The Trafalgar School at Downton

Knowledge Organiser

Year 9: 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.

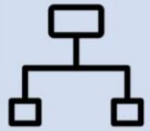
Why is a Knowledge Organiser important?
GCSE specifications require students to memorise more facts, equations, quotations and information than ever before and there are things you will learn right from the start of year 7 that you will need to know in year 11 when you sit your GCSE exams – the Knowledge 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

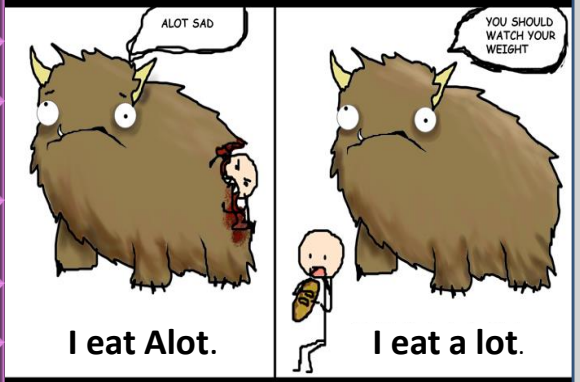
How to use a knowledge organiser – step by step guide

	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. 

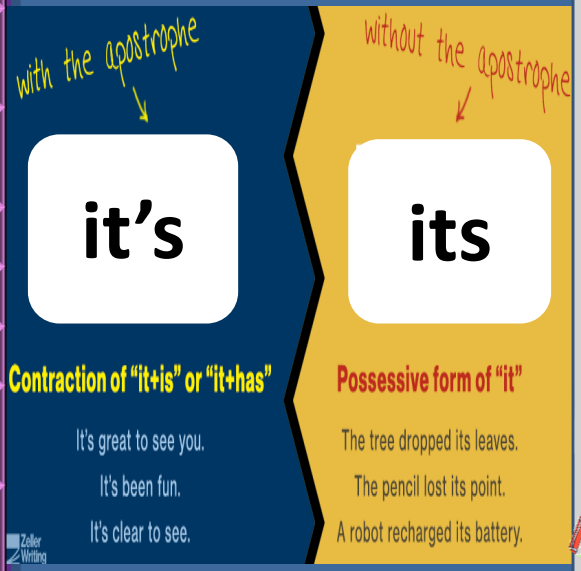
Language Methods to Practise in your Fortnightly Writing Challenge and Examine in your Reading

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.

PROPER GRAMMAR



IT SAVES LIVES.



Fortnightly Writing Challenge Year 9

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

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

Benefits of fundraising

subheadings

As part of this investigation we have spoken with school leaders at the five state secondary schools in the Danshire 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.' …

Suggestions for activities

subheadings

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.

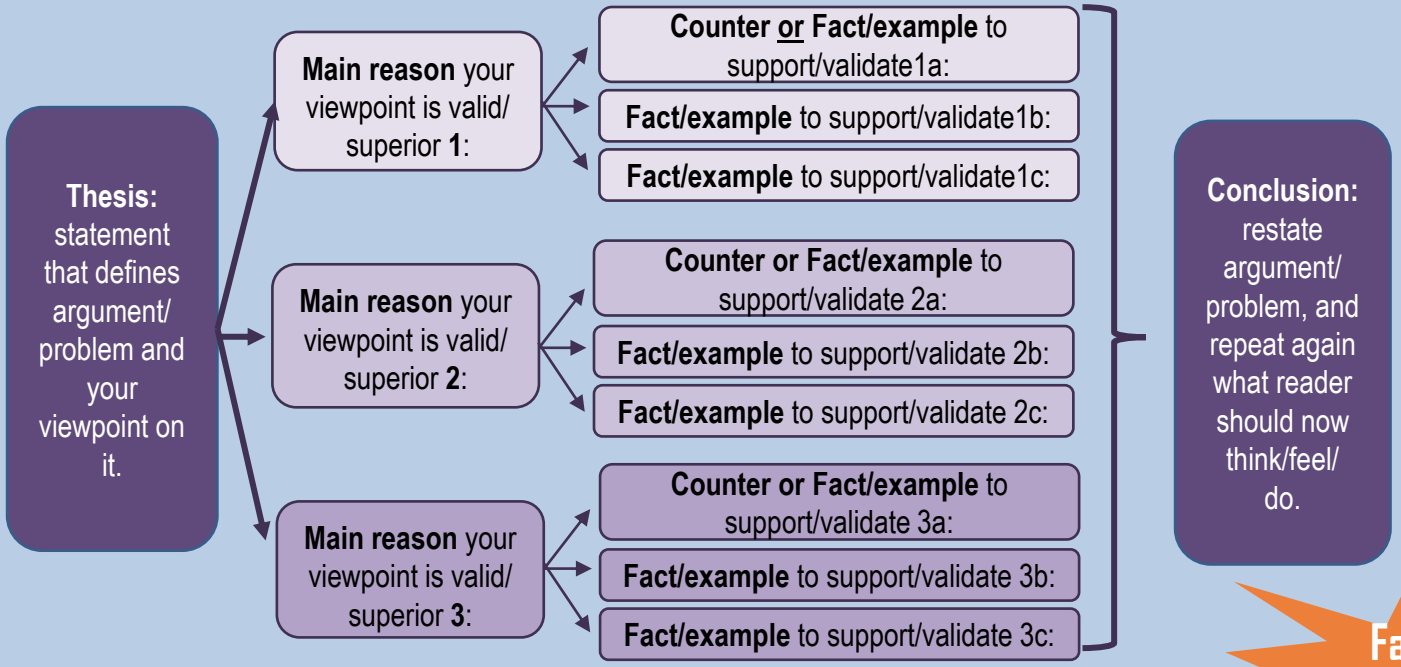
It was snowing again. Gentle six-pointed flakes from a picture book were settling on her jacket sleeve. The mountain air prickled with ice and the smell of pine resin. Several hundred metres below lay the dark outline of Saint-Bernard-en-Haut, their Pyrenean resort village; across to the west, the irregular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

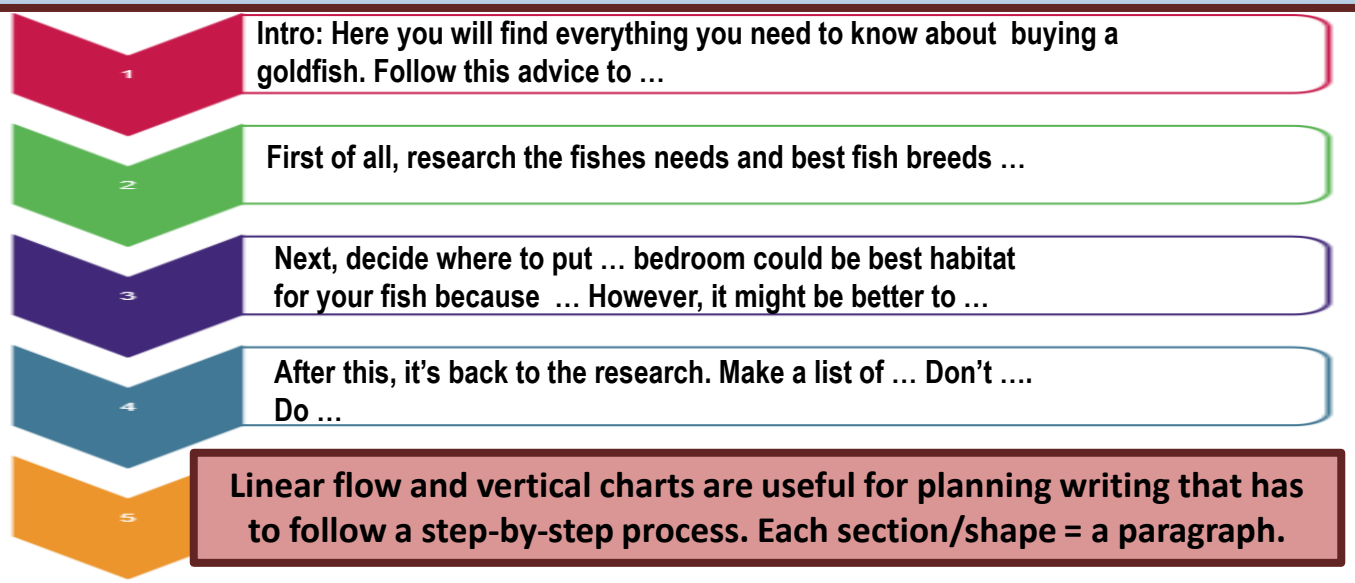
…

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!



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	… ;

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

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

argument	fourth
because	friend
completely	height
conscience	intelligence
conscious	knowledge
disappear	lightning
existence	occasion

Term 3 & 4 SPIVoT words

building	occurrence
conscious	thought
corroborate	unconscious
disappoint	barbaric
erroneous	muse
government	simulacrum
height	adverse
medicine	elucidate

ENGLISH READING
YEAR 9
TERMS 3 & 4
'WAR'

POETIC FORMS: Form, in poetry, can be understood as the physical structure of the poem: the length of the lines, their rhythms, their system of rhymes and repetition.

blank verse	non-rhyming, 10 syllable lines	lyric	emotional rhyming poem most often describing the emotions caused by a specific event
dramatic monologue	an imagined speaker addresses the reader	ode	formal poem celebrating a person, place, object or idea
elegy	about death of its subject	parody	comic imitation of another writer's work
free verse	non-rhyming, non rhythmical, following rhymes of natural speech	sonnet	14 line poem usually about love of person, object or situation

Key Concepts/Questions:

the glory and honour of war vs the reality of war	**the irrationality of war sacrifices made by men and families**
conflict between men and nature vulnerability of humans	**What is it like to be involved in conflict? Why are people compelled to write about war? What do they wish to achieve?**
the long term effects of war (PTSD, mental health)	**'Forgotten heroes'- those that survive war but live with the experience/consequences of it**

STRUCTURAL METHODS

Caesura/s: pause/s in a poem indicated by a **form** of punctuation, usually within lines. This helps to slow the pace, change the tone, or help it to focus on particular ideas	**End-stopped:** a line of poetry that ends with some form of punctuation, such as a comma or full stop
Enjambment: a thought or sense, phrase or clause, in a line of poetry that does not come to an end at the line break, but moves over to the next line	**Refrain**: a line or section of the poem that is repeated again and again as a kind of chorus: it really helps to emphasise one particular idea or section
Juxtaposition/ juxtapose: when an author places two things side by side as a way of highlighting their differences. Ideas, images, characters and actions are all things that can be juxtaposed with one another	**Rhyme**: close similarity in the final sounds of two or more words or lines of writing
Stanza: a verse or section of a poem When you write about stanzas, consider why the poet might have divided the poem into sections, what the stanzas might represent, signify or separate, or why the poet might have chosen to present the poem in only one stanza **couplet**: pair of rhyming lines **quatrain**: four line stanza **sestet**: six line stanza	**Volta**: in a sonnet, the volta is the sudden turn of thought or argument, but the term could be applied to other types of poetry, too, as long as there is a sudden change in tone, thought or argument

CONTEXT

World War I was fought primarily in Europe and the Middle East between a total of 32 countries: Germany, Austria-Hungary, Bulgaria and the Ottoman Empire (the Central Powers) fought against Great Britain, France, Russia, Italy, Romania, Japan and the United States (the Allied Powers). It began on July 28th, 1914, and ended on Nov. 11, 1918, with the Central Powers losing the war.

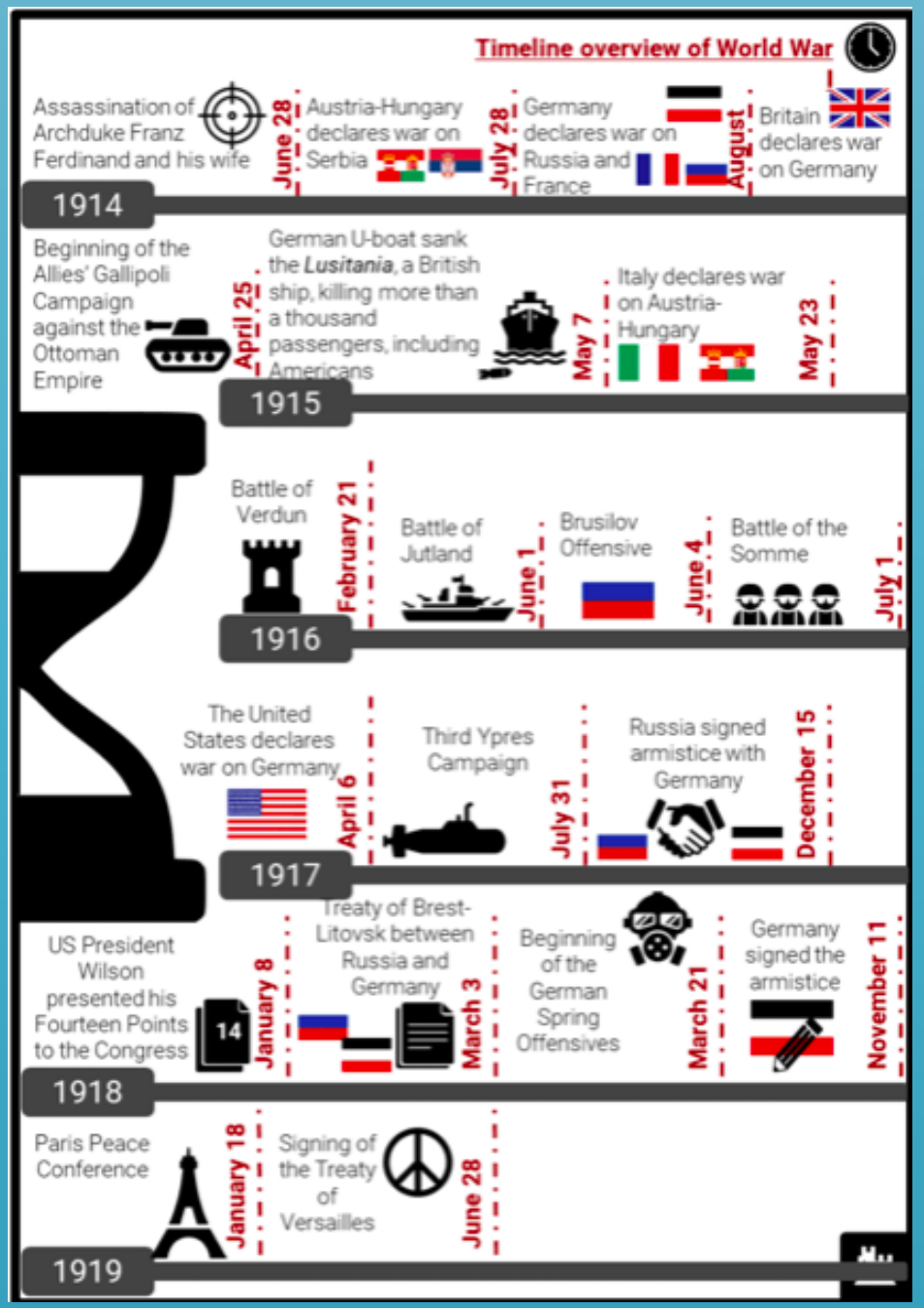
Also referred to as the Great War or the War of Nations, WWI was triggered by a local war between Serbia and Austria-Hungary; a Serbian individual assassinated the Archduke Ferdinand of Austria-Hungary. Austria declared war on Serbia after the assassination, with Germany declaring war on Russia and France a few days later. The United States entered the foray on April 6, 1917, because the Germans were sinking ships around Britain, and sunk a passenger ship that had 128 Americans onboard, and French ship that killed more Americans.

The main theatre of fighting in World War I was the **Western Front**, a meandering line which ran from the Swiss border in the south to the North Sea. Most of the Western Front's 700 kilometre length traversed the **north-east of France**, with its ends in **Belgium and southern Germany**. The line of fighting on the **Eastern side of Europe between Russia and Germany and Austria-Hungary** is known as the **Eastern Front.** The **Italian front** is the name given to the fighting that took place along the **border between Italy and Austria.**

Thanks to new military technologies and the horrors of trench warfare, World War I observed a change in warfare from the traditional hand-to-hand style of older wars, to the inclusion of weapons that used technology and removed the individual from close combat. This led to unprecedented levels of carnage and destruction: over 15 million dead and 20 million injured.

9/11: On September 11, 2001, 19 suicide bombers linked with the Islamic extremist group Al-Qaeda hijacked four commercial airliners and carried out suicide attacks against targets in the United States. At 8:50m AM, the first plane, an American Airlines Boeing 767 filled with 20,000 gallons of jet fuel, crashed into the north tower of the World Trade Centre, in New York City. United Airlines Flight 175 then crashed into Tower Two at 9:04 AM. American Airlines Flight 77 crashed into the Pentagon and the fourth plane, United Airlines Flight 93 crashed into a field near Shanksville, Pennsylvania, but it is believed that it was supposed to target the United States Capitol Building in Washington, D.C. Instead, the plane crashed in a field in Pennsylvania as passengers on the flight fought against the hijackers to regain control of the plane.

The attacks resulted in the deaths of 2,977 people. The victims included 246 passengers and crew on the four planes, 2,606 in New York City, both in the towers and on the ground, and 125 individuals at the Pentagon. Men, women and children from more than 90 countries died in these attacks. The 19 terrorist hijackers also died in the attacks.



KEY WORDS	
Artillery	A class of heavy military weapons
Futility/ Futile	Pointlessness/uselessness
Incessant	Continuing without pause or interruption
Infantry	The branch of an army that engages in military combat on foot (aka foot soldiers), distinguished from cavalry, artillery and tank forces
Obscene	**O**ffensive or disgusting by accepted standards of morality and decency
Over The Top	Phrase used by the British to describe the infantry emerging from the safety of their trenches to attack the enemy across open ground
Patriotic	Expressing devotion to one's country
Propaganda	Information, especially of a biased /misleading nature, used to promote a political cause or point of view
Trenches	An excavation in the ground that is deeper than it is wider - used in war to protect soldiers
Vulnerability	Being exposed to the possibility of being attacked or harmed either physically or emotionally
Wire	Barbed wire was used to slow down infantry so that trenches wouldn't be overrun as soon as the other side decided to attack with large hordes of infantry/aided in funnelling enemy soldiers into "kill zones"

LANGUAGE METHODS	
Alliteration:	the occurrence of the same sound at the beginning of adjacent or closely connected words
Anaphora:	repetition of words, phrases or clauses
Antithesis:	a figure of speech that juxtaposes two contrasting or opposing ideas, usually within parallel grammatical structures
Colloquial Language:	informal, casual language
Emotive Language:	language used to make you feel a specific emotion
Hyperbole:	exaggerated statements or claims
Imagery:	descriptive or figurative language
Irony:	a device or event in which what appears, on the surface, to be the case, differs radically from what is actually the case
Metaphor:	a comparison in which something is presented as something else, even though it isn't
Oxymoron:	a figure of speech in which two contradictory terms or ideas are intentionally paired in order to make a point.
Pathetic Fallacy:	the attribution or mirroring of human emotion and conduct to things found in nature that are not human
Personification:	A metaphor in which a thing or abstraction is represented as a person
Plosive:	a consonant that when it is said within a particular word is produced by stopping the airflow momentarily, which is then released in a sudden explosion of air (**cut, dark, bap etc.)** – which can sound harsh, aggressive or shocking
Rhetorical Question:	a question that is not expected to be answered, as the answer is usually obvious, or is about to be revealed
Semantic Field:	groups/categories of words with similar associations, connections or connotations
Sibilance:	Type of alliteration relying on the repetition of sibilants (consonants that create hissing sounds in words: fuss, fish box, chip, buzz **etc.**) Can sound gentle/calming, or nasty/threatening
Simile:	a comparison using the words 'like' or 'as'.

Edward Harold Begbie (1871–8 October 1929),

also known as **Harold Begbie**, was an English journalist and the author of nearly 50 books and poems. Besides studies of the Christian religion, he wrote numerous other books, including political satire, comedy, fiction, science fiction, plays and poetry. He died in London on 8 October 1929. Though initially a farmer, Begbie moved to London and worked for the *Daily Chronicle* and the *Globe*. In addition to children's literature, he wrote popular works of poetry. At the outbreak of World War 1 Begbie wrote a number of recruiting poems and visited America as behalf of his paper.

Siegfried Loraine Sassoon, (8 September 1886 – 1 September 1967) was an English poet, writer, and soldier. Decorated for bravery on the Western Front he became one of the leading poets of WW1. His poetry both described the horrors of the trenches and satirised the patriotic pretensions of those who, in Sassoon's view, were responsible for a jingoism-fuelled war. Sassoon became a focal point for dissent within the armed forces when he made a lone protest against the continuation of the war in his "Soldier's Declaration" of 1917, culminating in his admission to a military psychiatric hospital; this resulted in his forming a friendship with Wilfred Owen, who was greatly influenced by him. His war poetry intended to convey the ugly truths of the trenches to an audience soothed by patriotic propaganda. Details such as rotting corpses, mangled limbs, filth, cowardice and suicide are all trademarks of his work at this time, and this philosophy of 'no truth unfitting' had a significant effect on the movement towards Modernist poetry.

Rupert Chawner Brooke (3 August 1887 – 23 April 1915)was an English poet known for his idealistic war sonnets written during WW1, especially *The Soldier*. Brooke enlisted at the outbreak of war in August 1914. He came to public attention as a war poet early the following year, when *The Times Literary Supplement* published two sonnets ("IV: The Dead" and "V: The Soldier") on 11 March; the latter was then read In St Paul's Cathedral on Easter Sunday (4 April). Brooke sailed with the British Expeditionary Force on 28 February 1915 but developed pneumococcal sepsis from an infected mosquito bite. He died on a French hospital ship, moored in a bay in the Aegean Sea, while on his way to the landing at Gallipoli.

Wilfred Edward Salter Owen,(18 March 1893 – 4 November 1918) was an English poet and soldier. He was one of the leading poets of WW1. His war poetry on the horrors of trenches and gas warfare was much influenced by his mentor Siegfried Sassoon and stood in contrast to the public perception of war at the time and to the confidently patriotic verse written by earlier war poets such as Rupert Brooke. Among his best-known works – most of which were published posthumously – are "Dulce et Decorum Est", "Anthem for Doomed Youth" and "Futility". Owen was killed in action on 4 November 1918 during the crossing of the Sambre-Oise Canal, exactly one week (almost to the hour) before the signing of the Armistice which ended the war, and was promoted to the rank of Lieutenant the day after his death. His mother received the telegram informing her of his death on Armistice Day, as the church bells in Shrewsbury were ringing out in celebration.

Jessie Pope (18 March 1868 – 14 December 1941) was a British poet, writer and journalist, who remains best known for her patriotic, motivational poems published during WW1. Pope's war poetry was originally published in *The Daily Mail*; it encouraged enlistment and the handing of a white feather to youths who would not join the colours. Nowadays, this poetry is considered to be jingoistic consisting of simple rhythms and rhyme schemes, with extensive use of rhetorical questions to persuade (and sometimes pressure) young men to join the war. Her treatment of the subject is markedly in stark contrast to the anti-war stance of soldier poets such as Owen and Sassoon. Many of these men found her work distasteful, Owen in particular. His poem *Dulce et Decorum Est* was a direct response to her writing.

ALL INFO TAKEN FROM WIKIPEDIA

Lieutenant Colonel John McCrae

(November 30, 1872 – January 28, 1918) was a Canadian poet, physician, author, artist and soldier during WW1, and a surgeon during the Second Battle of Ypres, in Belgium. He is best known for writing the famous war memorial poem *In Flanders Fields*. McCrae died of pneumonia near the end of the war. The poem was written as he sat upon the back of a medical field ambulance near an advance dressing post at Essex Farm, just north of Ypres. The poppy, which was a central feature of the poem, grew in great numbers in the spoiled earth of the battlefields and cemeteries of Flanders.

Public Speaking Unit – Knowledge Organiser

Possible Speech Topics

- Physical Education should be required of all students throughout secondary school.
- Schools should block YouTube.
- Single-sex schools are better for students.
- All people should be vegetarians.
- It is never appropriate for the government to restrict freedom of speech.
- Human cloning should be banned.
- Poetry should be removed from the curriculum.
- All citizens who do not vote should pay a fine.
- The death penalty should be re-introduced.
- The voting age should be lowered.
- Video games are too violent.
- History (or other subject _____) is an important subject in school.
- The UK should not give foreign aid to other countries.
- People should be fined for not recycling.
- Parents should be allowed to choose their baby's gender.
- Animal testing should be banned.
- Drone attacks against specific targets are a necessary part of modern warfare.
- School uniform is unnecessary.

When thinking about your own topics, consider the following…

- Is there a charity which is close to your own heart?
- Is there a sport you love which more people should be aware of, or should it be in the Olympics?
- Is there a disease which has affected you or your family you would like to raise awareness of?
- Has something the government has done angered you?
- Is there a change you would like to bring about?

Success Criteria for Your Speech

Delivering your speech…

✓Confidence.
✓Clear and articulate.
✓Uses persuasive techniques to affect the audience.
✓Body language / gestures used.
✓Makes eye contact with the audience (you!)
✓Puts across a detailed and well-planned speech.

Writing & Planning your speech…

- When it is delivered, it should last for between one and two minutes.
- It should contain many techniques from APE FOR REST.
- It should be structured properly and put across several different arguments.
- It should be written up neatly, so you are able to read it to the class clearly.

When writing a speech, be persuasive; use APE FOR REST to help with this…

A

ALLITERATION (WORDS BEGINNING WITH THE SAME SOUND) **EFFECT:** EMPHASISES/FOCUSES ATTENTION ON POINT
"A really rich and rewarding opportunity"

ANECDOTE A SHORT PERSONAL STORY/MEMORY **EFFECT:** ADDS AUTHENTICITY/RELATABILITY. CAN BE EVOCATIVE
"I'll always remember year 7, because that was the year I was horrendously bullied. I know what it feels like to…"

P

PERSONAL PRONOUNS I, we, our, you
Using these helps to make your argument/persuasion difficult to ignore.

E

EMOTIVE LANGUAGE (ENGAGES AUDIENCES/READER'S EMOTIONS) EFFECT: HELPS CREATE SUPPORT/OPPOSITION
"An innocent bystander was brutally attacked by a violent thug by Tesco's last Tuesday."

F

FACTS (SOMETHING WE KNOW OR HAVE PROVEN TO BE TRUE) **EFFECT**: ADDS PLAUSIBILITY TO AN ARGUMENT
"We know/it has been proven/research has shown that… English is the best subject."

O

OPINION (ADVICE/PERSONAL VIEW) **EFFECT:** ADDS PERSONAL/RELATABLE EVIDENCE/INVESTMENT
"I strongly believe that we need to…"

R

RHETORICAL QUESTIONS (QUESTION ASKED FOR EFFECT). **EFFECT:** ENGAGE, PROVOKES THOUGHT
"How many more elephants have to die before we start enforcing harsher punishments on the ivory trade?"

R

REPETITION (REPEATING INFORMATION) **EFFECT**: EMPHASIS & CLARITY
"It is everybody's responsibility to keep our school clean, and everybody can do more."
"Research has found that 65% of girls…" "If 65% of girls are more likely too…"

E

EXPERTS using a fictional expert in your writing will make what you are saying more authoritative and give it more status. Create a job title for someone and follow with a statement that supports your ideas.
e.g. Professor Borras from Cambridge University Institute of Technology states that 'we need to be more careful with how many hours our young people spend online. The consequences could be devastating.'

S

STATISTICS (PERCENTAGES, FRACTIONS) **EFFECT**: ADDS PLAUSIBILITY AND GARNERS SUPPORT FOR ARGUMENT.
"74% of people agree..."

T

THREE (RULE OF) (LISTING IN GROUPS OF THREE) **EFFECT**: MEMORABLE, CONCISE, EMPHASIS
"Fast, convenient and secure".

TONE (THE ATTITUDE OF A PIECE OF WRITING) **EFFECT:** DRAWS IN THE AUDIENCE
Sincere, ironic, sarcastic, sentimental, enthusiastic, apathetic, bossy, instructive, assertive, outraged…

Public Speaking Unit – Knowledge Organiser

Structuring Your Speech

1. Say what your issue is and set out your argument.
2. Give two or three persuasive reasons why your argument is correct.
3. Give one reason why people might disagree with you, but ensure you then explain why this isn't correct.
4. Give a final persuasive reason why your argument is correct.
5. Thank your audience for listening and remind them what they should be thinking and feeling.

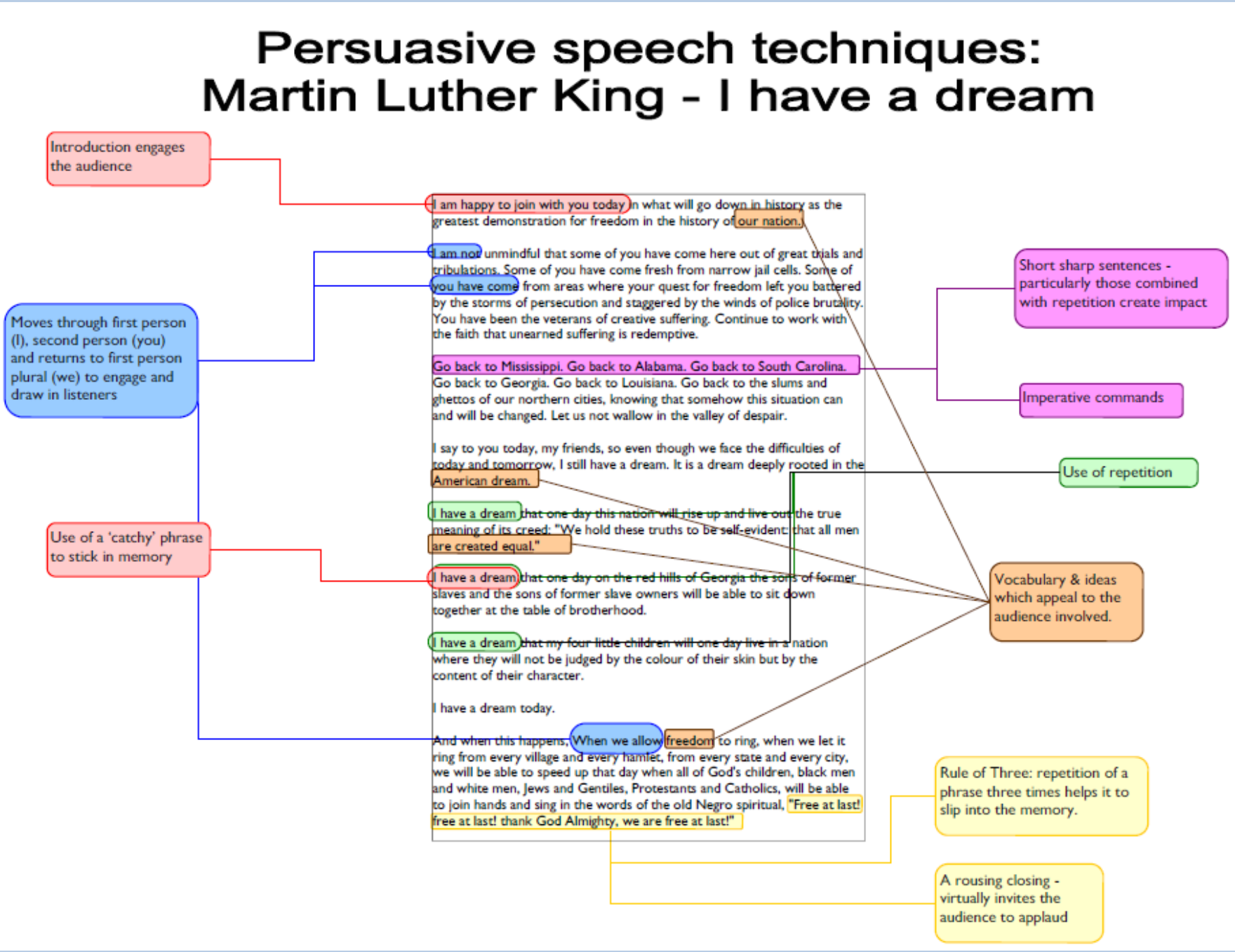
Say what your issue is and set out your argument.
I am here today to talk to you about why every person in our society should be a vegetarian. I know that not everyone will want to be a vegetarian, but I hope to explain why it would be better for society if we were.

Give two or three persuasive reasons why your argument is correct.
According to the U.N., it is estimated that the meat, egg, and dairy industries account for an astonishing 65 percent of worldwide nitrous-oxide emissions. Nitrous Oxide is a greenhouse gas for more potent than Carbon Dioxide. Surely nobody here is a climate change denier? Surely we all want to ensure we leave behind a world safe for our children and their children after them?

Give one reason why people might disagree with you, but ensure you then explain why this isn't correct.
Of course some people would argue that vegetarianism is a personal choice and we should not be forced to change our lifestyle. But I would remind these people that smoking in public places was once a personal choice. Fox hunting was once a personal choice. In fact, slavery was once a personal choice – would we ever suggest that these changes have made society a worse place?!

Thank your audience for listening and remind them what they should be thinking and feeling.
Thank you for taking the time to listen to me today, I am adamant that for intelligent people like yourselves, the conclusion is obvious: vegetarianism can save our planet from destruction.

Persuasive speech techniques: Martin Luther King - I have a dream



Year 9 Maths Term 3 & 4

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.

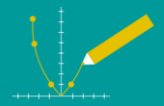
Solve
Find the solution of an equation or inequality.

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.

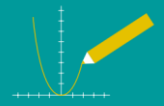
Prove algebraically
Use algebra in the proof.

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
- Maths Genie
- Maths Bot

Year 9 Maths Term 3&4 : Angles and Bearing

What do I need to be able to do?

- **Understand how sides and angles are labelled and draw diagrams from a written description.**
- **Know and apply the rules of angles at a point, angles at a point on a straight line, vertically opposite angles;**
- **Know and use the rules of alternate and corresponding angles on parallel lines.**
- **Understand how the sum of angles in a triangle and quadrilateral can be used to deduce the sum of angles in any polygon, and the properties of regular polygons.**
- **Apply the properties and definitions of special types of quadrilaterals and triangles.**
- **Use knowledge of angle facts to calculate bearings.**

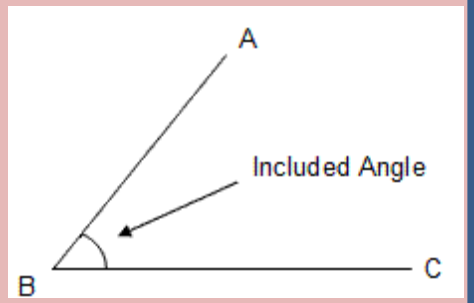
Key words

points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons, rotation symmetries, square, rectangle, parallelogram, trapezium, kite and rhombus,

How are sides and angles labelled?

Vertices – Points/corners are labelled with capital letters.

A **straight Line** has two points and is named after the starting vertex and the end vertex.
Eg. The line AB or the line BC



Angle – An angle is the space between 2 intersecting lines that meet at **vertex** (corner), this space is measured in Degrees or Radians. The included angle can be called <ABC or it can be written as ABC.

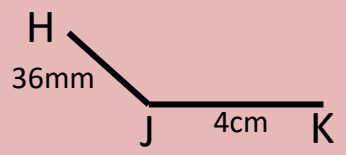
A **Polygon** is created when straight lines are joined up to enclose a space. The polygon can be labelled by it's vertices. For example, triangle ABC or ΔABC.

You might be asked to draw a diagram from a written description.

Eg.
Angle HJK is **obtuse JK** is **4cm** and **HJ** is **36mm**. Draw and label <HJK

The word **Angle** means you will be drawing two lines that meet at a point. The word obtuse means the included angle is greater than 90° but less than 180°. The order of the letters means J will be the vertex where the two lines meet. Using a ruler, HJ should be drawn exactly 36mm long and JK is 4cm long.

Answer



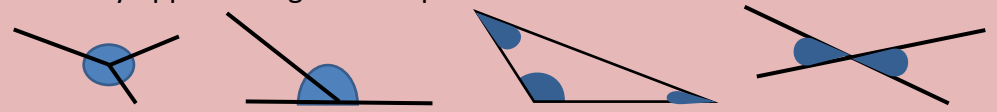
Angle Facts

Sparx: M818, M163, M606, M351, M319

Acute angles are less than 90°
Obtuse angles are between 90° and 180°
Perpendicular lines meet at a right-angle which is 90°
Reflex angles are between 180° and 360°

Acute | Obtuse | Right-angle | Reflex

Angles at a point sum to 360°
Angles on a straight line sum to 180°
Angles in a triangle sum to 180°
Vertically opposite angles are equal

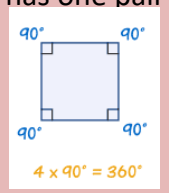


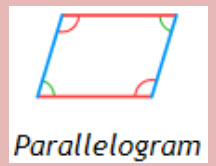
Sum to 360° | Sum to 180° | Sum to 180° | Opposite are equal

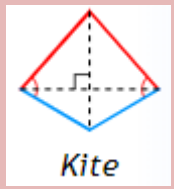
An equilateral triangle has 3 equal angles of 60°
Base angles on an Isosceles triangle are equal
The exterior angle of a triangle is the sum of the two opposite interior angles

All 60° | Base angles equal | Sum of opposite interior = Exterior angle

Angles in a quadrilateral sum to 360°
Opposite angles in a Parallelogram are equal
A kite has one pair of equal angles

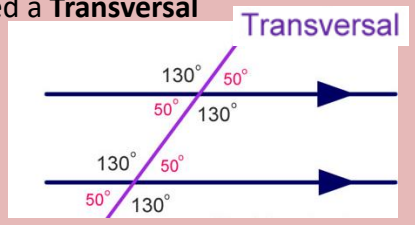




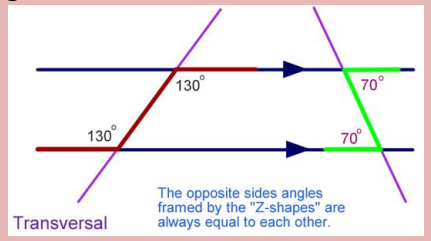


Angles in Parallel lines

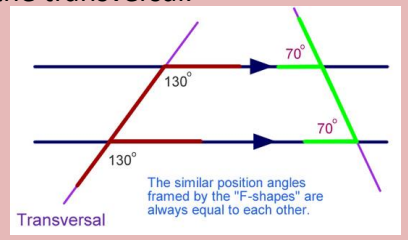
Parallel lines never get closer or further apart and therefore never intersect.
A line that intersects a pair of parallel lines is called a **Transversal**



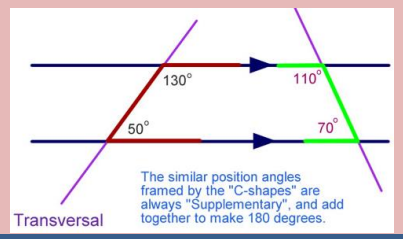
Alternate angles are **equal**, they form a 'Z' shape. When you think of 'alternate' you might think backwards and forwards, similar to how a 'Z' goes backwards and forwards. Alternate angles are on either side of the transversal.



Corresponding angles are **equal**, they form an 'F' shape. Corresponding angles on the same side of the transversal.

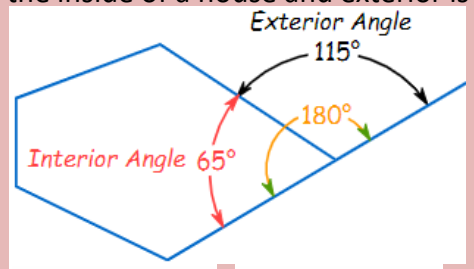


Co-interior angles sum to 180°, they form a 'C' shape.



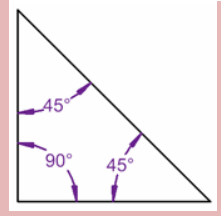
Sum of Interior angles in Polygons

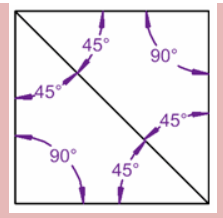
Polygons are 2D shapes with straight lines. Polygons have **Interior** and **Exterior angles**, think interior like the inside of a house and exterior is the outside.



Two angle facts we already Know are 'angles in a triangle sum to 180°' and 'angles in a quadrilateral sum to 360°'.

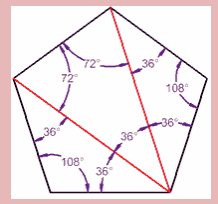
Spot the pattern……





Number of sides:	3	4
Split into least number of triangles:	1	2
Sum of interior angles:	180°	360°

If we follow this pattern then we can predict the sum of the interior angles on a pentagon…..hexagon…..heptagon…..etc.



N° of sides:	5
N° of triangles:	3
Sum of interior angles:	3 x 180° = 540°

General Rule: The number of triangles is always 2 less than the number of sides. The number of triangles multiplied by 180° equals the sum of the interior angles. In a regular polygon all angles are equal.

Therefore: (**n** = N° of sides)

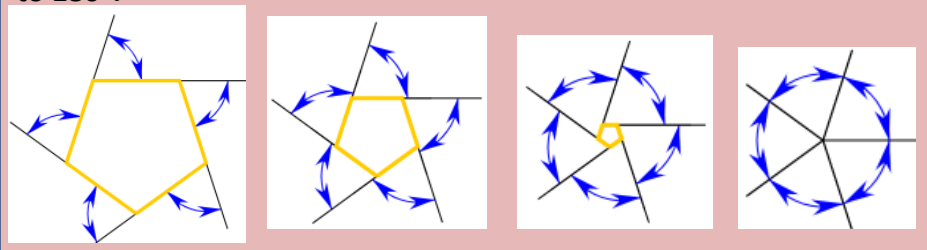
Sparx: M653

Sum of Interior Angles = $(n-2) \times 180°$

Each Angle (of a Regular Polygon) = $(n-2) \times 180° / n$

Sum of Exterior angles in Polygons

The exterior angle is formed by extending the side of a polygon, therefore the interior and exterior **angles on a straight line** will **sum to 180°.**

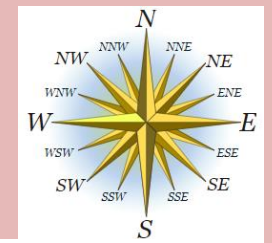


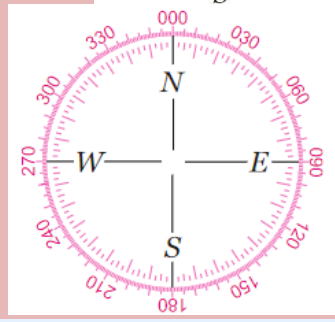
If we bring all the exterior angles on a polygon together we can see they meet at a point. We already know that angles at a point sum to 360°. Therefore the general rule is:

The Exterior Angles of a Polygon add up to 360°

Three Figure Bearings

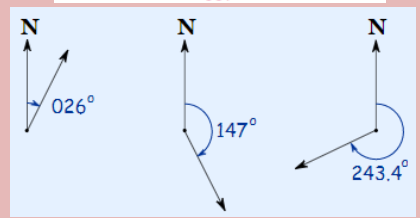
Bearings tell us direction. You are familiar with compass bearings - North, East, South and West.
Three figure bearings are an alternative to compass bearings that are much more precise, measured in degrees.





3 things to remember:

- Bearings always use three figures.
Eg. North is 000°, East is 090°, South is 180° and West is 270°
- Bearings are always measured from North (000°)
- Bearings are always measured Clockwise



Sparx: M260, M416

Year 9 Maths Term3&4: Statistics and Handling Data

What do I need to be able to do?

- **Understand what is data and what are the different types of data**
- **What are the different ways of collecting and organising data?**
- **Understand what averages are and how to calculate the Mean, Median, Mode and Range**
- **Construct accurate statistical representations including Pictograms, Bar charts, Pie charts and Scatter graphs.**
- **How to interpret data from a table, graph and chart and make reasonable deductions**

Key words

Data

Discrete
Continuous
Primary
Secondary
Qualitative
Quantitative
Numerical
Primary
Secondary
Tally
Frequency
Class Intervals
Averages
Mean
Median
Mode
Range
Ascending
Correlation

What is Data and what are the different types of data?

Data – Information in the form of words, numbers or symbols collected together for reference or analysis.

If the data is **numerical** (in numbers) we call this **quantitative** data, think quantity like amount. Example: How many pets do you have? "4" the answer is quantitative.

If the data is in words we call this **qualitative** data, think quality like the quality of an essay. Example: What's your favourite food? "Curry" the answer is qualitative.

Quantitative data can be split into 2 types;
Discrete data is when the answer is counted. Example: How many computer games do you own? You count how many games you have "10 games" and your answer is specific and therefore discrete.

Continuous data is measured.
Example: What is your foot length?
You can never measure anything exactly, your answer might be different depending on the tool you use and the accuracy with which you measure. You might measure your foot with a ruler to be 18cm but in a shoe shop with more accurate tools might measure it as 186mm, therefore the answer is continuous.

Sparx U322

Collecting Data

Primary data – data you collect yourself. Questionnaires, surveys, observation, experiments, interviews etc.
Secondary data – Using data collected by someone else.
Research, books, internet, newspapers, articles, studies etc.

Sparx M597, M945

Organising Data

Once the data has been collected it needs to be organised so it can be be analysed.
I ask 67 people what their favourite colour is, their responses can be organised in a **tally** chart like this one. Tallys are recorded in groups of 5. Adding the tally gives the **frequency**. Frequency is the total number of times an answer has been selected.

Colour	Tally	Frequency
Red	𝍸 𝍸 | | |	13
Blue	𝍸 | | | |	9
White	𝍸 𝍸 𝍸 𝍸 | | | |	24
Black	𝍸 𝍸 | |	12
Other	𝍸 | | | |	9

When there are many options the answers can be grouped into **class intervals**, or groupings. Grouped frequency table:

Number of magazines	Tally	Frequency
0 - 4	𝍸 | | |	8
5 - 9	𝍸	5
10 - 14	𝍸 | |	7
15 - 19	| | |	3
20 - 24	𝍸 | | | |	9
25 - 29	| | |	3
30 - 34		0
35 - 39	𝍸	5
40 - 44		0
45 - 49	| | |	3
more than 49		0

Analysing Data

Average – A number that best represents a set of data. A calculated "central" value of a set of numbers. There are 4 mathematical averages, the best type of average to use depends on the data set.
Mean – The most common type of 'average' It is easy to calculate: **add up** all the numbers, then **divide by how many** numbers there are.

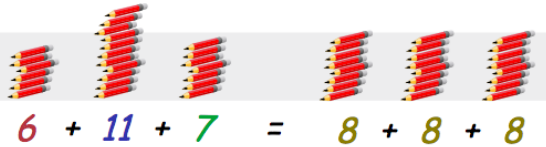
Sparx M940

Example 1: What is the Mean of these numbers?

6, 11, 7

- Add the numbers: **6 + 11 + 7 = 24**
- Divide by *how many* numbers (there are 3 numbers): **24 / 3 = 8**

The Mean is 8



It is like you are "flattening out" the numbers

Mode – The ***"most common"*** or the appears most often. There can be more than one Mode.

Sparx M841

Example:

3, 7, 5, 13, 20, 23, 39, 23, 40, 23, 14, 12, 56, 23, 29

In order these numbers are:

3, 5, 7, 12, 13, 14, 20, **23, 23, 23, 23**, 29, 39, 40, 56

This makes it easy to see which numbers appear **most often**.

In this case the mode is **23**.

Range – The **difference** between the largest and smallest values in a data set.
Biggest – smallest = Range

Sparx M934

Analysing Data

Median – The ***"middle"*** of a sorted list of numbers.

Step 1 – Put the numbers in **ascending** order (smallest to biggest)

Step 2 – Find the **middle** number. **count how many numbers, add 1 then divide by 2.**

$\frac{n+1}{2}$ n = how many numbers in the data set

Example 1: Calculate the median of 3, 13, 7, 5, 21, 23, 39, 23, 40, 23, 14, 12, 56, 23, 29

Step 1 – Order the numbers

3, 5, 7, 12, 13, 14, 21, 23, 23, 23, 23, 29, 39, 40, 56,

Step 2 – There are 15 numbers

n =15 $\frac{n+1}{2}$ $\frac{15+1}{2}$ = 8th

The middle number is the 8th number:

3, 5, 7, 12, 13, 14, 21, **23** 23, 23, 23, 29, 39, 40, 56,

The Median is 23

If the data set has an even amount of numbers then the median is mid-point between the 2 middle numbers.

Example: Calculate the median of 5, 7, 3, 9,

Step 1: Order numbers 3, 5, 7, 9,

Step 2: n =4 $\frac{n+1}{2}$ $\frac{4+1}{2}$ = 2.5th

The median is half way between the 2nd and 3rd number. The median is 6.

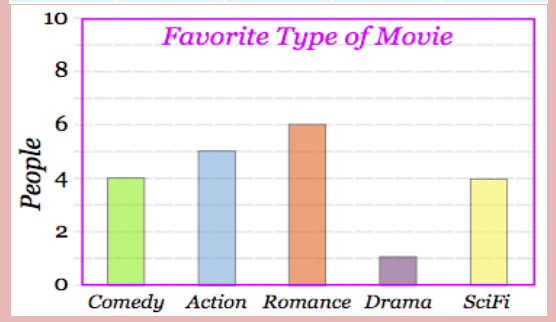
Sparx M738, M644

Presenting Data

The data has been collected, it has been sorted and now it can be presented.

Bar Chart:

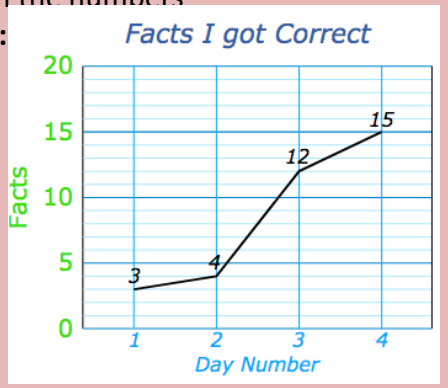
Table: Favorite Type of Movie				
Comedy	Action	Romance	Drama	SciFi
4	5	6	1	4



The perfect **Bar chart** must:

- Be drawn with a pencil and ruler
- Have a title
- Have spaces between the bars
- The axes must be labelled
- Have bars of equal width and equal sized spaces between the bars
- Have and even scale – equal sized space between the numbers

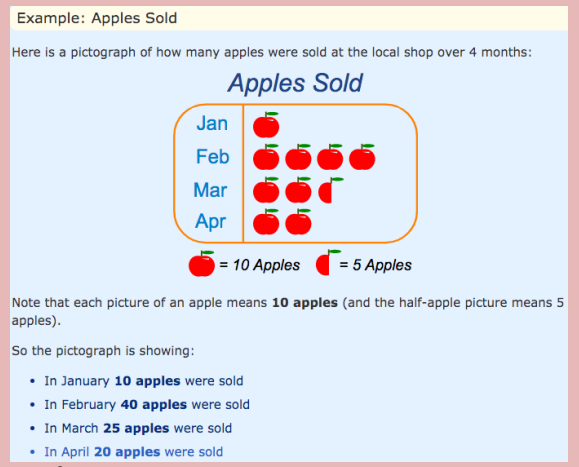
Line graph: Same as a bar chart but data points connected by straight lines.



Pictogram/pictograph – showing data using images. Each image represents a specific value.

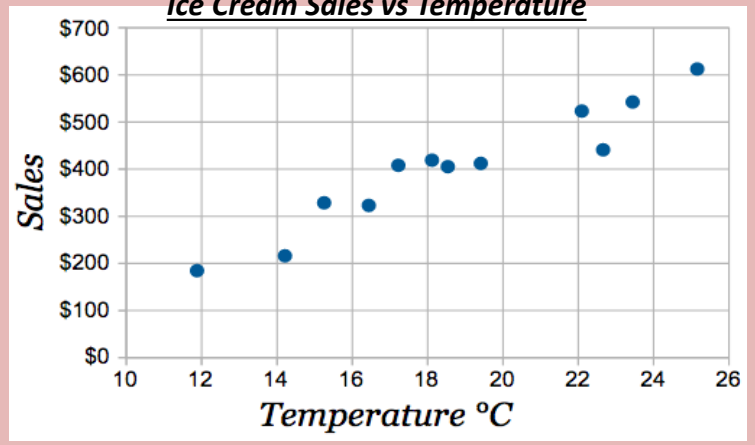
The perfect **Pictogram** must:

- Have a title
- Have a key showing the value of the image
- Have images of an equal size and shape with equal distance between each image



Scatter Graph – shows the relationship between two quantitative data sets**.**

Ice Cream Sales vs Temperature	
Temperature °C	Ice Cream Sales
14.2°	$215
16.4°	$325
11.9°	$185
15.2°	$332
18.5°	$406
22.1°	$522
19.4°	$412
25.1°	$614
23.4°	$544
18.1°	$421
22.6°	$445
17.2°	$408



This type of graph allows us to draw a conclusion about the relationship between two things, in this example we can say as the temperature increases, so does the number of ice creams sold. We call this a positive correlation as both values are increasing together. There are others types of correlation/relationships:

Pie chart

Represents data in a way that shows the relative size of the category. A good way of displaying data if there are large differences between the categories but not accurate when interpreting the data.

Sparx M574, M165

Example: You survey your friends to find out their favourite genre of movie. The results are

Table: Favorite Type of Movie				
Comedy	Action	Romance	Drama	SciFi
4	5	6	1	4

Table: Favorite Type of Movie					
Comedy	Action	Romance	Drama	SciFi	TOTAL
4	5	6	1	4	20

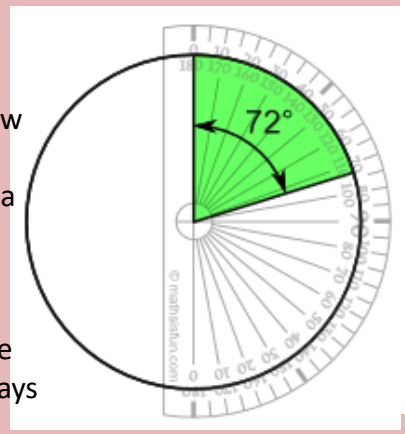
$\frac{360}{20} = 18°$

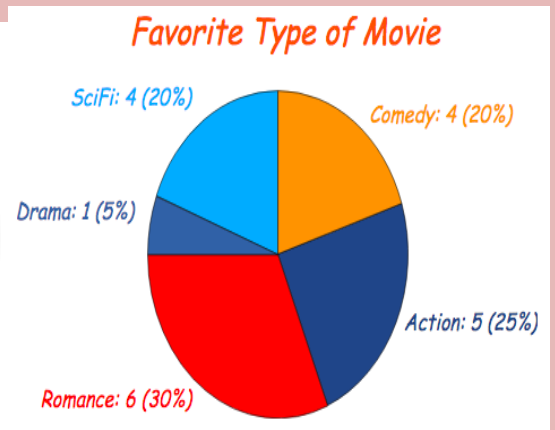
How to draw a pie chart:

1. Calculate the total frequency (add up all of the people in your survey)
2. There are 360º in a full circle, Divide 360 by the total frequency (the number of people in your survey) to calculate how many degrees each person is worth $\frac{360}{20} = 18°$
3. Multiply each frequency by the number of degrees per person to calculate the angle size of the sector (slice of the pie)

Table: Favourite Type of Movie					
Comedy	**Action**	**Romance**	**Drama**	**SciFi**	**Total**
4	**5**	**6**	**1**	**4**	**20**
4 x 18 = **72°**	5 x 18 = **90°**	6 x 18 = **108°**	1 x 18 = **18°**	4 x 18 = **72°**	20 x 18 = **360°**

4. Draw a circle using a compass and pencil
5. Draw a line from the centre of the circle to the edge, this is the base line
6. Line up a protractor with the base line, the centre of the circle positioned with the central cross of the protactor. Follow the base line to the edge of the protractor and counting up from zero, measure the angle of the first sector (slice). Make a mark, remove the protactor and draw a straight line to complete the first slice
7. Line up the protractor on the line you have just drawn and repeat the last step, this time measuring the slice to the angle of the next slice, repeat until complete. Remembering to always line up with the last line drawn.
8. Don't forget to add a title and Key.





Sparx M738

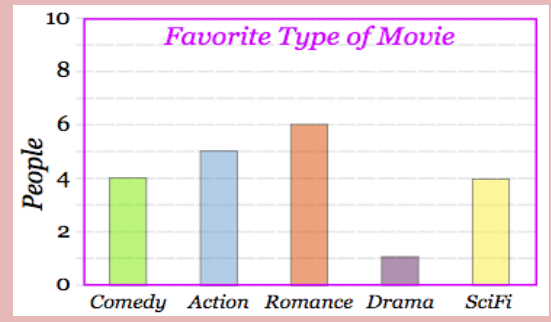
Interpreting Data

To interpret data is to analyse data and make deductions and infer relationships.

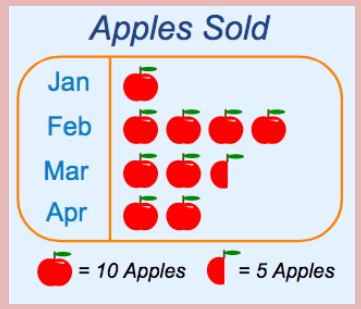
Examples:

Colour	Tally	Frequency
Red	𝍸 𝍸 |||	13
Blue	𝍸 ||||	9
White	𝍸 𝍸 𝍸 𝍸 ||||	24
Black	𝍸 𝍸 ||	12
Other	𝍸 ||||	9

By analysing this tally chart we can deduce that the most popular colour is white.



By analysing this bar chart we can deduce from the survey that the most popular genre of Movie is Romance and the least popular is Drama.



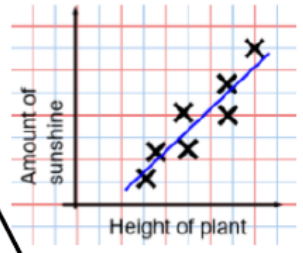
From this pictogram We can deduce that The most number of Apples were sold in February (40) and the least in January (10). The Range is 30.

The way in which the data is presented can show relationships and differences quickly and efficiently. Making analysis and interpretation easy depending on the type of graph/chart used.

Year 9 Maths Term 3&4: More Data Handling

The line of best fit (R)

The Line of best fit is used to make estimates about the information in your scatter graph



It is only an estimate because the line is designed to be an average representation of the data

It is always a straight line.

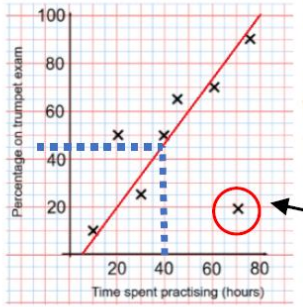
Things to know:

- The line of best fit DOES NOT need to go through the origin (The point the axes cross)
- There should be approximately the same number of points above and below the line (It may not go through any points)
- The line extends across the whole graph

Using a line of best fit (R)

Interpolation is using the line of best fit to estimate values inside our data point.

e.g. 40 hours revising predicts a percentage of 45.



Extrapolation is where we use our line of best fit to predict information outside of our data.
This is not always useful – in this example you cannot score more that 100%. So revising for longer can not be estimated

This point is an "outlier"
It is an outlier because it doesn't fit this model and stands apart from the data

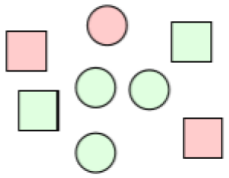
Sparx M596, M769

Comparing distributions

Comparisons should include a statement of average and central tendency, as well as a statement about spread and consistency.
Mean, mode, median – allows for a comparison about more or less average
Range – allows for a comparison about reliability and consistency of data

Representing data in two-way tables

Two-way tables represent discrete information in a visual way that allows you to make conclusions, find probability or find totals of sub groups



There are 2 green squares

There are 5 green shapes

	Squares	Circles	Total
Green	2	3	5
Red	2	1	3
Total	4	4	8

There are 8 items in total

Using your two-way table

To find a fraction
e.g. What fraction of the items are red? 3 red items
but 8 items in total $= \frac{3}{8}$

Interleaving: Use your fraction, decimal percentage equivalence knowledge

Sparx M899

Averages from a table (R)

Non-grouped data

Number of Siblings	0	1	2
Frequency	6	8	6
Subtotal	0	8	12

Overall Frequency: 20

Total number of siblings: 20

The data in a list: 0,0,0,0,0,0,1,1,1,1,1,1,1,1,2,2,2,2,2,2

Mean: $\frac{\text{total number of siblings}}{\text{Total frequency}} = 1$

Grouped data

x Weight(g)	Frequency	Mid Point	MP x Freq
$40 < x \leq 50$	1	45	45
$50 < x \leq 60$	3	65	195
$60 < x \leq 70$	5	65	325

Overall Frequency: 9

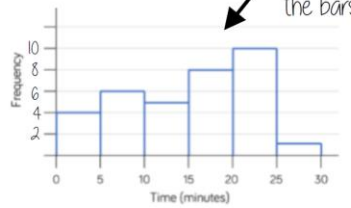
Overall Total : 565

Mean: 62.8g

The data in a list: 45, 55, 55, 55, 65, 65, 65, 65, 65

Grouped quantitative data

Time (minutes)	Frequency
$0 \leq t < 5$	4
$5 \leq t < 10$	6
$10 \leq t < 15$	5
$15 \leq t < 20$	8
$20 \leq t < 25$	10
$25 \leq t < 30$	1



This is a frequency diagram There are no gaps between the bars

"More than or equal to 25 and less than 30 minutes"

The use of inequalities shows that this will be a frequency diagram

Grouping the data is useful if there is a large spread of data to begin with

Sparx U312

Stem and leaf

A way to represent data and use to find averages

This stem and leaf diagram shows the age of people in a line at the supermarket

0	7 9
1	4 5 6 8 8
2	1 3
3	0

Key: 1|4 Means 14 years old

Stem and leaf diagrams:
Must include a key to explain what it represents
The information in the diagram should be ordered

Back to back stem and leaf diagrams

Girls		Boys
5	14	
7, 5, 5, 5, 4	15	3, 8, 9
8, 4, 2, 1, 0	16	2, 5, 7, 7, 7, 8, 8, 9
9, 8, 7, 6, 6, 4, 2, 1, 1, 0, 0	17	0, 2, 3, 6, 6, 7, 7
	18	0, 1, 4, 5

15 | 3,
Means 153 cm tall

Back to back stem and leaf diagrams
Allow comparisons of similar groups
Allow representations of two sets of data

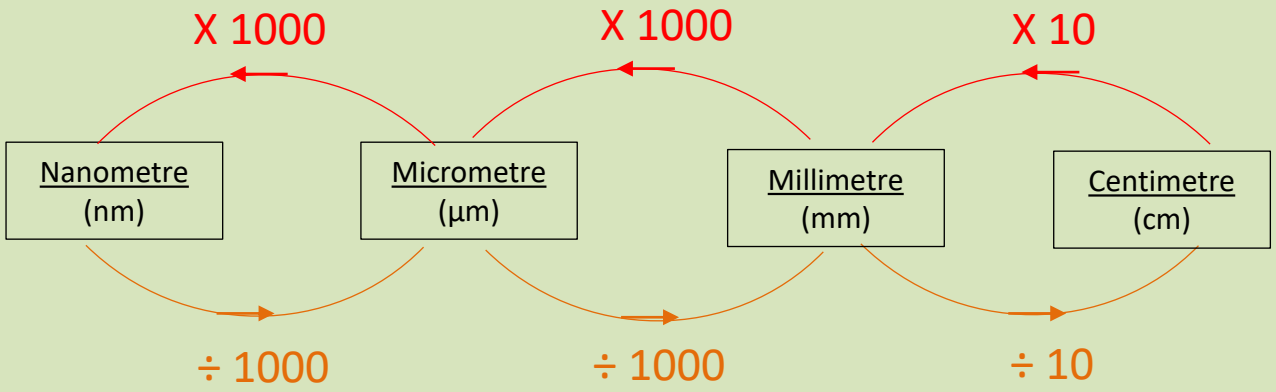
Sparx M648, M210

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:

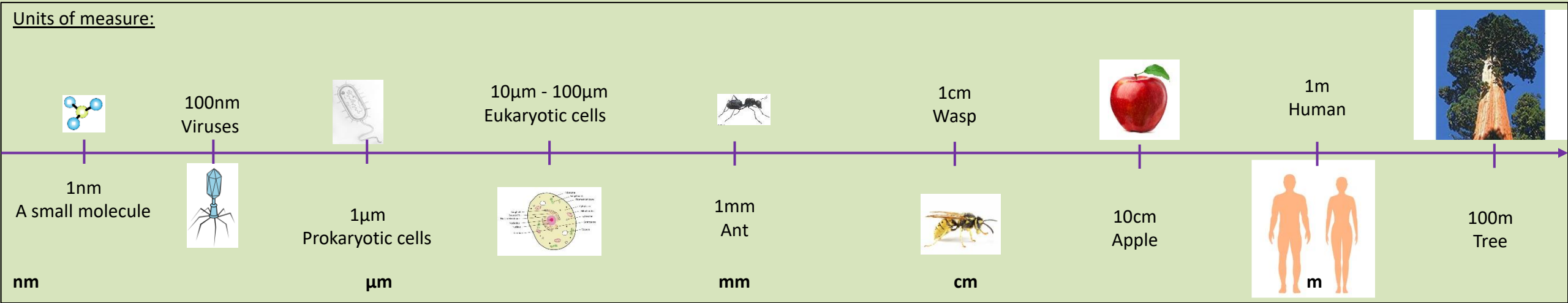
Independent: the variable that is being changed during the experiment

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

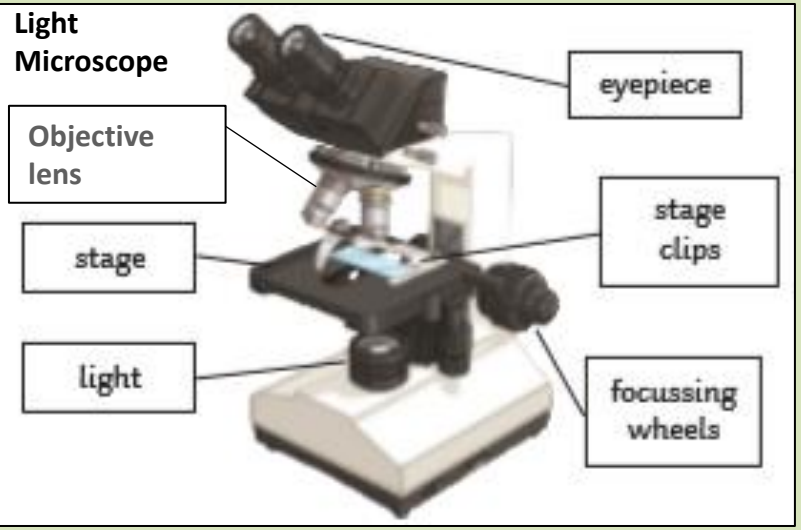
relative atomic mass
atomic symbol
name
atomic (proton) number

* 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: B1
Cell structure and transport

Light Microscope



Magnification Equation

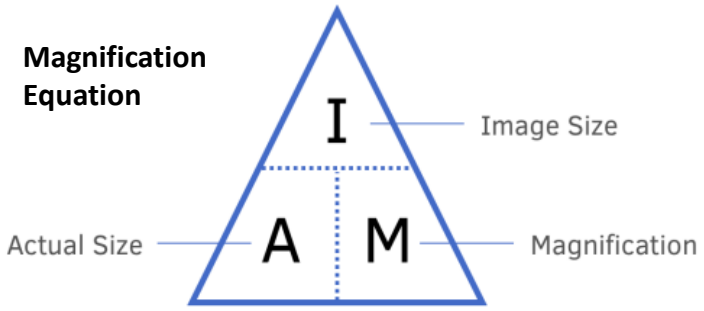


Fig 2. Formula Triangle for Magnification.

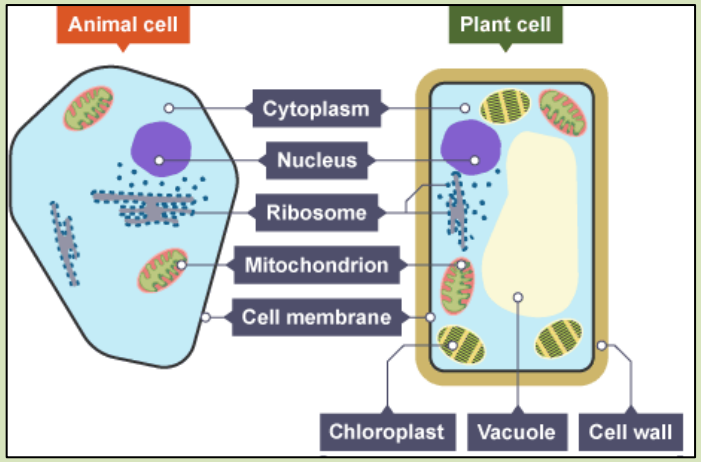
Microscopes:
Electron microscopes magnify up to x2 000 000 and have a resolving power up to 0.2nm. An electron microscope has much higher magnification and resolving power than a light microscope. This means that it can be used to study cells in much finer detail

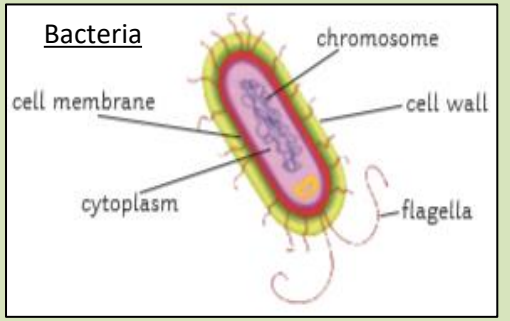
Light microscopes magnify up to x2000 and have a resolving power up to 20nm.

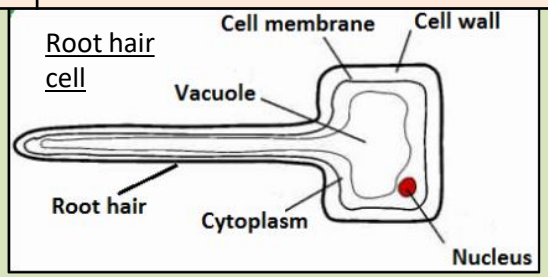
Cell Structure

Cell Structure	Function
Nucleus	Contains genetic information that controls the functions of the cell.
Cell membrane	Controls what enters and leaves the cell.
Cytoplasm	Where many cell activities and chemical reactions within the cell occur.
Mitochondria	Releases energy from aerobic respiration.
Ribosome	Synthesises (makes) proteins.
Chloroplast	Where photosynthesis occurs because it contains the chemical chlorophyll
Permanent vacuole	Used to store water and cell sap.
Cell wall	Strengthens and supports the cell. (Made of cellulose in plants.)
DNA loop	A loop of DNA, not enclosed within a nucleus.
Plasmid	A small circle of DNA, may contain genes associated with antibiotic resistance.

Specialised cell	Function	What its adaptations are!
Nerve	Carry electrical impulses around the body	•Branched connections with other nerve cells •Long to carry electrical impulses far •Lots of mitochondria to provide energy
Muscle	To contract quickly to allow movement	• Lots of mitochondria to provide energy for muscle contraction
Sperm	to carry half the DNA from the male to the female egg cell	•Lots of mitochondria in neck for energy to swim •Long tail, to swim to the egg cell •Streamlined head
Root hair	Absorb water and minerals and ions in the soil to the plant	•Root hair increases surface area for absorption •Lots of mitochondria to provide energy for active transport to transports minerals
Phloem	transports dissolved sugars made in photosynthesis,	•Sieve cells → allows sugars to move up and down in plant •Companion cells→ have lots of mitochondria to provide energy
Xylem	transport water and mineral ions in one direction up the plant	•Lignin → strength and support •No sieve cells → water can flow easily •No cytoplasm→ form hollow tube







Plant and animal cells are **eukaryotic cells,** they have a cell membrane, cytoplasm and genetic material enclosed in a nucleus. Bacterial cells are **prokaryotic cells** and are much smaller. They have cytoplasm and a cell membrane surrounded by a cell wall. The genetic material is not enclosed in a nucleus. It is a single DNA loop and there may be one or more small rings of DNA called plasmids.

KS4 Biology: B1
Cell structure and transport

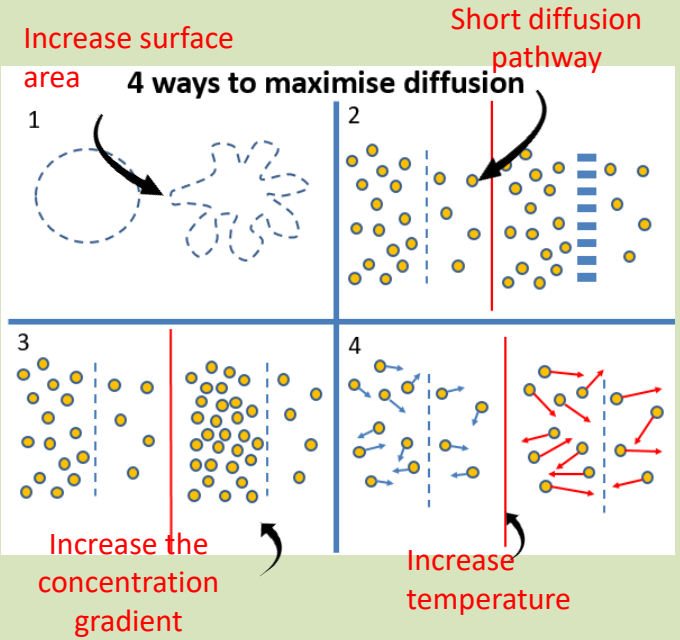
Keyword	Definition
Diffusion	Diffusion is the movement of a substance from an area of **high concentration** to an area of **low concentration (**down a concentration gradient). It does not require energy
Osmosis	The movement of water molecules across a selectively permeable membrane from a region of **higher water concentration** to a region of **lower water concentration (**down a concentration gradient). It does not require energy
Osmosis (second definition)	The movement of water molecules across a selectively permeable membrane from a **dilute solution** to a **concentrated solution**.
Active transport	The movement of substances **against the concentration gradient**, from a low concentration to high concentration. This requires **energy** from **respiration**.
Concentration gradient	Two areas of different concentrations
Surface area to volume ratio	The ratio of the amount of surface compared to the size of the cell/organism

Movement of particles

Cells

Exchange systems

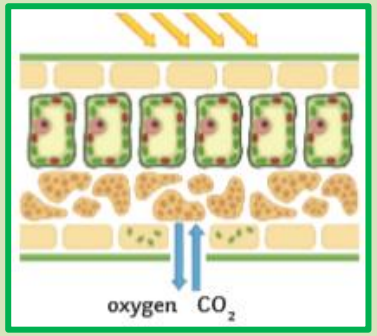
All organisms from bacteria to plants to fish, need to exchange substances in order to carry out life processes



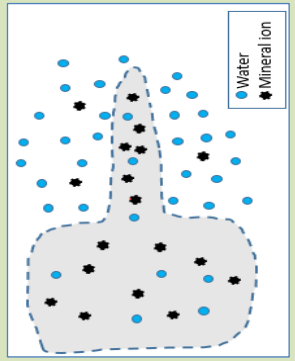
To be an efficient surface for exchanging materials it must:

- have a large surface area.
- be supplied with lots of blood vessels to take gases away – this maintains a concentration gradient.
- be very thin so there is a short diffusion path across the membrane
- Have a concentration gradient by being ventilated i.e keep the air circulating

Exchange in plants



Oxygen and carbon dioxide diffuse into leaf through stomata



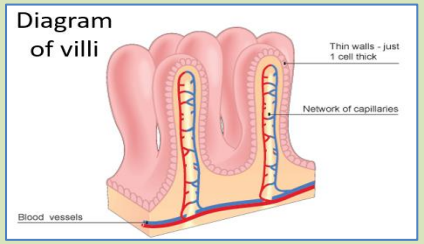
Root hair cell

Water moves into a root hair cell by **osmosis** as a higher concentration of water outside than inside the cell.

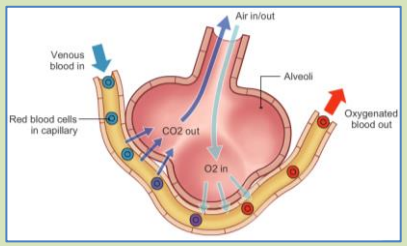
Mineral ions are moved by **Active transport** into the cell from a low concentration to high concentration against the concentration gradient. This requires energy from respiration and proteins to move the substance into the cell

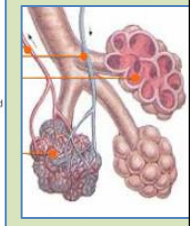
Exchange in animals

Glucose in the Small intestine / villi



Oxygen diffusion in the Lungs / Alveoli





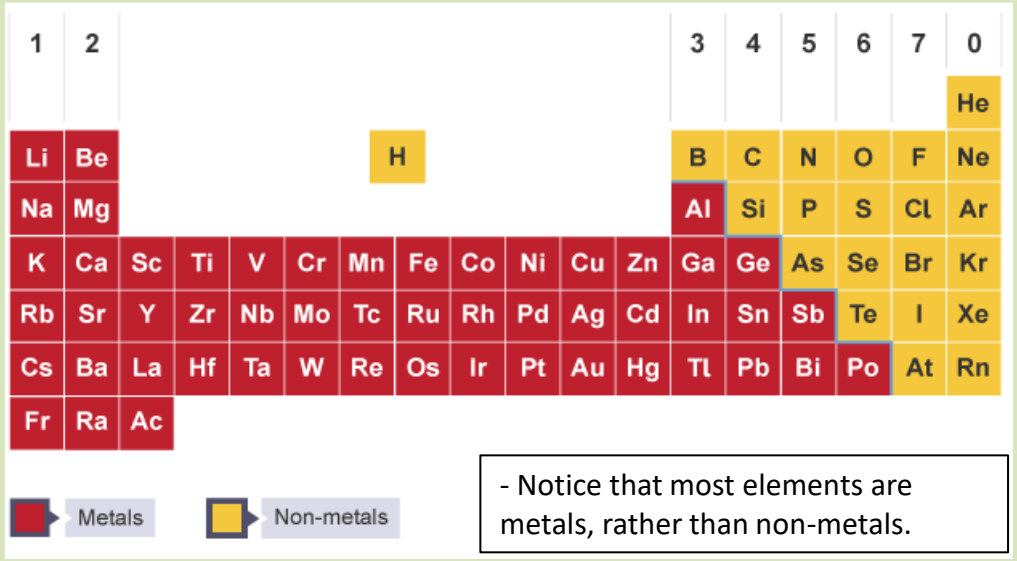
KS4 Chemistry:
C2 The Periodic table

Background: The Periodic Table organises elements into a way that helps us make sense of the physical world

Keyword	Definition
Atomic number	Number of protons in an atom.
Mass number	Number of protons plus neutrons in an atom.
Relative atomic mass	The average mass of atoms of an element taking into account the mass and amount of each isotope it contains. RAM = Total mass of atoms / total number of atoms
Ion	An electrically charged particle containing different numbers of protons and electrons.
Group	The name given to each column in the periodic table.
Element	A substance containing only one type of atom.
Period	The name given to a row in the periodic table.
Alkali metals	The elements in Group 1 of the periodic table.
Noble gases	The elements in Group 0 of the periodic table.
Halogens	The elements in Group 7 of the periodic table.
Transition element	Element from the central block of the periodic table
Diatomic molecule	A molecule containing 2 atoms.
Halides	Compounds made from Group 7 elements.

All the different elements are arranged in a chart called the periodic table. A Russian scientist called Dmitri Mendeleev produced one of the first practical periodic tables in the 19th century. The modern periodic table is based closely on the ideas he used:

- the elements are arranged in order of increasing atomic number
- the horizontal rows are called periods
- the vertical columns are called groups
- elements in the same group are similar to each other



- Notice that most elements are metals, rather than non-metals.

- The zig-zag line in this diagram separates the metals, on the left, from non-metals, on the right. Hydrogen is a non-metal but it is often put in the middle

- Each element has its own chemical symbol, made from letters. Remember that you will only find elements in the periodic table and never compounds. So you won't find substances like water or copper sulphate in the periodic table.

- The main groups are numbered from 1 to 7 going from left to right, and the last group on the right is group 0. The section in the middle of the table is called the Transition Metals.
- If you know what one of the elements in a group is like, you can make predictions about the other elements in a group. For example, all the elements in group 1 are reactive metals, and all the elements in group 0 are unreactive non-metals.

KS4 Chemistry: C2 The Periodic table

Non - Metals

- Dull (not shiny)
- Weak and Brittle (they easily break or shatter when solid)
- Poor conductors of heat and electricity (they are insulators)
- Gain electrons to form negative ions

Metals

- Shiny
- Good conductors of heat and electricity
- Malleable they can be bent/shaped
- Generally high melting and boiling point
- Loose electrons to form position ions

Development of the periodic table

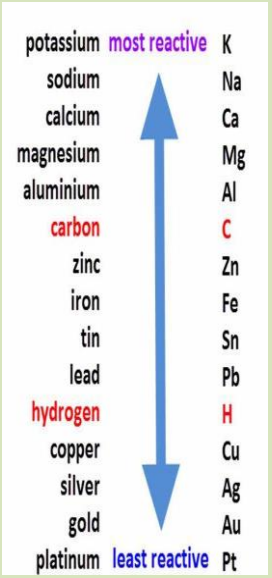
One of the first suggestions came from John Dalton, arranging the element based on their atomic weights.

John Newlands built on Dalton's ideas and also arranged known elements based on atomic weight, but he noticed that the properties of every eighth element appeared similar, producing a table showing his **law of octaves**. However he assumed all the elements had been found and his pattern only worked up until Ca and other scientists refused to accept his ideas.

Dmitri Mendeleev appeared to crack the problem of arranging the elements in 1869. He placed the 50 known elements (at the time) in order based on their atomic weight but arranged them so that a period (regularly occurring pattern) could be seen. Crucially, he left gaps for elements that had not yet been discovered and when necessary moved an elements position to ensure those with similar properties were in the same group.

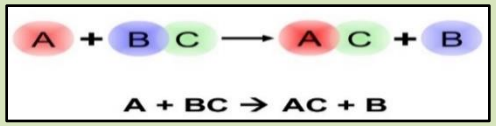
At the start of the 20th century scientists solved the problem of arranging elements as the discovered more about the structure of the atom. Elements were placed in order of the number of protons (atomic number)

The reactivity series of metals



Displacement Reactions

A more reactive metal (A) will displace (push out) a less reactive one (B) from a compound.



You can use the reactivity series of metals to predict the outcome of these reactions

	How the halogens react with hydrogen
$F_2(g) + H_2(g) \rightarrow 2HF(g)$	Explosive, even at –200 °C and in the dark.
$Cl_2(g) + H_2(g) \rightarrow 2HCl(g)$	Explosive in sunlight but slow in the dark.
$Br_2(g) + H_2(g) \rightarrow 2HBr(g)$	Only at over 300 °C in the presence of a platinum catalyst.
$I_2(g) + H_2(g) \rightarrow 2HI(g)$	Only at over 300 °C in the presence of a platinum catalyst (very slow, reversible).

Alkali metals

These group one metals are very reactive and have to be stored in oil to prevent reaction with oxygen or water

Their reactivity increases as you move down the group, as it is easier to loose the single electron in the outer shell to form an ion with a 1^+ charge

sodium + water → sodium hydroxide + hydrogen

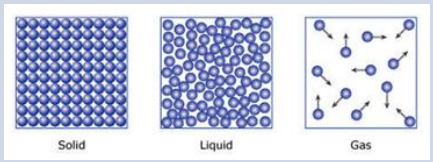
$Na_{(s)} + H_2O_{(l)} \rightarrow 2NaOH_{(aq).} + H_{2\,(g)}$

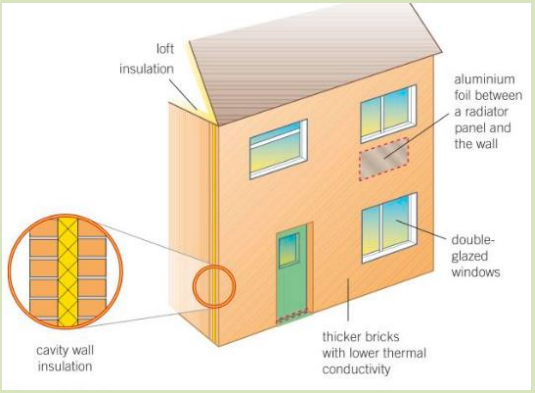
Halogens

These group 7 elements are toxic and have coloured vapours. As elements they exist as diatomic molecules, e.g. Cl_2. The become less reactive as you move down the group

KS4 Physics:
P2 Energy transfer by heating

Background: This topic can save you and your family money! Heat costs money and has environmental costs so if you can understand how heat is transferred and limit its loss you have to spend less heating your home for example.

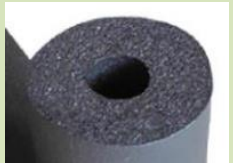
Keyword/term	Definition
States of matter	
Solid	Particles held in fixed positions. Strong forces between particles. Particles vibrating but not moving position. Less energy than liquids.
Liquid	Particles able to slide past each other. More energy than solids. Forces between particles weaker than in solids.
Gas	Particles moving randomly. Particles are far apart. Forces between particles are less than liquids. Particles have more energy than liquids.
The amount of thermal energy transferred depends on:	The thickness of a material *The thicker a material is the better the insulator.* The thermal conductivity of a material. *Metals are better than non-metals*. The temperature difference across a material. *A greater difference in temperature means more energy is transferred.*
Insulator	These materials are poor conductors, they prevent thermal energy passing through them.
Thermal conductivity	A measure of how good a material is at transferring thermal energy – high thermal conductivity means thermal energy easily passes through the material.
Infrared radiation	Electromagnetic waves between visible light and microwaves in the electromagnetic spectrum. *The higher the temperature of an object the more infrared radiation it emits. A black body is the best absorber and emitter of infrared radiation. A light shiny object is the worst absorber and emitter of infrared radiation.*



Ways to reduce heat loss from a house	Loft insulation – fibreglass material that is rolled out in the loft. It traps air in the house preventing it from transferring energy outside.
	Thick walls or glass – reduces the rate of energy transfer to the outside
	Cavity wall insulation – prevents air moving between the inner and outer walls of a house. This prevents energy transferring outside.
	Double Glazing – has minimal air particles between two panes of glass, so thermal conduction is reduced.
	Aluminium foil – this is placed behind radiators to reflect heat back into a room.

Good insulators

Good insulators often trap air, like wool or foam. Air is a poor conductor and by trapping pockets of air between fibres and within the foam you stop convection currents occurring too.



Specific heat capacity Definition:

It is the energy required to heat up 1kg of substance by 1°C.

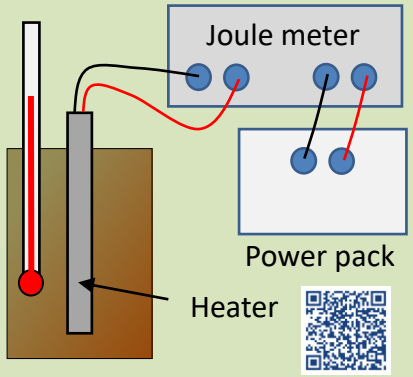
Energy = mass x specific heat capacity x change in temperature

E = m x c x Δθ

(J) = (kg) x (J/kg°c) x (°c)

The specific heat capacity will always be given in the exam.

Metals have low values as they are easily heated up.



Required practical: To work out the specific heat capacity of a material, use a heater to heat up a 1kg block and record the **temperature change** and **energy transferred**.

Use the **gradient** of the straight line section of the graph to calculate the specific heat capacity

Infra red radiation

Infrared radiation (IR radiation) also sometimes called heat radiation is emitted from and absorbed by all objects. The hotter an object the more infrared radiation is emitted.

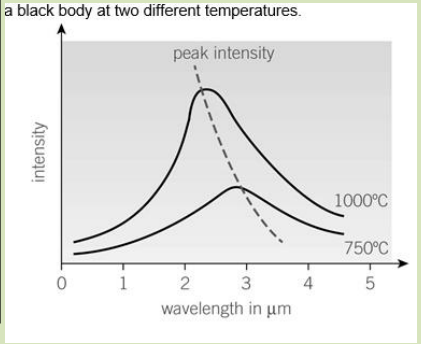
IR radiation travels at the speed of light, is and electromagnetic wave and can pass through a vacuum.

It is the only means of heat transfer that does not require particles.

Separates only: Objects emit radiation over a range of wavelength (IR, visible light, UV etc)

An objects peak output of radiation has a shorter wavelength as the object becomes hotter.

This is why hot stars look more blue and cooler stars are more red.



Black body is an object that absorbs all radiation that falls upon it. These are the best emitters of IR radiation too.

Emitting IR radiation

The best surfaces at emitting IR radiation are matte dark surfaces – Matte Black

The worst surfaces at emitting IR radiation are light shiny surfaces – shiny silver

Absorbing IR radiation

The best surfaces at absorbing IR radiation are also matte dark surfaces – Matte Black

The worst surfaces at absorbing IR radiation are also are light shiny surfaces – shiny silver

This can get a little confusing as the best emitter is matte black and the best absorber is matte black.

Consider whether the question you are addressing is about absorbing IR (heating up) or emitting IR radiation

The black mug will cool down faster than the white mug as it black is a better emitter of IR radiation than White.

3. NEXT STEPS IN PYTHON

Year 9 Computer Science – Spring Term

Python Data Types

Data Type	Category	Example	print(x)
str	Text	x = "Hello World"	→ Hello World
int	Number	x = 20	→ 14
float	Number	x = 20.5	→ 20.5
complex	Mixed	x = 1j	→ 1j
list	Structure	x = ["apple", "banana", "cherry"]	→ ['apple', 'banana', 'cherry']
Tuple	Structure	x = ("apple", "banana", "cherry")	→ ('apple', 'banana', 'cherry')
range	Number	x = range(6)	→ range(0, 6)
dict	Structure	x = {"name" : "John", "age" : 36}	→ {'name': 'John', 'age': 36}
bool	Boolean	x = True	→True

Casting (changing between data types)

Casting is the technical name for converting a **variable** from one data type to another.

- For example:

```
value = "3"
print (value + value)
value = int(value)
print (value + value)
```

→ This output will be: **33**
**a string/text*

→ This output will be: **6**
**an integer*

Casting is very important if you take in text and need to do arithmetic and vice versa.

Python Operators

Operator	Meaning
=	assign
= =	Equal to
! =	Not equal to
<	Less than
>	Greater than
<=	Less/equal to
>=	Greater/equal to
MOD	15 MOD 2 = 1
DIV	15 DIV 2 = 7

An Example Program (how does this work?)

```
correctPassword = "pa55word"
guesses = 0
guess = ""
```

1. Sets the values of three variables:

`correctPassword` **to** *pa55word*
`guesses` **to** *0*
`guess` **to** *" " (blank)*

```
while guess != correctPassword:
    guess = input("Try to guess the password: ")
    guesses = guesses + 1

print("Password guessed correctly")
```

2. Asks to repeat

- Keeps running ***while*** the guess is different from the correct password
- Asks the user to have a guess
- Counts the number of guesses

```
if guesses == 1:
    print("That took you 1 guess.")
else:
    print("That took you " + str(guesses) + " goes.")
```

Works out how many guesses it took and prints out the result.

Selection (IF – ELIF – ELSE statements)

These are useful for getting the program to make a choice.

```
if age >= 18:
  print("You can watch all films")
elif age >= 15:
  print("You can watch all films, except 18s")
elif age >= 12:
  print("You can watch all films, except 15s & 18s")
else:
  print("You can watch a U on your own or a PG or 12A with a parent/guardian")
```

3. NEXT STEPS IN PYTHON

Year 9 Computer Science – Spring Term

Python Iterations (For Loops and While Loops)

how many times

```
for counter in range(10):
  print(counter)
```
← prints what is currently held in counter

for() loops are perfect when you **DO** know how many times you want something to repeat.

reference to variable guess …and variable answer

```
while guess != answer:
  print("That's wrong, try again")
  guess = input("Guess the number")
```
…if they aren't equal; print this; ask for this again

while() loops are great when you don't.

Functions (defining a Function/calling a Function)

```
def bbcLogo():
    print()
    print("====================================")
    print("====================================")
    print("  BBBBBB      BBBBBB      CCCCCCCC  ")
    print("  BB    BB    BB    BB    CCCCCCCC  ")
    print("  BB    BB    BB    BB    CC        ")
    print("  BBBBBB      BBBBBB      CC  C     ")
    print("  BB    BB    BB    BB    CC        ")
    print("  BB    BB    BB    BB    CCCCCCCC  ")
    print("  BBBBBB      BBBBBB      CCCCCCCC  ")
    print("====================================")
    print("====================================")
    print()

# MAIN PROGRAM
bbcLogo()
print("EastEnders is a British television soap opera, ")
print("first broadcast on 19 February 1985.")
print("EastEnders storylines examine the domestic and")
print("professional lives of the people who live and work")
print("in the fictional London Borough of Walford in the East End of London.")
print()
input("Press Enter to coninue")
```
function called here

Using Functions in your programs will:
- reduce the amount of code
- make debugging easier
- allow for reuse (even across other programs)
- aids in problem solving (functional programming encourages effective decomposition and algorithm design)

Parameters

Parameter passed here

```
def printDouble(amount):
    print("Double",amount, "is",amount*2)

printDouble(10)
printDouble(50)
printDouble(1862)
```
Here we are giving the number 10 to our function as a parameter

Parameters give functions a little bit more data to work with

Function can return data

Parameter passed here

```
def calcDouble(amount):
    amount = 2 * amount
    return amount

question = 120
answer = calcDouble(question)
print("Double",question,"is",answer)
```
The data is doubled

Is sent back…

And the returned answer gets stored here

Python Lists

```
highscore = [125,63,35,12]
print(highscore)
print(highscore[0])
print(highscore[1])
```

When using lists we can use the index in square brackets to refer to one element in the list. `highScore[0]` is the first element in the list (computers count from 0)

Updating Lists

```
highscore = [125,63,35,12]
highscore[0] = 127
print(highscore)
```

Appending Lists

```
highscore = [125,63,35,12]
highscore.append(8)
print(highscore)
```

Using loops

```
highscore = [125,63,35,12]
for counter in range(4):
    print(highscore[counter])
```

highScore[0]	highScore[1]	highScore[2]	highScore[3]
125	63	35	12

```
counter = 0
print(highScore[counter])
```
One big advantage of lists is that you can use a **for** loop to step through each value

More Programming Resources

Programming is an activity that you can pretty much do anywhere and on most devices. Like anything, the more you do of it, the more accomplished you will be at it. Check out some of the available resources below.

More Programming Sites

Future Learn: https://www.futurelearn.com/subjects/it-and-computer-science-courses/coding-programming

Snakify: https://snakify.org/en/

Python Principles: https://pythonprinciples.com/

W3Schools: https://www.w3schools.com/

Snakify: https://snakify.org/en/

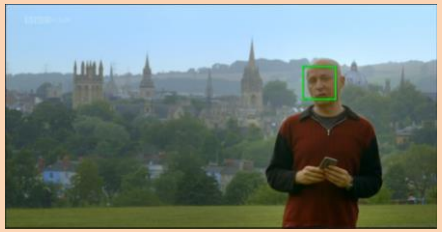
Time2Code: https://time2code.today

Programming is also an activity that you can put towards your skills sections for the Duke of Edinburgh award. The Computer Science department can sign evidence of this off as an assessor.

4. UNDERSTANDING ALGORITHMS

Year 9 Computer Science – Spring Term

The Secret Rules of Modern Living Algorithms (the key algorithms)



Face Detection: looking for patterns

Euclid: greatest common divisor

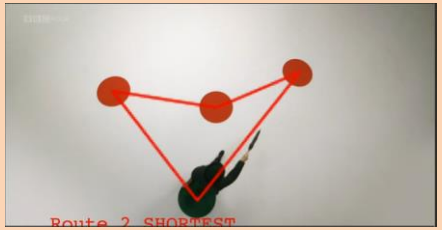
Chilli & Chocolate: mathematical

PageRank: Google's search algorithm

Sorting Algorithms: data in order

Matching algorithms dating

Rubiks Cube solvable algorithms



Travelling Salesman nsolvable

Bees: heuristics

Air Traffic Control: heuristics at work

Xbox Connect: decision trees

Automated warehouse: routing

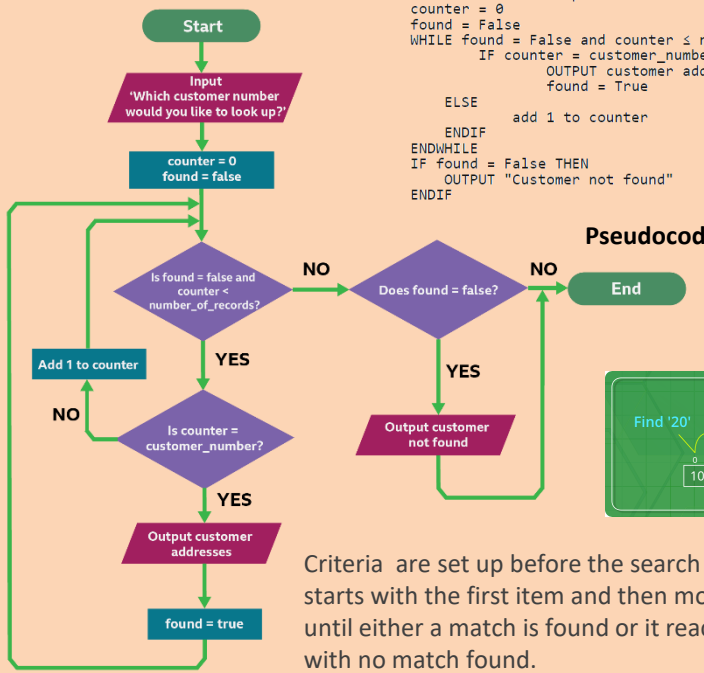
Algorithms for Searching

We often need to find one particular item of data amongst many hundreds, thousands, millions or more. For example, you might need to find someone's phone number on your phone, or a particular business's address in the UK.

This is why searching algorithms are important. Without them you would have to look at each item of data – each phone number or business address – individually, to see whether it is what you are looking for. In a large set of data, it will take a long time to do this. Instead, a searching algorithm can be used to help find the item of data you are looking for.

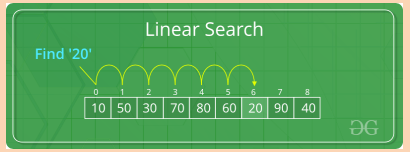
The two we cover are: **The Linear (serial) Search** and the **Binary Search**.

Linear Search Algorithm




```
OUTPUT "Which customer number would you like to look up?"
INPUT user inputs customer number
STORE the user's input in the customer_number variable
counter = 0
found = False
WHILE found = False and counter ≤ number_of_records:
        IF counter = customer_number THEN
                OUTPUT customer address
                found = True
    ELSE
            add 1 to counter
    ENDIF
ENDWHILE
IF found = False THEN
    OUTPUT "Customer not found"
ENDIF
```

Pseudocode for Linear Search

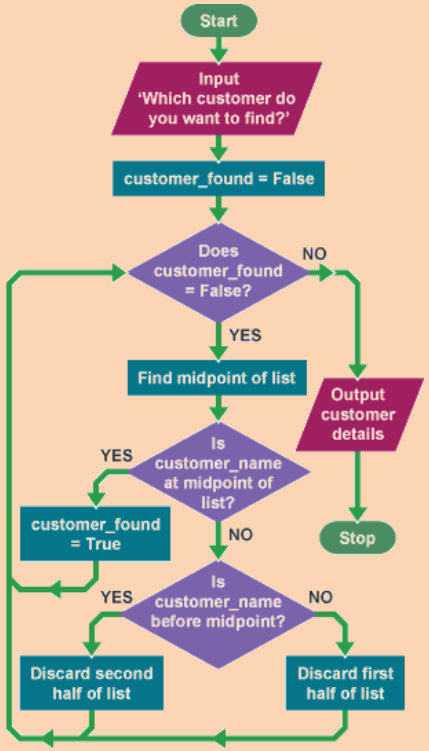


Criteria are set up before the search begins. The search then starts with the first item and then moves to each item in turn, until either a match is found or it reaches the end of the data with no match found.

4. UNDERSTANDING ALGORITHMS

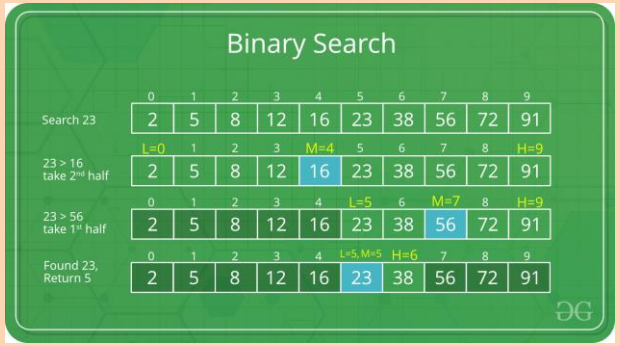
Year 9 Computer Science – Spring Term

Binary Search Algorithm



Binary search is a faster method for searching for an item that is in an **ordered list**.

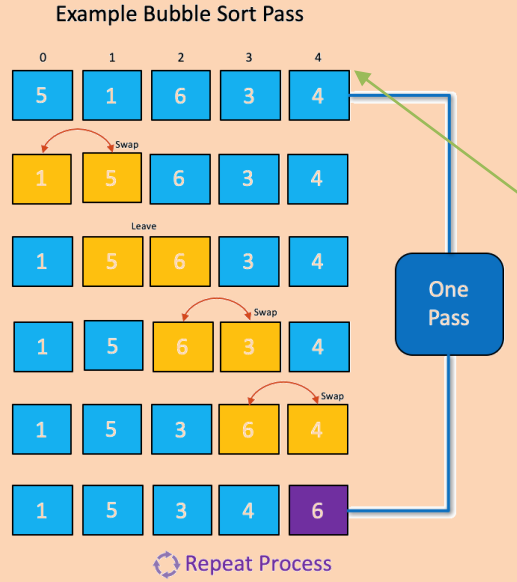
A binary search algorithm takes the data and keeps dividing it in half until it finds the item it is looking for.




```
OUTPUT "Which customer do you want to find?"
INPUT user inputs John Smith
STORE the user's input in the customer_name variable
customer_found = False
(we need to create a flag that identifies if the customer is found)
WHILE customer_found = False:
        Find midpoint of list
        IF customer_name = record at midpoint of list THEN
                customer_found = True
        ELSE IF customer comes before the midpoint THEN
                throw away the second half of the list
        ELSE
                throw away the first part of the list
OUTPUT customer details
```

Pseudocode for Binary Search

Bubble Sort Algorithm



Comparing Algorithms

It is important to understand that different algorithms might be best used in different situations. For example, sometimes an algorithm won't work with a particular set of data, and in some instances one algorithm will be much quicker or more efficient than another.

The **bubble** sort examines the first item and compares it with the next. If it is larger it swaps. It continues this action until the largest item has '**bubbled**' to the end of the list. This is called the **first pass**. It repeats this process again until the second largest item is now in place. This is called the **second pass**. This process repeats until the list is **sorted**.

Bucket Sort Algorithm

A bucket sort separates a list of into different collections of data, called '**buckets**'. Empty buckets are set up at the start of the sort and are filled with the relevant data. Each bucket is then sorted, and the data is finally gathered back into a list.

1. Set up a series of empty buckets.

2. Put the data into the correct buckets.

3. Buckets that have more than one item of data in them will be sorted (e.g using another sort algorithm such as a bubble sort).

4. The data will then be gathered from each bucket and put back into a list. The final list will be **15, 17, 18, 28, 32, 41, 54, 77.**

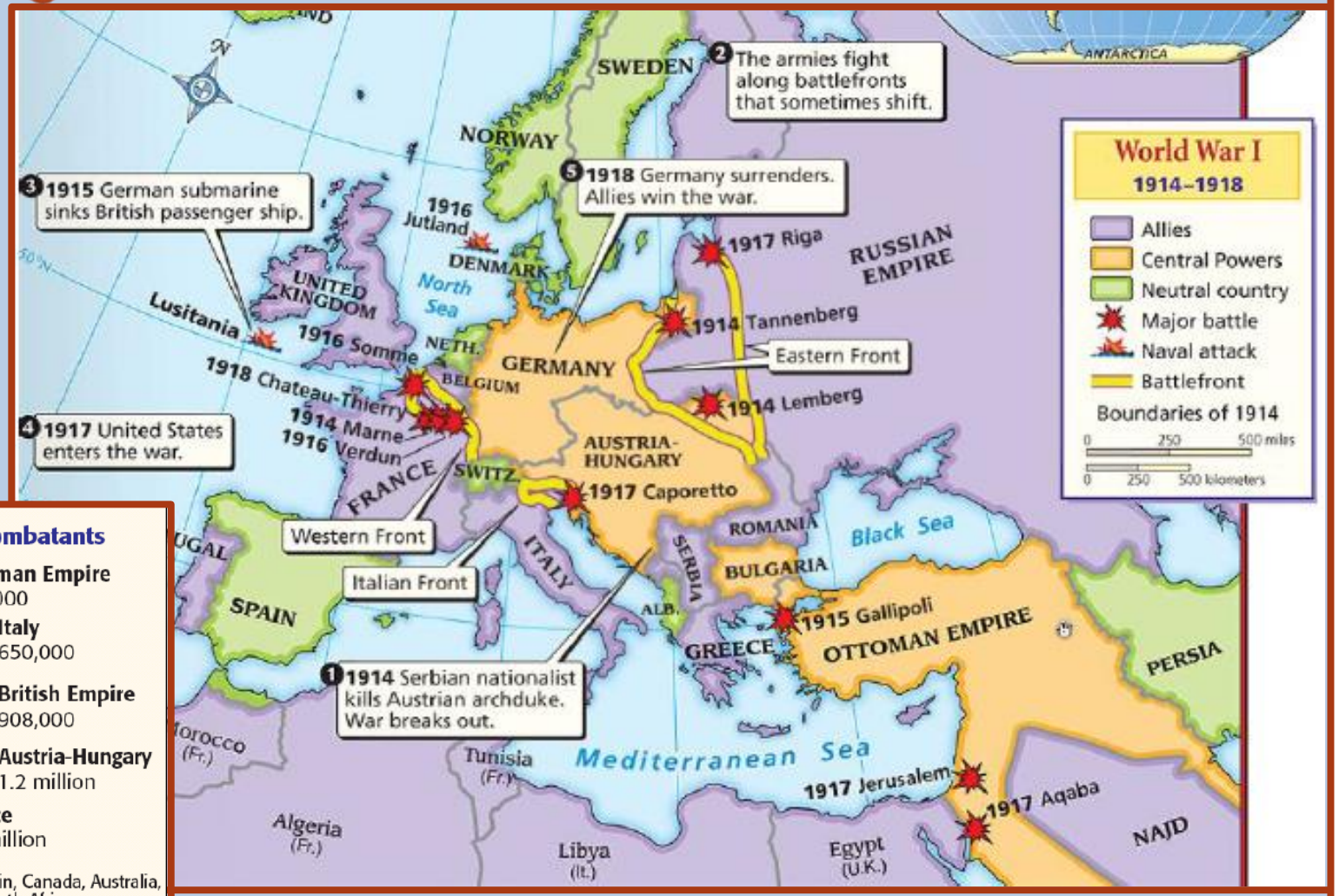
Algorithms for Sorting

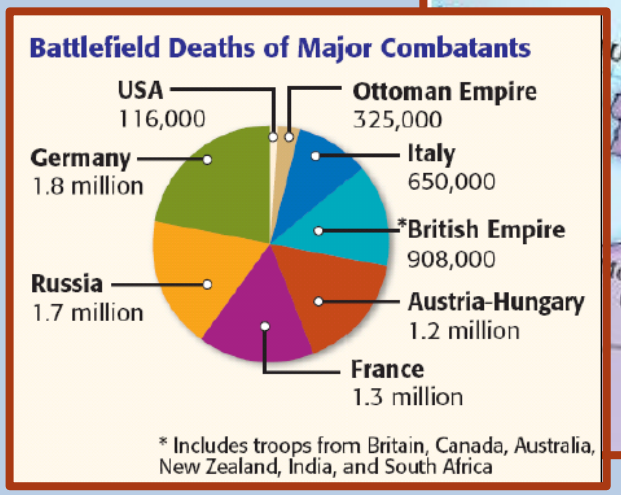
A sorting algorithm will put items in a list into an order, such as alphabetical or numerical order. For example, a list of customer names could be sorted into alphabetical order by surname, or a list of people could be put into numerical order by age. Sorting data is an important precondition if you want to use more efficient search algorithms like the **Binary Search**.

Sorting a list of items can take a long time, especially if it is a large list. A computer program can be created to do this, making sorting a list of data much easier.

There are many types of sorting algorithms. Two of them are **bubble sort** and **bucket sort**.

How was the end of the war seen in Britain?
https://youtu.be/bkN01F45mUs



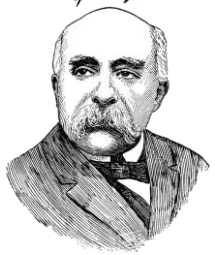


Specific Effects of World War 1:

- WW1 caused the downfall of four monarchies: Germany, Turkey, Austria-Hungary and Russia.
- The war made people more open to other ideologies, such as the Bolsheviks that came to power in Russia and fascism that triumphed in Italy and even later in Germany.
- The war changed the economical balance of the world, leaving European countries deep in debt and making the U.S. the leading industrial power and creditor in the world.
- With all the new weapons that were used, WW1 changed the face of modern warfare forever.
- Due to the cruel methods used during the war and the losses suffered, WW1 caused a lot of bitterness among nations, which also greatly contributed to WW2 decades later.
- Social life also changed: women had to run businesses while the men were at war and labour laws started to be enforced due to mass production and mechanization. People all wanted better living standards.
- After WW1, the need for an international body of nations that promotes security and peace worldwide became evident. This caused the founding of the League of Nations.
- The harsh conditions of the Treaty of Versailles caused a lot of dissent in Europe, especially on the side of the Central Powers who had to pay a lot for financial reparations

‘The Big Three’

Woodrow Wilson



Georges Clemenceau

David Lloyd George

Wilson's aims:

- to end war by creating a League of Nations based on his Fourteen Points
- to ensure Germany was not destroyed
- not to blame Germany for the war - he hated the Guilt Clause

Clemenceau's aims:

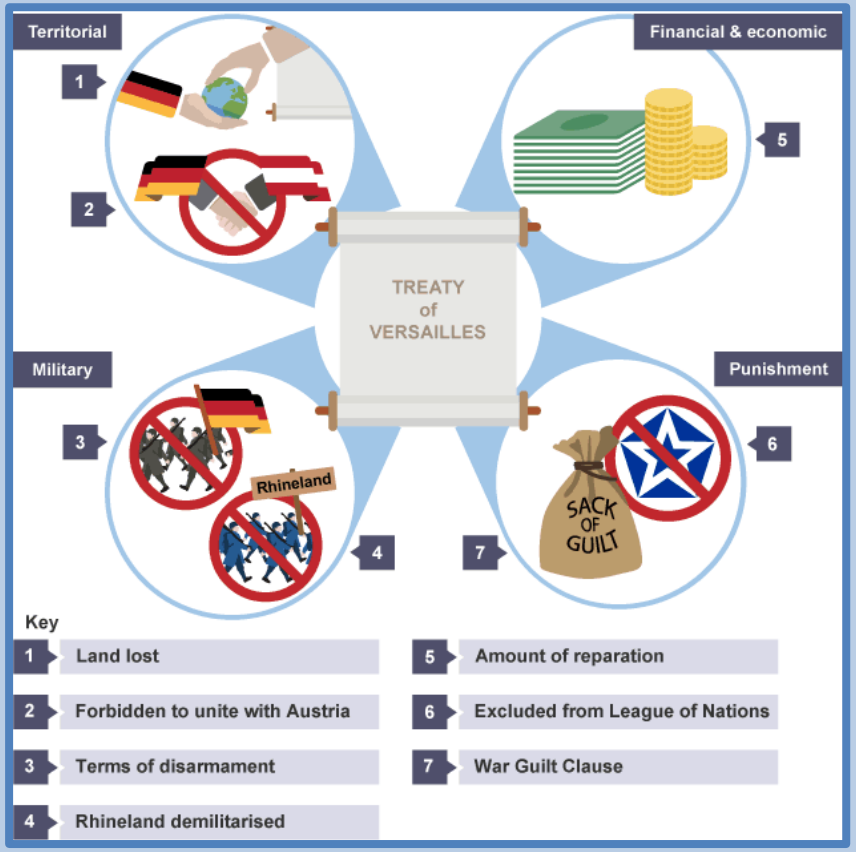
- to punish Germany and seek revenge
- to return Alsace-Lorraine to France
- no League of Nations
- an independent Rhineland
- huge reparations
- to disband the German army so that Germany would never be strong enough to attack France again

Lloyd George's aims:

- a 'just' peace that would be tough enough to please the electors who wanted to 'make Germany pay', but would leave Germany strong enough to trade
- land for Britain's empire
- to safeguard Britain's naval supremacy

The **Paris Peace Conference**, was the meeting in 1919 and 1920 of the victorious Allies after the end of World War I to set the peace terms for the defeated Central Powers.

The Treaty of Versailles dealt specifically with Germany



Find out more about the treaty:

https://youtu.be/TViVAmSlLG4

Summary of Germany terms

Territory	Germany to lose 13% of land and all overseas territory
Reparations	Germany to pay $6.6 billion
Armaments	Army reduced to 100,000 men, no tanks, no submarines, no air force, only 6 battleships
War Guilt	Germany to accept complete blame for the war
League of Nations	Germany forbidden to join the League of Nations.

The Effects of the Peace Treaty

Germany

The Germans hated **everything** about the treaty:

- They were angry that they had not been allowed to negotiate.
- 'Deutsche Zeitung', a German newspaper, vowed: "We will never stop until we win back what we deserve."
- Count Brockdorff-Rantzau, leader of the German delegation at Versailles said Article 231 - the war-guilt clause - was "a lie". Germany officially denied the war-guilt clause in 1927.
- There was a revolution (the Kapp Putsch) against the treaty in Berlin in 1920.
- Germany hated reparations, and was forced to begin paying them in 1921. They defaulted in 1923 and eventually Hitler refused to pay altogether.

Britain

Britain gained some German colonies and the German navy was destroyed **but**:

- Lloyd George thought the treaty was too harsh, saying: "We shall have to fight another war again in 25 years time."
- The British diplomat Harold Nicolson called it "neither just nor wise" and the people who made it "stupid".
- The economist John Maynard Keynes prophesied that reparations would ruin the economy of Europe.

France

France got Alsace-Lorraine, German colonies, harsh reparations and a tiny German army **but**:

- Many French people wanted an independent, not a demilitarised, Rhineland.
- Most French people did not think the League of Nations would protect them against Germany.

America

Woodrow Wilson got the League of Nations, and new nation-states were set up in Eastern Europe **but**:

- Wilson thought the treaty was far too harsh.
- Self-determination proved impossible to implement - neither Czechoslovakia or Yugoslavia survived as united countries.
- Many Americans did not want to get involved in Europe, and in 1920 the American Senate refused to sign the Treaty of Versailles, or join the League of Nations.

Key outcomes of the treaties were the separation of the Central Powers into independent countries. Many of these new countries struggled to create security and economic prosperity.

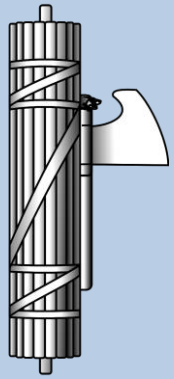
Germany and Austria were forbidden from uniting again, German territory was given to other nations.

In Nov 1918,the German King abdicated and a new German government was formed called the Weimar Republic. This new government faced many opponents from the outset.

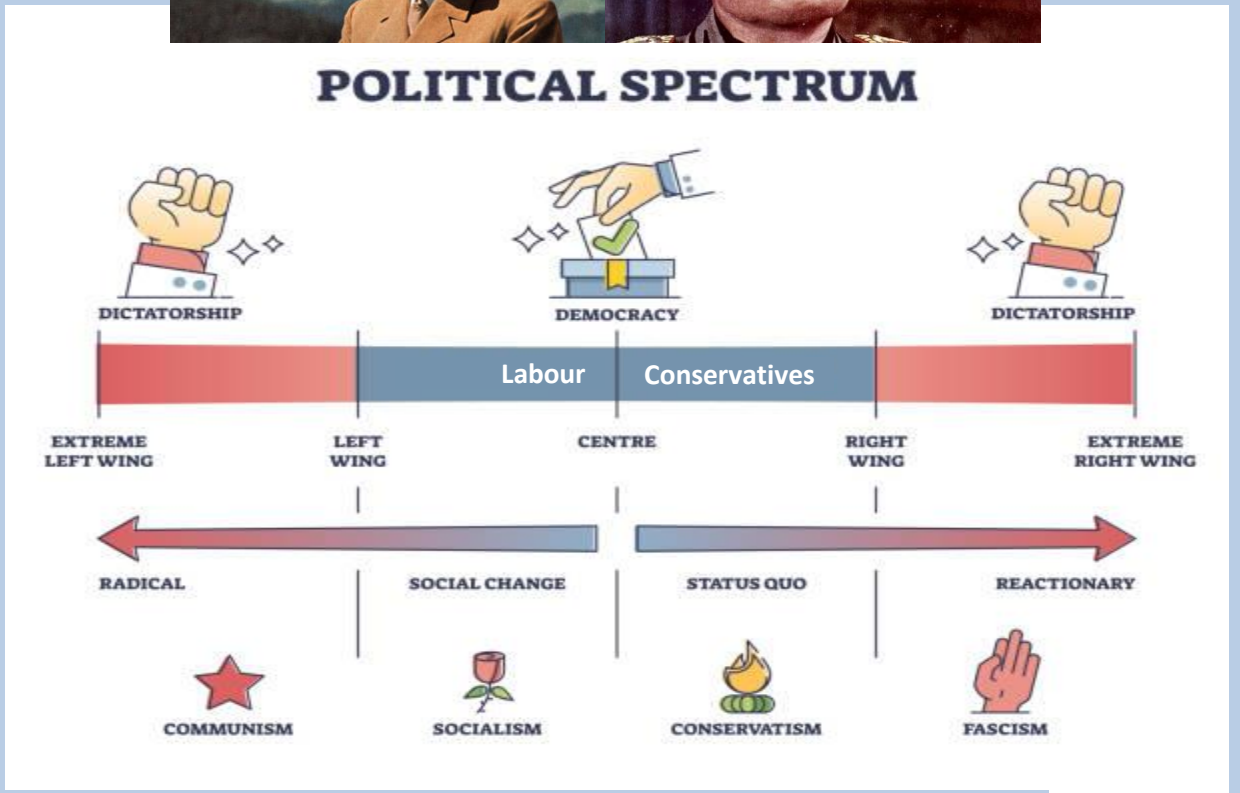
Many people in Germany felt that this new government had betrayed them by signing the Treaty of Versailles

The hammer and sickle is a communist symbol representing solidarity between agricultural and industrial workers

The original symbol of fascism in Italy under Benito Mussolini was the *fasces*. This is an ancient Imperial Roman symbol of power; a bundle of sticks featuring an axe, indicating the power over life and death and strength in unity.



Democracy	a system of government in which power is held by elected representatives who are freely voted for by the people, or held directly by the people themselves
Communism	a theory or system of social organization in which all property is owned by the community and each person contributes and receives according to their ability and needs
Fascism	a way of organising a society in which a government ruled by a dictator controls the lives of the people and in which people are not allowed to disagree with the government
Government	the group of people with the authority to govern a country or state; a particular ministry in office
Extremism	the holding of extreme political or religious views; fanaticism
Wall Street Crash	a financial crisis that occurred in October 1929, when stock prices on the New York Stock Exchange suddenly and steeply declined.
Great Depression	a period of severe global economic downturn that occurred from 1929 to 1939
Revolution	a forcible overthrow of a government or social order, in favour of a new system.
Cult of personality	is the result of an effort which is made to create an idealized and heroic image of a glorious leader.



This links to an excellent video on the rise of the dictators - https://tinyurl.com/2utxxf2y

SCAN ME

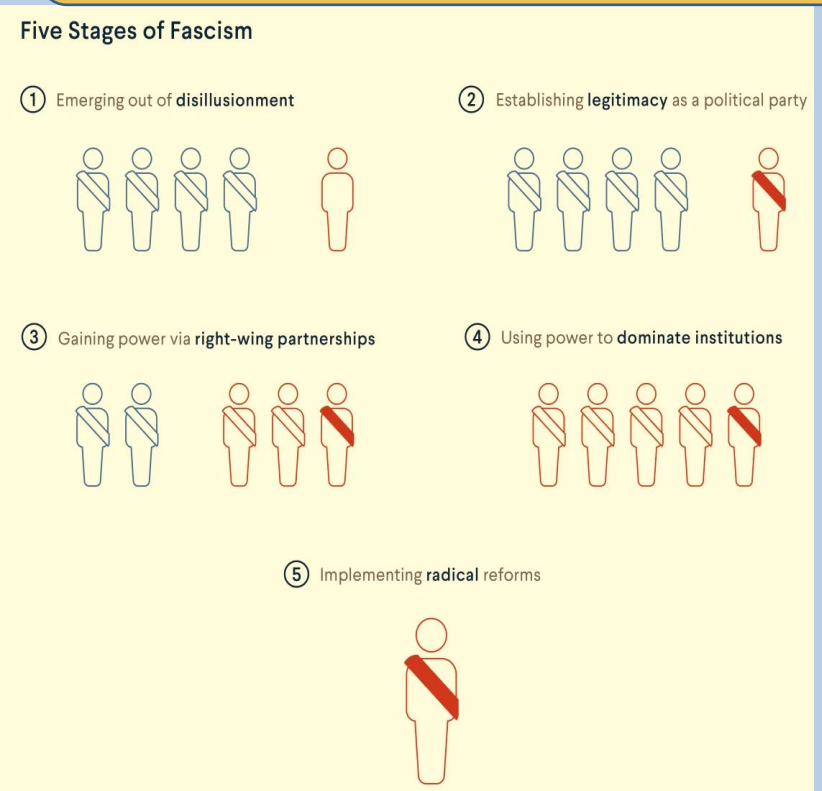
Several conditions contributed to the rise of dictatorships in Europe, including:

Economic instability: Many countries in Europe were experiencing economic instability in the 1920s, including Portugal, which had high inflation and a large public debt.

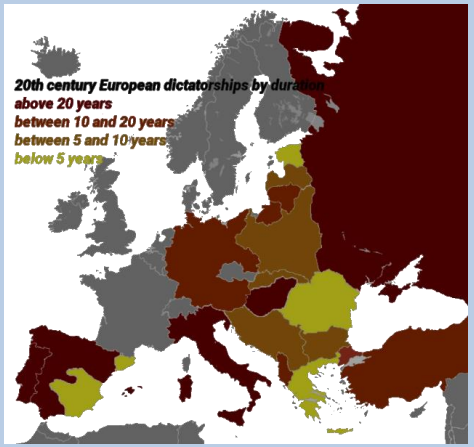
Dissatisfaction with the 1919 Peace Settlement: Many Europeans were dissatisfied with the outcome of the 1919 Peace Settlement.

Fear of the left: Some Europeans feared the rise of the left.

Technological advancements: New technologies, such as machine guns, public address systems, radio, television, and films, made it easier for dictators to control the population.



The aftermath of World War I: The conditions created by World War I and its aftermath led to reactionary politics and revolutionary socialism.



More on the rise of Hitler here: https://youtu.be/jFICRFKtAc4

Hitler's Rise to Power

1889 – Adolf Hitler is born in Braunau am Inn, Austria-Hungary. Hitler grows up in a middle-class family, his early years are marked by family troubles and academic failure.

1914-1918 – World War I Hitler volunteers for the German army and serves during World War I. He is wounded twice but is deeply affected by Germany's defeat, which fuels his desire for revenge and nationalism.

1919 – Hitler joins a small nationalist political group called the **German Workers' Party (DAP), which is later renamed the Nazi Party (1920), and starts gaining attention with his speeches about nationalism, anti-Semitism, and blaming others for Germany's problems.

1923 - The Beer Hall Putsch. Hitler attempts a violent coup in Munich, but it fails. He is arrested and sentenced to prison for treason.

1930-1932 The Nazi Party gains significant support in elections. During the Great Depression, many Germans are angry and desperate. Hitler and the Nazis promise to fix the economy and restore Germany's power. The Nazi Party becomes the second-largest party in the Reichstag (German parliament) by 1932.

1925 –After being released, Hitler focuses on rebuilding the Nazi Party, using propaganda, mass rallies, and growing discontent to gain support from more Germans, especially during the economic hardships of the Great Depression.

1933 –-Hitler is appointed Chancellor of Germany on January 30, after backroom deals and pressure from conservative politicians who believe they can control him.

1933 – In February, the Reichstag (parliament) building is set on fire. Hitler uses this as an excuse to crack down on political opponents and pass the Enabling Act, which gives him the power to make laws without approval from the Reichstag. This marks the beginning of Hitler's dictatorship.

1934, August – Hitler becomes Führer (Leader) of Germany after President Hindenburg's death, he merges the roles of Chancellor and President, declaring himself Führer, the supreme leader of Germany. He now has total control over the government and begins his radical and violent policies.

30th June 1934 – Night of the Long Knives. Hitler used his SS bodyguard to remove any rivals to his power

Mussolini's Rise to Power

1883 - Benito Mussolini is born on July 29, 1883. Born into a working-class family. His father was a socialist and his mother very religious.

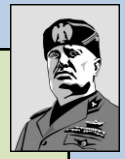
1902 - Mussolini moves to Switzerland and adopts socialist ideas. He becomes involved in writing for socialist newspapers and believes in workers' rights.

1914 - Mussolini supports Italy's entry into World War I, breaks with socialists, becoming more nationalistic and pro-war.

1919 - Mussolini forms the Fascist Party. Fasci di Combattimento
His movement attracts veterans, nationalists, and those frustrated by Italy's post-war instability.

1922 – Mussolini leads a mass march on Rome. He demands power, and the King of Italy asks him to form a new government.

1922 - Mussolini is appointed Prime Minister by King Victor Emmanuel III.



1925- Mussolini consolidates power and becomes a dictator. He silences opposition through violence, censorship, and propaganda, claiming absolute power.

1930s - Mussolini starts pushing for military expansion. In 1935, Italy invades Ethiopia, hoping to make Italy an empire. Mussolini forms an alliance with Nazi Germany in the late 1930s, leading Italy into World War II.

Key Similarities in Their Rise to Power:

1. **Exploiting National Discontent**: All three leaders took advantage of their countries' economic crises and post-war instability to gain support.

2. **Charismatic Leadership**: Mussolini, Stalin, and Hitler presented themselves as strong, visionary leaders who could solve their countries' problems and restore national pride.

3. **Violence and Repression**: All three used violence, intimidation, and terror to crush opposition, including political purges and secret police forces.

4. **Totalitarian Control**: Each leader established total control over the government and society, including the economy, media, education, and culture.

5. **Elimination of Rivals**: They systematically removed political rivals, using purges and violent means to eliminate threats to their power.

6. **Use of Propaganda**: They each used propaganda to build their *cult of personality* and manipulate public opinion, portraying themselves as the saviours of their countries.

Stalin's Rise to Power

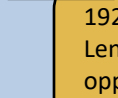
1878 - Stalin is Born in Georgia (part of the Russian Empire at the time). He grows up in poverty and faces a tough childhood.

1899 – Stalin becomes involved in revolutionary activities, joining Marxist groups that want to overthrow the Russian monarchy and bring about a workers' revolution.

1902-1913 - Stalin is arrested and sent to Siberia. Over the next several years, Stalin is arrested multiple times for his revolutionary activities.

1917 - Russian Revolution. The Russian monarchy is overthrown. The Bolsheviks, led by Vladimir Lenin, take control, and Stalin returns from exile. He supports Lenin's government.

1922 – Stalin is appointed General Secretary of the Communist Party.
Stalin takes on this powerful position allowing him to control appointments and gain influence.



1924 - Lenin Dies. After Lenin's death, Stalin sees an opportunity to take power. The Soviet Union is thrown into a leadership struggle.

1925-1927 - Stalin defeats rivals within the Communist Party, such as Leon Trotsky using political strategies, alliances, and propaganda.

1929 - Stalin becomes the undisputed leader of the Soviet Union, he has complete control over the Communist Party and the Soviet government, marking the beginning of his dictatorship.

1920s	Hitler forms his foreign policy – he aimed to: Destroy the Treaty of Versailles, create Lebensraum, unite all German speakers and to defeat communism
1935	Hitler begin the rearmament programme and introduces conscription
March 1936	Hitler marches into demilitarised Rhineland, breaking the Treaty of Versailles. Soldiers are told to retreat if they are stopped by France or Britain, but they are not
Feb-Mar 1938	Hitler completes the Anschluss (uniting) with Austria. Austrian Nazis demand a union with Germany. Hitler sends troops in to intimidate - 99% of Austrians vote for Anschluss
Sept 1938	Hitler tries to take the Sudetenland. Chamberlain & Hitler meet - Hitler is given the Sudetenland in return for promises he has no more territorial ambitions
March 1939	Hitler invades and takes the whole of Czechoslovakia. Britain begins to prepare for war, appeasement is abandoned.
Aug 1939	The Nazi Soviet Pact between Germany and Russia, they agree to split Poland between them and to remain friends.
Sept 1939	Hitler invades Poland on 1st September. Britain declares war on 3rd September. The Second World War begins.

After the First World War, the League of Nations had been set up to enforce the peace treaties and prevent war. In the 1930s it began to crumble, politicians turned to a new way to keep the peace - **appeasement**. This was the policy of giving Hitler what he wanted to stop him from going to war. It was based on the idea that **what Hitler wanted was reasonable** and, when his reasonable demands had been satisfied, he would stop.

Although historians recognise appeasement in the actions of Britain and France before 1938, the Sudeten Crisis of 1938 is the key example of appeasement in action. Neville Chamberlain was the British prime minister who believed in appeasement.

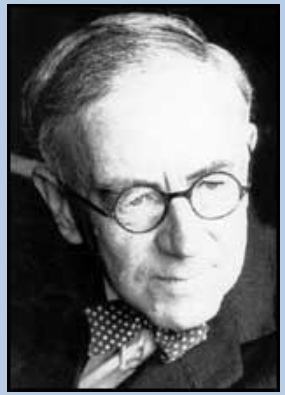
In 1938, Germans living in the border areas of Czechoslovakia (the Sudetenland) started to demand a union with Hitler's Germany. The Czechs refused and Hitler threatened war. On 30 September during the Munich Agreement - without asking Czechoslovakia - Britain and France **gave** the Sudetenland to Germany.

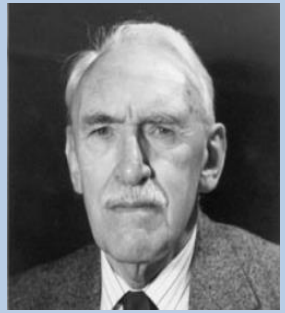
Appeasement in an international context is a diplomatic policy of making political or material concessions to an aggressive power in order to avoid conflict

British Prime Minister Neville Chamberlain meeting Hitler in 1938

Watch this short clip to see how the news reported the agreements at the time:

https://www.youtube.com/watch?v=e0uOsPBSKPo





In 1963, Historian A. J. P. Taylor said…

"Hitler had no plan. He waited to see what the other countries did. No-one tried to stop him. Britain let him take Czechoslovakia. Hitler did not think that Britain would go to war over Poland. Others provided Hitler with the opportunities and he took them. The leaders of Europe are as much to blame for war as Hitler."

In 1967, Historian Alan Bullock disagreed. He argued:
"Hitler said the German people needed living space in Eastern Europe. He knew this would lead to war. He wrote about going to war in his book 'Mein Kampf.' He always intended to go to war, no matter what anyone did to try to stop him."

On 15 March 1939, German troops marched into Czechoslovakia. Hitler's invasion of Czechoslovakia was the end of appeasement for several reasons:

- it proved that Hitler had been lying at Munich
- it showed that Hitler was not just interested in a 'Greater Germany' (the Czechs were not Germans)
- on 17th March, Chamberlain gave a speech saying that he could not trust Hitler not to invade other countries
- on 31st March, Chamberlain guaranteed to defend Poland if Germany invaded

Was appeasement the right policy?

Germany deserved a fair deal
Germany treated too harshly at Versailles, so were only being given their rightful land.

It encouraged Hitler
Giving into Hitler only made him feel he could do what he wanted - without fear of being stopped.

Germany was growing stronger
Allowed Germany to grow stronger meant it would be far more difficult to defeat.

Britain needed time
By giving Hitler what he wanted, Britain had more time to build up her armed forces.

The British people had to want war
In 1938, public opinion was against war - so the policy of appeasement was sensible.

Munich Agreement was a disaster
Churchill said Czechoslovakia was sacrificed for nothing - Hitler had fooled everyone.

Fear of another war
People wanted to avoid another terrible war and did everything possible.

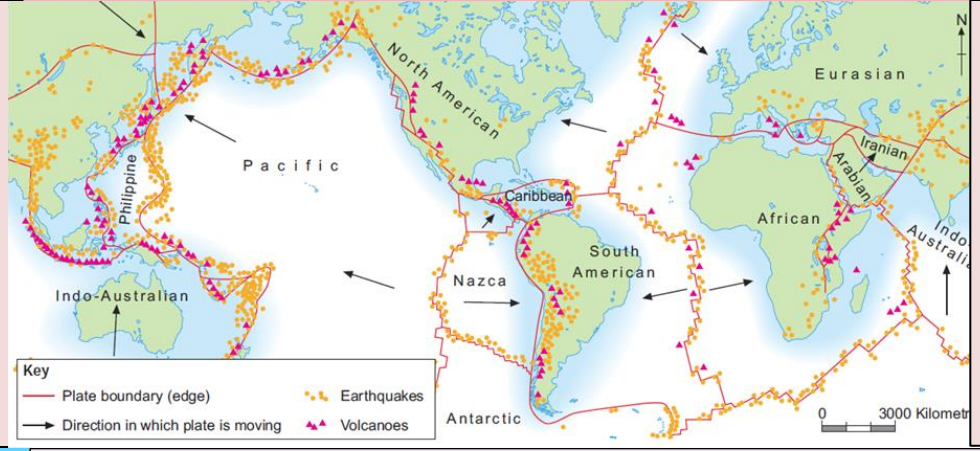
Fear of Communism
It was felt better to support a strong leader of Germany rather than risk Communist takeover.

Appeasement scared the USSR
When Britain and France did not stand up to Hitler, the USSR became worried about German power - and began thinking about deals with Hitler.

Hitler was determined to conquer Eastern Europe
Hitler had made his plans clear - the policy of appeasement was clearly doomed from the start - Hitler just lied.

Tectonic theory

Tectonic plates move because the core of the earth is very hot and having heated the magma in the mantle, this then rises as it is less dense, before reaching the crust, travelling in each direction underneath it, cooling again which makes it denser, and sinking back towards the core. As this process happens, friction moves the plates with it. Evidence for this includes matching geology and fossils on different continents, from when they were joined.



Global distribution

Earthquakes are commonly found in thin narrow
belts associated with a plate boundary. Most volcanoes are distributed along the plate boundaries, too, but only constructive and destructive boundaries/margins. Occasionally, volcanoes are found in the middle of plates (e.g. Hawaii). These are called hot spots.

Key terms and definitions for this topic

Inner core- solid centre of Earth; 5500°C; extremely dense, mostly made of iron and nickel.

Outer core-liquid around inner core due to lower pressures+ temperatures

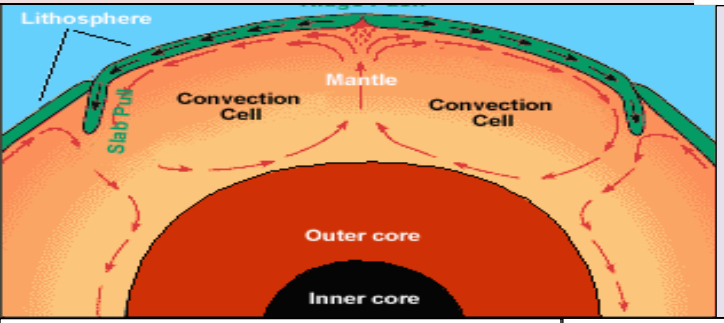
Mantle- made mostly of iron, magnesium and silicon, it is dense, hot and semi-solid.

Crust- outer layer, solid but fractured like a broken egg shell

Richter Scale- a numerical, logarithmic scale for expressing the magnitude of an earthquake on the basis of seismograph oscillations

Magnitude- the size of an earthquake measured on the Richter Scale

Subduction- the process of one plate being taken under, and destroyed under, another plate as they move towards each other



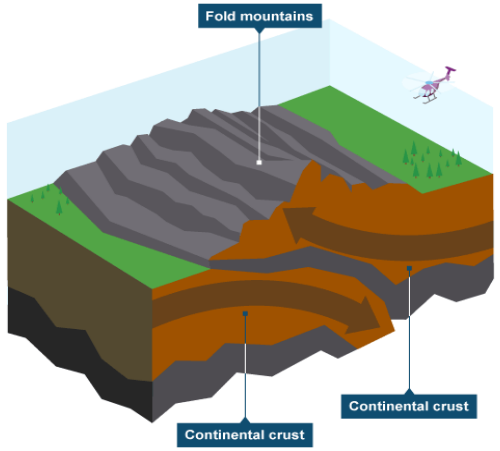
Types of plates

There are two types of tectonic plate: oceanic and continental. Continental plates are less dense and cannot be destroyed or renewed. The Eurasian, African and North American plates are all examples of continental plates.

Oceanic plates are denser and can be destroyed and renewed at plate boundaries. An example of an oceanic plate is the Pacific plate; found beneath the Pacific Ocean.

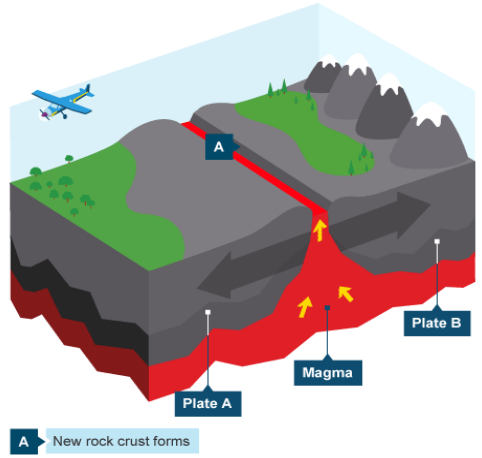
Collision plate boundary

Two plates of equal density collide and buckle to form Fold Mountains. Found in the Himalayas.



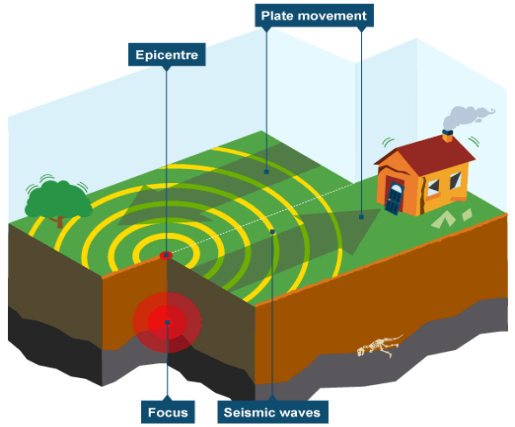
Constructive plate boundary

As 2 plates pull apart, eruptions occur and new crust is formed. Found in the mid-Atlantic ridge.



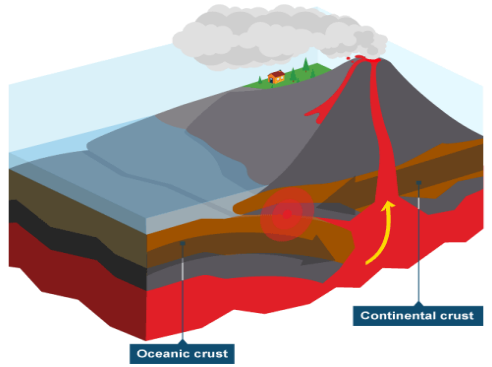
Conservative plate boundary

Two plates scrape past each other, causing violent earthquakes. Found in the San Andreas fault.



Destructive plate boundaries

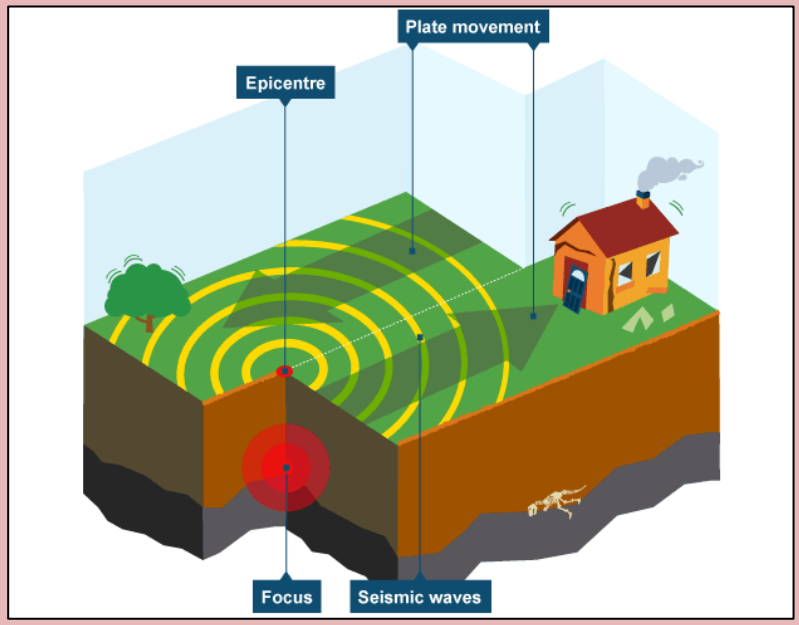
Two plates of different densities move towards each other. The denser oceanic plate is subducted causing earthquakes, volcanoes and tsunamis. Found in the ring of fire.



Earthquakes

- As plates carry on moving in different directions over long periods of time, friction causes energy to build up. Eventually it becomes so great that the energy is released, which creates a shock wave - an earthquake.
- There are thousands of earthquakes across the world each day and some are so small that they can only be detected by specialist equipment. Others can be so intense that they can create lots of damage and destroy towns and cities.
- Many earthquakes occur around the Pacific Ocean. People who live there, in countries such as Japan, are used to earthquakes happening and build earthquake-resistant buildings that sway with the shock waves rather than fall down. However, in LICs such as the Philippines, they cannot afford to protect their buildings and so damage and the number of deaths is likely to be higher.
- Although there are earthquakes in the UK, they are rare and so small that most people do not feel them.

Diagram of an Earthquake



How do we measure an earthquake ?

Size:

The Richter magnitude scale is used to measure the size of earthquakes.
Each step in the scale is ten times greater than the previous number. This is a **logarithmic** scale.

Damage:

The amount of damage caused by an earthquake is measured by the **Mercalli Scale**. This is a measure of **intensity**, and changes according to which area you are measuring - damage nearer the **epicentre** would usually be greater than further away, especially in an urban area. The Mercalli Scale runs from 1 to 12: at 3, you would observe pictures shaking on the wall; at 5 tiles might fall off the roof of your house; and 12 is total destruction.

CASE STUDY: Haiti

Haiti is part of a large Caribbean island and lies right on a **conservative plate boundary** between the Caribbean and North American plates. On 12 January 2010, a magnitude 7 earthquake hit Haiti at 16:53 local time, as the friction between the plates gave way under a massive build up of pressure. The earthquake's **epicentre** was 25 km west of Port-au-Prince, the capital. Most people, businesses and services were located in the capital.

Social impacts of the earthquake (effects on people)

- 3 million people affected - Over 220,000 deaths - 300,000 injured - 1.3 million made homeless - Several hospitals collapsed

Economic impacts of the earthquake (effects on money and jobs)

- 30,000 commercial buildings collapsed - Businesses destroyed - Damage to the main clothing industry - Airport and port damaged

Many of the effects were **immediate** or **primary**, eg injuries from falling buildings. Some **secondary** effects didn't happen until many months later, eg cholera outbreaks.

Response to the earthquake

Haiti is a very poor country without the money and **resources** to redevelop. It is one of the least developed countries in the world with most Haitians living on $2 or less per day, about £1.30.

Because there were few **earthquake-resistant buildings**, the devastation was massive. Many buildings simply collapsed or were damaged beyond repair. Therefore, the immediate response was heavily reliant upon aid from other countries such as the USA and UK, while the long term response of the Haitian government has been very slow, making things even worse for people.

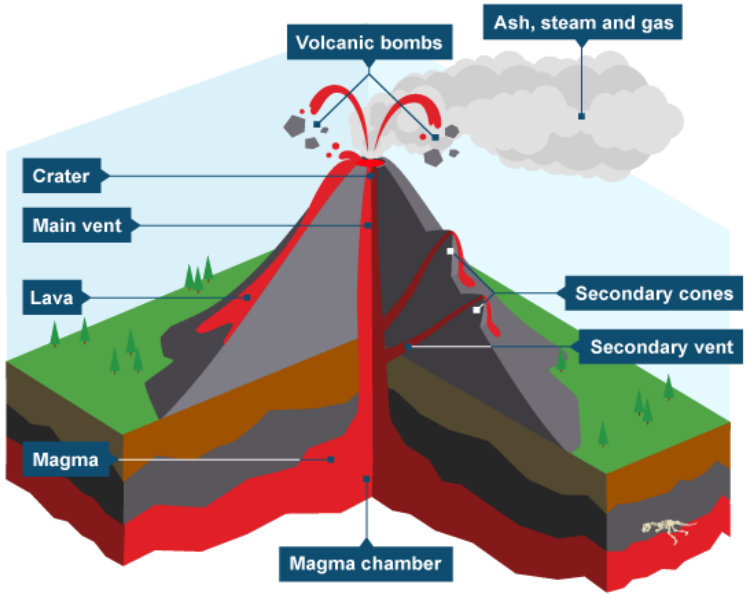
Volcanoes

A volcano is an opening in the Earth's crust that allows magma, hot ash and gases to escape.
Magma is molten rock - rock that is so hot it has turned into liquid. When magma reaches the surface of the Earth it is called lava and comes out of the volcano as a volcanic eruption, along with gases and ash.

Volcanic eruptions

Eruptions from volcanoes can be very dangerous. Most volcanic eruptions are caused by tectonic plates moving towards each other at **destructive plate boundaries**, which usually produces violent eruptions, or at **constructive plate boundaries** as the plates pull apart. Other volcanoes, such as Mauna Loa in Hawaii are caused by hot spots in the Earth's crust. These do not erupt violently and lava usually flows slowly out of them.

Volcanoes can, however, help people living near them earn money by bringing in tourists to the area and improving the soil so that crops can be grown.



- **Magma chamber** - large underground pool of magma
- **Lava** - magma, once it reaches the surface
- **Crater** - bowl-shaped basin in the top of the volcano
- **Vent** - central tube which magma travels through
- **Secondary cones** - eruptions from other vents may build up secondary cones on the flanks
- **Ash, steam and gas** - material thrown out by the volcano
- **Volcanic bombs** - larger material thrown out by the force of eruption
- **Pyroclastic flows** - fast moving clouds of hot ash, gas and rock

Diagram of a composite volcano

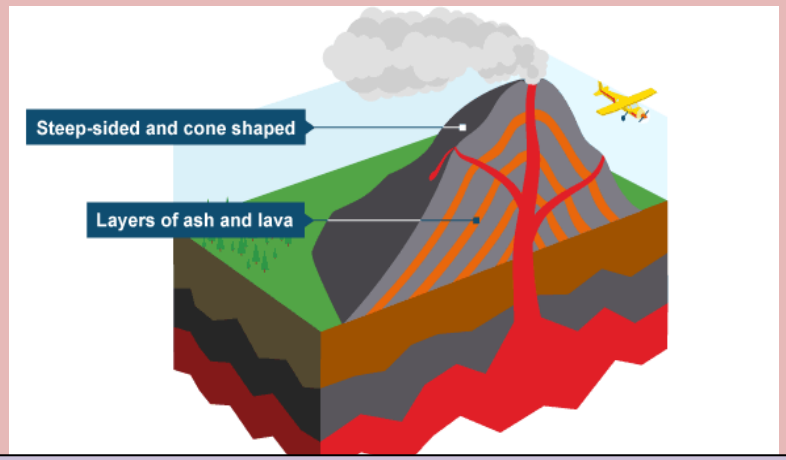
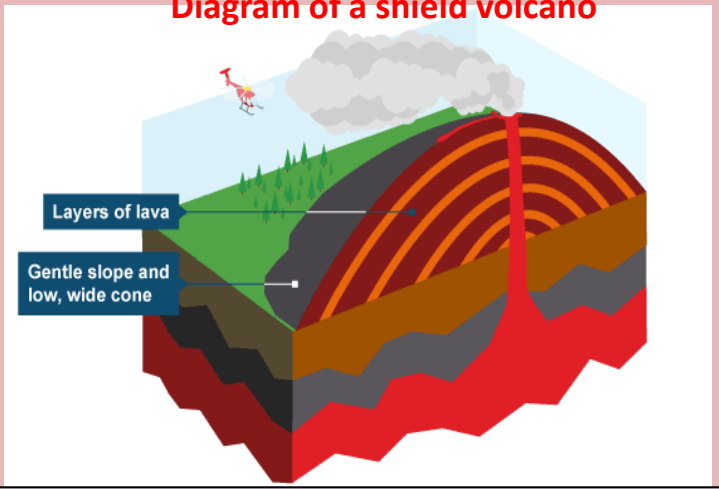


Diagram of a shield volcano

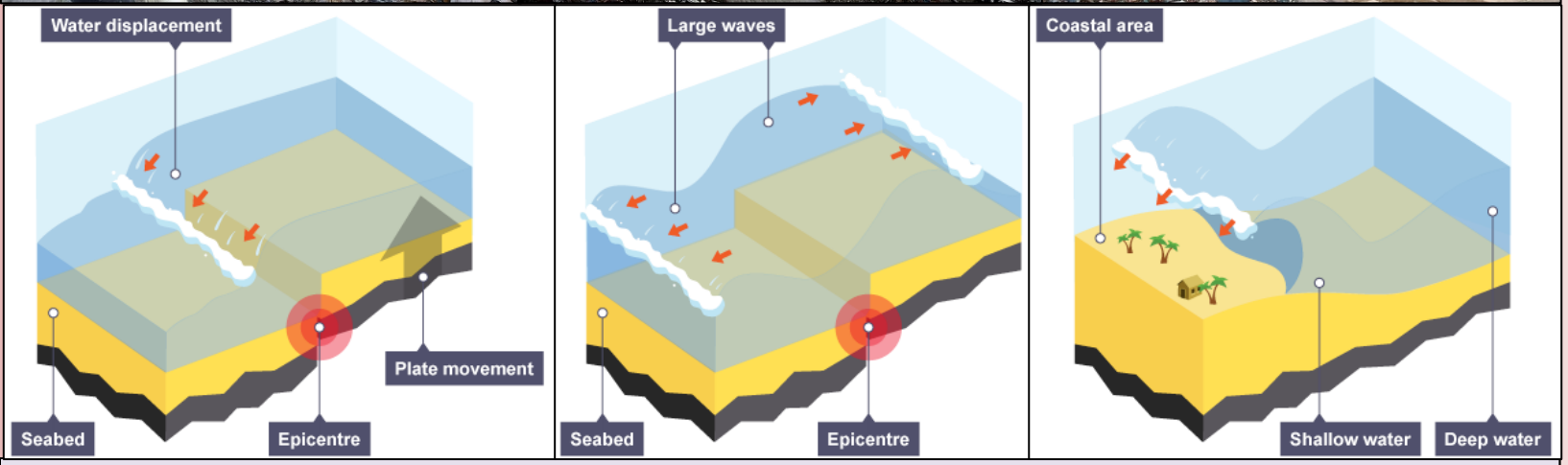


CASE STUDY: Eyjafjallajokull volcano, Iceland

In April 2010, the Eyjafjallajokull volcano in Iceland erupted. The eruption started on 20 March, when a 500 metre fissure opened up. The eruption happened underneath an ice sheet, and dissolved gases in the molten rock along with steam generated from the melting ice caused a large column of volcanic ash. Within Iceland, areas were flooded because of the glacier melt water which lay above the volcano, damaging agricultural land and destroying roads; farms were also hit by heavy ash fall, which poisoned animals in nearby farms. People were asked to stay indoors because of the ash in the air and the impact it can have upon your lungs.
European travel was severely disrupted as many flights were cancelled between 14 and 21 April 2010, leading to lost trade:
Air operators lost millions of pounds each day as the timing of the disruption was during the Easter holidays when levels of tourism are high.
Perishable foods were wasted as they could not be transported.
People were not able to get to work because they were stranded.

TSUNAMI

Tsunami is a Japanese word which means '**harbour wave**'. A tsunami is a large sea wave caused by the displacement of a large volume of water. They can be caused by earthquakes triggered by moving sections of the Earth's **crust** under the ocean. In the last decade there have been a number of devastating tsunamis. Two large ones caused particularly extensive devastation: the Indian Ocean tsunami (26 December 2004) and the Japanese tsunami (11 March 2011).



Most tsunamis are caused by earthquakes at **destructive plate boundaries**. Here, an oceanic plate is **subducted** into the mantle beneath a continental plate. This movement causes friction, which in turn causes the plates to stick. Energy accumulates, like that of a compressed spring. When the energy exceeds the **friction**, the plates snap back into position. This movement **thrusts** the water above causing a wave to form. The waves can travel large distances. When the waves reach shallower water the following happens:

- the shallow water slows the wave
- their height can increase by several metres
- the waves get closer together

A sign that a tsunami is approaching a coast is water retreating. Shortly after this happens. the waves reach the shore. This is actually the **trough** of the wave following behind.

CASE STUDY: Japan

On Friday 11 March 2011 at 14:46:24, an earthquake of **magnitude** 9.0 on the **Richter scale** occurred. It was at the point where the Pacific tectonic plate slides beneath the North American plate. The **epicentre** was 30 kilometres below the Pacific Ocean seabed and 129 km off the east coast of **Honshu**, Japan. This triggered a tsunami. High, powerful waves were generated and travelled across the Pacific Ocean. The area worst affected by the tsunami was the east coast of Honshu in Japan.

Main impacts:

Infrastructure

- The waves travelled as far as 10 km inland in Sendai.
- The tsunami flooded an area of approximately 561 square km.
- Ports and airports in Sendai were damaged and closed.
- The waves destroyed protective tsunami seawalls at several locations.
- The massive surge destroyed three-storey buildings where people had gathered for safety.
- A state of emergency was declared at the Fukushima nuclear power plant, where a cooling system failed and released radioactive materials into the environment.
- In July 2013, TEPCO, the Tokyo Electric Power Company, admitted that about 300 tons of radioactive water continued to leak from the plant every day into the Pacific Ocean.

Social and economic

- Four years after the quake, around 230,000 people who lost their homes were still living in temporary housing.
- The total damages from the earthquake and tsunami are estimated at $300 billion dollars (about 25 trillion yen).
- The number of confirmed deaths as of 10 April 2015 is 15,891. More than 2,500 people are still reported missing.

Responses to the disaster

- The country recently unveiled a newly-installed, upgraded tsunami warning system.
- Earthquake engineers examined the damage, looking for ways to construct buildings that are more resistant to quakes and tsunamis. Studies are ongoing.

Asia

Asia is the largest of the Earth's seven continents, both in terms of size and population. **4.5 billion** people call Asia home, roughly **60% of the world's total population.** It is also its most diverse, both physically and culturally. A continent of contrasts, it is home to some of the most densely populated cities on the planet, as well as barely populated areas.

Geography of Asia

Physical Geography of Asia

Asia is generally defined as comprising the Eastern four-fifths of the **Eurasian** landmass. It is located to the east of the **Suez Canal** and the **Ural Mountains**, and south of the **Caucasus Mountains** and the **Caspian** and **Black Seas**.

It is bounded on the east by the Pacific Ocean, on the south by the Indian Ocean and on the north by the Arctic Ocean.
The highest point in the World, is **Mount Everest** (8,848 m), situated in the Tibetan region of the Himalayas.

The longest river in Asia and third longest in the World is the **Yangtze** (6,211 km) which flows through China.
The largest desert in Asia is the **Gobi** desert measuring 281,800 km².

Climate Zones

There are 8 main climate zones in Asia, ranging from freezing cold **Tundra** in Siberia to the hot and wet **Tropical Rainforests** of equatorial regions, such as Indonesia and much of India, via the **Alpine/Mountain** region of the Himalayas and the Gobi **Desert** of Southern Mongolia.

Tropical storms, known as **Typhoons** in the Western Pacific, are a yearly threat to countries in Eastern Asia, such as the Philippines, which experienced the devastating Typhoon Haiyan in 2013.

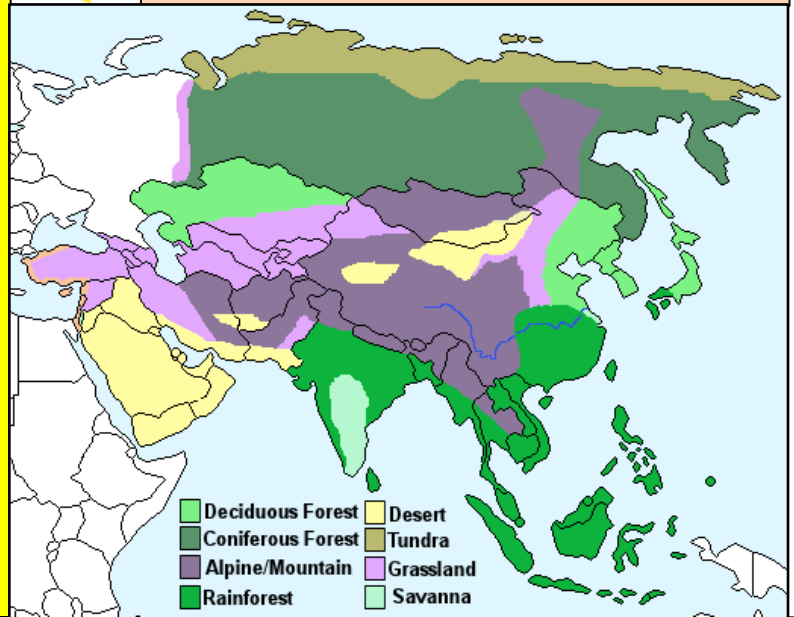
Climate change is increasing the likelihood of more intense storms occurring in the future, and increasing the area over which these storms will occur.

Human Geography of Asia

Asia is divided into **49 countries**, five of them (Georgia, Azerbaijan, Kazakhstan, Russia and Turkey) are transcontinental countries, having part of their land in Europe too.

Over 2,300 languages are spoken on the continent, from Mandarin Chinese to Arabic, and everything in between.

The continent has been the birthplace of most of the **world's major religions** (Islam, Christianity, Hinduism, Buddhism and Taoism to name but five). **The Fertile Crescent** is considered the birthplace of agriculture and allowed the development of great civilisations, thus paving the way for modern society as we know it.



Key terms and definitions for this topic

Belt and Road Initiative A massive infrastructural project to connect China to the West

Fertile Crescent An area spanning modern day Egypt to Iraq, considered the *cradle of civilisation*

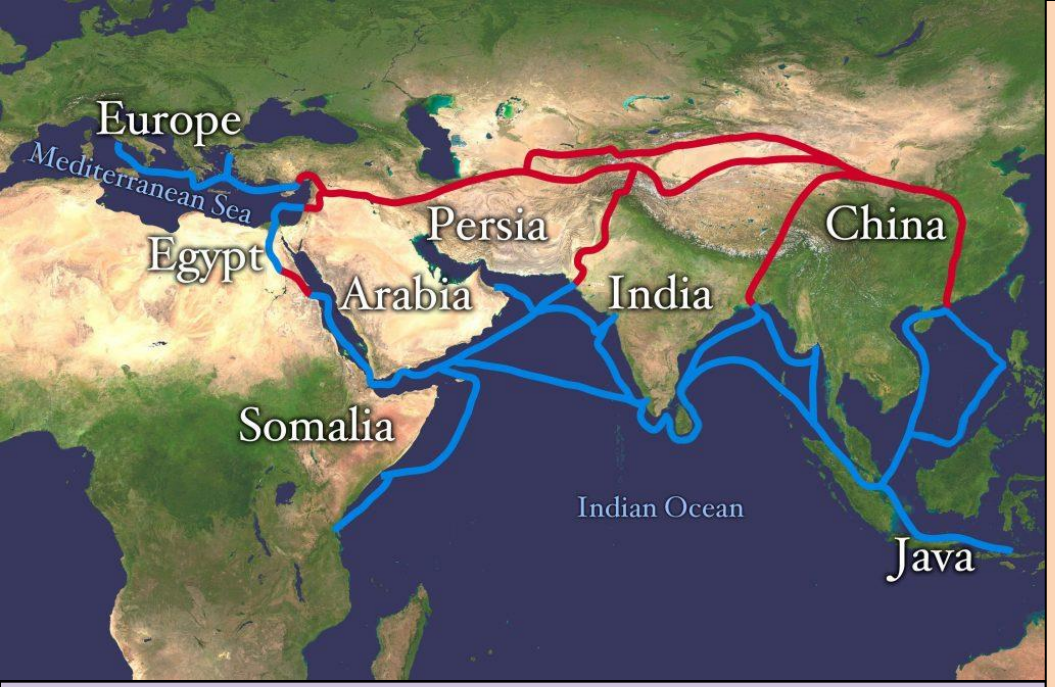
Globalisation The process by which the world is becoming increasingly interconnected.

Krakatoa Volcano in Indonesia, one of the world's deadliest eruptions in 1883.

Mount Everest The tallest mountain in the world at 8,848m

Silk Road The ancient trade routes spanning from Asia to Europe

Ulaanbaatar The capital of Mongolia, and most polluted city in the world.



The Silk Road

The **Silk Road** was a network of **trade routes** which connected the East to the Global West, and was central to the **economic, cultural, political, and religious** interactions between these regions from the 2nd century BC to the 18th century.

It takes its name from the lucrative trade in silk originally from China to the Roman Empire, but along these routes also existed a trade in other technologies such as gunpowder and paper, and the spread of religion and language.
This **interconnectedness** allowed the development of major civilisations in China, India, Europe, the Middle East and Indian subcontinent, and was the precursor to what we now know as **Globalisation.**

Disease and pandemics also spread along the route. In the 2nd century a plague, thought to originate in China, was transmitted back to the Roman Empire, eventually killing over 10% of its population.

The Belt and Road Initiative (BRI)

The BRI is effectively a 21st century 'Silk Road', it is a **global infrastructure development strategy** adopted by the Chinese government in 2013, to invest in over 70 countries, significantly expanding China's **economic** and **politica**l influence.
The project involves the creation of a vast network of railways, energy pipelines, highways, and streamlined border crossings, as well as increased expansion of ports to increase **maritime trade.** All this is projected to cost more than **one trillion US dollars.**

While this may link and benefit many nations (65% of the world's population live in countries along the routes), many view it critically. Some are worried about China's growing political influence (a plan for 'global dominance'), and potentially its plans to establish military bases along the route. Whilst many are critical of its links to the coal industry, and the vast **environmental damage** it will cause.

The Silk Roads

The Plight of the Uighurs

Many countries and NGOs are also critical of China's treatment of its Uighur Muslim population. There are 11 million Uighur, mostly Xinjiang province in China's North West Reportedly **over a million Uighur** are kept in prison like conditions in '**re-education camps**', in a concerted effort by China to quell **separatist ideology** and apparent '**extremist**' views. This widespread condemnation may cause issues for the BRI.

Mount Everest

The highest point on the Earth's surface at **8,848m**, Everest sits astride the border of **Nepal** and **China**, and is one of only 14 mountains that rise to 8,000m or over, all are in the **Himalayas**.
The Himalayas have been created by the collision of the **Indo-Australian plate** and the **Eurasian plate** at a **destructive** boundary, and continue to rise at a rate of about 2cm/year.
There have been disputes over the actual height of the mountain, as snow and ice cover the summit but both China and Nepal have settled on 8,848m. Further surveys are due to take place, however, to see if the massive **2015 Nepal earthquake** has affected this figure.

The Sherpas

Sherpas are native to the Himalayas and many are elite mountaineers, guiding and supporting most Everest attempts. As Buddhists they hold the mountains sacred, and call Everest 'Chomolungma' meaning 'Mother of the World'.

Climbing Everest

Many attempts were made prior to the first official summiting in 1953, most notably by **George Mallory and Andrew Irvine** in 1924 (it is unknown whether they reached the top, as both men perished on the mountain),
But on 29 May 1953 **Edmund Hillary and Tenzing Norgay** set foot on the summit, took photographs, buried a small cross, then descended.

Since then, over 5,000 people have reached the summit, often paying up to £100,000 in fees, permits and guides for the privilege. At 8,848m **air pressure is 1/3** of that at sea level, significantly reducing the amount oxygen climbers can breathe in. As such, the vast majority of climbers ascending Everest use **tanks of oxygen** to reduce the effects of the extreme altitude, as well as moving up and down the mountain between the *camps* to acclimatise. Often these tanks are left as litter on the mountain.

Mount Everest

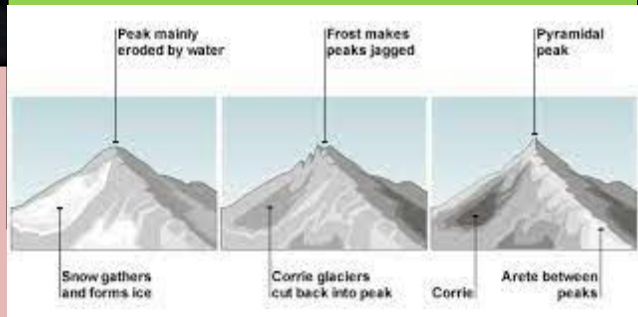
High and Lows

Summit expeditions and Everest tourism provide for the livelihoods of many local people, with 2019 the mountain's busiest year yet. An Everest porter, or **Sherpa**, can earn $5000 a month, far more than Nepalese local wages. The popularity of climbing Everest has led to an increased risk on the mountain, with hour-long **queues** to reach the summit, and rising tensions between locals and foreign climbers. The **1996 disaster**, in which 8 people died on the descent from the summit, has been written about in a popular book '**Into Thin Air**' and made it into a film 'Everest'.

Pyramidal Peak

An **arête** is a knife-edge ridge. It is formed when two neighbouring corries run back to back. As each glacier erodes either side of the ridge, the edge becomes steeper and the ridge becomes narrower, e.g. Striding Edge found on Helvellyn in the Lake District.

A **pyramidal peak** is formed where three or more corries meet. The glaciers carve away at the **top of** the **mountain** and this results in a sharply-pointed **summit**. **Mount Everest** is an example of a **Pyramidal Peak.**



Ulaanbaatar

The **capital** of Mongolia is home to **1.4 million** people, half of the country's total population.

It is a city of contrasts: cars and pedestrians comingle with livestock, and nomadic yurts sit luxury coffee shops.

It has also become the **most polluted city** in the world, which causes serious health issues for its population. The city is built in a river valley and surrounding mountains trap smog, as most of the population rely on burning coal to provide heat.

Climate and Geography

Mongolia is known as the '**Land of the Eternal Blue Sky**', experiencing over 250 sunny days a year. The country experiences short hot sunny summers and extremely cold and long dry winters (temperatures regularly dip below -**30°C in January**).

The south of the country is dominated by the vast **Gobi Desert**, with mountainous regions in the north, but the majority of the country is classified as temperate grassland steppe. This climate isn't suited to crop cultivation or livestock grazing and as such a **30-40%** of Mongolians are **nomadic**, moving their herds seasonally to find suitable pastures.

Total Pop: 3.3 million
HDI: 0.735 (92 of 189 countries)
GDP per capita: $4,121
Main religion: Buddhism
Nomadic Pop: 30-40%

'Outer Mongolia' is often considered shorthand for the middle of nowhere – a region so remote, wild and unpopulated that it represents all that is 'other' about the world

Mongolia

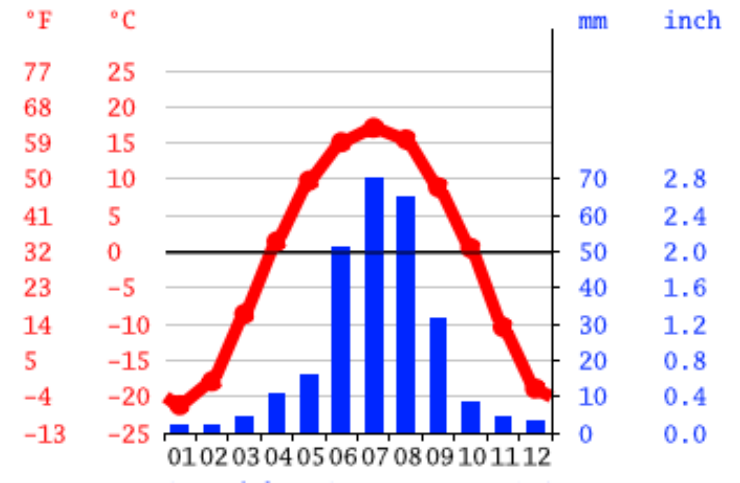
Tourism in Mongolia

The tourism industry is expanding, as people search more adventurous holidays in far flung destinations. Many tourists arrive on the **Trans-Siberian** rail route from Russia, attracted to the sparse beauty of the country. They can stay in traditional yurts (known as *gers*), attend the famous **Naadam** festival and see traditional Mongolian sports such as archery and wrestling.

History

Genghis Khan is considered the founding father of Mongolia. He came to power by uniting many of the **nomadic tribes** of northeast Asia and establishing the **largest empire in the world**, exceeded only by the British Empire in the 19th century.

Ulaanbaatar climate graph



Location and Geography

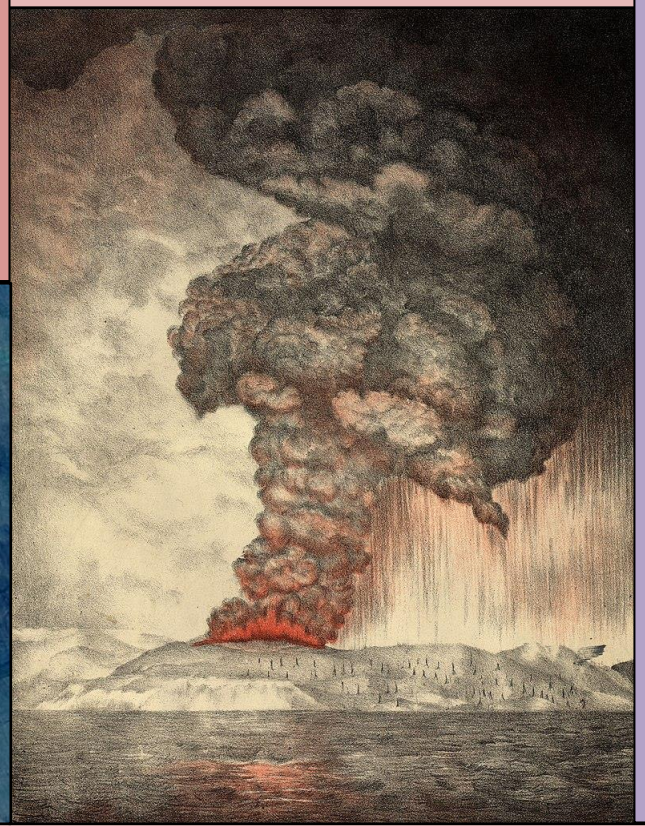
Krakatoa is a **stratovolcano** in the Sunda Strait, between the **Indonesian** islands of Java and Sumatra. It lies on the boundary of the **Indo-Australian** and **Eurasian** plates, a **destructive** plate margin.

Its explosive eruption in **1883** was on the most **catastrophic** in history. In **1927** a new island emerged from the **caldera** formed in 1883, called **Anak Krakatoa** or "Child of Krakatoa"

Krakatoa's effects around the globe

The eruption **lowered** global air temperatures by as much as **1.2°C** through the release of **global cooling aerosols** into the atmosphere. This in turn had a cooling effect on the ocean for as much as a century!
The dust and gas also causes light to refract in different ways as it passes through it and led to years of **spectacular sunsets** across the globe. These were the inspiration for many famous works of art including **Edvard Munch's 1893 'Scream'**, and its 'blood red sky'.

Krakatoa



Case Study :1883 Eruption

Prior to the massive eruption in August of 1883, Krakatoa had started to show some signs of activity, emitting clouds of gas and ash before finally on the **27th August** four giant explosions tore the island apart.
The explosions were so **violent** they were heard in Perth, Australia 2000 miles away, and Mauritius 3000 miles away! The pressure wave from the eruption was recorded to have travelled around the globe **3 ½ times!**

Primary Effects

- **Volcanic ash** was propelled 80km into the atmosphere,
- the combined effects of this ash, **pyroclastic flows** and deadly **tsunamis** killed at least **36,417** people.
- Some estimates put the death toll instead at least **120,000.**
- The eruption triggered a tsunami **120ft** high, which consumed local islands, and over **165** coastal villages were destroyed.
- The eruption hurled **45 cubic km** of debris into the atmosphere, darkening skies up to 442km away and locally the dawn did not return for three days.

Secondary effects

- Ships as far as South Africa rocked when the Tsunami hit , bodies of victims were found floating in the ocean months later.
- In the year following the eruption, average Northern Hemisphere summer temperatures fell by 0.4 °C

BVT: Human Rights

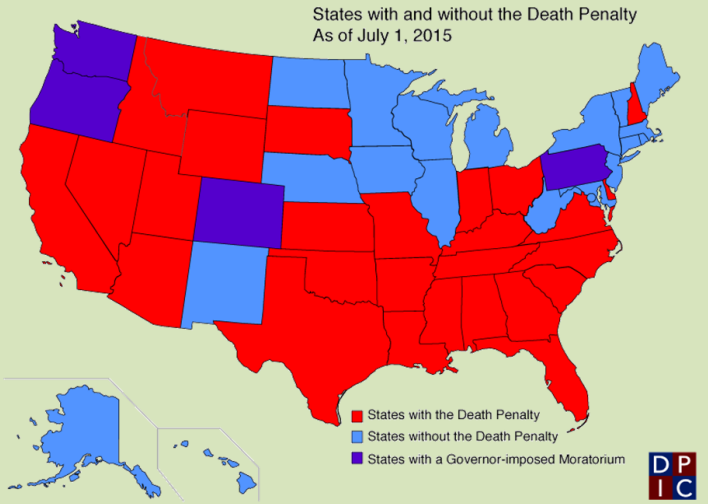
Death Penalty

Derek Bentley case:

On 2 November 1952, Derek Bentley and a sixteen year old companion, Christopher Craig, attempted to burgle a warehouse.

Craig armed himself with a revolver and carried a number of rounds for the revolver. Bentley carried a sheath knife and a spiked knuckle-duster, both of which Craig had given to Bentley.

When the police arrived, one of the police officers, Detective Sergeant Frederick Fairfax, climbed the drainpipe onto the roof and grabbed hold of Bentley. Bentley broke free of Fairfax's grasp. Bentley then called across to Craig "Let him have it Chris!" The police officer was shot.



Religions that agree with the Death penalty	Religions that disagree with taking life	Religions that say prison would be better
Christianity: The Bible teachers **God is Just** – the story of Original Sin - Adam and Eve show God's punishment. Also parables such as Lazarus and the Rich man. *Death penalty bring justice: "An eye for an eye"* – old testament **Islam:** "Stand up firmly for justice" Qur'an in Islam. Islam believe in the law of **retribution**. There is capital punishment for murder, adultery and homosexuality under Shari'ah Law in some Islamic Countries. The Qur'an says *"Life for life".*	**Christianity:** God teaches the **Sanctity of Life** – all life is sacred and only God has the right to take a life *"I your God, give life and take it away"* Bible. "Thou shall not kill" 10 Commandments **Islam:** Qur'an teaches *"The greatest sin is to take another mans life"* **Buddhism:** Also Buddhists 1st of the 5 Precept is not to harm living things. Eightfold path teaches Right Action	**Christianity:** Christians teach to forgiveness and second chances *"We may forgive those who trespass against us".* Teaching of the parable the Prodigal Son also shows forgiveness. **Islam:** In the Qur'an it says *"Those that pardon (forgive) are rewarded by God"* **Buddhism:** The Dali Lama says *"Hatred will not cease by hared but by love alone",* showing forgives and love.

The Death penalty in the USA

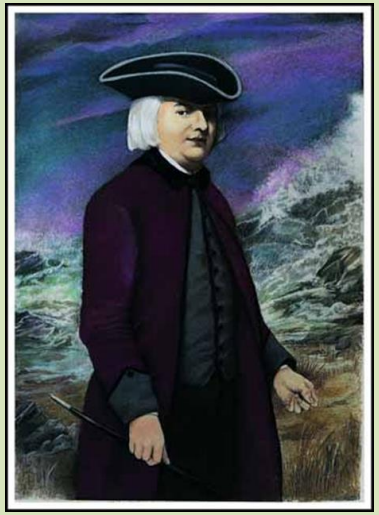
BVT: Philosophy and Religion

Theories on the existence of God

Theory of Gods existence	Philosopher associated with this theory	Details of the theory
By Design	Paley	It seems extremely unlikely that such a complex, life-supporting universe happened by chance. It must have been designed, and there must be a designer. William Paley said that the intricate detail of the world pointed to the existence of an intelligent designer.
First Cause	Aquinas	Aquinas argued that some things are caused and that anything that's caused, must have been caused by something else (cause & effect). Nothing can cause itself - there must be a first causer, itself uncaused. This causer was GOD.
By Morality	Kant	As morals seem to be so well established, it seems like they might even be hardwired into the human mind. They are more than in-built beliefs – they are rules. And if there are rules, there must be a rule maker. The argument from morality argues that this rule maker is God.

Philosophy – The study of general and fundamental questions about existence, knowledge, values, reason, mind, and language.

Philosopher – Someone engaged in, or studying philosophy.

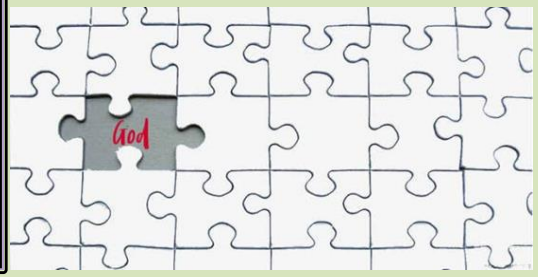


Kant (left) and Paley (right)

God of the Gaps Theory

The idea that God resides in the unknown is what philosophers call the God of the gaps. And we have this thing called science, which marches on and makes discoveries in those gaps, ultimately closing gaps.

Science has a better understanding of our origins and our world. With more evidence for different worldly occurrences and changes, there is no need for belief in God, where science can fill in the gaps of our knowledge.

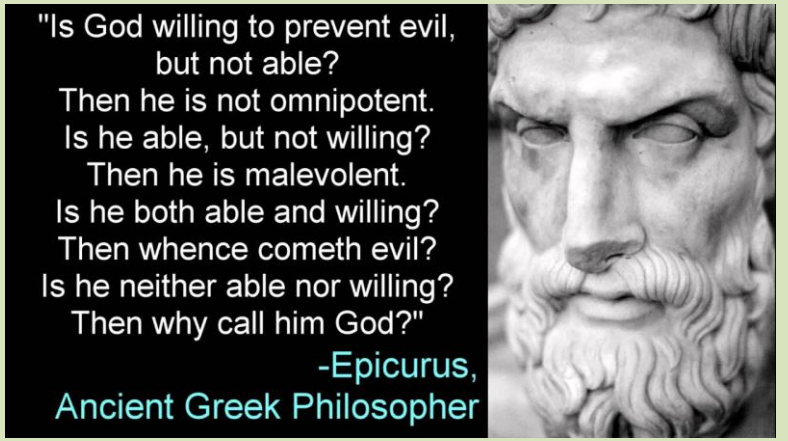


Theologian Irenaeus said:
Humans although created by God, were not created perfectly. We are still to learn about how to be good by witnessing evil and experiencing suffering. God allows us to experience suffering so we can learn and improve ourselves.

Theologian Saint Augustine said:
That suffering comes from evil that is within us all. This evil we are born with because it has been passed down through the generations by Eve, from her sin of eating the fruit from the forbidden tree, going against God's will.

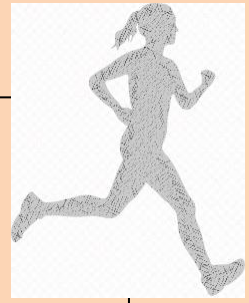
Philosopher Epicurus questioned the intention and ability of God to stop evil. He questioned whether God had any control over evil and our suffering.

Key term	Definition
Conscience and morality	Human sense and understanding to tell us right and wrong
Design argument	The argument that our existence was designed as it is so complex to be by chance.
Epicurus	Greek Philosopher to challenge the nature of God
First Cause	The argument that our existence must have been caused as nothing happens without a cause. Therefore something or someone must have caused our existence.
God of the Gaps	The idea that science, knowledge and exploration has developed our understanding of the world. What we didn't know previously was very large and often put down to God. As we learn more, the gap of what we account to God is shrinking.
Immortality	Living forever, never dying.
Natural Law	The belief that humans are easily tempted and cannot reason because by nature they are weak and sinful (Pope John Paul's theory)
Natural Evil	Acts of evil and suffering which are not caused by humans e.g. volcanoes, hurricanes
Moral Evil	Acts of evil and suffering caused by humans e.g. murder, war
Philosophy	The study of questions about existence, knowledge, values, reason, mind, and language.
Resurrection	Rebirth into the afterlife.
Thomas Aquinas	Christian theologian who came up with Natural Theory and First Cause argument.
William Paley	Christian philosopher who argued "existence by design."



Pope John Paul said that humans are tempted by evil because humans by nature are sinful and weak

FRENCH YEAR 9: FUTURE PLANS, WORK AND POCKET MONEY



Quelles sont tes bonnes resolutions pour le nouvel an?

je vais *(I'm going)*
je veux *(I want)*
je voudrais *(I would like)*
j'ai l'intention de *(I intend)*
j'ai décidé de *(I have decided)*
j'espère *(I hope)*

faire plus d'exercise *(to do more exercise)*
faire une régime (to do / go on a diet)
faire mes devoirs chaque *soir (to do my homework every evening)*
faire attention en classe *(to pay attention in class)*
aider plus à la maison *(to help more at home)*
aider mes copains plus *(to help my friends more)*
aller moins sur les réseaux sociaux to *(go on social media less)*
apprendre beaucoup au collège *(to learn lots at school)*
être moins aggressif/-ive *(to be less aggressive)*
être plus poli(e) *(to be more polite)*

me lever / me coucher de bonne heure *(get up / go to bed early)*
manger plus / moins de… *(to east more / less [of])*
promener le chien chaque weekend *(to walk the dog every weekend)*
regarder moins la télé *(watch tv less)*
utiliser moins mon portable *(use my phone less)*

dans le futur *(in the future)*
à l'avenir *(in the future)*
dans cinq ans *(in 5 years)*
dans vingt ans *(in 20 years)*
après trafalgar / mes études / l'université *(after trafalgar / my studies/ university)*
avec un peu de chance *(with a bit of luck)*

j'irai *(i will go)*
je ferai *(i will do)*
je serai *(i will be)*
j'aurai *(i will have)*
je mangerai *(i will eat)*
j'utiliserai *(i will use)*
je lirai *(i will read)*
je regarderai *(i will watch)*
je travaillerai [comme] *(i will work [as])*
j'étudierai *(i will study)*

être / devenir *(to be / to become)*
professeur *(teacher)*
mécanicien/ne *(mechanic)*
chef de cuisine *(chef)*
avocat *(lawyer)*

Que fais-tu pour aider à la maison? *(what do you do to help at home ?)*
je fais la lessive *(I do the washing)*
je fais la vaisselle *(I do the washing up)*
j'aide mes parents *(I help my parents)*
je range ma chambre *(I tidy my room)*
je passe l'aspirateur *(I hoover)*
je garde ma petite sœur *(I look after my little sister)*
je dois *(I have to / I must)*
faire *(do)*
laver *(wash)*
nettoyer *(clean)*

l'argent de poche *(pocket money)*
je reçois *(i get)*
je ne reçois pas *(i don't get)*
mes parents me donnent *(my parents give me)*
mon père me donne *(my dad gives me)*
…livres par semaine / mois *(…pounds per week / month)*

avec mon argent *(with my money)*
j'achète *(I buy)*
des bonbons *(sweets)*
des cadeaux *(presents)*
des jeux *(games)*
de la tech *(tech)*
j'économise pour acheter *(I'm saving to buy)*
je me paie ma facture de telephone *(I pay my phone bill)*

Near future

aller + infinitive (just like in English...!)

je vais faire = I'm going to do
on va manger = we're going to eat
nous allons jouer we're going to play

Simple future
This is when we want to say 'I **will** do x, y, z'
Most of the time put these endings on to the **INFINITIVE**
je –ai (je manger**ai**)
tu – as (tu manger**as**)
il –a (il manger**a**)

nous –ons (nous manger**ons**)
vous –ez (vous manger**ez**)
ils –ont (ils manger**ont**)
Note: j'irai = I will go / je serai = I wll be
je ferai = I will do / j'aurai = I will have

Jobs / professions
Drop the 'a' or 'an'.
In English, I am a teacher or My brother wants to become a soldier
In French:
Je suis prof
Mon frère veut devenir soldat

SPANISH YEAR 9: FUTURE PLANS, WORK AND POCKET MONEY

¿Cuáles son sus planes para el futuro?

voy a *(I'm going)*
quiero *(I want)*
intento *(I intend)*
he decidido *(I have decided)*
espero *(I hope)*

me gustaría *(I would like)*

hacer más ejercicio *(to do more exercise)*
sequir una dieta (to do / go on a diet)
hacer mis deberes cada tarde *(to do my homework every evening)*
prestar atención en clase *(to pay attention in class)*
ayudar más en casa *(to help more at home)*
ayudar más a mis amigos *(to help my friends more)*
usar menos las redes sociales (to *go on social media less)*
apprender much en el insti *(to learn lots at school)*
ser menos agressivo/-iva *(to be less aggressive)*
ser más simpático/a *(to be nicer)*

levantarme/ acostarme temprano *(get up / go to bed early)*
comer más/ menos… *(to east more / less)*
pasear al perro cada fin de semana*(to walk the dog every weekend)*
ver menos television *(watch tv less)*
usar menos mi móvil *(use my phone less)*

en el futuro *(in the future)*
dentro de cinco años *(in 5 years)*
dentro de veinte años *(in 20 years)*
después de Trafalgar / mis estudios/ la universidad *(after Trafalgar / my studies/ university)*
con un poco de suerte *(with a bit of luck)*

iré *(I will go)*
haré *(I will do)*
seré *(I will be)*
tendré *(I will have)*
comeré (I will eat)
usaré *(I will use)*
leeré *(I will read)*
veré *(I will watch)*
trabajaré [como] *(I will work [as])*
estudiaré *(I will study)*

seré / llegaré a ser *(I will be / I will become)*
profesor/a *(teacher)*
mecánico/a *(mechanic)*
cocinero*(chef)*
abogado/a *(lawyer)*

N.B Drop the 'a' or 'un'.
In English, **a)** I am a teacher or **b)** My brother wants to become a soldier
a) Soy profesor
b) Mi hermano quiere ser soldado

¿Qué haces para ayudar en la casa?*(what do you do to help at home ?)*
lavo ropa *(I do the washing)*
lavo los platos *(I do the washing up)*
ayudo a mis padres*(I help my parents)*
limpio mi dormitorio *(I tidy my room)*
paso la aspiradora *(I hoover)*
hago kanguro *(I babysit)*
debo*(I have to / I must)*
hacer *(do)*
lavar *(wash)*
limpiar *(clean)*

dinero de bolsillo *(pocket money)*
recibo *(i get)*
no recibo *(i don't get)*
mis padres me dan *(my parents give me)*
mi padre me da *(my dad gives me)*
…libras a la semana / mes *(…pounds per week / month)*

con mi dinero de bolsillo *(with my money)*
compro *(I buy)*
caramelos *(sweets)*
regalos *(presents)*
juegos *(games)*
technología *(tech)*
ahorro para comprar *(I'm saving to buy)*
pago mi factura de teléfono *(I pay my phone bill)*

Can you follow the story…!?

Near future

ir + infinitive (just like in English...!)

voy a hacer = I'm going to do
vamos a comer = we're going to eat
vamos a jugar = we're going to play

Simple future
This is when we want to say 'I **will** do x, y, z'
Most of the time put these endings on to the **INFINITIVE**
yo - é (comer**é**)
tú – as (comer**ás**)
él/ella –a (comerá)

nosotros –emos (comer**emos**)
vosotros –eis (comer**eis**)
Ellos/ellas (comer**án**)
Note: iré = I will go / seré = I will be
haré = I will do / tendré = I will have

The Fundamentals of Art

TONE means the lightness or darkness of something. This could be a shade or how dark or light a colour appears.

PATTERN is a design that is created by repeating **LINES**, **SHAPES**, **TONES** or **COLOURS**.

Patterns can be manmade or natural.

A **LINE** is the path left by a moving point, eg. A pencil or a brush dipped in paint. A **LINE** can take many forms, eg.
Horizontal, diagonal or curved.
A **LINE** can be used to show contours,
movements, feelings and expressions.

TEXTURE is the surface quality of something, the way
something feels or looks like it feels.
There are two types of
texture: **ACTUCAL TEXTURE** and **VISUAL TEXTURE**.
ACTUAL TEXTURE: really exists so you can feel it and touch it
VISUAL TEXTURE: created using different marks that
represent actual **TEXTURE**

A **SHAPE** is an area enclosed by a **LINE**. It could be just an outline or it could be shaded in.
FORM is a three dimensional shape such as a sphere, cube or a cone.

Sculpture and 3D design are about creating **FORMS**

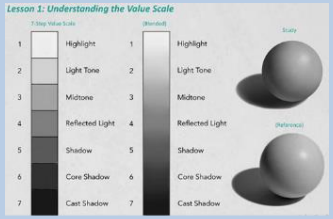
There are 3 primary **COLOURS**: RED, YELLOW, BLUE

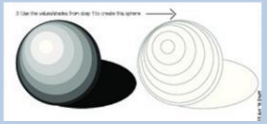
By mixing any 2 **PRIMARY COLOURS** together you create **SECONDARY COLOURS**; ORANGE, GREEN, PURPLE

SENTENCE STARTERS

I can vary tone by…
- layering mark making
- using a range of pencils
- varying the pressure of my marks
- using an eraser to add highlights

My work is successful because…
I could develop my work further by…
My design was inspired by the work of…





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.

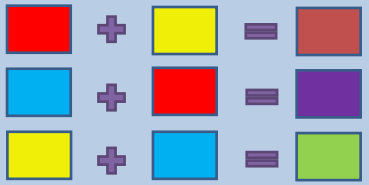
TARGET

Follow directions.

COLOUR	LINE	SHAPE/FORM/SPACE	PATTERN AND TEXTURE	TONE
BRIGHT	FLUENT	CLOSED	REPEATED	BRIGHT
BOLD	CONTINUOUS	OPEN	UNIFORM	DARK
VIBRANT	CONTROLLED	DISTORTED	GEOMETRIC	FADED
PRIMARY	LOOSE	FLAT	RANDOM	SMOOTH
SECONDARY	POWERFUL	ORGANIC	SYMMETRICAL	HARSH
TERTIARY	STRONG	POSITIVE	SOFT	CONTRASTING
RADIANT	ANGULAR	NEGATIVE	IRREGULAR	INTENSE
VIVID	FLOWING	FOREGROUND	UNEVEN	SOMBRE
DULL	LIGHT	BACKGROUND	ROUGH	STRONG
CONTRASTING	DELICATE	COMPOSITION	BROKEN	POWERFUL
COMPLIMENTARY	SIMPLE	ELONGATED	GRID	LIGHT
HARMONIOUS	THICK	LARGE	FLAT	MEDIUM
MONOCHROME	THIN	SMALL	WOVEN	DARK
NATUARL	BROKEN	2D	ORGANIC	LAYERED
SATURATED	OVERLAPPING	3D	SMOOTH	DEPTH
PASTEL	LAYERED	TWISTED	ABSTRACTED	DEVELOPED
COOL	MARK MAKING	JAGGED		SOFT
WARM				

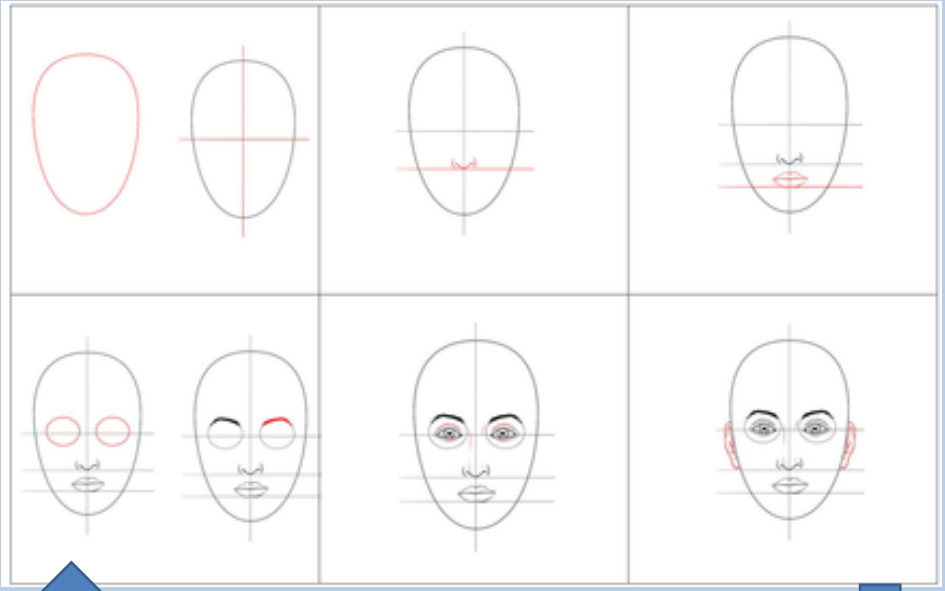
ESSENTIAL EQUIPMENT:
- PENCIL PACK (2B, 4B, 6B ETC)
- ERASER
- SHARPENER
- SKETCHBOOK

OPTIONAL EQUIPMENT:
- DRAWING PENS
- WATERCOLOUR SET
- WATERCOLOUR PENCILS
- PAINTBRUSHES

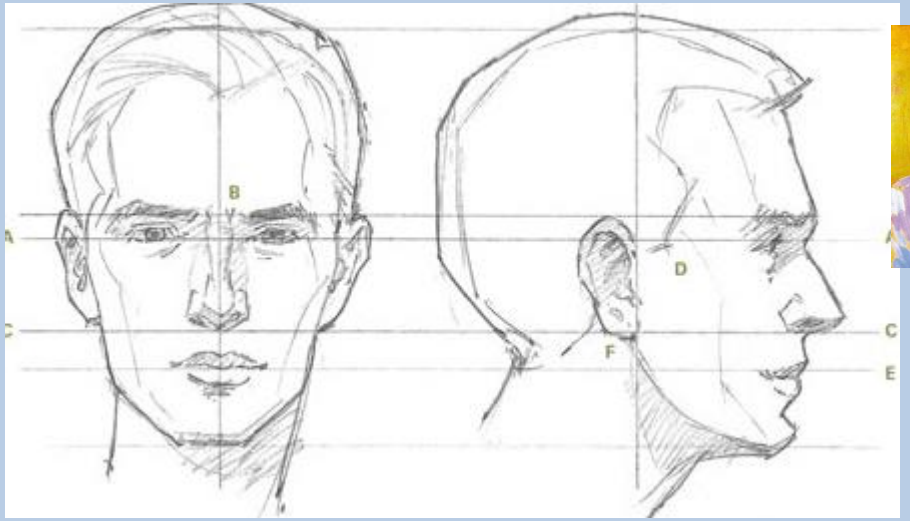


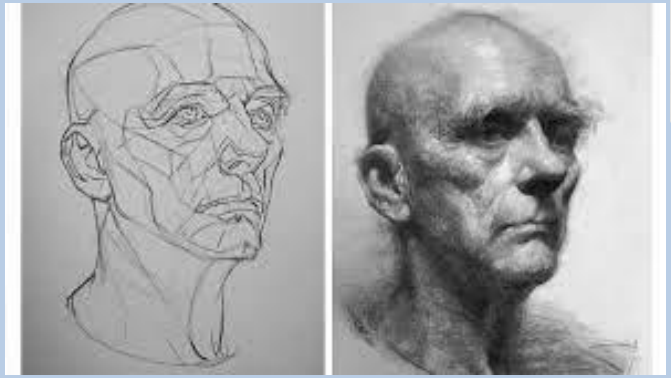
TAKING ABOUT ART:
- What are you looking at?
- How was it made?
- Who made it?
- How will it inspire your work?
- Do you like it/dislike it? Why?

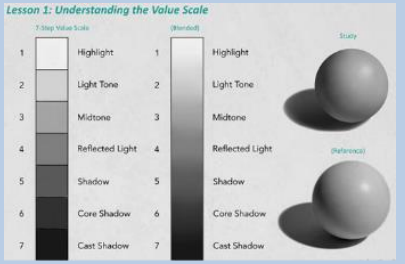
IDENTITY AND PORTRAITURE

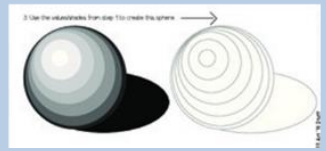


Step by step guide to portraiture.

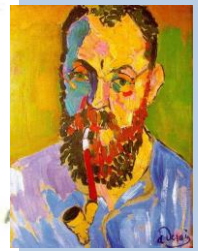




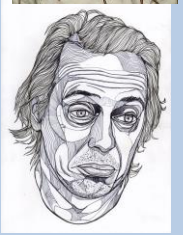




By adding tone to your outlines you can make your portraits more realistic.

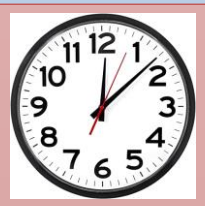


Once you've understood how to build a successful portrait, you can experiment with breaking the 'rules' and creating alternative portraits.



IDENTITY AND PORTRAITURE

Shells = travel, adventure, wealth



Clock = time

Vessels = life, water sustains life

Books = education

Pen/pencil = education and higher status

Plants = life and different flowers have different symbolic meanings

Music and instruments = education and the joy in life

Skulls = death and the afterlife

Possible modern symbolic objects

Original Vanitas paintings

Portraiture and Identity can be explored through a range of media and to create an alternative portrait you could use objects that relate to or remind you of a person.

Modern Vanitas paintings

- People have always created still life paintings throughout history.
- In many works of art, objects have meaning. For example, a shell might represent travel, a book might represent education and learning and a jug might represent water – which sustains life.
- This type of art is called Vanitas.
- Vanitas is art that is symbolic, displaying a narrative throughout the image using objects to represent different elements of life and death.
- There will always be a light source from the top of the image, cutting diagonally through the image. This light represents the afterlife, whatever that might be. It also allows the artist to create a dramatic tone to the work.
- In art, there is *nearly* always a greater meaning behind the work!

Year 9 Music

This exciting project takes us into the world of Gaming. We will be looking at Character Themes in computer and video game music and then move on to explore ways in which Character Themes can be developed and changed for different atmospheres and scenarios within computer and video games. Maybe compose a new theme for Mario or maybe Eivor the Viking Raider from Assassins Creed Valhaller?

- You will understand the various ways in which music is used within a range of computer and video games from different times.
- You will understand, describe and use common compositional and performance features used in computer and video game music.
- You will understand how to vary, adapt and change a melody (character theme) for different atmospheres/scenarios.
- You will understand the importance of sound effects and how these are used at certain cues to enhance gameplay within a computer or video game.

Watch and Listen

Gaming music has become so popular composers have even arranged game music for orchestra. Here is the Super Mario Bros.

Here is the Swedish Radio Orchestra playing Assassin's Creed IV: Black Flag

D Dynamics
(volume)

R Rhythm
(order of Musical Events)

P Pitch
(Highness or Lowness of a note)

S Structure
(how the composition is built)

M Melody
(the tune)

I Instrumentation
(instruments used when composing)

T Tempo
(the speed of the Music)

H Harmony
(This supports the melody)

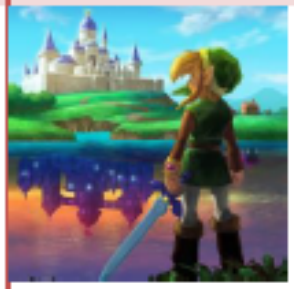
Computer and Video Game Music

Computer and Video Game Music

Early Computer and Video Game Music

Early video game music consisted primarily of **SOUND EFFECTS** (an artificially created or enhanced sound used to emphasize certain actions within computer and video games), **CHIPTUNES** or **8-BIT MUSIC** (a style of electronic music which used simple melodies made for programmable sound generator (PSG) sound chips in vintage computers, consoles and arcade machines) and early sound **SYNTHESISER** technology (an electronic musical instrument that generates audio signals that may be converted to sound). **SAMPLING** (the technique of digitally encoding music or sound and reusing it as part of a composition or recording) began in the 1980's allowing sound to be played during the game, making it more realistic and less "synthetic-sounding".

How Computer and Video Game Music is used within a Game



Music within a computer or video game is often used for **CUES** (knowing when a significant event was about to occur).

Video game music is often heard over a game's title screen (called the **GROUND THEME**), options menu and bonus content as well as during the entire gameplay. Music can be used to **INCREASE TENSION AND SUSPENSE** *e.g. during battles and chases*, when the player must make a decision within the game (a **DECISION MOTIF**) and can change, depending on a player's actions or situation *e.g. indicating missing actions or "pick-ups"*.

Musical Features of Computer and Video Game Music

JUMPING BASS LINE

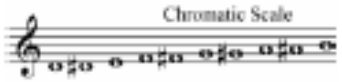
Where the bass line often moves by **LEAP (DISJUNCT MOVEMENT)** leaving 'gaps' between notes

STACCATO ARTICULATION

Performing each note sharply and detached from the others. Shown by a dot.

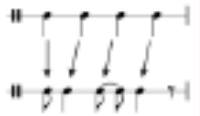
CHROMATIC MOVEMENT

Melodies and bass lines that ascend or descend by semitones.



SYNCOPATION

Accenting the weaker beats of the bar to give an "offbeat" jumpy feel to the music.



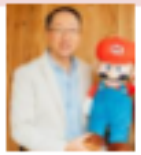
How Computer and Video Game Music is Produced

Fully-orchestrated **SOUNDTRACKS** (video game music scores) are now popular – technology is used in their creation but less in their performance. The composer uses **MUSIC TECHNOLOGY** to create the score, it is then played by an **ORCHESTRA** and then digitally converted and integrated into the game. Video game **SOUNDTRACKS** have become popular and are now commercially sold and performed in concert with some radio stations featuring entire shows dedicated to video game music.

Character Themes in Computer and Video Game Music

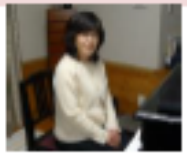
Characters within a video game can also have their own **CHARACTER THEMES** or **CHARACTER MOTIFS** – like **LEITMOTIFS** within Film Music. These can be manipulated, altered and changed – adapting the elements of music – **ORCHESTRATION** (the act of arranging a piece of music for an orchestra and assigning parts to the different musical instruments), **TIMBRE, SONORITY, TEXTURE, PITCH, TEMPO, DYNAMICS** – depending on the character's situation or different places they travel to within the game.

Famous Computer and Video Game Music Composers and their Soundtracks



Koji Kondo
Super Mario Bros. (1985)
The Legend of Zelda (1986)

Michael Giacchino
The Lost World: Jurassic Park (1997)
Medal of Honour (1999)
Call of Duty (2003)



Mieko Ishikawa
Dragon Slayer (1993)

Martin O'Donnell and Michael Salvatori
Halo (2002)

Daniel Rosenfield
Minecraft (2011)

Rom Di Prisco
Fortnite (2017)

Year 9 Music

New Directions

New Directions takes an in-depth exploration of three of the many various styles, movements and genres of twentieth century music: minimalism, expressionism and Experimentalism.

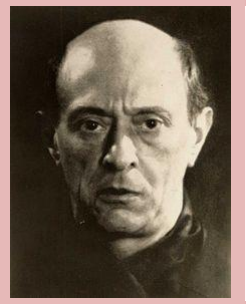
This project delves into weird and wonderful world of twentieth century western art music when composers decided to change the rules. We will explore compositional rhythmic and melodic devices and conventions the composers invented for their work compositional techniques such as note/tone rows and hexachords.

- You will explore changes in twentieth century music and how composers 'broke away' from late-Romantic ideals.
- You will understand how twentieth century music consisted of many different types, styles, movements and genres.
- You will investigate how the composers develop pieces from various 'rules'
- You will demonstrate the compositional techniques used by minimalist, expressionist and experimentalist composers.
- You will compose using motifs, cells and note/tone rows plus a variety of musical development techniques.

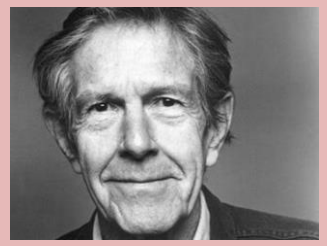
Watch and Listen

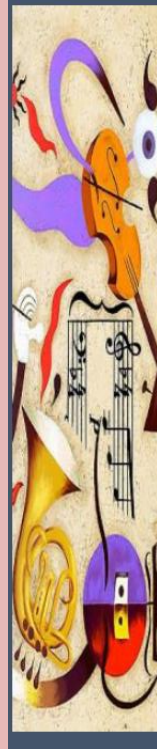
Phillip Glass is a Minimalist composer. He takes small ideas and layers them to produce a complex sound. Complexity from Simplicity. This is 'Glassworks'

This is Schoenberg he is an Expressionist composer. This piece is called Peripatie which is Greek for 'sudden changes'. He composed this after his wife had run off with her lover. As you can tell he was pretty messed up!



John Cage is an Experimental composer. He has many weird and wonderful ideas to bring to the world of music including sticking nails and such into a piano to change the sound…watch this!





A. Features of Music in the Twentieth Century (How Composers used the Elements of Music)

A1. Melody & Dynamics

CONJUNCT - wide leaps, angular and spiky.

CHROMATIC -uses all 12 notes (black and white) of the **CHROMATIC SCALE**.

DISSONANCE - harsh sounds.

EXTREMES OF DYNAMICS - *(pppp-ffff)*

No clear melody/"tune".

A2. Harmony

ATONALITY – no (sense of) key.

POLYTONALITY – two or more keys played at once.

DISCORDS – dissonant, clashing chords.

A3. Rhythm

SYNCOPATION – half beat followed by full beat emphasising weaker beats of the bar.

IRREGULAR ACCENTS (>) – *e.g. The Rite of Spring*

IRREGULAR TIME SIGNATURES – 5 or 7 beats per bar.

A4. Timbres and Sonorities

Strange, intriguing, and exotic sounds; striking, sometimes explosive, contrasts.

PERCUSSION – expanded in orchestra and more emphasis on percussion timbre and sonorities.

Unfamiliar sounds from strange instruments such as **EXTREME PITCH RANGES** and playing instruments in different and unusual ways.

TOTALLY NEW SOUNDS often involving **ELECTRONIC EQUIPMENT** and **MAGNETIC TAPE**.

B. Minimalism

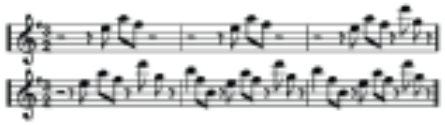
Based on **CELLS** or **MOTIFS** – short simple ideas.

Use of **REPETITION** – also called **LOOPING**.

LAYERED TEXTURES

NO CLEAR MELODY

GRADUAL CHANGES OVER TIME



PHASE SHIFT (PHASE IN/OUT) – when two or more motifs or cells begin in **UNISON** and gradually become "out of sync" with each other through displacement, either forwards or backwards.

METAMORPHOSIS – tiny changes are made over time to one note or to one part of the rhythm. This can go a "full circle" and end up exactly the same at the end.

ADDITIVE MELODY – adding notes to an original melodic cell gradually.

ISORHYTHMIC OVERLAP – combining different length motifs or ostinato patterns

AUGMENTATION – doubling the note values of a motif or cell.

DIMINUTION – halving the note values of a motif or cell.

RETROGRADE/INVERSION/RETROGRADE INVERSION (see D. Serialism)

Famous Minimalist Composers include: *Terry Riley, Steve Reich, Philip Glass, Michael Nyman.*

C. Expressionism

"Expressionism" is borrowed from painting and is concerned with dark, secret terrors, mental breakdowns, and fantastic visions.

ATONAL, DISSONANCE, DISJUNCT, LARGE ORCHESTRAS, UNUSUAL AND STRANGE TIMBRES AND SONORITIES.

Expressionist composers often use **HEXACHORDS** as a form of **ACCOMPANIMENT**. Hexachords are chords formed of **SIX NOTES**. A hexachord can be formed on any note of the **CHROMATIC SCALE**, but must follow a strict pattern of **TONES** and **SEMITONES**:

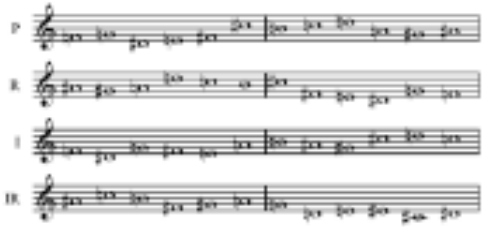
Semitone – Tone – Semitone – Tone+Semitone - Semitone

The notes can then be arranged in any order in different (and often extreme!) pitch ranges.

Famous Expressionist Composers include: Arnold Schoenberg, Alban Berg, Anton Webern

D. Serialism

TONE/NOTE ROWS – use the 12 notes of the **CHROMATIC SCALE** into an order (the **PRIME/ORIGINAL**) on which the entire composition is based.



All 12 notes are of equal importance and none should appear out of turn.

As well as being used in its **PRIME/ORIGINAL**, the tone/note row could also be used in:

INVERSION (intervals upside down)

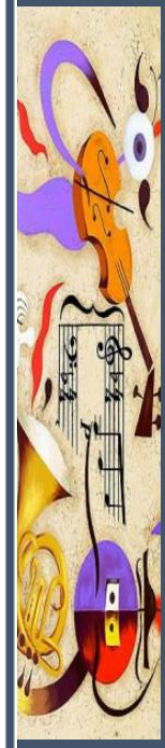
RETROGRADE (backwards)

RETROGRADE INVERSION (the inversion row backwards)

These 4 rows would then become the bases of the composition, used either vertically (as chords) or horizontally (as melody).

Famous Serialist Composers include: Arnold Schoenberg, Alban Berg, Anton Webern, Igor Stravinsky

New Directions



The social context: Liverpool and Britain in 1982

Willy Russell wrote Blood Brothers in 1982. The play is also set in Liverpool. It is very much a play of its time and it is more than that. It has stood the test of time and been in constant production since it was written.

In 1982 there was a **Conservative** government led by Margaret Thatcher in power. They were determined to make the UK a competitive country able to compete with the rest of the world economically. Britain had been plagued by much unrest and strikes in the 1970's. This, however, meant closing factories and industries that the Government deemed uncompetitive. Coal mines, steel works, factories and docks. The cuts and closures were particularly severe in the North of England. In 1982 10.6% of the population were unemployed. Over 6 million people.

Liverpool in 1982 was a city ravaged by these cuts It was a city of high unemployment…The Liverpool Docks had been a proud and historic part of Liverpool for hundreds of years, employing a large part of Liverpool's population. They were closed in 1981.

88,000 people were registered as unemployed in Liverpool in 1982- that is a lot of people. There was poverty, hardship, despair and hunger. **Soup kitchens** sprung up for the first time since the Second World War. The second scene that we study in this scheme of work is between the two now grown up boys. Mickey has just been made **redundant.** This is largely what affects his mood and behaviour towards Edward

Youths with placards protesting against 'Thatcher's' policies.

A 'still' from the last scene of ***Blood Brothers***

Dame Margaret Thatcher. British Prime Minister 1979-1990

Drama: Terms 5 and 6
Our Day Out* and *Blood Brothers
By Willy Russell

Micky & Edward; 1st meeting. Age 7 (nearly 8)

Blood Brothers- A summary of the plot

Mrs Johnstone is struggling financially to feed and clothe her 6 children after her husband has left. The woman she cleans for, Mrs Lyons has never been able to have children. When she hears Mrs Johnstone worrying about being pregnant with twins, Mrs Lyons persuades her to give one of them to her when they are born. She manipulates the deeply religious, Mrs Johnstone by making her swear on the bible.

The two boys grow up without knowing each other. One, Edward, who was given away, grows up in Mrs Lyon's rich, comfortable middle class household. Mickey grows up with the hardships of a single parent family with several siblings (brothers and sisters).

Fatefully- the boys meet when they are seven years old (the first scene that we study) and ironically they become blood brothers. They become great friends and share many wonderful times with their mutual friend, Linda.

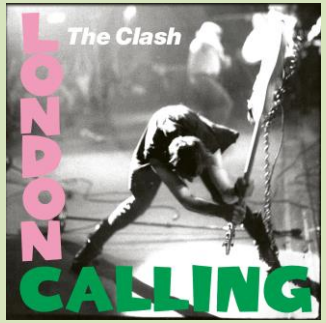
At 18 Eddie goes away to University. Mickey stays, gets a job at the local factory and finally marries Linda. They have a child. Mickey is made redundant. When the upbeat flourishing Edward returns at Christmas, the brothers could not be further apart in their life situations. Mickey goes to prison for being caught in a robbery that his bad influence brother persuades him to do. Prison brings depression and dependency on medication. Edward takes a promising job with the local council. He supports Linda with housing, friendship and some money. When Mickey discovers this is assumes that Linda and Edward are having an affair. Mickey bursts into the council offices with a gun. The police shoot Mickey who accidentally pulls the trigger as he falls killing Eddie. Both boys lay dead in a pool of their own blood. Blood Brothers to the last.

The cultural and artistic context

The general hardship and despair of the country and some Northern cities in particular was reflected in the music of the day. The music of many popular bands of the time was angry and often political,. **Punk Rock** and **Ska** were in fashion. You may want to compare the music of some Punk bands like ***The Clash*** or **Ska** bands like ***The Beat*** with the gentler, more optimistic music of the 1960's and the dreamy and extravagant songs of the early 1970's. c.f. **The Kinks, *The* Sweet, T. Rex** and many others.

UB 40 1980's ska group
UB 40 was the number of the for that people used to sign that they were entitled to unemployment pay because they had not worked in the last fortnight

Punk Rock – protest music of the 1980's
The Clash 1st album



Protests – the strict policies of the conservative government caused many to protest on the streets

Key Past Knowledge to draw on

You will need to remember our work on character; how characters are made up of their personalities, backgrounds, attitudes, beliefs, thoughts and feelings. You will add a character's job, education and training to this list.

You will also need to remember the ways that an actor shows their character to the audience once that they know what they are like (their personality etc.)

Study Focus

This scheme of work will focus on the detailed study of key scenes from a full length play. It will enable you to explore many of the ways in which dramatic literature goes from ***Page to Stage.*** These will involve the proper analysis of a scene, the preparation of a character using Stanislavski's acting techniques in rehearsal and your proposals to stage the scene considering, set, costume and lighting. The play will be properly studied in its socio- economic and cultural context

Key Ideas important to understanding the play

Dole Office- a common slang and colloquial term for the **Benefits Office, Unemployment Office** where people, ***signed- on.*** They are now known as **The Jobcentre.**

Signing – on –Going to the **Dole Office** once every 2 weeks to **sign a declaration - declare** that you have had no work or money paid in the last **fortnight** and so are entitled to **unemployment benefit.**

'Made redundant' – Losing a job because the workplace **shuts down** or the position is **cut.**

Superstition- The belief in Good Luck and Bad Luck – the idea that **Supernatural forces** influence events in our lives. Walking under a ladder is bad luck, seeing **two** magpies is Good Luck *('2 for joy')* seeing a black cat is either Good Luck or Bad Luck depending on who you ask !

Social Forces – These are the forces of social class (you 1st studied this in Y8). How being born and brought up in a working class, or middle class or upper middle class family affects our **opportunities**, **viewpoints** and **outcomes** in life. How do the differing class upbringings affect their lives unfold ?

Conservative Party- One of the major British political parties. Others include the **Labour Party, Liberal & Social Democratic Party, and The Green Party. Each party has their own ideas – their particular political views about what is best for everyone and the country**

The Miner's strike

Acting Techniques - rehearsal techniques

Hot- seating – this is the technique of asking an actor in character questions that will help them get clear about their character and gain a stronger connection with their character. It is only as useful as the quality of the questions being asked.

Duologue — a scene between two actors- the prefix *duo* means two.

Stanislavski's acting Techniques that you learned in Year 7 & 8 and earlier this year.

The Given Circumstances- Everything about the character's situation that is relevant to the scene- their age mood, financial situation, where they are, ***everything- that- is -going on- for- them.***

Objective- What the character wants in the situation**.** An ***Objective*** always begins with**, *'I want…'***

Creative If- This is a technique that you can use to help you get into character in a simple and honest way.You can say to yourself, ***'what if I was that character in that situation, how would I feel, how would I behave…'***

Emotion Memory- Using emotions that you have experienced in your life that are similar to those that a character is feeling in a situation that you have not personally been in.

Blocking – this rehearsal technique involves working out all the moves and actions that the actors in character make

Themes – what the play is about – what is iits meaning – its message

For me, some key questions that the play explores are:

What makes us the way that we are? What makes us behave the way that we do? What are the things that affect our choices, our decisions, our thoughts, our feelings, our confidence, our attitude to life, our self-esteem?

The play, for me, cleverly pitches one idea against another and offers no easy solutions. On the one hand the play clearly shows the way that our background, our social class is a clear determiner of our life expectations. Edward, the middle class twin, goes to university, gets a respectable, well paid job and is successful economically. Mickey, brought up in a working class family, in a working class area, loses his job because the government sees it as necessary for the sake of the country, he gets drawn into crime because it is on his doorstep- literally; his brother, whom he lives with, makes him an offer, that he can't refuse. He gets caught, charged, found guilty and imprisoned. He doesn't cope well with prison and gets clinically depressed which seriously impacts on his relationship with his wife, Linda.

Against these social pressures, Willy Russell, presents moments where, 'new shoes are put on a table' (bad luck) Mrs Johnstone swears to give her child away on does so on a bible- the Holy Book- especially for a Catholic. Mrs Lyons also warns Mrs Johnstone that, ' If two twins separated come to know the truth, they will both die' – quite a threat ! And then, the storyteller, the Narrator, is presented as a figure somewhere between representing Fate and the Devil.

Both boys- the subjects- are genetically the same because they are twins- so they should turn out the same- to have similar outcomes. But they don't and the playwright pitches two ideas; Fate & Social Class against each other to explore the reasons in a highly entertaining musical- I haven't even mentioned the songs- the wonderful songs and the music. It is a very clever device…. The more I get to know the play; (I've read it several times and watched it, maybe, 13 times) the more , I admire it for the way that it manages to engage audiences and, ' Educate through entertainment' Bertolt Brecht- someone that you will hear a lot about if you go on to do GCSE Drama.

Responsibility

Badminton

Problem Solving

Confidence

Double Tactics:

Attacking – Back and Front formation

- Attacking in doubles involves **hitting the shuttlecock downwards**, especially with net kills and smashes. These two shots are the most common winning shots.
- In doubles, **the two attackers work together to maintain their attack.** One player smashes from the back, and the other intercepts any replies to the net or midcourt.

Defending – Side by side formation

- Commons shots are:
  - Lift – clear to the back to create space and time to recover.
  - Drive – low flat shots over the net to put the opposition out of position.
  - Block to the net – cut out any Net shots and Smashes.
  - Push to the midcourt – put pressure on the opposition to be out of attacking formation.

Stretch and Challenge Task:

- How easily can you place the shuttle to the space on your opponents side?
- Can you use your serve to your advantage?
- How effective do you work as a team?
- Where should you be placing the shuttle in relation to your opponents?

Implementation of the Academic Standards to the PE Environment:

- Arrive promptly and change within the allocated time.
- Always have the correct PE kit.
- Fully engaged throughout the lesson, striving to improve performance of skills and techniques at every opportunity.
- Motivated and contributes 100% effort.
- Can work independently to complete a warm-up, drills and competitive situations.
- Perseveres and doesn't give up, demonstrates resilience when practicing and applying skills to different situations/ game scenarios.

Skills & Techniques:

Ready Position:

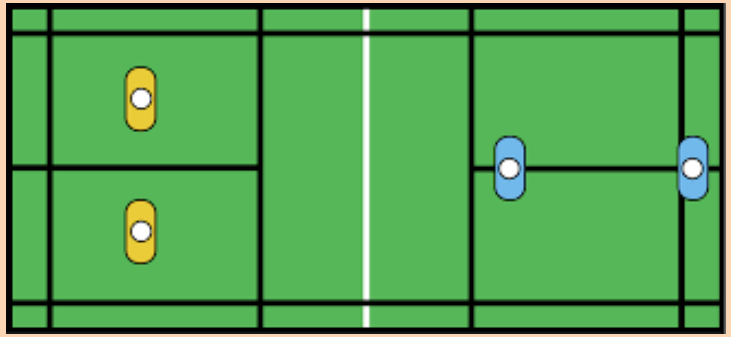
- Side on
- Racket up
- Non-racket up too for balance
- On your toes - ready to move

Drop Shot

- Deception – looks like a clear but drops over the net
- Focus on contact point with shuttle in front of you – guiding the shuttle downwards
- Low over net
- Fast Drop Shot: Travels down steeply. But lands further away from the net.
- Slow Drop Shot: Does not travel down steeply. But lands nearer to the net.

Smash

- Focus on contact point with shuttle in front of you - aim down.
- Use a flick of the wrist on contact to gain power.
- Weight transference to obtain extra power.



Responsibility

Football

Problem Solving

Skills Practice as part of the warm-up:
What skills would you include as part of your warm-up if the focus was on marking in Football?
How can you adapt your practice to make it harder or easier?

Basic Rules
1. Game is started by kicking the ball from the centre spot.
2. The game is played by 11 players made up of goalkeepers, defenders, midfielders and attackers.
3. Referee and two assistants will officiate the game.
4. If a ball goes over a touch line a throw in is taken. If an attacker kicks over the goal line it is goal kick and if a defender or goalkeeper kicks it over the goal line it is a corner.
5. To score the ball must cross the opposition's goal line.
6. The offside rule also applies where an attacker is in front of all opposing defenders when the ball is kicked.
7. Handball- It is forbidden to touch the ball from your finger tips to shoulder. Unless you are the goal keeper.

Game understanding:
- Why is it important to move the ball quickly when keeping possession?
- How can width be provided in different formations like 4-4-2, 4-3-3 or 5-3-2?
- What is zonal marking?
- How can we outwit our opponent at set plays?

Confidence

Implementation of the Academic Standards to the PE Environment:
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- Can work independently to complete a warm-up, drills and competitive situations.
- Perseveres and doesn't give up, demonstrates resilience when practicing and applying skills to different situations/ game scenarios.
- Participates in regularly outside of school either for a club, going to the gym or other regular physical activities.

Turning with the ball and outwitting a defender: Turning with the ball allows you to change direction using different techniques, such as dragging the ball back with the sole of your boot. Outwitting and opponent allows you to beat a defender using different techniques such as a step over.
Shooting: There are different types of shots that allows you to score goals. Your instep can be used to control and place the ball into the goal. If you use your laces then this allows more power to be produced.
Heading: Used in attack and defence. Defensive headers aim for distance and moving the ball away from central positions.
Tackling: Techniques – tackling, jockeying and forcing the player onto their weaker foot.

Strategies and Tactics:
Attacking: Using the width is very important when attacking. It is important teams keep possession and play one and two touch to move the ball quickly. Also, another effective strategy is to 'switch' the play using a lofted pass. To keep possession some teams may use the depth of the pitch to keep possession and build an attack.
Defending: Players are normally marked man to man, but can be marked zonally from corners. It is also important that defenders keep a good line, which may allow them to play the opposition offside. This also means the defending team isn't too deep near their goal.

Health and Fitness

Responsibility

Problem Solving

Confidence

To ensure any sort of training improves your performance, you need to apply the principles of training.

Principles of Training:	
Specificity	Training must match the requirements of the activity so that the right muscles and body systems are adapted
Progressive overload	Gradually increasing the amount of working training so that fitness gains occur.
Reversibility	Just as fitness improves with training it can decline if you stop training.
Tedium	This is the boredom that can occur when you train. A variety of training methods are needed to keep motivated to carry on without giving up.

Training intensities:
Max Heart rate: 220 - age
Aerobic target zone: 60% - 80% of MHR
Anaerobic training zone: 80% - 90% of MHR

Implementation of the Academic Standards to the PE Environment:

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Fitness Testing

Before a training programme:

- To identify strengths and areas for improvement
- Identify training requirements
- To show a starting level of fitness
- To motivate and provide goals

During and after a training programme:

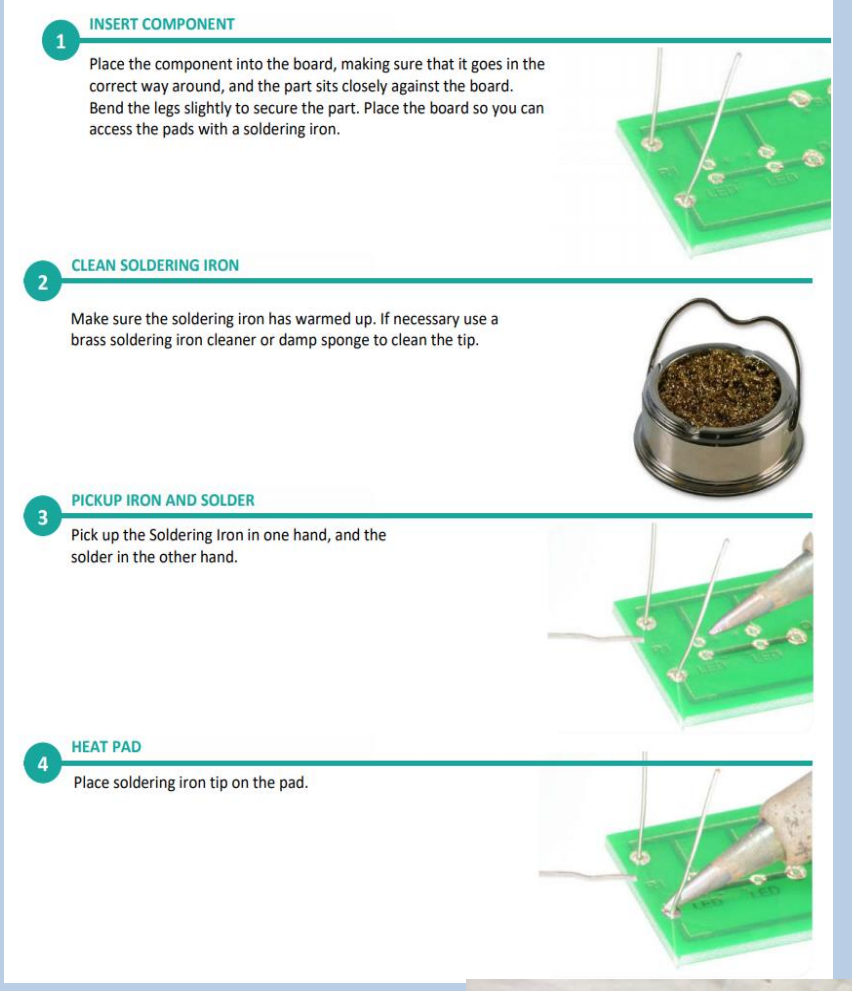
- To monitor improvement
- To provide variety to a training programme
- Compare results against norms of the group
- To identify whether training has been successful

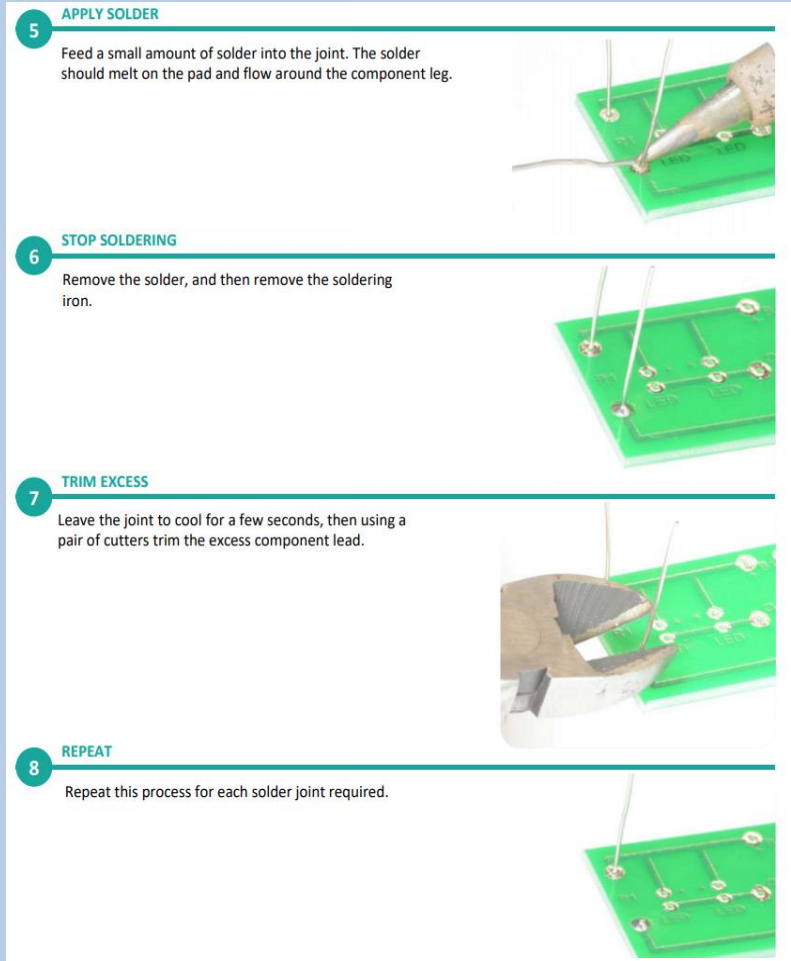
Fitness Component	**Fitness Test**
Agility	Illinois agility test
Balance	Stork balance
Cardiovascular endurance	Multi stage fitness test
Coordination	Alternate hand throw
Flexibility	Sit and reach test
Muscular endurance	Abdominal bleep test
Power	Vertical jump test
Reaction time	Ruler drop test
Speed	30m sprint

Design and Technology

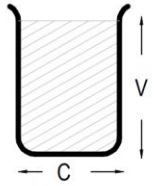
Key terms

Input device: something that can give an input signal to the system.
Output device: something that responds to an instruction of change in control elements.
Input signal: information given to the system by an input device.
Output signal: an instruction the system gives to an output device.
Program: a set of instructions the system controller has been given to make the electronic system do what it is supposed to do. If a transistor (see page 34) is used, there is no program, just a simple switching action due to the rise in voltage on the base of the transistor above 0.6 volts.
Resistance: an electrical quantity that is a measure of how the device or wire reduces the electric current flow through it.
Component: an individual piece of a circuit.
Circuit: individual components are joined up with a conductive material so electricity can flow through them and perform a task.
Voltage: the amount of potential electrical force available that could make electricity flow.
Current: the amount of electricity that is flowing through a circuit.
Semi-conductor: a material that allows electricity to flow under certain conditions. It can behave as an insulator or conductor.





What is a capacitor?

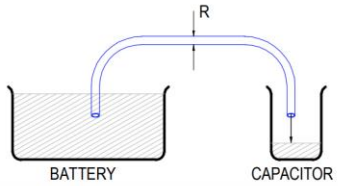


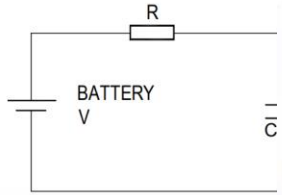
A capacitor is a component that can store electrical charge (electricity). In many ways, it is like a rechargeable battery.

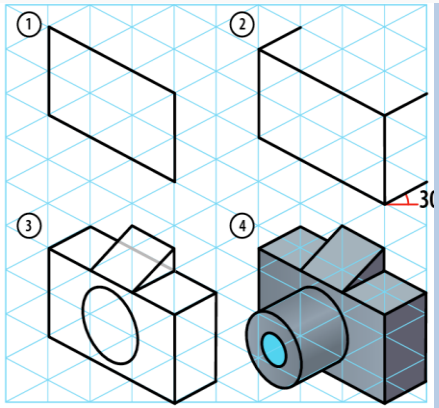
A good way to imagine a capacitor is as a bucket, where the size of the base of the bucket is equivalent to the capacitance (C) of the capacitor and the height of the bucket is equal to its voltage rating (V).

The amount that the bucket can hold is equal to the size of its base multiplied by its height, as shown by the shaded area.

Filling a capacitor with charge



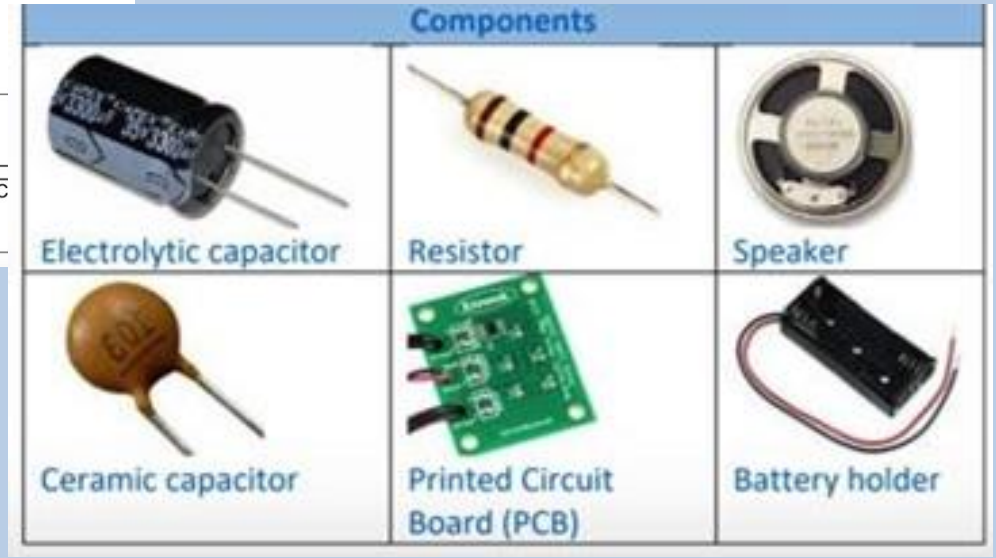




Isometric

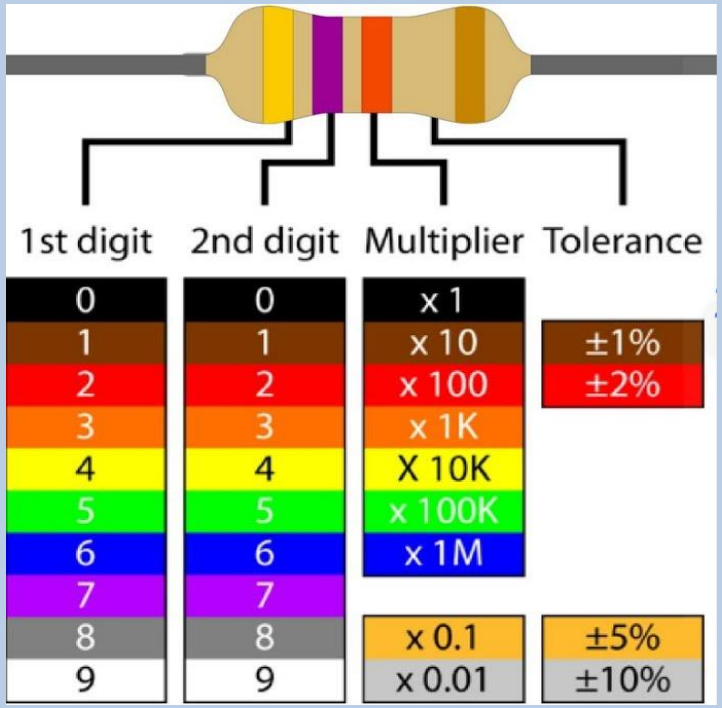
Isometric drawings look more realistic than oblique ones and are based on 30-degree lines. For support, use isometric grid paper to guide your angles:

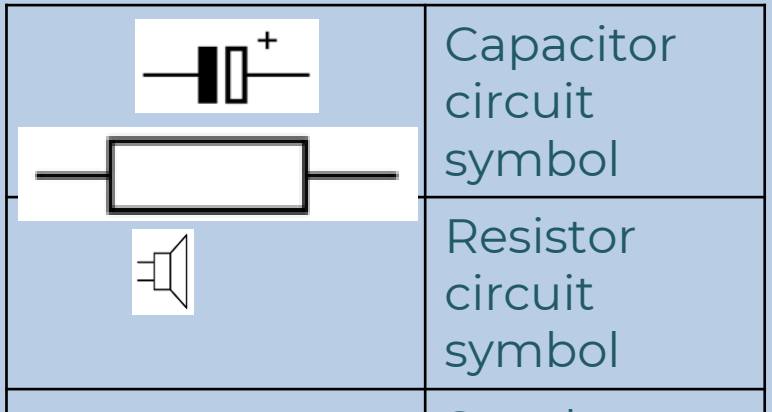
1. Instead of drawing the 2D front view in oblique, you begin with an edge of the product – draw this as a vertical straight line.
2. From this line, create **construction lines** going off at 30 degrees.
3. Fill in the next vertical lines.
4. From these vertical lines, draw your next construction lines going off at 30 degrees (repeat steps 3 and 4 depending on the complexity of your drawing).
5. Within these construction lines, draw your product.



Resistor Values

A resistor is a device that opposes the flow of electrical current. The bigger the value of a resistor, the more it opposes the current flow. The value of a resistor is given in Ω (ohms) and is often referred to as its 'resistance'.

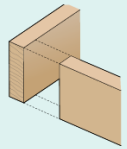
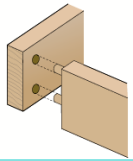
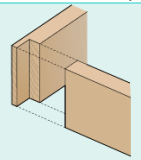
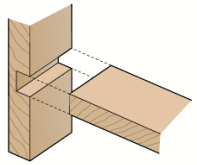
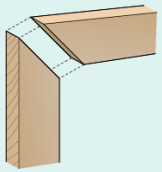
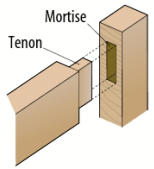
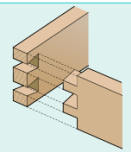




Alternating current supplied to the loudspeaker creates sound waves in the following way:

1. a current in the coil creates a magnetic field
2. the magnetic field interacts with the permanent magnet generating a force, which pushes the cone outwards
3. the current is made to flow in the opposite direction
4. the direction of the magnetic field reverses
5. the force on the cone now pulls it back in
6. repeatedly alternating the current direction makes the cone vibrate in and out
7. the cone vibrations cause pressure variations in the air - which are sound waves

The variety of methods used to join timbers
The advantages and disadvantages of a range of surface finishes that can be applied to timber

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

Type	Description	Advantages	Disadvantages
Paint	A coloured pigment in liquid that dries out	Available in a range of colours	Covers up the natural woodgrain
Stain	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
Varnish	A clear coating that dries to shine	Gives a hard wearing finish that shows the grain of the wood Can be a high gloss or a matte 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 a finish called French polish	Traditionally used on expensive furniture for its glossy lustre	Easily damaged by water and heat
Veneer	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

YR9 Textiles Knowledge Organiser

The fashion and textiles industry today has been transformed by the advent of new technologies and the development of computers and processors has led to the automation of a lot of areas within manufacturing processes.

CAD – Computer Aided Design

Computer Aided Design – allows designers to draw, design, plan and model on screen using a computer.

Advantages of CAD	Disadvantages of CAD
Designs can be created, saved and edited easily, saving time.	CAD software is complex to learn.
Designs or parts of designs can be easily copied or repeated.	Software can be very expensive. Upgrades may be necessary.
Designs can be worked on by remote teams simultaneously.	Compatibility issues with software.
Designs can be rendered to look photo-realistic to gather public opinion in a range of finishes.	Security issues - Risk of data being corrupted or hacked or get a 'virus'
CAD is very accurate.	
CAD software can process complex stress testing and model materials and components.	
Designs can be presented easily with the client or other members of the team.	

CAD Software

CAM – Computer Aided Manufacture

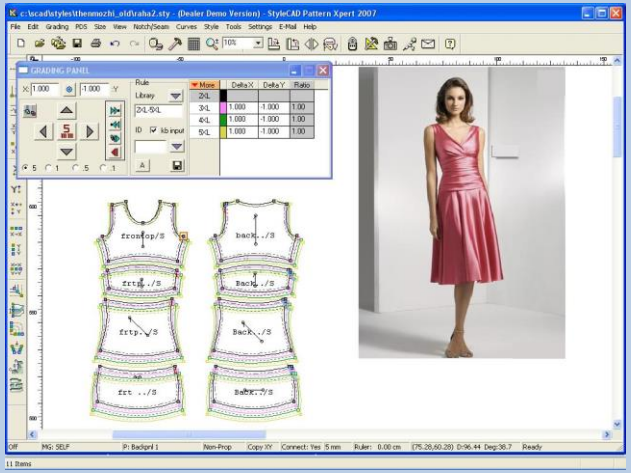
Computer Aided Manufacture is the manufacturing of products designed using CAD. CAM can create a faster production process.

Advantages of CAM	Disadvantages of CAM
Quick – Speed of production can be increased.	Training is required to operate CAM. This can add to cost.
Consistency – All parts manufactures are all the same.	High initial outlay for the machines.
Accuracy – Accuracy can be greatly improved using CAM.	Production stoppage – If the machines break down or there's a power cut, the production would stop.
Fewer Mistakes – There is no human error unless pre programmed.	Social issues . Areas can decline as human jobs are taken. This will lead to unemployment.
Cost Savings – Workforce can be reduced.	

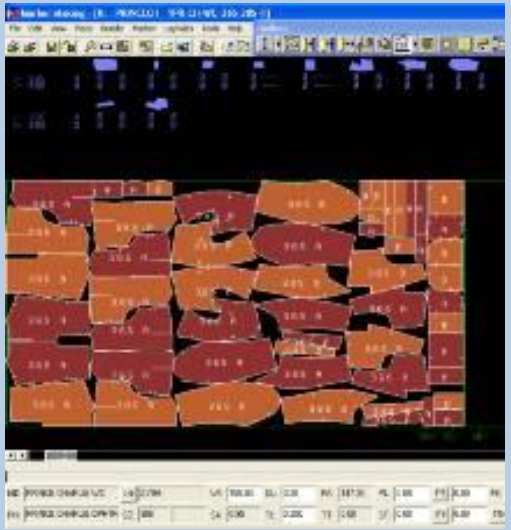
If you are designing products and they are made in another country you need to talk to the factory ALL the time.
E-mail used to be THE THING but now that's moved on to virtual 'cloud based' sites where product information can be uploaded to and which can be accessed from anywhere on the globe. So it's quick and easy. Designs can be worked on
by remote teams simultaneously

3D Modelling

With a good CAD program you don't need to be able draw at all – a CAD program will do it for you! You can also see what the fabric for the product looks like, how it drapes and whether it is the correct material for the product.



Drawing patterns and layplans



CAD is also used in planning how to cut out the fabric pieces. This is called a **layplan** or **layout**. It makes sure you are using the fabric economically – so there's no wastage.

Cutting out of materials

Once you have created the layplan/layout you can use CAM to follow this and cut out the fabric. Many layers are usually cut out at the same time.

Below are some of the main types of machines used in the manufacture of textile products.

Digital jet printer

Digital Knitting machine

Laser Cutter

Multi-head embroidery machine

Digital Printing is the process uses a computer to print directly onto fabric that have been coated with a special chemical wash. The fabric is steamed to set the design on the fabric. This can be used on natural fabrics. **Transfer** or **Direct printing** is the process of applying designs directly to a paper. The designs are then transferred to fabric using heated rollers for mass-produced designs or a heat press for small scale designs. This works best on synthetic or synthetic blend fabrics.

Scales of Production

One off/Bespoke: when you make a unique item.
Batch: when a limited number of the same product is made.
Mass: when a large quantity of the same product are made over a long period of time. This typically uses a production line.
Just-In-Time: a form of stock control when goods are delivered 'just in time' to use on the production line.

Production Line

In Industry products are usually made by passing each stage of making down a line: this is known as a **production line**. At each stage of making, a specific operator carried out a required task then passes it on to the next machine or person to continue making the product.

Planned Obsolescence

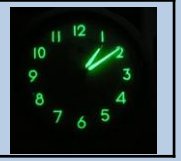
Sometimes manufacturing companies plan or design products to have a short useful life. They do this so the product will become obsolete or unfashionable or they will no longer function after a certain period of time and new products will have to be purchased. This is called **planned obsolescence**.

The following table explains how these production methods are used in the textile industry:

System	Product market	Design and production	Skill Level and Cost
Bespoke	Made-to-measure, eg suit, wedding dress;	Made-to-measure garments are made to fit the measurements of an individual client [client: person or organisation that wants a product manufactured - eg a retailer.]; the garment design is developed from a basic block pattern [basic block pattern: pattern made with standard-sized pattern pieces] and a toile [toile: a prototype garment made from low-cost fabric.] is made to test the fabric drape, the fit [the fit: how well the size and shape of a garment fits a human body.] and order of assembly	Very high-level skills in design and manufacture; high-cost materials; high labour costs
One-off	Haute Couture, eg made by fashion houses	Fashion designers such as Vivienne Westwood design Haute Couture garments for individual clients. These designers have catwalk shows which set trends for high street shops.	Very high-level skills in design and manufacture; high-cost material and labour costs
Batch production	Ready-to-wear (RTW) designer label, eg Designers at Debenhams	Garments are designed to fit a range of standard sizes and shapes. Garment patterns are developed from a basic block using CAD: Computer Aided Design - a system which helps the user produce accurate drawings.. A sample garment is made up in a medium size, from the intended fabric. Once the design has been approved it is put into production in a range of standard sizes. They are sold through up-market retailers.	High-level design, pattern making and sampling skills; cost-effective materials and lower manufacturing costs
Mass production	Mass-market retailers, e.g. Top Shop	Similar production methods to batch production: garments produced in limited range of sizes; standardised production methods are used to produce a wide range of styles. Most fashion products are batch produced in large batches e.g. 20,000. Some classic products like jeans are mass produced for a world market.	High-level design, pattern making and sampling skills; cost-effective materials; products often made overseas where labour costs are low

Technical Textiles

A 'Smart material' is one which reacts to an external stimulus or input. This means that it can alter its functional or aesthetic properties in response to a changing environment. This group of materials can react to stimuli such as heat, pressure, moisture, stress, PH level, light (including UV) and electricity.

Name and **stimulus**	Characteristics	Uses
Thermochromic pigments **Heat**	Pigments embedded into the thermochromic material respond to temperature changes by changing colour. They normally change as they heat up and cool down, but some versions are irreversible.	Flexible thermometers, temperature indicators, clothing, novelty goods, over-heating or over cooling indicators. 
Photochromic pigments **UV light**	The pigments that are embedded into photochromic material respond to changes in the UV light levels by changing colour or darkening. Once the UV light is taken away they change back or lighten.	Novelty products, paints and clothing that change colour in UV light 
Shape Memory Alloy (Nitinol) **Heat or electricity**	A shape can be programmed when heated to 540°C; it can be deformed and will return to the memory shape when reheated to 70°C.	Frames for glasses, dental braces, self-expanding stents used In surgical procedures to open capillaries. 
Hydrochromic	Hydrochromic inks change colour (become transparent) when wet or if moisture is present.	Often used on novelty products to bring out the colours of text or an image – e.g. an umbrella.
Hydrophobic	Hydrophobic finishes **REPEL** water and cause water to form nearly perfect spheres that roll off coated materials.	Products that require waterproofing –outdoor items such as tents and awnings.
Photo luminescent (Glow-in-the dark) **Light**	Glow in the dark materials carry inorganic phosphors that absorb light in the visible and ultra violet wavelengths and then re-emit visible light, or a "glow".	Toys, stickers, paints, clock face/dials, emergency signs. 

Modern materials are materials that are constantly progressing as well as new ways of working with materials.

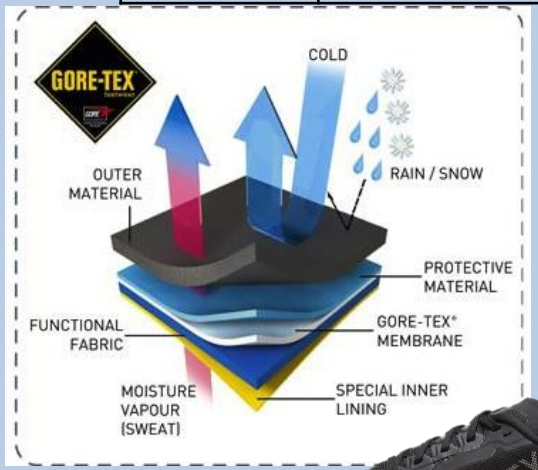
Name	Characteristics	Uses
Polylactic acid PLA	Widely used in 3D printers as reels of filament, it is non-toxic, easily moulded and fully biodegradable.	Bottles, pots, disposable food and drink containers, pens, phone cases and 3D printed items
Polyhydrox y-butyrate PHB Biopol	Stable, stiff, quite brittle, non-toxic, easily processed and moulded, has limited chemical resistance, fully (but slowly) biodegradable.	Bottles, pots, household items, disposable food containers.
Flexible MDF	Flexible in one direction along the cut groove, easily shaped into natural curves and waves, easily finished, can be laminated and veneered, not good in wet conditions	Modern furniture, curved and wave-shaped forms for interior spaces, interior walls and room dividers.
Titanium	High strength to weight ratio, anti-corrosive, can be easily formed and welded, hypoallergenic.	Jewellery and watches, medial uses such as joint and dental implants, aircraft, spacecraft and sports car parts.
Fibre optics	Flexible cable capable of transferring digital data at extremely fast speeds, light and images can be sent and received.	Data transfer cables, endoscopic cameras, novelty and bespoke lighting displays
Graphene	Highly conductive, flexible, stretchable, incredibly strong yet lightweight, impermeable to all known substances.	To be developed but potential use in the medical, electronic and energy industries amongst many others.
Metal foams	Strong, lightweight, electrically and thermally conductive, very porous, good sound absorptions.	Medical implants, aircrafts, aircrafts and car parts, lightweight load-bearing structures, impact absorption in vehicles.

Technical textiles are textiles that have been developed with enhanced properties to withstand specific uses.
The function is vastly more important that the aesthetics.

Name	Characteristic	Uses
Gore-Tex	Waterproof, wind proof, breathable fabric, moisture vapour can escape.	Outdoor clothing from skiwear to mountain wear, walking boots, cross country trainers, gloves sportswear.
Kevlar Poly-paraphenylene terephtalamide	Extremely strong and hard-wearing, excellent cut and tear resistance, high thermal protection, non-flammable, good chemical resistance.	Personal armour, helmets, bullet-proof vests, motorcycle safety clothing, extreme sports equipment, audio equipment, musical instruments.
Conductive fabrics and threads	The thread or fabric can pass an electrical current along its length, linking electronic components. It allows for flexible and wearable control of electronic products for entertainment, safety health and fitness.	Connecting wearable inputs, processes and outputs, such as switches, lights, Bluetooth connectivity and speakers in technical clothing, children's soft electronic toys, wearable electronic sports equipment and anti-static clothing.
Fire resistant fabrics	Resists heat and ignition from the naked flame to protect the wearer.	Fire blankets, firefighting or safety clothing such as gloves, aprons and boiler suits. Protection for racing car drivers.
Microfibres & Micro-encapsulation	Very depending on the specific textile, can be statically charged to pick up dust and filter particles, can be absorbent yet fast drying.	Medical textiles, fabrics, cloths and towels. High-tech clothing which can be anti-bacterial, heat regulating or insect repelling.

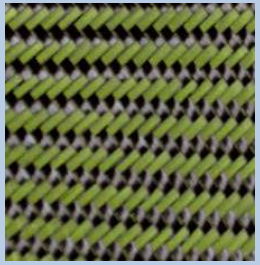
Composite Materials are formed when two to more distinctly different materials are combined together to create a new material with improved properties and functionality.

Name	Characteristics	Uses
Glass Reinforced Plastic (GRP)	Lightweight, good strength to weight ratio, good corrosion, chemical and heat resistance, waterproof, high VOCs/resins used. Can be trimmed with rotating blade. Labour intensive to produce.	Boat hulls, car and truck parts, liquid storage tanks, pipes, helmets, seating.
Carbon-fibre reinforced plastic.	Very high strength to weight ratio, good tensile strength but not good compressive strength, stiff and rigid, very expensive, high VOCs/resins used, waterproof, and resistant to chemicals. Manufacture is labour-intensive and skilled process.	Supercars and sports cars, top-end sports equipment, bespoke boats and musical instruments, increasingly developed for prosthetic uses.



Gore-Tex

Kevlar



Design Strategies

You can use design strategies to come up with initial design ideas without getting you on a bad one. Designing is a really complex process and there are several different ways of doing it:

Systems approach: This means breaking down the process into a number of different strategies and doing each in turn.

User-Centred design: The wants and needs of the client are prioritised - their thoughts are given a lot of attention at every stage of design and manufacture

Iterative design: Centred around the design process of evaluation and improvement at each stage of designing.

When you are designing a product it is easy to get stuck on a particular idea. This is called design fixation and it can stop you thinking creatively and coming up with innovative ideas.

Following the design strategy can help you avoid design fixation and encourage you to look at your design in a critical way to make improvements.

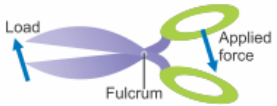
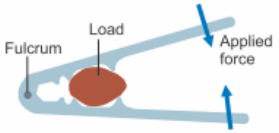
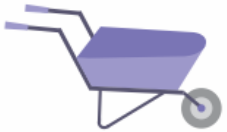
A=Aesthetics
C= Cost
C= Customer
E=Environment
S=Size
S=Safety
F=Function
M=Materials

You can also annotate your designs to fully explain further using ACCESSFM

- Different people and cultures have different needs. Technology and design affects and can have an impact on culture.
- The culture of a particular country or a group of people covers everything from their religion, beliefs and laws to their dress and traditions.
- If you're designing a product aimed at a specific target market, you'll need to take into account their views and feelings of people from that particular culture.
- New technology can also impact fashion and trends.
- Fashion itself is continually affected by new materials and techniques. Technology can also have an impact on fashion trends. The internet allows people to find out about fashion trends that are happening all over the world and new clothes can be seen by a global audience e.g. social media and blogs.
- Products can be designed to avoid having a negative impact on other people by being sensitive to their needs.

Eyelet Press

An eyelet press is a hand tool that uses a lever arm that converts your simple movement into enough pressure to crimp and press a mental eyelet and washer together securely. This creates a neat and strong hole for cord to pass through.

First class lever	Second class lever	Third class lever
Lever in which **fulcrum is situated in between load and effort** is called first class lever. e.g. pair of scissors, see-saw, pliers	Lever in which **load is situated inbetween fulcrum and effort** is called second class lever. e.g. nut cracker, wheel barrow, bottle opener	Lever in which **effort is situated inbetween the fulcrum and the load** is called third class lever. e.g. fishing road, pair of tongs, stapler
 Scissor	 Nut cracker	 Pair of tongs
 See-saw	 Wheel barrow	 Fishing rod

A lever is used to lift a load with the least amount of effort. Placing the fulcrum (the point which the lever turns) in different places effects where the load can be lifted.

The table on the left shows you the three different classes of lever.

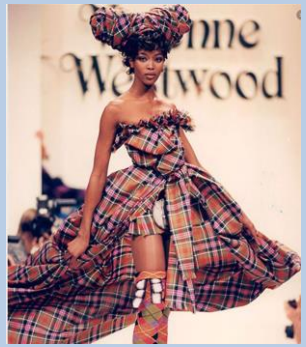
Design Culture

GCSE Preparation.

"Design creates culture. Culture shapes values. Values determine the future." Robert L Peters.

Vivienne Westwood (1941-2022)

Her iconic clothing became popular during the punk rock movement in the 1970s. She has since become a world famous fashion designer. Her designs often take inspiration from traditional British clothing and historical paintings.

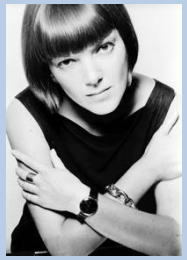


Coco Chanel (1883-1971)

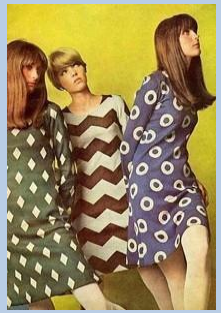
A fashion designer known for introducing practical casual-chic clothing for women who had traditionally worn corsets and long skirts.

Mary Quant (1934-2023)

A fashion designer who popularised the mini skirt, hot pants and OVC in the sixties. Her clothing often featured white collars, simple shapes and bold colours.



MARY QUANT



Alexander McQueen (1969-2010)

An influential fashion designer known for his theatrical, well tailored clothing and dramatic catwalk presentation displaying his collections.

Rei Kawakubo (1942 - Present)

Rei Kawakubo is a self-taught Japanese fashion designer based in Tokyo and Paris. She is the founder of Comme des Garçons

COMME des GARÇONS

Pierre Davis

The founder of gender-neutral fashion label No Sesso (Italian for No Gender). Their belief is fashion is about pursuing art and inclusivity.

William Morris (1834-1896)

A wallpaper, furniture and furnishings designer. His designs were often based on nature and repeat patterns. He is one of the founders of the Arts and Crafts movement

Joe Casely-Hayford OBE (1959 - 2019)

A renowned British fashion designer known for his innovative designs and contributions to men's fashion. Early in his career he dressed The Clash and U2 whilst working on his eponymous brand for men and women.

Knowledge Organiser – Year 9 Food

Macro and Micro nutrients

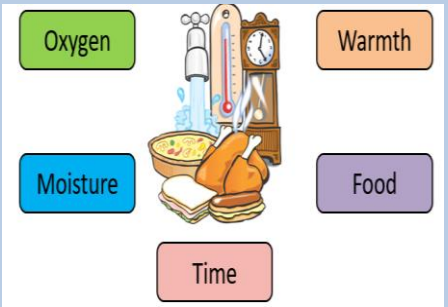
There are 5 main groups of nutrients. These 5 groups can be divided into 2 groups

Macronutrients which are needed by the body in large amounts.

Micronutrients which are needed by the body in small amounts.

Food Poisoning

Living organisms (including bacteria) need certain "things" or conditions to survive:



What are Nutrients?

Nutrients are the building blocks that make up food and have specific and important roles to play in the body. Some nutrients provide energy while others are essential for growth and maintenance of the body.

Macronutrients

Macro Nutrient	Role in the body	Food Example
Carbohydrate	The main source of energy for the body.	Bread, rice, pasta, potatoes
Protein	Provides the body with growth and repair.	Meat, poultry, beans, eggs, lentils, tofu, fish
Fat	Provides the body with insulation and a small amount protects vital organs. Provides essential fatty acids for the body.	Butter, oil, cheese, cream, nuts, oily fish, crisps

Micronutrients

Vitamin	Role in the body	Food examples
A	Helps to keep the eyes healthy and strengthen the immune system.	Dark green leafy vegetables, carrots, liver
B	Helps to release the energy from the food we eat.	Bread, milk, cereals, fish, meat
C	Help with skin healing and healthy skin. Help with the absorption of Iron.	Fresh fruit, broccoli, tomatoes
D	Important for absorbing calcium and help with healthy bone structure	Oily fish, eggs, butter, Sunshine
Mineral	**Role in the body**	**Food Examples**
Calcium	Important for strong teeth and bones. It also helps with blood clotting.	Milk, yoghurt, soya, dark green leafy vegetables
Iron	Needed for red blood cells which help to transport oxygen around the body.	Nuts, whole grains, dark green leafy vegetables, meat, liver

Hygiene

Personal

Hair up – Reduces the risk of bacteria transferring to food through hair dropping in

Aprons on – Protects you from spillages and reduces risk of bacteria transferring to food from everyday clothing

Washing hands - regularly using hot soapy water to reduce the bacteria on your hands

Blue plasters – Blue plasters should be used to cover cuts and grazes as they will be easily seen if they accidentally fall into food.

Food – Understanding the 4 C's Concept

Cooking – thorough cooking kills bacteria so ensure food is cooked to 75°c to make sure all bacteria are killed – check this by using a food probe.

Cleaning – effective cleaning removes harmful bacteria and stops them spreading so ensure all work tops, utensils and equipment are cleaned thoroughly with hot soapy water.

Cooling – effective chilling prevents harmful bacteria multiplying so ensure all food is stored at the correct temperatures, ensure cooked food is cooled within 90 minutes.

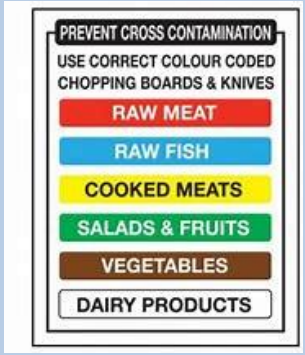
Cross contamination – Good hygiene practice prevents Cross contamination so when raw food comes into contact with ready to eat food. For example raw meat juices spilling onto salad.

Knowledge Organiser – Year 9 Food

Hospitality and Catering providers fall under two main categories

Commercial → Makes money as a business

Non-Commercial → Does *not* make money as a business



Personal Attributes

Hospitality and catering providers will look for certain personal attributes in people who want to work for their business, these can include:

- Honesty
- Team player
- Self motivation
- Initiative
- Patience
- Personal presentation

Factors **affecting food choice**	
Biological	Hunger appetite and taste
Economic	Cost of food, income, availability
Physical	Access to shops, food skills, education, time
Social	Family, culture, meal patterns
Attitudes	Knowledge about food and beliefs
Seasonality	The food is locally grown at certain times, cheaper
Religion	Certain religions restrict certain foods
Ethical	Your beliefs prevent you from eating some foods
Medical	Some illnesses dictate your diet like diabetes
Age	Activity levels and mobility affect requirements

Allergies

Itchy skin · Itchy mouth · Swelling · Vomiting

Are immune system reactions (symptoms of a reaction can include)

Red rashes · Swollen throat

In extreme cases, it can cause *"anaphylactic shock"*

Intolerances

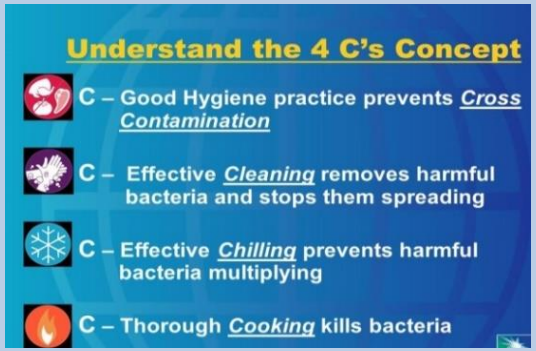
A food intolerance is not the same as a food allergy.
It is not an immune system response.
It is a chemical reaction in the gut.

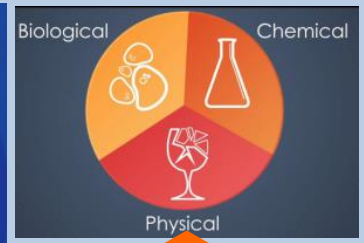
What are some of the symptoms?

Cramping gut · Bloating · Diarrhoea · Migraine

Fridge Storage

You should store meat and poultry on the bottom shelf of the fridge to prevent liquid dripping on to other food. Store in a clean, sealed container. Keep cooked and raw meats separate to avoid cross contamination. The fridge temperature should be between 1°c - 5°c.





Types of contaminant

Food Styling

Food styling is where a chef creates a dish and then uses a range of presentation techniques, these can include:

- Different textures
- Different flavours
- Different shapes/colour
- Interesting to look at
- Appetising

Organoleptic = using the senses

Customer Demographic

A profile showing what particular groups of people want, need and expect.

Technology · Tastes · Opinions · Money /Costs · Age · Gender · Choice · Nationality · Fashions

Wider thinking/further reading: www.foodafactoflife.org.uk www.wjec.co.uk/qualifications/hospitality-and-catering www.food.gov.uk

Year 9 Graphics: Interior and Exterior

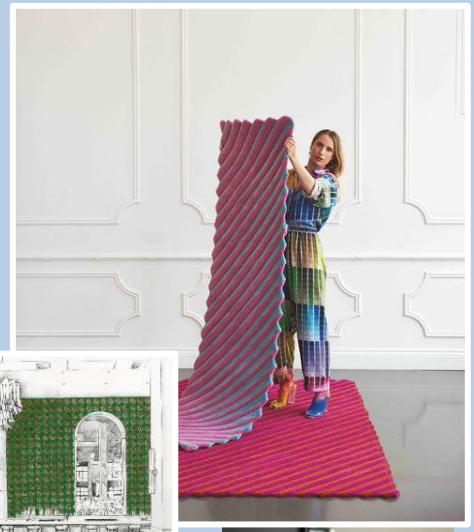
Interior and spatial designers are involved in the design or renovation of internal spaces, including structural alterations, furnishings, fixtures and fittings, lighting and colour schemes.
Exterior designers include, architects, public space designers, garden or landscape designers and many more! Exterior designers focus on the outside spaces and buildings, looking at functionality and aesthetics.

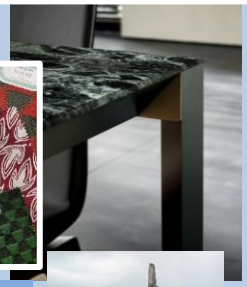
What is the definition of commercial interior design?

Commercial interior design refers to the interior design done in commercial spaces, such as offices, **shops**, restaurants, lobbies, and other public spaces.

British Design award winners 2021:

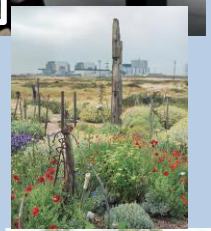
- Michel Anastassiades
- Soane Britain
- Kitty Joseph
- Tom Raffiald
- Zoffany
- Sam Wilde

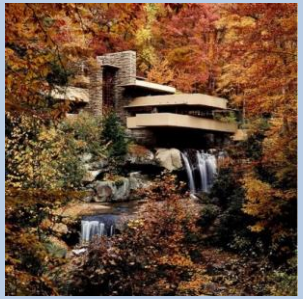




Architects:

- Zaha Hadid
- Potlemy Dean
- Jeanne Gang
- Frank Lloyd Wright

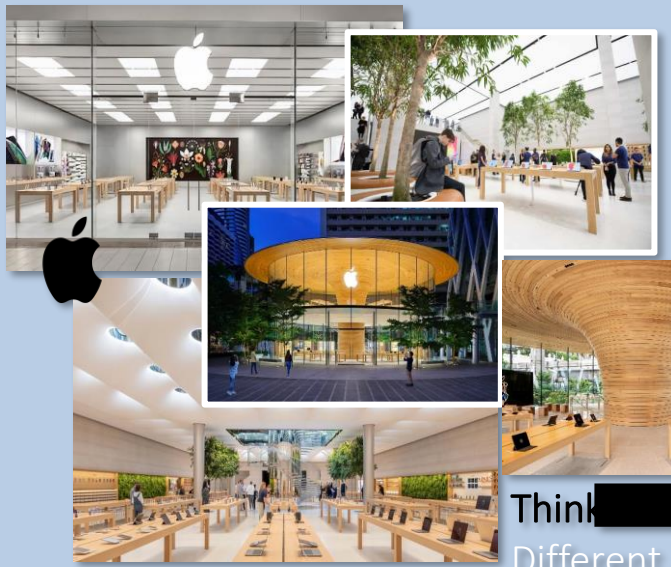




Garden/Landscape Designers:

- Tom Stuart Smith
- Getrude Jekyll
- Derek Jarman
- Capability Brown
- Beth Chatto

EXISTING STORE RESEARCH

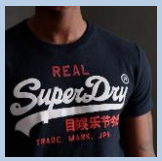


KEY TERMS	DEFINITION
Design Process	An approach for breaking down a large project into manageable chunks.
Target Audience	A particular group at which a product is aimed towards.
Design Brief	Outlines the specifics of a design project which can include the design project overview, timelines, target audience information, and budget.
Research	A collection of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts and understandings.
Colour Theory	The collection of rules and guidelines which designers use to communicate with users through appealing colour schemes in visual interfaces.
Mood board	An arrangement of images, materials, pieces of text, etc. intended to present a particular style or concept.
Evaluation	Is a process that critically examines a design.
Modelling	Making a model allows designers to visualise and test how a product looks and performs in 3D and is a great way of checking a product's viability .

Which Brand will you choose?...



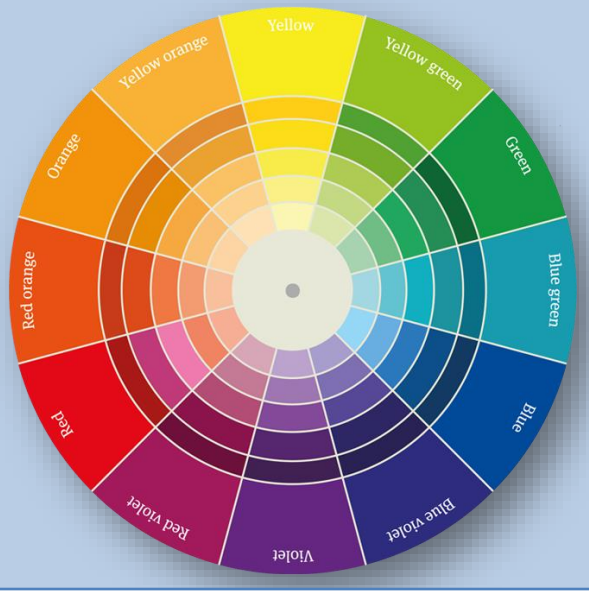




COLOUR PALLETS

Colours can convey a message that give us an idea of how the product or company wants to be perceived. They can entice a certain type of customer and can make us think of different things.

The Colour Wheel.



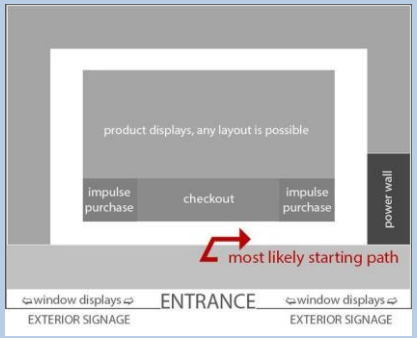
Colour pallets which effectively reflect our company brand.

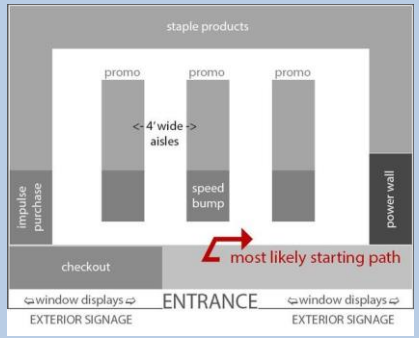

Interior Design Considerations in Retail Store Design

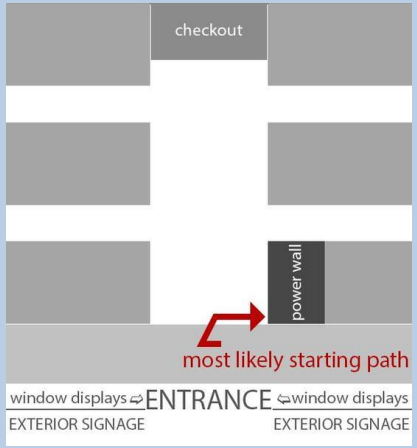
- Value of Space. The value of space, depending on the location within the store, is expressed in sales per square foot of floor space, and sales per cubic foot of cubic space.
- Space Utilization and Allocation.
- Storage of Stock.
- Customer Traffic Flow.
- Types of Goods.

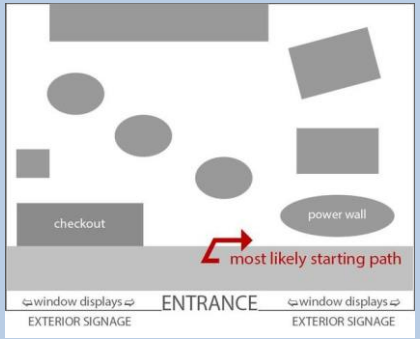
CUSTOMER FLOW

Customer flow is the movement of customers around a store. Providing more check-outs increased customer flow, reduced bottlenecks and improved sales.









MOOD BOARD

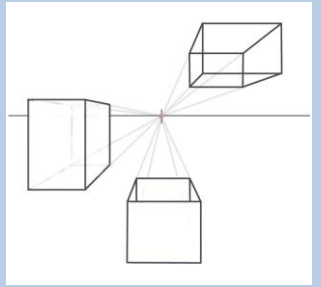
A mood board is a visual representation of ideas for a design project. At its most basic, a mood board is a collage of images. The purpose of a mood board is to help explore ideas and figure out the general style, mood, colours, and overall feel of a room or project space.

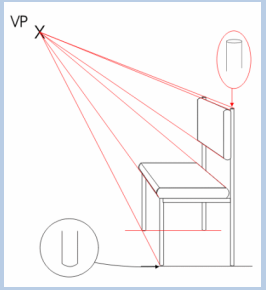
MODERN, LIGHTS, NEON, MINIMAL, CITY, URBAN

ORGANIC, NATURAL, WOOD, RUSTIC, COUNTRY

ONE POINT PERSPECTIVE

One point perspective is a drawing method that shows how things appear to get smaller as they get further away, converging towards a single 'vanishing point' on the horizon line. It is a way of drawing objects upon a flat piece of paper (or other drawing surface) so that they look three-dimensional and realistic.





3D MODEL

What is model in interior design?

An architectural model is a 3D representation of a proposed building design. With an architecture model, you can see the potential scale and design of a construction or interior design project.