

The Trafalgar School at Downton

Knowledge Organiser

Year 9: Terms 3 and 4

2022/2023



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Name.....House.....

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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?

New GCSE specifications mean that students have 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.





WHAT WE EXPECT FROM YOU

BE ON **TIME** ●

BE **EQUIPPED** ●

PEN, PENCIL, RULER, KNOWLEDGE ORGANISER & EXERCISE BOOK (AS A MINIMUM)

LISTEN TO STAFF AND **ALWAYS**
COOPERATE ●

DO NOT INTERRUPT **LEARNING** TIME ●

COMPLETE **ALL WORK** SET
BEST WORK, FIRST TIME ●

SHOW **RESPECT** ●

WEAR UNIFORM **PROPERLY** AND
WITH **PRIDE** ●

MOBILE DEVICES/SMART
WATCHES TO BE IN **YONDR** CASE ●

Being Trafalgar

At the end of your time at the school your knowledge organisers will provide you with lots of help and support when you 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!

Learning the knowledge in the organiser

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.

The best method to use when you are working on memorising things from your Knowledge Organiser is to self-quiz, using the Trafalgar Revision Method, below:

Really read and understand	Read the information 3 or more times and ask for help in understanding
Reduce the knowledge	Rewrite the information, making revision cards or mind maps
Remember	Reread and test that you can remember
Repeat	Repeat the process above until you can recall the information quickly and accurately. Only at this point have you acquired the knowledge!

How do I remember? Activating your memory

Students often say “I can’t remember” and the reason for this is that the information they are trying to remember and learn is not yet in their **long term memory**.

Your long term memory gets activated by repetition over a number of days. And so repeat the following process to embed knowledge in your long term memory.

Look	Read the information 3 or more times 
Cover	Now cover what you have just read up
Write	Now try and write down the information you have just read 
Check	Did you write down the information correctly? If you made mistakes, correct them with a different colour pen and repeat daily until you “just know it”.



Language Methods to Practise in your Fortnightly Writing Challenge



- alliteration:
- anecdote:
- antithesis:
- chiasmus:
- emotive language:
- experts:
- extended metaphor:
- foreshadowing:
- imperative verbs:
- metaphor:
- modal verb:
- pathetic fallacy:
- sensory description:
- simile:
- statistics:
- superlative:
- onomatopoeia:
- personification:
- repetition:

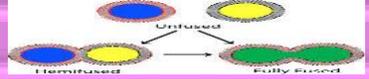
You'll never put a better bit of butter on your knife



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.



That's one small step for man, but a giant leap for mankind.



'Let us never negotiate out of fear, but let us never fear to negotiate.'

Think about the poor, defenceless animals that suffer due to our rubbish!



'Group chat can often be a source of upset,' warned psychologist Dr Linda Pappadopolis.

The Road Not Taken, by Robert Frost, is one of the most famous examples of extended metaphor; in the poem, he compares life's journey to a forest path.

The witches in Macbeth are used to foreshadow that Macbeth is not innocent: 'Fair is foul and foul is fair', a line he echoes in his first appearance when he says 'so foul and fair a day I have not seen'.



Chill out! Do as I say! Don't eat the daisies! Please be quiet! Be quiet!



'The sun in the west was a drop of burning gold that slid near and nearer the sill of the world.'

You must be home by midnight. You could be tired if you're any later. E.g. mustn't, can, might, shouldn't, may, will etc.

In Macbeth, the night the King is murdered 'has been unruly ... in th' air, strange screams of death ... Some say the Earth was feverous and did shake.'



Wind swirled around the beach house, whistling loudly. He felt the snowflakes melting on his skin, their liquid trickling down his neck, cold, wet, seeping into his clothes.



Without warning, Lionel gave one of his tight little sneezes: it sounded like a bullet fired through a silencer.

You only have a 20% chance of surviving a 60mph crash if you don't wear a seatbelt!

This is the worst day of my life but at least we're in the finest café in London.

The dog knocked over the vase with a crash!



Dancing on the water, the sun shone endlessly.

'As my grandfather went, arm over arm, his heart making sour little shudders against his ribs, he kept listening for a sound, the sound of the tiger, the sound of anything but his own feet and lungs.'

When writing, don't fragment. Fuse or splice your sentences.



Unfortunately, I don't think I'm going to get a good grade. Because I didn't study. X FRAGMENT

Fix it by re-joining the fragment to the sentence: Unfortunately, I don't think I'm going to get a good grade because I didn't study. ✓

In the holiday, I went to Paris it is the most beautiful place I have ever visited. X Fuse

Fix it by using a full stop (never a comma), coordinating conjunction (for, and, but, or, yet, so), or subordinating conjunction (as, because, so that, before, after, until, since, when, although, etc.), or semi-colon to join the two sentences: In the holiday, I went to Paris as it is the most beautiful place I have ever visited. ✓

Heavy rain fell throughout the night, by morning every major road was flooded. X SPLICE

Fix it in the same way you would fix a fuse: Heavy rain fell throughout the night; by morning every major road was flooded. ✓





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,

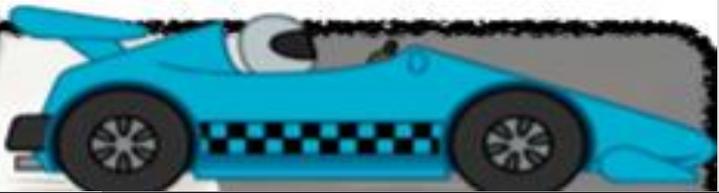
Meanwhile, Later that day, Seconds later, Subsequently, That afternoon,

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 ...

PUNCTUATION PIT STOP



Writing the text for a leaflet

Stay Safe and Sound Online

clear/apt/original title

subtitles

Manage your online reputation

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.

effectively/fluently sequenced paragraphs

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.

Writing Forms

bullet points

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;

Text for a Speech '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.'

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

Thank you.

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 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

Today, before he even steps out on to the Centre Court for his Wimbledon semi-final, the 27-year-old, 2009 Wimbledon champion has already been subject to several of these. He does a urine test every time he pops to the lavatory. The osmolarity 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 today, it will only be thanks to the bloke who inspects his wee.

Daily Diet

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

Writing in the Essay Form

clear title

Zoos Should be Banned

effective introduction

In America, approximately 175 million people visit a zoo each year. That's half of America's population. Clearly this suggests that zoos remain popular places for people to visit for entertainment and to learn about wild animals. However, although some people are of the opinion that zoos can provide a source of educational entertainment and a sanctuary for endangered animals, I believe that the cruelty that wild animals suffer outweighs this benefit, and that they should be shut down!

effectively/fluently linked paragraphs to sequence a range of ideas

On the surface, zoos are a huge tourist attraction because they allow families to spend a day out in the sun, looking at animals, and eating overpriced junk food. But what most people don't know is that zoos are far more sinister than selling small bottles of water for £5.00. Statistics show that in all zoos, fifteen percent of animals die every year due to living in captivity. Obviously then, zoos must be an unsuitable environment for wild animals and should, therefore, be abolished. How can zoos justify their existence by claiming animals in captivity provide people with the experience of observing wildlife they wouldn't otherwise experience, when it costs at a cost to their life?

a range of ideas (no room to reproduce the other two paragraphs here)

In conclusion, a zoos only purpose is to make as much money as possible by showing thousands of people per day to gawk at animals and spend far too much money on souvenirs and junk food. Zoos do not protect or help to repopulate animals, nor do they educate people on the specifics of these animals, and therefore should be abolished.

convincing conclusion

Writing a formal letter



writer's address

35 Hibiscus Crescent
Andover
Hants
SP10 3WE

reader's address

221B Bakers Street
London
NW1 6XE

date

20th February, 2020

Dear Sir or Madam

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

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

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

fluently sequenced paragraphs

fluently sequenced paragraphs

Furthermore, ...

Yours faithfully
Boris Johnson

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

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.

Description of Place

spatial discourse markers

adjectives

Green limbs tangled above the decaying shells of long-abandoned vehicles, forming a canopy that barely permitted the harsh rays of the sun to burn through. The stealthy fingers of squat oak trees reached out tenaciously towards them. The vehicles themselves were coated in a thick layer of rust and a patina of blue copper - and were battered and bruised through years of exposure to the elements.

Metaphor, simile, personification

Like a queue of taxi cabs, the vehicles waited patiently in the forgotten depths of the forest. Specks of light from the midday sun, which had successfully fought their way through the overhead canopy, lit up their broken bodies. Their trunks gaped open woefully and their shattered eye sockets stared blindly forward.

sensory description

sensory description

The aroma of rust and decay occupied the clearing: it was choking, corrosive. No fresh breeze could infiltrate the thick shrubbery to provide relief. The cars lay there, suffocating on their own putrid stench. It was overpowering. Meanwhile, the squawks of blackbirds echoed like sirens around the clearing. The chilling sound was relentless. It echoed through the car's hollow bodies, feeding its way through the cracks in windows and doors, striking the upholstery of the rotting seat as it passed.

spatial discourse markers

sensory description

Spread over the floor of the clearing, a thick blanket of autumn leaves hid the earth beneath. They had turned a shade of burnt red and had bleached edges that resembled torn parchment. They were brittle and cracked from the heat in the clearing. Amongst them, all manner of insects scuttled- manoeuvring themselves between moments of shade, before the unforgiving rays of sun could scorch their exposed bodies.

adjectives

Journey Description

Sitting in my seat - aisle, two rows from the front - I look out. Illuminating a town engulfed in darkness, lights flash past me: shop lights, street lights, car lights, and as the clouds part just enough for the moon to penetrate through the smog, moonlight!

Inside it's silent. No one speaks. The bus windows shut, lulled by the rocking motion, side-to-side, back-and-forth, up-and-down, my eyes feel heavy. Outside, I'm mesmerised by the noise I can only see, only imagine: mouths asking, replying, laughing, traffic screeching, angry drivers honking, shop doors opening and closing.

Once more the bus door opens and, as if I've lifted my head out from underwater, I can hear the street bustle, smell the takeaways, taste the diesel fumes.

Climax (problem at its worst)

- Use exciting/dynamic verbs;
 - Quicken pace;
- Show characters feelings through action;
- Attempts to solve problem fail/intensify problem.
- Vary sentence length: short for action, longer for description.

Fail to Plan
Plan to Fail!

Rising Action (build up/conflict)

- Build on character, setting and plot;
- Introduce a problem/conflict/dilemma;
- Build tension/excitement using interesting adjectives, metaphors, similes etc.

Falling Action (fix problem)

- Character/s solving conflict/dilemma/ problem.

Exposition (introduction)

- Use a story hook to grab attention e.g. atmosphere, sudden event etc.;
- Use descriptive vocabulary to set the scene and describe the main character;

Resolution/Dénouement (ending)

- Link back to the start.
- What has the character learned?
- Is there an exciting twist?
- Is there a cliff-hanger ending?

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

Conclusion:
To conclude,
repeat RQ,
Yes.

Yours
Sincerely

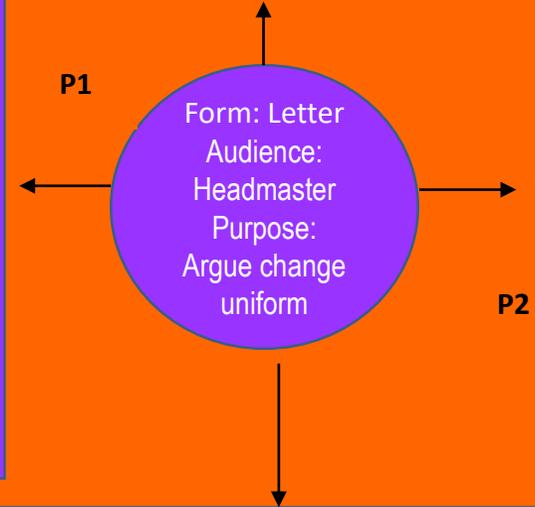
Intro: My address right hand side, +
date, school address left,
Dear Mr Curtis

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: all look same
so no
prejudice/bullying over
clothes,
Argument: no
individualism, learning
who we are
Reasons to: 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?

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

Counter: cost cheaper as not designer or from shops
making huge profit
Argument: 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,
Reasons to: 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

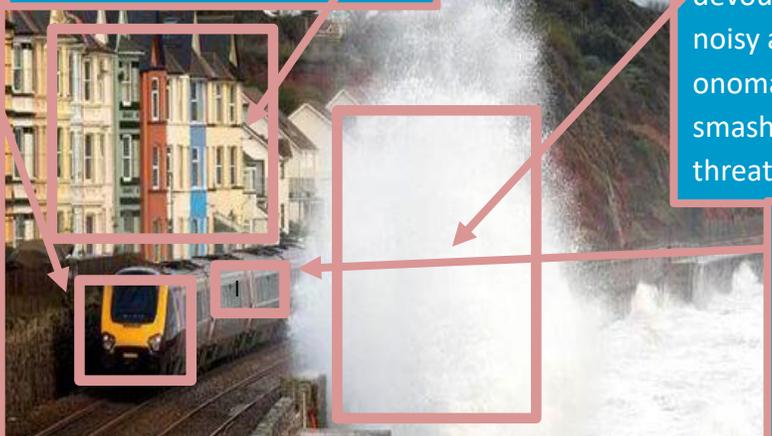
Personify train - a victim moving along railway line, past houses, towards destination - metaphor: caterpillar train sways and pitches precariously along the track to its daily destination. Snatching bites, the sea salt nips at its metal skin as it passes, gnawing at it, killing it. Rattles. Will it survive?

houses, like soldiers standing to attention - defending their inhabitants. Diff pastel colours of a seaside town: prawn pink, salmon peach, oyster grey, seaweed green ...

canopy of sky above threatening Adjectives for mood: grey sky, stuffed clouds full of cold, sharp rain, Verb: beating down, attacking!

waves engulfing and devouring the sea side town - noisy and disruptive, onomatopoeia: Crash! whip, smash personify so violent/threatening movement.

zoom in - one carriage window. Windows hit by spray that's 'like a tame cat turned savage'. Passenger pitched side-to-side: bubbling sickness, rising bile from stomach!

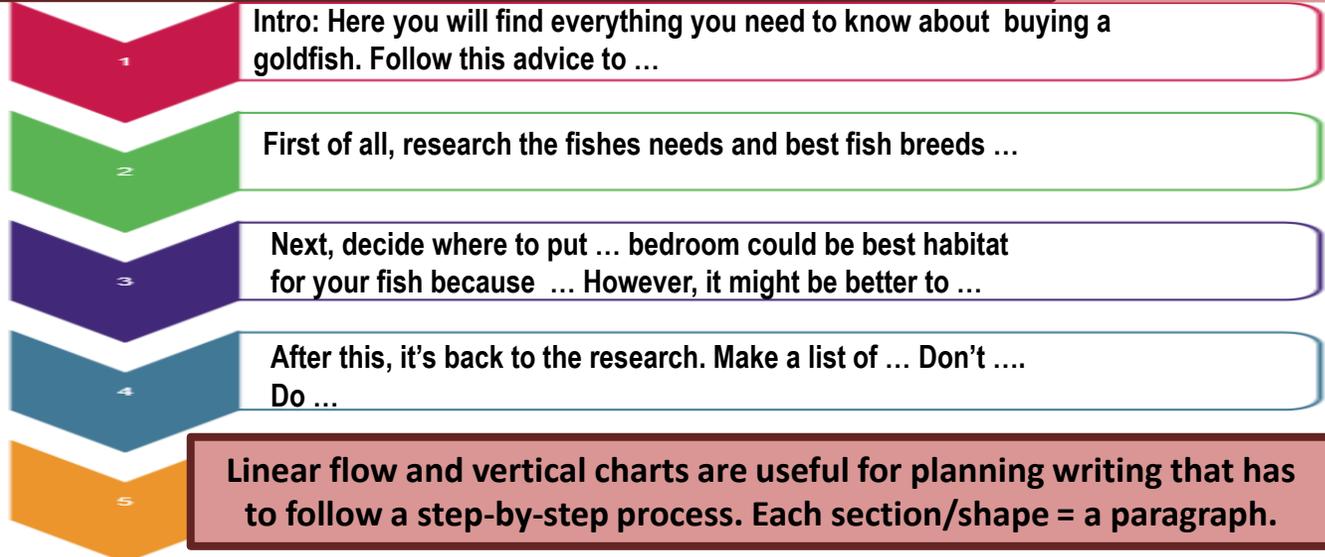


The Grid Plan is good for making sure you include lots of different methods, or to compare two/more things side-by-side. Each row/column = a paragraph.

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	... ;

**Fail to Plan
Plan to Fail!**

Plan describing pictures by boxing/framing parts of the image to help you to focus description on specific areas, zooming in on minute detail, and out again to another area. Each boxed area = a paragraph.



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

Writing Purposes

Key Language/Structural methods

Chocolate Model!



Most often

Mis spelled
words

amateur	miniature
basically	noticeable
beginning	occurred
blasphemy	official
changeable	possession
collectible	preferable
colloquial	receive
definite(ly)	relevant
environment	success
exceed	twelfth
government	propaganda
grateful	publicly
immediate	success
judgement	ultimate
library	unfortunately

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 **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.

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 A FOREST.
- 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.

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.

When writing a speech, be persuasive; use A FOREST 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..."

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?"

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

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."

EXAGGERATION/HYPERBOLE (STATEMENTS/CLAIMS NOT TO BE TAKEN SERIOUSLY) **EFFECT:** DRAMATIC, HEIGHTENS EMOTIONS, MORE INTENSE

"I died from laughing when I learnt that..." "This week I had six tonnes of homework to do – it's too much!"

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?

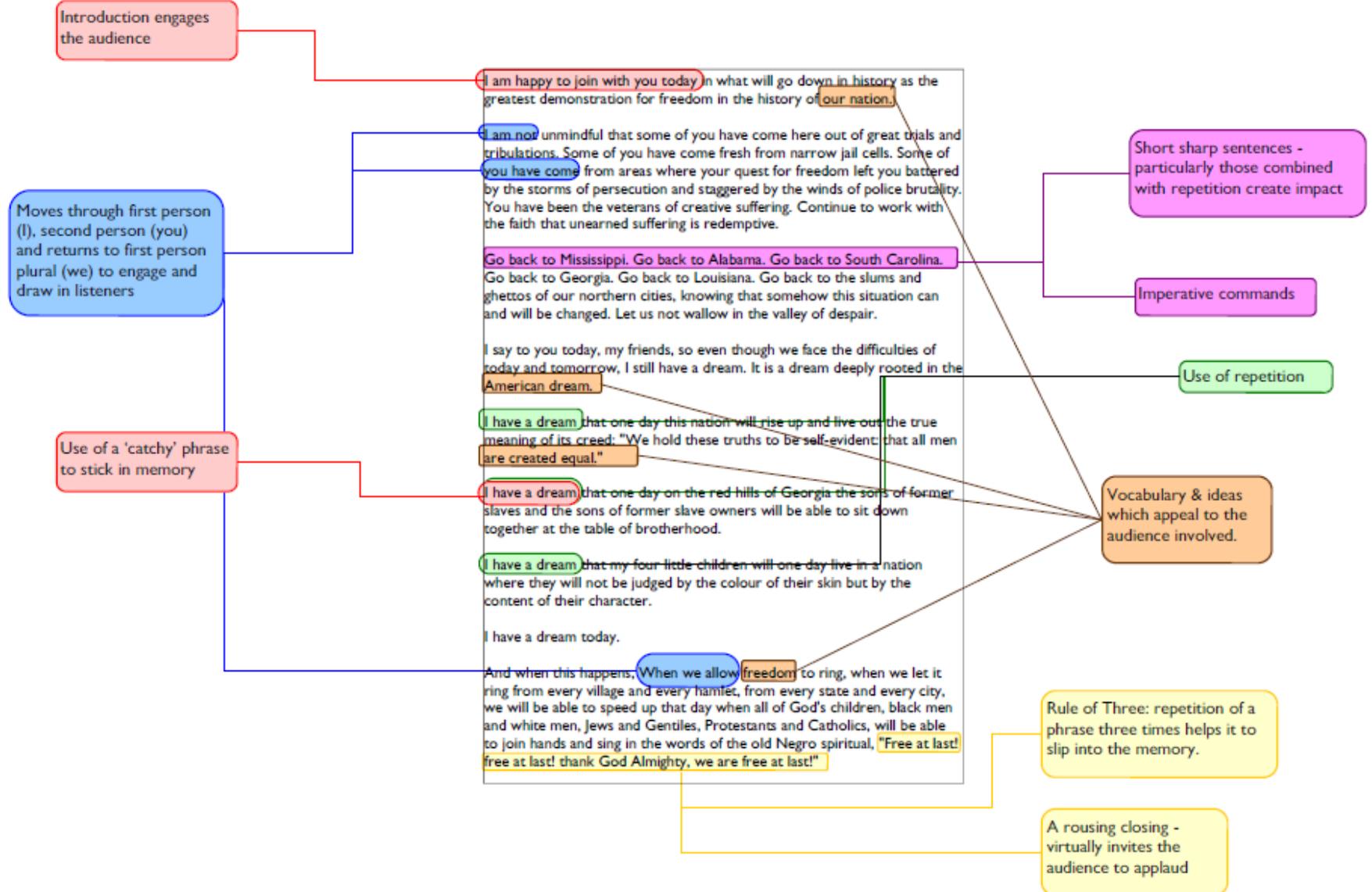
Give one reason why people might disagree with you, but ensure you then explain why this isn't correct.

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



ENGLISH READING
YEAR 9
TERMS 3 & 4
'WAR'

It's Our Flag



**Fight for it
Work for it**

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
		parody	comic imitation of another writer's work
elegy	about death of its subject	sonnet	14 line poem usually about love of person, object or situation
free verse	non-rhyming, non-rhythmical, following rhymes of natural speech		

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.

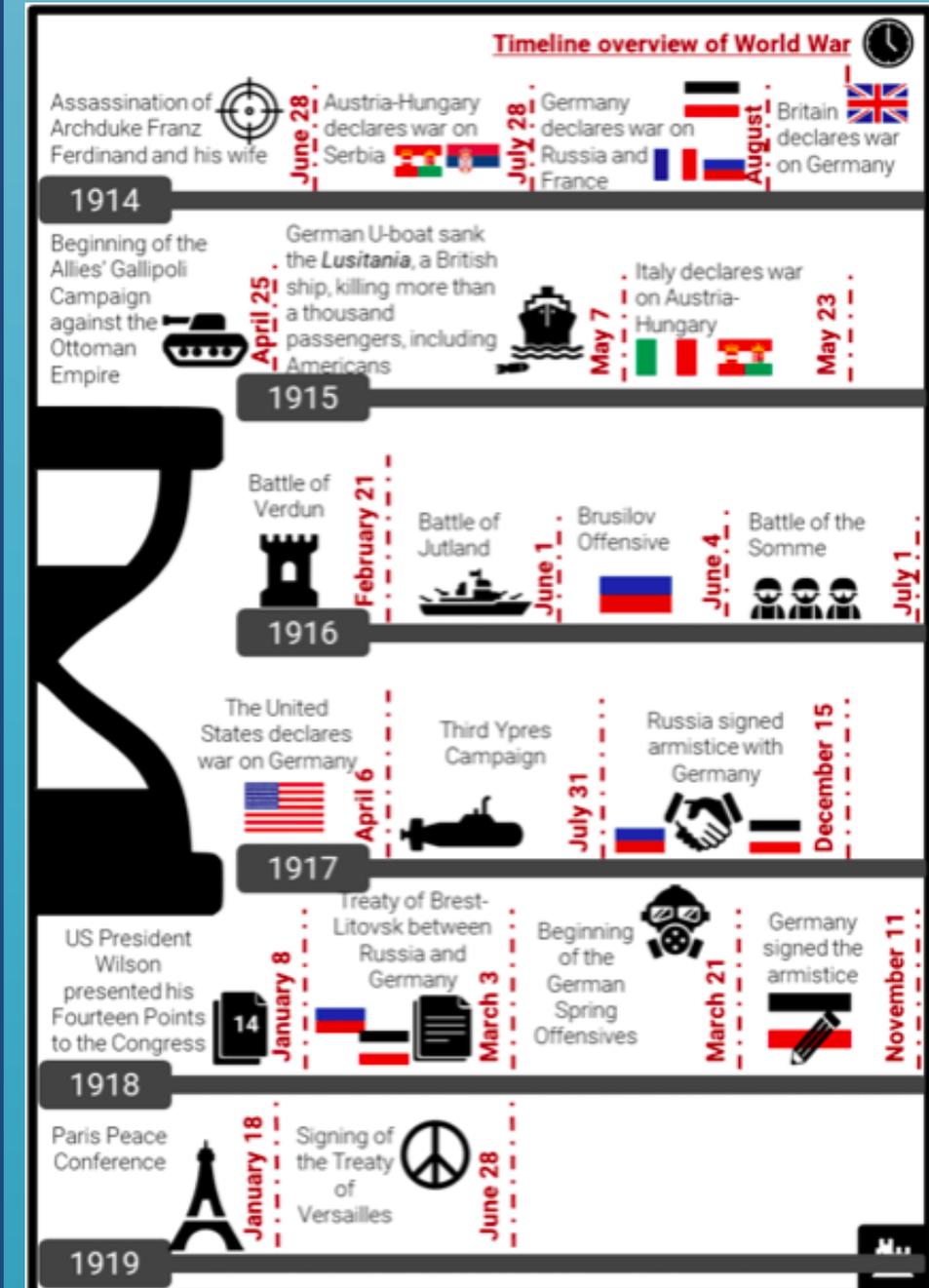
Also referred to as the Great War or the War of Nations, WWI was triggered by a local war between Serbia and Austria-Hungary; a Serbian individual assassinated the Archduke Ferdinand of Austria-Hungary. Austria declared war on Serbia after the assassination, with Germany declaring war on Russia and France 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	Offensive 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 <u>is</u> presented <u>as</u> 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 (<u>c</u>ut, <u>d</u>ark, <u>b</u>ap 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: fu <u>ss</u> , fi <u>sh</u> bo <u>x</u> , <u>ch</u> ip, bu <u>zz</u> 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.

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.

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.

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.



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
-1	-3
0	1
2	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 terminology.

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 Expressions - Foundation

Notation and collecting like terms

We group letters together

$a+a+a$ means 3 lots of a $3 \times a$
 $b+b$ means 2 lots of b $2 \times b$

We use indices/powers

$a \times a = a^2$ (a squared)
 $b \times b \times b = b^3$ (b cubed)

We do not use multiplication signs

$3 \times a = 3a$ $a \times b = ab$
 $5 \times b = 5b$ $a \times b \times c = abc$

We write division using fraction notation

$a+2$ is written as $\frac{a+2}{1}$ or $\frac{1}{1}a$
 $b+3$ is written as $\frac{b+3}{1}$ or $\frac{1}{1}b$

$4 \times x$ is $4x$ (no multiply sign)
 $b \times a$ is ab (no multiply sign, alphabetical order)
 $a \times a$ is a^2 (not aa)
 $a \div b$ is $\frac{a}{b}$
 $2a - 4b - a - 3b + 7$
simplifies (collect like terms)
 $to a - 7b + 7$

Sparx : M813

Substitution

To **replace** or 'substitute' the variable with a number and complete the sum.

For example, If $y = 3$ then

$$y + 2 = 3 + 2 = 5$$

$$2y = 2 \times 3 = 6$$

$$y^2 = 3^2 = 3 \times 3 = 9$$

$$\frac{12}{y} = 12 \div 3 = 4$$

Sparx : M208, M979

To change degrees Celsius ($^{\circ}\text{C}$) to degrees

Fahrenheit ($^{\circ}\text{F}$) is $F = \frac{9\text{C}}{5} + 32$

If temperature is 21°C then we can convert to $^{\circ}\text{F}$ by substituting $\text{C} = 21$ into the formula

$$F = \frac{9 \times 21}{5} + 32$$

$$F = 69.8^{\circ}\text{F}$$

Indices (are powers and roots)



$$a^m \times a^n = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{m \times n}$$

$$3^6 \times 3^4 = 3^{6+4} = 3^{10}$$

$$\frac{3^6}{3^4} = 3^6 \div 3^4 = 3^{6-4} = 3^2$$

$$(3^6)^4 = 3^{6 \times 4} = 3^{24}$$

Sparx: M135, M608, M150

Expanding (multiplying ALL the terms by a common factors)

Factorising (finding common factors and expressing with brackets)

Here is $x+2$:

$$x \quad \begin{matrix} 1 & 1 \\ 1 & 1 \end{matrix}$$

$3(x+2)$ means 3 lots of $x+2$ and would look like this:

$$\begin{matrix} x & 1 & 1 \\ x & 1 & 1 \\ x & 1 & 1 \end{matrix}$$

Altogether this is $3x+6$. Algebraically, we would write: $3(x+2) = 3x+6$.

We have multiplied each term inside the bracket by 3.

$$4(x+3) = 4x+12 \quad \begin{matrix} 4 \times x = 4x \\ 4 \times 3 = 12 \end{matrix}$$

$$5(2x+4) = 10x+20 \quad \begin{matrix} 5 \times 2x = 10x \\ 5 \times 4 = 20 \end{matrix}$$

Watch out!

Be really careful with negatives!

$$3(x-3) = 3x-9$$

$$-3(x-4) = -3x+12$$

Remember: $- \times - = +$

$$5(x+3) + 6(x-4)$$

$$5x + 15 + 6x - 24$$

$$11x - 9$$

Sparx
Expand: M237, M792
Factorise: M100

Expression, identify, formula, equation

An Expression

$$4a + 7b$$

An Equation

$$4a + 12 = 60$$

A Formula

$$A = \pi r^2$$

An Identity

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

Expressions for perimeter:

$a+b+a+b$ or $2a+2b$ or $2(a+b)$

Identify (always true): $2a+2b \equiv 2(a+b)$

Formula: $P = 2(a+b)$

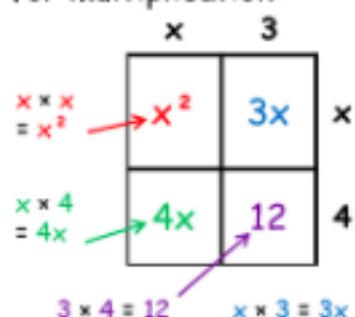
Equation: $2a + 10 = 40$ (so $a = 15$)

Expand and simplify double brackets

Sparx : M160

The grid method

Set this out exactly like the grid method for multiplication:



Add up: $x^2 + 3x + 4x + 12$

Simplify: $x^2 + 7x + 12$

FOIL

This reminds you to multiply all of the terms.

$$(x+3)(x+4)$$

First: $x \times x = x^2$

Outside: $x \times 4 = 4x$

Inside: $3 \times x = 3x$

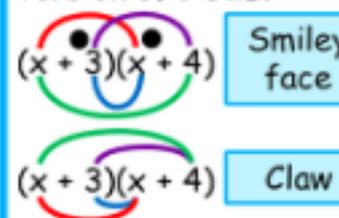
Last: $3 \times 4 = 12$

Add up: $x^2 + 3x + 4x + 12$

Simplify: $x^2 + 7x + 12$

Smiley face (or claw)

This is a more visual version of FOIL.



First: $x \times x = x^2$

Outside: $x \times 4 = 4x$

Inside: $3 \times x = 3x$

Last: $3 \times 4 = 12$

Add up: $x^2 + 3x + 4x + 12$

Simplify: $x^2 + 7x + 12$

This results in a quadratic expression

Factorise a quadratic expression

$$y^2 + 7y + 12$$

Find two numbers that multiply to give 12

and add to give 7 (must be 3 and 4)

Answer $(y+3)(y+4)$

Sparx : M100, M908, U365

$$a^2 - 9a + 14 = (a-7)(a-2)$$

because $-7 \times -2 = 14$

Factorise a quadratic expression using difference of two squares (DOTS)

$(b^2 - 16)$ is in the DOTS format as b^2 and 16 are both square numbers separated by a - (subtract/difference)

We can therefore immediately factorise $(b^2 - 16) = (b+4)(b-4)$

Keep an eye out for this format!

$$(25c^2 - 100) = (5c+10)(5c-10)$$

Follow the same structure and principles as numerical fractions..

$$\frac{3}{y-2} - \frac{4}{y+1}$$

multiply the left side by $y + 1$

multiply the left side by $y - 2$

$$\frac{3(y+1)-4(y-2)}{(y-2)(y-1)}$$

exp and

$$\frac{3y+3-4y+8}{y^2-y-2y+2}$$

simplify

$$\frac{11-y}{y^2-3y+2}$$

$$\frac{x}{x+2} \div \frac{x}{2}$$

multiply by reciprocal

$$\frac{x}{x+2} \times \frac{2}{x}$$

cross cancel the x

$$\frac{1}{x+2} \times \frac{2}{1}$$

$$\frac{2}{x+2}$$

All of the Foundation content PLUS

Factorise quadratic where coefficient of x^2 is not 1

Sparx: U365, U176, U963, U853

Multiply the coefficient of x^2 by the constant term

Factorise $3x^2 + 25x - 18$

step 1: $3 \times -18 = -54$

step 2: find two numbers with product of -54 and sum of $+25$

Numbers must be -2 and 27

25x has been 'split' into $27x - 2x$

step 3: split the equation $3x^2 + 27x - 2x - 18$

step 4: factorise $3x(x + 9) - 2(x + 9)$

step 5: factorise again to give answer $(3x - 2)(x + 9)$

Simple algebraic proof

An even number is represented as $2n$

An odd number is represented as $2n+1$

Prove the difference of any two odd numbers is even:

$2n + 1$ is the first odd number

$2m + 1$ is the second odd number

The difference between them is :

$$(2n + 1) - (2m + 1) = 2n + 1 - 2m - 1$$

$$= 2n - 2m$$

Factorise

$$= 2(n - m)$$

Since this is always a multiple of 2 this must be an even number

Note how this becomes -1

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,

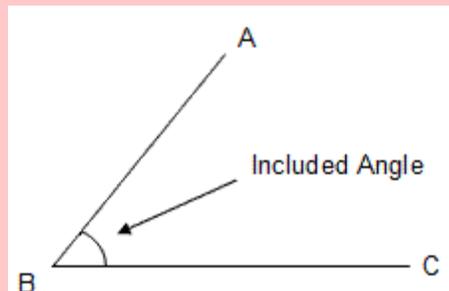
How are sides and angles labelled?

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 $\angle ABC$ 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 $\triangle ABC$.

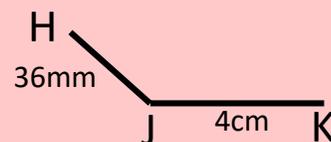
You might be asked to draw a diagram from a written description.

Eg.

Angle HJK is obtuse JK is 4cm and HJ is 36mm. Draw and label $\angle HJK$

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

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



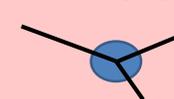
Reflex

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



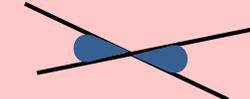
Sum to 360°



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

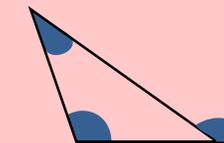
The exterior angle of a triangle is the sum of the two opposite interior angles



All 60°



Base angles equal

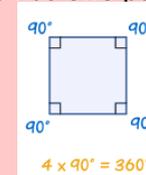


Sum of opposite interior = Exterior angle

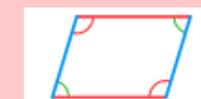
Angles in a quadrilateral sum to 360°

Opposite angles in a Parallelogram are equal

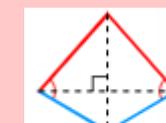
A kite has one pair of equal angles



$4 \times 90^\circ = 360^\circ$



Parallelogram



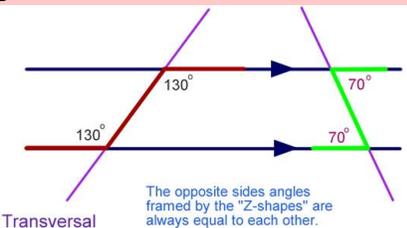
Kite

Angles in Parallel lines

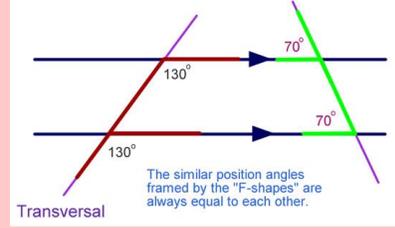
Parallel lines never get closer or further apart and therefore never intersect. A line that intersects a pair of parallel lines is called a **Transversal**



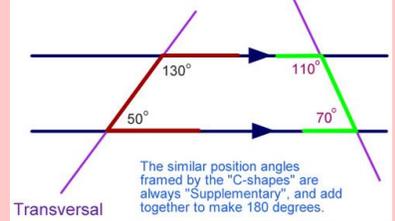
Alternate angles are equal, they form a 'Z' shape. When you think of 'alternate' you might think backwards and forwards, similar to how a 'Z' goes backwards and forwards. Alternate angles are on either side of the transversal.



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



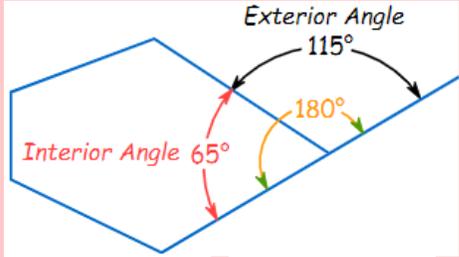
Co-interior angles sum to 180 degrees, they form a 'C' shape.



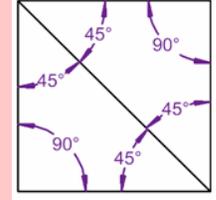
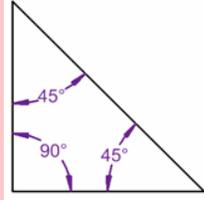
Sum of Interior angles in Polygons

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 degrees' and 'angles in a quadrilateral sum to 360 degrees'.



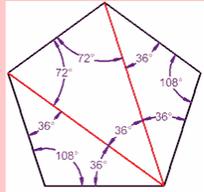
Spot the pattern.....



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

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

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



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

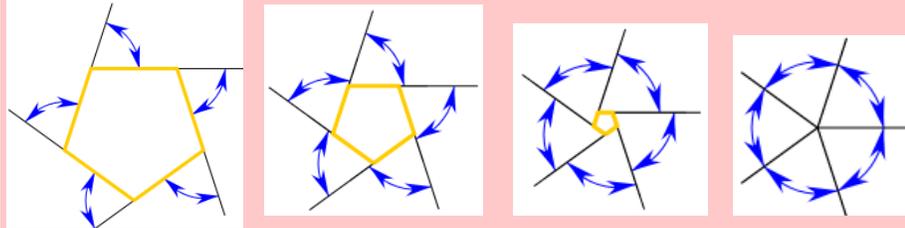
Therefore: (n = N degrees of sides)

Sparx: M653

Sum of Interior Angles = (n-2) x 180 degrees
Each Angle (of a Regular Polygon) = (n-2) x 180 degrees / 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 degrees.

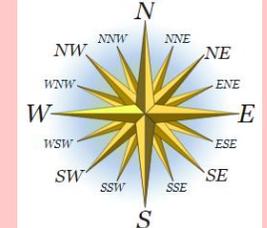


If we bring all the exterior angles on a polygon together we can see they meet at a point. We already know that angles at a point sum to 360 degrees. Therefore the general rule is:

The Exterior Angles of a Polygon add up to 360 degrees

Three Figure Bearings

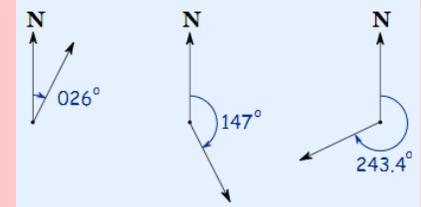
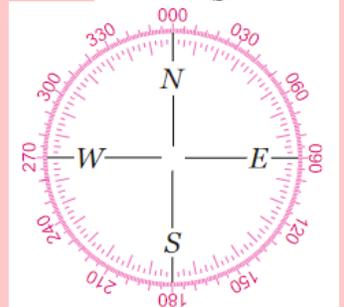
Bearings tell us direction. You are familiar with compass bearings - North, East, South and West.



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 degrees, East is 090 degrees, South is 180 degrees and West is 270 degrees
- Bearings are always measured from North (000 degrees)
- Bearings are always measured Clockwise

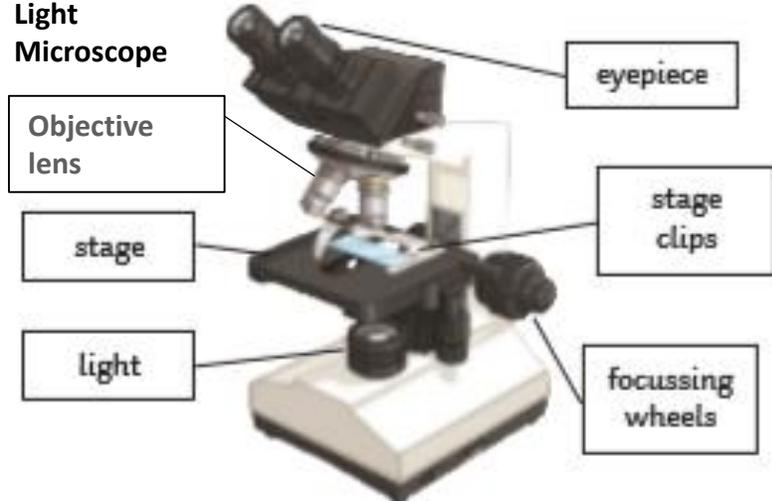


Sparx: M260, M416

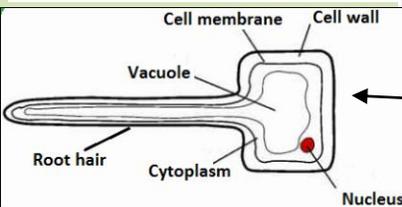
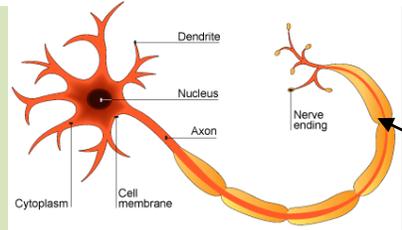
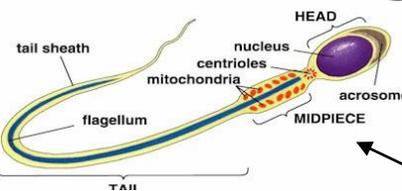
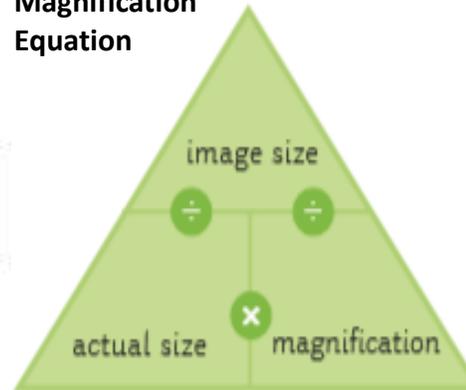
KS4 Biology: B1

Cell structure and transport

Light Microscope



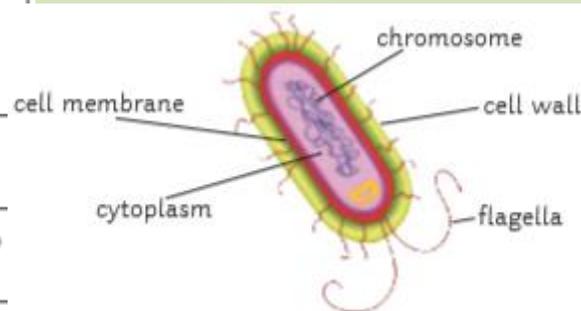
Magnification Equation



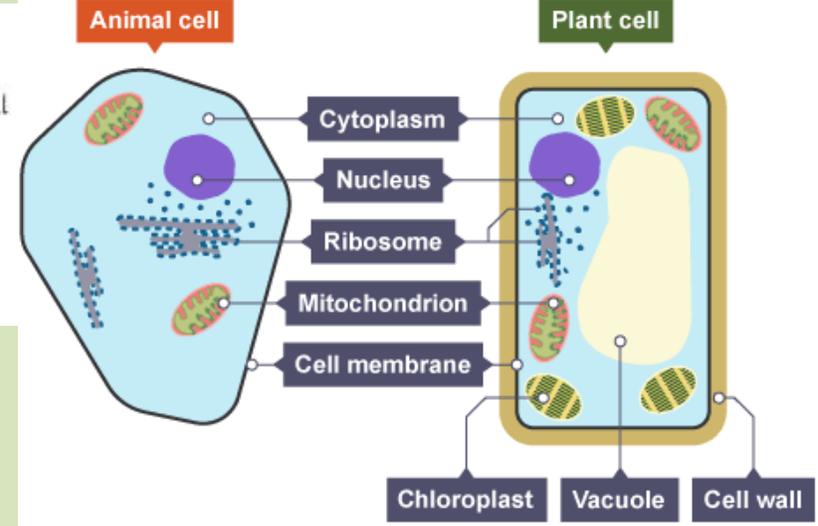
Specialised Cell	Function	Adaptation
sperm	To get the male DNA to the female DNA.	Streamlined head, long tail, lots of mitochondria to provide energy.
nerve	To send electrical impulses around the body.	Long to cover more distance. Has branched connections to connect in a network.
muscle	To contract quickly.	Long and contain lots of mitochondria for energy.
root hair	To absorb water from the soil.	A large surface area to absorb more water.
phloem	Transports substances around the plant.	Pores to allow cell sap to flow. Cells are long and joined end-to-end.
xylem	Transports water through the plant.	Hollow in the centre. Tubes are joined end-to-end.

Electron microscopes magnify up to x2 000 000 and have a resolving power up to 0.2nm

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



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



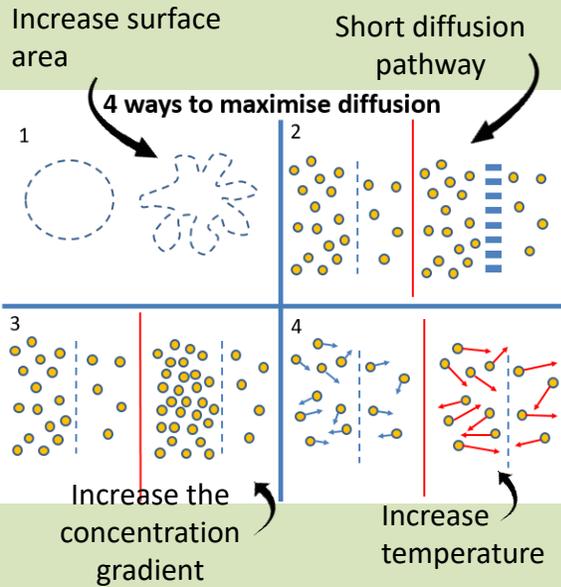
KS4 Biology: B1

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 through a partially permeable membrane
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 .
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

Exchange systems

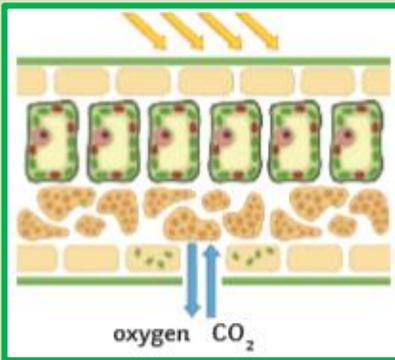
All organisms from bacteria to plants to fish, need to exchange substances in order to carry out life processes



Villi, gills, and alveolus all have:

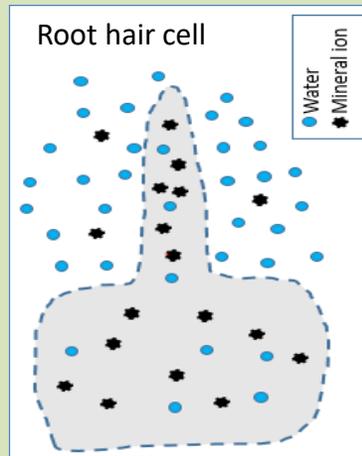
A **large number of capillaries** ensuring a good blood supply. **Very thin walls** (often only one cell thick) to **shorten the diffusion pathway**.

A **distinctive shape** (Villi: finger like, Alveoli: many spheres, Gills: thin filaments) that gives a **very high surface area** resulting in more areas for substances to diffuse across. Roots and leaves have this too.



Exchange in plants

Oxygen and carbon dioxide diffuse into leaf through stomata

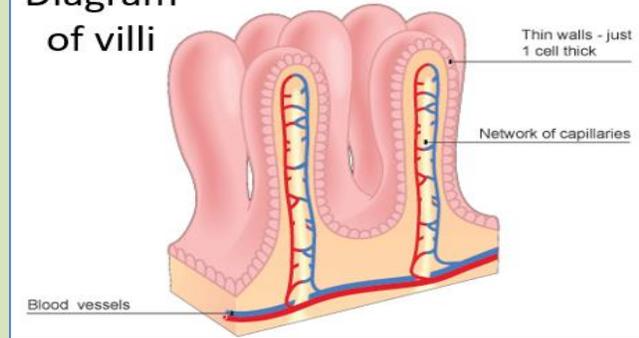


Water moves into a root hair cell by **osmosis** as a higher concentration of water outside than inside the cell. **Mineral ions** are moved by **Active transport** into the cell from a low concentration to high concentration against the concentration gradient. This requires energy from respiration and proteins to move the substance into the cell

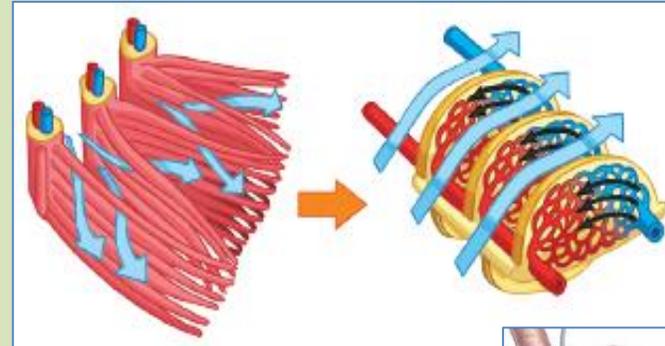
Examples of exchange organs

Glucose in the Small intestine / villi

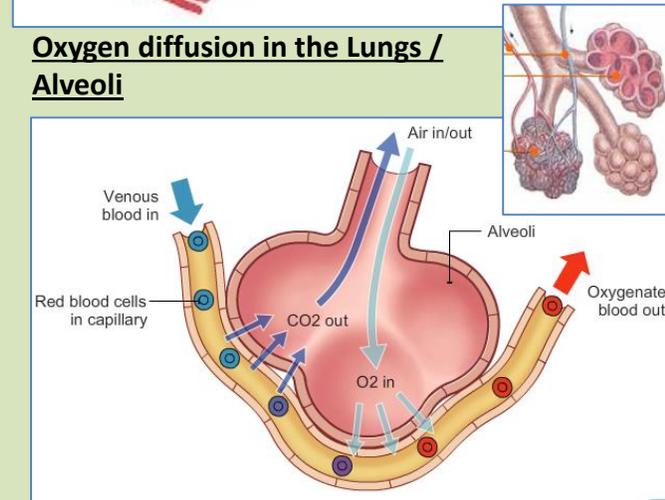
Diagram of villi



Oxygen diffusion in Gills



Oxygen diffusion in the Lungs / Alveoli



Active transport <https://www.youtube.com/watch?v=eDeCgTRFCbA>

Osmosis and diffusion <https://www.youtube.com/watch?v=PRi6uHDKew4>

Glucose in the Small intestine / villi https://www.youtube.com/watch?v=Onoq1Ok7_KM

KS4 Chemistry: C2 The Periodic table

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.

- 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.

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



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

1	2										3	4	5	6	7	0	
																	He
Li	Be										H	B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															

■ Metals ■ Non-metals

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

- 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. You may also see **all** the groups numbered (including the transition metals), this time from 1 to 18. 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



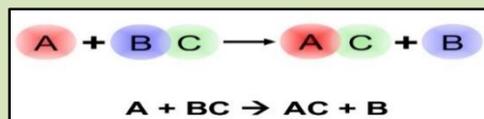
- Shiny
- Good conductors of heat and electricity
- Malleable they can be bent/shaped
- Generally high melting and boiling point
- Loose electrons to form positive ions

The reactivity series of metals

potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt

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

Further reading

<https://www.bbc.co.uk/bitesize/guides/zg923k7/revision/1>
<https://www.bbc.co.uk/bitesize/guides/zqwtcj6/revision/1>

How the halogens react with hydrogen

$F_2(g) + H_2(g) \rightarrow 2HF(g)$	Explosive, even at $-200^\circ C$ 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 $300^\circ C$ in the presence of a platinum catalyst.
$I_2(g) + H_2(g) \rightarrow 2HI(g)$	Only at over $300^\circ C$ in the presence of a platinum catalyst (very slow, reversible).

Halogens

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

Development of the periodic table

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

ELEMENTS	
Hydrogen	1
Carbon	5
Oxygen	7
Phosphorus	9
Sulphur	13
Magnesium	24
Lime	28
Soda	28
Potash	31
Strontian	38
Barytes	39
Iron	56
Zinc	58
Copper	58
Lead	60
Silver	60
Gold	60
Platina	60
Mercury	60

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 element's 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 they discovered more about the structure of the atom. Elements were placed in order of the number of protons (atomic number)

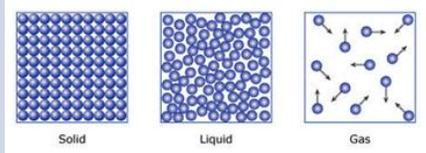
Alkali metals

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 lose the single electron in the outer shell to form an ion with a 1^+ charge

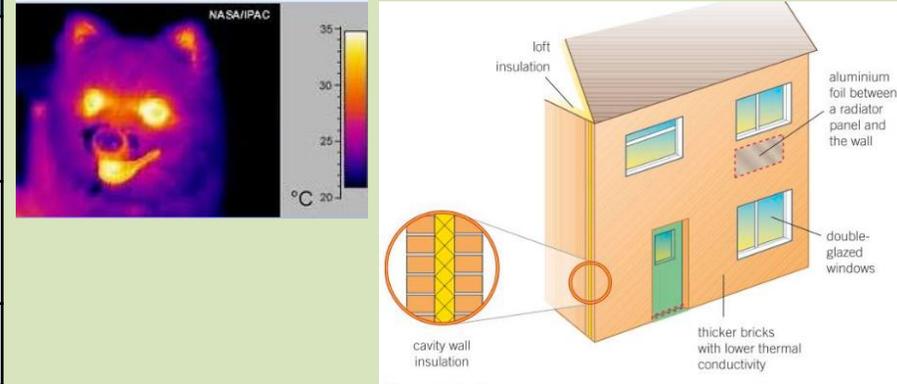
sodium + water \longrightarrow sodium hydroxide + hydrogen



KS4 Physics: P2 Energy transfer by heating

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 <i>The thicker a material is the better the insulator.</i> The thermal conductivity of a material. <i>Metals are better than non-metals.</i> The temperature difference across a material. <i>A greater difference in temperature means more energy is transferred.</i>
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. <i>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.</i>

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.



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.

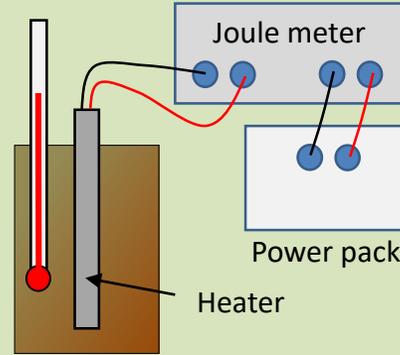
Energy = mass x specific heat capacity x change in temperature

$$E = m \times c \times \Delta\theta$$

$$(J) = (kg) \times (J/kg^{\circ}C) \times (^{\circ}C)$$

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.

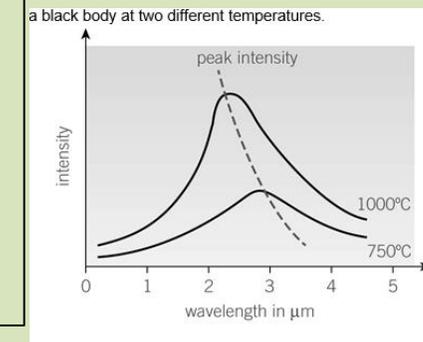
IR radiation travels at the speed of light, is an electromagnetic wave and can pass through a vacuum.

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 object's 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 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 is black is a better emitter of IR radiation than white.



Computer Science– Boolean Logic - Term 3

What is Boolean logic?

Programs use simple comparisons to help make decisions. Boolean logic is a form of algebra where all values are either True or False.

These values of true and false are used to test the conditions that selection and iteration are based around.

Boolean logic uses algebra and algebraic expressions. We use these expressions in algorithms and programs.

Most programming languages use these equivalent Boolean expressions. However, some, such as Python, have slightly different equivalents.

You can see the difference in the table to the right →

Expression	Boolean equivalent
Equals	=
Greater than	>
Less than	<
Greater than or equal to	>=
Less than or equal to	<=
Does not equal	<>
And	AND
Or	OR
Not	NOT

Expression	Boolean equivalent	In Python
Equal to	=	==
Does not equal	<>	!=
And	AND	and
Or	OR	or
Not	NOT	not

What is a Logic Gate?

A circuit board can be found inside most digital devices. It is a flat, thin board that has tiny electrical components built onto it. These components make up an electric circuit and include:

- Resistors
- Capacitors
- Diodes
- Transistors
- Integrated circuits

What is a Logic Gate? - Continued

Many electronic circuits have to make decisions. They look at one or more inputs and use these to determine the outputs from the circuit. The process of doing this uses electronic logic, which is based on digital switches called gates. Each input and output of the logic gates must be one of two states:

- True or 1 or on
- False or 0 or off

A single digital signal has only two states - on or off. However, if you use two inputs you can double the number of possible states, to four.

Number of states	Input A	Input B
1	0	0
2	0	1
3	1	0
4	1	1

Computer Science – Logic Gates- Term 3

Types of Logic gates

Logic gates use Boolean operators. The most common Boolean operators are **AND**, **OR** and **NOT**. Each operator has a standard symbol that can be used when drawing logic gate circuits.

AND Gate

An AND gate usually has two inputs. **AND** tells us that **both Input A AND Input B have to be 1 (or ON) in order for the output to be 1. Otherwise the output is 0.**

The Boolean expression can be written as $Q = A \text{ AND } B$.

The truth table would look like this:

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

Logic gate diagrams would look like this:



OR Gate

An OR gate has two inputs. **OR** tells us that **EITHER Input A OR Input B has to be 1 (or ON) in order for the output to be 1. Otherwise the output is 0.**

The Boolean expression can be written as $Q = A \text{ OR } B$.

The truth table would look like this:

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

Logic gate diagrams would look like this:



NOT Gate

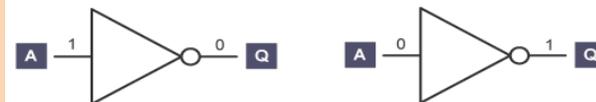
A NOT gate has just one input. **NOT** tells us that **Input A has to be 0 (or OFF) in order for the output to be 1. Otherwise the output is 0.** A NOT gate is sometimes called an inverter.

The Boolean expression is written as $Q = \text{NOT } A$.

The truth table would look like this:

Input A	Input Q
1	0
0	1

Logic gate diagrams would look like this:



What is a CPU?

CPU stands for **Central Processing Unit** and is commonly referred to as the brain of the PC.

The purpose of the CPU is to process data. The CPU is where processes such as calculating, sorting and searching take place. Whatever is done on our computers, such as checking emails, playing games and doing homework, the CPU has processed the data we use.

The CPU is made up of three main components, **the control unit**, **the immediate access store** and the **arithmetic and logic unit**.

The **control unit** controls the flow of data within the system. The **control unit** controls and monitors communications between the hardware attached to the computer. It controls the input and output of data, checks that signals have been delivered successfully, and makes sure that data goes to the correct place at the correct time.

The **immediate access store** is where the CPU holds all the data and programs that it is currently using. You can think of it like the numbers typed into a calculator – they are being stored inside the calculator while it processes the calculations. The immediate access store is often referred to as the registers in the CPU.

The **arithmetic and logic unit (ALU)** is where the CPU performs the arithmetic and logic operations. Every task that your computer carries out is completed here. Even typing into a word processor involves adding binary digits to the file, and then calculating which pixels on the screen should change so that you can see the characters.

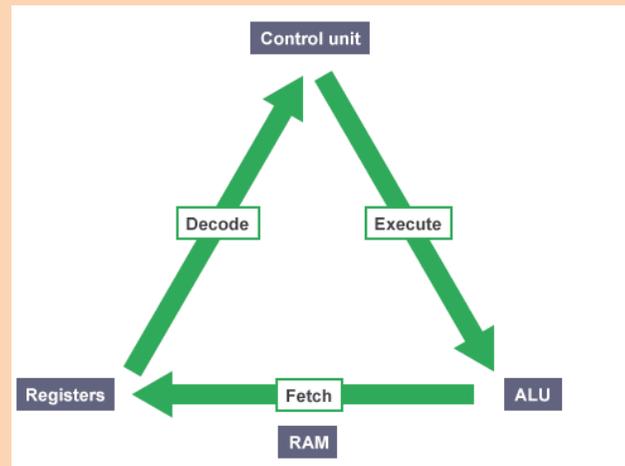
What is the Fetch – Decode - Execute

The main job of the **CPU** is to **execute** programs using the **fetch-decode-execute** cycle (also known as **the instruction cycle**). This cycle begins as soon as you turn on a computer.

To execute a program, the program code is copied from secondary storage into the main memory. The CPU's **program counter** is set to the memory location where the first instruction in the program has been stored, and execution begins. The program is now running.

In a program, each machine code instruction takes up a slot in the main memory. These slots (or memory locations) each have a unique memory address. The program counter stores the address of each instruction and tells the CPU in what order they should be carried out.

When a program is being executed, the CPU performs the fetch-decode-execute cycle, which repeats over and over again until reaching the STOP instruction.



Summary of the fetch-decode-execute cycle

1. The processor checks the program counter to see which instruction to run next.
2. The program counter gives an address value in the memory of where the next instruction is.
3. The processor fetches the instruction value from this memory location.
4. Once the instruction has been fetched, it needs to be decoded and executed. For example, this could involve taking one value, putting it into the ALU, then taking a different value from a register and adding the two together.
5. Once this is complete, the processor goes back to the program counter to find the next instruction.
6. This cycle is repeated until the program ends.

Computer Science – Data Representation – Term 2

How Computers see the world!

There are a number of very common needs for a computer, including the need to store and view data.

Computers use electrical signals that are on or off, so they have to see everything as a series of binary numbers. This data is represented as a sequence of **1s and 0s** (on and off). All data that we want a computer to process needs to be converted into this binary format.

What are Switches?

First, computers were built using electromechanical relays, then vacuum tube valves, Then the semi-conductor transistor (around late 1950's) And now we can put billions of transistors together in a little postage stamp sized silicon chip. These switches...transistors...are 14nm large (14 millionth of a meter)

In fact, transistors are so small that they physically cannot get any smaller which is why microprocessor manufactures had to start adding more cores (CPU's) to their new chips in order get more speed.



Microscopic image of a transistor.

What is binary?

Binary is a number system that only uses two digits: 1 and 0. All information that is processed by a computer is in the form of a sequence of 1s and 0s. Therefore, all data that we want a computer to process needs to be converted into binary.

The binary system is known as a 'base 2' system. This is because:

- There are only two digits to select from (1 and 0)
- When using the binary system, data is converted using the power of two.

How is Binary represented?

So a computer is, amongst other things, a machine capable of calculations. OK how do we create this?

First, we need to be able to store numbers bigger than 1! Mathematicians took the switch and put them together to form...x8 switches! They called them "a byte" (BTW x4 switches are called a "nibble" – not joking).

Starting from the right, each switch was given a value, that doubled. Like this:



Bits and bytes

Bits can be grouped together to make them easier to work with. A group of 8 bits is called a **byte**.

Other groupings include:

- **Nibble** - 4 bits (half a byte)
- **Byte** - 8 bits
- **Kilobyte (KB)** - 1000 bytes
- **Megabyte (MB)** - 1000 kilobytes
- **Gigabyte (GB)** - 1000 megabytes
- **Terabyte (TB)** - 1000 gigabytes

Most computers can process millions of bits every second. A hard drive's storage capacity is measured in gigabytes or terabytes. RAM is often measured in megabytes or gigabytes.

Data	Storage
One extended-ASCII character in a text file (e.g. 'A')	1 byte
The word 'Monday' in a document	6 bytes
A plain-text email	2 KB
64 pixel x 64 pixel GIF	12 KB
Hi-res 2000 x 2000 pixel RAW photo	11.4 MB
Three minute MP3 audio file	3 MB
One minute uncompressed WAV audio file	15 MB
One hour film compressed as MPEG4	4 GB

Computer Science – Data Representation – Term 2

Converting Binary into Denary

People use the Denary (or Decimal) number system in their day-to-day lives. This system has 10 digits that we can use: **0, 1, 2, 3, 4, 5, 6, 7, 8 and 9**.

This is how we understand and count. For us to understand what PC's are trying to do we need to learn to convert Binary into Denary.

Converting Binary into Decimal

The value of each binary place value is calculated by multiplying the previous place value by two. The first eight binary place values are:

128	64	32	16
	8	4	2
	1		

In binary, each place value can only be represented by 1 or a 0.

To convert binary to denary, simply take each place value that has a 1, and add them together.

For example, the binary number 00001011 in binary place values is:

128	64	32	16
	8	4	2
	1		
0	0	0	0
	1	0	1
	1		



Scan this with your phone to take you to the Thinct.com page on [Data Representation](#)

128	64	32	16	8	4	2	1
0	0	0	0	1	0	1	1
				$8 + 2 + 1 = 11$			
128	64	32	16	8	4	2	1
0	0	0	1	0	1	0	1
				$16 + 4 + 1 = 21$			
128	64	32	16	8	4	2	1
0	1	1	0	0	1	0	0
				$64 + 32 + 4 = 100$			

Hexadecimal

Hexadecimal (or **hex**) is a base 16 system used to simplify how binary is represented. A **hex** digit can be any of the following 16 digits: **0 1 2 3 4 5 6 7 8 9 A B C D E F**.

Each **hex** digit reflects a 4-bit binary sequence.

This table shows each **hex** digit with the equivalent values in binary and denary:

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

Example:

- **11010100** in binary would be **D4** in hex
- **FFFF3** in hex would be **11111111111111110011** in binary

Computer Science – Data Representation – Term 2

How do Computers represent characters?

When any key on a keyboard is pressed, it needs to be converted into a binary number so that it can be processed by the computer and the typed character can appear on the screen.

A code where each number represents a character can be used to convert text into binary. One code we can use for this is called **ASCII**. The **ASCII** code takes each character on the keyboard and assigns it a binary number. For example:

- The letter 'a' has the binary number 0110 0001 (this is the denary number 97)
- The letter 'b' has the binary number 0110 0010 (this is the denary number 98)
- The letter 'c' has the binary number 0110 0011 (this is the denary number 99)

Text characters start at denary number 0 in the **ASCII** code, but this covers special characters including punctuation, the return key and control characters as well as the number keys, capital letters and lower case letters.

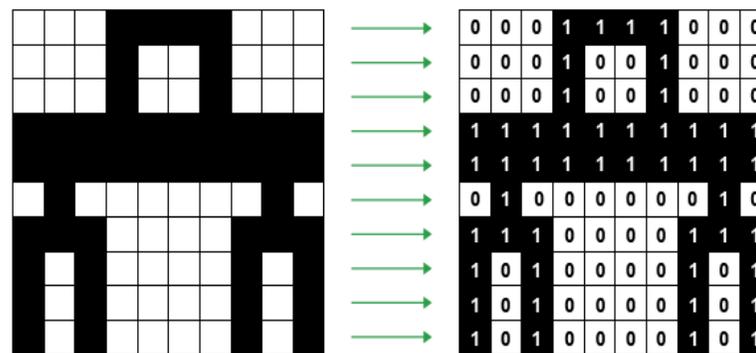
ASCII code can only store 128 characters, which is enough for most words in English but not enough for other languages. If you want to use accents in European languages or larger alphabets such as Cyrillic (the Russian alphabet) and Chinese Mandarin then more characters are needed. Therefore another code, called **Unicode**, was created. This meant that computers could be used by people using different languages.

How do Computers represent Images?

Images also need to be converted into binary in order for a computer to process them so that they can be seen on our screen. Digital images are made up of **pixels**. Each **pixel** in an image is made up of binary numbers.

If we say that 1 is black (or on) and 0 is white (or off), then a simple black and white picture can be created using binary.

To create the picture, a grid can be set out and the squares coloured (1 – black and 0 – white). But before the grid can be created, the size of the grid needs to be known. This data is called metadata and computers need metadata to know the size of an image. If the metadata for the image to be created is 10x10, this means the picture will be 10 **pixels** across and 10 **pixels** down.



How do Computers represent Sound?

Sound needs to be converted into binary for computers to be able to process it. To do this, sound is captured - usually by a microphone - and then converted into a digital signal.

An analogue to digital converter will sample a sound wave at regular time intervals. The samples can then be converted to binary. They will be recorded to the nearest whole number.

If the time samples are then plotted back onto the same graph, it can be seen that the sound wave now looks different. This is because sampling does not take into account what the sound wave is doing in between each time sample.

This means that the sound loses quality as data has been lost between the time samples. The way to increase the quality and store the sound at a quality closer to the original, is to have more time samples that are closer together. This way, more detail about the sound can be collected, so when it's converted to digital and back to analogue again it does not lose as much quality.

The frequency at which samples are taken is called the sample rate, and is measured in Hertz (Hz). 1 Hz is one sample per second. Most CD-quality audio is sampled at 44 100 or 48 000 KHz.



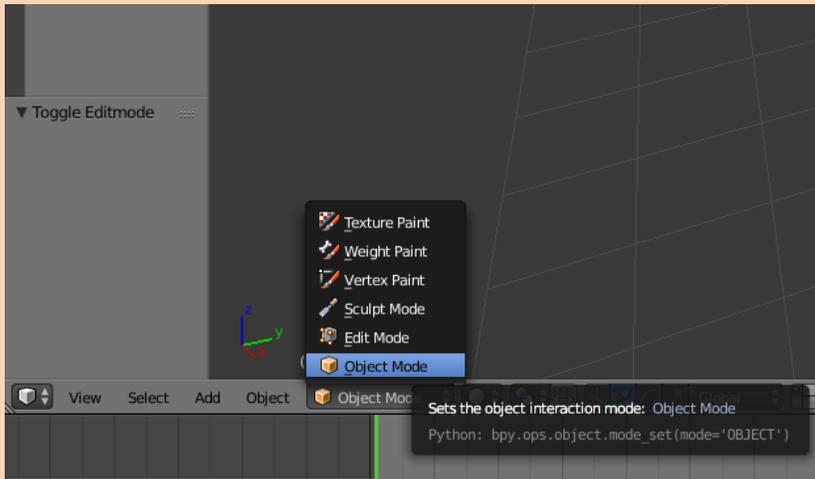
Scan this with your phone to take you to the Thinct.com page on [Data Representation](#)

Computer Science – Blender - Term 4

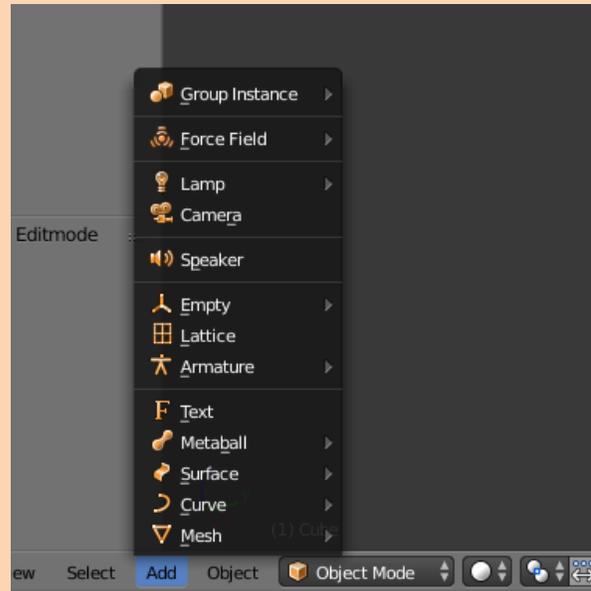


Below you will find a number of useful locations for certain modes or options you will be using during your lessons with blender.

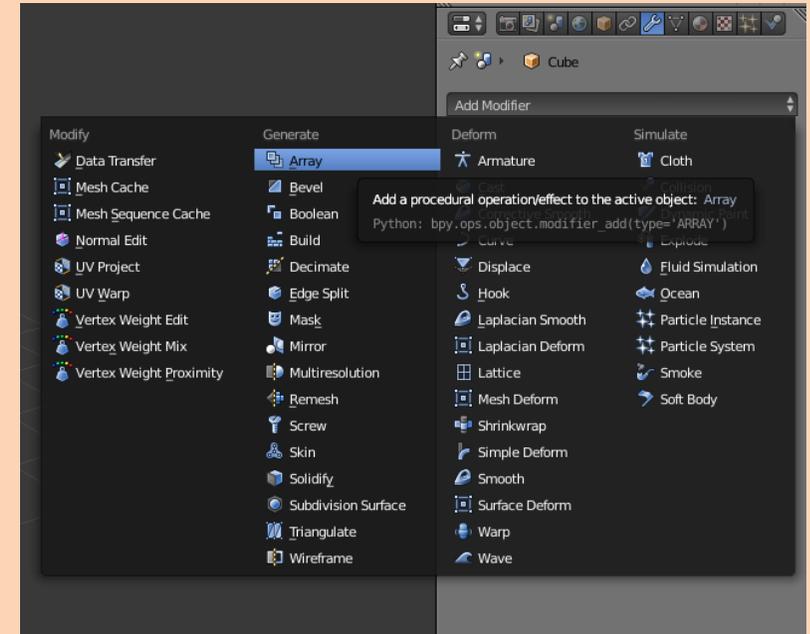
Mode selector



Add Object Menu



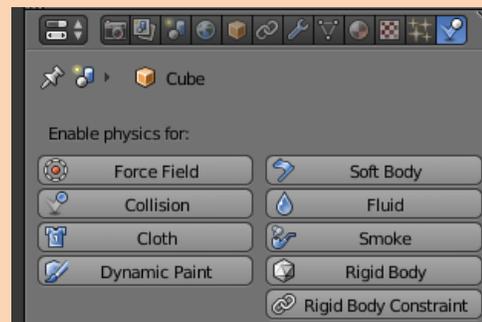
Object Modifier Menu



Scene Object Selection



Physics Object Tab



Animation Controls



THE ROADS TO WORLD WAR I



History – Terms 3 & 4. Causes and Events of the First World War



A good overview of causes of the war

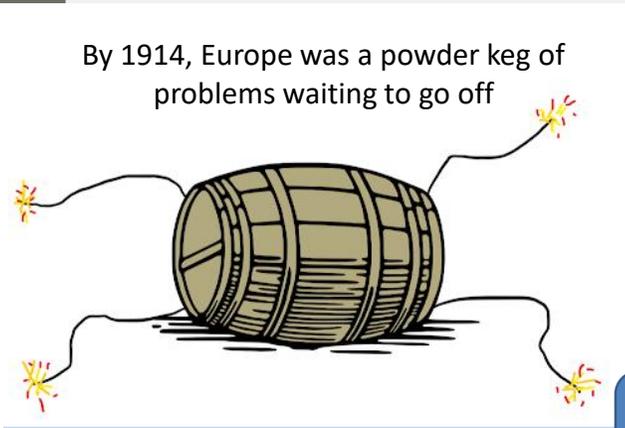
<https://youtu.be/KGImSTn-eM>



The **First World War**, also known as the **Great War**, began in 1914 after the assassination of Archduke Franz Ferdinand of Austria. His murder catapulted into a war across Europe that lasted until 1918. During the conflict, Germany, Austria-Hungary, Bulgaria and the Ottoman Empire (the Central Powers) fought against Great Britain, France, Russia, Italy, Romania, Japan and, from 1917, the United States (the Allied Powers). Thanks to new military technologies and the horrors of trench warfare, the First World War saw unprecedented levels of carnage and destruction. By the time the war was over and the Allied Powers claimed victory, more than 16 million people—soldiers and civilians alike—were dead.



- Use the word **MAIN** to remember the main issues surrounding the cause of the First World War:
- **Militarism** - many countries believed it was important to build large armies and navies.
 - **Alliances** - the Triple Alliance and the Triple Entente were said to have been formed to help prevent war.
 - **Imperialism** - European nations were creating empires and coming into conflict.
 - **Nationalism** - all countries were looking out for their own interests.



By 1914, Europe was a powder keg of problems waiting to go off



The assassination of Archduke Franz Ferdinand and his wife Princess Sofia on 28th June 1914 was a key spark of the war

Overview of key events of the First World War

28th June 1914 - Archduke Franz Ferdinand is assassinated in Bosnia
28th July - Austria-Hungary declares war on Serbia. Russia begins mobilizing its troops
1st August - Germany declares war on Russia
3rd August - Germany declares war on France as part of the Schlieffen Plan.
4th August - Germany invades Belgium. Britain declares war on Germany.
8th August 1914 Britain passes DORA (the Defence of the Realm Act) which gives the government powers such as to ration food, control the news and use factories.
September 1914 The French stop the German attack at Marne, leading to the start of Trench Warfare on the Western Front
April 1915 – Poison gas is used for the first time at the Second Battle of Ypres
June 1915 – The first ever ‘dog fight’ between German and British airplanes
February 1916 - The Battle of Verdun begins between France and Germany. This battle will last until December 1916 and will finally result in a French victory.
May 31 - The largest naval battle of the war, the Battle of Jutland, is fought between Britain and Germany in the North Sea.
July 1916 – Battle of the Somme, the largest battle of the war.
Sept 1916 – The ever first tank is used in the Battle of the Somme
January 1917 – Conscription introduced in Britain
31st July – 10th November 1917 – The Battle of Passchendaele.
20th November – 7th December 1917 – The Battle of Cambrai, first large scale use of tanks in battle.
February 1918 – Representation of the People Act, this gives the first time vote to men over 21 and women over 30
21st March – 18th July 1917 – German Spring Offensive, Germans make the largest territorial gains in the war since 1914.
11th November 1918 – An armistice is signed, Germany surrenders and WW1 ends
1919 – Government passes a law forcing women to leave their war time jobs as men return from the war and factories were not needed for wartime production

Key Vocabulary

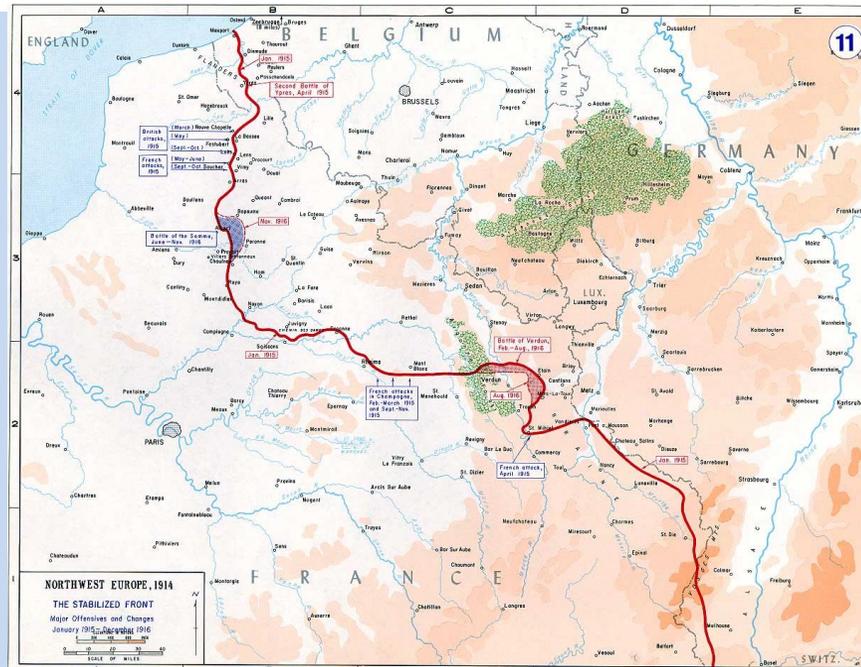
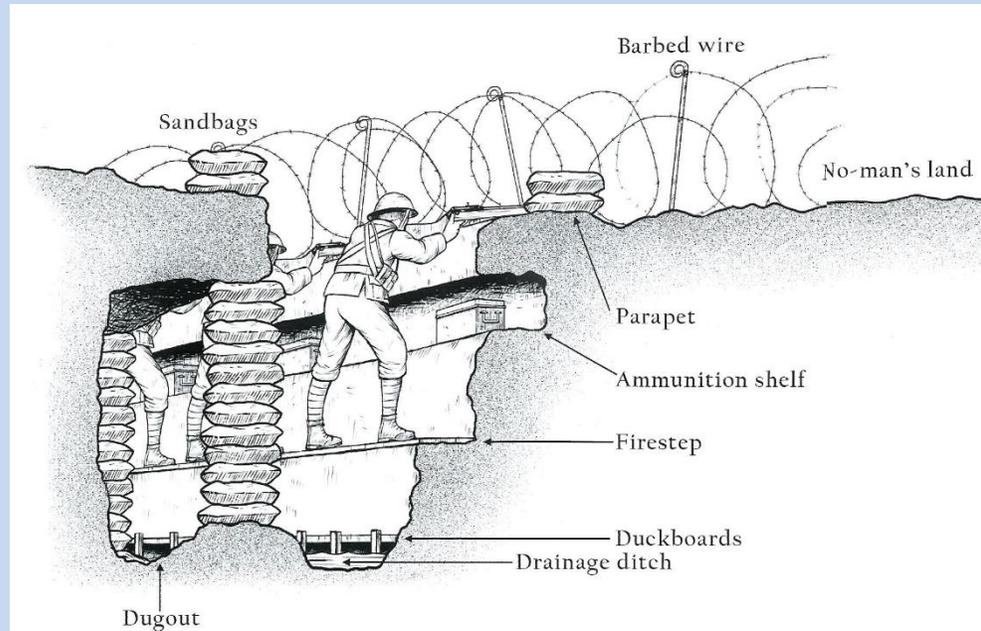
The BEF	The British Expeditionary Force, Britain's army in 1914
Conscription	Compulsory order for all men 18 to 41 to join the army
Schlieffen Plan	German plan in 1914 to attack and defeat France, then attack Russia so they would not have to fight both.
Stalemate	A deadlock where no side is able to make progress to win.
No Mans Land	Area separating opposing armies in trench warfare.
Tommy	Nickname for a British soldier.
Barbed Wire	Strong wire with sharp barbs at regular intervals, used to stop people passing.
Mustard Gas	Poisonous gas used by the Germans, French and British
Artillery	Large guns that fire explosive shells over long distances
Trench Foot	A painful condition of the feet caused by long exposure in cold water or mud, as a result some feet were amputated.
Trench Fever	A disease caused by lice bites which made soldiers very ill in the trenches.
Dugout	Shelter dug into the side of the Trench
Bayonet	A blade attached to the end of a soldiers rifle
Armistice	An agreement made by tin a war to stop fighting.
War effort	How people at war and at home contribute to the war.
Conscientious Objector	Someone who refuses to fight or be involved in war for religious, moral or political reasons, also called ‘Conchies’
Suffragette	Women who protested, using violent methods to achieve equal rights for women, like voting.
Suffrage	The right to vote in political elections.
Strike	Where workers refuse to work in protest
Munitions	Military weapons and ammunition
David Lloyd George	Prime Minster of Britain during and after WW1

British Soldiers Equipment



The British Expeditionary Force that went to war in 1914 was arguably the best equipped and trained force in Europe. The khaki serge uniforms adopted in 1902 and worn by officers and men were the first real example of camouflaged combat clothing. Men wore a soft peaked cap with the regimental cap badge. This was replaced by the end of 1915 with a steel helmet.

Cross-section of a typical frontline trench



Key Concepts

Trench Warfare	Trench warfare is a type of fighting where both sides build deep trenches as a defence against the enemy. These trenches can stretch for many miles and make it nearly impossible for one side to advance.
Western Front	The area of fighting in western Europe in the First World War. A majority of fighting was done in North-Eastern France and Belgium in trenches
Alliance	An agreement between countries to protect each other in war. This was major cause of WW1, there were two main alliance in 1914. The Triple Entente (France, Britain and Russia) and the Triple Alliance (Germany, Austria-Hungary and Italy)
War of Attrition	A war based on winning by wearing down the enemies armies, economy and morale. This happened in the First World War

By the end of 1914, the trench system in Western Europe ran from the Belgian coast to the Swiss border over 480 miles away!



YouTube

Check out a First World War frontline trench here:

<https://youtu.be/FvYIIuxh2kY>

Medical Problems on the Western Front.

Trench Foot

Trench foot was a major problem caused by standing in waterlogged trenches with no change of boots or socks. In the first stage, the feet would swell, go numb and the skin would turn red or blue. The condition could get worse quickly, leading to gangrene and amputation of limbs!

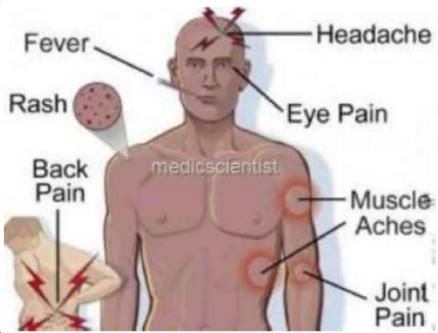
In the cold, wet winter of 1914-15 cases of Trench Foot were serious. The 27th Division of the British army experienced 12,000 cases of trench foot.

Attempted Solutions

To prevent the impact of trench foot, medical officers ordered soldiers should carry 3 pairs of socks and change them twice a day. They were also encouraged to rub whale oil into their feet.



Attempts were made to pump out trenches to reduce waterlogging and add duckboards, but constantly bombing made this hard



Trench Fever (PLO)

Flu like symptoms with high temperature, headache and aching muscles which was spread by lice. Men could be ill for up to a month

Estimated half a million men on the Western front were affected by Trench Fever.

Attempted Solutions

Delousing stations were set up on the front; clothes were disinfected, men were bathed and sprayed with chemicals to prevent lice.

As a result of this, there was a decline in the numbers experiencing the condition.

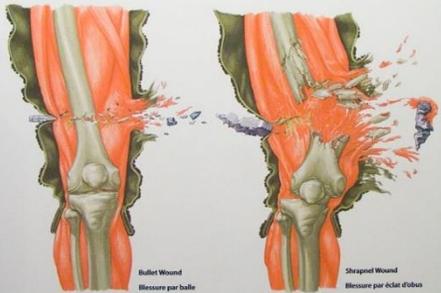


Shell Shock

Symptoms included tiredness, headaches, nightmares, loss of speech, uncontrollable shaking and complete mental breakdown. It is estimated 80,000 British troops experienced shellshock

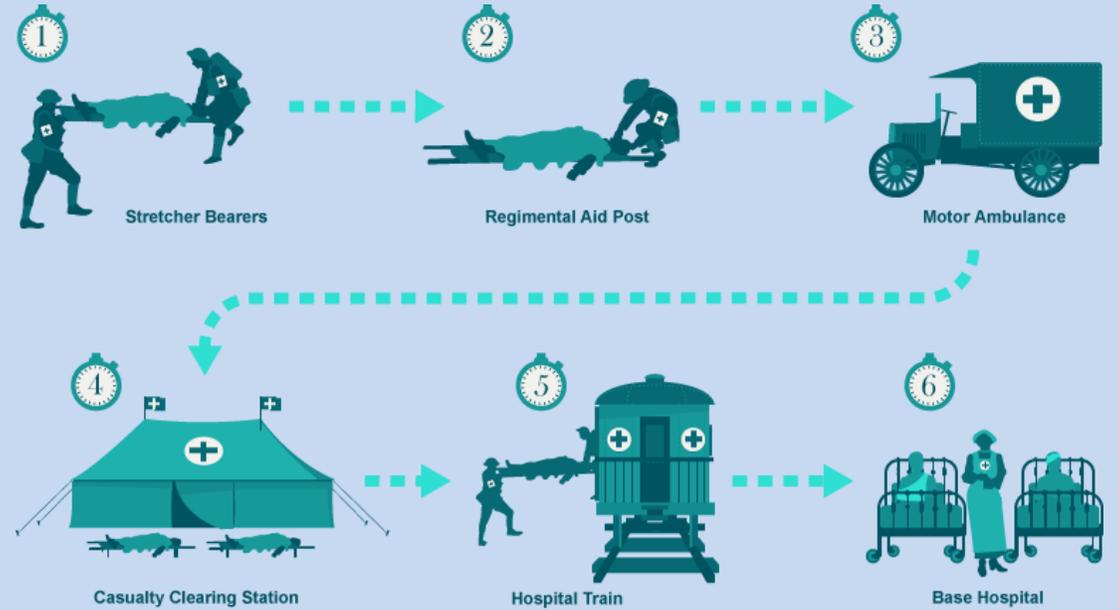
Called NYD,N (Not Yet Diagnosed, Nervous) as a code by the army for shellshock.

Attempted Solutions This condition was not understood at the time, some soldiers who experienced shell shock were accused of cowardice and any were punished, some even shot.



Wounds were nearly always infected by the time soldiers reached aid stations, so new methods of treatment had to be introduced

Evacuation Route for Wounded Men



New Wounds

The First World War introduced a wide range of wounds for medical staff to attend to. For example, high explosive shells and shrapnel (fragments of metal) were responsible for 58% of wounds whilst bullets were responsible for another 39%

The high number of head wounds led to the steel Brodie Helmet being introduced, it reduced fatal head wounds by 80%. All soldiers were given it.

60% of shrapnel wounds were to the arms and legs, a common treatment was amputation. Over 41,000 had their limbs amputated.

Most injuries often got infected due to the bacteria in the soil, causing gangrene. The impact of gangrene was reduced by tetanus injections from end of 1914.

Gas gangrene could not be cured, it could often kill in a day.

Artillery, gun fire and bombs could break bones, pierce vital organs and destroy tissue. Many never made it to hospital

Gas Attacks

Gas caused great panic as soldiers were unprepared for it. It wasn't a major cause of death, only 6000 soldiers died during WW1.

There were 3 types used in the war:

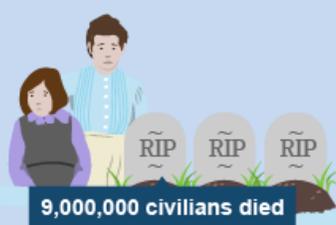
Chlorine: Ypres 1915
Caused death by suffocation. Before gas masks, soldiers soak cotton pads in urine and pressed them to their faces

Phosgene 1915
Used Ypres. Faster acting than chlorine, killing an exposed person within 2 days.

Mustard Gas 1917
Odourless gas that worked within 12 hours. Caused internal and external blisters and could pass through clothing to burn skin.

Solution
British soldiers were given Gas masks from July 1915, which became more sophisticated over time





Consequences of the First World War:

- 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.
- WW1 largely marked the end of colonialism, as the people became more nationalistic and the one country after the other started colonial revolts in Southeast Asia, the Middle East and Africa.
- 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.
 - Inflation shot up in most countries and the German economy was highly affected by having to pay for reparations.
 - With troops traveling all over the world, influenza was spread easily and an epidemic started which killed more than 25 million people across 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, WWI caused a lot of bitterness among nations, which also greatly contributed to WWII 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.
 - WW1 boosted research in technology because better transport and means of communication gave countries an advantage over their enemies.
 - 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

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.

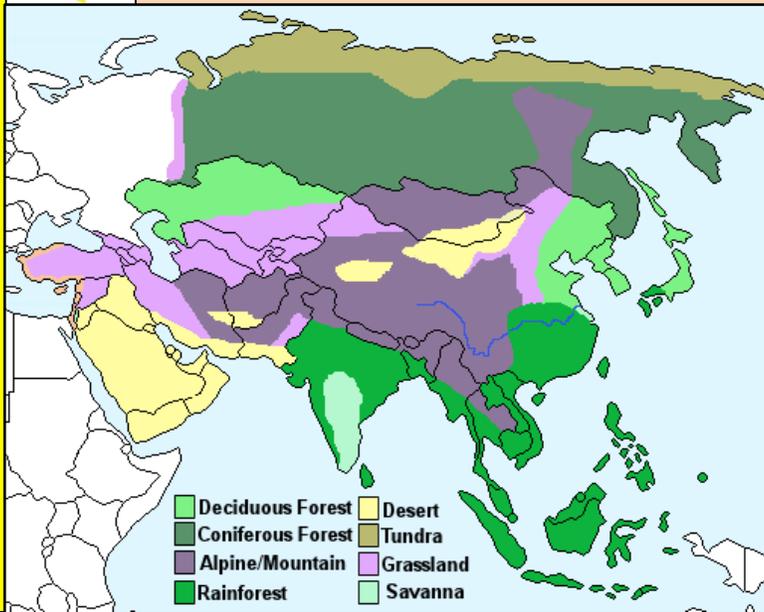


Climate Zones

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*

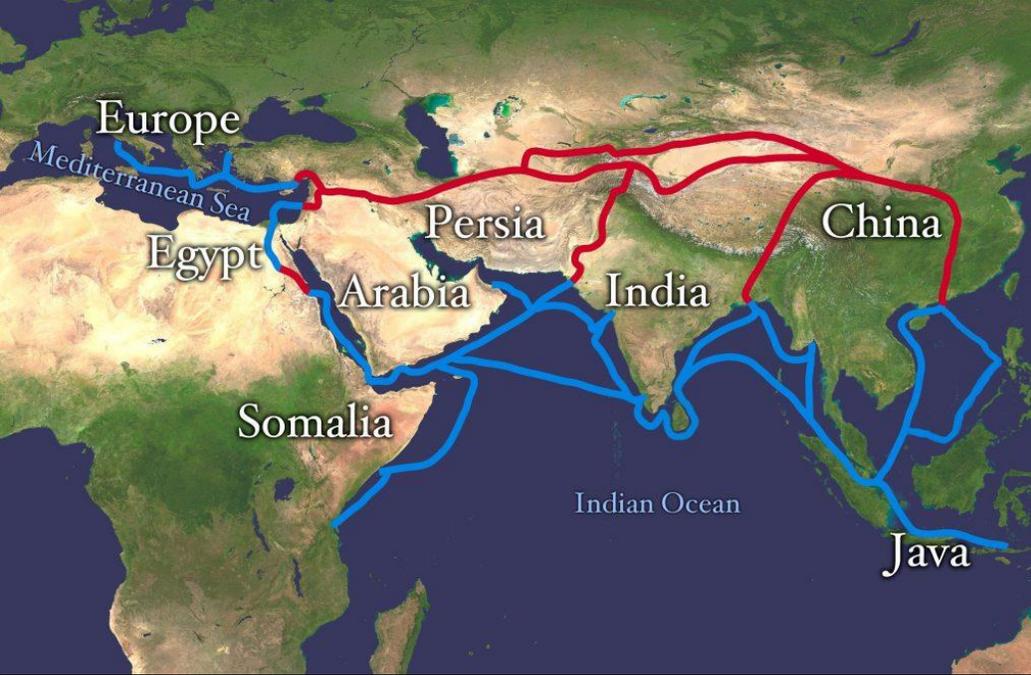
Globalisation The process by which the world is becoming increasingly interconnected.

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 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 political** 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 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 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 *camp*s 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'.

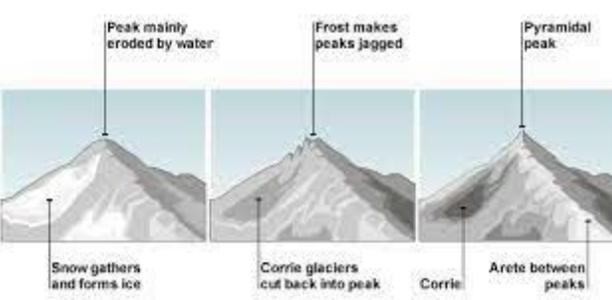


Pyramidal peak
Arête
Corrie
Accumulation of snow

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**.





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.

'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

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.

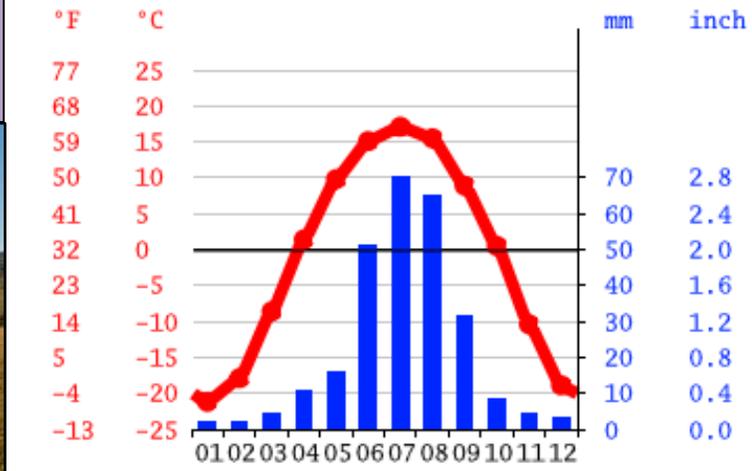
It has also become the **most polluted city** in the world, which causes serious health issues for its population. The city is built in a river valley and surrounding mountains trap smog, as most of the population rely on burning coal to provide heat.



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



Ulaanbaatar climate graph





Location and Geography

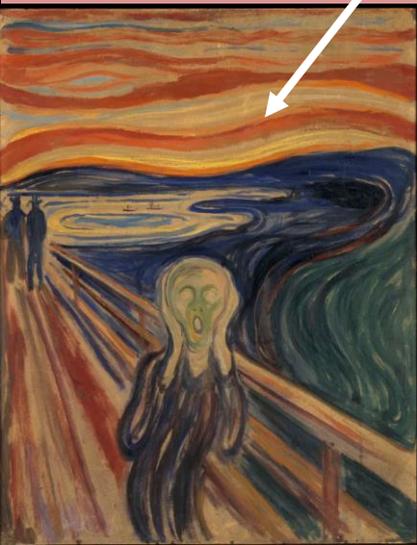
Krakatoa is a **stratovolcano** in the Sunda Strait, between the **Indonesian** islands of Java and Sumatra. It lies on the boundary of the **Indo-Australian** and **Eurasian** plates, a **destructive** plate margin.

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

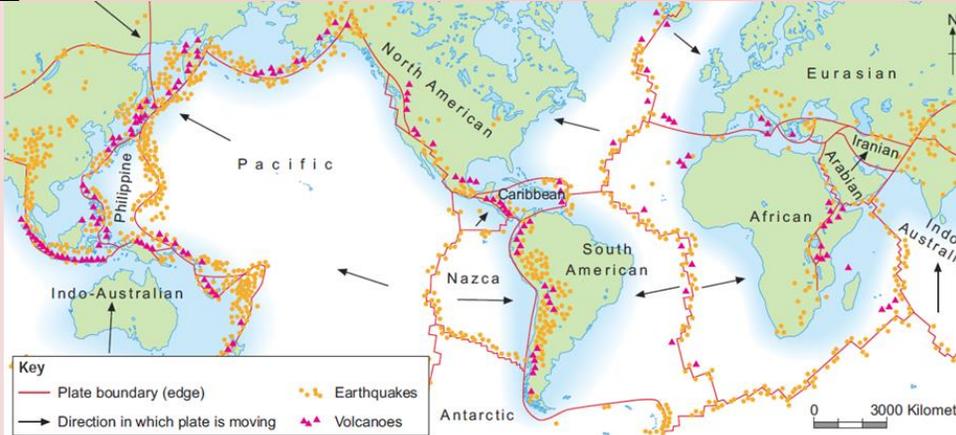
- **Volcanic ash** was propelled 80km into the atmosphere,
- the combined effects of this ash, **pyroclastic flows** and deadly **tsunamis** killed at least **36,417** people.
- Some estimates put the death toll instead at least **120,000**.
- The eruption triggered a tsunami **120ft** high, which consumed 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

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

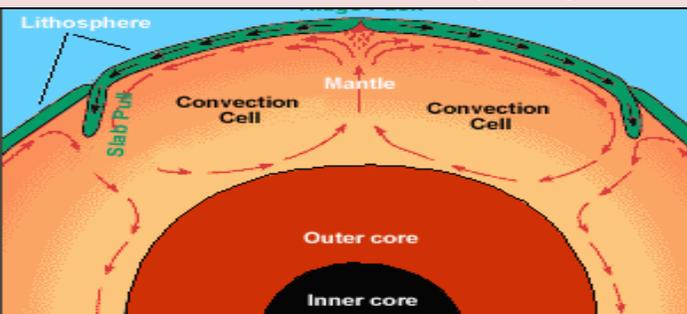
Mantle- made mostly of iron, magnesium and silicon, it is dense, hot and semi-solid.

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.

A 3D block diagram showing two continental plates colliding. The crust is being pushed together, forming a range of 'Fold mountains'. Labels include 'Fold mountains', 'Continental crust', and 'Continental crust'.

Constructive plate boundary

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

A 3D block diagram showing two plates, 'Plate A' and 'Plate B', pulling apart. Magma is rising from the mantle to form 'New rock crust forms' at the boundary. Labels include 'Plate A', 'Plate B', and 'Magma'.

Conservative plate boundary

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

A 3D block diagram showing two plates sliding past each other horizontally. Seismic waves are shown radiating from a 'Focus' point below the surface. Labels include 'Plate movement', 'Epicentre', 'Focus', and 'Seismic waves'.

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.

A 3D block diagram showing an oceanic plate being subducted under a continental plate. The oceanic plate is being pushed down into the mantle. Labels include 'Oceanic crust' and 'Continental crust'.

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.

How do we measure an earthquake ?

Size:

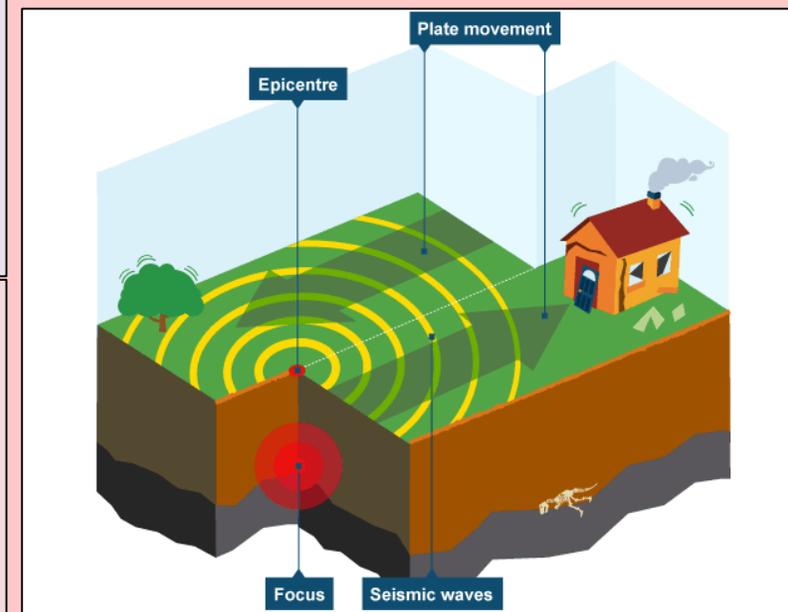
The Richter magnitude scale is used to measure the size of earthquakes.

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.

Diagram of an Earthquake



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.

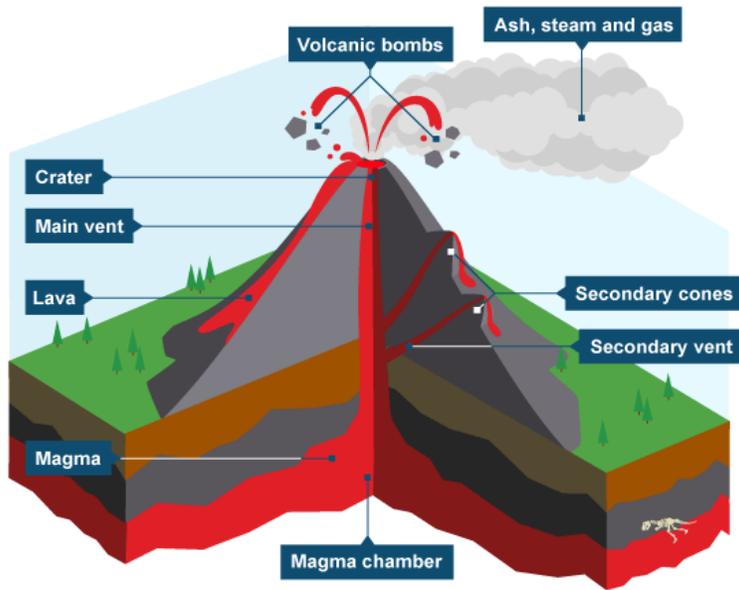
Response to the earthquake

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.

Diagram of a composite volcano

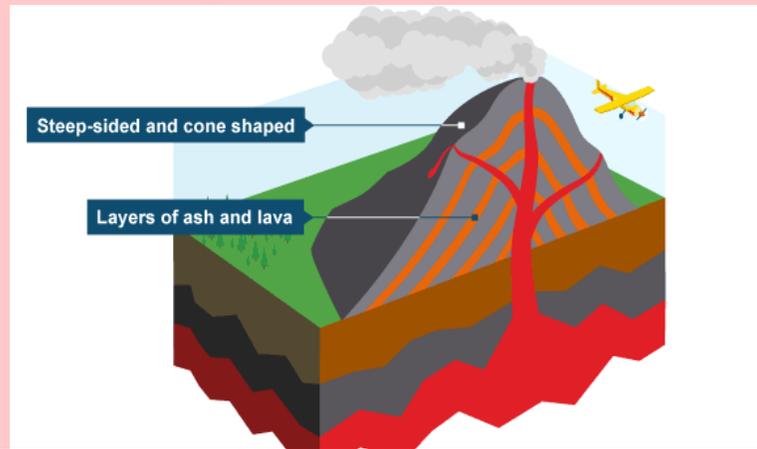
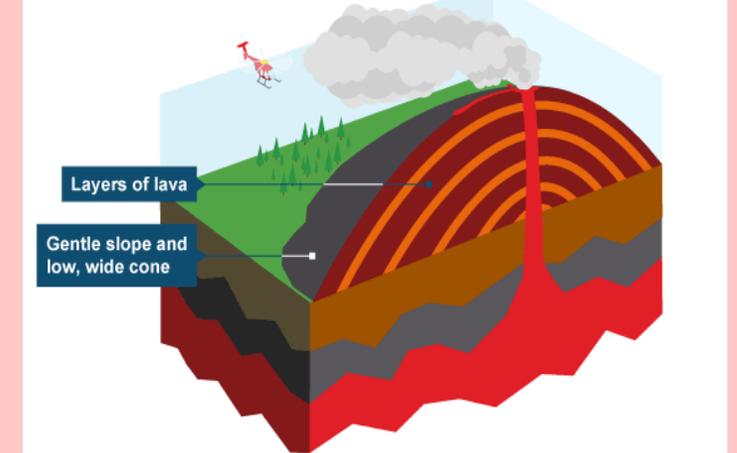


Diagram of a shield volcano



- **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

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:

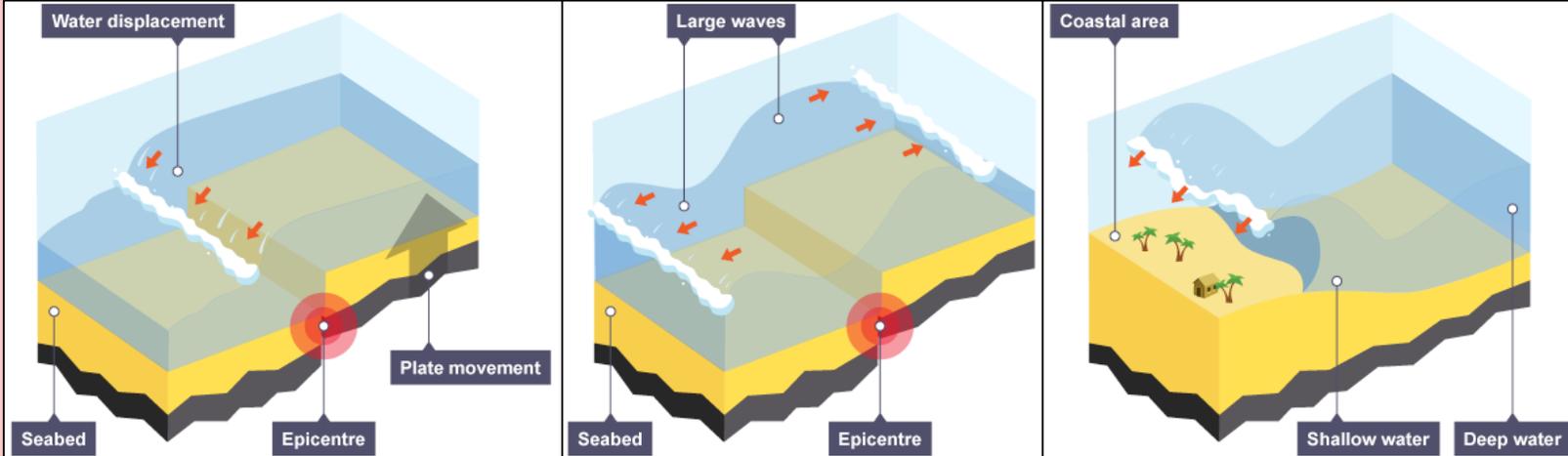
Air operators lost millions of pounds each day as the timing of the disruption was during the Easter holidays when levels of tourism are high.

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.

Human rights - the rights a person is entitled to simply because they are human

Human Rights Act - a law which protects the rights of all human beings and allows us to challenge when these are violated

Justice - getting fairness

Rights - entitlements, e.g. the right to education

UN Declaration of Human Rights - a statement adopted by the United Nations organisation to protect all human beings

Exploitation - misuse of power to treat people or things unfairly

Discrimination - actions based on prejudice, often negative

Homophobia - prejudice against someone on the grounds of their (perceived) sexuality

Positive discrimination - discriminating in favour of a person with a protected characteristic

Prejudice - pre-judging someone based on a characteristic they have, e.g. their looks

Racism - prejudice based on a person's racial/ethnic origins

Tolerance - acceptance of difference

BVT: Human Rights



Freedom of religion - the right to believe or practise whatever religion one chooses

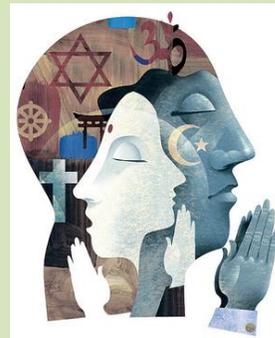
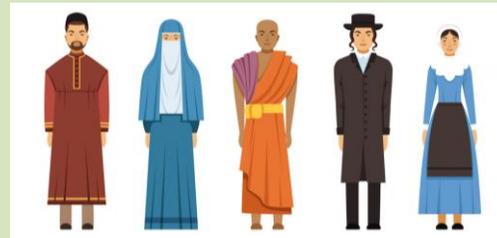
Freedom of religious expression - the right to worship, preach and practise one's faith in whatever way one chooses

Examples of religious expression:

Islam – wearing Hijab or Niqab.

Christianity – freedom to worship or wear a cross

Sikhs – carrying the kirpan. This is worn by Sikhs, both men and women, and is one of their five articles of faith. As it is a reminder of their faith, it is symbolic and the knife inside is not used or taken out



The Universal Declaration of HUMAN RIGHTS

Adopted by the General Assembly of the United Nations in 1948, the Universal Declaration states basic rights and fundamental freedoms to which all human beings are entitled.

WE ARE ALL BORN FREE AND EQUAL

EVERYONE IS ENTITLED TO THESE RIGHTS
NO MATTER YOUR RACE, RELIGION OR NATIONALITY

EVERYONE HAS THE RIGHT TO LIFE, FREEDOM AND SAFETY

No one has the right to hold you in slavery.

You have the right to own property.

No one has the right to torture you.

Everyone has the right to belong to a religion.

You have the right to recognition everywhere as a person before the law.

Freedom of Expression: You have the right to free thought and to voice your opinions to others.

We are all equal before the law and are entitled to equal protection of the law.

Everyone has the right to gather as a peaceful assembly.

You have the right to seek legal help if your rights are violated.

You have the right to help choose and to take part in governing your country, directly or through chosen representatives.

No one has the right to wrongly imprison you or force you to leave your country.

You have the right to a fair and public trial.

Everyone is innocent until PROVEN guilty.

You have the right to privacy. No one can interfere with your reputation, family, home or correspondence.

Workers' rights: Every adult has the right to a job, a fair wage and to join a trade union.

You can travel wherever you want.

You have the right to seek asylum in another country if you are being persecuted in your own country.

Everyone has the right to leisure and rest from work.

Everyone has the right to an adequate standard of living for themselves and their family.

Everyone has the right to education.

Your intellectual property as an artist or scientist should be protected.

All adults have the right to marriage and to raise a family.

We are all entitled to social order so we can enjoy these rights.

You have the responsibility to respect the rights of others

NO ONE CAN TAKE AWAY ANY OF YOUR RIGHTS

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Islamophobia

Islamophobia is the **prejudice** against, hatred towards or fear of the religion **Islam or Muslims**

A recent Newsround survey of Muslim children revealed: 4 of every 10 Muslim children asked thought the news showed Islam in a bad way. 1 in 3 Muslim kids had been bullied, and 4 in 10 of those believed it was because of their religion. Nearly 7 out of 10 Muslim kids identified themselves as a Muslim rather than British.

The word "Islam" is derived from the word meaning "**peace**" in Arabic. Islam is a religion revealed to mankind with the intention of presenting a peaceful life where compassion to others is important.

"O You who believe! Enter absolutely into peace (Islam). Do not follow in the footsteps of Satan. He is an outright enemy to you." Quran.

Muslim terrorists have been **radicalised** and taken advantage of, by groups such as ISIS who are **NOT religious** and want to dominate, gain control and strike **FEAR** into the west.

They have been radicalised and indoctrinated to misinterpret their faith.

Jihad

Jihad means the struggle for Allah. Greater jihad is a Muslims inner spiritual struggle e.g. to follow Allah's wishes. Lesser Jihad is a Muslim's external struggle to preserve Islam for Allah. This is to defend Allah and Islam.

Muhammad said *"The best jihad is the word of justice in front of an oppressive ruler"*. This means that lesser Jihad should be used to fight for Muslims being oppressed in the world.

BVT: Human Rights

- Key vocabulary**
- Islamophobia
 - Prejudice
 - Jihad
 - Radicalisation
 - Hijab
 - Niqab
 - Burka



"Hijab" "Niqab" "Burka"

Women

Women play an **important role** in Islam. They are mothers and wives and as family is very important to Allah, their role is very important.

- Islam says men and women are equal in the sight of Allah. They're accountable for their own actions and will be judged equally by Allah.
- *"Be you a man or woman, you are equal to the other"* Qur'an
- Men and women have different roles. Women are to look after children and the family. Men are to provide for the family.
- Women are not allowed to become an Imam (Islamic leader), nor are they allowed to pray at the front of the mosque

Muslim Women headscarf's

In the Qur'an it says that women should cover their modesty *"draw their veils over their body and not display their beauty except to their husbands and family"*. Qur'an

It does not suggest covering their face and many women choose not to even cover their head. It is a Muslim woman's choice and not forced upon her.



Racial Equality

Martin Luther King	
Who?	Christian Baptist minister who campaigned for equal rights for black people
How?	He used non-violent protests such as bus boycotts, sit-ins and peace marches. He was arrested and put in prison many times for his personal conviction.
Teachings?	<p>He was influenced by Jesus' teachings</p> <p><i>"Turn the other Cheek" Jesus</i> – Don't fight back</p> <p><i>"Those who live by the sword, die by the sword" Jesus</i> – If you are involved in violence, it leads to more violence.</p> <p><i>"Blessed are the peacemakers" Jesus</i></p> <p>The parable of the Good Samaritan teaches to not discriminate and help people of different race.</p> <p><i>"Be you Jew or slave, male or female, you are all equal to Christ"</i> Bible</p>
Quotes from MLK	<p>"I have a dream that my children will not be judged by the colour of their skin"</p> <p>"Non-violence is the answer – the foundation of such a method is love"</p>



Over 50 years after Martin Luther King... Do we have race equality?

Around the world in 2020 the **Black Lives matter** protests and campaigners think race is still an issue.



BVT: Human Rights

Selma Marches

In early **1965**, Martin Luther King and the Southern Christian Leadership Council (SCLC) decided to campaign in Selma for **voting rights** because **only 2 percent** of Selma's eligible black voters (300 out of 15,000) had managed to register.

First March:

A group of **600** people set out on Sunday, **March 7th 1964** to march from **Selma to Montgomery**, but didn't get far before Alabama state troopers wielding whips, nightsticks and tear gas rushed the group at the **Edmund Pettis Bridge** and beat them back to Selma. The brutal scene was captured on television, enraging many Americans and drawing civil rights and religious leaders of all faiths to Selma in protest.

By the Third march:

On **March 21st** King and the SCLC were joined by over **3500** people for a third march. They came from across America and were black, white, Christian, Jewish, Muslim, Atheist – there seemed to be no pattern. After walking some 12 hours a day and sleeping in fields along the way, they reached Montgomery on March 25th.

In **August 1965**, Congress passed the **Voting Rights Act**, which guaranteed the right to vote to all African Americans.



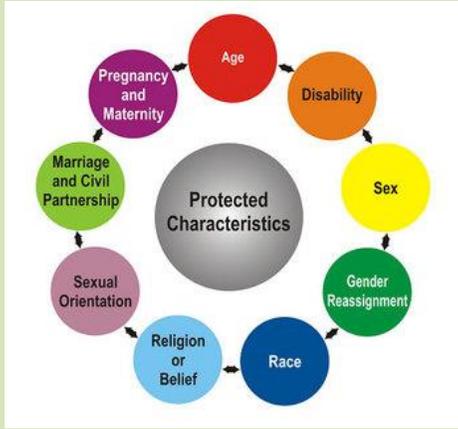
Buddhist teachings for equality and peace:

"Hatred will not cease by hatred but by love alone" Dali Lama – Buddhism

Buddhist teachings of **Eightfold path of Right Action** and **4 Noble Truths** encourage peace and equality.

Gender Equality

BVT: Human Rights



Equality Act 2010 UK

Women in the boardroom

CEOs or chairmen in FTSE100 companies



Total women 7



Men named David 14



Men named John 17

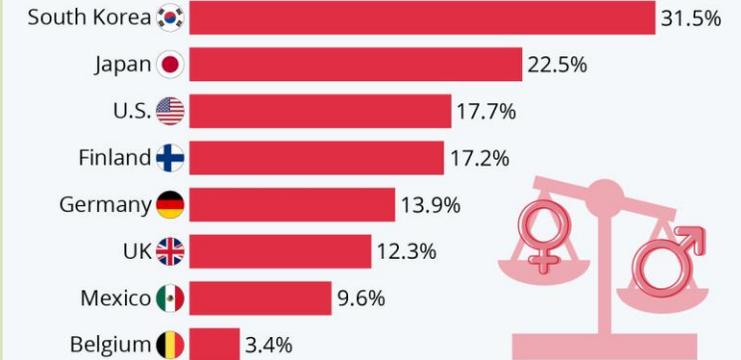


Men who have the title 'Sir' 19

GUARDIAN GRAPHIC

Where the Gender Pay Gap is Widest

Difference in median full-time earnings of men and women in selected OECD nations*



* percentage of men's earnings women are lacking. 2020 or latest available year. Source: OECD



statista

UK GENDER PAY GAP

15.4%

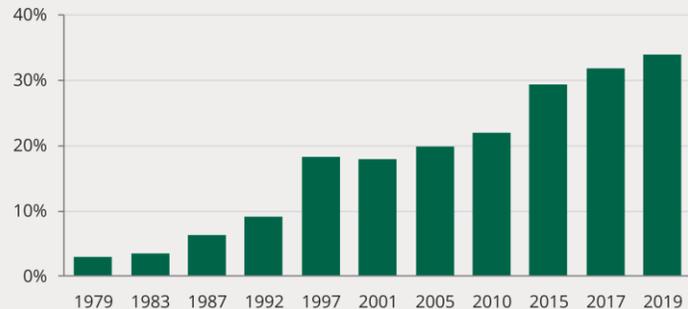
AVERAGE ANNUAL FULL-TIME EARNINGS FOR UK WOMEN

28,305 GBP

UK GENDER PAY GAP IN THE FINANCE SECTOR

30%

% female MPs elected at general elections since 1979



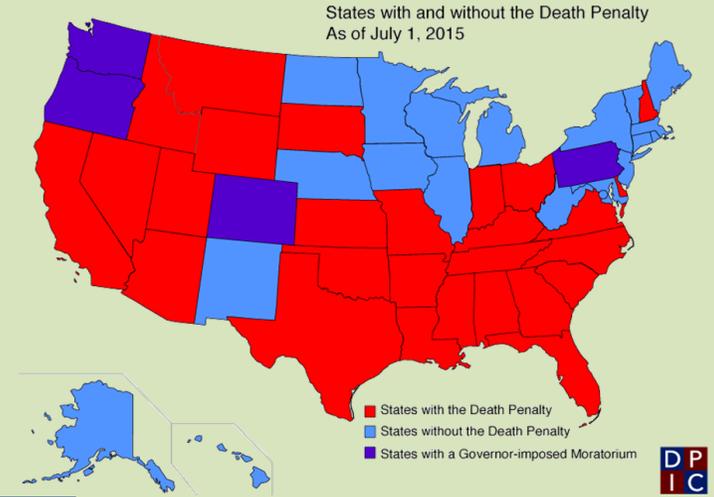
	Christianity	Islam
Equality: Beliefs and Practices	<ul style="list-style-type: none"> God created man in his own image, so they are all equal In 2015 the first female bishop was appointed in the Anglican Church <i>"Neither Jew nor Greek, slave nor free, male nor female, for you are all one in Jesus Christ"</i> Bible 	<ul style="list-style-type: none"> <i>"Be you a man or a woman, you are equal to the other"</i> – Qur'an <i>"Men and women have equal rewards for their deeds"</i> Qur'an Muhammad said <i>"I command you to be kind to women"</i>
Inequality: Beliefs and Practices	<ul style="list-style-type: none"> No woman can become a Priest in the Catholic Church Eve is portrayed in the Original Sin as a temptress to Adam, leading him astray 	<ul style="list-style-type: none"> Men and women have different roles, women look after the Children Women are not allowed to pray at the front of the mosque. Women are not allowed to become an Imam (Islamic leader)

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.

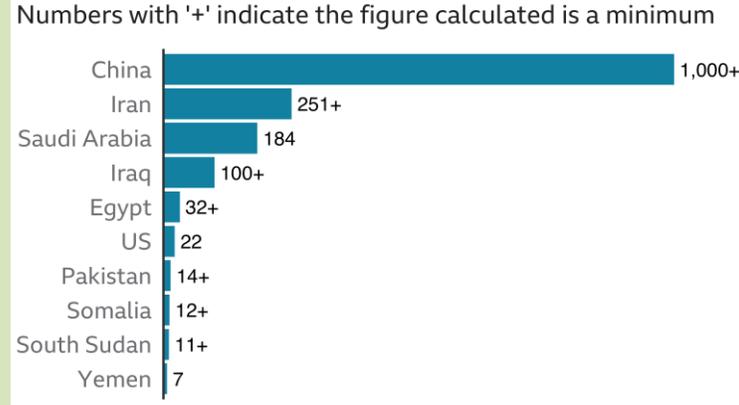


The Death penalty in the USA

RIGHT: Figures for the **USA** of number killed using the death penalty between 1976-2014. 32 states have the death penalty, Texas is responsible for over a 1/3 of all executions

Lethal Injections	1194
Electrocution	158
Lethal Gas	11
Hanging	3
Firing Squad	3

Top ten countries by number of executions



Note: Data for China is unavailable but Amnesty estimates thousands are executed
 Source: Amnesty International 2019 report



Religion that agrees with the Death penalty	Religion that disagrees with the Death penalty
---	--

"An eye for an eye" – old testament
 The Bible teaches **God is Just** – the story of Original Sin - Adam and Eve show God's punishment. Also parables such as **Lazarus and the Rich man**.

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"*.

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.

Christians teach to forgiveness *"We may forgive those who trespass against us"*. Teaching of the parable the **Prodigal Son** also shows forgiveness.

Buddhists follow the Dali Lama where he says *"Hatred will not cease by hared but by love alone"*, showing forgives and love. Also Buddhists **1st of the 5 Precept** is not to harm living things.

In the Qur'an it says *"Those that pardon (forgive) are rewarded by God"*.

FRENCH YEAR 9: FUTURE PLANS, WORK AND POCKET MONEY

Quelles sont tes bonnes résolutions 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'exercice (*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 agressif/-ive (*to be less aggressive*)

être plus poli(e) (*to be more polite*)

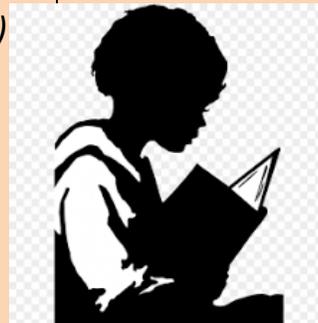
me lever / me coucher de bonne heure (*get up / go to bed early*)

manger plus / moins de... (*to eat 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 mangerai)

tu - as (tu mangeras)

il -a (il mangera)

nous -ons (nous mangerons)

vous -ez (vous mangerez)

ils -ont (ils mangeront)

Note: j'irai = I will go / je serai = I will 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

¿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*)

tecnología (*tech*)

ahorro para comprar (*I'm saving to buy*)

pago mi factura de teléfono (*I pay my phone bill*)



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 (comeré)

tú - as (comerás)

él/ella -a (comerá)

nosotros -emos (comeremos)

vosotros -eis (comereis)

Ellos/ellas (comerán)

Note: iré = I will go / seré = I will be

haré = I will do / tendré = I will have



The Fundamentals of Art

TERM 3 and 4

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.

TEXTURE is the surface quality of something, the way something feels or looks like it feels. There are two types of texture: **ACTUAL 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**

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.

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

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

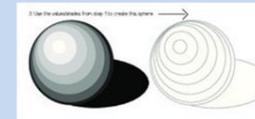
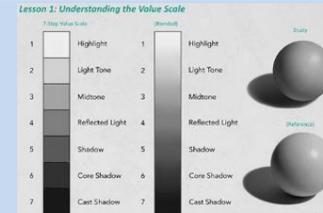
SENTENCE STARTERS

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...

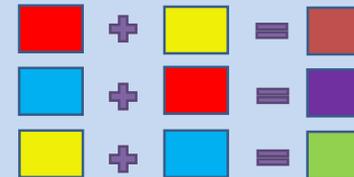


ESSENTIAL EQUIPMENT:

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

OPTIONAL EQUIPMENT:

- DRAWING PENS
- WATERCOLOUR SET
- WATERCOLOUR PENCILS
- PAINTBRUSHES



COLOUR

BRIGHT
BOLD
VIBRANT
PRIMARY
SECONDARY
TERTIARY
RADIANT
VIVID
DULL
CONTRASTING
COMPLIMENTARY
HARMONIOUS
MONOCHROME
NATURAL
SATURATED
PASTEL
COOL
WARM

LINE

FLUENT
CONTINUOUS
CONTROLLED
LOOSE
POWERFUL
STRONG
ANGULAR
FLOWING
LIGHT
DELICATE
SIMPLE
THICK
THIN
BROKEN
OVERLAPPING
LAYERED
MARK MAKING

SHAPE/Form/SPACE

CLOSED
OPEN
DISTORTED
FLAT
ORGANIC
POSITIVE
NEGATIVE
FOREGROUND
BACKGROUND
COMPOSITION
ELONGATED
LARGE
SMALL
2D
3D
TWISTED
JAGGED

PATTERN AND TEXTURE

REPEATED
UNIFORM
GEOMETRIC
RANDOM
SYMMETRICAL
SOFT
IRREGULAR
UNEVEN
ROUGH
BROKEN
GRID
FLAT
WOVEN
ORGANIC
SMOOTH
ABSTRACTED

TONE

BRIGHT
DARK
FADED
SMOOTH
HARSH
CONTRASTING
INTENSE
SOMBRE
STRONG
POWERFUL
LIGHT
MEDIUM
DARK
LAYERED
DEPTH
DEVELOPED
SOFT

ATTITUDE

Be positive and try your best!

RESPECT

Respect others, work and the room

THINK

Understand and demonstrate.

IMAGINE

Be creative, use your imagination!

SPOTLESS

Tidy up after yourself.

TARGET

Follow directions.

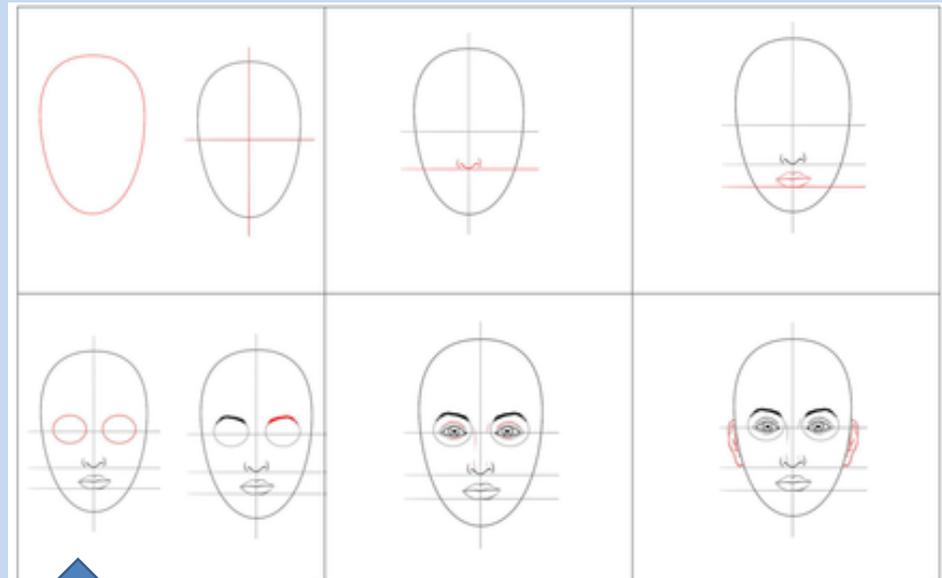


TAKING ABOUT ART:

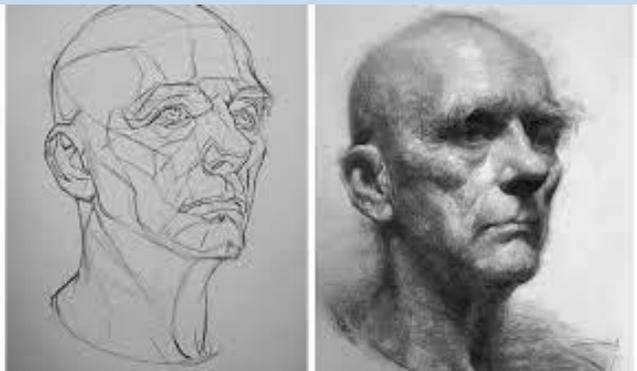
- What are you looking at?
- How was it made?
- Who made it?
- How will it inspire your work?
- Do you like it/dislike it? Why?

IDENTITY AND PORTRAITURE

TERM 3 and 4



Step by step guide to portraiture.

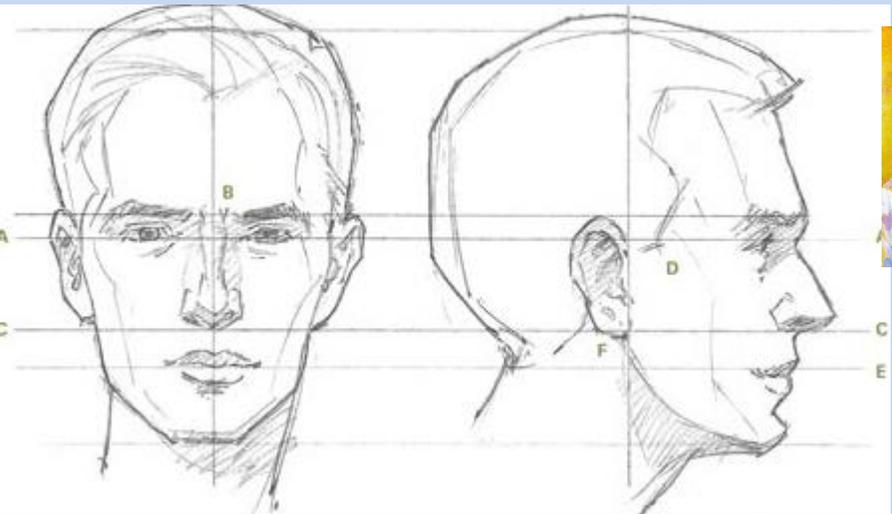


By adding tone to your outlines you can make your portraits more realistic.

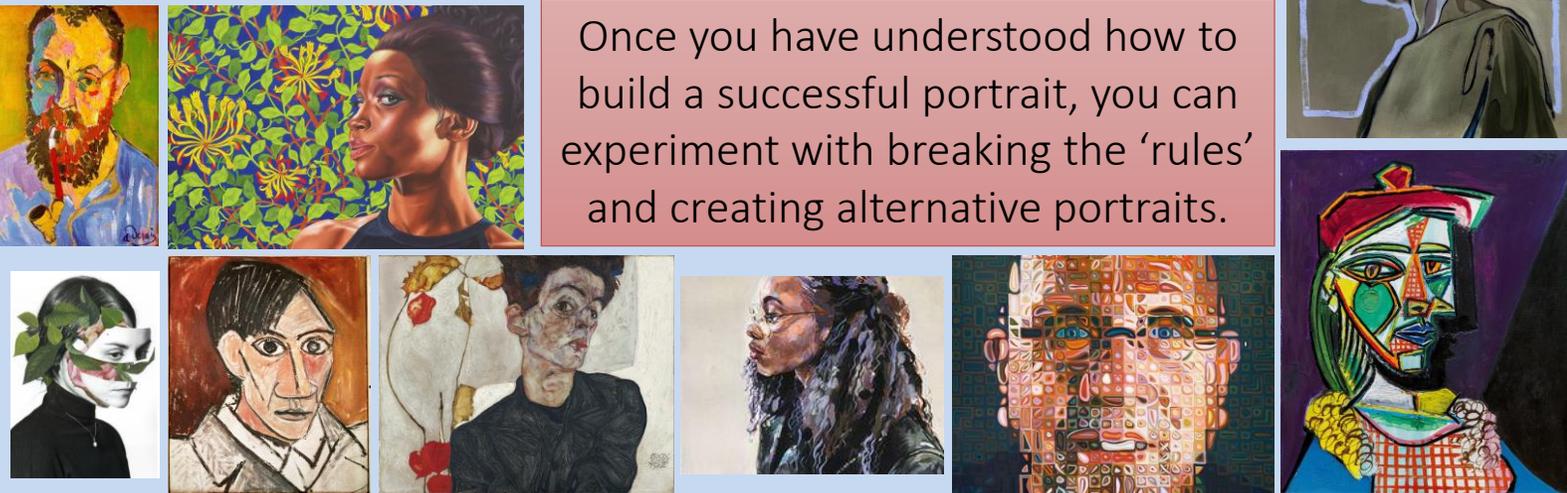
Lesson 1: Understanding the Value Scale

1	Highlight	1	Highlight	
2	Light Tone	2	Light Tone	
3	Midtone	3	Midtone	
4	Reflected Light	4	Reflected Light	
5	Shadow	5	Shadow	
6	Core Shadow	6	Core Shadow	
7	Cast Shadow	7	Cast Shadow	

3 Use the value scales from step 1 to create this sphere



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

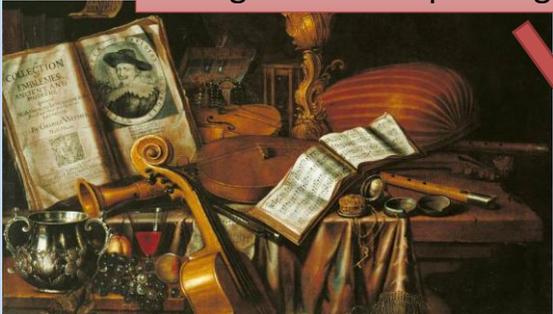


IDENTITY AND PORTRAITURE

TERM 3 and 4



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



Vessels = life, water sustains life



Clock = time



Shells = travel, adventure, wealth



Pen/pencil = education and higher status



Books = education



Skulls = death and the afterlife



Music and instruments = education and the joy in life



Plants = life and different flowers have different symbolic meanings

- 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!

Possible modern symbolic objects





Year 9 Music

#Learning Objectives

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)

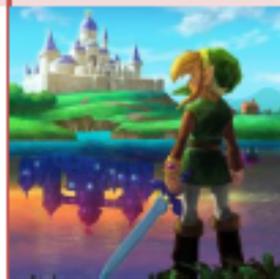
Early Computer and Video Game Music



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

<p>JUMPING BASS LINE Where the bass line often moves by LEAP (DISJUNCT MOVEMENT) leaving 'gaps' between notes</p>	<p>STACCATO ARTICULATION Performing each note sharply and detached from the others. Shown by a dot.</p>	<p>CHROMATIC MOVEMENT Melodies and bass lines that ascend or descend by semitones.</p>	<p>SYNCOPIATION Accenting the weaker beats of the bar to give an "offbeat" "jumpy feel to the music."</p>
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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

#Learning Objectives

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.

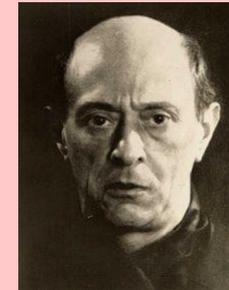
- You will explore changes in twentieth century music and how composers 'broke away' from late-Romantic ideals.
- You will understand how twentieth century music consisted of many different types, styles, movements and genres.
- You will investigate how the composers develop pieces from various 'rules'
- 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

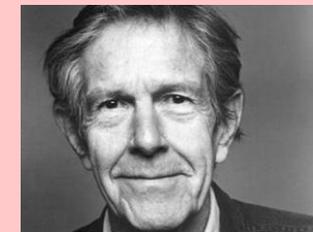
Phillip Glass is a Minimalist composer. He takes small ideas and layers them to produce a complex sound. Complexity from Simplicity. This is 'Glassworks'



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	A2. Harmony	A3. Rhythm	A4. Timbres and Sonorities
<p>CONJUNCT - wide leaps, angular and spiky.</p> <p>CHROMATIC -uses all 12 notes (black and white) of the CHROMATIC SCALE.</p> <p>DISSONANCE - harsh sounds.</p> <p>EXTREMES OF DYNAMICS - (<i>pppp-ffff</i>) No clear melody/"tune".</p>	<p>ATONALITY – no (sense of) key.</p> <p>POLYTONALITY – two or more keys played at once.</p> <p>DISCORDS – dissonant, clashing chords.</p>	<p>SYNCOPATION – half beat followed by full beat emphasising weaker beats of the bar.</p> <p>IRREGULAR ACCENTS (>) – e.g. <i>The Rite of Spring</i></p> <p>IRREGULAR TIME SIGNATURES – 5 or 7 beats per bar.</p>	<p>Strange, intriguing, and exotic sounds; striking, sometimes explosive, contrasts.</p> <p>PERCUSSION – expanded in orchestra and more emphasis on percussion timbre and sonorities.</p> <p>Unfamiliar sounds from strange instruments such as EXTREME PITCH RANGES and playing instruments in different and unusual ways.</p> <p>TOTALLY NEW SOUNDS often involving ELECTRONIC EQUIPMENT and MAGNETIC TAPE.</p>

B. Minimalism	C. Expressionism	D. Serialism
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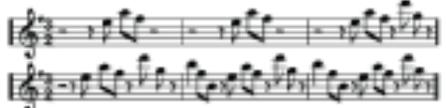
Based on **CELLS** or **MOTIFS** – short simple ideas.

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.

"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

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



Interpretation, genre & performance

Study Focus

We will look at a variety of texts and dramatic situations from a variety of genres with the intention of you appreciating how you might use the skills of the actor, director and to some degree, the stage designer. We will work practically, where possible, so that you get to work with the plays as they were intended to be used. We will look at the playwright's use of language and structure and the way that actors and directors can take the playwright's ideas, from page to stage, as the saying goes. You will explore how, subtext, pause, space and silence combine to communicate subtle and dramatic meaning. The intention is that You will gain some breadth of knowledge of how different playwrights from different era's and cultures have 'told their stories' and shared their ideas.

Things that you will practise and learn

- Playwrights use the play format differently to communicate their ideas.
- You will investigate how playwright's use language to suggest subtext and hidden meaning.
- You will investigate how playwrights use language to suggest character, class and status as well as mood and personality.
- You will learn how different silence and pause create meaning and how to realise this meaning on stage as an actor / director.
- You will explore how to use a variety of vocal skills to interpret and communicate different characters in different situations and emotional states.
- You will discover how pace and tempo rhythm affect the meaning of a moment and a scene and the mood that is created.
- You will explore Shakespeare's particular use of language and how actors can use it
- You will explore ideas of context and how plays from the past can be brought to life for a modern audience by situating them in modern settings and contemporary events and situations.

Key Concepts and Ideas

- **Subtext** – The prefix, ‘sub’ means below or underneath, like a submarine goes under the sea (marine means sea). So sub – text is the text, or meaning, beneath the actual words that are said or not said. In naturalistic theatre, the hidden meaning is brought out by the playwright’s very specific use of language- words and phrases that have a double meaning. In performance, the subtext comes out through the actor’s body language, intonation and tone of voice.
- **Intonation** – this is how the voice pitch rises and falls in a sentence. Characters sound excited and animated when there is a significant rise and fall. They sound dull and depressed when the voice stays flat in monotone.
- **Silence**- is such a powerful option on the stage. Young actors rarely use this device, often falling into the trap that they have to be saying something, as well as doing something, all of the time, probably out of awkwardness and lack of confidence. Silence – not saying something can be especially potent when the audience knows that there is lots that could be said, or indeed, needs to be said. As the playwright, Anton Chekhov wrote, “Characters often reveal more about themselves by what they do NOT say than by what they do say”. Lack of speech maintains the tension and builds the suspense.
- **Suspense** – This is the tension that puts us on the edge of our seats when we are watching something. The dictionary describes it as the state or feeling of excited or anxious uncertainty about what may happen. The more that we care about the characters on stage, the more anxious we get when it seems something bad may happen to them. The suspense increases in theatre because, as an audience, we can do nothing to save the situation - at least in naturalistic theatre.
- **Space** – We tend to put ourselves close to the people we like and apart from those that we do not like. Recent research has found this to be even more true than we previously assumed. Theatre people can use this basic information to communicate the state of character’s relationships. We also look for opportunities and excuses to be near those we like and similarly will walk a mile around someone we’re wanting to avoid. The study of spatial relationships is called. **Proxemics**. It is not an easy word to use and you can experiment. It is a favourite with the Examination boards.
- **Context** – It is important to remember that all scenes in a play and all events are partly the result of things that have previously happened. Past events inform and motivate character’s words and actions- everything comes out of a context. Knowing this will help you as an actor know how to behave in a scene and why the character is feeling this way and acting this way. In your devised work, creating the context of a scene will help you extend your scenes and make them clearer and richer, as you discovered in our last scheme of work.
- **Naturalism/ Realism** – Later on you will explore the difference between these two genres, for now, we can think of them as the style of theatre that tries to depict things as they are like in everyday life. Television like EastEnders and Coronation Street might be examples of these genres.
- **Melodrama** – This is a very exaggerated style of theatre. Key features include; a very clear strong plot line often with twists and turns. Very clear heroes and villains. Melodramas often have a clear moral message. It is quite a difficult style to perform in but a very enjoyable one for those who give it a good go.
- **Genre** – a timely reminder that this is the word we use for the category or style that a play is performed in. We will explore a variety of genres in both text and devised work. Some examples are; Naturalism, Western and melodrama.

Some example texts from different genres

Texts by Philip Ridley

Fairytaleheart

In *Fairytaleheart*, two fifteen-year olds confront their loneliness by exploring the language of theatre itself in a derelict community centre in the East end of London.

‘This sixty-minute gem of a play- poetic perfection’ Daily Mail.

First staged at The Hampstead Theatre 1998

Sparkleshark

There are nine wonderful characters in this modern example of storytelling in the theatre. Jake, a young East end boy uses his amazing powers of storytelling to avoid getting beaten up by the local bullies. His narrative interweaves real and challenging elements from all the characters lives and in so doing brings about some healing for the group.

Sparkleshark premiered at The Royal National Theatre London in 1997

Romeo & Juliet Shakespeare

Does true love conquer all or does unbridled passion destroy everything in its wake? Two contrasting themes that could be taken from this classic play. We look at key early scenes and explore how a modern setting can help communicate the characters and situation.

Black-Eyed Susan Douglas William Jerold

This most famous of 19th century melodrama a handsome heroic sailor returns from the Napoleonic wars to find his virtuous wife has fallen on hard times and fallen play to the harassment of her crooked landlord uncle.

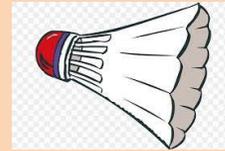




Responsibility



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:

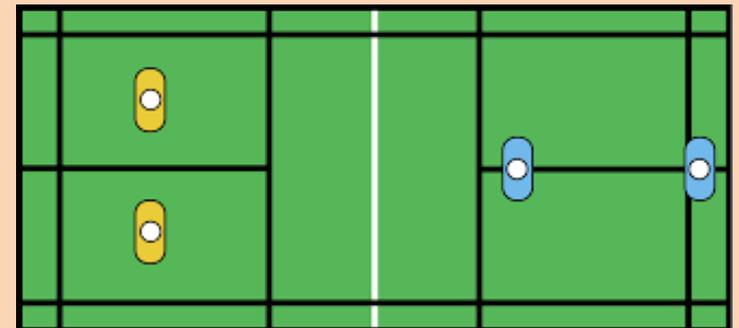
- Side on
- Racket up
- Non-racket up too for balance
- On your toes - ready to move

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.





Understanding

Aim:

The object of hockey is to hit a ball with a stick into a goal.

Rules:

- Each team consists of 11 players, 1 goalkeeper and 10 outfield players (defenders, midfielders and attackers)
- Only the flat side of the stick can be used, using the back of the stick will result in a foul.
- A goal is scored when the ball is successfully hit into the opponent's goal from within the 16 yard area.
- The ball must be dribbled or passed using the stick, no other body part is allowed to intentionally come into contact with the ball.
- Games last two halves of 35mins with a 5 minute rest in between.

A foul or infringement is called when a player:

- Purposely tries to hit the ball off another player with the intent of causing harm to that player.
- Intentionally uses a body part to assist in moving or stopping the ball.
- Hits the ball with the rounded side of the hockey stick.
- Raise their stick above waist height.
- Hit their stick off their opponents to interfere with play.

Positions:

Goalkeeper: responsible for the defensive circle and leadership of the defence

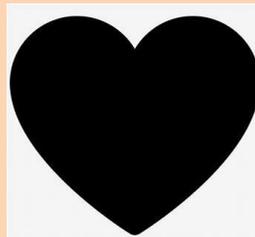
Defenders: work as a unit and limit the opposition's chances of scoring (right half, left half, right back and left back)

Midfielders: required to support and contribute to the attack as well as maintain key defensive responsibilities (inside right, inside left, centre half)

Attackers: responsible for generating and scoring opportunities (right wing, left wing, centre forward)



Hockey



Resilience

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.

Problem Solving



Skills & Techniques:

General Safety:

- Stick remains below waist height at all times
- Stick on the floor at all times when in contact with the ball

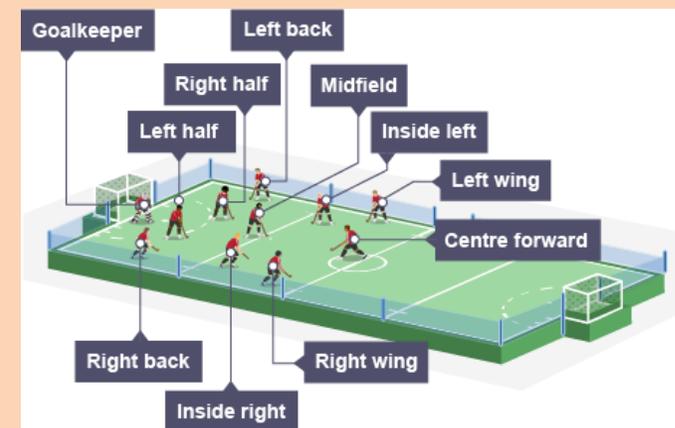
Shooting:

Drives

- Both hands gripped tightly at the top of the stick
- Swift backswing in order to take a shot on the ball
- The shot is used for long passes, taking a free hit or a hard shot at goal.

Slap Shots

- Hands are slightly apart.
- Half a back swing is used.
- Allows you to control the ball whilst shooting or passing.





Expectations and Routines

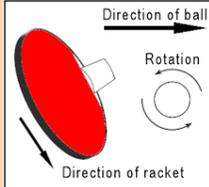
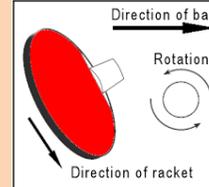
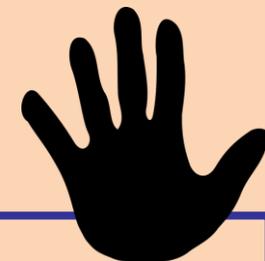


Table Tennis



Physical Ability and Technique



Developing tactical practices to outwit your opponent:

- Using targets as part of your skills practice to develop accuracy and directional control.

Basic Rules of Table Tennis

1. To start a point, the server must stand at the back of the table and can serve either forehand or backhand. The ball must be thrown up either equal to or above the height of the net before striking the ball and the ball must be thrown from an open palm to stop finger spin.
2. A serve must hit both your side of the table and your opponent's side to be seen as a 'good' serve.
3. If the ball hits the net on a serve but continues over the other side then a 'let' is played.
4. There are no second serves.
5. Service must can be straight or diagonal in singles but can only travel diagonal in doubles.
6. Players are allowed to hit the ball around the side of the net.
7. The ball must bounce on a player's side of the table before playing their shot.
8. During play, competitors are not allowed to touch the table.

Game understanding:

Applying a slice

1. You only slice when you're far in the back court.
2. Raise the racket. Let the ball come to you and strike down and forward as though you were trying to slice off a piece of the ball.
3. Keep the ball low.



Effort and Engagement

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.
- Participates in regularly outside of school either for a club, going to the gym or other regular physical activities.

Doubles

Service must be diagonal, from the right half court (marked by a white line) to the opponent's right half court.

Service changeover in doubles is as follows:

- At the start of a game, the serving team will decide which player will serve first. The first player to serve is A1 and;
- A1 serves to B1 (2 services)
- B1 then serves to A2 (2 services)
- A2 then serves to B2 (2 services)
- B2 serves to A1 (2 services)
- Repeat until one team wins the game.

Rotation rules for doubles

In doubles, you should alternate hitting the ball with your partner. So, for example, A1 serves the ball to B1, who serves the ball. A2 then hits the ball and B2 returns this. A1 hits to B2, A2 hits and B1 returns...and so on.

Examples of tactics played in Table Tennis

- Play to opponents crossover point (playing elbow)
- Use wide angles
- Add spin to your shots
- Keep everything tight and short so opponents cannot attack
- Always try to attack first
- Vary your serves
- Keep ball away from your opponents strongest side

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.

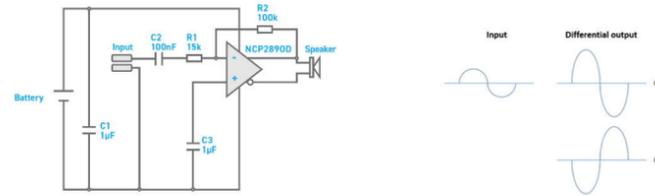
How the Amplifier Works

At the centre of the circuit is an audio amplifier Integrated Circuit or IC. Inside the IC are lots of transistors, which are connected together to allow the small input signal to be amplified into a more powerful output that can drive a speaker.

All amplifiers need to use feedback to ensure the amount of gain stays the same. This allows the output to be an exact copy of the input just bigger. The gain is the number of times bigger the output is compared to the input, so if an amplifier has a gain of 10 and there is 1 volt on the input there will be 10 volts on the output. Before looking at how the feedback works, we first need to understand how a standard amplifier works. An operational amplifier has two inputs these are called the inverting (-) and non-inverting (+) inputs. The output of the operational amplifier is the voltage on the non-inverting input less the voltage on the inverting input multiplied by the amplifiers gain. In theory an operational amplifier has unlimited gain so if the non-inverting input is a fraction higher than the inverting input (there is more + than -) the output will go up to the supply voltage. Change the inputs around and the output will go to zero volts. In this format the operational amplifier is acting as a comparator, it compares the two inputs and changes the output accordingly.

With an infinite gain the amplifier is not good to amplify audio, which is where the feedback comes in. By making one of the inputs a percentage of the output the gain can be fixed, which allows the output to be a copy of the input but bigger. Now when the two inputs are compared and the output is adjusted, instead of it going up or down until it reaches 0 volts or $V+$, it stops at the point when the two inputs match and the output is at the required voltage.

Looking at the circuit diagram for the audio amplifier, R2 is the feedback resistor. For a standard (single ended) amplifier the gain would be calculated by $R2 / R1$, giving a gain of $100k / 15k = 6.66$. However this amplifier is a differential amplifier, which means the second output is an inverted version of the first output (see diagram below) and results in twice the gain, so the overall gain is 13.33



The rest of the components are needed as follows:

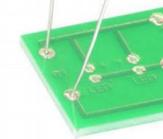
C1 is connected across the supply to make sure that it remains stable.

C2 forms a high pass filter, with R1, to block DC voltages which could damage the amplifier.

C3 provides a controlled start to the amplifier, to prevent speaker damage.

1 INSERT COMPONENT

Place the component into the board, making sure that it goes in the correct way around, and the part sits closely against the board. Bend the legs slightly to secure the part. Place the board so you can access the pads with a soldering iron.



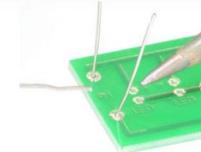
2 CLEAN SOLDERING IRON

Make sure the soldering iron has warmed up. If necessary use a brass soldering iron cleaner or damp sponge to clean the tip.



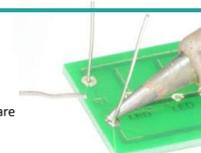
3 PICKUP IRON AND SOLDER

Pick up the Soldering iron in one hand, and the solder in the other hand.



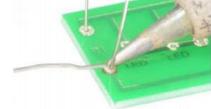
4 HEAT PAD

Place soldering iron tip on the pad.



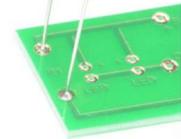
5 APPLY SOLDER

Feed a small amount of solder into the joint. The solder should melt on the pad and flow around the component leg.



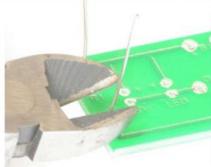
6 STOP SOLDERING

Remove the solder, and then remove the soldering iron.



7 TRIM EXCESS

Leave the joint to cool for a few seconds, then using a pair of cutters trim the excess component lead.

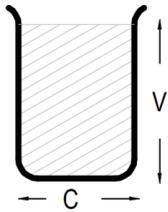


8 REPEAT

Repeat this process for each solder joint required.



What is a capacitor?

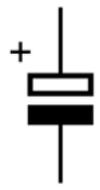
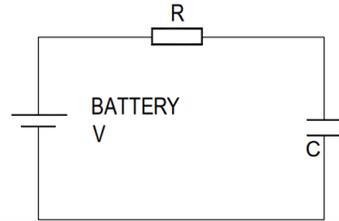
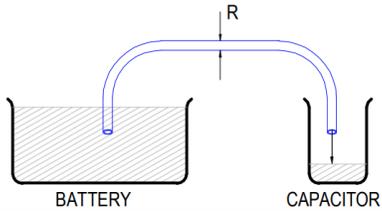


A capacitor is a component that can store electrical charge (electricity). In many ways, it is like a rechargeable battery.

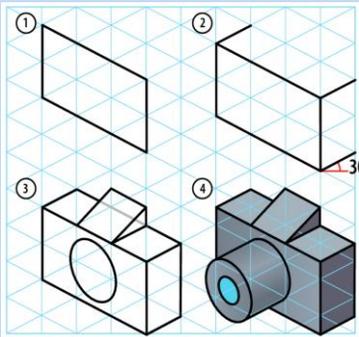
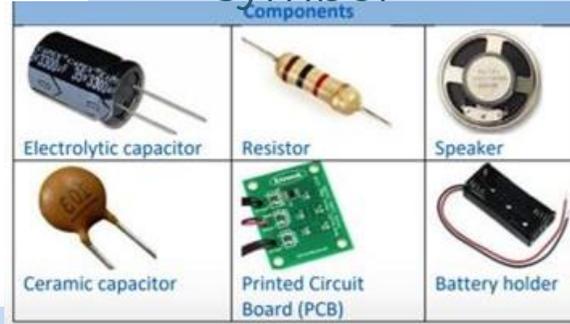
A good way to imagine a capacitor is as a bucket, where the size of the base of the bucket is equivalent to the capacitance (C) of the capacitor and the height of the bucket is equal to its voltage rating (V).

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



Capacitance
or
circuit
symbol



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.

Picture	Description	Voltage	Capacity	Estimated life	Max power
	Polymer Lithium Ion Cell	3.7 V	400 mAh	2 days	0.7 W
	Polymer Lithium Ion Cell	3.7 V	1000 mAh	5 days	0.7 W
	2x AAA	3V	1000 mAh	7 days	0.45W
	3x AAA	4.5 V	1000 mAh	4.5 days	1 W
	2X AA	3V	1500mAh	10 days	0.45W
	3x AA	4.5 V	1500 mAh	6 days	1 W
	3x C cell	4.5 V	3000 mAh	13 days	1 W

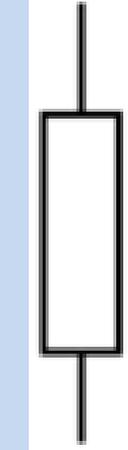
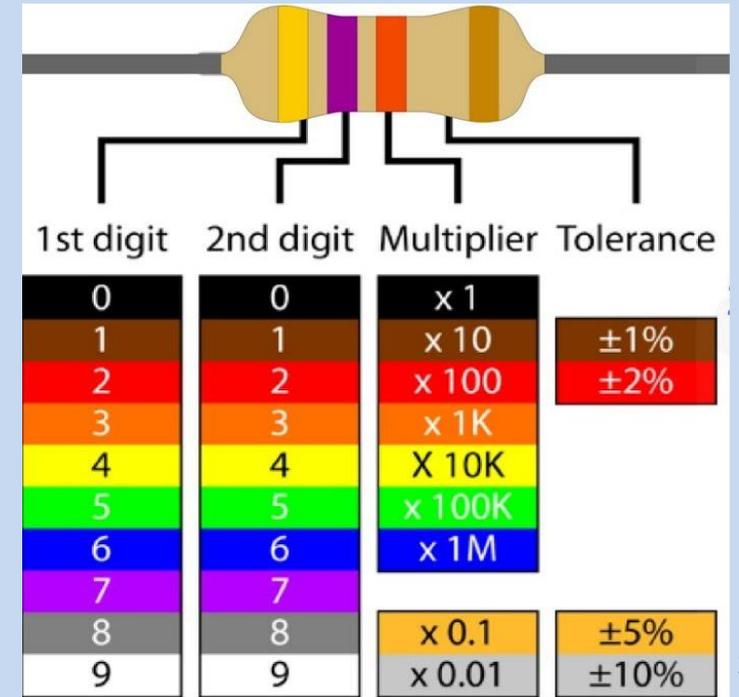
You will have to decide which of these is most important and select your choice of batteries accordingly:

- Compact case.
- Higher volume.
- Long battery life.

Please note that the estimated battery life has been calculated running the amplifier on standard alkaline batteries at full power, hence the higher power choices have a shorter battery life. Obviously if you don't run your MP3 player at the maximum volume, the batteries will last longer.

Resistor Values

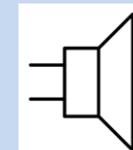
A resistor is a device that opposes the flow of electrical current. The bigger the value of a resistor, the more it opposes the current flow. The value of a resistor is given in Ω (ohms) and is often referred to as its 'resistance'.



Resistor
or
circuit
symbol

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



Speaker
circuit

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	<ul style="list-style-type: none"> 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		<ul style="list-style-type: none"> Holds a shelf or divider securely in the middle of a carcass (frame) Pairs well with corner lap joints 	<ul style="list-style-type: none"> 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		<ul style="list-style-type: none"> Looks good because no end grain shows Good for picture frames 	Weak, it is only a butt joint at 45°
Mortise and tenon		<ul style="list-style-type: none"> A strong joint Good for joining a table or chair frame to legs 	Time consuming to cut by hand
Dovetail		<ul style="list-style-type: none"> 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

Year 9 Design Technology Knowledge Organiser – Spatial and Interior Design:

Retail Store Design

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.

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 Raffiold
- Zoffany
- Sam Wilde



EXISTING STORE RESEARCH



Think **Different.**

Once you have chosen the brand you will be designing your store based upon it is vital to research their existing stores. This enables us to gain a clear knowledge and understanding of their branding choices which include colour palettes, concepts, materials and product displays.

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 .

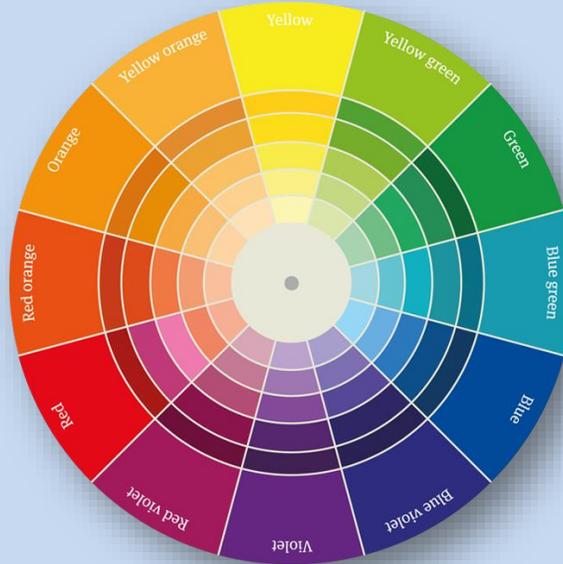
Which Brand will you choose?...



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.

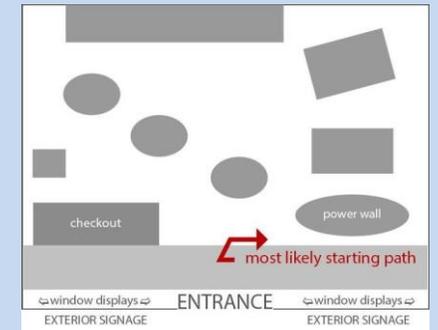
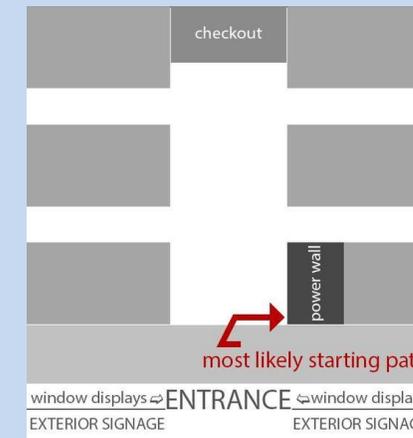
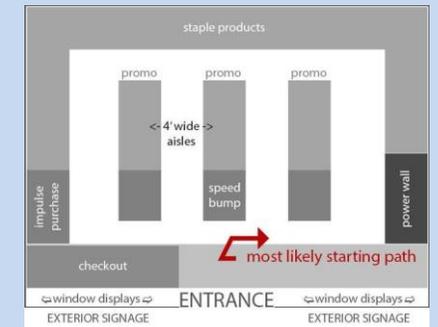


Interior Design Considerations in Retail Store Design

- 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

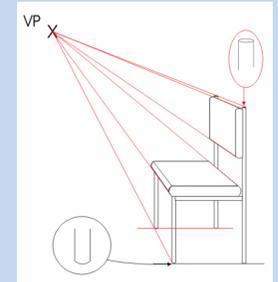
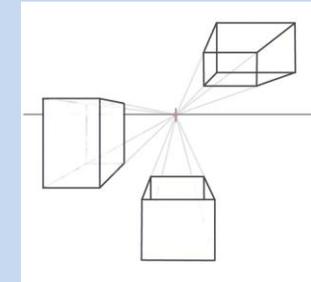


ORGANIC, NATURAL, WOOD, RUSTIC, COUNTRY



ONE POINT PERSPECTIVE

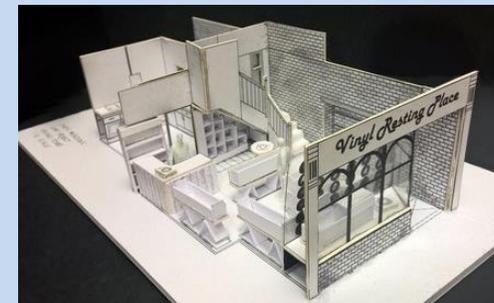
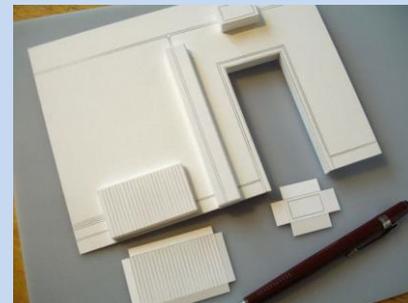
One point perspective is a drawing method that shows how things appear to get smaller as they get further away, converging towards a single 'vanishing point' on the horizon line. It is a way of drawing objects upon a flat piece of paper (or other drawing surface) so that they look three-dimensional and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



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.

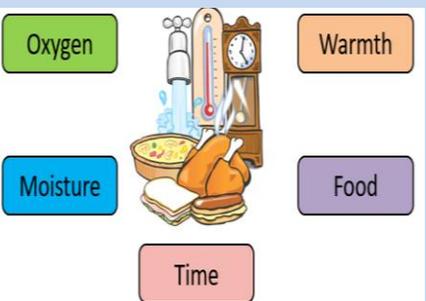
Micronutrients which are needed by the body in small amounts.

Macronutrients

Micronutrients

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.

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

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.

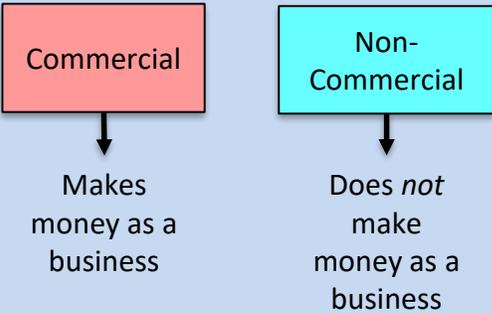
Cleaning – effective cleaning removes harmful bacteria and stops them spreading so ensure all work tops, utensils and equipment are cleaned thoroughly with hot soapy water.

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.

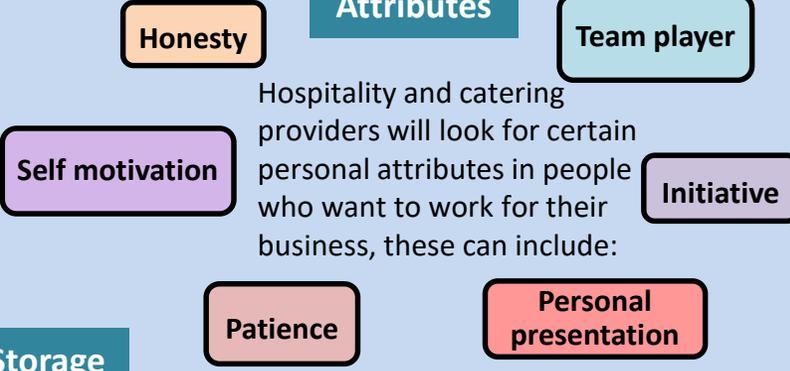
Cross contamination – Good hygiene practice prevents Cross contamination so when raw food comes into contact with ready to eat food. For example raw meat juices spilling onto salad.

Knowledge Organiser – Year 9 Food

Hospitality and Catering providers fall under two main categories



Personal Attributes



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

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

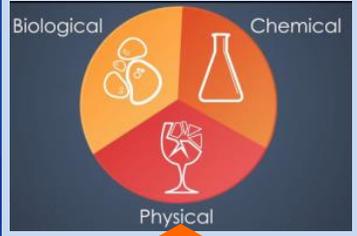
Fridge Storage

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.



Understand the 4 C's Concept

- C** – Good Hygiene practice prevents Cross Contamination
- C** – Effective Cleaning removes harmful bacteria and stops them spreading
- C** – Effective Chilling prevents harmful bacteria multiplying
- C** – Thorough Cooking kills bacteria



Allergies

Itchy skin, Swelling, Itchy mouth, Vomiting, Red rashes, Swollen throat

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

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.

Cramping gut, Diarrhoea, Bloating, Migraine

What are some of the symptoms?

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

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.	 <p>CAD Software</p>
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.	

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.	

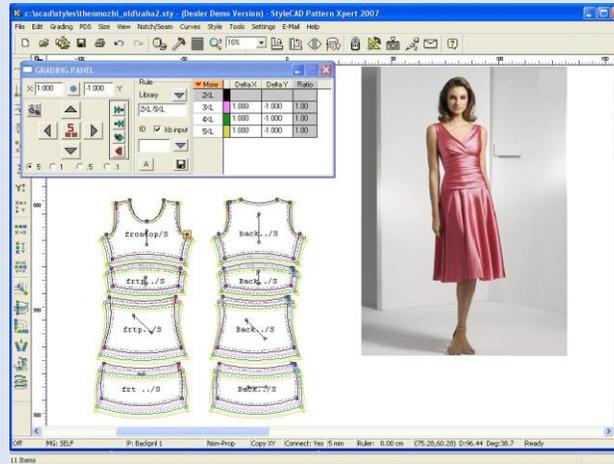
If you are designing products and they are made in another country you need to talk to the factory ALL the time.

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.

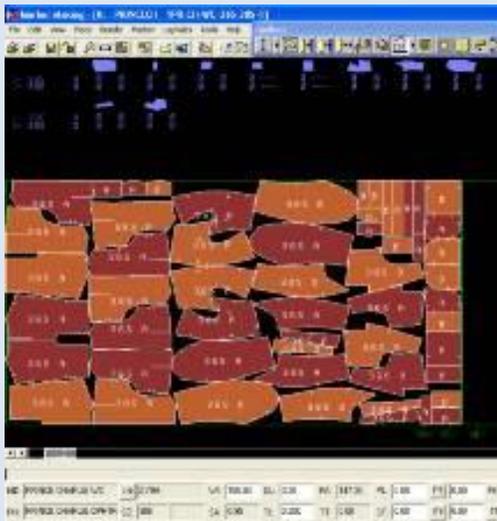


Cutting out of materials



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.

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.

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, medical 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.

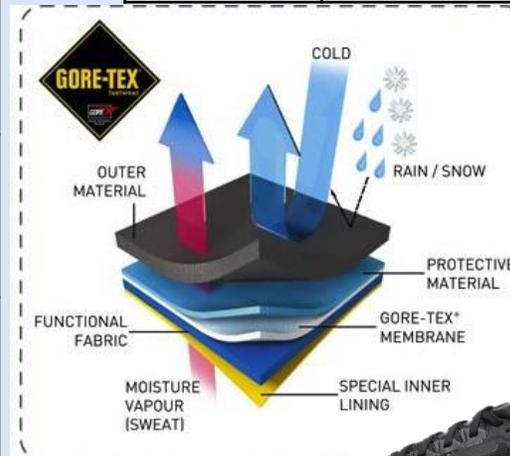
Technical textiles are textiles that have been developed with enhanced properties to withstand specific uses.

The function is vastly more important than the aesthetics.

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	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 terephthalamide	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.

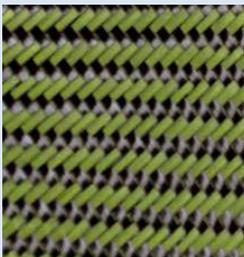
Name	Characteristics	Uses
Glass Reinforced Plastic (GRP)	Lightweight, good strength to weight ratio, good corrosion, chemical and heat resistance, waterproof, high VOCs/resins used. Can be trimmed with rotating blade. Labour intensive to produce.	Boat hulls, car and truck parts, liquid storage tanks, 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 metal 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 in between fulcrum and effort is called second class lever. e.g. nut cracker, wheel barrow, bottle opener	Lever in which effort is situated in between the fulcrum and the load is called third class lever. e.g. fishing rod, pair of tongs, stapler
<p>Scissor</p>	<p>Nut cracker</p>	<p>Pair of tongs</p>
<p>See-saw</p>	<p>Wheel barrow</p>	<p>Fishing rod</p>

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-Present)

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.



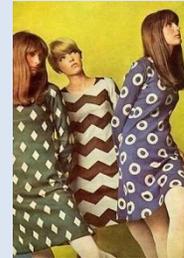
Coco Chanel (1883-1971)

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



Mary Quant (1934-Present)

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.



Alexander McQueen (1969-2010)

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



Harry Beck (1902-1974)

He redesigned the London Underground map in the 1930's. It's simplified layout made it a huge success and maps of many other transport networks now use Beck's style.



Marcel Breuer (1902-1981)

A modernist architect and furniture designer. Some of his best works include- tubular steel furniture and concrete sculpted buildings.



Norman Foster (1935-Present)

Architect famous for creating the Millennium Bridge, Gherkin London and Wembley Stadium.



William Morris (1834-1896)

A wallpaper, furniture and furnishings designer. His designs were often based on nature.



Aldo Rossi (1931-1997)

An architect who published work on architectural theory. He also worked for the company Alessi.

