average Rate of Return, Gross Profit and Net Profit

Average Rate of Return—how much a business will make or lose as a proportion of the original investment

Step 1: Calculate the **average annual profit** =
total profit / number of years
Step 2: Calculate the **aveage rate of return %** =
(average annual profit / cost of investment) X 100

The bigger the average rate of return (%) the more successful the investment

Gross Profit—the profit a business makes after the costs of making the product (**costs of sales**) has been taken from the revenue. **Gross Profit** =
Revenue - Costs of Sales

Net Profit—the profit a business makes after all of the costs and **expenses** (wages, salaries, rent, bills) have been taken away from the revenue. **Net Profit:**
Gross Profit - (Other expenses + interest)

Profitability Ratios

Profit Margins - Measures how much out of every £1 a business makes in profit

Gross Profit Margin (%) = (gross profit / sales revenue) X 100

Net Profit Margin (%) = (net profit / sales revenue) X 100

It is hard to say if the business is performing well based just on the profitability ratios, you need to know the type of business and how long it has been established to see if it's a good or poor profit margin

Don't be a "man on the street"

- Remember not all investments will be profitable
- Even if an investment is not profitable, this does not mean a business should dismiss it – it may be needed to maintain a competitive position
- A business can not lose profit – it makes a profit OR a loss
- A loss in one year does not always indicate failure – this may be due to high one-off costs

Topic 2.4.2 Understanding Business Performance

Core Knowledge

Data can be figures or visually represented. The most common types of visual representation are graphs.

	Line graphs	Bar charts	Pie charts
Pros	Good for data shown over many time periods and for comparisons with how one factor affects another	Good for data over 2-3 time periods Good for comprising size / number of serval different items	Good for showing proportions
Cons	Too many lines can be confusing Assumptions can be made about trends continuing	Cannot be easily used to compare data over many time periods	Show big differences clearly but not small differences Cannot show trends over a number of years

A business can use a variety of data:
Financial data – profit margins, profit levels, ARR, break-even point, cash flows
Marketing data – analysis of sales figures, market research data
Market data – analysis of data such as market size, changes in market size, figures for difference segments

Limitations of data:
A need to understand why trends are happening and the causes of these trends
Bias can be in place when interpreting data
Some numbers will be estimates not facts

Don't be a "man on the street"

- Remember that data may be biased or unreliable – always check the source
- One set of data alone is not much help – a business will need to compare to previous years or competitors to put the data into context
- Financial data alone is not the whole picture – consider what external factors may have caused a change, as well as HR and Marketing data
- Don't confuse market data and marketing data

The Fundamentals of Art

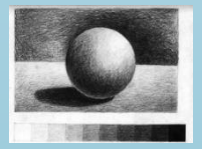
ESSENTIAL EQUIPMENT:
- PENCIL PACK (2B, 4B, 6B ETC)
- ERASER
- SHARPENER
- SKETCHBOOK

OPTIONAL EQUIPMENT:
- DRAWING PENS
- WATERCOLOUR SET
- WATERCOLOUR PENCILS
- PAINTBRUSHES

THE FORMAL ELEMENTS:

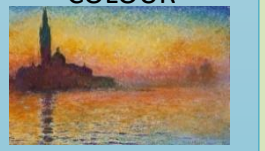
LINE

TONE



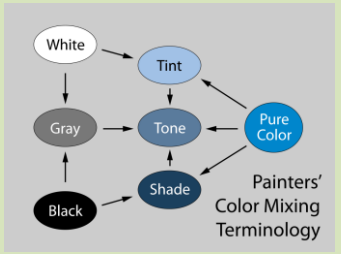
SHAPE/FORM

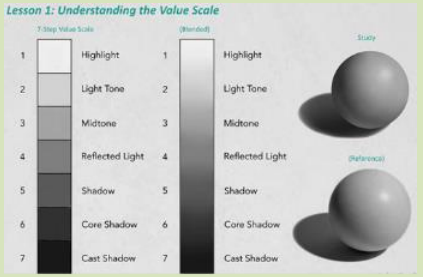
COLOUR

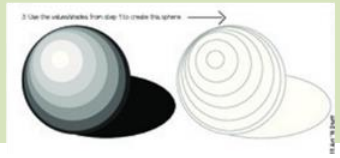


TEXTURE

PATTERN







ATTITUDE

Be positive and try your best!

RESPECT

Respect others, work and the room

THINK

Understand and demonstrate.

IMAGIINE

Be creative, use you imagination!

SPOTLESS

Tidy up after yourself.

TARGET

Follow directions.

COLOUR
BRIGHT
BOLD
VIBRANT
PRIMARY
SECONDARY
TERTIARY
RADIANT
VIVID
DULL
CONTRASTING
COMPLIMENTARY
HARMONIOUS
MONOCHROME
NATUARL
SATURATED
PASTEL
COOL
WARM

LINE
FLUENT
CONTINUOUS
CONTROLLED
LOOSE
POWERFUL
STRONG
ANGULAR
FLOWING
LIGHT
DELICATE
SIMPLE
THICK
THIN
BROKEN
OVERLAPPING
LAYERED
MARK MAKING

SHAPE/FORM/SPACE
CLOSED
OPEN
DISTORTED
FLAT
ORGANIC
POSITIVE
NEGATIVE
FOREGROUND
BACKGROUND
COMPOSITION
ELONGATED
LARGE
SMALL
2D
3D
TWISTED
JAGGED

PATTERN AND TEXTURE
REPEATED
UNIFORM
GEOMETRIC
RANDOM
SYMMETRICAL
SOFT
IRREGULAR
UNEVEN
ROUGH
BROKEN
GRID
FLAT
WOVEN
ORGANIC
SMOOTH
ABSTRACTED

TONE
BRIGHT
DARK
FADED
SMOOTH
HARSH
CONTRASTING
INTENSE
SOMBRE
STRONG
POWERFUL
LIGHT
MEDIUM
DARK
LAYERED
DEPTH
DEVELOPED
SOFT

AO1 EXPLORE
DEVELOP
DEVELOP IDEAS
INVESTIGATE & RESEARCH OTHER ARTISTS WORK
ANALYSE
ANNOTATE

AO2 REVIEW
REFINE
EXPERIMENT
EXPLORE DIFFERENT IDEAS AND MEDIA
A RANGE OF TECHNIQUES & PROCESSESS
SELECT
IMPROVE

AO3 EVIDENCE
RECORD
PRESENT IDEAS
PRIMARY OBSERVATION
DRAWING, PAINTING, PRINTING, PHOTGRAPHY, WRITING, PHOTPGRAPY...
ANNOTATE
DIFFERENT MEDIA

AO4 OUTCOME
PRESENT
FINAL IDEAS
DEVELOPED AS PLANNED
CLEARLY RESPONDS TO ARTISTS EXPLORED
CONNECTION
CONCLUSION

ART ANALYSIS GUIDE

CONTENT/DESCRIPTOPN OF AN IMAGE

- What is it? (portrait/landscape/painting/mixed media etc)
- What is it about? What is happening? (describe the contents)
- Type of image? (black and white/colour/pencil etc)
- What is the theme of the image? Is there a greater meaning to the image?
- What message does the image communicate?
- Do you the year of the piece? What was happening in the world at the time? Does that have an influence on the piece?

PERSONAL OPINION

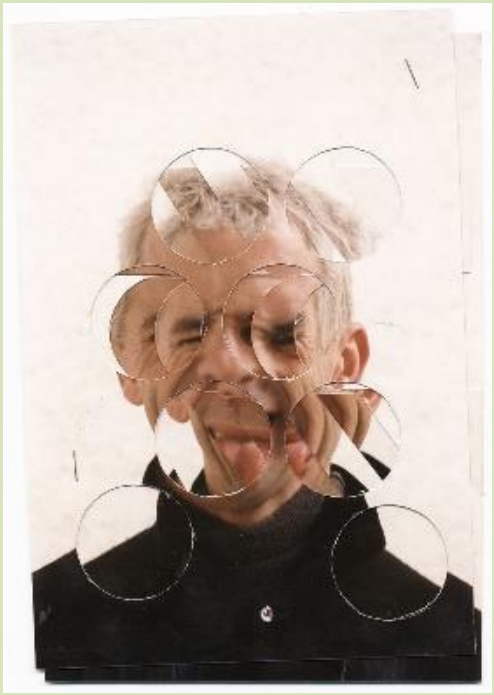
- What was your first reaction?
- What is the mood of the image?
- What is the message of the image?
- What do you like or dislike and why? Use art specific language and justify your opinions.
- How does the image make you feel? Why do you think you feel like this?
- Does the colour, texture, form, detail, tone or theme of the image affect your mood? How and why?

PROCESS

- What type and direction of light was used/created? (harsh, soft, artificial lamp/natural lighting)
- How was this image 'built'?
- What kind of patterns and/or textures are in the image? How would you describe them?
- Describe the use of tone/texture/detail/scale/ perspective/composition/colour within the image.

FORM/VISUAL ANALYSIS

- What do you look at first?
- How does your eye move around the frame?
- How is the image composed: lines, shapes, areas of tone?
- What was the artist's viewpoint? (worms eye view/birds eye view)
- Tone – is the image high or low contrast? How and why?
- Line – describe the lines in the image? How have they been positioned in relation to the rest of the composition? What effect does his have?



MAJOR PROJECT AND EXAM UNIT

Your major project title will be given to you in lessons with the sub-themes of; PEOPLE, PLACE and PATTERN.
Your exam unit will be given to you in January.
You will have scope within these titles to work more independently.

Artists you could research:
Jon Measures
John Piper
Billy Kidd
Elly Smallwood
Georgia O'Keeffe
Liz Orton
David Hockney
Yayoi Kusama
Helen Ahpornsiri
Mat Collishaw
Micheal Brennand-Wood
Angie Lewin
Henry Moore
Jean Faucheur
Polly Morgan
David Theron
Kehinde Wiley
Abigail Reynolds
Alexander Calder

MONOPRINT

PHOTOGRAPHY

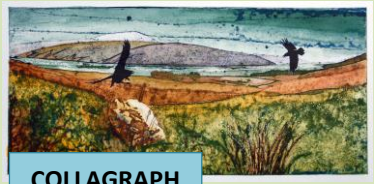
LINO PRINT

PAINTING

SCREEN PRINT

PEN AND INK

COLLAGRAPH

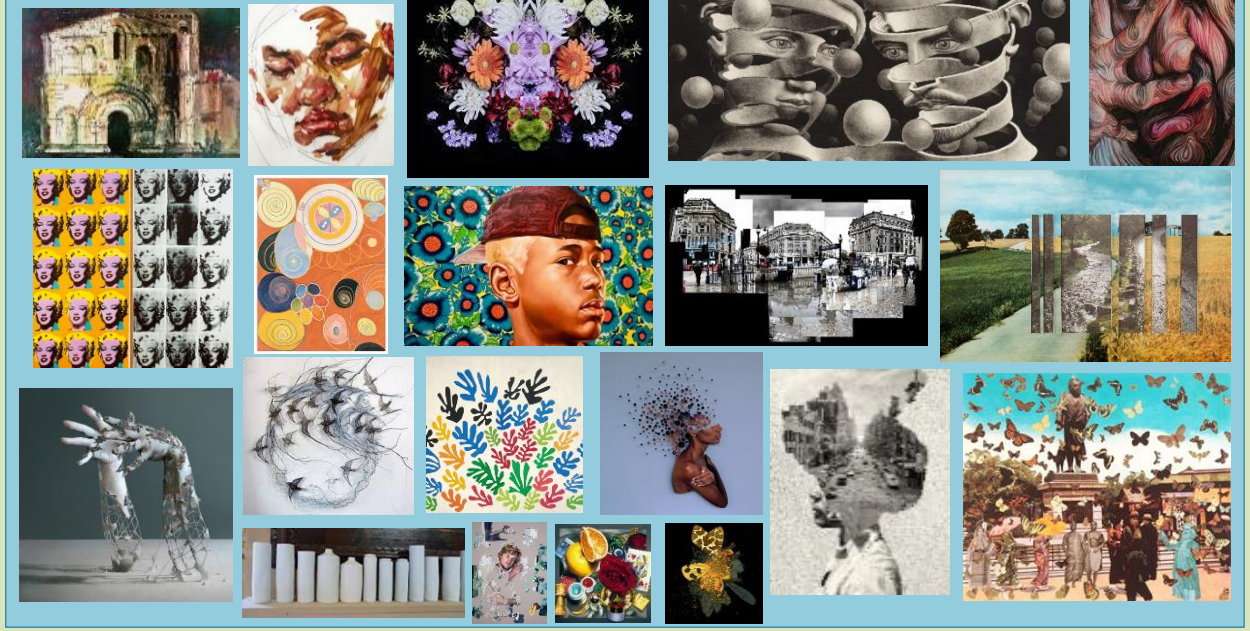


MIXED MEDIA

PHOTOSHOP

EXPERIMENTAL DRAWING

Example outcomes



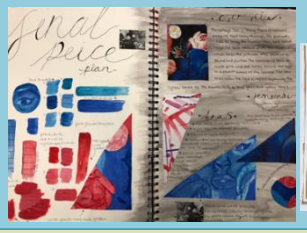
AO1

AO2

Strong sketchbook presentation

AO3

AO4



MAJOR PROJECT AND EXAM UNIT

This sketchbook plan is the MINIMUM required for this (and most) projects. If you have gaps in your work please attend catch up sessions.

1. MOOD BOARD/MIND MAP: an initial starting point of images and keywords for your theme.
2. GENRE PAGE (EXTRA TASK): 4-8 different 'mini' artist analysis sections. Choose artists from your knowledge organiser, one or two images per artist and a short sentence about them and their work.
3. INITIAL IDEAS: This is a written paragraph setting out your intentions for your project; artists you'll look at and why, materials you want to work with, any greater theme or meaning you would like to explore. There is a support booklet on RM Unify, Art if needed.
4. ARTIST ANALYSIS 1: Including studies in the style of the artist's work. This should be an in depth research page looking at an artist linked to your theme. Include: images, your own work in the style of the artist, information and opinion. Use you art analysis guide in your knowledge organiser.
5. PHOTO SHOOT 1: This shoot should be linked to or inspired by all previous research and/or artist 1. You must present annotated contact sheets, 3-6 larger images to show critical analysis of images and annotation. You should have a small shoot plan to accompany this shoot.
6. STUDIES FROM SHOOT 1: This should be a minimum of a double page/3-8 drawings, paintings, pen, ink, collage, mixed media, printing, Photoshop, anything in response to your photo shoot.
7. RECORDING AND EXPERIMENTATION: Drawing, painting, collage, printing, mixed media, mono-prints, poly-prints, lino cuts, manual manipulations of photos. This work links to both AO2 and AO3.
8. ARTIST ANALYSIS 2: Including studies in the style of the artist's work. This should be an in depth research page looking at an artist linked to your theme. Include: images, your own work in the style of the artist, information and opinion. Use you art analysis guide in your knowledge organiser.
9. BIRO/PEN STUDIES FROM SHOOT 1: 3-5 smaller studies or 2/3 smaller studies and one larger study in biro or fine liner pen from images from shoot 1.
10. PHOTOSHOP/PIXLR E (www.pixlr.com/e): Using either digital platform to create 3-5 digital experimentations. Layer images together, use filters, alter colours and compositions.
11. STUDIES FROM PHOTOSHOP: Experiments can be created using any media of your choice. Aim to complete 3-5 studies, ranging from A5 to A3.
12. PHOTO SHOOT 2: This shoot should be linked to or inspired by all previous research and/or artists. You must present annotated contact sheets, 3-6 larger images to show critical analysis of images and annotation. You should have a shoot plan to accompany this photo shoot.
13. ARTIST ANALYSIS 3: Including studies in the style of the artist's work. This should be an in depth research page looking at an artist linked to your theme. Include: images, your own work in the style of the artist, information and opinion. Use you art analysis guide in your knowledge organiser.
14. STUDIES FROM PHOTO SHOOT 2: This should be a minimum of a double page/3-8 drawings, paintings, pen, ink, collage, mixed media, printing, Photoshop, anything in response to your photo shoot.
15. PLANNING FOR FINAL OUTCOME: This should include 3 different sketched plans, paint trials, exploration of colour schemes and/or mark making to be used within your final outcome. You need to make clear notes about each idea showing a clear understanding of how your ideas link to your book work. This should be roughly 2-3 pages.
16. FINAL OUTCOME PRACTICE PIECE: This is a smaller piece to be completed in your sketchbook/for your boards where you fully explore and practice using the materials and techniques you plan to use for your final outcome.
17. FINAL OUTCOME: A final piece to be completed.

ASSESSMENT OBJECTIVES SPECIFICS

AO1
AIM TO HAVE AT LEAST 4-8 DIFFERENT ARTIST ANALYSIS PAGES (THESE CAN BE SMALLER INSERTS TO EXPERIMENTS)

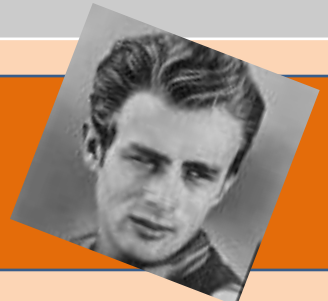
AO2
YOU SHOULD DEMONSTRATE A WIDE RANGE OF EXPERIMENTAION. AIM TO EXPLORE AT LEAST 6 OF THE EXPERIMENTAION EXAMPLES ON THIS PAGE.

AO3
YOU NEED TO SHOW INITIAL DRAWINGS/STUDIES EXPLORIONG THE WORK OF YOUR ARTISTS. YOU MUST HAVE A PHOTOGRAPHY ELEMENT – PLEASE CONTINUE TO DEVELOP STUDIES FROM SHOOTS.

AO4
YOU MUST INCLUDE AT LEAST 3-5 DIFFERENT FINAL OUTCOME IDEAS, SKETCHED WITH NOTES. THIS MUST INFORM YOUR FINAL OUTCOME WHICH SHOULD BE REFLECTED ON THROUGH AN EVALUATION AFTER IT IS COMPLETE.

FILM STUDIES YR 11 - TERM 3 – COMPARATIVE US FILM AND FILM TECHNOLOGY

KEY TERMINOLOGY	EXPLANATION
HOLLYWOOD	**Hollywood** is a neighbourhood in the central region of Los Angeles, California. Its name has come to be a shorthand reference for the U.S. film industry and the people associated with it. Many of its studios such as Disney, Paramount Pictures, Warner Bros., and Universal Pictures were founded there; Paramount still has its studios there.
CINEMATOGRAPHY	Includes all on screen VISUAL elements, such as: lighting, framing, composition, camera movement, camera angles, depth of field/focus, zoom and colour pallette
COMING OF AGE	Coming of age films portray **the feeling of growing up and moving from one part of your life to the next that every audience can relate to**. Even in the most obscure film set in another country or time in history, the audience can still reflect upon their own experiences in relation to the characters.
MISE-EN-SCENE	**Mise en scène** is the arrangement of scenery and stage properties in a play. Translated from French, it means "setting the stage" but, in film analysis, the term mise en scene refers to everything in front of the camera, including the set design, lighting, and actors. Mise en scene in film is the overall effect of how it all comes together for the audience.
MCCARTHYISM	a vociferous campaign against alleged communists in the US government and other institutions carried out under Senator Joseph McCarthy in the period 1950–4. Many of the accused were blacklisted or lost their jobs, though most did not in fact belong to the Communist Party. An era of Communist paranoia.
VERISIMILITUDE	A **film** has **verisimilitude** if it seems realistic and the story has details, subjects, and characters that seem similar or true to real life, or mime convincing aspects of life in important or fundamental ways. Basically, true to life/believable.
CONTINUITY	the principle of making sure that all details in a **film** or TV show are consistent from shot to shot and from scene to scene.
JUXTAPOSITION	**Juxtaposition** is a **film** editing technique that combines two or more shots to generate ideas or create thoughts. The intended impact of this is to create contrast for emphasis.
SOUND/SOUNDSCAPE	A **soundscape** is a sound or combination of sounds that forms or arises from an immersive environment. ... Crucially, the term **soundscape** also includes the listener's perception of sounds heard as an environment: "how that environment is understood by those living within it" and therefore mediates their relations.



FOR MORE INFORMATION ON ALL THINGS FILM, PLEASE VISIT
https://www.filmsite.org/filmhistory-overview.html

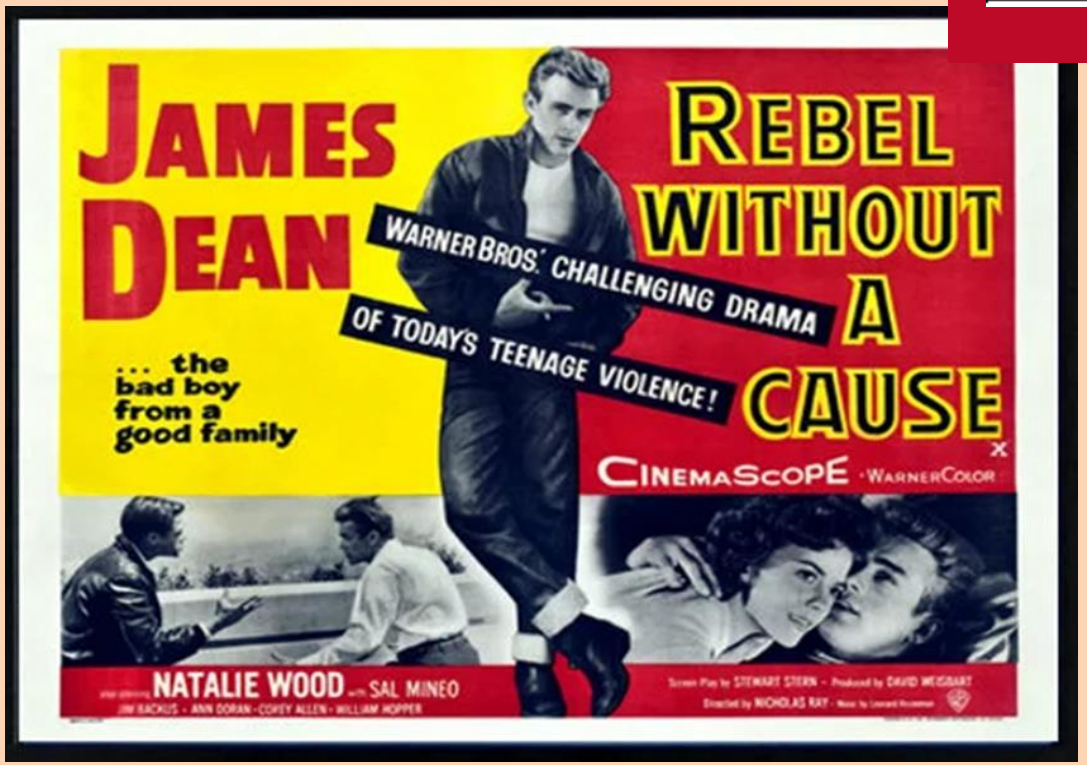
COMPONENT 1 – COMPARATIVE US FILM

REBEL WITHOUT A CAUSE

Institutional Information
1. Director – Nicholas Ray
2. Year of release – 1955
3. Production company – Warner Brothers
4. Star marketing – James Dean and Natalie Wood

Narrative
1. Narrative –the method and means by which you construct the events of a story into a plot
2. Narrative structure - Follows a five act structure
3. Narrative viewpoint – Teen POV. A mistrust of authority figures, parents are overtly criticized for being too weak, or too dominant, they can't win at all. But this message clearly appeals to the target audience.
4. **Binary Oppositions** – create conflict – key oppositions are children vs. their parents and teenagers vs. adults

Context
1. Set in a suburb of **Los Angeles** in the early **1950s**
2. **1950s** – Considered the birth of the teenager
3. Young people had more money (a disposable income); products such as music, film and fashion were targeted at this group. They were powerful consumers and therefore a powerful 'voice' in consumerist America.
4. Better education, which led them to question the world.
5. It was a time of peace, so young men were not at war, a confusing era for young men who could not identify with their war time fathers or have a war to fight and prove themselves.
6. This new social group was considered by some as **threatening**, **unruly** and **out of control**, the film reflected and responded to this concern.
7. This film offers a **sympathetic representation of teenagers**, blaming the parents for their delinquency.
8. More people were **speaking out against inequality** and **civil rights** in this time. The film demonstrated the **desire for young people to do the right thing**. Jim wants to confess and desires justice, it is **the older generation that get in the way** of this, and they do not listen.



Key Characters	
Jim Stark	**Protagonist**. 'The Outsider'. Struggling with finding his place in the world. Wants to do what's right.
Judy	"He hates me." Craves love and affection from her father. "I'll never get close to anybody". Later falls in love with Jim.
John 'Plato' Crawford	Another 'outsider' character. Bullied and alone. His father is absent His mother leaves him for long periods of time. He too craves love and affection. The first gay teenager on film? Plato's sexuality is only ever inferred. Never commented on explicitly.
Buzz	The film's **antagonist**. The bully. A teen film genre character type. Provides an opposition to Jim for much of the film. Highlights Jim as the 'outsider'.
Frank Stark	Represented as unable to connect with his son. Unable to stand up for himself. Until the end: "I'll stand up with you."

COMPONENT 1 – COMPARATIVE US FILM
REBEL WITHOUT A CAUSE

Key Quotes	
"You're tearing me apart" – **Jim**	Significant line in the film. Shows the impact that his relationship with his parents is having on him.
"How can a guy grow up in a circus like that?" - **Jim**	Jim talking to Ray (Police Officer) at the start of the film. Gives the audience an insight into his family life.
"What does he know about man alone?"- **Plato**	This line gives the audience an insight into how Plato feels. He too feels alone in the world, abandoned by his parents and craving love and affection.
"Don't I buy you everything you want?" – **Frank Stark (Jim's Dad)**	Shows that his father associates buying his son material possessions with being a good parent. He can't understand why his son is misbehaving.
"If only you could've been my dad." – **Plato**	Plato sees Jim as a replacement father figure. Someone who looks out for him and is kind to him. Further supports the film's theme of parent/child relationships.
"You, you say one thing, he says another, and everybody changes back again." – **Jim**	All Jim really wants—and he really demands—from his parents is that they communicate. Tell the truth. Allow him to understand what they mean and, perhaps, come to a more incisive understanding of themselves in the process.
She'll outgrow it dear. It's just the age…It's the age when nothing fits." – **Judy's mother**	This is a close as any adult in the film comes to understanding the teenagers in the film and society in general.
"One thing I know is I never want to be like him." – Jim	Jim is angry with his father. He doesn't feel a connection with him and doesn't look up to him as an example of how to live his life. His worst fear is turning into him.

Key Element of Film Form	
Mise-en-scene – Use of the colour red in **costumes**.	Judy's dress and lipstick symbolise at the start her desire to stand out and be noticed. Jim's red jacket creates a connection to this idea and also comes to symbolise danger. Plato later wears the red jacket. It foreshadows his death. All three central characters wear red. Teenagers standing out.

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FILM STUDIES YR 11 - TERM 3 & 4 COMPARATIVE US FILM
WIDER SOCIAL, HISTORICAL AND POLITICAL CONTEXTS...

1950s AMERICA

The US became a world superpower after WW2. before the war, the US was the biggest economic power, but the government concentrated on problems at home rather than get involved in problems overseas. After the war, however, the US became far more involved across the globe to stop the Soviet Union (Russia) spreading its influence and its communist ideals.

The fear of communism was strong in America as it has a long tradition of opposition to any form of collective ownership. In the 1950s, a suspected communist in the US was treated with a high level of suspicion and fear – they were seen as an 'enemy of the state'.

At the end of WW2, another conflict began – The Cold War between Russia and America. This lasted for over 40 years . Each saw the other as an arch enemy and they built more and more nuclear weapons to defend themselves and deter the other from launching an attack. Young people growing up in the 1950s lived in fear of nuclear war.

Life in 1950s America was a paradox. The fear of the bomb, communism, invasion and the pleasures of prosperity all existed at the same time. Many Americans had more in terms of material wealth than they had ever had before; the more they had, the more frightened they were of losing it. These fears found their way into popular culture, especially in novels, TV programmes and films.

1980s AMERICA

If the 1950s were the true beginning of the Cold War, then the 1980s was the last full decade of this superpower confrontation. Although the fear of 'the bomb' was still there, it had continued at a desensitised lower level. There was some relief in the late 1980s, when President Reagan (USA) and Gorbachev (Russia/USSR/Soviet Union) eventually began the process for arms reduction which was concluded in 1991.

The 1980s was the decade that seemed to be about rewarding success and allowing people with money to keep more it. The reasoning was that the more money people had, the more they would spend – this investment would benefit businesses and, eventually their workers, meaning that everyone had a better deal in terms of economic growth. This did not happen – the gap between rich and poor grew. The symbol of this decade's approach to wealth was the 'yuppie' – a baby boomer (born between 1946 and 1964) with a college education, well paying job and expensive tastes. This character trope can be seen in many films of this decade.

The 1980s was a time when family dynamics and societal views changed to allow men and women to share the financial and domestic responsibilities within their family. The number of families grew and the number of lone parent families grew by 74%. The 1980s saw a huge rise in divorce rates. The 1950s 'culture of marriage' had turned into the 1980s 'culture of divorce'.

COMPONENT 1 SECTION C: GLOBAL NON-ENGLISH FILM

KEY TERMINOLOGY

KEY TERMINOLOGY	DEFINITION
INDEPENDENT	One that received less than 50% of its funding from one of the 'big six' major film studios; typically, with a relatively small budget, where the filmmaker gets to tell the story they want to tell in the way they want to tell it.
FILM PRODUCTION BUDGET	The money allowed to be spent on making the film project.
'BIG SIX' STUDIOS	Sony – Columbia (MGM & UA), 20th Century Fox, Walt Disney Pictures, Warner Brothers, Paramount Pictures, Universal Pictures.

For this part of the specification, you are asked to engage with some specialist writing based on the independent film that you are studying.

This specialist writing will be provided for you – you are not to choose/use your own. These are set by Eduqas (our Examination Board).

These extracts will not be available in the examination. You are not expected to learn them off by heart but you are expected to be aware of one or two key points.

You can use quotations but this is not compulsory.

For this aspect of the course, you have an opportunity to study films produced in the 21st century that have been made, and at least in some part funded, outside the Hollywood system. This section also allows a consideration of how institutional issues affect the kinds of films that are made.
Juno places young people and their experiences centre stage whereas *Hurt Locker* is set against the context of military conflict.

COMPONENT 1 SECTION C: GLOBAL NON-ENGLISH FILM

Characters	
Juno Macguff:	An intelligent, precocious, single-minded teenager, Juno is quick-witted, with an acerbic tongue and her use of sarcasm and snappy dialogue marks her out as being an especially unique character.
Paulie Bleeker:	In many respects the opposite of Juno; a much shyer, reserved person who is perhaps somewhat under the control of his mother. Also intelligent and ambitious-dedicated to his running and ultimately, Juno.
Vanessa Loring:	We are introduced to Vanessa as a very formal and almost person who is clearly desperate to have a child. Through various scenes we witness how natural she will be as a mother and that the breakdown of her relationship is no cause for her to stop wanting a baby of her own.
Mark Loring:	Generally regarded as a selfish and somewhat immature character who doesn't consider the feelings of others. His character development is interesting in that he seems to be a slightly different person each scene he's in, owing to the pressure of situation he's under causing him to behave in a variety of ways including a worryingly comfortable relationship with Juno.
Leah:	Juno's best friend and her rock throughout the film. She has her own opinions about what Juno should do, but besides learning that she likes older men, she is developed much as a character beyond the stereotypical 'best friend' role.

Context:
Made for a reported budget of $6.5-7.5 million, the film made over $230million worldwide.
Along with KNOCKED UP and WAITRESS, JUNO was another film released in 2007 films about women facing unplanned pregnancies.
Jennifer Garner accepted a lower salary than usual to prevent the film from exceeding its budget.
Cody collected stories of adoptees, birth parents and adoptive parents, including that of her then-husband, an adoptee who reunited with his birth parents after she wrote the film.
Much of Juno was based on Cody's own high school experiences: She dated a tic-tac-loving boy, she was best friends with a cheerleader and she used a hamburger phone identical to the one that appears in the film.
She also found inspiration in the story of a close friend who had become pregnant in high school and used details of her experiences, such as mistreatment from an ultrasound technician.
In 2008, after 17 students under sixteen in Gloucester, Massachusetts, Time magazine named the "Juno Effect", for glamorising teenage pregnancy.

Key vocabulary						
composition	semiotics	rebellious	adolescent	irresponsible	disparaging	verbose
mise-en-scene	symbolic	arrogant	distant	acerbic	contemptuous	palaverous
cinematography	visual metaphor	sarcastic	sophisticated	altruistic	idiosyncratic	periphrastic

COMPONENT 1 SECTION C: GLOBAL NON-ENGLISH FILM

JUNO

Themes/issues.	
Teenage pregnancy:	The key narrative element: Juno's unplanned pregnancy is the inciting incident for the film and something which every character in the film is affected by. The representation of Juno and her pregnancy are handled in a very positive way, with Juno being a mature and intelligent woman who takes charge of her own destiny.
Adults vs. teenagers:	Generally, this theme is seen throughout teen films in the form of conflict. In JUNO. we see that the adults, the Maguffs and the Lorings, are broadly not involved in conflict with the teenagers. Instead, we do see some individual scenes involving Juno and Mark Loring, Bren Maguff and Paulie's mum. In this way, it's somewhat different to other teen films and reflects how single-minded Juno is and how the film isn't as concerned with what adults say and do.
Coming-of-age:	Coming-of-age is a theme that shows a teenage character maturing or growing up in some way during the course of a film. The use of a 3 or 5 Act structure is usually employed to help show the development of a character's personality. In JUNO, we see this most notably through Juno who, whilst mature at the beginning of the film, takes responsibility for her actions and is much more honest about her feelings towards Bleeker by the end of the film. We also see her consider the nature of love and relationships beyond platonic friendship and casual sex, suggesting a sense of achieved maturity after the birth of her child.
Love:	A classic theme which is seen in various ways in the film; the romance between Juno and Bleeker, the platonic love between Juno and Leah, maternal love as demonstrated with Vanessa and the unborn baby as well as the paternal love between Mac and Juno.
Consequences:	Consequences refer to the idea of one thing leading to another; in the case of Juno, the consequence of her having unprotected sex with Bleeker is her pregnancy. Other significant consequences include Mark's reluctance to have a baby resulting in divorce with Vanessa and Juno seeing Vanessa in the mall having the consequence that Juno decides to continue with the adoption despite the separation of their marriage.
Selfishness vs selflessness	Throughout the film we see examples of Juno acting in selfish manner, whether that means pouring slushy into Bren's vase to spite her, her use of Mark as a way to comfort herself, her apparent use of Bleeker for sex or her nature in trying to handle things by herself. Other characters such as Mark are also somewhat selfish in their overall nature, but the adults are generally seen in the film as somewhat more selfless and wanting to help others. By the end of the film we see a Juno who is much more selfless, suggesting a growth and a maturity that was absent at the start of the film.

COMPONENT 1 SECTION C:
GLOBAL NON-ENGLISH FILM

JUNO

Key scenes	
AUTUMN: The opening scene http://bit.ly/junoks1	An establishing shot of Juno, THE chair and her house. The text on screen says Autumn and instantly tells the audience that the film will not only be split into 4 distinct sections but that the seasons are metaphorical for Juno's experiences in the next 9 months. The extreme long shot also features warm, ambient lighting and the overall appearance is that this is a welcoming scene that suggests the protagonist is alone, isolated and in some way connected with the props and location she shares the shot with. The close up of her face after this shot shows that Juno is confused, concerned or just deep in thought and the jump cut to the next scene, her and Bleeker just before they had sex, is inside, lit differently and shot from an entirely different perspective. These combine to make clear that this is a memory and is a direct, engaging way to open the film.
The Abortion Clinic http://bit.ly/junoks2	Teen pregnancy is a subject that other films have dealt with before openly discuss abortion as an option. Even in this film, Bren cannot bear to utter the word abortion later on and it's interesting to see then that we get an entire scene taking place both outside and inside of an abortion clinic. Outside the clinic, Su Chin protests and presented in an isolated way, standing alone. Juno briefly stops and chats but then proceeds to the clinic, also looking alone and isolated. Inside, the clinic is drab, the colour palette emphasising the lack of natural light. The receptionist is shot from a high-angle and Juno eventually leaves of her own volition, highlighting her power in the situation. The montage of extreme close-ups of others in the clinic is an interesting use of cinematography and editing to show Juno's discomfort in the situation.
Meeting the Lorings http://bit.ly/junoks3	First seen in montage, Vanessa is shot through a variety of tight close-ups that focus on her hands, adjusting and making her home seem more presentable. The montage is inter-cut with a montage of Juno's van passing large, imposing but impressive houses. Any one of these takes as individual shots show how large and impressive the houses are in scale compared to Juno and her van, suggesting a sense of superiority. The similarity of the houses also suggest the people inside are somewhat similar and lack personality or the individualism that we see in Juno. Interesting to note that there is a lot of foreshadowing used in this scene in relation to the Loring's relationship. For example, Vanessa opens the door alone and Mark doesn't come into the scene immediately. His reticence over the situation is clear; note his performance and the use of composition to help highlight this.
Juno tells Leah http://bit.ly/junoks4	The first shot is an ECU of Juno's fingers on the phone, indicating her anxiety about making the call, we then see Juno standing up, whilst Leah lies down showing how relaxed she is. Leah then sits up and the CU allows us to see her reaction to the news & to make clear their bond, Juno is seen in the next shot in a very similar manner in terms of composition-in the centre of the frame, shallow focus and facing broadly towards the camera. Both bedrooms are excellent in offering ideas relating to the characterisation of both people and offer insights into generic conventions and character types.
The Loring's Divorce http://bit.ly/junoks5	One of the more literal visual ideas in the film: when the Loring's are discussing their divorce, Vanessa sits at a table alone, emphasising her loneliness and foreshadowing her future. She sits opposite an empty chair, symbolic of the lack of a father-figure that Mark represents. There is the use of a table runner as a prop which also acts as a divider across the table, making clear that the couple are now strictly divided. Later in the scene, Mark joins the scene, but never sits at the table, indicating how he is no longer part of this family.

COMPONENT 1 SECTION C: GLOBAL NON-ENGLISH FILM

Author and title	Specialist writing A [Adapted from The Filmmaker's Eye: Learning (and breaking) the rules of cinematic composition by Gustavo Mercado, 2010	Specialist writing B [Adapted from Studying American Independent Cinema (pp. 18-19), by Rona Murray, 2011, Auteur]	Specialist writing C Juno - Get Real ' (Excerpt) Jim DeRogatis, Chicago Sun Times, January 2008)
Summary	Anything and everything in a shot is there for a reason and therefore important. Every shot matters, even if it doesn't seem to at first glance.	Independent films are different from mainstream films from major Hollywood studios. Audiences expect this and it means that 'Indie" films can do things that are unique in their story, style or purpose.	The film is not as good as others say. Teenagers do not talk like Juno and others in the film, Juno would make better decisions than have unprotected sex and the only honest (genuine) character is Mark.
Key quotes	"…anything and everything that is included in the composition or frame of a shot is there for a specific purpose." "The framing of a shot conveys meaning through the arrangement of visual elements." "Every shot counts no matter how inconsequential it may seem."	"…something that strays artistically from the norm ." "…independent cinema does not need to adhere to generic patterns…" "…challenges this cinematic form artistically and looks to create something individual in either its aesthetics or its ideological viewpoint, or both."	"The notion that kids — even smart and sarcastic ones — talk like Juno is a lie…" "Are we really supposed to believe that a girl as intelligent… neglects to bring birth control?" "…simplistic and insulting caricatures drawn by screenwriter Diablo Cody." "Bateman's Loring actually can be seen as a more honest…"

YR 11 FILM STUDIES THE NEA

NEA = 30% of whole GCSE (Production = 20%, Evaluative Analysis = 10%)

PRODUCTION:
An extract from a screenplay for a genre film (800 – 1000 words) and a shooting script of a key section from the screenplay (about 1 min of screen time about 1 page of screenplay)

PLUS…
Evaluative Analysis of between 750 – 850 words. This analyses your production in relation to other professionally produced films/screenplays.

The NEA must be individual – no group submissions are allowed. There are strict controls in place regarding supervision, support and ensuring no plagiarism/copying takes place.

WE ARE WORKING WITH CRIME GENRE

OUR QUALIFICATION IS CALLED EDUQAS GCSE FILM STUDIES https://www.eduqas.co.uk/qualifications/film-studies-gcse/

IMPORTANT INFORMATION ABOUT NEA

SCREENPLAY/SEQUENCE - GENRE OPENINGS

Musical forms and devices

Area of study 1 - Eduqas GCSE Music

Baroque era (1600-1750)

- Harpsichord
- Ornaments
- Terraced dynamics
- Basso continuo
- Small orchestra (mostly strings, plus some wind)
- Suite, sonata, oratorio, chorales, trio sonata
- **Bach, Handel, Vivaldi**

Classical era (1750-1810)

- Slightly larger orchestra
- Piano introduced
- Alberti bass
- String quartets
- Symphony, solo sonata, solo concerto
- Balanced, regular phrases
- **Haydn, Mozart, Beethoven**

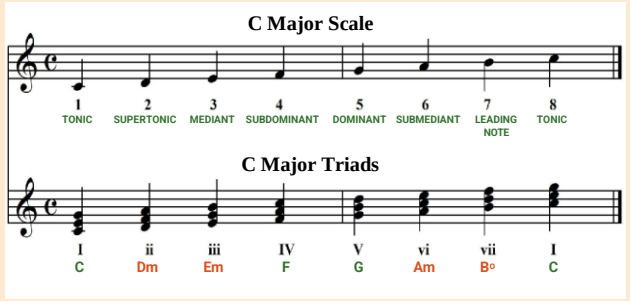
Romantic era (1810-1910)

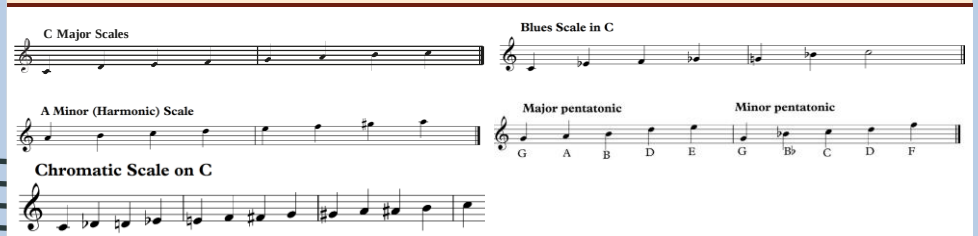
- Lyrical, expressive melodies
- Large orchestra
- Wider range of dynamics
- Richer harmonies and use of chromatic chords
- Programme music
- Opera symphony
- **Tchaikovsky, Grieg, Schumann, Dvorak, Brahms, Verdi, Wagner**

Scales and chords

A **CHORD** is a group of two or more notes played at the same time. A **TRIAD** has three notes. A **CHORD SEQUENCE/ PATTERN** is a series of chords. **DIATONIC HARMONY** is based on the chords of major/minor scales.

Primary chords I, IV, V
Secondary chords ii, iii, vi, vii





Form and structure

BINARY — **A B**
Two sections: A usually ends in a related key (e.g. dominant or relative minor), but B returns to the tonic. B will contain with some change/contrast.

TERNARY — **A B A**
Three sections: section B provides a contrast (e.g. new tune key change). A may return exactly or with some slight changes.

RONDO — **A B A C A**
A longer form: A returns throughout the piece, with contrasting sections called 'episodes', containing new ideas and using different keys.

MINUET AND TRIO — **II: AB: II II:CD :II AB**
The minuet was a type of graceful dance from the 17-18th century, and was often used as the 3rd movement in symphonies in the Classical era. The minuet had two repeated sections, the trio had two new repeated sections, with a return to the minuet at the end (no repeat).

VARIATIONS — **A a *A* *A*A**
The main theme (tune) is repeated and developed a number of times in a variety of different ways.

STROPHIC — **A A A**
A simple form where the song uses the same melody over and over.

Devices

Repetition	A musical idea is repeated exactly.
Imitation	An idea is copied in another part.
Sequence	Repetition of an idea in the same part at a higher/lower pitch.
Ostinato	A short, repeated pattern or phrase.
Drone	A long held or constantly repeated note(s).
Arpeggio/ broken chord	The notes of a chord played individually.
Alberti bass	A broken chord accompaniment (I,V,iii,V) common in the Classical era.
Anacrusis	An 'up-beat' or pick-up before the first strong beat.
Dotted rhythms	A rhythm using dotted notes (gives a 'jagged' or 'bouncy' type of effect).
Syncopation	Off beat accents.
Conjunct	Notes that move in steps.
Disjunct	Notes that move in leaps/ intervals.
Regular phrasing	Balanced parts of a melody (like the phrases in a sentence) e.g. four bar phrases.

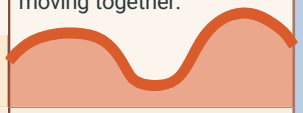
The two chords at the end of a phrase

Perfect	**V-I**	Strong ending – sounds 'finished'; a musical full stop.
Plagal	**IV-I**	Sounds finished but 'softer'; Amen.
Imperfect	**I-V, ii-V, vi-V**	Sounds unfinished.
Interrupted	**V-vi**	Moves to an unexpected chord; 'surprise'.

Music for ensemble

Area of study 2 - Eduqas GCSE Music

Texture

MONOPHONIC	A single melodic line. 
HOMOPHONIC	A chordal style or melody and accompaniment: moving together. 
POLYPHONIC	A more complex (contrapuntal) texture with a number of different lines. 
Melody and accompaniment	A tune with accompaniment (e.g. chords).
Unison	All parts play/sing the same music at the same time.
Chordal	The music moves in chords (e.g. like a hymn/ chorale).
Descant	A decorative, higher pitched line.
Countermelody	A new melody, combined with the theme.
Round	A short (vocal) canon.
Canon	The melody is repeated exactly in different parts but starting at different times, with parts overlapping.
Drone	Long held notes.
2-3-4 part texture	Textures which have 2/3/4 different lines.

Jazz and blues

Scat: vocal improvisation using wordless/ nonsense syllables.
Improvised: music made up on the spot.
Blue notes: flattened 3rd, 5ths, 7ths.
Syncopation: off-beat accents.
Call and response: a phrase played/sung by a leader and repeated by others.
Walking bass: bass line that 'walks' up and down the notes of a scale/arpeggio.
Swing style: 'jazzy' rhythm with a triplet/ dotted feeling.

A jazz ensemble may contain:
Rhythm section
- Drums
- Bass (guitar or double bass)
- Piano/guitar

'Horn section'
- Trumpet
- Trombone
- Saxophone

Some groups use a wider range of instruments e.g. clarinet, violin.

12 bar blues

Chords

I	I	I	I
IV.	IV	I	I
V.	IV	I	I/V

Example in C major

C	C	C	C
F.	F	C	C
G.	F	C	C/G

Chamber music

Chamber music was music for a small ensemble, originally played in a small room in someone's home.

Baroque: The **trio sonata** featured one or two soloists, plus **basso continuo** (which consisted of a low-pitched instrument such as a cello playing a bassline, with an instrument playing chords e.g. harpsichord).

Classical: String quartets (two violins, a viola and a cello) were popular. They had **four** movements, with the 1st movement usually in sonata form.

Romantic: Chamber music groups were more varied in the Romantic era, using a wider range of instruments (e.g. piano quintet, horn trio). Performances happened in larger concert halls as well as in small 'chambers'.

A piece of music for:

DUET	2 performers
TRIO	3 performers
QUARTET	4 performers
QUINTET	5 performers
SEXTET	6 performers
SEPTET	7 performers
OCTET	8 performers

Musical theatre

Musical numbers may include:
Solo: a song for one singer.
Duet: a song for two singers.
Trio: a song for three singers.
Ensemble: a song sung by a small group.
Chorus: a large group (usually the full company/cast).
Recitative: a vocal style that imitates the rhythms and accents of speech.
Overture: an orchestral introduction to the show, which usually uses tunes from the show.
The orchestra/band is used to **accompany** the voices and to **underscore**.

Voices

Soprano
Alto
Tenor
Bass

The band/orchestra (sometimes called the 'pit' orchestra), may use **strings, woodwind** (sometimes called 'reeds'), **brass** and **percussion** and/or a rock/pop band, depending on the style. Most shows also use keyboards or synths.

Film Music

Area of study 3 - Eduqas GCSE Music

Some film **SOUNDTRACKS** include specially composed **SCORES**, either for orchestra (e.g. composers like John Williams, Ennio Morricone) or songs written especially for the film (e.g. Disney films). Other films use pre-existing music e.g. popular songs from the era/place in which the film is set.

STRINGS
- Violin
- Cello
- Viola
- Double bass
- Harp

BRASS
- Trumpet
- Trombone
- French horn
- Tuba

PERCUSSION
- Bass drum
- Snare drum
- Triangle
- Cymbal
- Drum kit (untuned)
- Timpani
- Glockenspiel
- Xylophone (tuned)

WOODWIND
- Flute
- Clarinet
- Oboe
- Bassoon
- Saxophone

KEYBOARDS
- Piano
- Electronic keyboard
- Harpsichord
- Organ
- Synthesizer

OTHER
- Electric guitar
- Bass guitar
- Spanish/ classical guitar
- Traditional world instruments

Musical elements

Film composers use the **MUSICAL ELEMENTS** (tempo, texture, dynamics, timbre, tonality, rhythm, melody, harmony) to create mood and atmosphere to help to tell the story and enhance the action.

For example:

In a **sad, reflective scene,** a composer might use slow tempo, minor tonality, soft dynamics, legato, homophonic texture, long sustained notes, and a conjunct melody.

An **exciting car chase scene** in a thriller might have a fast tempo, busy, polyphonic texture, dissonant chords, loud dynamics, syncopated rhythms, a disjunct melody and short riffs.

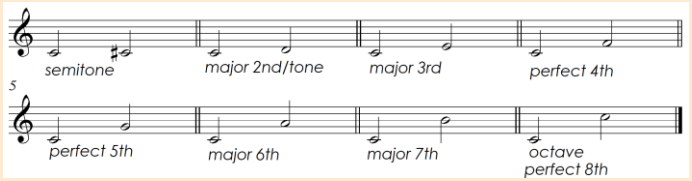
A scene where the **superhero 'saves the day'** might use a major tonality, brass fanfares, loud dynamics, accents, 4ths and 5ths (intervals).

Composers will often use **CONTRASTS** to create effect (e.g. using a wide range of pitch from very high to very low).

Intervals

Film composers often use intervals to create a particular effect (e.g. a rising perfect 4th sounds 'heroic', and a semitone can sound 'menacing').

An **interval** is the distance between two notes.



Rising interval: moving upwards (ascending)
Falling interval: moving downwards (descending)

Specific instrumental terms

Pizzicato	Plucking the strings.
Divisi	Two parts sharing the same musical line.
Double stopping	Playing two strings at the same time.
Arco	Using a bow to play a stringed instrument.
Tremolo	A 'trembling' effect, moving rapidly on the same note or between two chords (e.g. using the bow rapidly back and forth).
Tongued	A technique to make the notes sound separated (woodwind/brass).
Slurred	Notes are played smoothly.
Muted	Using a mute to change/dampen the sound (brass/strings).
Drum roll	Notes/beats in rapid succession.
Glissando	A rapid glide over the notes.
Trill	Alternating rapidly between two notes.
Vibrato	Making the notes 'wobble' up and down for expression.

Composers also use:

Theme	The main tune/melody.
Motif	A short musical idea (melodic or rhythmic).
Leitmotif	A recurring musical idea linked to a character/object or place (e.g. Darth Vader's motif in Star Wars).
Underscoring	Music playing underneath the dialogue.
Scalic	Melody follows the notes of a scale.
Triadic	Melody moves around the notes of a triad.
Fanfare	Short tune often played by brass instruments, to announce someone/something important; based on the pitches of a chord.
Pedal note	A long, sustained note, usually in the bass/ lower notes.
Ostinato/riff	A short, repeated pattern.
Conjunct	The melody moves by step.
Disjunct	The melody moves with leaps/intervals.
Consonant harmony	Sounds 'good' together.
Dissonant harmony	Sounds 'clashy'.
Chromatic harmony	Uses lots of semitones/accidentals that's not in the home key.
Minimalism	A style of music using repetition of short phrases which change gradually over time.

Popular Music

Area of study 4 - Eduqas GCSE Music

Popular music includes:

- **POP**
- **ROCK**
- **RAP**
- **HIP HOP**
- **REGGAE**

Plus many other genres, e.g. soul, ska, heavy metal, R&B, country, rock'n'roll.

FUSION: when two different styles are mixed together. This can be two styles of popular music e.g. 'rap metal', or could combine a popular music genre with other styles, folk-rock, gospel, world music, classical to create a new and interesting sound. **Jazz fusion** (jazz and pop) is a popular genre.

Instruments

ELECTRIC GUITAR:

- Lead guitar: plays the melody/ solos/riffs
- Rhythm guitar: plays the chords/ accompaniment.

BASS GUITAR: plays the bass line.
DRUM KIT: provides the beat.
LEAD SINGER: the main vocalist.
BACKING VOCALS: singers who provide harmony.

Pop/rock groups may also include **acoustic** (not electric) instruments e.g. trumpet, trombone, saxophone and/or electronic keyboards/synthesizers.

Features and techniques found in popular music

Riff	A short, repeated pattern.
Hammer on	Finger brought sharply down onto the string.
Pitch bend	Altering (bending) the pitch slightly.
Power chords	A guitar chord using the root and 5th note (no 3rd).
Distortion	An effect which distorts the sound (creates a 'grungy' sound).
Slap bass	A percussive sound on the bass guitar made by bouncing the strings on the fret board.
Fill	A short, improvised drum solo.
Rim shot	Rim and head of drum hit at same time.
Belt	A bright, powerful vocal sound, high in the chest voice.
Falsetto	Male voice in a higher than usual range.
Syllabic	One note sung per syllable.
Melismatic	Each syllable sung to a number of different notes.
A cappella	Voices singing without instrumental accompaniment.

The structure of a pop/rock song may include:

INTRO: short opening section, usually instrumental.
VERSE: same music but different lyrics each time.
CHORUS: repeated with the same lyrics each time (refrain).
MIDDLE EIGHT: a link section, often eight bars, with different musical ideas.
BRIDGE: a link/transition between two sections.
OUTRO: an ending to finish the song (coda).
*You may also hear a pre-chorus, instrumental interlude or instrumental solo.

***Strophic songs, 32 bar songs (AABA) and 12 bar blues are also found in popular music.**

A typical rock ballad in verse-chorus form could follow the pattern:

- Intro
- Verse 1
- Chorus
- Verse 2
- Chorus
- MiddleEight
- Chorus
- Outro

Technology

Amplified	Made louder (with an **amplifier**).
Synthesized	Sounds created electronically.
Panning	Moving the sound between left and right speakers.
Phasing	A delay effect.
Sample	A short section of music that is reused (e.g. looped, layered).
Reverb	An electronic **echo** effect.

COMPACT BACH AOS 1

Form and structure:

The piece is in **Binary** form (**AB**).

Section A is 16 bars long.

Section B is 24 bars long.

Each section is repeated (**AABB**).

Dynamics:

Mostly ***forte*** throughout, although no markings appear on the score.

On some recordings, **terraced dynamics** (sudden changes) are included.

Background details:

Composed by **Johann Sebastian Bach** (1685 – 1750), one of the main composers of the **Baroque** era in music.

Badinerie is the last of seven movements from a larger piece called **Orchestral Suite No.2**.

The piece was composed between **1738-1739**.

Harmony:

Diatonic; mixture of root position and inverted chords; uses V7 chords and a Neapolitan sixth chord.

Imperfect and perfect cadences are clearly presented throughout. Both sections end with a **perfect cadence**.

Metre and rhythm:

Simple duple time – 2/4 – with two crotchet beats in every bar.

Uses **ostinato rhythms** which form the basis of two short musical ideas (X and Y), consisting almost totally of **quavers and semi-quavers**.

Instrumentation:

Flute, string orchestra and harpsichord.

The score has five parts (flute, violin 1, violin 2, viola and cello). The harpsichord player reads from the cello line and plays the notes with their left hand whilst filling in the chords with their right hand.

Tonality:

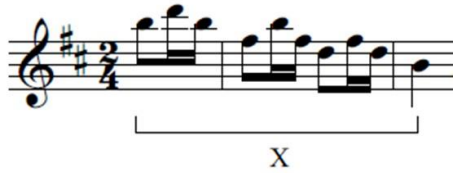
Section A begins in **B minor** (tonic) and ends in **F♯ minor** (dominant minor).

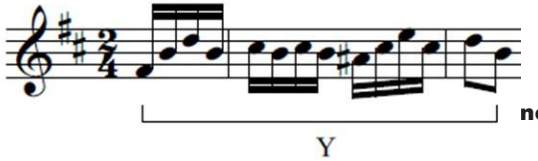
Section B begins in **F♯ minor** (dominant minor) and ends in **B minor** (tonic). Section A modulates from B minor through **A major** before arriving at F♯ minor.

Section B modulates from F♯ minor through **E minor, D major, G major** and **D major** before arriving at B minor.

Melody:

The movement is based on **two musical motifs**.





Both moti nct whilst mo

Typical **ornaments and compositional devices** of the period are used including **trills, appoggiaturas** and **sequences**.

Texture:

Homophonic: melody and accompaniment.

The flute and cello provide the main musical material; however, the 1st violin participates occasionally.

The 2nd violin and viola provide harmony with less busy musical lines.

Tempo:

The tempo is **Allegro** (quick, lively, bright), although not marked on the score.

Toto: Africa

Soft rock

COMPACT TOTO AOS 4

Form and structure:

The piece is in **strophic** or **verse-chorus** form.

1 – 4	5 – 39 / 14 – 39	40 – 57	58 – 65	66 – 82	40 – 92	93 – 96
4 bars	35 bars / 26 bars	18 bars	8 bars	17 bars	22 bars	4 bars

Metre and rhythm:

Simple duple time – 2/2 (split common time) – with two minim beats in every bar.

Uses distinctive **ostinato rhythms** for both riffs, consisting almost totally of **quavers**, with constant use of **syncopation**.

Vocal rhythm looks complex but follows the natural rhythm of the lyrics.

Background details:

Composed by band members **David Paich** and **Jeff Porcaro**.

Recorded by the American rock band Toto in **1981** for their fourth studio album entitled **Toto IV**.

Released in **1982** and reached number one in America on 5 February **1983**.

Genre: **soft rock**.

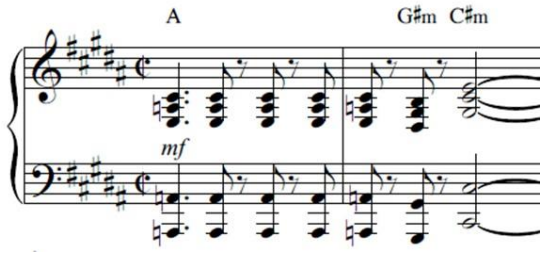
Instrumentation:

Rock band: drum kit with additional percussion, lead and bass guitars, synthesisers, male lead vocals and male backing vocals.

Harmony:

Diatonic; mixture of root position and inverted chords.

Riff a can be heard during the intro, verses, link sections, instrumental and outro. This riff uses a three-chord pattern: **A** – **G♯m** – **C♯m**.



Choruses use a standard chord pattern: **vi** (F♯m) – **IV** (D) – **I** (A) – **V** (E).

The **harmonic rhythm** (the rate of chord change) is mostly once

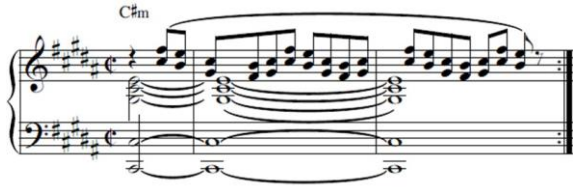
Dynamics:

Most of the song is ***mezzo-forte*** (moderately loud) whilst the choruses are ***forte***.

Melody:

Mostly **conjunct** (moving in step) with a **wide vocal range**.

Riff b uses the **pentatonic scale** (interpreted through E major):



Vocal improvisations occur towards the end of the song.

Texture:

Homophonic: melody and accompaniment.

Tonality:

The majority of the song is in **B major** whilst the choruses are all in **A major**.

Tempo:

The tempo is **moderately fast**.

Chapter 5: Socio-cultural influences

5.1 Engagement Patterns

Engagement patterns are the general trend of different social groups participation in physical activity and sport.

M	Media	Lack of TV coverage of female role models
I	Inclusiveness	Facilities may not run sessions for people with disabilities
R	Role Models	Lack of female role models in many sports
A	Attitudes	You may not play a sport because your friends don't like it.
C	Culture/ Religion	Family/peer influence on whether you do something. Religious festivals take precedence over playing sport
L	Leisure time	Less time available owing to work commitments
E	Education	School may not offer or have the facilities to play some activities.
S	Sexism/ Stereotyping	Some girls do not want to play football as they may be thought of as masculine. Some men do not want to dance or play netball as they think these activities are for females only.
S	Socio-economic/ Disposable income	Some people in minority groups have les money, someone without a permanent job will have less money.
A	Accessibility	Lack of facilities or clubs as well as physical barriers, lack of ramps, pool hoists.
F	Family	Family commitments, looking after younger siblings.
F	Familiarity	You may do activities the same as other members of your family.

5.1 Social Groups

Social group	General Information	Reasons affecting engagement patterns/ Barriers to participation
Gender	Gender groups are determined by a person's sex – male or female.	Role models, Media coverage, Sexism/ stereotyping, Funding, Body Image, Attitudes, Family Commitments, Accessibility
Age	People are split into groups based on their age: Children, teenagers, adults, retirees	Accessibility, Education, Socio-economic/ disposable income, Leisure time, Sexism/stereotyping
Socio-economic	A group's place within society.	Occupation, education, income, where you live, income
Ethnicity	Race/Religion/ Culture – People are grouped on their culture or specific origin.	Cultural influences, Religious festivals, Stereotyping, Socio-economic/disposable income, Family Commitments, Accessibility
Disability	A physical or mental condition that limits a person's movements, sense or activities.	Adaptability, Inclusiveness, Accessibility, Socio-economic/disposable income, Stereotyping, Media coverage, Role models
Family/Friends	You can be grouped by those you spend time with the most: parents, relations, guardians, friends, siblings, classmates	Attitudes, Role models, Cultural influences,

Key Vocabulary

Barrier to participation	An obstacle that prevents a group within society from participating in sport or physical activity and therefore reduces overall levels of participation
Engagement patterns	Trends/ tendencies in involvement
Ethnic group	A group of people who share common origins – be they racial, religious or cultural
Social group	People who interact with one another, share similar characteristics, and have a sense of unity/ togetherness
Stereotyping	Widely held but fixed and over simplified idea of a particular type of person
Discrimination	The unjust or prejudicial treatment of different groups of people, especially on the grounds of race or gender

5.2 Commercialisation

Sponsorship

A sponsor is an individual or group that provides support in the form of sponsorship in return it is seen by millions, via advertising, sponsorship and endorsement

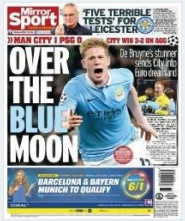
It can be for:

- An individual (Ronaldo sponsored by Nike)
- A team (Man City sponsored by Etihad)
- An event (Olympics sponsored by MacDonald's)

Different types of sponsorship include:

- Money
- Clothing and equipment
- Facilities

Media



The media are a broad range of technologies that act as the main means of communication. They include:

- Printed media (newspapers and magazines)
- Broadcast media (TV and radio)
- Internet and social media

Sponsorship and the media

- Sponsors want to promote their products via the media as they can reach millions of potential customers
- Media companies need high viewing figures to make them more attractive to sponsors
- Media companies therefore pay sports clubs to allow them to televise matches as this attracts lots of viewers, making it more likely that they will get funding from sponsors

Sport

The player/performer and the sport need funding for:

- Facilities
- Equipment
- Competitions

Both the media and commercialisation can help promote sports. The media can also provide opportunities for the spectator

The Advantages of Commercialisation

Sponsor or company 	• Excellent and relatively inexpensive advertising of their products as: • Media can show products during breaks in play • Brand names can be seen around venues and on clothing • Raised awareness of brands increase sales • Products associated with high quality performance give it a high status • Media hype gets more viewers which means more exposure of the brand
Sport 	• Raised awareness = increase participation • Higher profile = commercial interest • Increases funding from sponsors • Funding means that you can run events, develop the sport and facilities
Player Performer 	• Paid millions to endorse products • Train full time and focus on being the best in their sport • Receive top quality products to use to improve performance
Spectator 	• More coverage and top event • Red button/Replays • Player cam • Buy the same clothes and equipment to their role models
Official 	• Sponsors can provide kit • Media can support correct decisions • More likely to become role models

The Disadvantages of Commercialisation

Sponsor or company 	The media may not get a high number of viewers The company doesn't get the amount of exposure they wanted The player/team doesn't perform well The player who becomes a bad role model due to cheating, violence, infidelity, racism etc…. affects popularity and sales
Sport 	Fixtures can be changed to maximise viewing opportunities Breaks in play for advertising purposes Minority sports not shown on TV which decreases sponsorship Negative reporting can give a sport a bad name Clothing and rule changes are more appealing to viewers
player performer 	Event times make it less favourable for performers Withdrawal of sponsorship could cause financial difficulties Required appearances take time away from training Pressure to win at all costs to keep a sponsor No privacy and negative reporting can lose sponsorship
Spectator 	High costs for subscription fees to sports channels Pay per view for certain events High cost of merchandise Minority sports not shown Sponsors keep best tickets for hospitality
Official 	Under the spotlight for all decisions as they can be replayed, so poor decisions are highlighted undermining the official They have to wear the sponsors logo

5.3 Impact of Technology

The Advantages of Technology		The Disadvantages of Technology	
To the sponsor	• Easier to see logos due to enhanced viewing quality • More coverage of sports provides more opportunities to see products • Advertising opportunities during breaks on TV • Better standard of play using improved equipment encourages more sales	To the sponsor	• They need to provide more funding to buy equipment for performers so they stay at the top of their game and give access to the best medical support to keep them fit such as ice baths and hypoxic tents • Sponsored players may be found cheating which reflects badly on the sponsor
To the performer and sport	• Improved equipment, clothing and footwear to improve performance such as running blades for disabled athlete • Improved equipment, clothing and footwear to improve safety such as ski helmets and head guards in boxing • Improved security at venues such as cameras and metal detectors • Better facilities such as velodromes for cycling • Better decisions by officials due to technology support such as VAR • Better drug testing to prevent cheating	To the performer and sport	• The cost of equipment increases • State of the art facilities cost more • Technology can go wrong • Repairs are expensive • Technology can be inaccurate • The human part of lucky decisions is lost • People can watch at home rather than attend live games • Players/performers unable to afford modern technology are at a disadvantage
To the spectator	• Multiple viewing platforms such as TV tablet, mobile phone • Better picture and sound creating a better viewing experience • Interactive options such as player cam • Increases enjoyment as a result of better performances due to technology • Increased interaction at live games for decisions VAR and Hawkeye	To the spectator	• Breaks in play waiting for decisions is boring • Technology changes the nature of the sport • They have to pay to view some sports • They have to pay for specialist sports channels • Technology is expensive 3D and ultra HD TV's • They don't experience the excitement of watching the match live
To the official	• Technology support means less chance of errors as it provides additional help to reach the right decision (VAR, Hawkeye, Hot spot) • Improved timing devices mean more accurate results • Wifi allows for improved communication with officials and technicians	To the official	• They become reliant on the technology • Technology can go wrong • Technology highlights the official's errors • Decisions are challenged more owing to loss of respect for officials and judgement

5.4 Ethical Conduct of performers

Etiquette	A convention or unwritten rule in an activity. It is not an enforceable rule but is usually observed.
Sportsmanship	Conforming to the rules, spirit and etiquette of a sport
Gamesmanship	Attempting to gain an advantage by stretching the rules to their limit.
Contract to compete	An unwritten agreement between opponents to follow and abide by the written and unwritten rules of the sport.

5.4 Ethical Conduct of performers – Performance Enhancing Drugs

Advantages to the performer from PED's	
Level playing field	If every athlete were to take them it would make things equal when competing
Fame	The more successful you are the more famous you can become owing to more publicity
Wealth	If you are successful you are more likely to win more prize money and attract sponsorship deals
Increase chance of success	An archer taking beta blockers to reduce anxiety may be more accurate and have a greater chance of winning
Disadvantages to performer from taking PED's	
Cheating/ immoral	If caught everyone will know you cheated
Fines	If caught you may have to pay an expensive fine
Bans	If caught you will not be able to compete, when the ban is over you may be past your peak fitness
Associated health risks	Many performance enhancing drugs have health risks. Taking diuretics can cause kidney damage
Damage to reputation	If caught you will not be able to compete, when the ban is over you may be past your peak fitness

Disadvantages to the Sport when performers take PED's	
A bad reputation	If a performer takes drugs the sport may not get the respect it deserves
Poor Credibility	If a performer takes drugs the sport may be seen as untrustworthy or unreliable

Drug	Effect on Performance	Health risks	Which Sports
Anabolic Agents	Allows performers to train longer and harder It increases protein synthesis helping develop lean muscle mass and speeds up recovery time	• Liver damage/CHD • Testicular atrophy • Infertility • Skin problems • Mood swings • Aggression • Baldness	Activities that require power: Sprinters Rugby players Weightlifting Boxers Baseball
Beta Blockers	Beta blockers improve fine motor control by slowing heart rate and reducing anxiety which allow the performer to remain calm and controlled	• Nausea • Sleep disturbance • Tiredness/weakness • Lower blood pressure • Slow heart rate	Activities that require precision: Archery/shooting Snooker Gymnastics
Diuretics	Diuretics achieve quick weight loss (fluids). They also mask other drugs making them harder to detect	• Dehydration • Nausea • headaches • Heart/kidney failure	Drug cheats and sports with weight categories: • Boxing • Jockey
Narcotic Analgesics	Narcotic analgesics increases the performers pain threshold so can mask injuries, also give a feeling of invincibility	• Nausea/vomiting • Anxiety/depression • Kidney/liver damage • Addiction • Risk further injury	Any sport that a performer is injured: • Boxers • Sprinters • Football
Peptide Hormones	EPO: Erythropoietin (EPO) Can increase red blood cell production increasing O_2 deliver	• Thickening of blood • Blood clots • Strokes • Heart attack	Aerobic events e.g. long distance: • Running • Cycling
	HGH: Human Growth Hormone Helps muscle mass and burns fat	• Arthritis • Heart failure • Abnormal feet/hands	Strength events: • Weightlifting • Sprinting • Rugby
Stimulants	Stimulants increase alertness, reduce tiredness and increase heart rate (therefore oxygen delivery)	• Insomnia • Anxiety • Aggression • Irregular heart rate	Alert/aggressive sports: • Rugby • Boxing • Ice hockey
Blood Doping	Blood doping involves the removal of blood a few weeks prior to competition. The blood is frozen and re-injected just before competition. (increase red blood cells)	• Infection • Thickening of blood (viscosity) • Heart attack • Embolism (blockage of vessel)	Aerobic events e.g. long distance: • Running/cycling • Cycling • Swimming • Games players

5.5 Spectator Behaviour

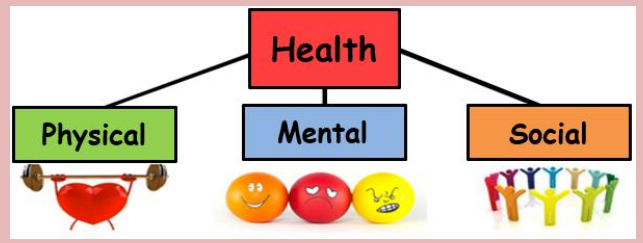
Advantages of spectators	Disadvantages of spectators
Creation of atmosphere: • A large crown creates excitement interest and enjoyment • Player can be more motivated • Interaction for the fans • Positive experience leads to more fans who want to attend • Raises income and raises the profile of the sport, increasing participation Home-field advantage: • Teams and individual performers can gain an advantage from being in familiar surroundings, with fan support and referee bias. • You feel lifted with the majority of spectators cheering for you and so you play better	Increasing pressure: • With spectators wanting you to win can lead to an increase in anxiety causing performance to drop Safety costs/concerns: • It is expensive to employ security staff and repair damage caused by spectator behaviour Negative effect on participation numbers among young people: • The reputation of a sport due to spectator behaviour can cause a drop in the number of young people interested and therefore a loss of potential elite performers Potential for crowd trouble/hooliganism: • Hooliganism can lead to fans not attending matches leading to a loss in ticket sales, support and sponsorship

5.5 Hooliganism

Reasons for	Strategies to prevent	Implications of preventing hooliganism
Rivalries (local derby)	Segregation All seater stadiums	Cost Groups of fans can still sit together People can buy tickets for known hooligans
Hype (from media)	Travel Restrictions Bans, fines, prison Educational Campaigns	Fans arrange fights elsewhere Cost Impact of educational campaigns – do they make a difference?
Fuelled by drugs/alcohol	Early kick-offs Alcohol restrictions	Loss of income for pubs Fans will drink at home before the match
Gang culture	Bans, fines, prison Increased security Travel restrictions	Cost and police time Fans arrange fights elsewhere
Frustration (official's decision)	Don't show controversial replays on the big screen	Media and social media highlight decisions, therefore causing unrest amongst fans
Displays of masculinity	Bans, fines, prison Alcohol restrictions	Loss of income for pubs Fans will drink at home before the match

Chapter 6: Health, fitness and well-being

6.1 Physical, emotional and social health and well-being, and fitness



Physical health and well-being

Regular Exercise	Explanation of Health Benefit
Improved heart function	A stronger heart means that it pumps more efficiently so there is less strain on the heart reducing the chance of heart attacks
Improved efficiency of body systems	The musculoskeletal and cardiorespiratory systems are more efficient with regular exercise. Weight bearing exercise increases bone density reducing the chance of osteoporosis
Reduce the risk of some illness	Exercise reduces blood pressure so there is less chance of having a heart attack or stroke. Exercise also improves the immune system so you are less likely to get ill
Ability to do everyday tasks	Due to improved body systems you can function more easily. You can do everyday tasks without getting tired such as gardening, running up the stairs. You are not slowed down by excess weight
Avoid being obese	Exercise burns calories so you are less likely to be overweight or obese. Obesity is linked to several health problems such as heart attacks, stroke and diabetes

Fitness

Regular Exercise	Explanation of Health Benefit
Improved fitness	All components of fitness can be improved through exercise. These improvements in fitness lead to better performance
Reduced chance of injury	Due to stronger bones and muscles and increased flexibility reduces the chance of injury, this means more time can be spent training or performing
Supporting physical ability to work	Due to improved fitness components such as muscular strength and muscular endurance will mean you can cope better with the physical demands of work, for example a bricklayer will have the fitness to cope with demands of carrying, mixing and laying bricks

Mental health and well-being

Regular exercise	Achieved Health benefits
Reduced stress/tension	Taking part in exercise can take your mind of your problems from work, home or school. This helps prevent stress related illness such as depression
An increase in serotonin levels	When you exercise you release a chemical called serotonin also known as the 'feel good hormone'. When serotonin is released it makes you feel good
Ability to control emotions	When playing sport, you need to be disciplined as you need to follow the rules and stick to tactics or roles. This can help you control your emotions, improve confidence and self-esteem
Increase in self-confidence & self-esteem	Exercise can make you feel part of something. Being part of a team can give you confidence. The more you exercise you do the better you perform this can also improve confidence

Social health and well-being

Social Health benefits from exercise
Regular exercise allows us to meet new people and make new friends
Regular exercise allows us to meet and socialise with our current friends
Regular exercise can improve our cooperation skills
Regular exercise can increase our social activities

6.2 Consequences of a Sedentary Lifestyle

A sedentary lifestyle is a lifestyle where there is little or no exercise

More People leading a Sedentary Lifestyle

Why?

- More people use cars and public transport than cycle or walk
- Large amount of time at school or work is spent sitting
- More jobs are computer based and are therefore sedentary
- Large amount of time at home is spent sitting playing computer games and watching TV

Health risks due to a sedentary lifestyle	Explanation
Obesity/ excessive weight gain	Due to inactivity and a reduction in metabolic rate
Poor Self-esteem	Being over-weight or obese can lead to depression a lack of brain function and release of serotonin
Hypertension (High BP)	Lack of exercise and poor dies can lead to an inefficient heart and potentially damaged blood vessels
Poor Sleep	Lack of oxygen delivery to cells and excessive weight have been linked to snoring and restless legs. This disturbs sleep, as not doing enough to feel tired at night
Type 2 diabetes	Being overweight can increase the risk of developing type 2 diabetes
Heart disease and stroke	High Bp and cholesterol increase the risk of a heart attack and stroke
Lethargy (lacking energy)	Low oxygen levels can lead to a feeling of fatigue and tiredness

Obesity

Obesity is a term used to describe people with a large fat content, caused by an imbalance of calories consumed compared to energy expenditure

A person is considered obese if they have a body mass index (BMI) of over or over 20 % above standard weight to height ratio

If body fat gets to this level it can have serious health implications

Obesity can lead to ill-health:

Physical	Mental	Social
It is linked to: • Types of cancer • Heart disease • Heart attacks • Type 2 diabetes • High cholesterol levels	It is linked to: • Depression • Low self esteem • Loss of confidence	It is linked to: • An inability to socialise (loss of confidence) • Inability to leave home (due to mobility)
		

How Obesity can affect performance:

Limits cardiovascular endurance: Unable to exercise without stopping repeatedly, due to the excess weight and the drop-in efficiency of the cardio-respiratory system

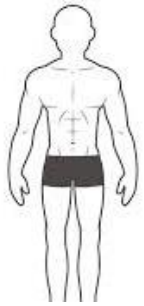
Limits flexibility: Excess fat around the joints restricts movement

Limits agility: Excess weight makes it harder to change direction quickly

Limits speeds/power: Excess weight makes it harder to move fast

6.3 Somatotypes

A method of classifying body types

Ectomorph	Mesomorph	Endomorph
Characteristics: • Tall and thin • Narrow shoulders and hips	Characteristics: • Muscular appearance • Wide shoulders • Narrow hips	Characteristics: • Pear-shaped • Tendency towards fatness • Wide hips • Narrow shoulders
		
Suited to endurance events:	Suited to strength agility and speed sports:	Suited to strength sports where their bulk is an advantage:
		

6.4 Energy Use

In order to maintain a healthy weight, the amount of energy taken into the body must be matched by the amount of energy expended.

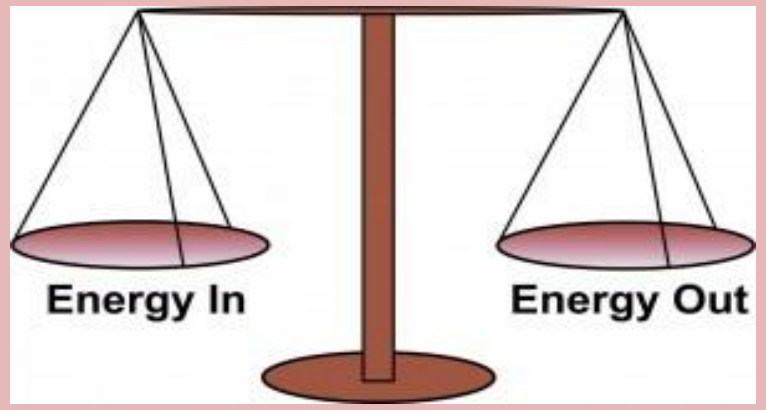
Energy is measured in **calories (KCAL)** and is obtained from the food we eat

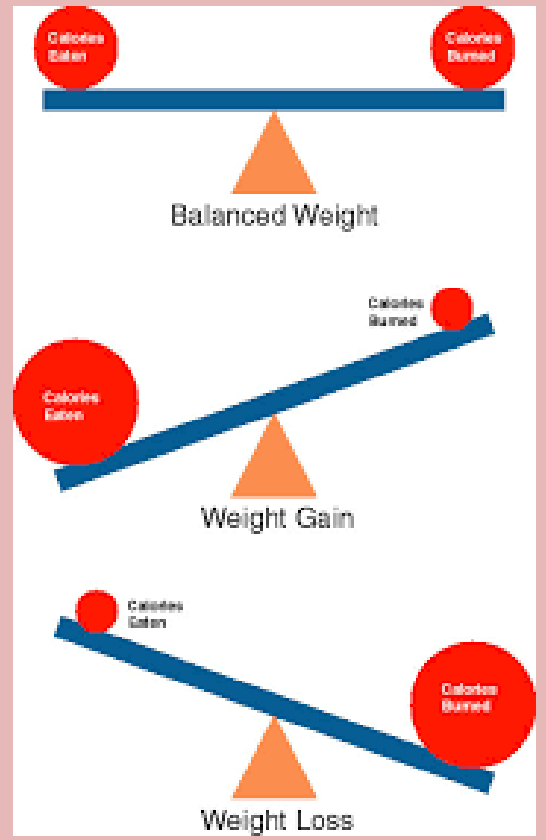
Adult Male: 2500 Kcal per day

Adult Female 2000Kcal per day

Factors affecting calories required:

Age	Younger people (U25) need more calories because as you age the body replaces muscle with fat and fat burns fewer calories than muscle
Energy expenditure	The more you exercise, the more energy you need, the more calories you need to consume
Gender	Men tend to need more calories then women because: • Men tend to have a larger skeleton • Men tend to have a greater muscle mass
Height	Taller you are the more calories needed because of the larger skeleton





6.5 Balanced diet

Eating the right foods in the right amounts. This will allow us to exercise and work properly

Insufficient nutrients can cause ill health such as anaemia, rickets and scurvy

No single food contains all of the nutrients the body needs, so you need to eat a variety of foods in the correct proportions

Reasons for a balanced diet

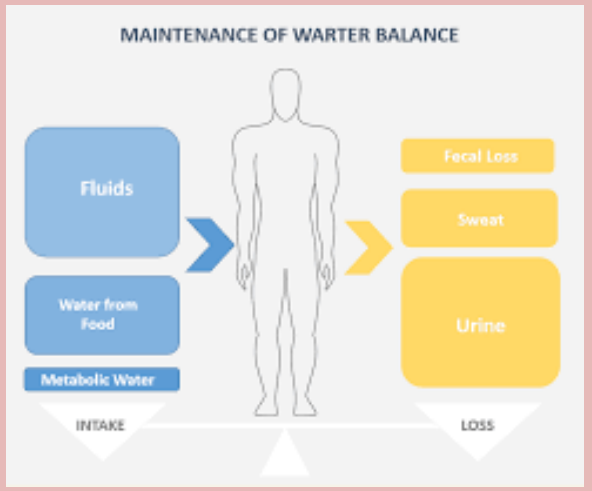
- Any unused energy is stored as fat, which could cause obesity (particularly saturated fat)
- To provide suitable energy that can be used for activity
- To provide the nutrients needed for energy, growth and hydration

Nutrition	Explanation	Foods
Carbohydrates 	Carbohydrates are the main preferred energy source for all types of exercise of all intensities (aerobic and anaerobic) A balanced diet should contain 55% - 60% carbohydrate	• Bread • Pasta • Rice • Potatoes
Fats 	Fats are an energy source; they provide more energy than carbohydrates but only at low intensity. It is easily stored in the body and can lead to weight gain A balanced diet should contain 25% - 30% fat	• Butter • Oil • Fatty meats • Fried food
Protein 	Protein are for growth and repair of muscle tissue. It is used by performers such as sprinters to aid muscle growth (hypertrophy) A balanced diet should contain 15% - 20 % protein	• Cheese • Milk • Eggs • Fish • Meat
Vitamins and minerals 	Vitamin and minerals are for maintaining the efficient working of the body systems and general health this includes keeping our bones strong and our immune system working	Vitamins • Fresh fruit • Vegetables Minerals • Meat • Vegetables

6.6. Maintaining Water Balance - Hydration

Dehydration: excessive loss of body water, such that it interrupts the function of the body
Hydration: having enough water to enable normal functioning of the body
Rehydration: Consuming water to restore hydration
Water balance: taking in water (hydrating) to prevent dehydration due to loss of fluids

Effects of dehydration	
Blood thickening (increased viscosity)	Slows blood flow which preventing the delivery of oxygen
Increase in heart rate causing irregular rhythm	The heart has to work harder to deliver oxygen to the working muscles
Increase in body temperature	Causes overheating, leading to heat exhaustion
Slowing of reactions	Increases reaction time, which can slow the time to make important decisions
Muscle fatigue	Causes cramp in muscles



AQA GCSE PE
Non-exam Assessment
Analysis and Evaluation of Performance
25 marks

Part 1 Analysis (15 marks)

Fitness Component Strength:

1. Pick one of the components of fitness that you feel is a strength.
2. Give a definition of this component.
3. Explain why it is important for **your** sport – when/why/how you use the fitness component when playing – specific skills or techniques it is important to – how it links to the success of your performance and the consequences if it is not successful
4. Give examples from at least 2 different recent matches/performances where this fitness component was important to your performance and the outcome/impact it had as a result of being a strength of yours.

   "in a recent game against …… I was able to demonstrate …… as in the match I was able to ……. This had an impact on myself and the team because……."

5. You must use specific terminology from your sport and link to your position.

Fitness Component Weakness:

1. Pick one of the components of fitness that you feel is a strength.
2. Give a definition of this component.
3. Explain why it is important for **your** sport – when/why/how you use the fitness component when playing – specific skills or techniques it is important to – how it links to the success of your performance and the consequences if it is not successful
4. Give examples from at least 2 different recent matches/performances where this fitness component was important to your performance and the outcome/impact it had as a result of being a strength of yours.

   "in a recent game against …… I was able to demonstrate …… as in the match I was able to ……. This had an impact on myself and the team because……."

5. You must use specific terminology from your sport and link to your position.

Skills/ Techniques:

Attacking skills:

- Passing
- Dribbling

Defending skills

- Marking a player, the ball, space

Tactics:

- Set plays
- Awareness of opposition

Fitness components:

- Agility
- Balance
- Cardiovascular endurance
- Coordination
- Flexibility
- Muscular Endurance
- Power
- Reaction time
- Speed
- Strength

Skill/ Tactic Strength:

1. Pick one skill from your sport that is a strength *e.g. dribbling*
2. Explain what the skill is (describe the perfect model) and say why it is important for **your** sport.
3. Say why you think it is a strength – what is the outcome when performing the skill, for you and for your team mates and the impact on the game as a whole.
4. Give examples from at least 2 different recent matches/performances and explain these. This about what happened, how do you know it was good and what was the impact for you and your team.

   "in a recent game against …… I was able to demonstrate …… as in the match I was able to ……. This had an impact on myself and the team because……."

5. You must use specific terminology from your sport and link to your position.

Skill/ Tactic Weakness:

1. Pick one skill from your sport that is a weakness *e.g. shooting*
2. Explain what the skill is (describe the perfect model) and say why it is important for **your** sport.
3. Say why you think it is a weakness – what is the outcome when performing this skill for you and for you team mates and the impact on the game as a whole.
4. Give examples from at least 2 different recent matches/performances and explain these. This about what happened, how do you know it was a weakness and what was the impact for you and your team.

   "in a recent game against …… I was struggled with …… as in the match I wasn't able to ……. This had an impact on myself and the team because……."

5. Explain the technique that you use. Say why it is wrong/why it doesn't work for you and say what the correct technique should be.
6. Say why improving this would help **you** in your sport.
7. You must use specific terminology from your sport and link to your position.

Evaluation (10 marks)

Using appropriate theoretical content included in the specification, you should produce an action plan that suggests ways to improve upon the weaknesses identified in section A.

This plan of action must include:
Part 2 Evaluation

1. An appropriate training method to improve the fitness weakness
2. A full description of one training session that provides an example of what could be used
3. An explanation of how prolonged use of the training method could improve the fitness weakness
4. Another strategy other than a training method that could improve the skill weakness

Part 3 Evaluation

1. An explanation of how the additional specification content selected could lead to improvement of the skill weakness

Plan of action:
Suggests ways to improve upon the weaknesses they have identified.

Part 2: Fitness Weakness
Part 3: Skill Weakness

Part 2: Fitness component Weakness

Appropriate Training Type:

1. Select a type of training that trains the fitness component weakness – advantages and disadvantages of this type of training
2. Explanation of the type of training – how it is carried out
3. Explanation and justification linked to you and your personal needs
4. Detailed and relevant safety considerations

Training Session:

1. Description of one session
    - Thorough explanation of what will happen in the session
    - Training intensities (Aerobic / Anaerobic Training zones or One Rep Max) – linked to performance and improving the fitness component
2. Principles of training (SPORT/ FITT)
3. Injury prevention:
    - warm-up and cool down
    - match the type of training and the intensity to the performers individual needs
    - Wear appropriate clothing and footwear
    - Keep hydrated
    - Do not over train
    - Stretch
    - Always use the correct technique

Long term benefits of this type of training:

If you complete the training for a prolonged period of time what will the improvement look like and how will you ensure you continue to improve as time progresses.

Progressive Overload – FITT Principle

Types of Training:

1. Circuit training (All Fitness Components)
2. Continuous training (CV Endurance)
3. Fartlek Training (CV Endurance)
4. Interval/ HIIT Training (CV Endurance)
5. Plyometric Training (Power)
6. Static Stretching (Flexibility)
7. Weight Training (Muscular strength, power, muscular endurance – Sets/ Reps)

Principles of Training:

1. Specificity – specific to the sport
2. Progressive - gradual
3. Overload – increasing the stress
4. Reversibility – loss of gains
5. Tedium – boredom

FITT: increasing workload to achieve overload

1. Frequency – how often
2. Intensity – how hard
3. Time – how long
4. Type - type of training

Part 3: Skill/ Tactic Weakness

Appropriate additional content from Specification:
Select the right theoretical content that will bring about improvement to the skill or tactic, explaining how this will happen:

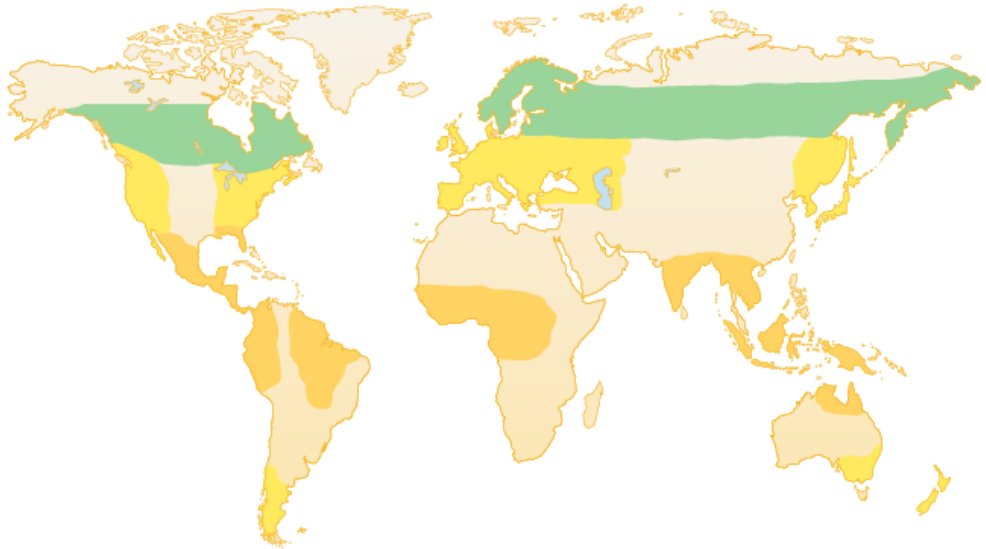
- Goal Setting
- Information processing
- Guidance and feedback on performance
- Arousal
- Aggression
- Motivation

Explanation of how this could lead to improvement:
How will your chosen area of theory content bring about the desired improvement – how will you use it to ensure your skill weakness improves?

The types, properties, structure and uses of the main natural and manufactured timbers

Natural timbers: hardwoods

A hardwood comes from a broad-leaved tree whose seeds are enclosed in a fruit, such as an acorn. Hardwood trees grow quite slowly, often taking more than 100 years to be big enough to use for timber. This means hardwoods are rarely planted and they are increasingly rare and expensive.



Cold climates (such as Alpine) with softwood forests, such as pine, cedar and larch.
Temperate climates (such as European) with a mix of softwoods and temperate hardwoods, such as oak, beech, ash and birch.
Tropical climates (such as Amazonian) with rainforests of tropical hardwoods, such as mahogany and jelutong.

Figure 7.2.1 Where different types of timber can be found in the world

Type	Description	Advantages	Disadvantages	Common uses
Oak		• Strong and durable • Has an attractive **grain** when well finished	• Expensive • Becoming rarer • Harder to work with than some woods • Corrodes iron and steel	• Used a lot for building houses and boats in the past • Now used for high-end furniture and wine and whisky barrels
Mahogany		• Has a very attractive finish • Quite easy to work	• Expensive • Environmental problems with sourcing from tropical forests • Oils in the wood can give some people a skin rash or breathing problems	• High-quality furniture, jewellery boxes, windows
Beech		• A tough wood • Does not crack or splinter easily • Hard	• Expensive • Not very resistant to moisture • Not suitable for exterior use	• Toys, cooking implements, solid and laminated furniture
Balsa		• Very lightweight • Easy to cut	• Much too soft and weak for most products	• Model making, primary school projects, surf board cores • Used for rafts in ancient times
Jelutong		Even, close grain is easy to cut and shape	Soft and not very strong, so not good for structural uses	Model making, moulds for casting or vacuum forming
Birch		Regular, even grain and easy to work	Low resistance to rot and insect attack	Veneers: to make plywood and to surface cheaper materials that are used for interior door and furniture
Ash		Strong, tough, flexible and finishes well	Low resistance to rot and insect attack	Handles for tools, sports equipment, ladders

Natural timbers: softwoods

A softwood comes from a tree with needle-like leaves and seeds in a cone. Most softwood trees are evergreen, meaning they have leaves all year. Softwood trees grow quite quickly, and can be used for timber after about 30 years. This means they can be grown commercially, which is why softwood timber is a lot cheaper than hardwood timber.

Manufactured timbers

Natural timber is a useful material, but because of the size of a tree trunk, it is only available in fairly narrow planks. If you want a large, thin sheet of wooden material, you need a manufactured board. Manufactured boards use timber to make a board that has different properties to plain timber.

Key term

Veneer: a thin slice of wood, about 1 mm thick. Used as a decorative surface and to make plywood.

Type	Description	Advantages	Disadvantages	Common uses
Plywood	• A tree trunk is sliced into thin layers called **veneer** • These layers are glued together with the grain lines going in alternate directions	• Flat and structurally strong • Surface looks like wood • Resistant to warping, cracking and twisting	• Quite expensive • Edges can look rather rough • Susceptible to water damage if wrong grade is used	• Building and furniture panels that need some strength
Medium density fibreboard (MDF)	• Wood dust and fibres are mixed with a glue and pressed into flat sheets under extreme heat and pressure	• Cheap (made from waste wood) • Smooth ungrained surface is good for painting or staining • Easy to machine	• Does not look good, so needs coating • Weak compared to real wood or plywood • Tools blunt quickly due to the glue	• Cheap flat-pack furniture, wall panels, display cabinets, storage units
Chipboard	Wood chips are mixed with glue and pressed into flat sheets	Uses waste materials so is cheap to produce	• Not much structural strength, especially in damp conditions • Surface is very rough, so usually plastic coated	Desktops, kitchen worktops, cheap flatpack furniture

Type	Description	Advantages	Disadvantages	Common uses
Pine		• Very durable • Easy to work • Quite cheap as it grows quickly enough to be forested • Reasonably strong, lightweight and easy to work with	• Can warp, crack and splinter more than some other woods	• House construction, for roof joists and floorboards • Furniture, doors, interior woodwork
Cedar		• Natural oils make it resistant to water and fungal growth	• More expensive than pine and not as strong	• Outdoor furniture, fences, sheds, boats
Larch		• Tough, durable and resistant to water • It can be used outside untreated, and fades to a silvery grey	Costs more than some other softwoods	Small boats, yachts, exterior cladding on buildings

Term	Properties
Hardness	Ability of a material to withstand cutting and scratching. Timber is generally quite a soft material. It can easily be scratched and cut with metal tools, which are much harder.
Toughness	Ability of a material to be hit. A tough material can be quite soft, and bight bend and deform when hit. Timber is quite a tough material. If you hit it with a hammer it may dent.
Durability	Ability to last a long time. Timber that has been dried out and is kept dry is durable. However, wood that is left wet can rot quite quickly and won't then be durable.

Selection of timber

Aesthetics factors
Form
Colour and texture

Environment Factors
Sustainability
Genetic engineering
Seasoning
Upcycling

Availability Factors
Use of stock materials
Use of specialist materials
Hurricanes, storms and disease

Cost Factors
Quality of material
Manufacturing processes necessary
Treatments

Social Factors
Use for different social groups
Trends, fashion and popularity

Cultural and ethical factors
Avoiding offence
Suitability for intended market
The consumer society
The effects of mass production
Built in product obsolescence

Stock forms/types

Timber is available in a variety of stock forms.

Name	Availability	Picture	
Regular sections	• Timber is sold in a standard range of cross-sectional shapes and sizes – sawmills do this for convenience, so there is a limited range of sizes to cut • Designers can use the standard sizes when designing products		Commonly available sizes and shapes of timber
Mouldings	• Lengths of timber cut into decorative shapes • There are lots of shapes available for different purposes, such as skirting boards or decorative edging • Saves time but can be relatively expensive		Common moulding shapes
Dowels	• Wooden rods that are round in cross-section • Have a variety of uses, from model making to furniture construction – can be used to strengthen simple joints • Short lengths of dowel are used to join pieces of wood with a dowel joint • Requires accurate drilling of holes		Different-sized dowels
Sheets	• Manufactured boards come in standard-sized sheets in a range of thicknesses • Available in large sizes but large sheets are relatively difficult to cut and edges may splinter		A stack of manufactured boards in a warehouse

The Physical characteristics of timber
Knots
Colour
Grain structure and density

Working properties
Elasticity
Tensile strength
Compressive strength

Mechanical properties
Hardness
Toughness
Durability

Social Footprint
Trend forecasting
Impact of logging on communities
Recycling and disposal

Ecological Footprint
Sustainability
Deforestation
Habitat destruction and loss
Processing
Transportation
Wastage
Pollution

Name	Appearance	Use	Advantages	Disadvantages
Twist drill		• Drilling smaller-sized holes in most materials • The **flutes** lift the swarf out of the hole	Readily available in a wide range of sizes from very small up	• Usually only up to 13 mm diameter • Deep holes can block up the flutes
Flat bit		Drilling larger holes in wood	• Centre spur gives an accurate starting point • Drills quickly	Cannot be used to make an existing hole bigger
Forstner bit		Drilling flat-bottomed holes in wood	Small centre spur can make a blind hole with a flat base	Slower than a flat bit
Auger		Drilling deep holes in wood	Can bore deep holes	Needs to be used at a slow speed
Hole saw		Cutting large holes	Can make a large hole in a sheet of manufactured board	• Only good for quite thin materials • Limited range of sizes available

Machinery

The first woodworkers had to do everything with hand tools, which could be quite time consuming. Nowadays we have a lot of electrically operated machinery that makes woodwork much quicker and easier. The circular saw and bandsaw in Section 7.6 on page 292 are very useful machines for cutting timber to the required size.

Digital design and manufacture

Computer-aided design software is useful for drawing parts of a product accurately. It is essential if the work is going to be cut out with computer-aided manufacture, as the computer sends information from the drawing to the machine, such as a CNC router or a laser cutter. The big advantage of computer-aided design and manufacture is the speed and accuracy with which it can cut.

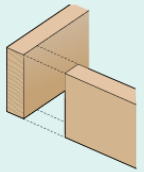
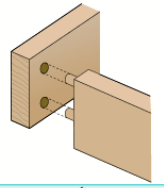
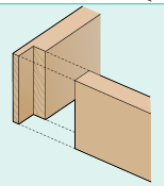
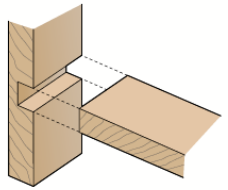
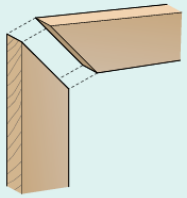
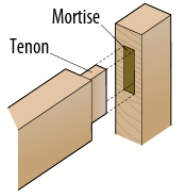
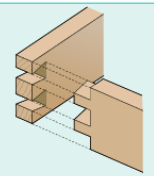
Shaping

Drilling

A drill makes a round hole in material. There are different types which all have their advantages and disadvantages.

A pillar drill: in a workshop work is held flat on the table and the drill makes accurate 90° vertical holes. It requires various clamping methods depending on the shape and thickness of the material to be drilled

A hand-held 'cordless' battery-operated drill is very useful on site or for big pieces of work that are hard to move – no power lead so it can work away from a power source, but requires a charged battery to work

Name	Appearance	Advantages	Disadvantages
Butt		Easy to make, it is just square ends glued together	• Weak: there is no mechanical strength, just the glue • Not aesthetically pleasing
Dowel		Automated machines can drill the dowel holes quickly and accurately	Hard to line up the dowels accurately by hand
Lap		Quite easy to cut	Not very strong
Housing		• Holds a shelf or divider securely in the middle of a carcass (frame) • Pairs well with corner lap joints	• Can be tricky to cut neatly on a wide board • Very accurate marking out and cutting required to ensure a shelf is exactly level
Mitre		• Looks good because no end grain shows • Good for picture frames	Weak, it is only a butt joint at 45°
Mortise and tenon		• A strong joint • Good for joining a table or chair frame to legs	Time consuming to cut by hand
Dovetail		• A very strong joint – the dovetails lock together securely • Good for a drawer front that will get pulled hard	Very tricky to cut accurately by hand

Use of a mortiser

A mortiser makes a square hole. It gets its name from the mortise (slot) half of a mortise and tenon joint. The round centre of the chisel drills a round hole, and the square chisel around it cuts the corners out to make a square. Produces mortises quickly and accurately, but requires requires accurate marking out and care to get the exact size mortise required.

Use of a bag press

A bag press is a bag that can be sealed and have the air sucked out of it. A mould and laminates are put inside it. When the air is sucked out of the bag, the laminates are forced into the mould, and are held there while the glue dries. Presses equally on all surface areas but may not work with thicker laminates.

Name	Appearance	Use	Advantages	Disadvantages
Butt hinge		Used to fit doors	Hidden from sight when door is closed	Hard to fit as an accurate slot needs to be cut on both sides
Flush hinge		Used for small cupboard doors	Easy to fit as no slots to cut	Leaves a gap between the door and frame
Butterfly hinge		Screws onto the surface, often a decorative shape	Easy to fit, as it screws onto the surface with the parts lined up	The whole hinge shows on the surface
T hinge		Used for gates and shed doors	Long bar good for supporting the weight of a gate	Sits on the surface, so shows on the front of the gate or door

Fabricating and constructing

Lamination

Laminating is joining layers together. Plywood is laminated, it is layers of veneer glued together. Laminate flooring is made up of layers. Laminating is useful in the workshop because thin layers can be bent and glued together, and they stay in the bent shape when the glue has dried. The bag press on page 293 is helpful for this.

Veneering

Veneer is a thin layer of wood, which means it can be more prone to damage. Plywood is made of layers of veneer laminated together. Veneer can be glued onto the surface of a cheaper material, such as MDF, to make the surface look like more expensive wood. MDF can be bought covered with hardwood veneer.

Use of screws

Screws are a very useful fixing for joining pieces of wood together. They create a tight fit to make a strong joint, and they can be unscrewed and removed if necessary.

There are two main head designs: slotted (also known as flat) and Phillips (a cross shape). You need the right screwdriver tip to fit the screw head.

A countersunk screw is useful in wood, because you can make the head of the screw fit flat with the surface of the wood. A clearance hole must be drilled first to accommodate the screw head. Drilling a pilot hole as well, which must be narrower than the screw thread, will make it easier for the screw to go in.

Nailing

Nails come in a range of shapes and sizes. Nails are hammered into the wood grain, which pinches tight onto them so they are hard to pull out. It is quick and nails can be driven below the surface and covered over to improve appearance. However, holes may need to be drilled to prevent wood from splitting.

- **Round wire nails** usually have a large flat head so they do not pull through thin materials.
- **Oval nails** spread the grain less, so are less likely to split the wood when hammered in.
- **Panel pins** are small nails for small workpieces and for holding thin boards onto timber.

Adhesives

PVA (polyvinyl acetate) is a commonly used wood glue. It is a thick white liquid, but becomes clear when it dries. It makes a strong joint in wood as long as the pieces are clamped tightly together while the glue dries. It is almost impossible to disassemble a joint without destroying it when PVA has set.

Contact adhesive is good for sticking a flat piece of a different material onto wood. Spread a thin film onto both surfaces, wait until it is nearly dry, then press the two parts firmly together. It is fast but there is little or no opportunity to reposition the pieces and it gives off solvent fumes.

Jigs

A jig can be put over a piece of work and guide a drill or a saw to cut in the required place. It is a quick and accurate way to make lots of holes or cuts in exactly the right place, as long as the jig is positioned correctly. Jigs are very useful for batch production because once you have the jig you can keep using it.

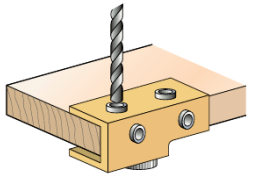


Figure 7.6.2 A drilling jig that has been clamped to the corner of the workpiece to get the holes in the correct place

Fixtures

A fixture holds the workpiece in place while it is being cut or shaped. This speeds up processes but a range of fixtures may be required, adding to initial costs.

Templates

A template is a cut-out shape that you can draw around to mark out the shape you want to cut from a piece of material. A template might be made from paper or card for a single use, or it might be made from a thin sheet of wood or metal if it is going to be used a lot. A template is really useful in batch production because it allows workers to mark out the same shape quickly and accurately. Templates must be accurately produced and protected from damage.

Patterns

A pattern is similar to a template, but the term is sometimes used to refer to a collection of templates used to make the complete product. The pattern for a product might include several individual templates needed to make the whole product. One pattern can result in multiple accurate replicas but the template must be accurately produced, which may be expensive.

Sub-assembly

Sub-assemblies are components that have been assembled and used as an individual component in a larger product. The sub-assembly is built to a uniform specification, quality tested in its own right and can be entirely replaced. An example is a standard DVD module inserted into different desktop computers.

Computer-aided manufacturing

Computer-aided manufacturing (CAM) uses a computer to guide the cutters on a computer numerically controlled (CNC) machine. The product outline will be drawn on a computer-aided design package (CAD). The computer sends cutting instructions to the CNC machine, which has cutters moved around by electric motors. This is very accurate and can operate 24/7. It has high initial costs and training is required for programmer.

CNC routers, milling machines and laser cutters can all be used in a workshop to make one of a product or a batch of lots of the same products. Factories use large machinery controlled by computers.

Quality control

Quality control is a system for trying to make sure the products being manufactured are good enough for sale. It reduces waste and should help customers to receive a more reliable product. At stages through the manufacturing, a sample of the product is inspected to make sure it is correct. The more complex a product is, the more sampling is likely to take place. Careful planning and implementation is required. If the sampling finds a faulty product, the process might be stopped so it can be corrected before many more faulty ones are made.

Working within tolerance

Manufactured parts will always have a tolerance. That is the range of sizes within which the part is acceptable. The designer will need to specify a tolerance for a part. If the holes on a flat-pack cupboard are the wrong size the fittings will not work. If the holes are 2 mm out of line, the pieces will not go together properly. Careful application of tolerances ensures a product with several components will always fit together and that spare/replacement parts will fit too. Manufacturing processes must be able to produce the right tolerance, and part of quality control is checking the parts are all within the required tolerance. Parts of a product are often made and assembled in different factories, so stating the acceptable tolerance for every part is essential for the parts to fit together. It requires accurate machine set-up and checking systems, for example go, no-go gauges.

Efficient cutting to minimise waste

Material costs money, so it is important to use as little as possible when making products. This includes minimising waste to reduce costs and better use finite resources. When cutting out materials, the way shapes are marked out can make a big difference to waste. Using a template to mark out shapes so they are as close together as possible, and designing the part to ensure the closest possible fit to the next one, can make a big difference to the amount of material wasted, although this requires careful planning.

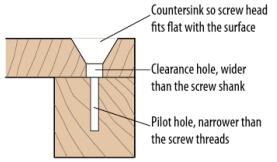


Figure 7.7.3 Drilling timber parts ready for a countersunk screw

Name	Appearance	Use	Advantages	Disadvantages
Hand saw		Used to cut larger pieces of wood	Can cut long, deep cuts through big planks	• Blade can bend, so it's important to saw straight • Harder work than a power saw
Tenon saw		Used to cut smaller pieces of wood and accurate detail like joints	Stiffened blade makes it easier to make precise, straight cuts	Stiffened blade back means it cannot cut deeper than the blade, as the spine that keeps the blade stiff is thicker than the blade
Coping saw		Used to cut shapes out of thin wood and manufactured boards	• Thin blade can go around curves • Blade can be taken out and put through a hole to cut internal shapes	• Blade snaps quite easily • Small teeth saw slowly
Scroll saw		Used to cut shapes out of thin wood and manufactured boards	Can cut fine, accurate details	Large pieces of wood cannot be cut with it
Jigsaw		• The blade goes up and down • Used to cut large thin pieces of wood clamped to a bench	• Can cut quite quickly • Thin blade can cut curved shapes	• Difficult to cut straight lines • Blade can wander in thicker materials

Tools and equipment

Hand tools

There is a variety of useful hand tools for marking out, cutting and shaping wood.

Tools for marking out accurately are important. If you mark out your work accurately you can cut it accurately too.

A try square is used to mark a line at 90° to an edge and check if something is square – versatile, may be damaged if dropped

A marking gauge used to mark a line parallel to an edge – can mark out several pieces of timber at the same measurement, the scribing point (spur) scratches the timber so it is vital the gauge is set correctly

Planing

A plane has a sharp blade, which must be kept sharp, protruding from a flat base plate. It is used to remove wood from the edge of a piece of timber, and is good for getting a crooked edge straight. Planes are available in different lengths and it is easy to adjust depth of cut.

A planer/thicknesser is a useful machine for preparing timber. A rotating cutter block planes the wood. The top of the table planes it to get flat, square faces and edges. Under the table the thicknesser draws the wood in and planes it to the set thickness.

Chiselling

A wood chisel is used for paring wood, that is, slicing between the grains. A mortise chisel has a much thicker blade and a heavier duty handle. It is used for cutting slots in wood, so it is hammered with a mallet a lot. Chisels are hard to use across end grain. A sharp chisel is easier and safer to use.

Turning

A wood-turning lathe holds a piece of wood and spins it. The operator holds a chisel on a rest and guides it over the spinning wood to chisel wood away. It requires careful preparation of material and setting up of the lathe.

Name	Appearance	Use	Advantages	Disadvantages
File		A range of tooth sizes and shapes available	Good for smoothing and shaping the sawn edges of manufactured boards	Small teeth are quite slow on wood
Rasp		• Large individual teeth • Available in different shapes, usually flat, half-round and round	• Big teeth cut soft woods quickly • Good for rough shaping	Big teeth leave marks in the wood that need removing with a file or sandpaper
Surform		A frame holds the blade with pressed metal teeth, rather like a cheese grater	• Good for rough shaping of soft materials • Blade can be removed from frame and replaced	• Leaves a rough surface • Hard work on harder woods

Scale	Description	Advantages	Disadvantages
One-off	One product made at a time, either for a specialist product or to test an idea	• No set-up cost • Made with existing equipment • Product can be customised to the user's needs	Slow, so expensive to make several
Batch	Several copies of the same product are made at the same time	• Jigs, templates and moulds speed up the process and can be kept for future use • Special machinery is not needed, so set-up cost is not high	• Labour intensive, so it is quite expensive per product • Takes time to make jigs, moulds and templates
Mass	Factory machinery set up to make lots of identical products	Can make a product quickly and cheaply	Machinery expensive to set up, so only worthwhile for making a lot of products
Continuous	Factory machinery making the same thing 24/7	Makes the product very quickly and cheaply	Machinery very expensive to set up, so only worthwhile for making huge quantities of a product

Mechanical properties		Physical properties	
Strength	Ability to withstand force, e.g. by resisting squashing (compression) or stretching (tension)	**Density**	Compactness of a material, defined as mass per unit volume
Elasticity	Ability to return to original shape once deforming force is removed	**Electrical conductivity**	Ability to conduct electricity
Plasticity	Ability to permanently deform without breaking when subjected to a force	**Thermal conductivity**	Ability to conduct heat
Malleability	Ability to be permanently deformed in all directions without fracture	**Size**	Dimensions of the material
Ductility	Ability to be deformed by bending, twisting or stretching	**Corrosion**	Metal is eaten away as it reacts with oxygen and water in the air. Rust is formed through the corrosion of iron or steel
Hardness	Ability to resist deformation, indentation or penetration	**Aesthetics**	Appearance of a material, e.g. grain
Toughness	Ability to withstand sudden stress or shocks	**Optical**	Ability to absorb or reflect light
Brittleness	Inability to withstand sudden stress or shocks	**Joining**	Ability to be joined to other materials
Durability	Ability to withstand deterioration over time	**Magnetism**	Attraction to magnetic material
Stability	Ability to resist changes in shape over time		
Stiffness	Ability to resist bending		

	Description	Advantages	Disadvantages
Painting	• A coloured pigment in liquid that dries out	• Available in a range of colours	• Covers up the natural wood grain
Staining	• A coloured liquid that soaks into the wood surface	• Makes a pale-coloured wood like pine a darker colour to mimic more expensive woods like oak or mahogany	• Does not look quite like another wood as the pine grain still shows
Varnishing	• A clear coating that dries to a shine	• Gives a hardwearing finish that shows the grain of the wood • Can be a high gloss or a matt finish	• Can scratch or chip and expose the wood
Wax	• A soft solid that is rubbed into the surface with a cloth	• Easy to apply • Gives a plain, natural look	• Rubs away and needs reapplying • Not a glossy finish
Oil	• Is rubbed onto the surface and soaks in	• Good waterproofing for timber • Vegetable oil on kitchen ware is non-toxic	• Surface feels oily
Shellac	• A cloudy liquid made from a resin secreted by a beetle • Lots of layers are rubbed on and polished to create a finish called French polish	• Traditionally used on expensive furniture for its glossy lustre	• Easily damaged by water and heat
Veneering	• A thin layer of wood glued onto the surface	• An expensive, decorative wood like mahogany can be put onto a cheaper wood like pine or chipboard	• The veneer is natural wood, so it still needs a finish applied

AQA Design and Technology Textiles 8552 – NEA Controlled Assessement

This project work is the coursework for your GCSE. It covers 50% of your GCSE marks and gives you the opportunity to show your ability to design and make a high quality product in answer to a specific design brief. The controlled assessment is split into three parts, AO1 (research) is 20% of the grade, AO2 (designing, modelling and making) is 60% and AO3 (evaluating) is worth 20%.

Your project will involve **a lot** of work. 30-35 hours in total in class time, plus you will need to put in time after school and at home on your folder work. It is therefore important that you choose to make a product you are interested in. It is expected that you plan and organize your time wisely during lesson time and for homework.

The assessment criteria for the NEA are split into six sections as follows.

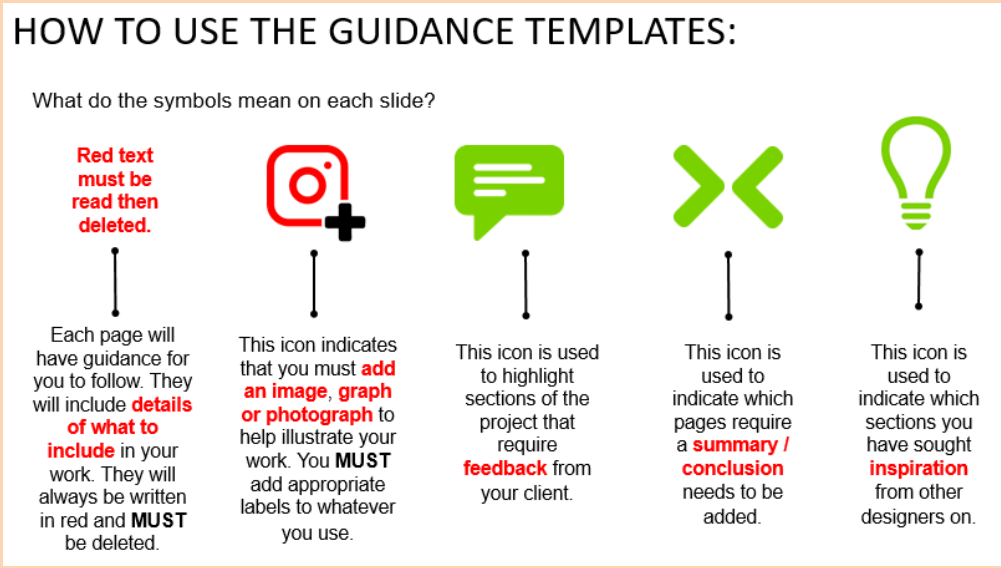
	Section	Criteria	Maximum marks
AO1 (Phase 1) Identify, investigate & outline design possibilities	A	Identifying & investigating design possibilities	10
	B	Producing a design brief & specification	10
A02 (Phase 2) Design & make prototypes that are fit for purpose	C	Generating design ideas	20
	D	Developing design ideas	20
	E	Realising design ideas	20
A03 (Phase 3) Analyse & evaluate	F	Analysing & evaluating	20
	Total		100

Each section of your coursework folder is worth a different amount of marks.

As you can see, the sections in AO2 covering the Development of your design and the practical (Making) are worth almost ⅔ of the overall folder grade.

REMEMBER: you should only have 20 pages in your folder so **WHAT you include** in your folder is important.

You can use the coursework guide to help you present your work. The following symbols



AO2: Generating Design Ideas

1. Initial Ideas

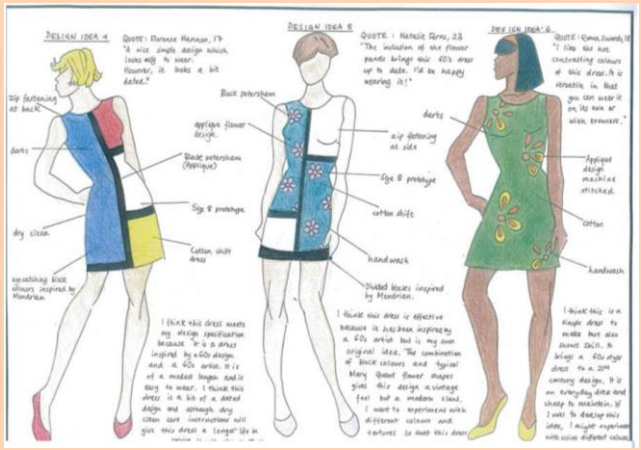
- Re-read your **DESIGN BRIEF**
- Look at your **RESEARCH**
- Re-read your **SPECIFICATION/DESIGN CRITERIA**.

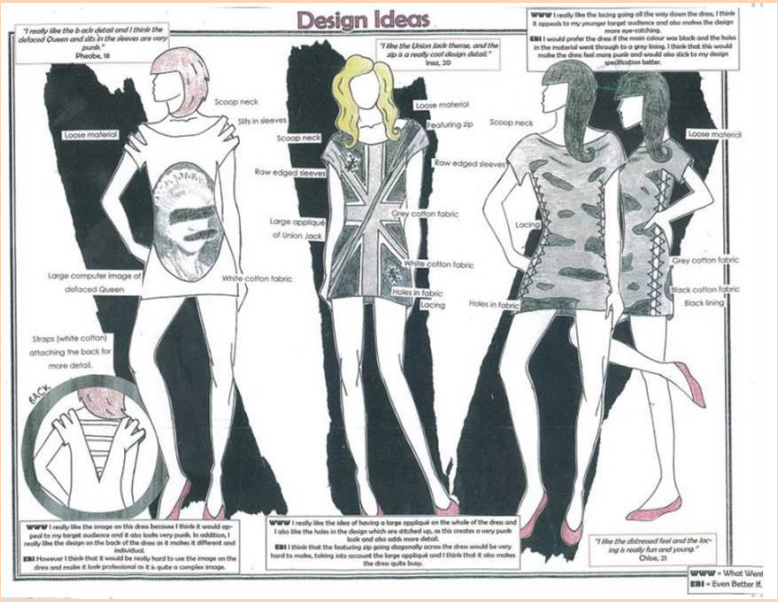
You must be very clear about what it is you are designing and **WHO IT IS FOR**!

Use an **HB** or **2B** pencil to **SKETCH** your ideas. Relax and sketch **FREELY.** Be **BOLD** and **CONFIDENT.** Let the **MODERATOR** see what you are thinking – **LABEL** your ideas, use **KEYWORDS**

The **PURPOSE** of the task is to design something **NEW, ORIGINAL** and **EXCITING**! It must be a product with a **DIFFERENCE** and something your 'Target Audience' will want to buy.

Pick out **SHAPES, PATTERNS** and **ELEMENTS** that appeal to you. **COMBINE** ideas.





If you find this difficult, it is usually because AO1 - the research element of your coursework **ISN'T GOOD ENOUGH**.
Is there any more research you could do that would help?

You will need to get feedback from your client about your first ideas so that you can develop one further into a final product.

GENERATING DESIGN IDEAS concept one

You are expected to produce a range of imaginative, creative and innovative ideas some of which take inspiration from existing designs. A good design sheet will have a mixture of rough sketches, notes/annotations, better-refined sketches, evaluative comments and colour on it.

INSERT PICTURE HERE THAT YOU WILL TAKE INSPIRATION FROM

Evaluation

Evaluate your idea making judgments about:
- How well will it work. Good points and bad points ?
- Are its aesthetics appealing to your clients?
- How difficult will it be to make?
- Will it be expensive, a reasonable cost, or cheap?

You will need three/four concept sheets.

Use the **Coursework guidance** to help you and always refer to the **coursework mark scheme** to make sure you are on track.

GENERATING DESIGN IDEAS concept two

You are expected to produce a range of imaginative, creative and innovative ideas some of which take inspiration from existing designs. A good design sheet will have a mixture of rough sketches, notes/annotations, better-refined sketches, evaluative comments and colour on it.

INSERT PICTURE HERE THAT YOU WILL TAKE INSPIRATION FROM

Evaluation

Evaluate your idea making judgments about:
- How well will it work. Good points and bad points ?
- Are its aesthetics appealing to your clients?
- How difficult will it be to make?
- Will it be expensive, a reasonable cost, or cheap?

AO2: Developing Design Ideas

2. Review Of Initial Ideas

1. You need to determine which of your designs follow your design brief and specification and should be taken forward for development.

I. Compare each idea against the **SPECIFICATION** the table shown.
II. Give each idea a tick or a cross to show whether or not it meets each criteria.
III. Total up ticks for each idea.
IV. This will indicate which ideas are the strongest ones.

Review of initial ideas

	Design 1	Design 2	Design 3	Design 4	Design 5	Design 6
Aesthetics						
Customer						
Cost						
Environment						
Size						
Safety						
Function						
Materials & Manufacture						
Total						

2. Client's Opinions Of Your Ideas

Ask your client what they think of your design ideas. Which one is the strongest? Why did they like it? Why did they reject the others? Does this correspond with your comparison against the SPECIFICATION?

3. Evaluation of Initial Ideas

Say which design was your CLIENT's favourite, which meets specification the best and which one you prefer and why.

Explain why you are going to take this design forward and how you can develop it in 3 ways to improve design for your FINAL DESIGN taking on board any of your client's suggestions.

DEVELOPMENT

Selection

Explain which concept you are going to develop into your final solution. Justify your selection.

You must refine and improve you chosen design idea, using an iterative design (the next improved version) approach.

Produce a range of 2D, 3D isometric and exploded sketches that show developments in the functionality, constructional detail and aesthetics of your design. You will also need to suggesting materials, that could be used.

Add lots of notes to your work saying what improvements you have made, and how it more closely meets your specification or user needs.

INSERT PICTURE HERE THAT YOU WILL TAKE INSPIRATION FROM E.G. HINGE ASSEMBLY.

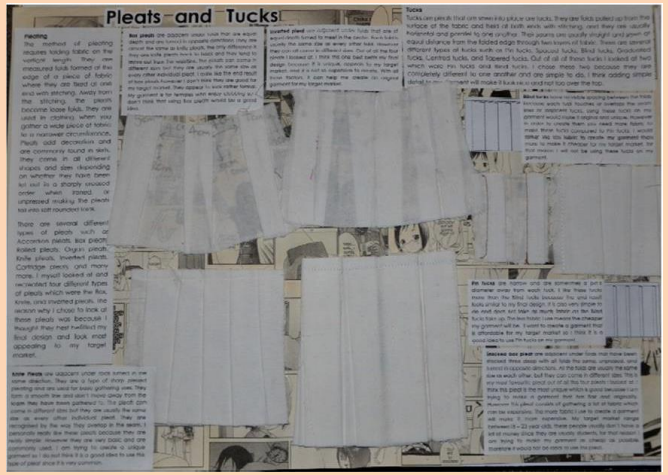
Use the **Coursework guidance** to help you and always refer to the **coursework mark scheme** to make sure you are on track.

3. Development And Refinement Of Design Ideas

You will now need to continually test, evaluate and refine your ideas.
Look at the 2-3 most suitable ideas from your Initial Ideas and refine them so they suit the brief and specification even better.

Develop these design ideas. Evidence everything you do, this should a mix of...

- Prototype modelling
- Client testing and feedback
- Materials testing
- Aesthetics
- Further Research



PHYSICAL MODEL

This next iteration (the next improved version) of your design will be done through modelling.

Model some aspects of your project to try and find out something you don't know or are not sure of.
- Model one of the techniques you intend to use.
- Make a part that you are not sure will work.
- Make a part that you are not sure how to do.
- Make a small scale version of your whole product to help you visualise it.

PICTURES OF MODEL

Model Construction

Describe the materials and joining methods used to make your model.

PICTURES OF MODEL

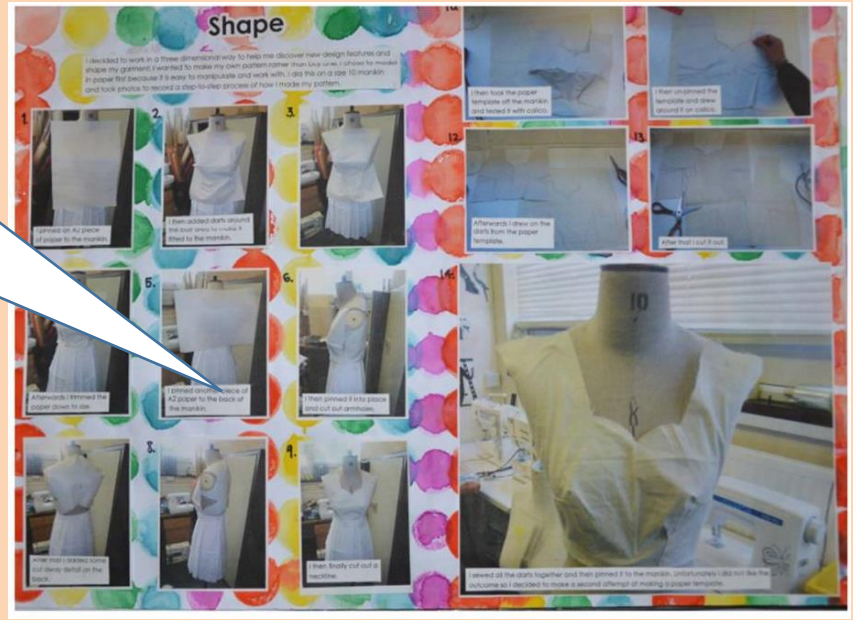
Model Evaluation

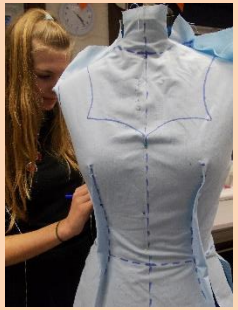
Explain what you have learnt from making this model. How will this change your design as you move forward?

AO2: Developing Design Ideas

4. Modelling Ideas

Produce a fully detailed model of your final prototype. The functionality, constructional detail and aesthetic appearance of your design should be finalised.





Use good technical knowledge and effectively use modelling to make quality refinements of your design ideas so that they fully meet the requirements of the design specification.

VIRTUAL MODEL

This iteration (the next improved version) of your design will be done through modelling – testing .

Produce a fully detailed model of your final prototype. The functionality, constructional detail and aesthetic appearance of your design should be finalised. Your model will be used to create a materials and equipment list, overall project cost and manufacturing specification. It is a massively important part of the project.

SCREENSHOT OF YOUR FINAL PROTOTYPE (FULL VIEW)

SCREENSHOT OF YOUR FINAL PROTOTYPE (EXPLODED VIEW)

SCREENSHOT OF YOUR FINAL PROTOTYPE (CROSS SECTION VIEW)

Feedback

Add some feedback from either your client or users at this stage. As well as positive comments it should include at least one thing that they think could be improved.

Use the **Coursework guidance** to help you and always refer to the **coursework mark scheme** to make sure you are on track.

5. MATERIALS AND EQUIPMENT LIST

MATERIALS AND EQUIPMENT LIST

Produce a list of materials, components, and other times you will use to make your product. Create a costings chart to show total cost of product.

INCLUDE AN IMAGE OF YOUR PATTERN ENVELOPE – FRONT AND BACK.

INCLUDE A LAYPLAN (layout) OF YOUR PATTERN PIECES.

Justification

Explain the purpose of the pattern, layplan and material list.

Summary

Comment on whether you feel the price is reasonable. What did your client specify? Have you been successful?

Produce a list of materials, components, and other times you will use to make your product. Create a costings chart to show total cost of product.

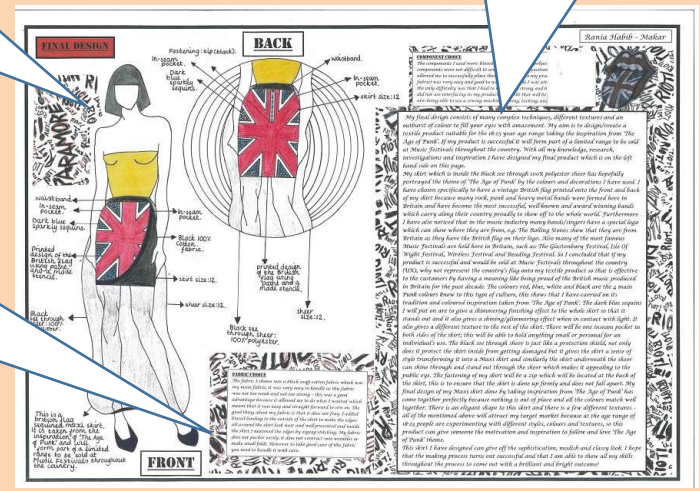
Your modelling will be used to create a materials and equipment list, overall project cost and manufacturing specification. It is a massively important part of the project.

6. Final Design Idea

Present your final design idea. From your final design ideas:

Choose the idea you want to make into a prototype and produce a presentation drawing or CAD image.

Make sure you have given consideration given to the materials, techniques and processes required to produce the chosen design.



Make sure you get feedback from your client or end users regarding their thoughts on the chosen design.

AO2: Realising Design Ideas

7. Production of a prototype

You now need to start making the prototype of your final design.

Annotate all of your work.
Explain what you did and importantly why you did.
Say what went well, what went wrong and why

As you make your prototype take photographs to evidence the processes and techniques you use.

Include information on….
- Safety
- Quality control
- Material choices
- How you fixed problems

Part name - add
Process used - add

PICTURE OF MANUFACTURE

Quality checks applied

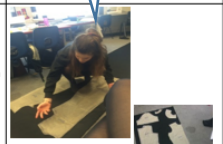
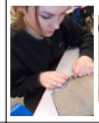
Describe the quality checks you did to check you had completed the task accurately / that it worked / looked good, etc. Name any checking equipment used, and focus on any tolerances applied.

Description of process

Describe how you completed the work here **naming** the tools used.

Health & Safety

Describe how you applied health and safety procedures to ensure the processes did not cause injury to you or others.

	Process	Photo	Equipment	Time	Health & Safety Precautions	How I made sure I produced a 'Quality' Product
1	I cut out pattern pieces I needed to make my dress		Felt tipped pen, paper scissors, pattern pieces	45 minutes		I selected the correct size for my **TARGET AUDIENCE**, I drew around the line I was cutting on in felt tip so that I made no mistake and cut out slowly and carefully.
2	I pinned down pattern pieces and cut them out in fabric (**COTTON** and **VISCOSE**) and interfacing.	 		1 hour & 15 minutes	I tied my hair back and worked in a clear area. I put equipment away after I had used it.	I pinned down making sure there were no creases which could alter the shape and size. I made sure that the **GRAINLINE** was parallel with the **SELVEDGE** of the fabric. I cut out all of the pattern pieces slowly and remembered to cut out **NOTCHES** on the patterns.
3		 	Needle, thread, fabric scissors, appropriate pattern pieces attached to its fabric	15 minutes	I tied my hair back and worked in a clear area. I put away **NEEDLES** and other equipment after I had used it.	I made sure that I had transferred all markings and that the loops were small and the ends were long on the **TAILOR TACKING**.
4	Using **CARBON PAPER** and a **TRACING WHEEL**, I marked on the **DART** pattern markings.		Carbon paper, tracing wheel, pattern pieces with its fabric attached	5 minutes	I tied my hair back and worked in a clear area. I put away needles and other equipment after I had used it. I used the **TRACING WHEEL** carefully as it is sharp.	

8. Finished Prototype

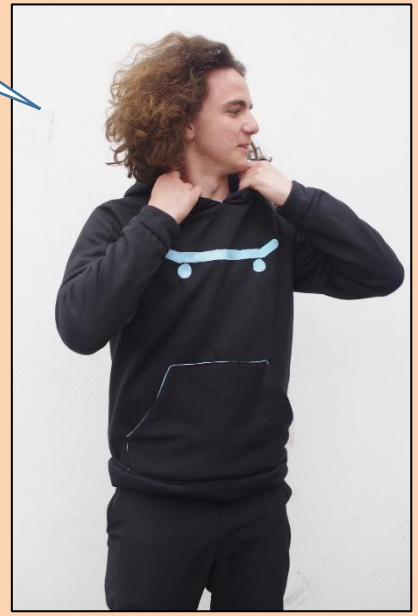
Summarise what you think of your work and how the final prototype meets the end user needs.

To get top marks ensure you produce a fully functioning prototype that fully meets the end user and meets the requirements of the specification.

Annotate each photograph to include which tools were used and what features have been produced.

Make sure your prototype is accurately made and finished to a high quality.

Set-up and take at least one high quality presentation photograph.



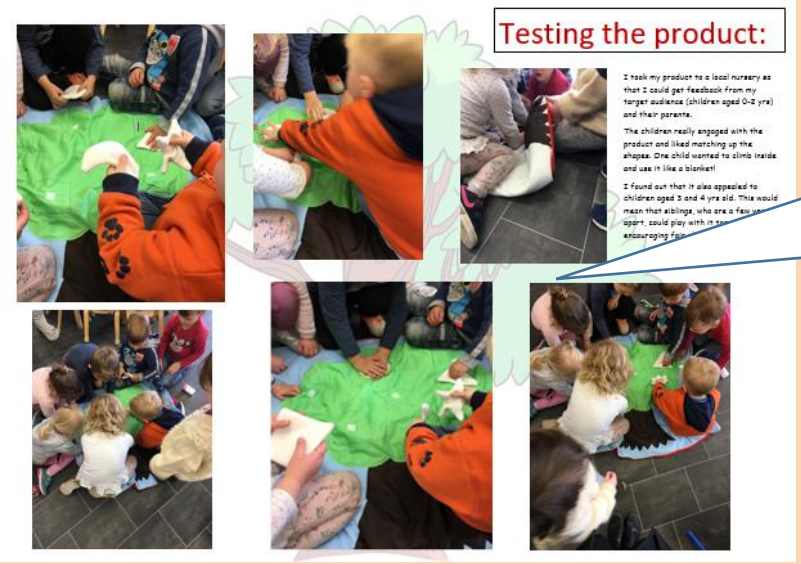
Use the **Coursework guidance** to help you and always refer to the **coursework mark scheme** to make sure you are on track.

AO3: Analysing and Evaluating

9. Evaluation

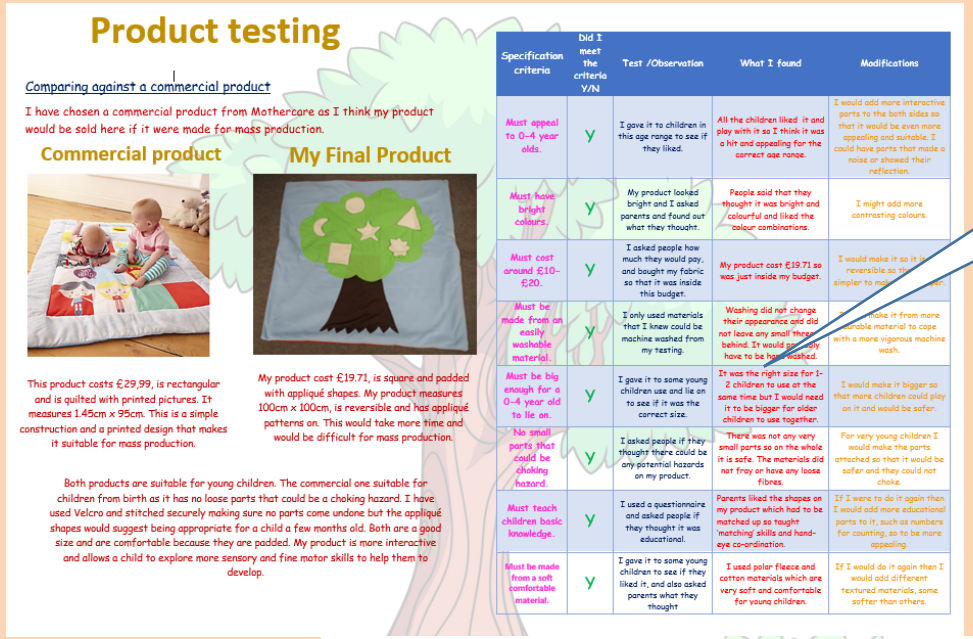
Evaluate the prototype against each of your SPECIFICATION/DESIGN CRITERIA.

Now you have made the prototype you need to test and evaluate it. You must evaluate the PRODUCT and the PROCESS (how you made it) and NOT the project (how hard you worked).



Test your product! Use it for its intended purpose where possible and ask potential end users for feedback.

Explain the results.



Compare your product your Design Criteria/ Specification

TESTING

Carry out several tests (at least 3) on your product and explain in detail how well it worked. Make sure you add positives and any negatives issues that are evident.

Test 1

Test 2

Test 3

PICTURE OF PRODUCT BEING TESTED

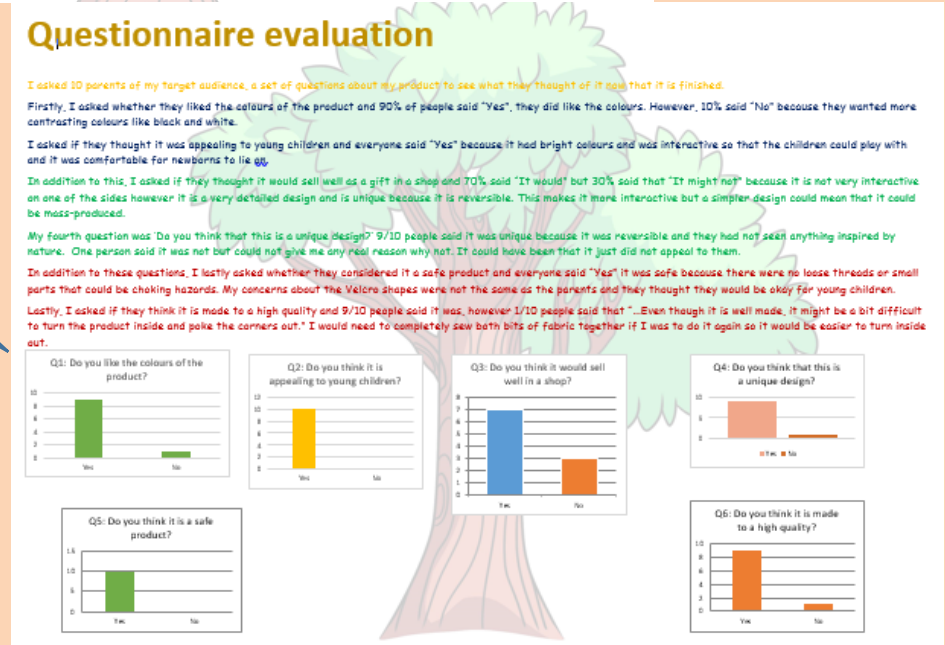
PICTURE OF PRODUCT BEING TESTED

PICTURE OF PRODUCT BEING TESTED

MARKET TESTING

Get some comments from your client and or your target population about how well they think it works, how good it looks, ease of use, safety, cost and whether they would buy it or not. Use their "Quotes" then write a conclusion.

Collect feedback from your clients. What did they think?



Use the **Coursework guidance** to help you and always refer to the **coursework mark scheme** to make sure you are on track.

Unit 1: 1.1.1 – Types of Hospitality & Catering Provisions

Hospitality & Catering Providers
You must understand, be able to name and explain the two different provisions in H&C.
Commercial: the business aims to **make a profit** from the provision they provide.
Non-commercial: the service provider **doesn't aim** to make a profit from the service they provide.

Commercial (residential)

Commercial (residential): meaning the hospitality and catering provision aims to create a from the service they provide, but also offers accommodation.

For example:
- Hotels, motels & hostels
- B&B, guest houses and Airbnb
- Holiday parks, lodges, pods and cabins
- Campsites and caravan parks

Commercial (residential)

Non-commercial (residential): the hospitality and catering provision offers accommodation but does not aim to make a profit from the service they provide.

For example:
- Hospitals, hospices and care homes
- Armed forces
- Prisons
- Boarding schools, colleges and university residences

Commercial (non-residential)

Commercial (non-residential): catering establishments that aim to make a profit from their service, but no accommodation is provided.

For example:
- Restaurants, pop up restaurants and bistros
- Cafes, tea rooms and coffee shops
- Takeaways
- Fast food outlets
- Pubs and bars
- Airlines, cruise ships and long distance trains
- Food and drink provided by stadiums, concert halls & tourist attractions
- Mobile food vans and street food trucks
- Vending machines

Commercial (residential)

Non-commercial (non-residential): catering establishments with no accommodation provided and don't aim to make a profit from their service.

For example:
- Schools, colleges and universities
- Meals on wheels
- Canteen in working establishments (subsidised)
- Charity run food providers

Unit 1: 1.1.1 – Types of service in commercial and non-commercial provisions

Types of service in commercial and non-commercial provision
You need to be able to understand and know the different types of service within commercial and non-commercial provision. They are split into two main categories of food service and residential service.

Food service

The different types of food services in the sector are listed below. You should know the meaning of each one and be able to provide examples .For instance;

Table service
- Plate: the food is put on plates in the kitchen and served by wait staff. Good portion control and food presentation consistent.
- Silver: a waiter will transfer food from a serving dish to the customers plate using a silver spoon and fork at their table.
- Banquet: a range of foods suitable for large catered events such as weddings, parties or award ceremonies.
- Family style: the food is placed in serving bowls on the customers table for customers to share between them.
- Gueridon: is served from a trolley to the customers table, the food is then cooked and/or finished and presented in front of the customer. Creates an atmosphere of sophistication and entertainment.

Counter service
- Cafeteria: all types of food and drink are shown on a long counter for customers to move along with a tray for them to choose what they want to eat.
- Fast food: the food and drink is displayed on a menu behind the counter, often with pictures. Quick ,simple and usually served with disposable packaging.
- Buffet: a range of foods served on a large table where customers walk up to where customers collect a plate and help themselves to food and drink. The food can be hot or cold and some items could be served by wait staff.

Personal service
- Tray or trolley: the meals are served on trays from a trolley and sometimes can order in advance.
- Home delivery: customers order is made over the phone or online and then delivered to the customers home address.
- Takeaway: food that's cooked by a business' premises and eaten elsewhere.

Residential service

Listed below are the different types of residential types of service in the hospitality and catering sector. You should know the different types of service offered in various hospitality provisions**.**

Rooms:
- Single/double/king/family
- Suite (en-suite bath/ shower room/shared facilities)

Refreshments:
- Breakfast/lunch/evening meal
- S4-hour room service/restaurant available

Leisure facilities:
- Spa
- Gym
- Swimming pool

Conference and function facilities:
- Large rooms
- Overhead projector and computer
- Pens and paper provided
- Refreshments available

Unit 1: 1.1.1 – Standards and ratings

Standards and ratings
You will need to be able to know the importance od standards and rating within the hospitality and catering industry, they are hotel and guest house standards and restaurant standards.

Hotel and guest house standards

Hotel and guest houses standards are awarded and given star ratings. You should know wat criteria is needed to be met for an establishment to receive each star rating.

Star rating 1 = Basic and acceptable accommodation and facilities. Simple rooms with no room service offered.

Star rating 2 = Average accommodation and facilities, a small establishment and would not offer room service or have a restaurant.

Star rating 3 = Good accommodation and facilities. One restaurant in the establishment, room service available between certain hours and Wi-Fi in selected areas are provided. The establishment could have a pool and gym.

Star rating 4 = Very good accommodation and facilities. Large hotel and reception area of a very good standard. Certain hours of room service with a swimming pool and valet parking offered.

Star rating 5 = Excellent standard of accommodation, facilities and cuisine. Offers valet parking, 24 hour room service, spa, swimming pool/gym and concierge services.

Restaurant standards

Restaurant standards have three main possible awards or ratings that you should know. They are listed below and to the right:

AA Rosette award

Ratings between one and five rosettes could be awarded based o the following:

- Different types and variety of foods offered
- Quality ingredients used
- Where the ingredients are sourced
- How the food is cooked, presented ad tastes
- Skill level and techniques used as well as the creativity of the chef

Michelin star

A rating between one and three Michelin stars could be awarded based on the following:

- Quality of ingredients used
- Cooking and presentation techniques
- Taste of the dishes
- Standard of the cuisine
- Value for money

Good food guide

A rating of between one and ten could be awarded based on the following criteria:

- Cooking skills
- Quality of ingredients
- Techniques and cooking skills shown

Unit 1: 1.1.2 – Types of employment roles and responsibilities within the industry

Types of employment roles and responsibilities within the industry
There are four main areas within the industry that you should know the roles and responsibilities within. They are listed below:

Front of house

Front of House manager: oversees all staff at the restaurant, provides training, hires staff and ensures good customer service.
Head Waiter: oversees the wait staff of the restaurant in high end establishments**.**
Waiting Staff: greets customers, shows them to their table, takes food and drink orders from customers and serves them their order. Makes sure customers needs are met and the food order has been made correctly.
Concierge: advises and helps customers with trips and tourist attractions. Books taxis for customers and parks customer cars.
Receptionist: takes bookings, deals with questions and complaints from customers, checks-in customers, takes payment and provides room keys.
Maitre d'hote: oversees the service of food and drinks to customers. They greet customers, check bookings, reservations and supervise wait staff.

Kitchen brigade

Executive chef: in charge of the whole kitchen. Develops menus, writes rotas, ordering and completes kitchen admin and overlooking the rest of the staff.
Sous-Chef: the deputy in the kitchen and in charge when the executive chef isn't available. In charge of production in the kitchen.
Chef de partie: in charge of a specific area/station in the kitchen.
Commis chef: learning different skills in all areas of the kitchen. Helps every chef in the kitchen. Answers to the Sous Chef.
Pastry chef: prepares all desserts, pastry dishes, breads and bakes.
Kitchen assistant: helps with the peeling, chopping, washing, cutting of ingredients and helps washing dishes and making sure they're stored correctly.
Apprentice: an individual in training in the kitchen and helps chef prepare and cook dishes.
Kitchen porter/plongeur: washes the dishes and other cleaning duties.

Housekeeping

Chambermaid: cleans guests' rooms when they leave and restock products that have been used. They also provide new bedding and towels.
Cleaner: cleans hallways and the public areas of the establishment.
Maintenance: repairs and maintains the establishment's machines and equipment such as heating and air conditioning. These responsibilities could also include painting, electrical and flooring repairs.
Caretaker: carries out the day to day maintenance of the establishment.

Management

Food and beverage: responsible for the provision of food and drink in the establishment which will include breakfast, lunch, dinner and conferences**.**
Housekeeping: ensuring laundering of bed lines & towels, ordering of cleaning products and overseeing housekeeping staff duties.
Marketing: promotes events and offers to increase custom at the establishment and is responsible for the revenue of the business.

Unit 1: 1.1.3 – Working conditions in the Hospitality and Catering industry

Types of employment contracts and working hours

You need to know the following types of employment contacts and working hours.

Casual: this type of contact could be provided through an agency and used to cover employees that are absent from work due to illness. There is no sick pay or holiday entitlement with this type of employment. and working hours.

Full-time (permanent): working hours including start and finishing times are fixed and stated in this type of contract. A contact of this nature allows the employee to have sick pay and holiday entitlement.

Part-time (permanent): working hours mean that the employee works on certain days of the week. Work times are stated in the contract, including the starting and finishing times that are fixed in this type of contract. The employee has sick pay and holiday entitlement in this type of contract.

Seasonal: this type of contact is used when a business needs more staff due to busy times throughout the year, such as the Christmas period. The contracts will state for the employee to work for a specific time frame only. Also, the contract would not expect further or regular work after the contract is complete.

Zero hours contract: this type of contract is chosen between the employer and the employee. This means that the employee can sign an agreement to be available for work when the employer needs staff. No number of days or hours is stated in the contract and the employer doesn't require to ask the employee to work and neither does the employee have to accept the work offered. No sick pay or holiday entitlement is offered for this type of contract.

Pay and benefits in the industry

The following pay and benefits are what you should be aware of in the industry.

A salary: this type of pay is a fixed amount of money paid by employer monthly, but is often shown as an annual sum on the contract.

Holiday entitlement: Employees are entitled to 28 days paid a year. Part time contracts are entitled less depending to their contracts hours.

Sickness pay: money paid o the employee with certain contracts when they are unable to go to work due to illness.

Rates of pay: national minimum wage should lawfully be offered to all employees over 18 years of age. This rate is per hour and is reviewed each year by the government.
Tips: money given to an employee as a 'thank you' reward for good service from the customer.

Bonus and rewards: given from an employer to the employee as a way of rewarding all the hard work shown from the employee throughout the year, and helping make the business a success. Also known as remuneration

Working hours

The working hours directive in the UK states that employees on average cannot work more than 48 hours which is worked out over a period of 17 weeks. Employees can choose not to follow this and work more hours if they want to.

People under the age of 18 cannot work more than eight hours a day and 40 hours a week..

Employees that work six hours or more a day must have a break of 20 minutes, and have the right to have at least one day off every week.

Unit 1-1.3.1 - Health and safety in Hospitality and Catering provisions

Control of Substances Hazardous to Health Regulations (COSHH) 2022

What employers need to do by law	What paid employees need to do
Control substances that are dangerous to health.	Attend all training sessions regarding COSHH.
Provide correct storage for those substances and appropriate training for staff.	Follow instructions carefully when using the substances.
Some examples of substances that are dangerous to health include cleaning products, gases, powders & dust, fumes, vapours of cleaning products and biological agents	Know the different types of symbols used to know different types of substances and how they can harm users and others when used incorrectly.

Health and Safety at Work Act 1974 HASAWA

What employers need to do by law	What paid employees need to do
Protect the health, wellbeing and safety of employees, customers and others.	Take reasonable care of their own health and safety and the health and safety of others.
Review and assess the risks that could cause injuries.	Follow instructions from the employer and inform them of any faulty equipment.
Provide training for workers to deal with the risks.	Attend health and safety training sessions.
Inform staff of the risks in the workplace.	Not to misuse equipment.

Risks to health and security including the level of risk (low, medium or high) in relation to employers, employees, suppliers and customers.

Review and assess level of risks in the workplace e.g. slips, trips, falls, burns etc by completing a risk assessment to avoid them from happening.

Personal Protective Equipment at Work Regulations (PPER) 1992

What employers need to do by law	What paid employees need to do
Provide PPE e.g. masks, hats, glasses and protective clothes.	Attend training and wear PPE such as chef's jacket, protective footwear and gloves when using cleaning chemicals
Provide signs to remind employees to wear PPE.	
Provide quality PPE and ensure that it is stored correctly.	

Report of injuries, Diseases and dangerous Occurrences Regulations (RIDDOR) 2013

What employers need to do by law	What paid employees need to do
Inform the Health and Safety Executive (HSE) of any accidents, dangerous events, injuries or diseases that happen in the workplace.	Report any concerns of health and safety matters to the employer immediately. If nothing is resolved, then inform the HSE.
Keep a record of any injuries, dangerous events or diseases that happen in the workplace.	Record any injury in the accident report book.

Manual Handling Operations Regulations 1992

What employers need to do by law	What paid employees need to do
Provide training for staff.	Ask for help if needed.
Assess and review any lifting and carrying activities that cannot be avoided.	Squat with feet either side of the item. Keep back straight as you start to lift. Keep the tem close to your body whilst walking. Make sure you can see where you are going.
Store heavy equipment on the floor or on low shelves.	
Provide lifting and carrying equipment where possible.	

Hazard Analysis and Critical Control Points (HACCP)

Every food business lawfully needs to ensure health and safety of customers whilst visiting their establishment. To ensure this, the need to take reasonable measures to avoid risks to health. HACCP is a food safety management system which is used in business to ensure dangers and risks are noted and how to avoid them.

All food businesses are required to:

- Review and assess food safety risks
- Identify critical control points to reduce or remove the risk from happening.
- Ensure that procedures are followed by all members of staff
- Keep records as evidence to show that the procedures in place are working.

Food Hazards

A food hazard is something that makes food unfit or unsafe to eat that could cause harm or illness to the consumer. There are three main types of food safety hazards:

- Chemical – from substances or chemical contamination e.g. cleaning products.
- Physical – objects found in food e.g. metal or plastic.
- (Micro)Biological – harmful bacteria e.g. bacterial food poisoning such as Salmonella

HACCP table

Here is an example of a HACCP table – it states some risks to food safety and some control points.

Hazard	Analysis	Critical Control Point
Receipt of food	Food items damaged when delivered/perishable food items are at room temperature/frozen food that is thawed on delivery.	Check the temperature of high-risk foods are between 0°c and 5°c and frozen are between -18°c and -22°c. Refuse any items that are not up to standard.
Food storage (dried/chilled/frozen)	Food poisoning/cross contamination/named food hazards/stored incorrectly or incorrect temperature/ out of date foods.	Keep high risk foods on the correct shelf in fridge. Stock rotation – FIFO. Log temperatures regularly.
Food preparation	Growth of food poisoning in food preparation area/cross contamination of ready to eat and high-risk foods/using out of date food.	Use colour coded chopping boards. Wash hands to prevent cross-contamination. Check dates of food regularly. Mark dates on containers.
Cooking foods	Contamination of physical, (micro) biological and chemical such as hair, bleach, blood etc. high risk foods may not be cooked properly.	Good personal hygiene and wearing no jewellery. Use a food probe to check the core temperature is 75°c. Surface area and equipment cleaned properly.
Serving food	Hot foods not being held at the correct temperature. Foods being held too long and risk of food poisoning. Physical/cross contamination from servers.	Keep food hot at 63°c for no more than 2 hours. Make sure staff serve with colour coded tongs or different spoons to handle the food. Cold food served at 5°c or below. Food covered until needed.

Unit 2: 2.1.1 – Nutrition at different life stages & special dietary needs

Nutrition at different life-stages

Adults:

Early – Growth in regard to height of the body continues to develop until 21 years of age. Therefore, all micro-nutrients and macro-nutrients especially carbohydrates, protein, fats, vitamins, calcium and iron are needed for strength, to avoid diseases and to maintain being healthy.

Middle – The metabolic rate starts to slow down at this stage, and it is very easy to gain weight if the energy intake is unbalanced and there isn't enough physical activity.

Elderly – The body's systems start to slow down with age and a risk of blood pressure can increase as well as decrease in appetite, vision and long-term memory. Because of this, it is essential to keep the body strong and free from disease by continuing to eat a healthy, balanced diet.

Children:

Babies – All nutrients are essential and important in babies, especially protein as growth and development of the body is very quick at this stage. Vitamins and minerals are also important. You should try to limit the amount of salt and free sugars in the diet.

Toddlers – All nutrients remain very important in the diet at this stage as growth remains. A variety of foods are needed for toddlers to have all the micro-nutrients and macro-nutrients the body needs to develop.

Teenagers – The body grows at a fast pace at different times at this stage as the body develops from a child to an adult, therefore all nutrients are essential within proportions. Girls start their menstruation which can sometimes lead to anaemia due to not having enough iron in the body.

Special Dietary Needs

Different energy requirements based on:

Lifestyles / Occupation / Age / Activity level
The amount of energy the body needs is determined with each of the above factors e.g. active lifestyle or physical activity level would need more energy compared to a person being sedentary.

Medical conditions:

Allergens – Examples of food allergies include milk, eggs, nuts and seafood.

Lactose intolerance – Unable to digest lactose which is mainly found in milk and dairy products.

Gluten intolerance – Follows a gluten free diet and eats alternatives to food containing wheat, barley and rye.

Diabetes (Type 2) – High level of glucose in the blood, therefore changes include reducing the amount of fat, salt and sugar in the diet.

Cardiovascular disorder – Needing a balanced, healthy diet with low levels of salt, sugar and fat.

Iron deficiency – Needing to eat more dark green leafy vegetables, fortified cereals and dried fruit.

Dietary requirements:

Religious beliefs – Different religions have different dietary requirements.

Vegetarian – Avoids eating meats and fish but does eat dairy products and protein alternatives such as quorn and tofu.

Vegan – Avoids all animal foods and products but can eat all plant-based foods and protein alternatives such as tofu and tempeh.

Pescatarian – Follows a vegetarian diet but does eat fish products and seafood.

Unit 2: 2.1.1 – Understanding the importance of nutrition

The importance of nutrition

Listed below are the macro-nutrients and micro-nutrients. You need to know their function in the body and know examples of food items for each. You need to know why they are needed in the diet and why there is a need for a balanced/varied diet.

Nutrition at different life-stages

Carbohydrates - Carbohydrates are mainly used in the body for energy. *There are two types of carbohydrates which are:*
- Starch - Examples include bread, pasta, rice, potatoes and cereals.
- Sugar - Examples include sweets, cakes, biscuits & fizzy drinks.

Fat - This is needed to insulate the body, for energy, to protect bones and arteries from physical damage and provides fat soluble vitamins. *There are two main types of fat which are:*
- Saturated fat - Examples include butter, lard, meat and cheese.
- Unsaturated fat - Examples include avocados, plant oils such as sunflower oil, seeds and oily fish.

Protein - Protein is mainly used for growth and repair in the body and cell maintenance. *There are two types of protein which are:*
- High biological value (HBV) protein - Includes meat, fish, poultry, eggs, milk, cheese, yogurt, soya and quinoa.
- Low biological value (LBV) protein - Includes cereals, nuts, seeds and pulses.

Special Dietary Needs

Vitamins

Fat soluble vitamin A - Main functions include keeping the skin healthy, helps vision in weak light and helps children grow. ***Examples include:*** *leafy vegetables, eggs, oily fish and orange/yellow fruits.*
Fat soluble vitamin D - The main function of this micro-nutrient is to help the body absorb calcium during digestion. ***Examples include:*** *eggs, oily fish, fortified cereals and margarine.*
Water soluble vitamin B group - Helps absorbs minerals in the body, release energy from nutrients and helps to create red blood cells. ***Examples include:*** *wholegrain foods, milk and eggs.*
Water soluble vitamin C - Helps absorb iron in the body during digestion, supports the immune system and helps support connective tissue in the body which bind cells in the body together. ***Examples include:*** *citrus fruits, kiwi fruit, cabbage, broccoli, potatoes and liver.*

Minerals

Calcium - Needed for strengthening teeth and bones. ***Examples include:*** *dairy products, soya and green leafy vegetables.*
Iron - To make haemoglobin in red blood cells to carry oxygen around the body. ***Examples include****: nuts, beans, red meat and green leafy vegetables.*
Sodium - Controls how much water is in the body and helps with the function of nerves and muscles. ***Examples include:*** *salt, processed foods and cured meats.*
Potassium - Helps the heart muscle to work correctly and regulates the balance of fluid in the body. ***Examples include:*** *bananas, broccoli, parsnips, beans, nuts and fish.*
Magnesium - Helps convert food into energy. ***Examples include:*** *wholemeal bread, nuts and spinach.*
Dietary fibre (NSP) - Helps digestion and prevents constipation. ***Examples include:*** *wholegrain foods (wholemeal pasta, bread and cereals), brown rice, lentils, beans and pulses.*
Water - Helps control temperature of the body, helps get rid of waste products from the body and prevents dehydration. *Foods that contain water naturally include fruits and vegetables, milk and eggs.*

Unit 2: 2.1.2 – How cooking methods can impact on nutritional value

Boiling

- Up to 50% of vitamin C is lost boiling green vegetables in water.
- The vitamin B group is damaged and lost in heat.

Roasting

- Roasting is a method of cooking in high temperatures and so this will destroy most of the group C vitamins and some of the group B vitamins.

Poaching

- The vitamin B group are damaged in heat and dissolve in water.

Frying

- Using fat whilst frying increases the amount of vitamin A the body can absorb from some vegetables
- Cooking in fat will increase the calorie count of food e.g. deep fat frying foods.

Steaming

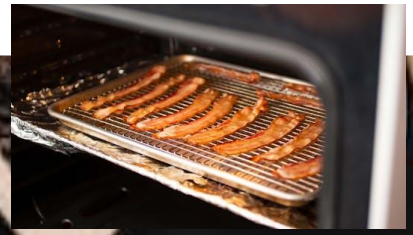
- Steaming is the best cooking method for keeping vitamin C in foods.
- Only up to 15% of vitamin C is lost as the foods do not come into contact with water.

Stir-frying

- The small amount of fat used whilst stir-frying increases the amount of vitamin A the body can absorb from some vegetables.
- Some vitamin C and B are lost due to cooking in heat for a short amount of time.

Grilling

- Using this cooking method can result in losing up to 40% of group B vitamins.
- It is easy to overcook protein due to the high temperature used in grilling foods.



Baking

- Due to high temperatures in the oven, it is easy to overcook protein and damage the vitamin C and B group vitamins.