The Trafalgar School at Downton

Knowledge Organiser

Year 9: Terms 5 and 6

Contents

Name……House……

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.	

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”.

Fortnightly Writing Challenge: TITLE

Methods to include:

Here you will find details about the actual task.
You will need to read this carefully as it will provide clues about what you need to do in your writing lesson.

Here you will find some challenges – these are skills that we would like you to include.

These will be colour coded and, if you click on them, they will take you to another slide explaining the technique and giving you some examples.

Every Week B, you will have a FWC ppt loaded to your google classroom. Your homework is to ensure that you practise the skills/methods ready for your writing lesson in Week A.

Here you will find an image. Sometimes, the image will be to illustrate or contextualise your task. For some tasks, the image will be part of the writing challenge.

Don't forget to plan writing!

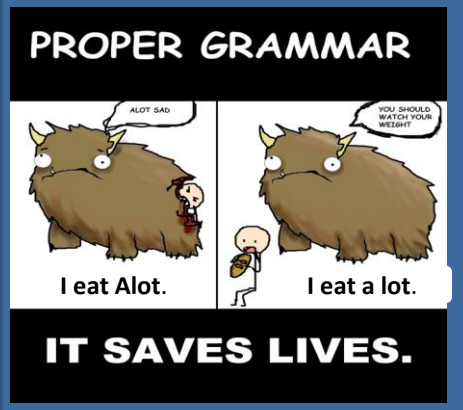
Here you will find information to help you during your writing session. There will be prompts so you do not forget the important things – full stops, capital letters, paragraphs etc

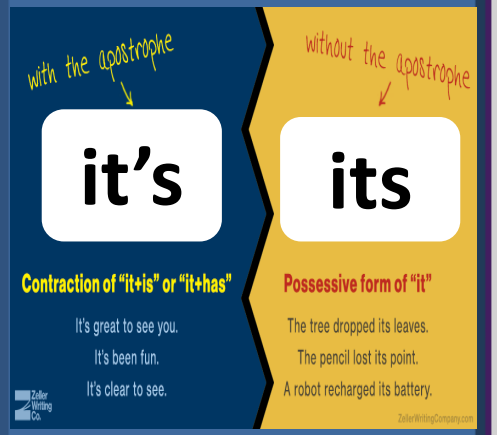
Homophones

- **there**: I'd love to go **there**.
  their: Is that **their** cat?
  they're (they are): **They're** late.
- **to**: I'm going **to** work.
  too: I've had **too** much to eat!
  two: I have **two** hands.
- **no**: We have **no** chance.
  know: How do you **know** that?
- **your**: What's **your** name?
  you're (you are): **You're** not alone.
- **new**: She has a **new** phone.
  knew: I already **knew** that.
- **which**: **Which** colour do you like?
  witch: She was a wicked **witch**.
- **of**: Please have a piece **of** pie.
  off: Get **off** the grass!
- **where**: **Where** are you going?
  wear: What should I **wear**?
  were (was): **Were** you joking?
- **our**: I want **our team to win!**
  are: When **are** you home?
- **here**: Please come back **here**.
- **hear**: Can you **hear** the birds?

Use *lie* to indicate the act of reclining: I am tired just watching the dog *lie* in the warm sunlight.
(to lie: lie(s), lay, lain, lying)

Use *lay* to indicate the placement of something: Please *lay* the paper on the table.
(to lay: lay(s), laid, laid, laying)





FORTNIGHTLY WRITING CHALLENGE

Language Methods to Practise in your Fortnightly Writing Challenge

ALLITERATION:	**You'll never put a better bit of butter on your knife**
ANECDOTE:	**Talking to his children about the dangers of running in the house, a dad might include an anecdote about falling and breaking his arm.**
ANTITHESIS:	That's one small step for man, but a giant leap for mankind.
CHIASMUS:	**'Let us never negotiate out of fear, but let us never fear to negotiate.'**
EXPERTS:	'Group chat can often be a source of upset,' warned psychologist Dr Linda Pappadopolis.
EXTENDED METAPHOR:	*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.
FORESHADOWING:	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'.
IMPERATIVE VERBS:	Chill out! Do as I say! Don't eat the daisies! Please be quiet! Be quiet!
METAPHOR:	**'The sun in the west was a drop of burning gold that slid near and nearer the sill of the world.'**
MODAL VERB:	You must be home by midnight. You could be tired if you're any later. You should ring your uncle. E.g. mustn't, can, might, shouldn't, may, will
PATHETIC FALLACY	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.'
SENSORY DESCRIPTION:	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.**
SIMILE:	**Without warning, Lionel gave one of his tight little sneezes: it sounded like a bullet fired through a silencer.**
STATISTICS:	You have a 20% chance of surviving a 60mph crash if you don't wear a seatbelt!
SUPERLATIVE:	This is the **worst** day of my life but at least we're in the **finest** café in London.
ONOMATOPOEIA:	**The dog knocked over the vase with a crash!**
PERSONIFICATION:	**Dancing on the water, the sun shone endlessly.**
REPETITION:	**'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.'**

FORTNIGHTLY WRITING CHALLENGE

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, 'don't expect me before 11.'

Mrs Smith replied, 'What time?'

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, excitement, anger, 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?'
'Oh! When are you going?'
'Ouch! That hurt.'

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.
Interesting, David's house does not have a garden, but Sarah'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 pillow — in a mighty clay oven.

Paul was scared – more scared 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 …

FORTNIGHTLY WRITING CHALLENGE

Writing the text for a leaflet

Stay Safe and Sound Online

clear/apt/original title

Manage your online reputation

subtitles

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

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.

....

Remember:

bullet points

- 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;

Dystopian Narrative:

***The Machine Stops* by E.M. Forster**

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

"Kuno!"

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

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

His image faded.

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

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

Writing Forms 1

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.

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, a colour of burnt copper – and were battered and bruised through years of exposure to the elements.

Metaphor, simile, personification

sensory description

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

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, feeling its way through the cracks in windows and doors, stroking the upholstery of the rotting seat as it passed.

sensory description

spatial discourse markers

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

Writing a formal letter

Writing Forms 2

writer's address

35 Hibiscus Crescent
Andover
Hants
SP10 3WE

221B Bakers Street
London
NW1 6XE

reader's address

date

20th February, 2020

Dear Sir or Madam

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

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

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

Furthermore, ...

Yours faithfully
Sherlock Holmes

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

fluently sequenced paragraphs

fluently sequenced paragraphs

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.'

Thank you.

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

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!

introductory (overview) paragraph

sub-headings

Sample Check

Today, before he even steps out on to the Centre Court for his Wimbledo huge-hitting Pole Jerzy Janowicz, Murray w ve been subject to several of these. He does time he pops to lavatory. The osmolar eck is conducted by one of his staff, its purpose to gaug the percent ater and m s in his urine, to show whether his body is correctly hydrated. The fact is, if Murray wins to y be thanks to the bloke who inspects his wee.

fluently sequenced paragraphs

Daily Diet

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

fluently sequenced paragraphs

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 th mals suffer outweighs this benefit, and that they should be shut down!

effectively/fluently linked paragraphs to sequence a range of ideas

On the surface, z huge tourist attraction because they allow families to spend a day out in the sun, looking a 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 pe le with the experience of observing wildlife they wouldn't otherwise experience, when it s 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 owing thousands of people per day to gawk at animals and spend far too much money 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

FORTNIGHTLY WRITING CHALLENGE

BEST FOR PLANNING NARRATIVES (STORIES).

HOW TO PREPARE AND PLAN EFFECTIVELY

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.

F: Letter
A: Headmaster
P: Argue change uniform

P1

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

P2

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?

P3

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

F = FORM
A = AUDIENCE
P = PURPOSE

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

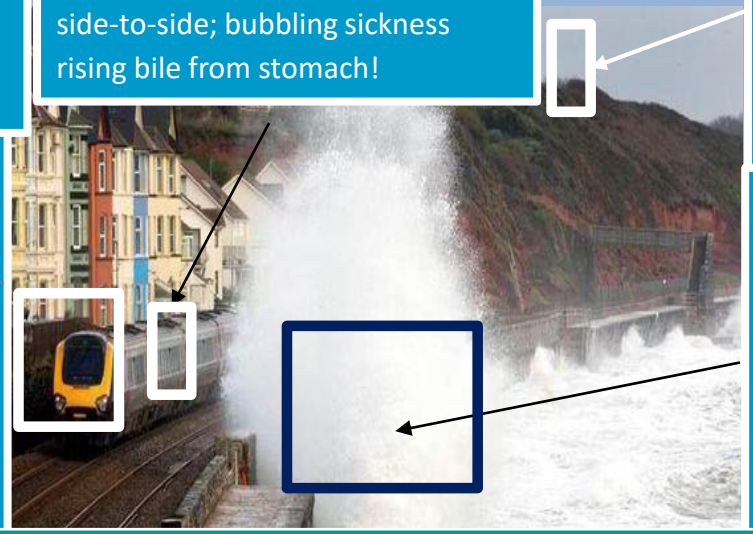
Best for planning descriptions from a picture: Boxing/framing sections of a picture forces you to focus your description on specific areas within the image, zooming in on specific detail and then out again to focus on another area. Each boxed area = a paragraph

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

zoom in on one carriage window, motion sick. Windows hit by spray that 'like a tamed cat' has 'turned savage' today. Passenger pitched side-to-side; bubbling sickness rising bile from stomach!

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

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?



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

1. introduction: Here you will find everything you need to know about buying a goldfish. Follow this advice to
2. First of all, research fish needs and best fish breeds for starters
3. Next, decide where to put … bedroom could be best habitat for your fish because … However , it might be better to …
4. After this, it's back to the research. Make a list of … Don't …. Do …

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

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

Paragraph content/topic	Language method/vocab	Sent struc	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 cat' 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	… ;

READING LITERARY FICTION TEXTS

KEY THINGS TO CONSIDER ABOUT THE SOURCE TEXT YOU ARE GIVEN…

Genre: What type of story is it? Is it horror? Romance? A mystery? What makes you recognise it as that genre? Which conventions does the story include that make it fit into that genre? Why has the writer chosen this genre?
Reader: How is a reader supposed to respond to this text? Are they meant to be scared? Happy? Confused? How does the writer achieve this? What would you say was the writer's **intention**?
Atmosphere: What type of mood or tone does the writer create in their story? How do they achieve it?
Characters: Which characters are named? What are they called? Which characters are **not** named? Why might this be? Why might their names by important?
Description of character: How are the characters described? What does this information reveal to us about them?
Dialogue: Do characters speak to each other? Why? Why do they talk about? What does this tell us about character, theme or plot? What do characters say about each other? How might this influence a reader?
Archetypes: What **types** of characters do we have in this story? Villains? Heroes? Antiheroes? Comedic characters?
Description of setting: How is the setting described? Why is this important? Is the setting as important as character?

PACE AND TONE – HOW SENTENCES HAVE AN IMPACT ON THE READER…

- **Sometimes students can feel a little confused when asked to consider 'sentence forms', but there is an easier way to look at them. Every writer wants to establish a pace and a tone to their writing. Pace is how fast or slow a text is meant to be read, and tone is the kind of sound or mood you want to give to a piece of writing.**
- **If you use lots of short sentences together it can build tension, but it can also speed up a text as a reader becomes more desperate to find out what happens as tension builds. Alternatively short sentences can make a reader stop and reflect on specific ideas.**
- **Longer, more complex sentence forms can be used to aid description or to help a reader build up an understanding of setting or character.**
- **So whenever you read a text, think about what kind of tone and pace is created and how the writer uses sentences to achieve that effect on the reader.**

LANGUAGE FEATURES
Pronouns
Direct speech
Terms of address
Noun phrase
Subordinate/ main cause
Narrative voice
Simple/compound/complex sentences
Accent /Dialect
Utterances
Ellipsis
1st/3rd person
Hyperbole
Imperatives
Exclamations

Make sure you learn these key terms and understand what they mean

YR 9 READIMG UNSEEN TEXTS

KNOW YOUR BASICS!
Noun/verb/adverb/adjective/simile/metaphor/question /alliteration/ onomatopoeia/5

STRETCH YOURSELF! Look at the bigger picture – not just individual quotes/ Consider genre and form/narrative voice/use terms: implies/ illustrates

READING LITERARY FICTION TEXTS

How does the writer use **LANGUAGE** to…..?

To answer: Read and highlight key words in the question

'Analysis of Language' means you **must** write about **SYMBOLISM**

Pick your quotations **first** then consider devices

- ❑ **CONTRAST** is the number 1/most important language technique – it is <u>always</u> in all good writing/extracts – so always look for & comment on it – *e.g. Light/dark; small/big; 1 person/crowds of people; day/night; etc…*
- ❑ **There are 10 key terms to learn for writing about language:**
- ❑ **Imagery =** Simile, metaphor, personification, & alliteration
- ❑ Nouns, verbs, adverbs & adjectives
- ❑ **Motif** – repeated images or patterns – often colours or ideas – freedom/flight/light

- ❑ And use the phrase ***'perhaps…'*** (allows you to speculate & offer alternative ideas)
- ❑ And also the phrases: ***'the effect of this is…'*** & ***'the effect of the motif is…'*** (don't be afraid of sounding repetitive, the marks here are for your comments on the 'effect' of language…not for style!)
- ❑ And there will usually be at least one complex sentence used as a list – try to find this and refer to it – this will be the only comment on sentence forms you need to make.

Top tip: Pick out individual words afterwards and discuss their effect (not meaning). When you pick out a word/device <u>underline</u> it – so the examiner knows you know which word is the 'verb' etc. Track through the extract from start to finish.

LANGUAGE FEATURES … YOU SIMPLY NEED TO LEARN THESE!	
IMAGERY	**Imagery** is language used by writers to create images in the mind of the reader. **Imagery** includes figurative and metaphorical language to improve the reader's experience & understanding through their senses. E.g. simile, metaphor, personification & alliteration
SIMILE	Similes help readers to picture a particular object, person or place by **comparing something they don't know to something they do**. They can also be used for **exaggeration.**
METAPHOR	Metaphors help readers to picture a particular object or place by **transforming them into something they understand better**. They can also be used for **exaggeration.**
PERSONIFICATION	Personification gives inanimate objects a sense of life or human characteristics
ALLITERATION	Alliteration creates a memorable sound in the readers' head that means they notice that particular line more or they can remember it quite well. **This means it can be used to emphasise a particular point, idea or feeling**.
NOUNS AND VERBS	Nouns are people, places or objects. Verbs are actions or 'doing words'. **Both can be used carefully to evoke or give off certain emotions or feelings.**
ADJECTIVES AND ADVERBS	Adjectives are words that **describe <u>nouns</u>.** Adverbs are words that describe **verbs.** These are both used to add to **descriptions** and help **build specific images or feelings in the readers' heads.**
MOTIF	A motif is **a symbolic image or idea that appears repeatedly** in a piece of writing. Motifs can be symbols, sounds, actions, ideas, or words. Motifs are used to give subtle clues or reminders about a theme present throughout the writing.

These are used to have the same effects in all writing

YR 9 READIMG UNSEEN TEXTS

READING LITERARY FICTION TEXTS

MAKE SURE YOU HAVE SOME HIGHLIGHTERS!
USE A DIFFERENT COLOUR TO HIGHLIGHT THE INFORMATION FOR DIFFERENT QUESTIONS

How far do you agree with a statement about the text?

To answer: Read and highlight key words in the question

Two stages: recognising **how** the writer tries to achieve effects and deciding **how effectively** this has been done.

- ❑ The best answers *mostly* agree with the statement
- ❑ "I agree with … except when …"
- ❑ **CONTRAST** – how does the writer use this? (it will always be there)
- ❑ Narrative voice – Who is talking? 1st 2nd/3rd person - Why this person/viewpoint?
- ❑ Use this phrase to frame your answer: ***The writer uses …***
- ❑ Then add: ***… the word/phrase/personification/metaphor/simile/alliteration…***
- ❑ Then add: **… a quotation**
- ❑ Then add: … t***his method shows that/suggests/implies …***
- ❑ End by evaluating: ***although/however/but …***
- ❑ Then: **repeat** until you run out of time (literally repeat the above frame)

How has the writer **STRUCTURED** the text to…?

To answer: Read and highlight key words in the question

At the end, write a 3 line summary of what you've said about structure

NOT LANGUAGE …JUST STRUCTURE

The 5Cs of structure [+ HOW & WHY]

- ❑ **Construction** – how has the writer 'built' the text? Is it simply ***chronological*** or more ***complex*** – flashbacks, single/multiple narratives, repetition, patterns, motifs…
- ❑ **Contrast** = again, no.1 structural technique…it will always be there so learn what to say about it! Light/dark; small/big; 1 person/crowds of people; day/night; etc…
- ❑ **Camera / Cinema** – imagine this is a film - where are we positioned? What do we see?
- ❑ **Circular** = means we start & end in a similar place but something has changed – what?
- ❑ **Changes** = paragraphs! Look at each para – **how** has it changed? **why** has it changed? [TiPToP]
- ❑ Summary statement = one sentence overview of how the structure changes across the text
- ❑ Always write about the ending
- ❑ Check you've commented on each change of focus/perspective/paragraph
- ❑ Consider **coherence**, (connections and links across paragraphs, links within paragraphs, topic sentences.)

STRUCTURE
Narrative perspective/voice
Flash-forward/ Flash-back
Dialogue
Topic sentence
Discourse markers
Ellipsis
Foreshadowing
Focus/Narrowing
Contrast/ juxtaposition

Top Tip: Comment on the writer's techniques like a film maker using phrases like: focusing, zooming, narrowing, widening, introducing, developing, changing focus, concluding, foreshadowing, contrasting. E.G. 'We start to see things through the father's eyes as if we are searching with him' or 'We zoom-in to a close-up focus as if we are getting inside the father's mind'

READING LITERARY NON-FICTION TEXTS

BEFORE YOU BEGIN READING, ALWAYS READ THE SUMMARY INFORMATION ABOUT THE TEXT

You are trying to show you can identify the techniques the writer has used and the effect these have on the reader. HOW the writer has constructed the text. WHAT you think their intention was and WHY.

How does the writer use **LANGUAGE** to… (in a single text)

writing a lot about a little

T E E

HOW TO DO THIS:

MAKE SURE YOU HAVE SOME HIGHLIGHTERS!

- ❑ **Read the text first**
- ❑ Highlight key words in the question – what specific focus are you being asked to identify?
- ❑ Read the text again and highlight any techniques you find – these can be words or sentences
- ❑ Start your answer with an **overview sentence that includes the technique** you have spotted, E.g. *"The writer uses personification …"*
- ❑ Then add **evidence** = a **short quotation**,
- ❑ followed by the specific **effect of the technique** (how does it guide/influence the reader?)
- ❑ **Don't just do this once** - identify as many TEEs [techniques/evidence/effect] as you can identify or write about in the time you have
- ❑ Write **a lot about a little** - e.g. *"The writer uses personification in the phrase, 'Death stood at my bedside,' to create an intense feeling of fear for the reader, suggesting the writer felt death was imminent; it was a threatening being, about to take his life."*

TECHNIQUE: personification

EVIDENCE: quotation shows use of personification– Death is standing

EFFECT: explain why the writer uses this technique + how it works – Be specific…DON'T just generally say what the technique means

Example:

"The writer uses personification in the phrase, 'Death stood at my bedside,' to create an intense feeling of fear for the reader, suggesting the writer felt death was imminent; it was a threatening being, about to take his life."

T E E

TECHNIQUE EVIDENCE EFFECT

Learn the following techniques
Personification
Giving inanimate objects human or lifelike qualities
Adjectives/adjectival phrases
Descriptions chosen to create a bias or influence a viewpoint
Lexical Field
Words linked to a topic share the same 'lexical field'
Semantic Field
Words with a similar meaning share the same 'semantic field'
Colloquialisms
Commonly used alternatives to standard language
Tone/Register
This could be humorous, formal, self-deprecating, sceptical, sarcastic, ironic…

YR 9 READIMG UNSEEN TEXTS

COMPARING LITERARY NON-FICTION TEXTS

BEFORE YOU BEGIN READING, ALWAYS READ THE SUMMARY INFORMATION ABOUT BOTH TEXTS – THEY GIVE YOU CLUES.

THEN SUMMARISE EACH TEXT – what is the purpose, audience & form of each?

You are trying to show you can identify the techniques the writers have used

…and understand HOW they are different or similar.

WHAT have they both done?

WHAT have they done differently? WHY?

WHICH do you think is the most effective? Think CONTRAST

ALWAYS CALL THE WRITERS BY THEIR SURNAMES

MAKE SURE YOU HAVE SOME HIGHLIGHTERS! USE A DIFFERENT COLOUR TO HIGHLIGHT THE INFORMATION FOR EACH QUESTION IN SECTION A

Compare DIFFERENCES in LANGUAGE in two texts (how does each writer present/convey their ideas or try to convince/persuade the reader?)

HOW TO DO THIS:

- ❑ **Read both texts**
- ❑ highlight key words in the question – what specific focus are you being asked to identify?
- ❑ Start with an **overview sentence** stating the main **difference** in the language each writer has used. E.g. The writer of Source A believes that…, whereas the writer of Source B is saying…
- ❑ Then compare the differences in the **writers' viewpoints** using **short** quotations and stating **specific effects.** E.g. For example, *"The writer of Source A uses expert opinion … QUOTE … to demonstrate that … , however, the writer of Source B uses statistics … QUOTE … to back up their argument. The **effect** on the audience is similar as both add weight to the arguments the writers are putting forward and convince their audience of their standpoint."*
- ❑ Go back and forth between the texts. Use **comparison words or phrases** = *Likewise, Similarly, In the same way…, Different to…, Unlike…, In contrast……., However…, etc.*

Techniques identified

EFFECT: explains why the writer uses these techniques + how they both have a similar effect on the reader

"The writer of Source A uses expert opinion … QUOTE … to demonstrate that … , however, the writer of Source B uses statistics … QUOTE … to back up their argument. The effect on the audience is similar as both add weight to the arguments the writers are putting forward and convince their audience of their standpoint."

APE FOR REST

- ANECDOTE
- PERSONAL PRONOUNS
- EMOTIVE LANGUAGE
- FACTS
- OPINIONS
- RHETORICAL QUESTIONS
- REPETITION
- EXPERTS
- STATISTICS
- TRIPLETS

A good general awareness of the 19thC will really help you here - the most common themes include: Poverty, education, class & equality

YR 9 READING UNSEEN TEXTS

SUMMARISING LITERARY NON-FICTION TEXTS

BEFORE YOU BEGIN READING, ALWAYS READ THE SUMMARY INFORMATION ABOUT BOTH TEXTS – THEY GIVE YOU CLUES.
THEN SUMMARISE EACH TEXT – what is the purpose, audience & form of each?...there may be some easy points to make here!
You are trying to show you understand WHAT each text is about and HOW they are different or similar.
The differences will usually be based on the writers' attitudes towards the same topic – recognising tone will be very useful
START BY…listing what each text is about – and then highlight the differences between the two texts/writers' attitudes
Then…put the differences in order of importance and use the biggest or most important difference first

Write a **SUMMARY** of the **DIFFERENCES** between Source A and Source B (focus will be on the attitudes of the writers towards a subject)

- ❑ **Read both texts**
- ❑ highlight key words in the question and any useful clues from the info for each text – e.g. when it was written
- ❑ **Always start with the following sentence: "*There are similar attitudes about _____ in the two extracts but they have a different emphasis.*"** This will fit any Q and you can **learn it** to get you started.
- ❑ Select a quotation from the older text first and explain what it shows by using ***"so"*** or ***"which suggests/implies"***
- ❑ Link to the second text with a **connective**: e.g. ***while…whereas…in contrast…on the other hand…***
- ❑ Say how it is different in the other extract…
- ❑ Quote from the other extract and explain what this shows using ***"so"*** or ***"which suggests/implies"***
- ❑ Repeat these steps with each difference…or until you run out of time
- ❑ For top marks - try to find the less obvious differences or link up several under the same point
- ❑ E.g. "Firstly, the differences between Eddie and Henry are vast as Henry's experience of school is much harsher than Eddie's; we can see this when Henry complains about not being able to write freely as Mr. Smith, 'would flog me if he knew it.' This is in contrast to…"

E.g. "There are similar attitudes about school in the two extracts but they have a different emphasis. The tone in Source A is very negative 'Mr. Smith…would flog me if he knew it.' which suggests that Henry's experience of school is very harsh. In contrast, in Source B, Eddie's experience of school is much more fair; we can see this when Eddie says…Quotation…which implies that schools have become nicer places since Source A was written in 1895…"

POSSIBLE LAYOUTS/TYPES OF TEXT/FORMATS

Letter	❑the use of addresses & date ❑formal e.g. Dear Sir/Madam or a named recipient ❑fluently sequenced paragraphs ❑appropriate sign off: Yours sincerely/faithfully.	Speech	❑clear address to an audience ❑fluently linked sections to indicate sequence ❑rhetorical devices ❑a clear sign off e.g. 'Thank you for listening'.
Article	❑Broadsheet = formal/Local or tabloid = informal ❑a strapline & subheadings ❑an introductory (overview) paragraph ❑fluently sequenced paragraphs.	Leaflet	❑a clear/apt/original title ❑organisational devices – subheadings/boxes ❑bullet points ❑fluently sequenced paragraphs.

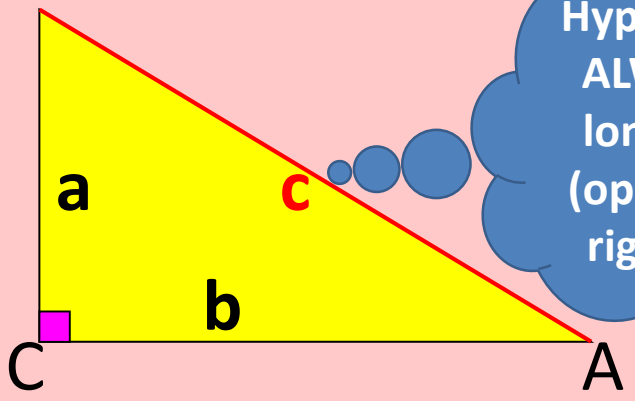
YR 9 READING UNSEEN TEXTS

Year 9 Maths Term 5/6 Pythagoras' Theorem

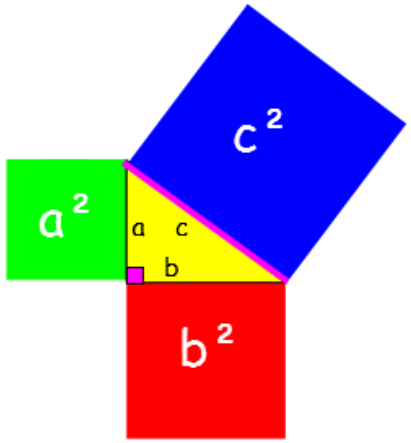
Pythagoras' Theorem states that for right angled triangles, the sum of the squares of the two shorter sides is equal to the square of the hypotenuse

Hegarty : 497 - 507

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



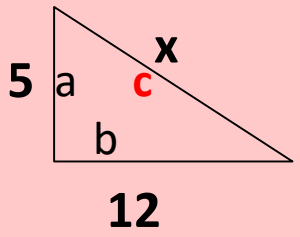
Hypotenuse is ALWAYS the longest side (opposite the right angle)



Hegarty : 501 - 507

Finding the hypotenuse

Hegarty : 498



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

$x^2 = 5^2 + 12^2$

$x^2 = 25 + 144$

$x^2 = 169$

$x = \sqrt{169}$

$x = 13$

Pythagorean Triples are 3 integers that follow the Pythagorean rule e.g.

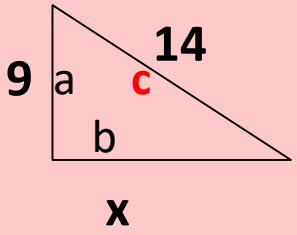
3,4,5 **5,12,13** **7,24,25**

and any multiples of these triples e.g.

6,8,10 15,36,39, 14,120,125

Finding a shorter side

Hegarty : 499



Find x

All lengths in cm

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

Rearrange for shorter side

$b^2 = c^2 - a^2$

$x^2 = 14^2 - 9^2$

$x^2 = 196 - 81$

$x^2 = 115$

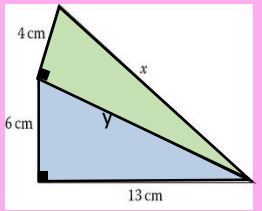
$x = \sqrt{115}$

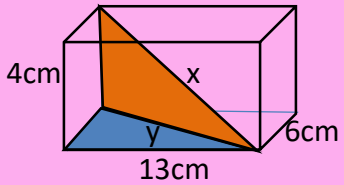
$x = 10.72380....$

$x = 10.7$ cm (3 sf)

Remember to give degree of accuracy of rounding and **UNITS** of measure when needed.

Problems Solving: Pythagoras in 3D





Find the interim hypotenuse:

$c^2 = a^2+b^2 \rightarrow$ $y^2 = 13^2+6^2$

$y^2 = 169+36 = \mathbf{205}$

No need to find value of y as it is y^2 that will be used in next calculation!

Find the wanted hypotenuse:

$c^2 = a^2+b^2 \rightarrow$ $x^2 = \mathbf{y^2}+4^2$

$x^2 = \mathbf{205}+16 = 221$

$x = \sqrt{221} = 14.866....$

$x = 14.9$ cm (3sig fig)

Summary 3D Formula: $d^2 = a^2+b^2+c^2$

Year 9 Maths Term 5/6 Basic Trigonometry (in right angled triangles)

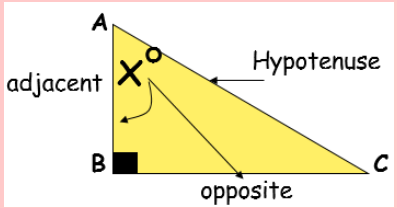
Hegarty : 508 - 515

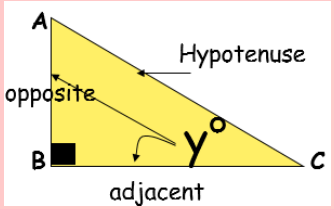
Understanding Trigonometry

Trigonometry enables us to find **missing angles and sides in right angled triangles** because the ratios between different sides of a right angled triangle will be the same for all similar triangles (with the same angles).

Trigonometry Notation

For any right angled triangle ABC:
The **HYPOTENUSE** is ALWAYS the LONGEST SIDE
The **other sides are named according to where they are in relation to the angle**
The **OPPOSITE** side is OPPOSITE the ANGLE known/wanted
The **ADJACENT** side is NEXT TO the ANGLE known/wanted





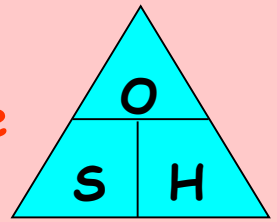
Pythagoras or Trigonometry?: Pythagoras only deals with sides; Trigonometry MUST INVOLVE AN ANGLE

A common way to remember the ratios is: **"SOH CAH TOA"**.... but make up your own mnemonic to remember the order of letters e.g. from one former pupil: "sunny on holiday, cloudy at home, today only average!"

Sine Ratio

$$\sin \delta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

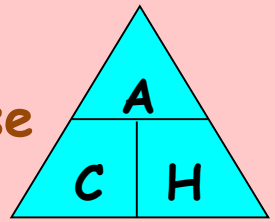
Finding angle ⇨ $\sin^{-1}\left(\frac{o}{h}\right)$



Cosine Ratio

$$\cos \delta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

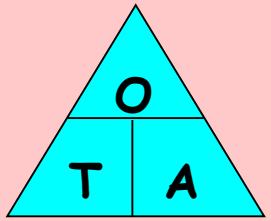
Finding angle ⇨ $\cos^{-1}\left(\frac{a}{h}\right)$



Tangent Ratio

$$\tan \delta = \frac{\text{Opposite}}{\text{Adjacent}}$$

Finding angle ⇨ $\tan^{-1}\left(\frac{o}{a}\right)$



METHOD

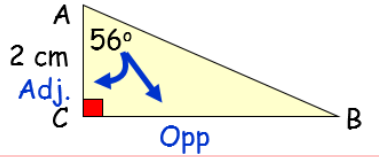
STEP 1: Label the sides you need or know (only 2 out of the 3!)
Remember to label according to the known/wanted angle

STEP 2: Identify the trig ratio needed from the sides involved

STEP 3: Draw out the required calculation triangle
Cross out the item you need to find

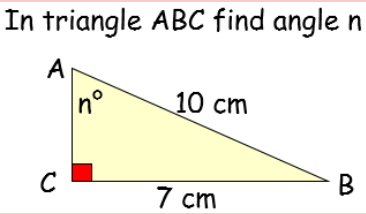
STEP 4: Write down the required calculation – times or divide?

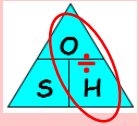
In triangle ABC find side CB



CB = tan(56) x 2
= 2.965...
= 2.97cm s(3sf)

In triangle ABC find angle n



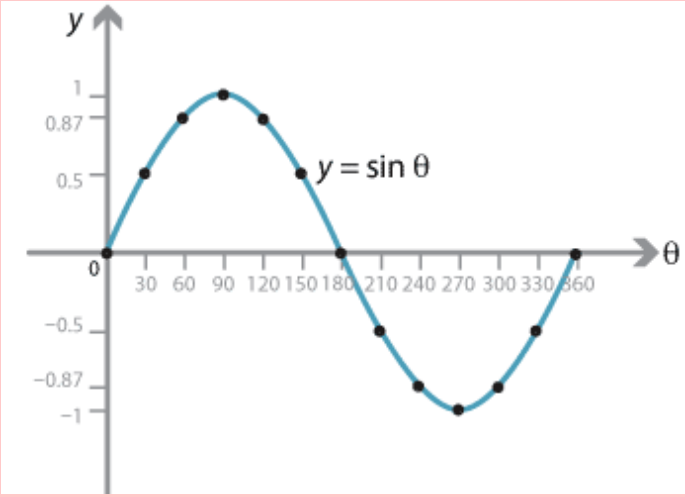


Angle n = $\sin^{-1}\left(\frac{7}{10}\right)$
= 44.427....
= 44° (nr°)

Year 9 Maths Term 5/6 - Trigonometric Graphs

Hegarty : 303 - 306

Sine Graph



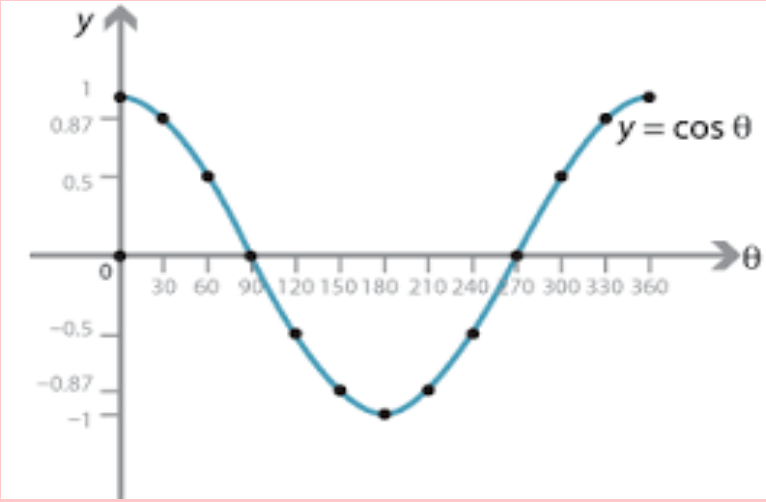
Minimum value -1 Maximum value +1

Lines of symmetry at 90° and 270°

Pattern repeats every 360° so within every 360° there are 2 angles with same sine ratio

e.g. $\sin^{-1}(½) = 30°$ AND $150°$

Cosine Graph



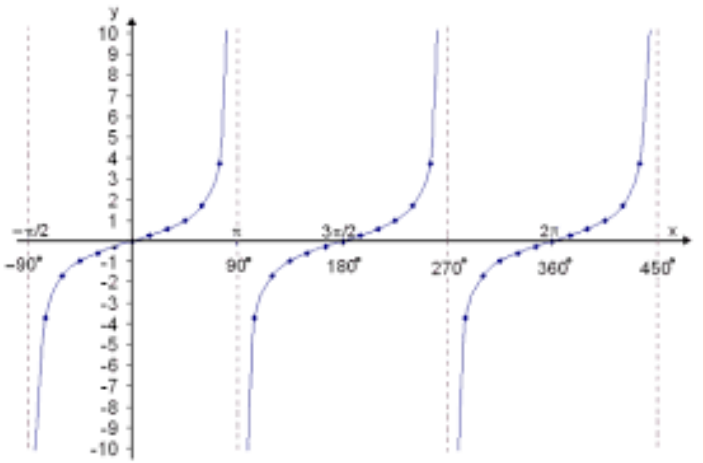
Minimum value -1 Maximum value +1

Lines of symmetry at 180°

Pattern repeats every 360° so within every 360° there are 2 angles with same cos ratio

e.g. $\cos^{-1}(-½) = 120°$ AND $150°$

Tangent Graph



Minimum value -∞ Maximum value +∞

Asymptotes at 90° and 270° - no tan value for these angles.

Pattern repeats every 180° so within every 360° there are 2 angles with same tan ratio

e.g. $\tan^{-1}(1) = 45°$ AND $(45+180=)\ 225°$

Exact Values:

Some trigonometric values need to be learnt BY HEART

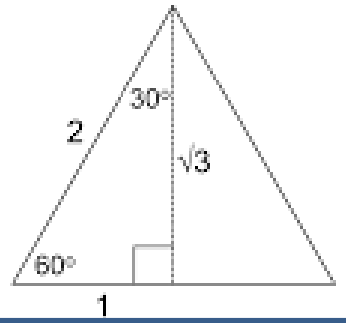
Exact Values of Trigonometric Functions

Angle (θ) Degrees	0°	30°	45°	60°	90°
$\sin(\theta)$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\cos(\theta)$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\tan(\theta)$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not Defined

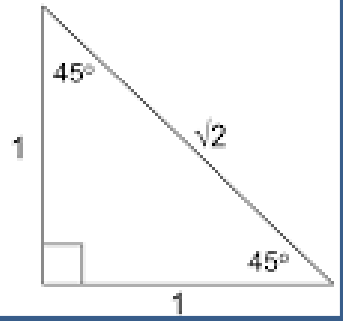
Exact trig values can be calculated using properties and known angles in a "unit" equilateral triangle (60° and 30°) and a right angled isosceles triangle (45°) - Pythagoras is applied to find the 3rd side….

two famous triangles

an equilateral triangle



an isosceles, right-angled triangle



Year 9 Maths Term 5/6 -Trigonometry in non-right angled triangles ("wonky trig")

Hegarty : 516 - 533

Knowing this basic fact is key as correct use of formula requires knowing which sides and angles are involved

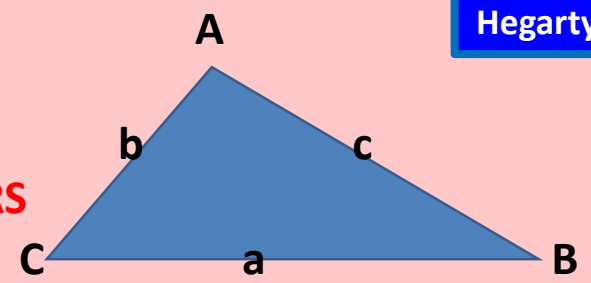
KEY LABELLING Notation

For any triangle ABC:

Angles are labelled with **CAPITAL LETTERS**

Sides are labelled with **LOWERCASE LETTERS**

Side a will be opposite **Angle A** etc.

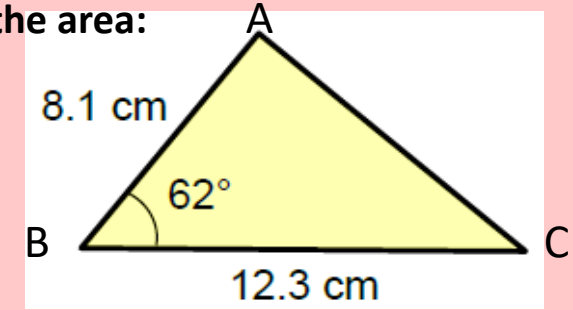


Sine Rule for AREA OF TRIANGLES

$$Area = \frac{1}{2}abSin(C)$$

Requires: 2 sides and INCLUDED angle

Find the area:



Area = ½ x 8.1 x 12.3 x Sin(62)

= 43.984....

= 44.0 cm^2 (3sig fig)

Remember to show answer to 3 or 4 decimal places before rounding.
Always state degree of accuracy and **units**

Sine Rule for LENGTHS and ANGLES

Finding sides:

$$\frac{a}{Sin\ (A)} = \frac{b}{Sin\ (B)}\ \left(= \frac{c}{Sin(C)}\right)$$

Finding angles:

$$\frac{Sin\ (A)}{a} = \frac{Sin\ (B)}{b}\ \left(= \frac{Sin\ (C)}{c}\right)$$

Requires: a known SIDE & ANGLE pair
the opposite side/Angle of the wanted Angle/side

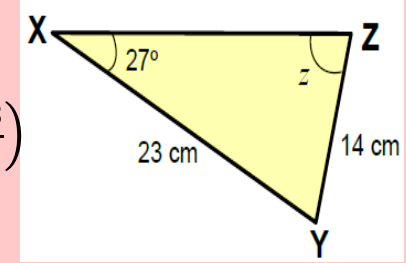
Find the angle Z

$$\frac{Sin\ (Z)}{23} = \frac{Sin\ (27)}{14}$$

$$Z = sin^{-1}\left(\frac{Sin\ (27)\times 23}{14}\right)$$

= 48.234....

= 48° (nr degree)



Cosine Rule for LENGTHS and ANGLES

Finding sides:

$$a^2 = b^2 + c^2 - 2bcCos(A)$$

Requires: 2 sides and INCLUDED angle being the angle opposite wanted side.

Finding angles:

$$Cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$$

Requires: all 3 sides

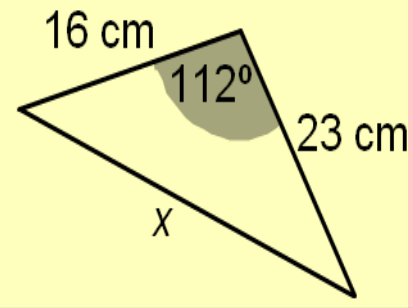
Find the side x

$x^2 = 16^2 + 23^2 - 2 \times 16 \times 23 \times Cos(112)$

$x^2 = 1060.710 \ldots$

$x = 32.568 \ldots$

$x = 32.6$ cm (3 sf)



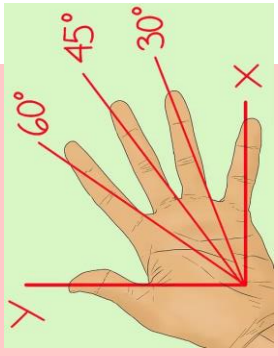
Tables for sine, cosine and tangent between 0 and 90 degrees (to 3dp)

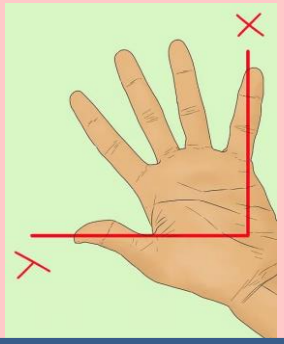
Angle	Sine	Cosine	Tangent
0	0.000	1.000	0.000
1	0.017	1.000	0.017
2	0.035	0.999	0.035
3	0.052	0.999	0.052
4	0.070	0.998	0.070
5	0.087	0.996	0.087
6	0.105	0.995	0.105
7	0.122	0.993	0.123
8	0.139	0.990	0.141
9	0.156	0.988	0.158
10	0.174	0.985	0.176
11	0.191	0.982	0.194
12	0.208	0.978	0.213
13	0.225	0.974	0.231
14	0.242	0.970	0.249
15	0.259	0.966	0.268
16	0.276	0.961	0.287
17	0.292	0.956	0.306
18	0.309	0.951	0.325
19	0.326	0.946	0.344
20	0.342	0.940	0.364
21	0.358	0.934	0.384
22	0.375	0.927	0.404
23	0.391	0.921	0.424
24	0.407	0.914	0.445
25	0.423	0.906	0.466
26	0.438	0.899	0.488
27	0.454	0.891	0.510
28	0.469	0.883	0.532
29	0.485	0.875	0.554

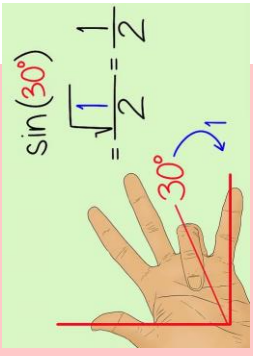
Angle	Sine	Cosine	Tangent
30	0.500	0.866	0.577
31	0.515	0.857	0.601
32	0.530	0.848	0.625
33	0.545	0.839	0.649
34	0.559	0.829	0.675
35	0.574	0.819	0.700
36	0.588	0.809	0.727
37	0.602	0.799	0.754
38	0.616	0.788	0.781
39	0.629	0.777	0.810
40	0.643	0.766	0.839
41	0.656	0.755	0.869
42	0.669	0.743	0.900
43	0.682	0.731	0.933
44	0.695	0.719	0.966
45	0.707	0.707	1.000
46	0.719	0.695	1.036
47	0.731	0.682	1.072
48	0.743	0.669	1.111
49	0.755	0.656	1.150
50	0.766	0.643	1.192
51	0.777	0.629	1.235
52	0.788	0.616	1.280
53	0.799	0.602	1.327
54	0.809	0.588	1.376
55	0.819	0.574	1.428
56	0.829	0.559	1.483
57	0.839	0.545	1.540
58	0.848	0.530	1.600
59	0.857	0.515	1.664

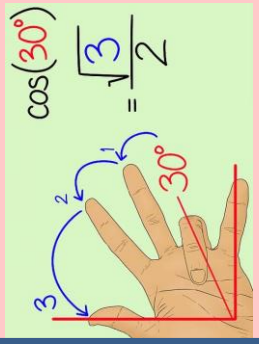
Angle	Sine	Cosine	Tangent
60	0.866	0.500	1.732
61	0.875	0.485	1.804
62	0.883	0.469	1.881
63	0.891	0.454	1.963
64	0.899	0.438	2.050
65	0.906	0.423	2.145
66	0.914	0.407	2.246
67	0.921	0.391	2.356
68	0.927	0.375	2.475
69	0.934	0.358	2.605
70	0.940	0.342	2.747
71	0.946	0.326	2.904
72	0.951	0.309	3.078
73	0.956	0.292	3.271
74	0.961	0.276	3.487
75	0.966	0.259	3.732
76	0.970	0.242	4.011
77	0.974	0.225	4.331
78	0.978	0.208	4.705
79	0.982	0.191	5.145
80	0.985	0.174	5.671
81	0.988	0.156	6.314
82	0.990	0.139	7.115
83	0.993	0.122	8.144
84	0.995	0.105	9.514
85	0.996	0.087	11.430
86	0.998	0.070	14.301
87	0.999	0.052	19.081
88	0.999	0.035	28.636
89	1.000	0.017	57.290
90	1.000	0.000	Undef.

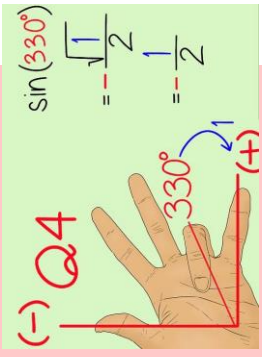
The left hand trick for Sine and Cosine

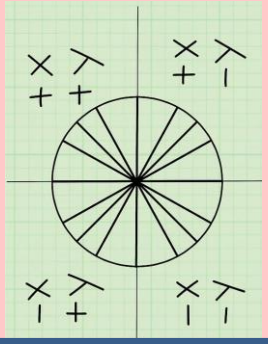












- Your pinky is the x-axis, your thumb is the y-axis
- Each finger represents an angle
- Find Cosine coordinate of an angle by counting fingers to the left
- Find Sine coordinate of an angle by counting fingers to the right
- Switch the charge to represent the coordinates
- Fill in your circle using your hand trick

Year 9 Maths Term 5 and 6: Functions and Formula

Hegarty : 278 - 297

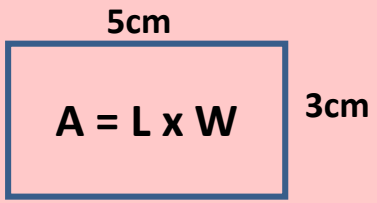
Example:	Glossary : Key terms and concepts explained
a, b, x, y	**VARIABLES** – are letters or symbols used to represent numbers.
4a + 2b xy $5(x+3)$ $x^2 - 4$	**EXPRESSIONS** – are formed from variables and numbers combined with operation signs and brackets. Each part of an expression is called a **TERM**, terms are separated by operators. Eg. 3*n* + 5 has two terms 3*n* and 5 separated by the operation + **An expression does NOT have an equals sign.**
$A = \frac{1}{2}xy$ $5(x+3) = 8$ $x^2 - 4 = 0$	**EQUATIONS** – are mathematical statements showing two expressions have equal value, indicated by the equals symbol =. Eg. 5*x* + 4 = 29, the = symbol shows that 5x + 4 has the same value as 29. **An equation MUST have an equals sign.**
a < 2 $5(x+3) > 8$ $x^2 - 4 \leq 0$	**INEQUALITIES** – are mathematical statements showing the comparative value of one expression to the other. Instead of = the two sides might be Greater than (>); Greater than or equal to (≥); Less than (<); Less than or equal to (≤) the other. Like equations, inequalities may be "solved" but unlike equations, **solutions of an inequality will be a range of possible values**. For example, the inequality **a<2** indicates that the variable a may take any value as long as it is less than 2.
$\mathrm{d} = 2\mathrm{r}$ $A = \frac{1}{2}xy$ ***v = u + at***	**FORMULA (pl. formulae or formulas)** – are equations linking at least two variables and explains the relationship between them. Eg. $\mathrm{d} = 2\mathrm{r}$ has two variables (d and r) and explains that the diameter of a circle (d) is equal to twice the length of the radius (r). **Formulae cannot be solved without substituting in known values.** For instance, the formula *v* = *u* + *at*, has 4 linked variables (v, u, a, t). Only if the values of three variables are known, can the fourth value be calculated.
$ab \equiv ba$ $x + 2 \equiv 2 + x$	**Identities** – are expressions which are *identically equal* (in other words the same just written in a different way). Such expressions are linked with the symbol ≡. **Identities cannot be solved** as both expressions will be equal in value.

Substitution into Expressions and Formula

Hegarty : 780 - 789

Substitution is when an unknown (variable) is replaced with a known value (number).
For example, you are asked to find the area of this rectangle….

You know the formula for area:	Area = Length x Width
You now know actual values:	(L) = 5cm (W) = 3cm
So you can substitute these in...	A = 5 x 3
… and calculate the Area:	A = 15cm^2



Things to note when substituting:

- **Be careful of algebraic notation** – remember number problems need multiplication signs!
- Be careful when substituting **negative numbers** – it is best to write them in a bracket particularly if you are going to use a calculator
- **Write out the new calculation in full** replacing the variables with their new known value
- When calculating the final answer, **follow BIDMAS rules** for order of operations

Examples: if **a = 2**, **b = 3** and **c = -5**, find the value of the following expressions:

abc	a - b - c	ab + c / 2	ac^2	(ac)^2
⇨ 2 x 3 x (-5) = -15	⇨ 2 - 3 - (-5) = 2-3+5 = 4	⇨ $\frac{2x3+(-5)}{2} = \frac{1}{2}$	⇨ 2x(-5)x(-5) = 2 x 25 = 50	⇨ 2x(-5)x2x(-5) = -10 x -10 = 100

Real life formulae and substitution examples

Hegarty : 278 - 287

Example 1: Using given formula

$$F = \frac{9C}{5} + 32$$

This is the formula to change degrees Celsius (°C) to degrees Fahrenheit (°F).
Use the formula to convert 21°C to °F

Substitute in **C =21**: $F = \frac{9 \times 21}{5} + 32$

$$F = \frac{189}{5} + 32$$

$$F = 37.8 + 32$$

Temperature of 21°C is equal to **69.8** °F

Example 2: Writing formula
The cooking time for a turkey is 35 minutes per Kilogram plus an extra 20 minutes.

a) Write a formula for this problem
b) Use your formula to calculate the cooking time for a turkey weighing 5kg in hours and minutes

Define variables:	Cooking Time (C); Weight (W = 5)
Write formula:	Cooking Time = 35 x Weight + 20
a) Formula:	**C = 35W + 20**
b) Substitute:	C = 35 x 5 + 20
	C = 195 minutes
	C =3hours and 15 minutes

Functions

Hegarty : 288 - 297

A function links two variables. When you know one, you can work out the other.
There are three elements to a function: the input, the relationship and the output.
These elements can be represented by a **function machine:**

Input → Times by 3 → Subtract 4 → **Output**

5 → **11**

A true function must produce only one output for each input.

Inverse operations
+ ⇔ -
x ⇔ ÷
□² ⇔ √□
(Powers) (Roots)

Once a function has been understood it can be "undone" by working backwards and applying **inverse operations**.

Input ← Divide by 3 ← Add 4 ← **Output**

8 ← **20**

… so an **output** of 20 from this function could only have resulted from an input of (20+4)÷3 = 8.

Functions, Equations and Formula

Many equations and formula can be represented using a function machine:

Example: (i) Create a function machine for the equation y = 2x³ – 5

Y is the **Subject** of this formula - it is the variable on its own on one side of the equals sign. The subject is the **Output** of the function machine. "y" is the output, which means "x" will be the **Input**. The process that turns the input value "x" into output "y" is the 'story of "x" into "y"'.
Eg. What is happening to "x" to turn it into "y" – remembering to follow BIDMAS, "x" is being cubed first, then multiplied by 2 then 5 is subtracted from the value.

Input → Cube → Times by 2 → Subtract 5 → **Output**

(ii) Use your function machine to find the value of x when y = 11

y is the output so x is the input. To the calculate x you need to work back through the function machine with inverse operations.

Input ← Cube Root ← Divide by 2 ← Add 5 ← **Output**

2 ← $\sqrt[3]{8} = 2$ (16÷2=8) (11+5=16) ← **11**

Input must be 2 for output of 11 **so if y=11 then x = 2**

Changing the subject of a formula or equation

Hegarty : 280 - 286

This method - creating functions machines and their inverses - can help in rearranging (or changing the subject of) a formula.

Examples: (1) Rearrange the equation $y = 5x + 6$ to make x the subject

Step 1: create the Function machine. Remember start with x and build to y

x → x5 → +6 → y **(old subject)**

Step 2: reverse the Function machine applying inverse operations

x ← ÷5 ← -6 ← y

Step 3: follow the reversed function to write the new relationship around y which is equal to the new subject x

(new subject) **(relationship around y)**

$$x = \frac{y-6}{5}$$

(2) Rearrange the equation $y = \frac{1}{2}x^2 - 5$ to make x the subject

Step 1: x → Square → ÷2 → - 5 → y

Step 2: x → Square root → x2 → +5 → y

Step 3: **(new subject)** **(relationship around y)**

$$x = \sqrt{2(y+5)}$$
$$= \sqrt{2y+10}$$ **(Simplify if necessary)**

Once you are confident that you know how to "unpick" a function accurately , an alternative way to set out your workings is similar to that for solving equations:

(3) Rearrange these formula to make x the subject

(i) $y = mx + c$

(-c)	$y - c = mx$	(-c)
(÷m)	$\frac{y-c}{m} = x$	(÷m)

(ii) $y = \frac{x}{2} - b$

(+b)	$y + b = \frac{x}{2}$	(+b)
(x2)	$2(y+b) = x$	(x2)

Finally remember to write your final answer with x as the subject at the start.

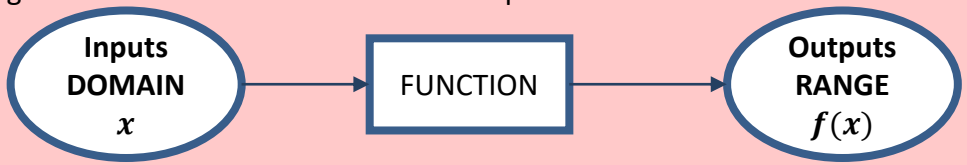
$$x = \frac{y-c}{m} \qquad x = 2(y+b)$$

Function Notation

Hegarty : 288 - 289

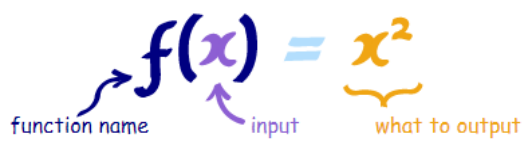
More mathematically, a function is a relation between a set of **INPUTS** (the "**DOMAIN**") and a set of **OUTPUTS** (the "**RANGE**") such that each input is related to an output.

Functions can be named. The most common name is "f", but others, "g", "h" etc can be used to distinguish between different functions in a problem.



Here the function "f" has been applied to the input x producing the result $f(x)$ which can be said "f of x". As you can see, we are using $f(x)$ where previously we have used y to represent the output … the two are EXACTLY THE SAME – it's just using different notation!

More commonly , function are written:



..and just like functions machines, we may be given different parts (input or output) of the problem and asked to find the other – the trick is to work out which you have been given…

Example 1: Given that the function $f(x) = x^2 + 1$

(i) Find $f(3)$ and (ii) $f(-2)$

The values given are **INSIDE** the bracket. They are the **INPUTS** into the function. **SUBSITUTE** to find the output

(i) $f(3) = 3^2 + 1$
$f(3) = 10$

(ii) $f(-2) = (-2)^2 + 1$
$f(-2) = 5$

Example 2: Given that the function $f(x) = 2x + 7$

(i) Find $f(x) = 3$ and (ii) $f(x) = (-2)$

The values given are **OUTSIDE** the bracket. They are the **OUTPUTS of** the function. **SOLVE** the equation to find the input

(i) $f(x) = 3 \Rightarrow$ $2x + 7 = 3$
$2x = -4$
$\underline{x = -2}$

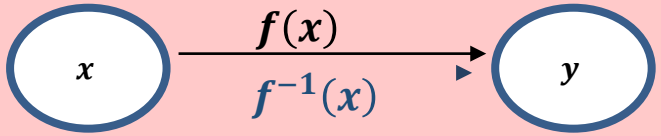
(i) $f(x) = (-2) \Rightarrow$ $2x + 7 = -2$
$2x = -9$
$\underline{x = -4.5}$

Get into the habit: Remember negatives in brackets may be a MUST if you are SQUARING using your calculator!

Inverse Functions

Hegarty : 295 - 296

The inverse of a function $f(x)$ is written $f^{-1}(x)$



If a function maps the input x to an output y then the inverse function will map the output y to the input x

Given the function $g(x) = 4x - 3$

Find $g^{-1}(x)$

$g(x) = 4x - 3 \quad \Rightarrow \quad y = 4x - 3$
$y + 3 = 4x$
$\frac{y+3}{4} = x$

$\Rightarrow g^{-1}(x) = \frac{(x+3)}{4}$

Rewrite your answer using x as the input for the new function

To calculate the inverse function of $f(x)$, remember "$f(x)$" **is the same as "y"**, so simply rewrite the function as an equation and rearrange to **make x the subject** of the formula. However, using function notation, the inverse function $f^{-1}(x)$ will still need x as the named input variable so rewrite your answer simplify **replacing "y" with "x"**

Given the function $h(x) = \frac{1}{x}$

Find $h^{-1}(x)$

$h(x) = \frac{1}{x} \quad \Rightarrow \quad y = \frac{1}{x}$
$xy = 1$
$x = \frac{1}{y}$

$\Rightarrow h^{-1}(x) = \frac{1}{x}$

Rewrite using x as the input

Note : Most be not all functions will produce different inverse functions. Exceptions:

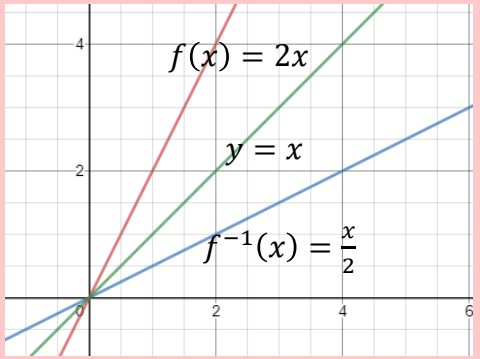
(i) A function can be its own **self inverse** for example if $f(x) = \frac{1}{x}$ **then** $f^{-1}(x) = \frac{1}{x}$

(ii) A function may not have a inverse function without further definition. For example, if $f(x) = x^2$ then the inverse would $\pm\sqrt{x}$ but a function is such that each input must map to a single output… with two possible outputs from square rooting this would not be the case. Therefore, it is sometimes important to "restrict the domain" for inverse function i.e. here for $f(x) = x^2$ then $f^{-1}(x) = \sqrt{x}$ *where* $x \geq 0$

Identifying inverse functions graphically

For any given function $f(x)$ and its inverse $f^{-1}(x)$, the graph of

$f^{-1}(x)$ is a reflection of $f(x)$ in the line $y = x$



Composite Functions

Hegarty : 293 - 294

Composite functions are a combination of functions where the output of the first function applied becomes the input to the second; the relationship between original input and final output can then be simplified into a single composite function. The order in which the functions need to be applied are shown in the composite function notation – simply put, work back way from the input (x)…

Examples: Given that $f(x) = x^2$ and $g(x) = 2x + 1$, ….

a) Find $gf(x)$

(⇒ apply "f" first then "g" to its output)

$x \rightarrow \boxed{f(x)} \rightarrow \boxed{g(x)} \rightarrow gf(x)$

The output of $f(x)$ is x^2. This becomes the input for $g(x)$ so…

$x^2 \rightarrow \boxed{x2} \rightarrow \boxed{+1} \rightarrow gf(x)$

$\Rightarrow gf(x) = 2x^2 + 1$

Number in bracket ⇒ input

b) Find $gf(5)$

If $gf(x) = 2x^2 + 1$, then

$gf(5) = 2 \times 5^2 + 1$

$= 51$

Check:
$f(5) = 5 \times 5 = 25$
$g(25) = 2 \times 25 + 1$
$= 51$

Number outside bracket ⇒ output

c) Find $gf(x) = 19$ where $x \geq 0$

If $gf(x) = 2x^2 + 1$, then

$2x^2 + 1 = 19$

$2x^2 = 18$

$x^2 = 9$

$x = 3$

Check:
Substitute answer into functions…
$f(3) = 3 \times 3 = 9$
$g(9) = 2 \times 9 + 1$
$= 19$

(1) Find $fg(x)$

(⇒ apply "g" first then "f" to its output)

$x \rightarrow \boxed{g(x)} \rightarrow \boxed{f(x)} \rightarrow gf(x)$

The output of $g(x)$ is $2x + 1$. This becomes the input for $f(x)$ so…

$2x + 1 \rightarrow \boxed{square} \rightarrow fg(x)$

$\Rightarrow gf(x) = (2x + 1)^2$

$\Rightarrow gf(x) = (2x + 1)(2x + 1)$

$\Rightarrow gf(x) = 4x^2 + 4x + 1$

(2) Find $fg(-2)$

If $gf(x) = 4x^2 + 4x + 1$, then

$gf(2) = 4 \times (-2)^2 + 4 \times (-2) + 1$

$= 9$

(3) Find $gf(x) = 36$ where $x \geq 0$

If $fg(x) = 4x^2 + 4x + 1$, then

$4x^2 + 4x + 1 = 19$

$(2x + 1)^2 = 36$

$2x + 1 = 6$

$2x = 5$

$x = 2.5$

Hegarty : 307 - 313

Example: Given that $f(x) = 2x - 3$ and $g(x) = x^2 + 1$

Solve $gf(x) = 2fg(x)$

Step 1: Find $gf(x)$

$\Rightarrow gf(x) = (2x - 3)^2 + 1$

$\Rightarrow gf(x) = (2x - 3)(2x - 3) + 1$

$\Rightarrow gf(x) = 4x^2 - 12x + 10$

$gf(x) \Rightarrow$ apply "f" first then "g" to its output. The output of $f(x)$ is $2x - 3$. This becomes input for $g(x)$ so $(2x - 3)$ needs to be squared then 1 add

Step 2: Find $2fg(x)$

$\Rightarrow fg(x) = 2(x^2 + 1) - 3$

$\Rightarrow gf(x) = 2x^2 + 2 - 3$

$\Rightarrow gf(x) = 2x^2 - 1$

$\Rightarrow 2gf(x) = 4x^2 - 2$

$fg(x) \Rightarrow$ apply "g" first then "f" to its output then times 2. The output of $g(x)$ is $x^2 + 1$. This becomes input for $f(x)$ so needs to be x2 then subtract 3. Finally $2fg(x)$ means 2 x $fg(x)$…

Step 3: Form and solve equation

$\Rightarrow 4x^2 - 12x + 10 = 4x^2 - 2$

$(-4x^2)$ $\Rightarrow -12x + 10 = -2$

(-10) $\Rightarrow -12x = -12$

$(\div -12)$ $\Rightarrow x = 1$

Functions and Graphs

Hegarty : 206 - 213

All straight line graphs with Linear equations in the form

$$y = mx + c$$

are functions as they represent the relation between a single x –coordinate and a single y-coordinate

Every straight line has an equation in the form of:

$y = mx + c$

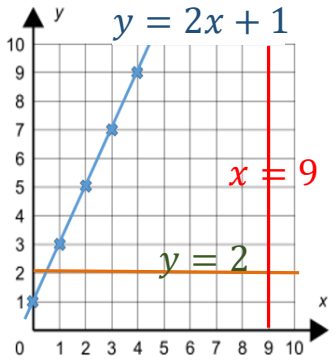
the steepness of the line — The **GRADIENT**

where the line cuts the y axis — The **y-INTERCEPT**

To plot functions, substitute your inputs into the function to generate linked coordinate pairs Record your pairs in a table of values : **example**: for $f(x) = 2x + 1$

x	0	1	2	3	4	5	6
$y = x + 3$	1	3	5	7	9	11	13
	(0, 1)	(1, 3)	(2, 5)	(3, 7)	(4, 9)	(5, 11)	(6, 13)

Remember $f(x)$ and y mean same thing – the final output value



The **Vertical line test**: If an equation (relationship) produces a **vertical line for any part of the line – it is NOT a function** as it has produced MORE THAN ONE output value for an input so $y = 2$ **IS a function** but $x = 9$ **IS NOT a function**

KS4 Biology: B2
Cell division

Keyword	Definition
Mitosis	Cell division where one set of chromosomes are pulled to each end of the cell and the nucleus divides
Differentiation	When a cell becomes a specialised cell
Cell Cycle	The process in which a single cell grows and divides
Chromosomes	A thread like structure of coiled DNA found in the nucleus of eukaryotic cells.
DNA	The genetic material of eukaryotic cells. A polymer made up of two strands forming a double helix.
Meristem	Plant tissue found in the growing tips of roots and shoots
Cloning	Creating a genetically identical copy of a cell or organism

The Cell cycle and Mitosis

Your body needs to make new cells to do the following;

- Growth and development as an organism
- Replace damaged or worn out cells

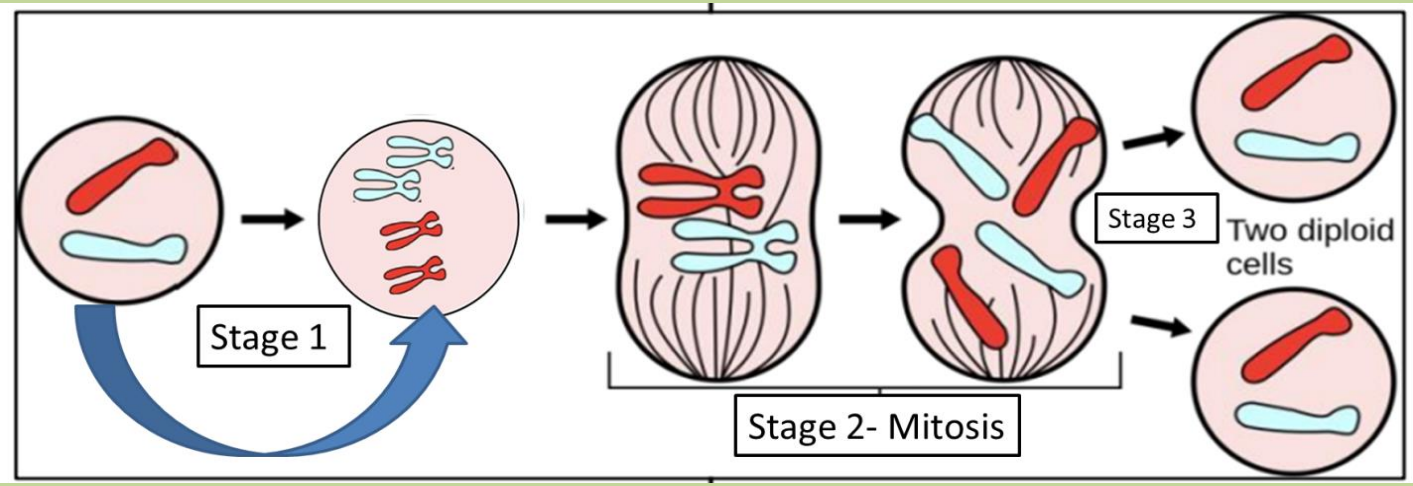
Cell division is part of the cell cycle, part of the cell cycle divides cells into genetically identical cells- this is called Mitosis

Chromosomes

In the nucleus of a human cell there are 23 pairs of chromosomes. These contain a double helix of DNA

Cell division

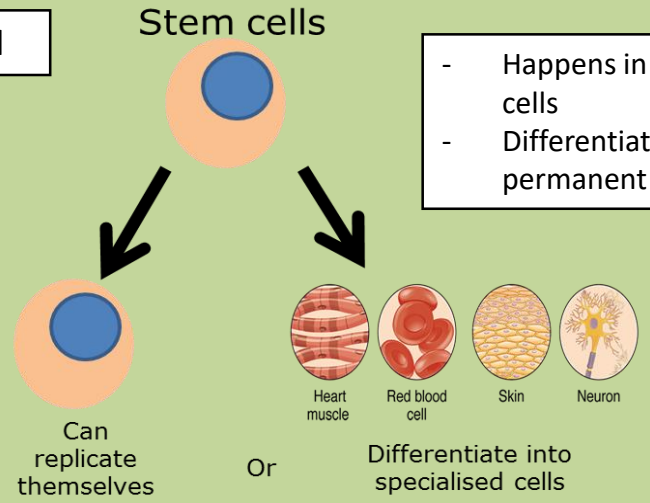
Stage 1	Stage 2	Stage 3
- Longest stage of the cell cycle - Cells grow larger- increase in number of organelles such as mitochondria and ribosomes - DNA replicates into two copies of each chromosome	- Mitosis occurs - One copy of each chromosome is pulled to the end of the cell – the nucleus then divides	- The cell divides to form two cells - These are diploid cells which contain a full set of chromosomes



Differentiation

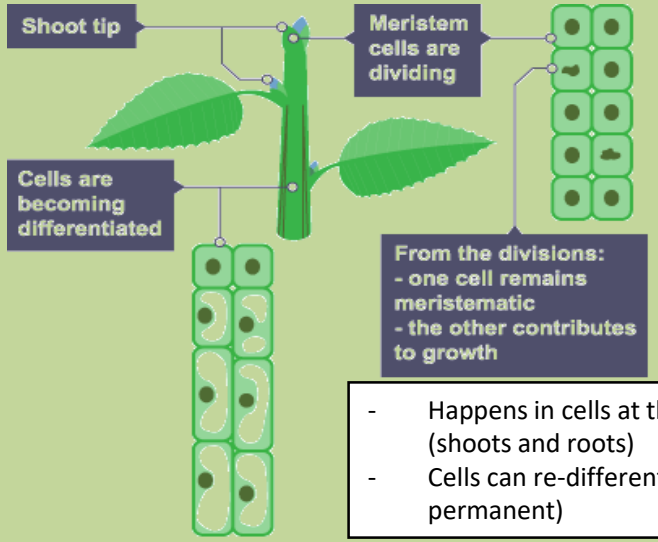
Differentiation is where stem cells become specialised cells, this happens in both animals and plants

Animal



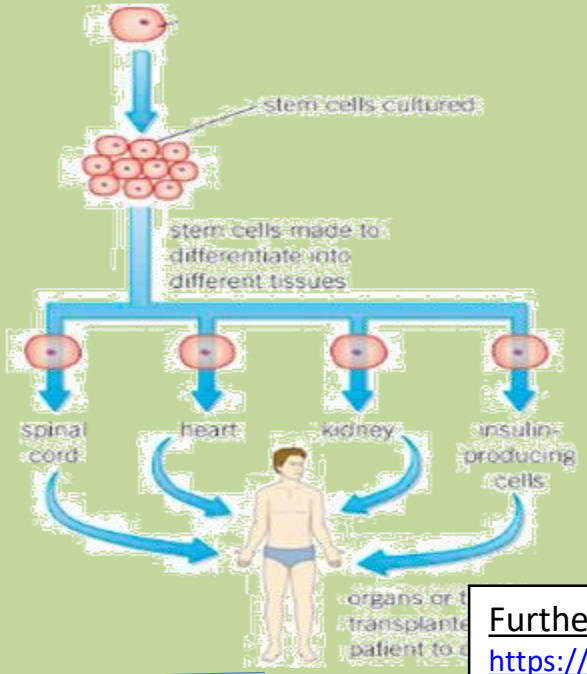
- Happens in stem cells
- Differentiation is permanent

Plant



- Happens in cells at the meristems (shoots and roots)
- Cells can re-differentiate (not permanent)

Type of cell	Properties	Clinical use
Human embryonic stem cell	Can be cloned and forced to differentiate into any cell type	Therapeutic cloning using the same DNA so the body does not reject the cells
Adult stem cell	Can form any cell related to its origin. Very few types of cell can be formed	Can be used to replace cells and tissue such as blood, skin and muscle. Must be match to avoid rejection
Plant Meristems	Can differentiate into any plant cell type throughout the life of the plant.	Can be used to produce genetic clones quickly and economically- can save rare species and provide disease resistance



Pros of stem cells

- Can be cloned to treat diseases such as diabetes and use same DNA to avoid rejection
- Potential in the future to be used to grow whole organs to transplant

Cons of stem cells

- People object on religious and ethical reasons as most stem cells come from aborted foetuses and the potential risk of viral transfer from the cells

Further reading

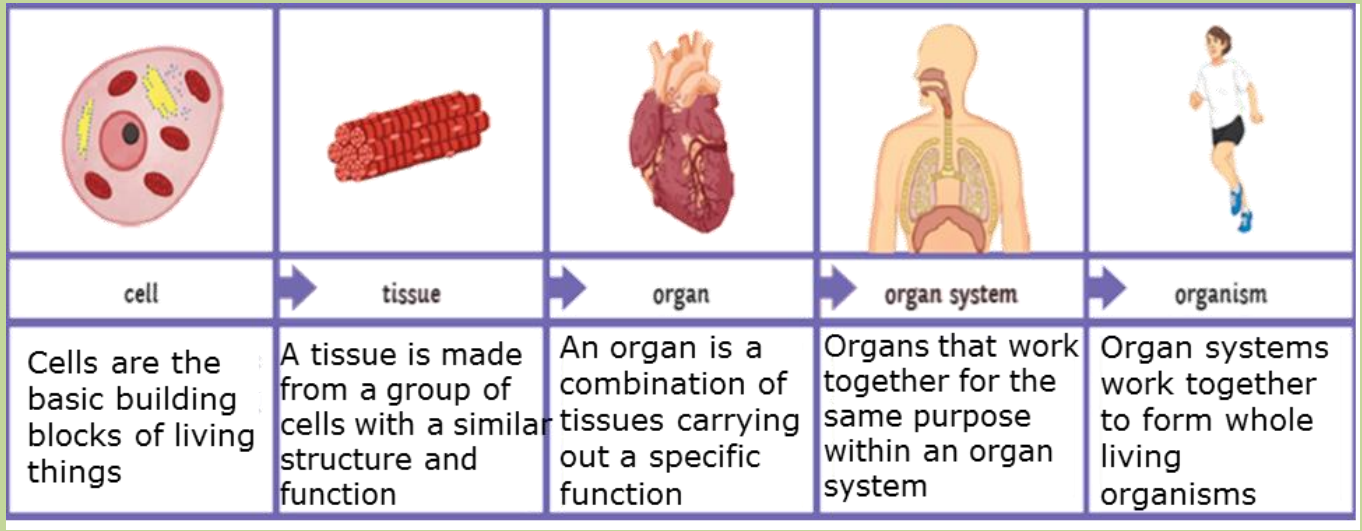
https://www.bbc.co.uk/bitesize/guides/z2kmk2p/revision/1
https://studyrocket.co.uk/revision/gcse-biology-triple-aqa/triple-cell-biology/cell-division

KS4 Biology: B3 Organisation & the digestive system

Keyword	Definition
Enzyme	Protein with an active site of a specific shape which speeds up reactions
Villi	Finger like projections in the small intestine that increase surface area, helping with absorption
Catalyst	A molecule/chemical that speeds up the rate of reaction
Lock and key mechanism	Only one type of substrate can fit into the active site of an enzyme, like a key fits into a lock.
Active site	The part of the enzyme that helps break down the substrate
Substrate	The specific molecule that binds to an enzyme's active site
Rate of reaction	The speed at which a reactant is converted into a product
Denatured	When the active site of an enzyme changes shape and the substrate can no longer fit in. Can be caused by pH or temperature
pH	How acidic or alkaline a substance is. Enzymes are very sensitive to pH.
Bile	Alkaline substance produced in the liver and stored in the gall bladder. It neutralises stomach acid and breaks down fats into small droplets
Emulsification	Mixing two liquids such as oil and water that would not normally mix

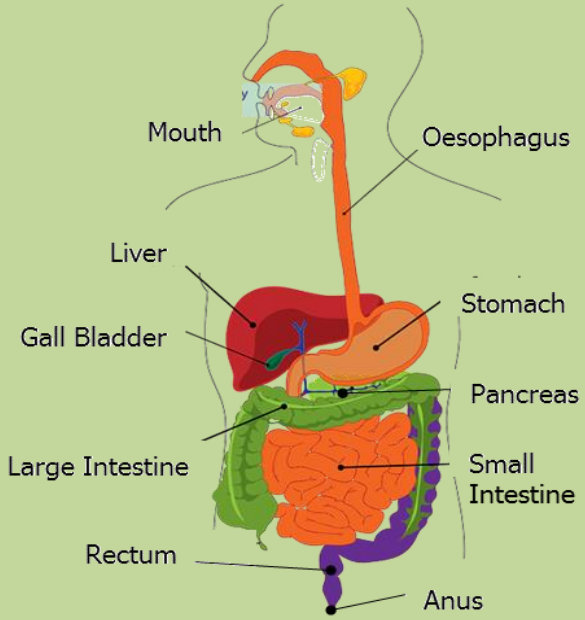
Organisation

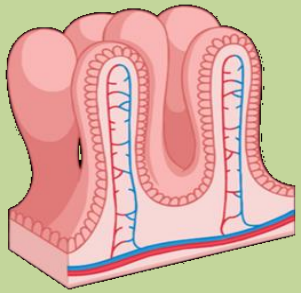
Organisms like you and I are organised from our smallest units (cells)



The digestive system

This system is made up of multiple organs that break down and absorb your food

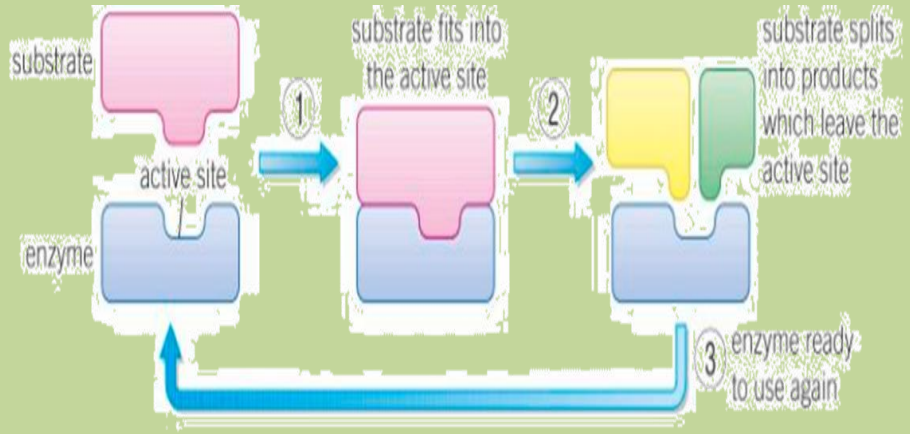




Your small intestine absorbs all of the required nutrients from your food. The villi help it do this by increasing the surface area

Organ	Function
Liver	Produces bile
Stomach	Breaks down large insoluble molecules into smaller soluble ones
Small intestine	Further breaking down of larger molecules and absorption into the blood
Large intestine	Absorbing water from undigested food

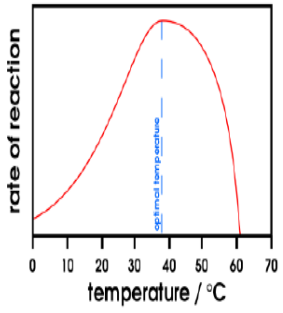
Enzymes are proteins and function in many reactions in the body as a biological catalyst- this means they do not change the reaction but they do speed it up



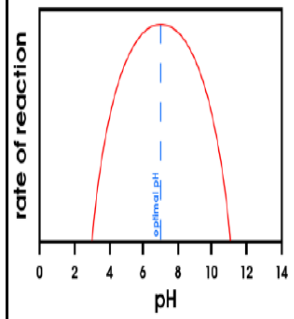
Most enzymes are specific, meaning that only one type of substrate will only bind to the enzymes active site- like a key fitting a lock

The activity of enzymes is affected by changes in temperature and pH

Enzymes activity has an optimum temperature



Enzyme activity has an optimum pH



Enzymes have 3 main functions
- To make larger molecules from smaller ones
- Breaking down larger molecules into smaller ones
- Converting molecules- e.g converting one amino acid to another

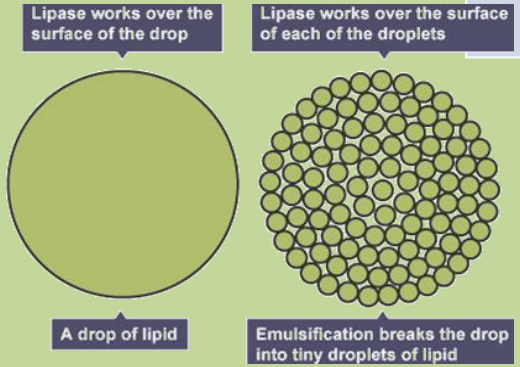
If the temperature is too high or the pH is not optimum then the active site will be denatured

Carbohydrates, lipids and proteins make up the cell's structure-and are needed in a balanced diet- we can test food for these using the following tests

Molecule	What is it made from	Chemical test	Positive result looks like
Sugar	Carbohydrates with one or two sugar units	Benedict's reagent and heat	Small amount= green Large amount = yellow/red
Starch	Is a complex carbohydrate made from long chains of simple sugars bonded together	Iodine	Turns blue/black
Protein	Made from long chains of amino acids	Biuret reagent	Turns purple
Lipid/fat	3 fatty acids bonded to a glycerol molecule	Ethanol	Dissolve in ethanol and then turn white/cloudy when water is added

The digestive system uses several enzymes which work on different organs of the system- the three main sites are the mouth, stomach and small intestine

Digestive enzyme	Where is it produced	Site of action	substrate	product
Carbohydrase (e.g amylase)	Salivary glands, pancreas and small intestine wall	Mouth and small intestine	Complex carbohydrates - e.g. starch	Simple sugars - e.g. glucose
Protease (e.g pepsin)	Stomach, pancreas, small intestine wall	stomach	Proteins	Amino acids
Lipase	Pancreas, small intestine wall	Small intestine	Lipids	Glycerol and fatty acids



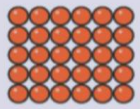
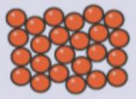
Bile (not an enzyme)

- Produced by the liver this is transported to the small intestine to neutralise stomach acid.
- It also emulsifies fat, increasing its surface area for lipase to work on

KS4 Chemistry:
C3 Structure and Bonding

States of matter

The three states of matter are represented by simple models, where particles are shown as solid spheres and no forces are shown between these particles (limitations of this model). The amount of energy required to change state depends on the strength of the force between the particles of the substance.

State	Solid	Liquid	Gas
Closeness of particles	Very close	Close	Far apart
Arrangement of particles	Regular pattern	Randomly arranged	Randomly arranged
Movement of particles	Vibrate around a fixed position	Move around each other	Move quickly in all directions
Energy of particles	Low energy	Greater energy	Highest energy
2D diagram			

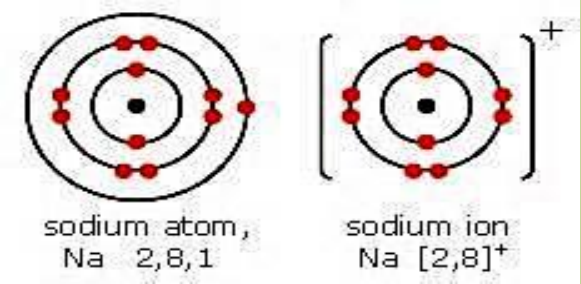
Ions

All atoms are more stable with a full outer shell of electrons. Some atoms will lose electrons to get a full outer shell: these are metals. Some atoms will gain electrons to get a full outer shell: these **are non metals**.

An ion is an atom with a positive or negative charge, these are formed by an atom gaining or losing electrons.

For example, sodium has one electron in it's outer shell, it therefore loses one electron to form a Na^{+1} ion.

We represent ions with square brackets around the ion and the charge in the top right corner.

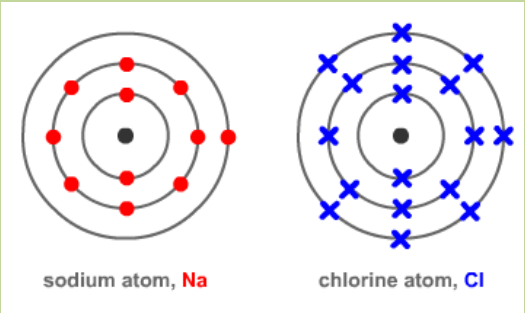


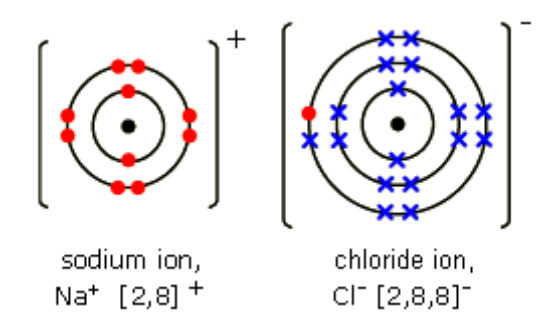
The group number indicates how many electrons an atom would loose or gain to form an ion. e.g. group two elements loose two electrons, forming $^{2+}$ ions

Keyword	Definition
Alloy	a mixture of two or more elements, at least one of which is a metal
covalent bond	the bond between two atoms that share one or more pairs of electrons
covalent bonding	the attraction between two atoms that share one or more pairs of electrons
delocalised electron	bonding electron that is no longer associated with any one particular atom
dot and cross diagram	a drawing to show only the arrangement of outer shell electrons of the atoms or ions in a substance
fullerene	form of the element carbon that can exist as large cage-like structures, based on hexagonal rings of carbon atoms
giant covalent structure	a huge 3D network of covalently bonded atoms, such as the bonding in silicone dioxide
giant lattice	a huge 3D network of atoms or ions
intermolecular forces	the relatively weak attraction between the individual molecules in a covalently bonded substance
ionic bond	the electrostatic force of attraction between positively and negatively charged ions
metallic bonding	The bonding that occurs in metals, due to the electrostatic force between positive metal ions and negative electrons
nanoscience	the study of very tiny particles or structures between 1 and 100 nanometres in size, where 1 nanometre = 10^{-9} metres
polymer	a substance made from very large molecules made up of many repeating units

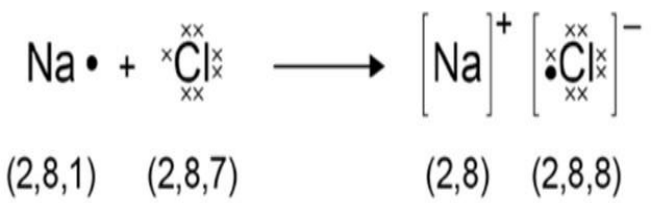
Ionic Bonding

When a metal atom reacts with a non-metal atom electrons in the outer shell of the **metal atom are transferred to the non metal atom**. This means the metal has a positive charge and the non metal has a negative charge. This means there is an **electrostatic attraction** between the two ions, this is what forms an ionic bond. Both atoms will have **a full outer shell** (this is the same as the structure of a noble gas) see example below of sodium chloride.





Ion formation: When a metal atom reacts with a non-metal atom electrons in the outer shell of the metal atom are transferred. Metal atoms lose electrons to become positively charged ions. Non-metal atoms gain electrons to become negatively charged ions.



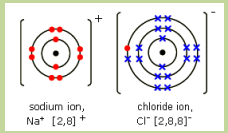
Formula of Ionic Compounds

In sodium chloride, 1 sodium atom gives an electron to a chlorine atom, therefore the empirical formula is NaCl. However there are some examples where the ratio of atoms is not 1:1. For example when sodium bonds with oxygen, sodium only wants to lose one electron but oxygen needs to gain two. So you need two sodium atoms for every oxygen so the **empirical formula is Na_2O.**

Ionic Bonding- Models

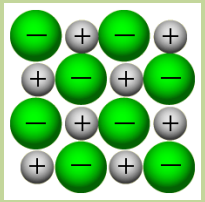
There are a number of ways we can represent ionic bonding all; of these have **advantages and limitations.** For example all the diagrams below show ways we can represent **sodium chloride**

1. Dot and cross diagrams- These show clearly how the electrons are transferred. It does not, however, show the 3D lattice structure of an ionic compound or that this is a giant compound.



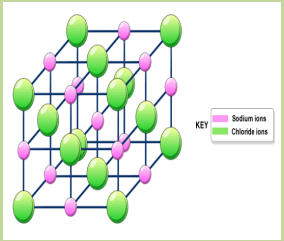
2. 2D ball and stick model of ionic bonding

This has the advantage of showing that electrostatic forces happen between oppositely charged ions in an ionic compound. However, does not show the 3D structure of an ionic compound.



3. 3D Ball and Stick model of ionic bonding

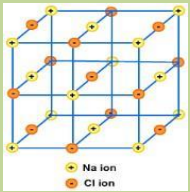
This clearly shows the 3D structure of the **ionic lattice** and how different ions interact with other ions **in all directions** to create an ionic lattice.



Properties of Ionic compounds

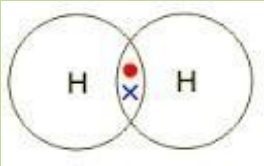
Ionic compounds have **high melting points, due to strong electrostatic forces between the oppositely charged ions.** This means a lot of energy is required to break these bonds. For example the melting point of sodium chloride is 801 °C. Ionic compounds **do not conduct electricity** as a solid. They **do conduct electricity** if they are dissolved in water (aqueous) or in the liquid state. This is because the ions are free to move, carrying the electric charge.

Ionic Lattice ionic compounds have **regular structures (giant ionic lattices)** in which there are strong **electrostatic forces** of attraction in all directions between oppositely charged ions.

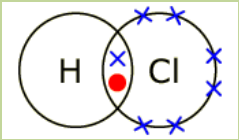


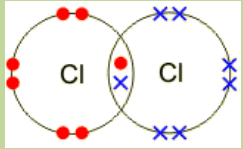
Covalent Bonding

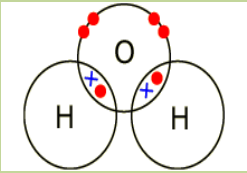
Covalent bonding occurs between non metals. Electrons are shared between the atoms, so that they have a full outer shell. Covalent bonds are strong and require a lot of energy to break. The simplest example is hydrogen: both hydrogen atoms have one electron in their outer shell. Therefore both hydrogen atoms share one electron each, to give them both a full outer shell, we can show this bond on a dot and cross diagram.

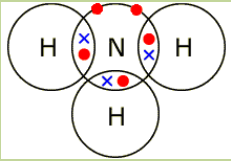


When drawing covalent molecules we use "dot cross diagrams" as we do with ionic compounds. It is important to represent the electrons on one atom with a dot and on the other atom with an X.
The first five examples, **hydrogen, chlorine, water, hydrogen chloride and ammonia (NH_3)** all share one electron per atom in a to make a full outer shell of electrons on each atom.

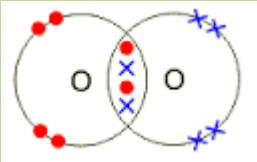






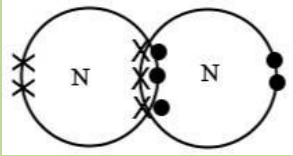


Some atoms need more than one electron to give them a full outer shell, for example oxygen needs 2 electrons to complete its outer shell. Oxygen therefore shares two electrons per atom to make a double bond.



Nitrogen needs three electrons to complete its outer shell, this forms a triple bond between the two nitrogen atoms, to make a nitrogen molecule.

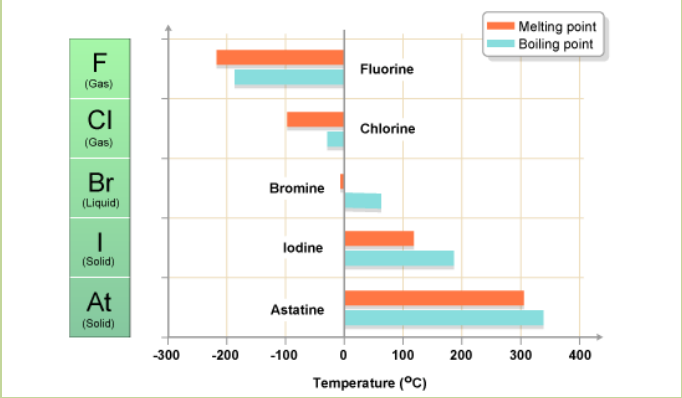
Covalent bonds are strong because there is a attraction between the electrons in the covalent bond and the positively charged nucleus. This means a lot of energy is required to break a covalent bond.



Properties of Simple Covalent Compounds

Simple covalent compounds have low melting points and are often gases at room temperature, for **example oxygen and carbon dioxide.** Although the covalent bonds between the atoms are strong, the **intermolecular forces between the molecules are weak. It is very important to remember that covalent bonds are strong but the intermolecular forces are weak .** This means that only a small amount of energy is required to overcome these weak forces.

The size of the intermolecular force between molecules increases as the molecules get larger. This is because a force called the van der Waals force increases (you do not need to know that for GCSE).
For example as you go down group 7, the boiling points increase because **the molecules get larger**.



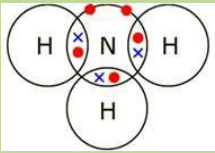
As well as having low melting points, covalent compounds **do not conduct electricity.** This is because they have no free electrons or ions and therefore there is nothing to carry the electric charge**.** Remember pure water does not conduct electricity, only when it has ions dissolved in it will it conduct.

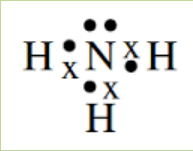
Additional information
https://www.bbc.co.uk/bitesize/topics/zq6h2nb
https://www.youtube.com/watch?v=YpEQ-NWxKBc
https://www.youtube.com/watch?v=o_jDaUe9p5o
https://www.youtube.com/watch?v=9bbCFUyluWg

Representing Covalent Compounds

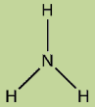
Like ionic compounds, there are variety of ways that scientists use to represent covalent compounds.

1. Dot cross diagram





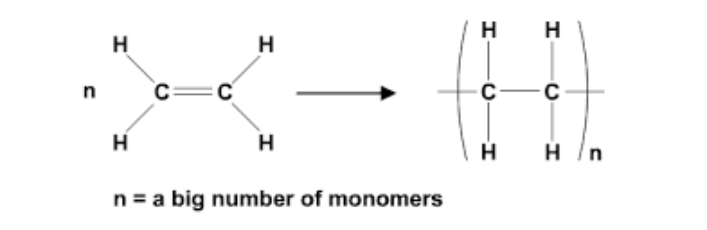
2. Ball and stick model



Chemistry only - Polymers

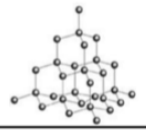
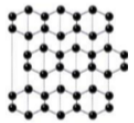
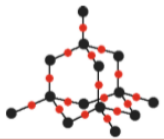
Polymers are large covalent compounds which can be many thousands of atoms in length. They are made from small molecules known as **monomers.**

Rather than drawing out all the atoms in a polymer we draw a **repeating unit** which is the structure of the monomer in square brackets, with a n representing a very large number of atoms. Polymers have higher melting points than smaller covalent compounds like carbon dioxide as the intermolecular bonds are stronger. However the bonds are not as strong as they are in ionic or giant covalent compounds so the melting points are lower than those compounds.



Giant Covalent Compounds

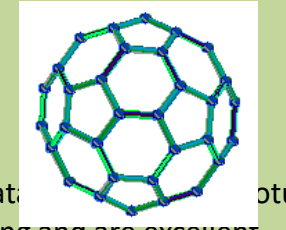
In a giant covalent structure all atoms are bonded to each other by strong covalent bonds. Giant covalent compounds have a **high melting point** because many strong covalent bonds need to be broken and this requires a lot of energy. There are three examples you need to know, diamond, graphite and silicone dioxide - often called silica (see table)

Substance	Diagram	Description	Properties
Diamond		Each carbon is covalently bonded to four other carbons	Very hard, very high melting point, due to strong covalent bonds. Does not conduct electricity – no free electrons/ions.
Graphite		Each carbon is covalently bonded to 3 other carbons, there are weak (non covalent) bonds between the layers.	High melting point, conductor of electricity due to **delocalised electrons which can carry a charge.** Slippery as layers can slide over each other
Silica		Every silicon atom is bonded to 2 oxygen atoms and vice versa	High melting point

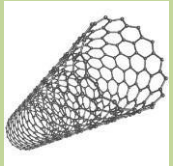
Graphene and Fullerenes

There are other forms of carbon which have been discovered recently: **graphene is a single layer of graphite** so it is 1 atom thick.

Fullerenes are molecules of carbon with hollow shapes. The most famous example is Buckminsterfullerene (C60).

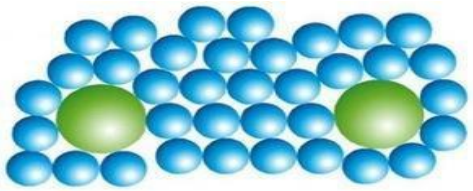


Fullerenes have use in drug delivery and as cat otubes are cylinder shaped fullerenes, these are strong and are excellent conductors of both **heat and electricity.**



Alloys

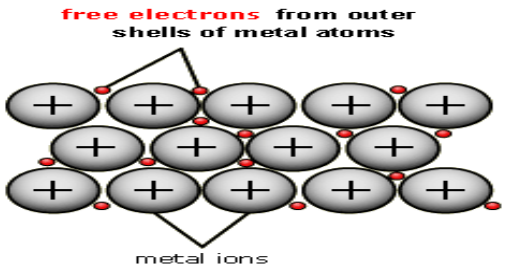
Alloys are mixtures of **2 or more elements, one of which is a metal.** Examples of alloys include brass and steel. Metals are alloyed so that the regular structure of metals is changed and the layers of ions can no longer slide over one another; therefore making it much stronger.



Metallic Bonding

Metals form giant structures. The metal atoms form a regular pattern and the donate their outer electron to the **"sea of delocalised electrons".** These electrons are free to move. The 2D structure of metallic bonding looks like this:

This would be the structure of a group 1 metal like sodium, if it were a group 2 metal like magnesium then the charge on the ions would be Mg^{2+}.



Chemistry only - Nanoparticles

Nanoparticles have a diameter **between 1 nm and 100 nm**, this means they are only a few hundred atoms in size. Nanoparticles have an **extremely large surface area to volume ratio**, this gives them a variety of useful properties.

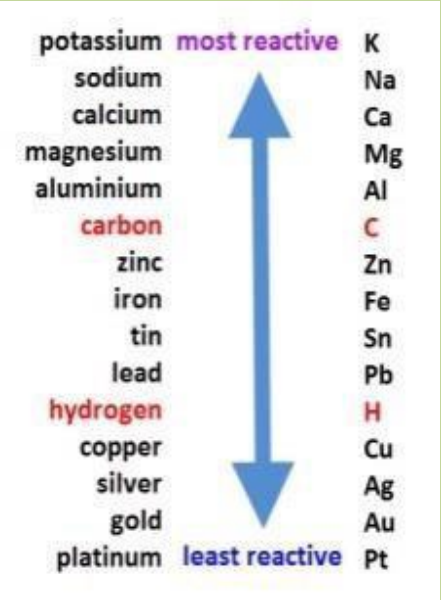
- The targeted delivery of drugs- they are more easily absorbed into the body and therefore could be use to deliver drugs to specific tissues.

- Making synthetic skin
- Silver nanoparticles have antibacterial properties. These can be used in things like clothing, deodorants and surgical masks.
- Some nanoparticles are electrical conductors, these can be used to make components in very small circuit boards.
- cosmetics, to make them less oily
- sun creams, they provide better protection from UV than conventional sun creams. They also provide better skin coverage.

Properties of Metals

Metals are **good conductors of electricity**, due to the delocalised electrons, which can carry the electric charge. Metals are also **good conductors of heat** as the free electrons can transfer the heat energy through the metal.
Metals are also **malleable** (bendy) as the layers of ions can easily slide over one another. This means that many pure metals are too soft for uses such as building.

Reactivity of metals When a metal reacts it **forms a positive ion.** The easier it is for a metal to form a positive ion, the more reactive it is. This is shown in the reactivity series; you should memorise the position of different elements:



Chemistry only - Dangers on Nanomaterials

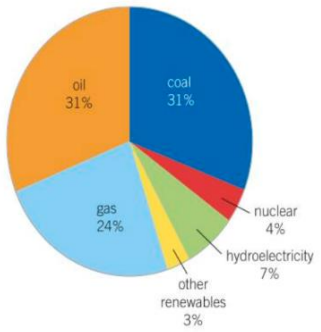
The long term affects of nanomaterials on the body have not been well researched. For example when using sun cream, nanoparticles are absorbed through the skin. The affects of long term exposure to these has not been well researched.
Some people believe anything containing nanoparticles should be clearly labelled.

KS4 Physics:
P3 Energy resources

Keyword/term	Definition
Carbon neutral	Balancing carbon emissions with carbon removal e.g. by photosynthesis OR simply eliminating carbon emissions altogether.
Dissipate	To scatter in all directions or to use wastefully. When energy has been dissipated it means we cannot get it back. The energy has spread out and heats up the surroundings.
Non-renewable energy resources	Energy resources which will run out, because they are finite reserves, and which cannot be replenished.
Renewable energy resources	Energy resources which will never run out and (or can be) replenished as they are used.
Alternative energy resource	Resources other than fossil fuels. The resources may or may not be renewable. Nuclear power is not a renewable energy resource, but tidal power is. Alternative energy resources do not contribute to global warming.
Biofuel	Fuel produced from biological material. Biofuels are provided by trees such as willow that can be grown specifically as energy resources.
National grid	The network of cables and transformers used to transfer electricity from power stations to consumers (i.e. homes, shops, offices, factories etc.)
Geothermal energy	Energy released by radioactive substances deep within the Earth
Nuclear fuel	Substance used in nuclear reactors that releases energy due to nuclear fission

Background: It is hard to imagine a World without electricity. It reaches into every aspect of our lives. But where do we get the energy to make it from? Will they run out? Have we got a backup plan?

World energy demands and sources (2015)

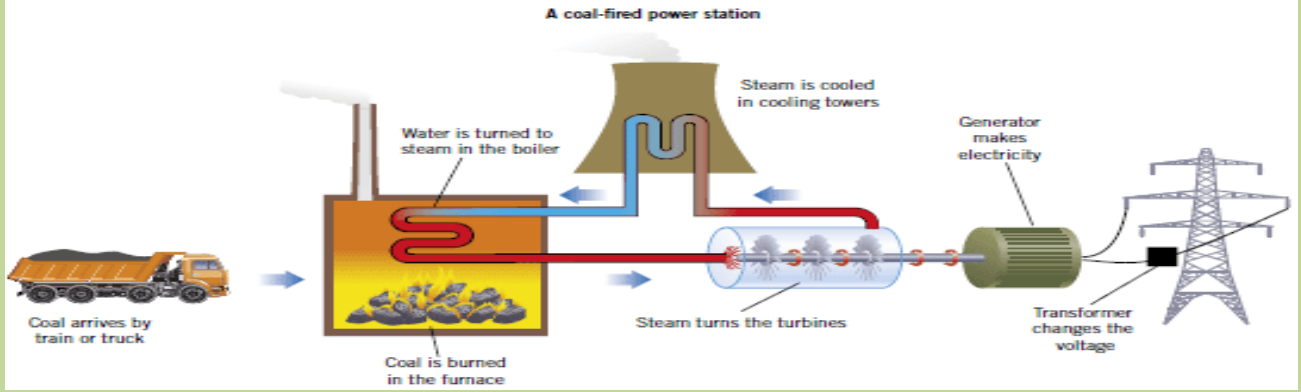


Hydroelectric power:

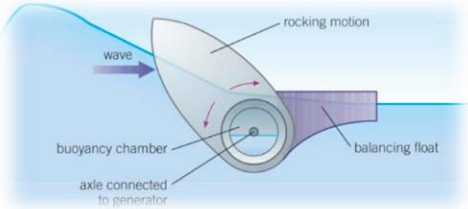
Hydroelectricity can be generated when rainwater that is collected in a reservoir

(or water in a pumped storage scheme) flows downhill.

The flowing water drives turbines that turn electricity generators at the bottom of the hill.



Wave power: A wave generator is used to make a floating
generator move up and down,
turning a generator to
create electricity.



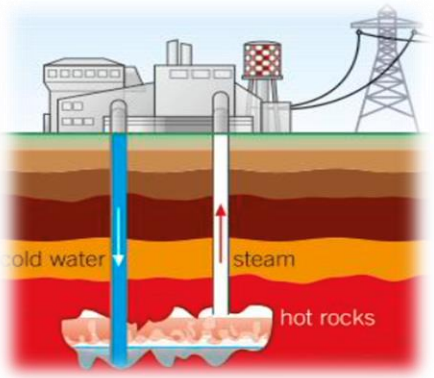
Tidal power: Tidal power stations trap water from each high tide behind a barrage. The high tide can then be released into the sea through turbines.

These turbines drive generators.

In some coastal areas, electricity generated by tidal flow passing through undersea turbines, placed on the sea bed.

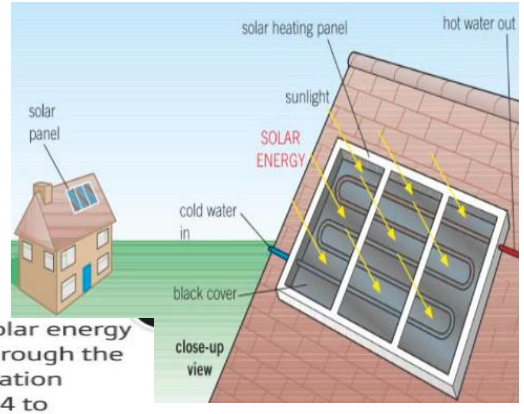
Resource	Renewable?	Uses	Advantages	Disadvantages
Fossil Fuels	Non-Renewable	Electricity, transport, heating	Reliable – electricity can be generated all of the time. Relatively cheap way of generating electricity.	Produces carbon dioxide, a greenhouse gas that causes global warming. Can produce sulphur dioxide, a gas that causes acid rain.
Nuclear Fuel	Non-Renewable	Electricity	Produces no carbon dioxide when generating electricity. Reliable – electricity can be generated all of the time.	Produces nuclear waste that remains radioactive for thousands of years. Expensive to build and decommission power stations.
Bio Fuel	Renewable	Heating, electricity	Carbon neutral. Reliable – electricity can be generated all of the time.	Production of fuel may damage ecosystems and create a monoculture.
Wind	Renewable	Electricity	No CO_2 produced while generating electricity.	Unreliable – may not produce electricity during low wind. Expensive to construct.
Hydroelectricity	Renewable	Electricity	No CO_2 produced while generating electricity.	Blocks rivers stopping fish migration. Unreliable – may not produce electricity during droughts.
Geothermal	Renewable	Electricity, heating	Does not damage ecosystems. Reliable source of electricity generation.	Fluids drawn from ground may contain greenhouse gases such as CO_2 and methane. These contribute to global warming.
Tidal	Renewable	Electricity	No CO_2 produced while generating electricity.	Unreliable – tides vary. May damage tidal ecosystem e.g. mudflats.
Waves	Renewable	Electricity	No CO_2 produced while generating electricity.	Unreliable – may not produce electricity during calm seas.
Solar	Renewable	Electricity, heating	No CO_2 produced while generating electricity.	Unreliable – does not produce electricity at night. Limited production on cloudy days. Expensive to construct.

Geothermal energy:
This comes from the energy released by radioactive sources deep in the Earth.
- The energy transferred from these substances heats the surrounding rock
- The hot rocks are used to turn water into steam



Geothermal power station

Solar water heating



Solar heating panels use solar energy to heat water that flows through the panel. You can use the equation $\Delta E = m\,c\,\Delta\theta$ from Topic P2.4 to estimate the temperature increase of mass m of water that flows through the panel, where c is the specific heat capacity of water and E is the solar energy absorbed by the panel.

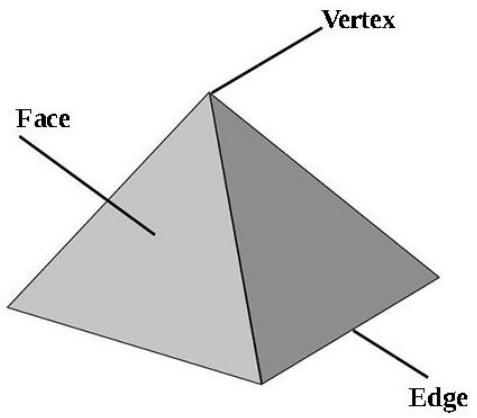
Further reading

https://www.bbc.co.uk/bitesize/guides/zchgdxs/revision/1

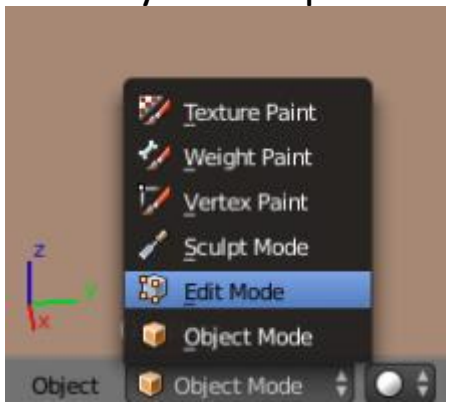
Y9 CT Term 5 – Vector graphics

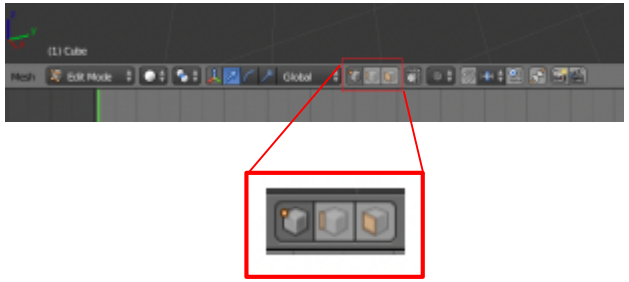
Vector graphics are images described in terms of polygons (straight line shapes with no start or end, eg. triangle))
We use Blender to manipulate vector graphics. This is free, but used by professional animators and game developers.

Vertices, edges and faces

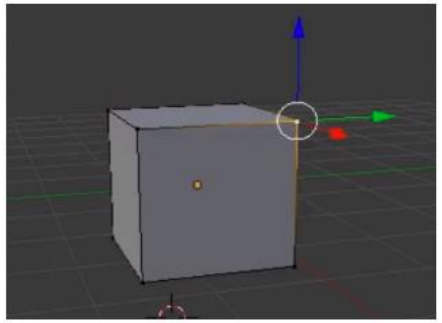


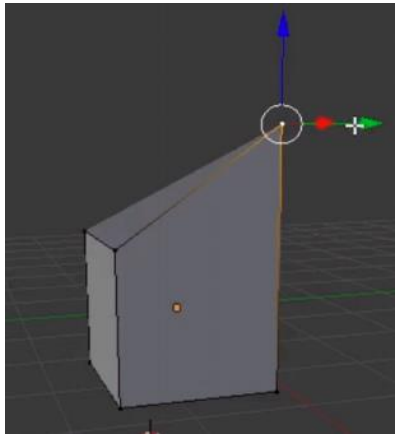
To manipulate a **vertices**, **edge** or **face** select **Edit mode**.
Select your shape and...



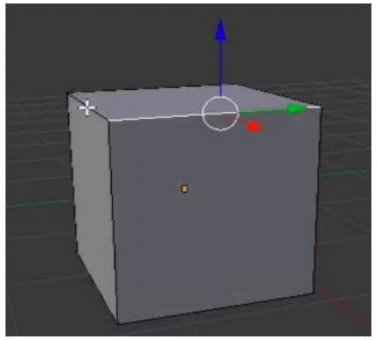


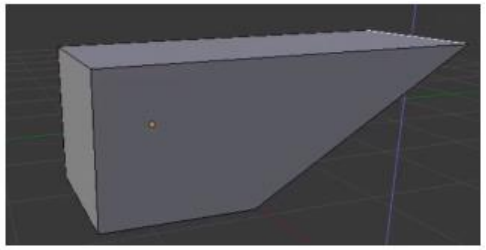
Manipulating a vertice



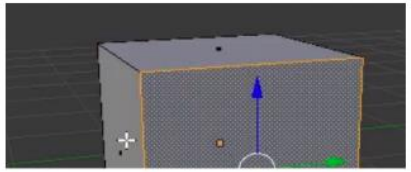


Manipulating an edge





Manipulating a face

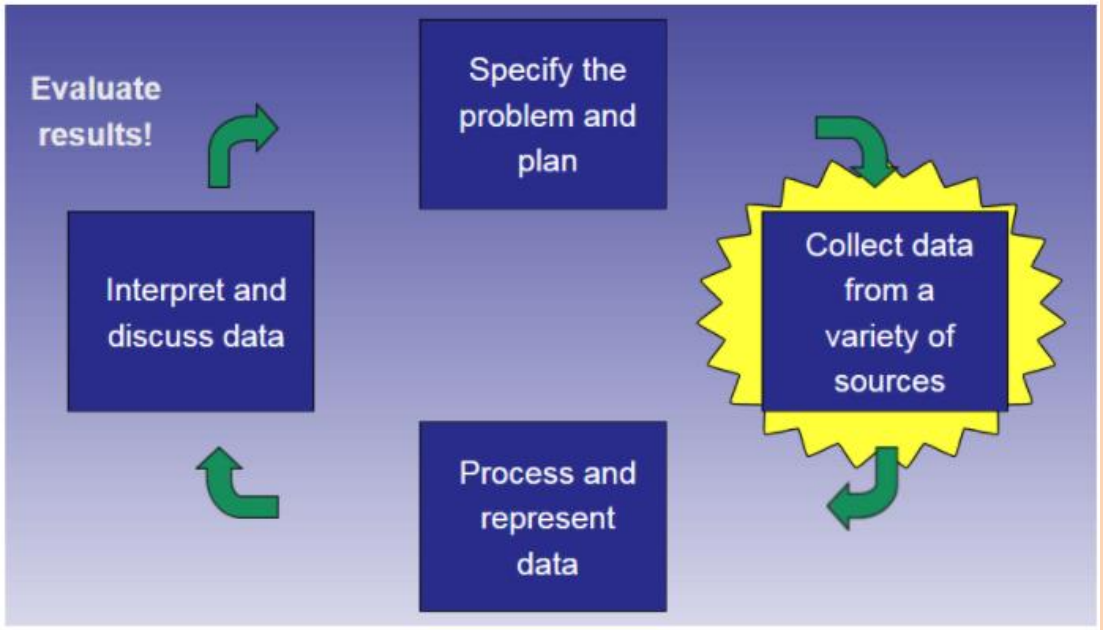


Y9 CT Term 6 – Data Science

Data is the new oil. Big data is big business, but it needs collecting, cleaning and organising.

Data Science is answering questions using Data.

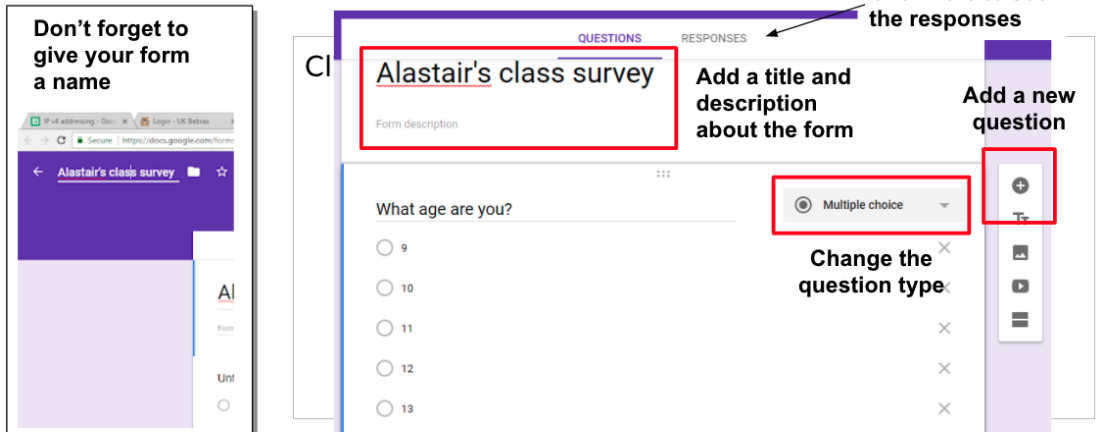
The process of proving if a hypothesis is true or false: The Data Handling Cycle

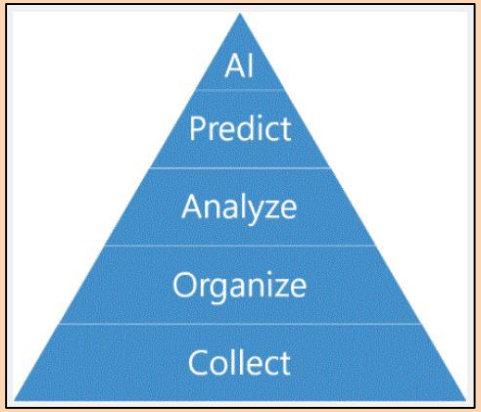


A *hypothesis* is a statement that can be true or false.

- We can prove/disprove a hypothesis by data analysis.
- The Data Handling Cycle is a well used process to collect appropriate data from various sources, present it in a way that is useful, then a conclusion can be made either way.
- A spreadsheet is an excellent tool to collate and present collected data to be useful (graphs & conditional formatting)

Collect data efficiently by using online forms





AI - AI and Deep Learning models enable the testing of hypothesis

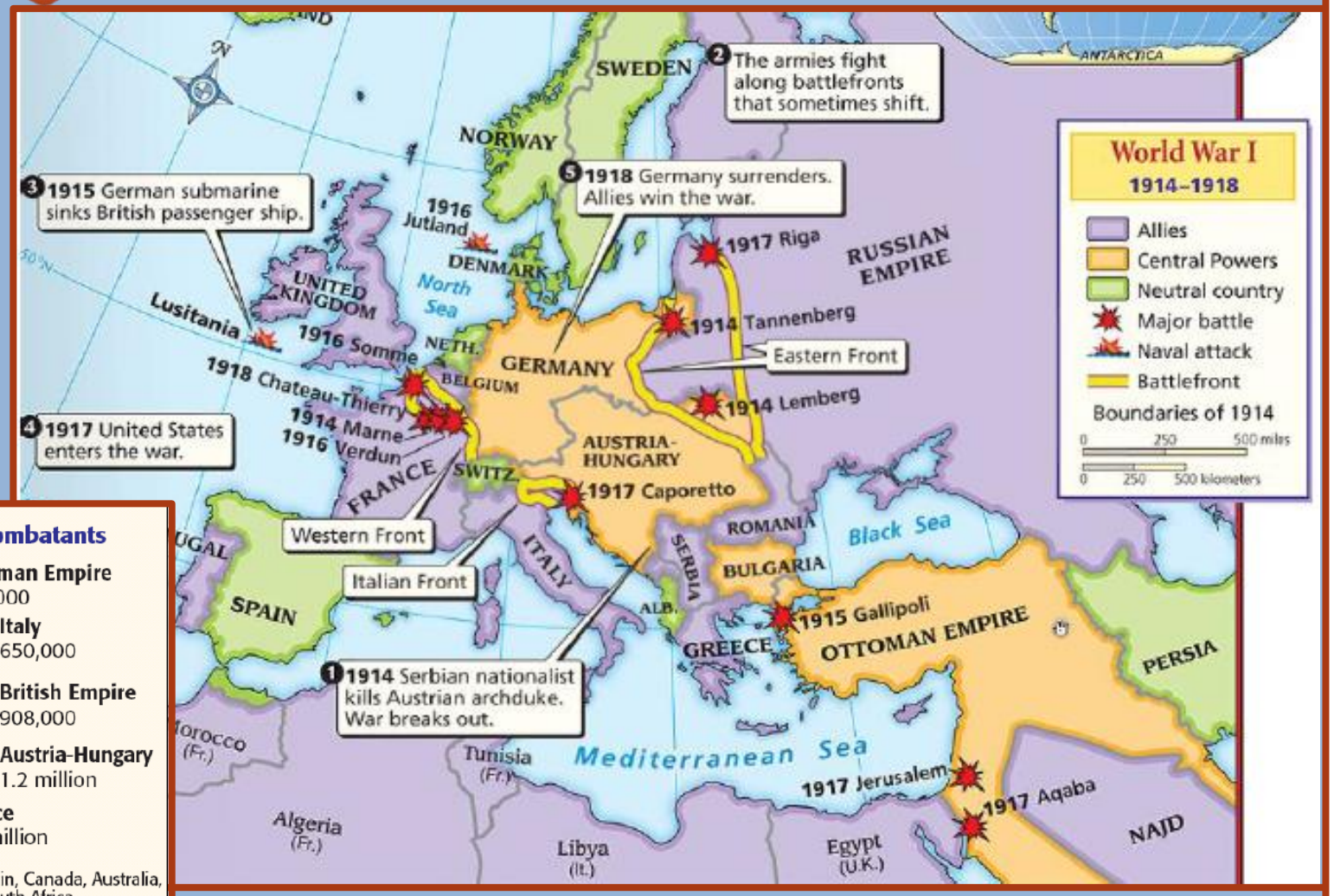
Predict - Extrapolate graphs or use models to predict what will happen next

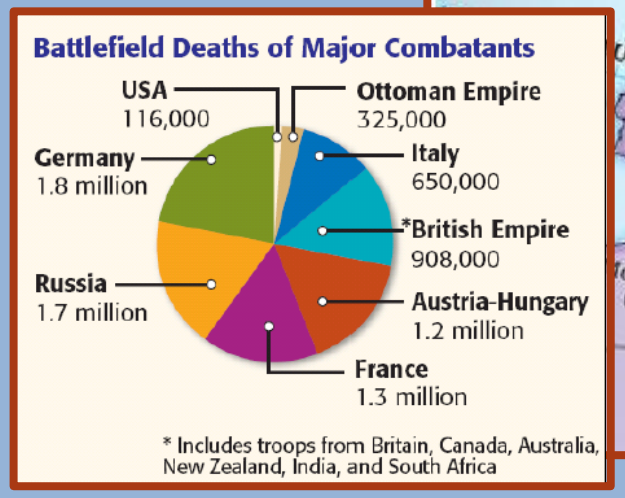
Analyse - Visualise the data using graphs. Enables trends to be spotted

Organise - Clean the data and remove unnecessary details. Store in a usable data format

Collect - Data collection of appropriate data from relevant source. Data logging, sensors, secondary sources, surveys

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



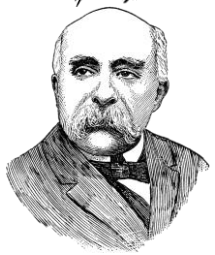


Specific Effects of World War 1:

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

‘The Big Three’

Woodrow Wilson



Georges Clemenceau

David Lloyd George

Wilson's aims:

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

Clemenceau's aims:

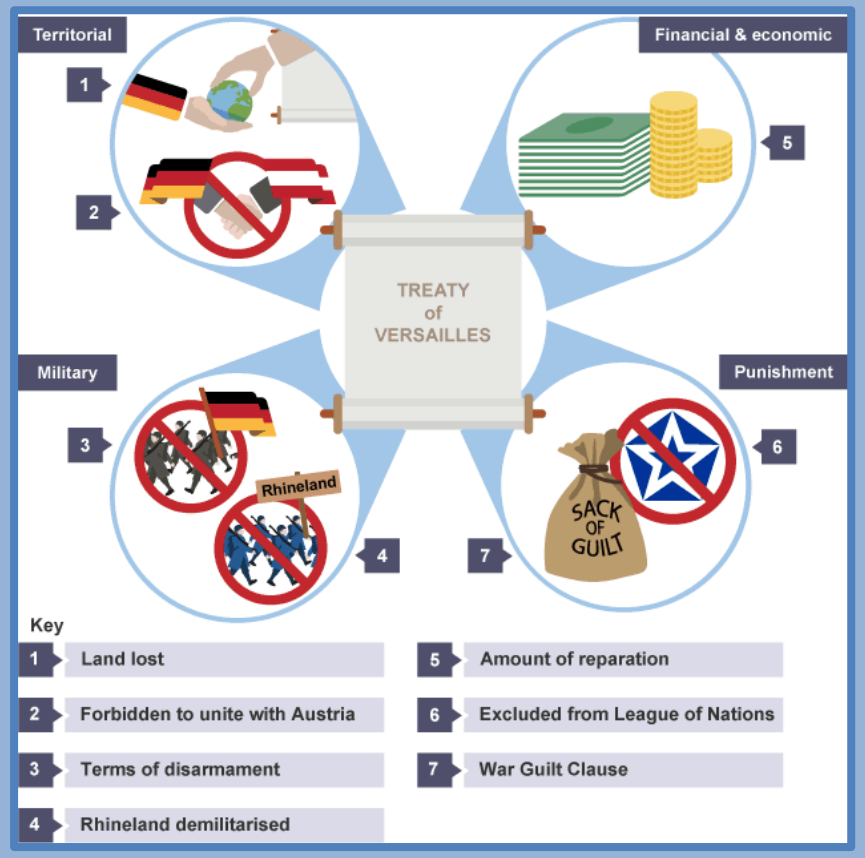
- to punish Germany and seek revenge
- to return Alsace-Lorraine to France
- no League of Nations
- an independent Rhineland
- huge reparations
- to disband the German army so that Germany would never be strong enough to attack France again

Lloyd George's aims:

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

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

The Treaty of Versailles dealt specifically with Germany



Summary of Germany terms

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

Find out more about the treaty:

https://youtu.be/TViVAmSlLG4

Term 5: The Effects of the Peace Treaty

Germany

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

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

Britain

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

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

France

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

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

America

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

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

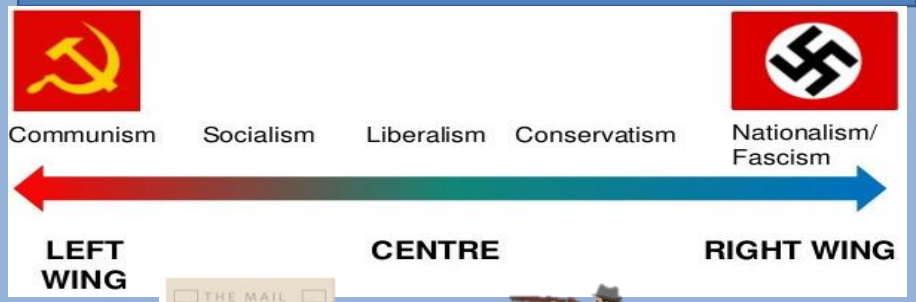
Key outcomes of the treaties were the separation of the Central Powers into independent countries. Many of these new countries struggled to create security and economic prosperity.

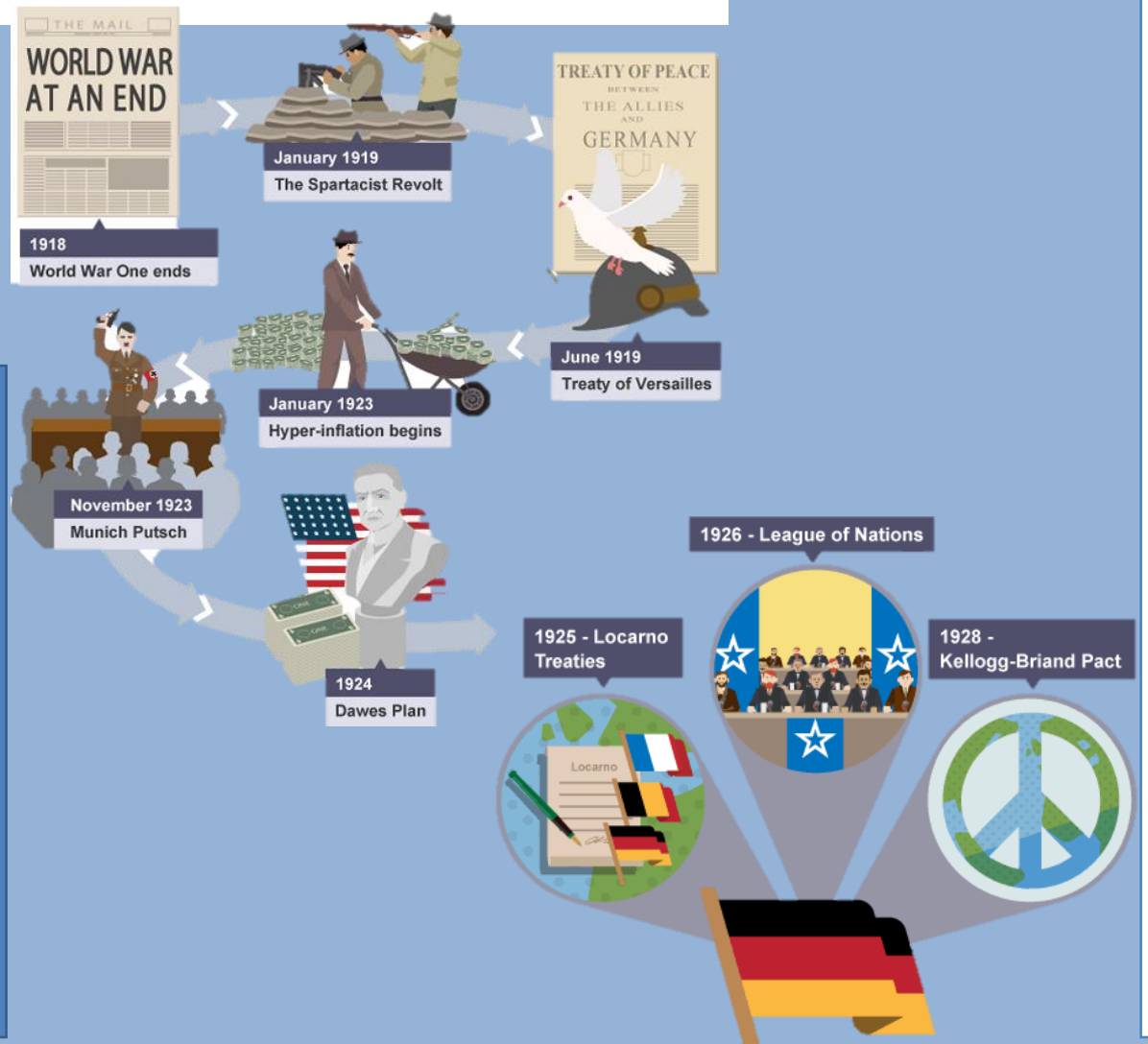
Germany and Austria were forbidden from uniting again, German territory was given to other nations.

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

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

Term 5 – The Weimar Republic





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

9th November 1918: Kaiser Wilhelm II abdicates his throne, there are several protests and a mutiny of German sailors in Kiel.

11th November 1918: The Armistice is signed.

5th-12th January 1919: The Spartacist Uprising in Berlin. Leaders include Karl Liebknecht and Rosa Luxemburg. The Freikorps suppress the rebellion.

February-June 1919: Weimar National Assembly established. Friedrich Ebert is elected President.

28th June 1919: Germany signs the Treaty of Versailles - the peace treaty that ends the First World War.

13th March 1920: The Kapp Putsch - A revolt in Berlin led by Wolfgang Kapp supported by the Freikorps. A strike brings the Putsch to an end.

11th January 1923: Occupation of the Ruhr - French and Belgian troops occupy the Ruhr industrial region as Germany had stopped paying reparations.

1923: Hyperinflation begins - Prices begin to rise rapidly made worse by the printing of money to pay striking workers in the Ruhr. The Reichsmark becomes worthless.

13th August 1923: Gustav Stresemann becomes Chancellor and Foreign Minister

8th November 1923: The Munich Putsch - The Nazis attempt a failed putsch in Munich. Hitler is sent to Landsberg prison for his role in it.

August 1924: The Dawes Plan - The agreement helps Germany with its reparations.

18th July 1925: Mein Kampf, Hitler's book is published with his ideas for Germany.

16th October 1925: The Locarno Pact - Germany agrees to the border set out in the Treaty of Versailles.

14th February 1926: The Bamberg Conference - Hitler meets with leading Nazis to reorganize the party and cement his authority.

8th September 1926: Germany is admitted to the League of Nations. This had been prohibited under the Treaty of Versailles.

27th August 1928: The Kellogg-Briand Pact is agreed, binds nations into an agreement not to use war as a method of solving disputes.

31st August 1929: Young Plan agreed, significantly reduces German reparations and gives Germany longer to pay them.

3rd October 1929: Gustav Stresemann dies

29th October 1929: Wall Street Crash - US Stock market crashes triggering events that lead to the Great Depression in the 1930s.

31st July 1932: The Nazis win 230 seats in the Reichstag election making them the largest party. 37% of voters support Hitler and the Nazis.

30th January 1933: Hitler appointed Chancellor of Germany

WORLD WAR II

Term 6 – The Road to War

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

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

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

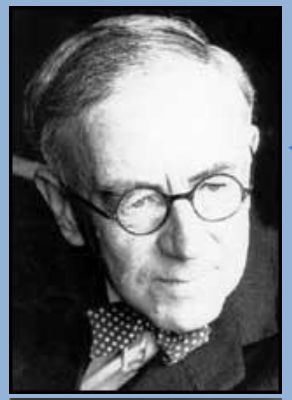
In 1938, Germans living in the border areas of Czechoslovakia (the Sudetenland) started to demand a union with Hitler's Germany. The Czechs refused and Hitler threatened war. On 30 September during the Munich Agreement - without asking Czechoslovakia - Britain and France **gave** the Sudetenland to Germany.

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

British Prime Minister Neville Chamberlain meeting Hitler in 1938

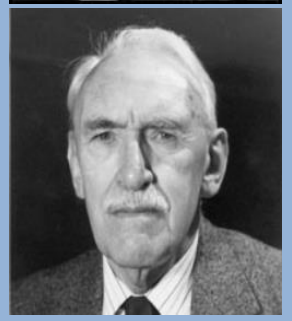
Watch this short clip to see how the news reported the agreements at the time:

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



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

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



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

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

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

Was appeasement the right policy?

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

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

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

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

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

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

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

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

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

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

World War Two

Key Events

The Phoney War (September 1939–April 1940)

Hitler conquered Poland. There was no other major activity on land, although there were actions at sea. Historians believe that this period saw very little action as all countries involved were biding their time and waiting for the other to make the first move. The governments of Germany, Britain and France began to issue propaganda. The British government even flew over Germany but, rather than dropping bombs, they dropped **propaganda** leaflets. Very little of military significance happened that was noticeable. However, all countries were developing their military bases and new technologies. People began to get frustrated and some evacuated children were sent home because people felt there was no point staying in the countryside when there were no bombs to worry about.

Blitzkreig (April 1940–June 1940)

The Nazis conquered Denmark, Norway, Holland, Belgium and France. The British Expeditionary Force was trapped at Dunkirk, but managed to withdraw by sea back to Britain. On 4th June, 1940, Winston Churchill delivered one of the most famous speeches of all time to the House of Commons in Westminster. In it, he warned about the possibility of a German invasion of Britain and said to the inspiration of many: ”We shall defend our island, whatever the cost may be. We shall fight on the beaches, we shall fight on the landing grounds, we shall fight on the fields and in the streets, we shall fight in the hills; we shall never surrender.”

Britain and the empire stands alone (July 1940–June 1941)

•Britain withstood the German Airforce, called the Luftwaffe, in the Battle of Britain (July–September 1940).
•But Britain was alone, and in great danger of losing the war.
•The Luftwaffe bombed London for 76 nights running (the Blitz), then other cities such as Coventry. People took cover in air raid shelters; some were made of corrugated iron in gardens; others were located inside train stations and tunnels.
•The British were driven out of Greece and most of North Africa.
•The British ran out of money, and had to sign the Lend-Lease Agreement with America (America sold arms to Britain, to be paid back after the war).

KEY COUNTRIES AND PEOPLE

Axis
Germany
Japan
Italy

Adolf Hitler
Leaader of the Nazi party and German Chancellor, 1933-1945

Benito Mussolini
Italian Prime Minister, 1922-1943

Allies
Great Britain
USA
Russia
France

Neville Chamberlain
UK Prime Minister, 1937-1940

Winston Churchill
UK Prime Minister, 1940-1945 (and again from 1951-1955)

Franklin D. Roosevelt
US President, 1933-1945

Harry S. Truman
US President, 1945-1953

Joseph Stalin
General Secretary of the Communist Party in Russia and Leader of the USSR, 1929-1953

Here is a link to an overview of WW2:
https://www.youtube.com/watch?v=HUqy-OQvVtI

The tide turns (1941–1943)

•In June 1941, Hitler invaded Russia, known as Operation Barbarossa. This brought Russia back into the war, this time against Germany. The failure of Operation Barbarossa was the first major German defeat.
•In December 1941, the Japanese bombed Pearl Harbour. This brought America into the war.
•As a result the Allies gradually began to win the war:
•In June 1942 the Americans defeated the Japanese at the Battle of Midway.
•In November 1942 the British won the Battle of El-Alamein in Egypt.
•In January 1943 the Russians defeated the Nazis at the Battle of Stalingrad.

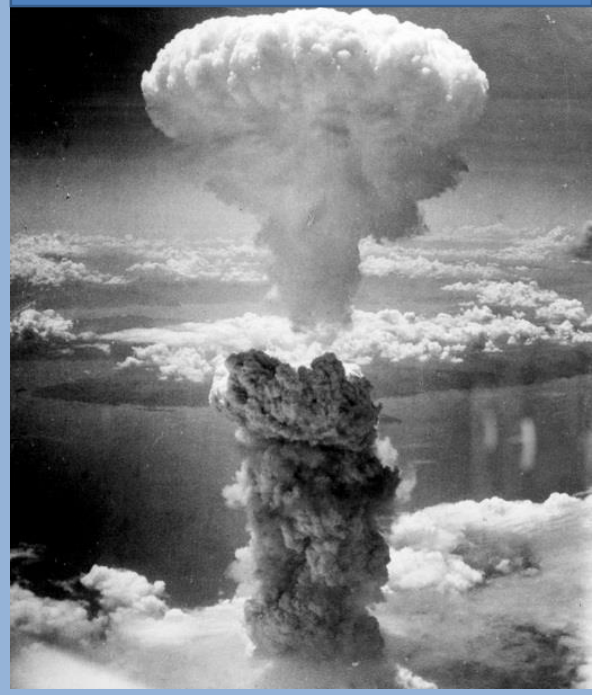
Victory (1943–1945)

•In 1944, the Nazis launched V-1 rockets, known as doodlebugs, which fell randomly in southern Britain.

But:

•After D-Day on 6 June 1944, Germany was gradually driven back in Western Europe by the British, Americans and their allies.
•The Americans and British continued the strategic bombing campaign on German cities.
•The Russians advanced in Eastern Europe and in April they reached Berlin. Hitler committed suicide.
•Germany surrendered and war came to an end in Europe shortly afterwards and VE Day was announced on 8 May 1945. Winston Churchill announced this with caution: ”We may allow ourselves a brief period of rejoicing; but let us not forget for a moment the toil and efforts that lie ahead”. He was speaking of Japan, where the war would continue for three months more.
•On 6 August 1945, the Americans dropped the atomic bomb on Hiroshima, and again on Nagasaki on 9 August. Within weeks Japan surrendered, and VJ Day was announced 15 August 1945. By this stage, Winston Churchill was no longer Prime Minister. Clement Attlee had taken over following a general election in which the majority of people voted for a Labour government believing that they would help them more in recovering from the destruction of war. Attlee said, at midnight, “The last of our enemies is laid low”.

Should the bomb have been dropped?



World War Two created a new world:

It has been estimated that 50 million people died in World War Two.
The old empires of France and Britain were ruined. A 'wind of change' meant that by the end of the 1960s almost all the old colonies of the British Empire had gained their independence.
America and Russia were the new 'superpowers', and immediately started on a **Cold War**.
The dropping of the atomic bomb on Hiroshima and Nagasaki created a world which was terrified by the threat of atomic war.
Germany was divided, and remained so until 1990.
The League of Nations was disbanded. Instead, a new United Nations was declared.

A good analysis of WW2:
https://www.youtube.com/watch?v=Q78COTwT7nE

The Holocaust

After 1919, Jewish people in Germany were free and legally equal and often felt more German than Jewish. Many were wealthy and successful.

But there was an undercurrent of anti-Jewish racism, called '**anti-Semitism**', in Germany. Hitler appealed to this anti-Semitism by blaming the Jewish people for Germany's defeat in the First World War. Nazi race-scientists incorrectly claimed that the Jewish people were sub-human.

As soon as Hitler came to power he introduced a programme of **persecution**. The Nuremberg Laws (1935) deprived Jewish people of many of their civil rights. On 9 November 1938, Kristallnacht or the 'Night of Broken Glass' took place. Jewish businesses, synagogues and homes were attacked and destroyed. This was a response to the assassination of a German diplomat by a Polish Jewish man in Paris.

After the outbreak of World War Two in 1939, the Nazis stepped up the persecution of the Jewish people:

•They were herded into over-crowded '**ghettos**'.

•After 1941, following the invasion of the Soviet Union, Nazi death-squads, called 'einsatzgruppen', murdered more than a million Jewish people in eastern Europe.

•In 1942, a Nazi conference at Wannsee decided on the 'Final Solution' – the Jewish people were to be systematically taken to camps such as Auschwitz and gassed.

Nobody knows how many Jewish people died during the Holocaust, but the usual figure given is 6 million.

1933	Hitler's 'brownshirts' stood outside Jewish shops and persuaded Germans to boycott them.
Summer 1935	'Jews not wanted here' posters began to go up around Germany.
September 1935	The Nuremberg Laws deprived Jewish people of their civil rights. They were forbidden to vote and they were not allowed to marry Germans. Other laws were passed forbidding them to go out at night or own a bicycle, among other things.
9 November 1938	Kristallnacht was when Jewish businesses, synagogues and homes were destroyed. Many Jewish men were killed or put in concentration camps.
January 1939	Hitler accused the Jewish people of stirring up other countries against Germany. He threatened them with annihilation if a war broke out.
1940	In many towns, Jewish people were forced to leave their homes and go to live in Jewish areas, or 'ghettos', where they were forbidden to earn a wage. Many starved to death.
1941	All Jewish people were forced to wear a yellow Star of David.
1941	In eastern Europe, Nazi Einsatzgruppen rounded up and murdered over a million Jewish people.
1942	Wannsee Conference: In January, the decision was taken for a 'Final Solution to the Jewish Problem' – to exterminate all the Jewish people in Europe. Camps were built at places such as Auschwitz and Jewish people were rounded up and sent there to be gassed. Jewish prisoners were organised into Sonderkommando units to burn the bodies in the crematoria. Others were worked to death in labour camps to help the war effort.
Winter 1944–1945	The 'Death Marches'. As the Russians advanced, the SS guards marched the Jewish people to concentration camps in the west. Many Jewish people died on the marches. Many were killed because they could not keep up. When they reached camps such as Bergen-Belsen in West Germany, they were crammed in in such numbers that they died of starvation or disease.

YEAR 9/GCSE Geography - Coasts

How do waves form?

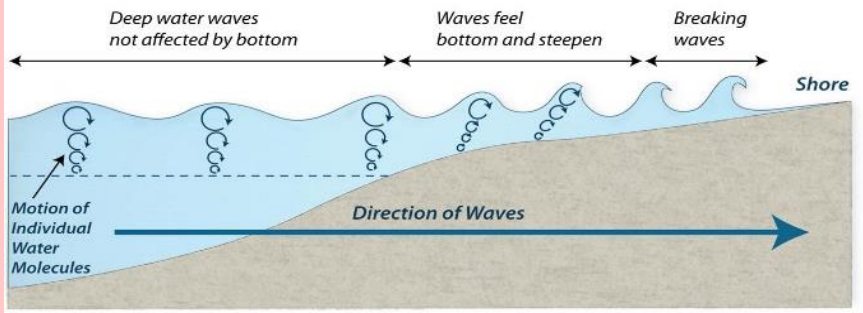
Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

The size of the wave is determined by:

1. **Fetch** – how far the wave has travelled
2. Strength of the wind
3. How long the wind has been blowing

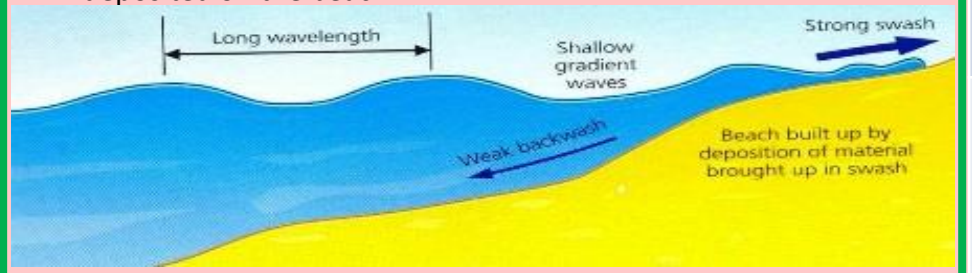
Why do waves break?

1	Waves start out at sea.
2	As waves approaches the shore, friction slows the base.
3	This causes the orbit to become elliptical.
4	Until the top of the wave breaks over.



Constructive waves

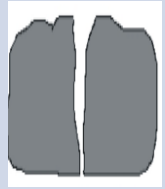
- Low and long waves.
- Low frequency of waves (6-8 waves a minute).
- The swash is more powerful than the backwash, so sediment is deposited on the beach.



Destructive waves

- Steep and high waves.
- High frequency of waves (10-15 waves a minute).
- The backwash is more powerful than the swash, so sediment is eroded away from the beach (destroying the beach).

Mechanical Weathering Example: Freeze-thaw weathering

Stage One - Water seeps into cracks and fractures in the rock.	
Stage Two - When the water freezes, it expands about 9%. This wedges apart the rock. Water can travel deeper into crack	
Stage Three - It thaws and the water seeps further into the cracks. With repeated freeze-thaw cycles, the rock breaks off.	

Chemical weathering is the breakdown of rock through changing its chemical composition. When rainwater hits rock it decomposes it or eats it away. This is known as **carbonation**. This occurs when slightly **acidic (carbonic) rain** or sea water comes into contact with sedimentary rock, such as **limestone or chalk**, it causes it to **dissolve**.

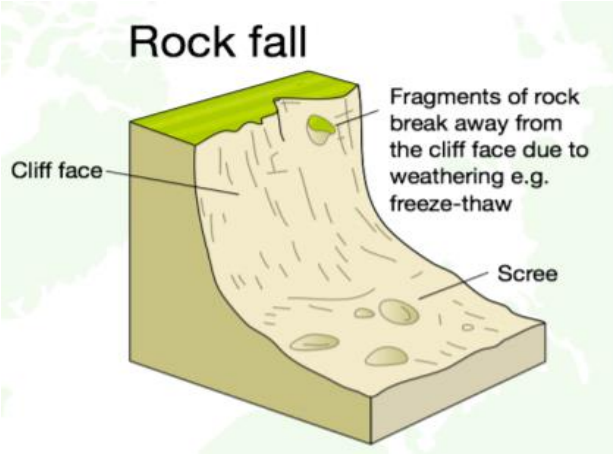
A chemical reaction occurs between the acidic water and the calcium carbonate and forms calcium bicarbonate. This is soluble and is carried away in solution.

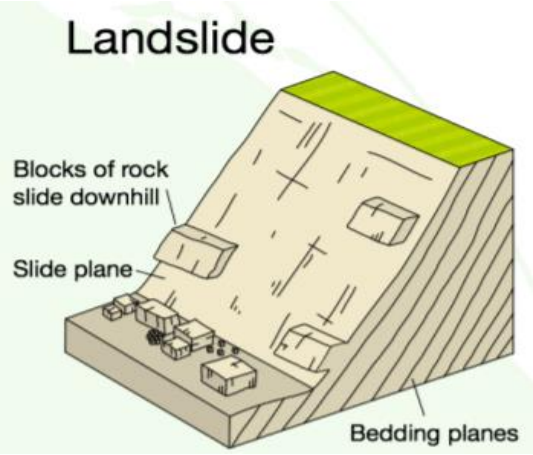
Types of erosion

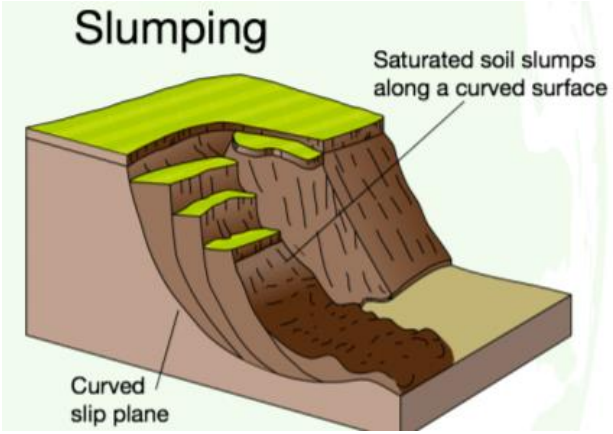
Hydraulic power – As the powerful waves smash into the cliff face, air is compressed in the small cracks of the rock and breaks fragments off.	**Attrition** – eroded material in the sea bumps into other and eventually wears down – materials becomes smaller and more rounded.	**Abrasion/corrasion** – strong waves picks up rocks and pebbles. These are then smashed into the cliff face which breaks new rock fragments off.	**Solution** - when certain types of cliff dissolve as a result of weak acids in the sea.

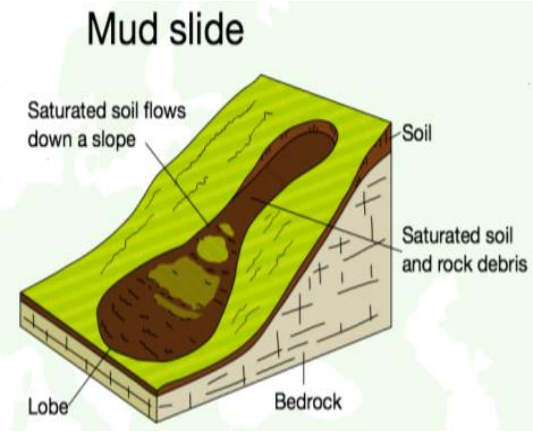
Mass Movement

Mass Movement is the downhill movement of cliff material under the influence of gravity and extreme weather changes.









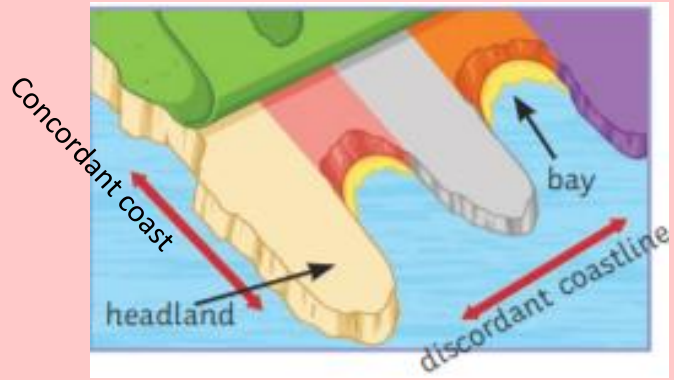
Wave-cut platform

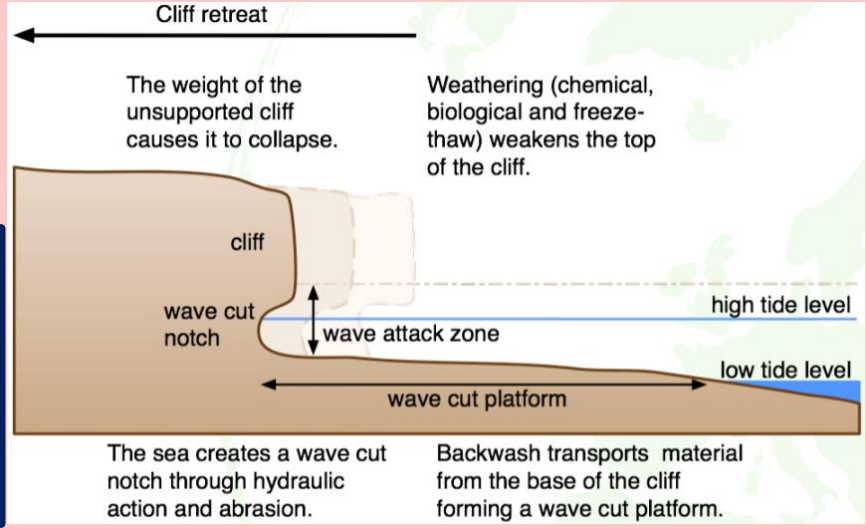
A wave-cut platform is formed when (1) The sea attacks a weakness in the base of the cliff. For example, this could be a joint in chalk. (2) A wave-cut notch is created by erosional processes such as hydraulic power and abrasion. (3) As the notch becomes larger the cliff becomes unstable and collapses as the result of gravity. (4) The cliff retreats inland. (5) The material from the collapsed cliff face is eroded and transported away. This leaves a wave-cut platform. (6) The process repeats over time as the cliff collapses and retreats repeatedly.

Bays and Headlands

Headlands form along discordant coastlines where bands of soft and hard rock outcrop at right angles to the coastline (see image below). Due to the different nature of the rock erosion occurs at different rates. Less resistant rock (e.g. boulder clay) erodes more rapidly than more resistant rock (e.g. chalk).

The bands of soft rock, such as sand and clay, erode more quickly than those of more resistant rock, such as chalk. This leaves a section of land jutting out into the sea called a headland. The areas where the soft rock has eroded away, next to the headland, are called bays. Sandy beaches are often found the sheltered bays where waves lose energy, and their capacity to transport material decreases resulting in material being deposited.



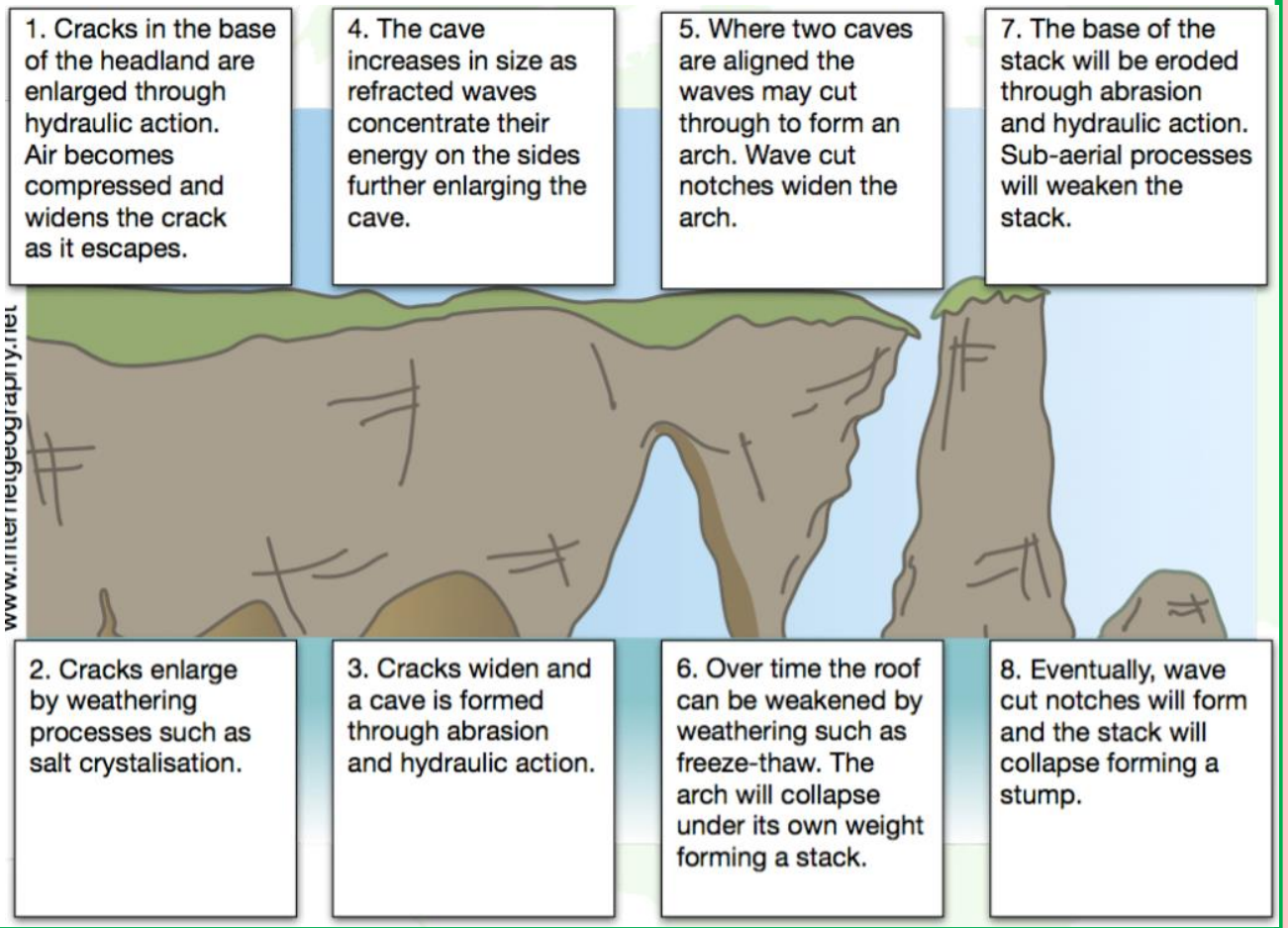


Discordant and Concordant Coastlines

Where coastlines vary in bands of soft and hard rock are called discordant coastlines. A concordant coastline is where the same rock runs along the length of the coast and normally has fewer bays and headlands. Along the coastline of Dorset, there are both – the concordant coastline runs from west to east along the south coast, but the discordant coastline runs from Studland Bay to Durlston Head as the geology changes from clay and sands, to chalk and limestone.

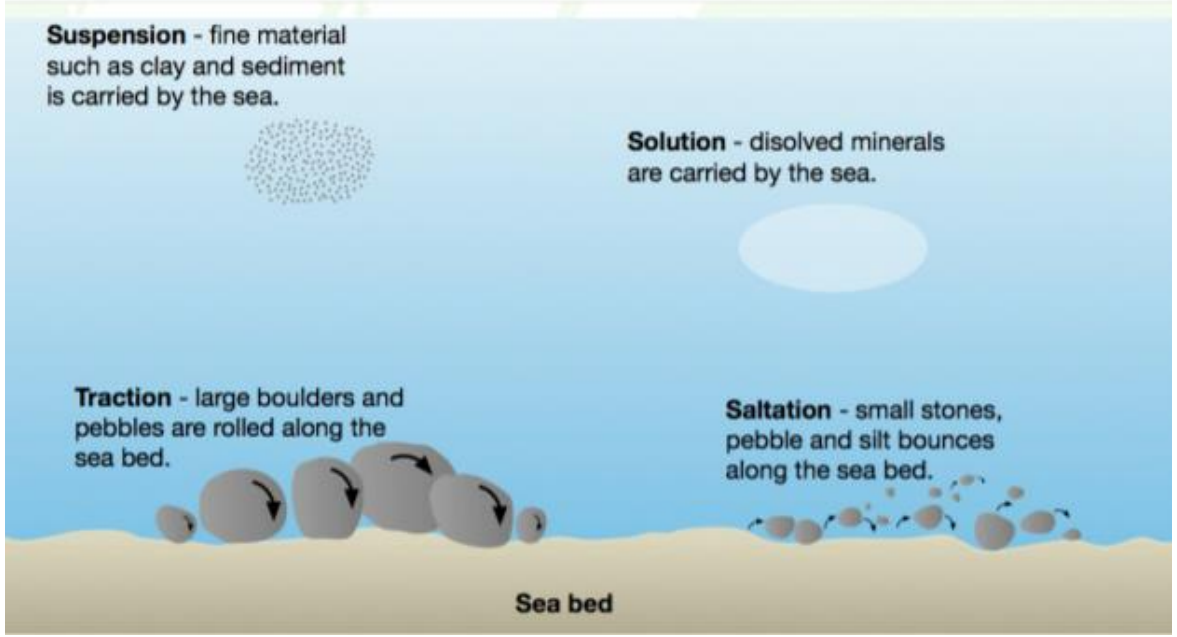
Erosion of Headlands

Headlands are normally made of resistant rock, so do not erode easily. However, when they do erode, they form these landforms as shown in the diagram below:



Process of transportation

Once sediment has been eroded from the cliff face, it will then be transported. There are 4 different ways which sediment can be transported.

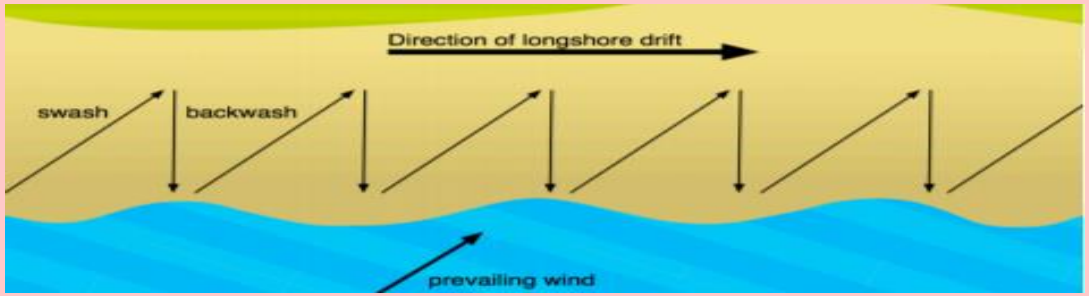


Key Words

Fetch, constructive, destructive, freeze-thaw weathering, chemical weathering, carbonic acid, hydraulic power, abrasion, attrition, solution, mass movement, rock fall, landslide, slumping, mud slide, bay, headland, concordant coast, discordant coast, wave-cut platform, wave-cut notch, erosion, deposition, transportation, cave, arch, stack, stump, suspension, traction, solution, saltation, longshore drift, swash, backwash

Longshore Drift

Longshore drift is the movement of material along the shore by wave action. It happens when: (1) waves approach the beach at an angle, (2) the swash (waves moving up the beach) carries material up and along the beach. (3) the backwash (waves moving back down the beach) carries material back down the beach at right angles. This is the result of gravity. (4) This process slowly moves material along the beach and provides a link between erosion and deposition. Material is transported through suspension, traction, solution and saltation. Longshore drift provides a link between erosion, transportation and deposition.



Coastal Deposition

Deposition is when material that is being transported is dropped by constructive waves, as the waves lose their energy.
Deposition happens when the swash is stronger than the backwash and is associated with constructive waves.

Deposition is likely to occur whenever wave energy is reduced, such as where:

- waves enter an area of shallow water;
- waves enter a sheltered area, e.g. a bay;
- there is little wind;
- a river or estuary flows into the sea;
- or, where there is a good supply of material and the amount of material being transported is greater than the wave energy can transport.

Depositional Landform - Beaches

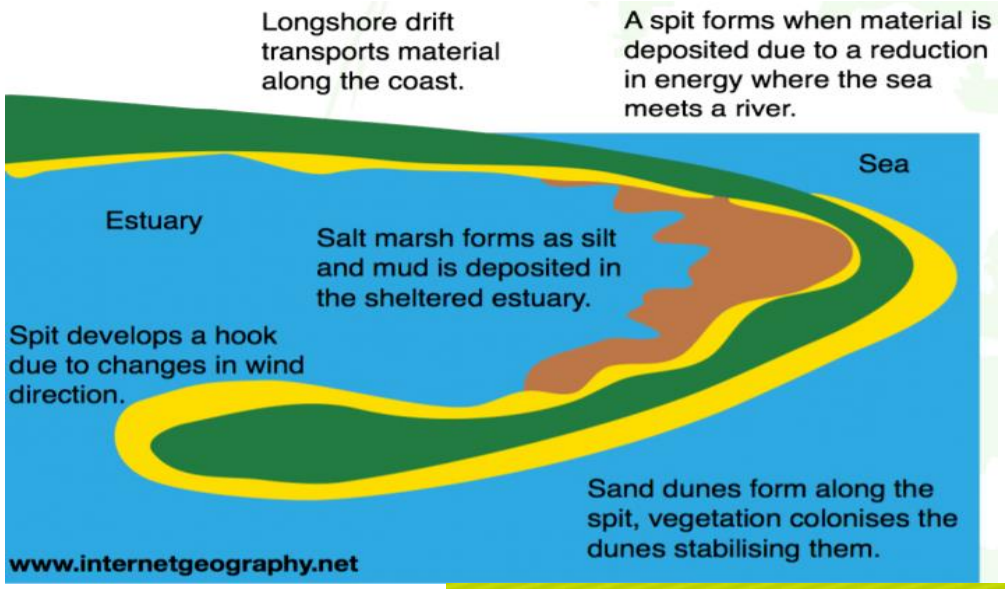
The beach is the area between the lowest spring tide level and the point reached by the storm waves in the highest tides. Every beach is different but they are usually made up of material deposited on top of a wave-cut platform and are formed from sand, shingle or pebbles, or mud and silt.

A sandy beach is usually formed in sheltered bays, where constructive waves with low energy transport material onto the shore: The swash is stronger than the backwash so the material is moved up the beach.

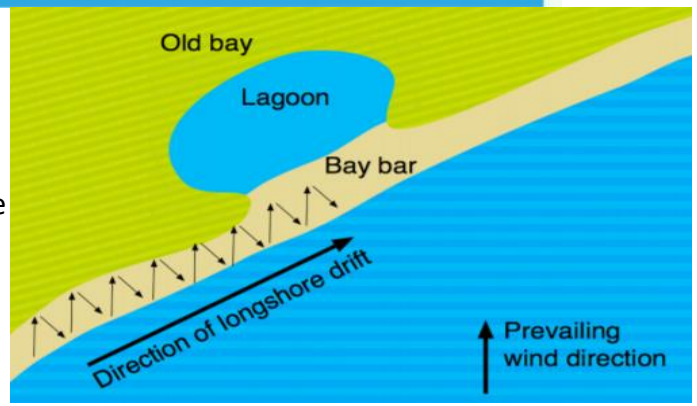
However, a pebble beach is usually found where there are waves of high energy (destructive waves) and this causes a steeper gradient as the strong backwash erode away the beach, leaving only the largest material (pebbles).

Depositional Landforms – Spits and Bars

A spit is a landform of coastal deposition and is formed when longshore drift moves material along a coastline. Where the coastline changes direction, or the power of the waves is reduced because it meets a river or estuary, material being transported by the sea is deposited. The sediment which is deposited usually builds up over the years to form a long ridge of material (usually sand or shingle) called a spit. An example of this is Hurst Castle Spit in Hampshire, or Mudeford Spit in Dorset. Over time, the shape of the spit can change, often due to changes in wind directions or river discharge during storms. This can cause it to become hook shaped, trapping sediment to form a salt marsh habitat.



Similarly, longshore drift will continue transporting and depositing sediment and if this continues in the same direction long enough, it will connect up with another headland creating a bar. The water behind the bar is cut off and becomes a lagoon. As it is a low energy zone, over time, deposition may fill in the lagoon to create a saltmarsh.



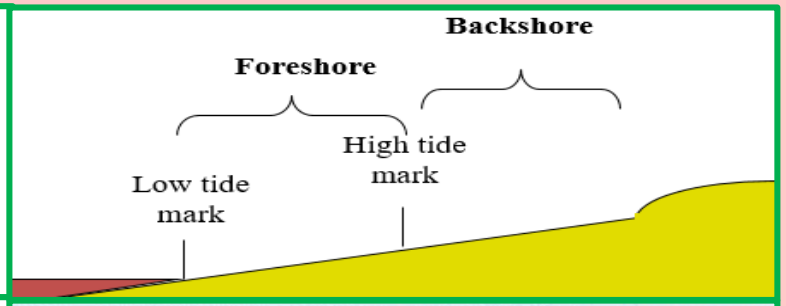
Depositional Landform – Sand Dune

For a sand dune to form there needs to be 3 main ingredients:

1. A large amount of loose, dry sand
2. Wind to move the grains of sand
3. An obstacle that causes the sand to lose momentum and settle, e.g. plant or driftwood

Sand Dune Supply of Sediment

Generally, 20% of the sand is blown up the beach from the foreshore (between the high and low tide mark), when it is exposed at low tide. 80% is blown onto the dunes from the backshore (the area between the high tide line and the dunes). This is because the sand is drier and thus lighter.

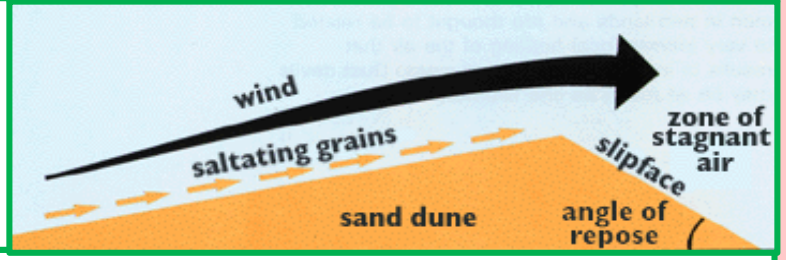


Sand Dune - Wind Force

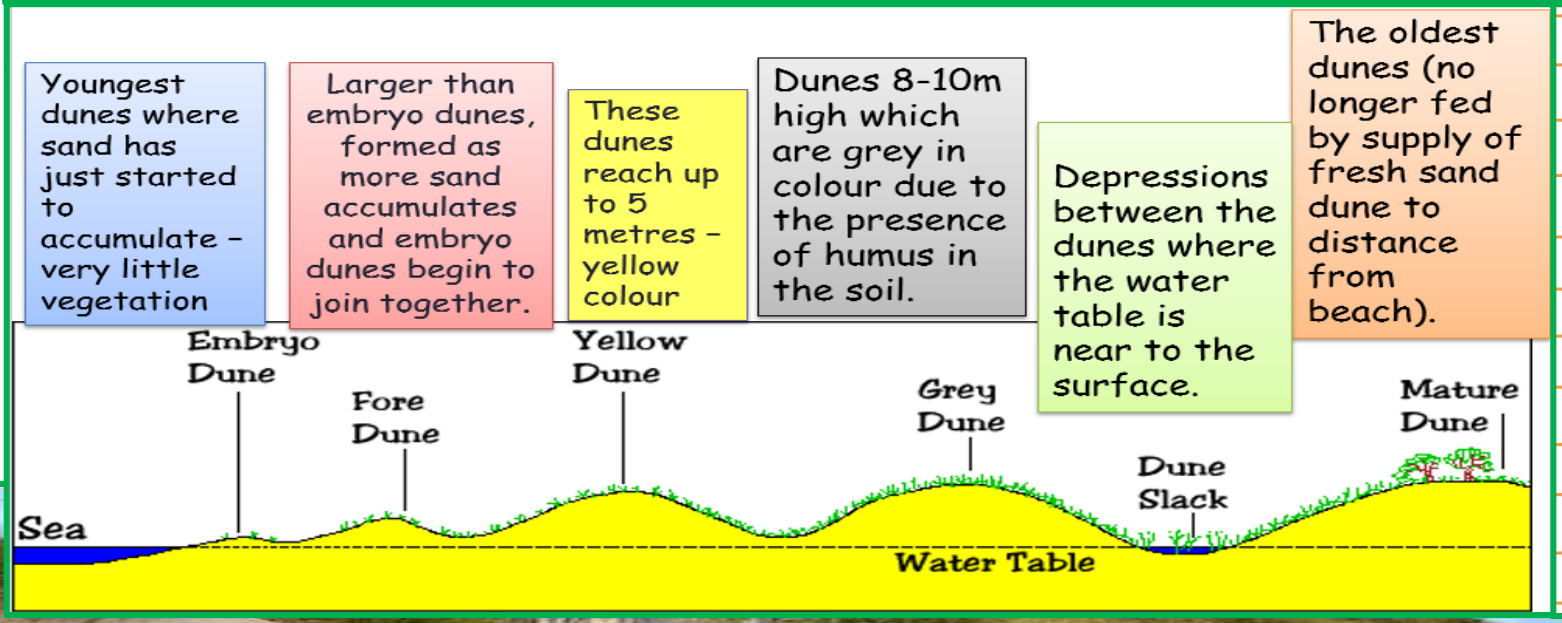
In the UK, most dunes are located on the south west and the north east coasts. This is because of prevailing winds coming across the Atlantic and the North Sea. If there was no wind, there would be no sand dunes!

The beginnings of a dune…

Wind-blown sand is generally moved up the beach through creep (rolling) or saltation (bouncing). It builds up against the obstacle, then as the dune grows, moves over the top, slipping down the slipface into the dune slack between dunes.



For a sand dune system to develop, it follows a progression from the harsh environment of an embryo dune to the intricate ecosystem of a mature dune. Grains of sand gradually move from the embryo dune towards the mature dunes. The diagram below which shows how each stage differs.



Embryo dunes
↓
Fore dunes
↓
Yellow dunes
↓
Grey dunes
↓
Dune slack
↓
Mature dunes

Protecting our coastline

Our coastlines need to be protected for many economic, social and environmental reasons, though it is important to remember we cannot protect everything.

In order to protect coastlines from constant erosion and weathering, people have used 2 different groups of engineering methods to minimise change. These are:

1. Hard Engineering methods - involves building and using structures made of solid materials such as steal concrete or rocks. The main idea is to stop the waves eroding the coast. However, they can be very costly and could cause visual pollution
2. Soft engineering methods – these work with the physical and natural processes within an area rather than building large man made structures to protect the land from wave attack. These methods are usually based on preserving and managing the beach or dunes.

Take a look at the table to find out different examples of each type…

Type of engineering method		Advantages	Disadvantages
Hard engineering	Sea wall	Have a recurved shape to minimise wave energy and reduce erosion. Stops erosion in a small area.	Very expensive to build and maintain. Look quite ugly and might destroy habitats. Stops people accessing the beach.
	Groynes	Groynes are fences which stick out perpendicular to the sea. They stop the movement of sediment through longshore drift and help build beaches. This is particularly good if you rely on a beach for tourism or protecting habitats.	As they stop the movement of sediment from one area, this could cause more erosion down the coast. Older looking groynes might not look as attractive and could also be hazardous.
	Rock armour	These are large rocks dumped in certain positions on a beach to absorb and reflect wave energy. As they absorb a lot of the waves energy, this stops erosion from taking place, but also causes sediment to be deposited so helping to build the beach.	These are very expensive, especially as the rocks need to be transported from very far away. Many of the rock armour we have in the UK has rocks from Norway. They might not fit in with the local scenery and look ugly.
	Gabions	Gabions are wire cages filled with smaller rocks that form a wall to reduce power of waves. They are significantly cheaper than a sea wall and easy to build. They can also last for a long time in the right conditions	As the wire corrode, they can become quite dangerous to people and animals as well as looking unappealing.
Soft engineering	Beach Nourishment	This is where sediments is taken from offshore or from a different area and dumped onto the beach making it wider. The wider beaches reduce erosion and flooding.	Can be very expensive as special equipment is needed to dredge sediment from offshore. They might not last for a very long time as the sediment is eroded after extreme weather.
	Dune Stabilising	This involves creating/restoring sand dunes through beach nourishment or planting vegetation to stabilise sand. This provides a barrier between land and sea, prolonging the effects of erosion. Looks more natural and provides habitats for plants and animals	Although they look more natural, they require a lot of maintenance to keep the dunes from eroding
	Managed retreat	This involved removing all defences from an area and giving up the land to the sea. This could allow for salt marshes to form and prevent flooding happening in another area. This is a very cheap method as you do nothing.	Normally means that buildings, houses and habitats will be lost, so you might have to give out compensation.

Protecting our coastline – Case Study –Bournemouth

Bournemouth Beach Management Scheme is a programme of work, planned from 2015 to 2032 to:

- Replace Bournemouth's existing 53 groynes
- Construct an additional three new groynes
- Replace the groyne at Hengistbury Head known as 'Long Groyne'
- Replenish the beach every five years

What work is taking place at Bournemouth Beach?

A phased programme of work is planned over 17 years. This is to replace the existing 53 groynes and install an additional three, as well as replacing the groyne at Hengistbury Head known as the Long Groyne.

The first phase involved the replacement of 30 groynes. These are along the coast from Southbourne to Hengistbury Head. Beach replenishment has taken place between Bournemouth and Boscombe Piers and to the east of Boscombe Pier. 320,000 m^3 of sand was replaced during autumn/winter 2015/16. There will be beach replenishment taking place once every five years. The first phase ran from autumn 2015 until 2020. The second and third phases (up to year 2032) will replace the remaining 29 groynes. These are along the seafront from Southbourne to Alum Chine. There will also be a further two beach replenishment operations. The locations of the future beach replenishments will be determined nearer the time, by continually monitor beach levels and assessing which areas need attention.

How is the beach replenished of sand?

Sand is dredged from a licensed area of seabed, for example, to the South East of the Isle of Wight. It is brought by dredger close to the section of beach where it will be deposited. The sand is then pumped through a long pipe on to the beach. The sand is mixed with water to assist it being pumped. As the mixture exits the pipe the water flows back in to the sea leaving the new sand behind. The beach is then levelled using bulldozers.

How much will it cost?

The total cost of the entire project (phases 1 – 3) is £50m approximately. The majority is funded by the Environment Agency and a small proportion by Council funding and local levy.

Why is the work necessary?

The work is required to ensure that Bournemouth's coastline continues to be protected from coastal erosion in the future.

Groynes were originally installed along the coastline in 1915. Groynes control beach material and prevent undermining of the promenade seawall. Groynes interrupt wave action and protect the beach from being washed away by longshore drift. Longshore drift is the wave action that slowly erodes the beach.

The sea wall and groynes alone will not protect the coastline. The beach is eroded over time by wave action and the longshore drift. The sand must be dredged and pumped back on to the beach to maintain it.

It is important that the beach is maintained as it is one of the UK's biggest attractions: There is an estimated 4.5 million visitors per year as well as being enjoyed by thousands of residents.

What would happen if we did not do the work?

The life span of a groyne is around 25 years. They must be replaced periodically to ensure the coastline continues to be protected. The process for removing and replacing each groyne can take up to two months. The groynes would eventually deteriorate and no longer be effective, if not replaced. The beach would eventually be washed away. The sea wall would become exposed and disintegrate, exposing the cliffs to further erosion.

BVT: The Origins of Islam - The Life of Muhammad

Muhammad's early life and visions

Muhammad was the founder of the religion of Islam and is considered by Muslims to be a messenger and prophet of God. Muslims believe he was the last of the Islamic prophets, which included Noah, Abraham, Moses and Jesus.

Born in 570 in the Arabian city of Mecca, he was orphaned at an early age and brought up by his uncle, Abu Talib.

He later worked mostly as a merchant, as well as a shepherd, and was married by age 25. He also worked to help the people in his community, was a public speaker and military leader.

He was not happy with his life in Mecca but could not understand why. He realized that, in Mecca, no one cared about the poor and the needy. People believed in evil spirits and magic and worshipped many different gods.

Muhammad wondered if there was anything that would show these people how to live better lives. He decided to leave Mecca and spend time in a cave outside the city, thinking about these things. According to Islamic beliefs it was here, that he received his first message from God.

The Night of Power

- One day, Muhammad had a strange feeling that he was no longer alone. "Do not be afraid," said a voice. Muhammad rubbed his eyes and stared – it was the **Angel Jibril.**
- Jibril showed Muhammad some words. 'Read!' the angel commanded. But Muhammad had never gone to school. He had never learned to read or write. The angel repeated his command, before squeezing Muhammad so hard that he thought that he would faint.
- The angel released Muhammad and he began to read out the beautiful words. Muhammad immediately knew that these words came from God. He listened carefully and was able to remember everything the angel said.
- Over 23 years Muhammad wrote down these words that had been revealed to him by God (**Revelations**).
- These were written down to create the **Qur'an**, the Holy Scripture for Muslims.

The picture above is of **Cave Hira** – the cave in which Mohammed received his first revelation.

Cave Hira is a popular pilgrimage site for Muslims to visit.

Key Terms	Definitions
Mecca	City in Saudi Arabia where Muhammad lived
Medina	First city in Saudi Arabia Muhammad converted to Islam
Islam	Name of the religion Muhammad founded; Muslims are part of this religion
Cave Hira	Where Muhammad had his Night of Power
Revelations	When God reveals himself to someone – words or visions
Angel Jibril	Angel sent by God or Allah; Also known as Gabriel
Prophet	A chosen man by God to teach others about God

There are no images or paintings of Mohammed – to create one is deemed disrespectful in Islam.

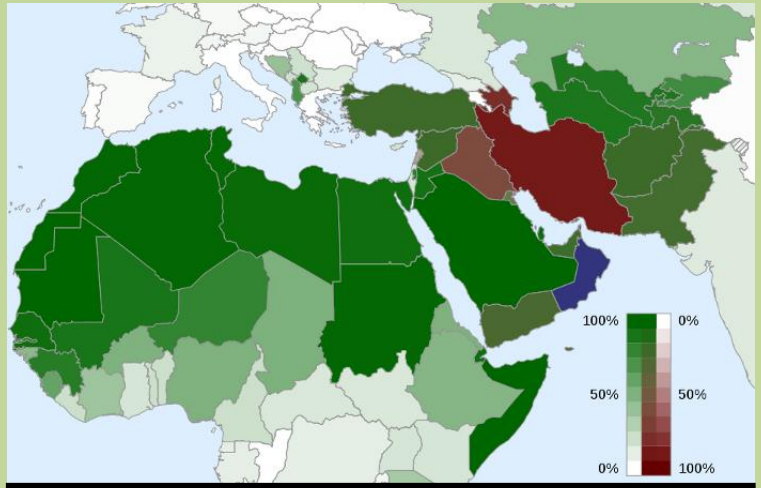
If you search Prophet Mohammed you find his name in Arabic, but no pictures. This is very different to Christianity, which has many paintings of Christ.

Muhammed spreads the word of Allah

- Muhammad did not win many followers to begin with, and some tribes around Mecca did not like his message, so he and his followers were treated harshly.
- To escape from this danger, Muhammad and his followers in Mecca went to **Medina** in the year 622. This event, the **Hijra**, marks the beginning of the Islamic calendar. This is because Medina was the first city that Muhammad fought and converted to Islam. Muhammad managed to unit the tribes and gain a following of 10,000 followers who helped him conquer Medina after 8 years of fighting.
- In 632, Muhammad fell ill and died. By the time of his death, he had united the tribes of Arabia into a single group who all followed the religion of Islam, and most people who lived on the Arabian Peninsula were Muslims.
- To Muslims, Muhammad and the other prophets are so holy, that the phrase *'Peace Be Upon Him'* is always said when their names are mentioned.

Books associated with Muhammad: The Qur'an, the Hadith, the Sunnah

- The Qur'an was dictated by Angel Jibril (from Allah) to Muhammad over 21 years.
- The Qur'an was written over 23 years (2 years after his death too).
- It was dictated by Muhammad and scribed by followers and the next leader of Islam, called the Caliph, after Muhammad's death.
- It has authority to Muslims as it is the words of Allah and has never been translated or changed throughout history. *"Falsehood shall never come to it" (Qur'an)*
- The Hadith is a book of Muhammad's teachings and life. It was written after Muhammad's death by later Caliphs (some 3 generations after).



Green is the % of Sunni Muslims
Red is the % Of Shi'a Muslims

Sunni and Shi'a Muslims.

- Like in other faiths, there are different groups of Muslims.
- This came about after the **death of Muhammad**. Some Muslims believed that Muhammad's cousin Ali should have been the next leader of Islam; they formed a group called Shi'a Muslims.
- However, other Muslims believed that the next ruler should be elected, which fitted with Arab tradition where they lived. These Muslims formed a group called the Sunni Muslims. 90% of Muslims in the world are Sunni Muslims.
- Both Muslims have very similar beliefs and follow the teaching of Muhammad and are dedicated to Allah; however there are small differences to their beliefs and practices, just like within Christianity.

Key Term	Definitions
Medina	First city in Saudi Arabia Muhammad converted to Islam
Hijra	Journey when Muhammad fled Mecca and went to Medina
Qur'an	Holy scripture / book for Muslims
Hadith	Book of Muhammad's teachings and life
Sunni	Main Muslim group. Sunni Muslims make up most of African Muslims and parts of the Middle East
Shi'a Muslims	Smaller Muslim group; found dominant in countries such as Iran and Iraq

Nature (Qualities) of Allah

Monotheism - Muslims believe in one god, Allah - they are **monotheists**.

Muslims follow important ideas to show their beliefs about Allah – for Sunni Muslims this is the **6 Articles of Faith** (see below)

Tawhid - the belief in the **oneness** and unity of Allah as expressed in the first of the five **Pillars of Islam**, the **Shahadah**. Belief in this oneness or unity of Allah is essential.
Angels – messengers of Allah. They deliver messages from Allah to prophets. The Angel Jibril is most important as it was **Jibril** that revealed Allah's beliefs to Muhammad.
Allah's will – this is the idea that **Allah is all knowing and seeing** in Muslims lives. Muslims believe that nothing is random and Allah has to some extent control over what will happen to Muslims

6 Articles of Faith

- Allah is Tawhid
- Holy Texts, including the Qur'an
- Prophets will teach about Allah
- Angels
- Judgement (**Adalat**) Day of judgement at death
- Allah's Will

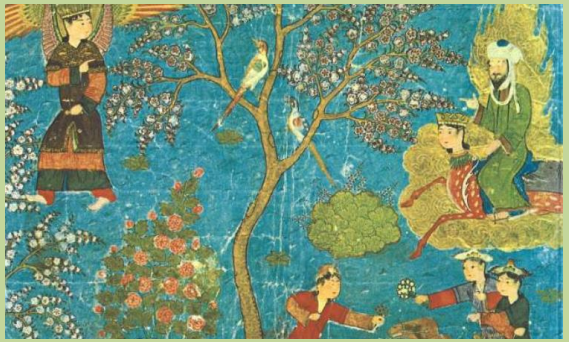
"…your sins are against your soul…. We will show you the truth of what you did" Qur'an

Afterlife

Akhirah – the belief in everlasting life after death. Muslims believe that this life is merely preparation for the eternal life or **Akhirah**. Every act of good and bad that a Muslim does is recorded by Allah, so they must act in a way that benefits them in Akhirah.

Hell is a place of fire, pain, misery and torture.

Heaven or paradise is a place with no suffering where there is no pain and your desires are fulfilled. You can go to paradise by your actions and gaining forgiveness for your sins.



Year 8 – BVT

British Muslims

Introduction: Muslims in Britain

Within Britain there are about 3 million Muslims. This is about 5% of the population, compared to just over 50% who are Christian. Though despite this small %, studies show that it is the fastest growing religion worldwide and within Britain. So, studying how Muslims live in Britain is important.

Key vocabulary

Adhan
Mosque
Wudu
Imam
Rak'ah
Ummah
Minbar
Mihrab
Minaret

Pray hall, with pray mats imprinted into carpet floor

Rak'ah movements

Minbar

"Allahu Akbar"
First line of prayer meaning God is Supreme.
"Prostrate and draw near to Allah" Qur'an

Mosques

You would have already learnt that Muslims pray 5 times a day. This is very important to them, especially Friday night prayer. Muslims pray in their Mosque, their place of worship.

The priest that runs the mosque and prayer is called an **Imam.** However, prayer follows **Rak'ah.** This is a set prayer of movements and words said. Muslims pray at mosque in the prayer Hall as a group to show **Ummah** – Brotherhood or Community. However, **Friday Night prayer** is slightly different as Muslims receive a sermon from their Imam also.

The **mosque and worship contains different features** Here are some important ones:

Adhan – call to prayer
Wudu – washing before prayer
Prayer hall – large room where men pray at mosque
Minbar – like a pulpit, where the Imam conducts sermons on Friday Prayer
Mihrab – an alcove that faces Makkah. This is at the front of the Prayer hall. The Imam prays here.
Minaret - the tower of the mosque, from which the call of prayer comes from.

Mosques are **important** for different reasons:

- Prayer and reflection
- To show your faith to Allah
- Community
- Teaching: Muslim children / young adults are taught about Muslim ways of life and to read the Qur'an

The mosque to the left is in Britain. The mosque to the right is in the Middle East. Both look different but both have the similar features needed for worship.

Year 8 – BVT

British Muslims

Festival of Eid

Eid is a festival that celebrates the end of the pillar **Sawm** (fasting) which happens during the month of **Ramadan**.
All Muslims worldwide celebrate this at the same time (the 9th Islamic Month)
The Festival is to celebrate the end of the month Muslims fast. This period is important because:

- Fasting allows Muslims to spiritually focus on Allah
- The month of Ramadan was when the Qur'an was sent down to Muhammad
- It develops Muslims determination and resilience
- It allows Muslims to feel grateful for what they have; this is also the month that Muslims give charity or **Zakah** for the poor.

Therefore, the Festival is a celebration of the achievement of this.

Celebrations of Eid in the UK and around the world

Eid is broken by a large family feast and exchanging gifts. Muslims wear new clothes and spend the day with families, friends and communities. Muslims go to mosque and attend Eid prayers. Muslims in the UK are given the day off work and school.

Key vocabulary

Sawm
Ramadan
Zakah
Eid
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.

Year 8 – BVT

British Muslims

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.

Key vocabulary

Islamophobia
Prejudice
Jihad
Radicalised

Where does prejudice come from?

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.

Is it not surprising that with news headlines like this, that some people get their facts wrong about Muslims?

Why is the word "Muslim" used in these headlines. These stories are about violent attacks. Does their religion have something to do with this? What do you think?

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.

FRENCH YEAR 9: ADVERTISING MY TOWN / DESCRIBING A FRENCH TOWN OR TOURIST ATTRACTION

Pourquoi visiter Salisbury / Downton?

Elle est située / il est situé dans le sud / sud-ouest *(it is in the south / south west)*

La ville / elle est petite / grande / calme / intéressante / plein de choses à faire *(the town / it is small / big / quiet / interesting / full of things to do)*

Elle est située à la campagne / près d'une forêt / au bord de la mer *(it is situated in the countryside / near a forest / by the sea)*

à ... km de *(... kilometers from)*

Il y a / nous avons *(there is, are / we have)*

Il n'y a pas de / nous n'avons pas de *(there isn't, aren't / we don't have)*

La ville / le village est... *(the town / village is...)*

Beaucoup de / plein de / assez de *(lots of / full of / enough)*

Les magasins / les espaces verts / les arbres / les plantes / les fleurs / les champs *(shops / green spaces / trees / plants/ fields)*

See opposite for a full list of places in a town

Dans le passé / il y a trente ans / avant *(in the past / 30 years ago / previously, before)*
C'était *(it was)*
Il y avait / il n'y avait pas de *(there was / were, there wasn't / weren't)*
On pouvait / on ne pouvait pas *(you could / you couldn't)*

En été / en automne / en hiver / au printemps *(in summer / autumn / winter / spring)*
S'il pleut / neige / fait froid / chaud *(if it rains / snows / is cold, hot)*
Quand il fait beau / mauvais *(when it's nice / horrible weather)*
On peut... *(you / one can)*
Faire des promenades / faire du sport / faire des randonnées / faire du vélo / faire du shopping / visiter des monuments / aller voir un match de foot *(go for walks / do sport / go on hikes / go cycling / go shopping / see the sights / go and see a football match)*
C'est plus .... que / moins ... que *(it's more... than / less ... than)*
C'est facile de *(it's easy to)*
Se déplacer / voyager *(get around / travel)*

l'agence de voyages (f) = travel agency
l'auberge de jeunesse (f) = youth hostel
la banque = bank
la bibliothèque = library
la bijouterie = jeweller's shop
la boucherie = butcher's shop
la boulangerie = bakery
le café = café
le centre commercial = shopping centre
le centre sportif = sports centre
le château = castle
le cinéma = cinema
le collège = school (11-15)
le commissariat = police station
l'école primaire (f) = primary school
l'église (f) = church
l'épicerie = grocer's shop
la ferme = farm
la gare = railway station
la gare routière = bus station

l'hôpital (m) = hospital
l'hôtel (m) = hotel
l'hôtel de ville (m) = town hall
le lycée = school (15-18)
le magasin = shop
la maison = house
le marché = market
le musée = museum
la poste = post office
le parc = park
la parfumerie = perfume shop
la pension = guest house
la pharmacie = chemist
la piscine = swimming pool
le restaurant = restaurant
le stade = stadium
la station-service = petrol station
le supermarché = supermarket
le théâtre = theatre
la zone piétonne = pedestrian area

Venez chez nous!
Venez à ... ! *(come to)*
Visitez ! *(visit)*
Venez voir *(come and see)*
Profitez de... *(take advantage of)*

Si vous vous intéressez à *(if you're interested in...)*
Si vous aimez *(if you like)*
Si vous êtes fana de... *(if you're a fan of...)*
Si vous cherchez... *(if you're looking for)*
Si vous voulez ... *(if you want)*

Imperfect tense
When we're talking about what things used to be like, we are using the 'imperfect tense'.

La ville **était** petite = the town used to be (was) small
Il y **avait** beaucoup de polllution = there used to be (was) lots of pollution
Tout le monde **allait** à pied = everyone walked
Il n'y **avait** pas de voitures = there weren't any cars
C'**était** plus calme = it was more quiet / quieter

Giving instructions ('imperative')

In English, when you tell someone to do something, you are using the 'imperative' form of a verb.
Come here! Buy this / that! Enjoy yourself!
Eat food! Drink lemonade! Don't smoke! Don't drink and drive!

In French, you can use the 'tu' form (personal, informal) or (more commonly in adverts) the 'vous' form of the verb.
Examples:
viens / venez = come!
visite / visitez = visit
amuse-toi / amusez –vous = enjoy youself

Modal verbs
Modal verbs are verbs which require a second verb.
In English, can, must, should etc are all modals as they need a second verb to make sense.

On peut = one can is a modal verb.
It comes from the verb 'pouvoir', which means 'to be able to'.

je peux	= I can
tu peux	= you can
il / elle / on peut	= he/she/one can
nous pouvons	= we can
vous pouvez	= you (pl) can
ils peuvent	= they can

Examples:
on peut faire du shopping = one can (you can) do / go shopping
on ne peut pas nager dans la mer = one can't (you can't) swim in the sea

Pros and Cons

A couple of ways you can talk about good / bad things:

un avantage / un point positif, c'est que...
(an advantage is that...)

un désavantage / un inconvénient / un point négatif, c'est que...
(a disadvantage is that...)

ce qui est bien c'est....
(what's good is...)

Adjectival Agreement
Adjectives change spellings, depending on the gender of the noun, and the quantity of the noun they are describing.

Le stade est petit *(the stadium is small)*
La ville est grand**e** *(the city is big)*

Les magasins sont varies ***(****the shops are varied)*
Les piscines sont belles (*The swimming pools are beautiful)*

Masculine singualar	Feminine singualar	Masculine plural	Feminine plural	English
beau	belle	beaux	belles	beautiful
sale	sale	sales	sales	Dirty
tranquille	tranquille	tranquilles	tranquilles	Peaceful
jolie	jolie	jolis	jolies	Pretty
laid	laide	laids	laides	Ugly
ancien	ancienne	anciens	anciennes	Old
moderne	moderne	modernes	modernes	modern

Comparatives (more than/less than)

PLUS* + adjective + *que
Southampton est ***plus*** grande **que** Salisbury
*Southampton is **bigger** (more big) **than** Salisbury*

moins* + adjective + *que
Salisbury est **moins** grande **que** Southampton
*Salisbury is **smaller** (less big) **than** Southampton*

Superlatives (the most/the least)

To say the **most** you need to use **le, la, les**
+ **plus** + adjective
Salisbury est la plus jolie
(Salisbury is the prettiest)

To say the **least** you need to use **le, la , les** + **moins** + adjective
Salisbury est la moins jolie
Salisbury is the least pretty

FRENCH YEAR 9: ADVERTISING MY TOWN / DESCRIBING A FRENCH TOWN OR TOURIST ATTRACTION

¿Por qué visitar Salisbury / Downton?

Mi ciudad / mi pueblo está en el sur / sur-oeste *(it is in the south / south west)*

está ubicado/a en el sur de Inglaterra *(is situated in the south of England)*

La ciudad / es pequeña/ grande / tranquila / interesante / llena de cosas que hacer *(the town / it is small / big / quiet / interesting / full of things to do)*

Está situado/a en el campo / cerca de un bosque / al lado del mar *(it is situated in the countryside / near a forest / by the sea)*

a ... km de *(... kilometers from)*

hay / tenemo *(there is, are / we have)*

no hay / no tenemos *(there isn't, aren't / we don't have)*

La ciudad / el pueblo es ... *(the town / village is...)*

mucho / lleno de / bastante *(lots of / full of / enough)*

las tiendas / los espacios verdes / los árboles/ las plantas/ las flores/ los campos *(shops / green spaces / trees / plants/ fields)*

See opposite for a full list of places in a town

en el verano / en el otoño / en el invierno / en la primavera*(in summer / autumn / winter / spring)*
si llueve / nieva / hace frío/ calor *(if it rains / snows / is cold, hot)*
cuando hace buen tiempo / mal tiempo *(when it's nice / horrible weather)*
se puede... *(you / one can)*
visitar / hacer / ver / nadar / jugar / relajarse / ir *(visit / do / see / swim / play / relax / go)*
Es facíl *(it's easy to)*
desplazarse / viajar *(get around / travel)*

más *(more)*
menos *(less)*
tranquilo/a *(quiet)*
ruidoso/a *(noisy)*
sucio/a *(dirty)*
limpio/a *(clean)*

un aeropuerto *(an airport)*
un ayuntamiento = (*town hall)*
un castillo *(a castle)*
un centro commercial *(a shopping centre)*
un cine *(a cinema)*
un colegio *(a secondary school)*
un estación de trenes = *(train station)*
un estadio *(a stadium)*
una hamburguesería *(a fast-food restaurant)*
un hospital = (*hospital)*
una iglesia *(a church)*
un mercado *(a market)*
un museo *(a museum)*
un palacio *(a palace)*
un parque *(a park)*
un polideportivo = *(sports hall)*
un puerto *(a port)*
un supermercado *(a supermarket)*
una universidad *(a university)*

En el pasado / hace xx años / antes *(in the past / xx years ago/ before)*

Mi barrio / pueblo / ciudad *(my neighbourhood / village / town)*

Era / no era *(was / wasn't)*

Más / meno *(more / less)*

Tenía / no tenía *(It had / didn't have)*

mucha gente *(lots of people)*
más basura *(more rubbbish)*
menos contaminación *(less pollution)*
un problema con la delincuencia *(crime)*
menos edificios *(fewer buildings)*

¡Visita!!
¡ Visite... ! *(visit)*
¡ Venga ! *(come)*
¡ Venga a ver! *(come and see)*
Aproveche... *(take advantage of)*

Si le interesa *(if you're interested in...)*
Si le gusta *(if you like)*
Si es un fan de... *(if you're a fan of...)*
Si busca... *(if you're looking for)*
Si quire... *(if you want)*

Comparatives (more than/less than)

más* + adjective + *que
Southampton es ***más*** grande **que** Salisbury
*Southampton is **bigger** (more big) **than** Salisbury*

menos* + adjective + *que
Salisbury es **menos** grande **que** Southampton
*Salisbury is **smaller** (less big) **than** Southampton*

Superlatives (the most/the least)

To say the **most** you need to use **el, la, los, las**
+ **más** + adjective
Salisbury es **la más** bonita
(Salisbury is the prettiest)

To say the **least** you need to use **el, la, los, las**
+ **menos** + adjective
Salisbury es **la menos** bonita
Salisbury is the least pretty

The imperfect tense = was ….. / used to …..

- When the verb has the –AR, -ER, -IR ending it is called the INFINITIVE.
- Remove the –AR, -ER, -IR
- Dd the correct ending for the person who is speaking

- Hablar = habl_ = habl**aba** = I used to speak
- Leer = le_ = Le**ía** = I used to read
- Vivir = viv_ = viv**ía** (I used to live)

		AR	IR/ER
yo	(I)	**aba**	**ía**
tú	(you)	**abas**	**ías**
él, ella	(he/she**)**	**aba**	**ía**
nosotros	(we**)**	**ábamos**	**íamos**
vosotros	(you)	**ais**	**íais**
Ellos	(they)	**aban**	**ían**

Modal verbs
Modal verbs are verbs which require a second verb.
In English, can, must, should etc are all modals as they need a second verb to make sense.

Se puede = one can is a modal verb.
It comes from the verb 'poder', which means 'to be able to'.

puedo	= I can
puedes	= you can
puede	= he/she/one can
podemos	= we can
podéis	= you (pl) can
pueden	= they can

Examples:
se puede ir de compras= one can (you can) do / go shopping
no se puede nadar en el mar = one can't (you can't) swim in the sea

Pros and Cons

A nice way to describe the pros and cons of something is to use 'lo + adjective' to mean 'the…thing'

Lo bueno – the good thing
Lo malo – the bad thing
Lo interesante – the interesting thing
Lo gracioso – the funny thing

Lo bueno es que Salisbury es limpia*
The good thing is that Salisbury is clean

Lo malo es que Salisbury es ruidosa*
The bad thing is that Salisbury is noisy

- *The word for town in Spanish is feminine so the adjective must end in 'a'*

Adjectival Agreement

Adjectives change spellings, depending on the gender of the noun, and the quantity of the noun they are describing.

El estadio es modern**o** *(the stadium is modern)*
La ciudad es modern**a** *(the city is modern)*

Los mus**eos** son modern**os** *(the museums are modern)*
Las tiend**as** son modern**as** *(The shops are modern)*

Masculine singualar	Feminine singualar	Masculine plural	Feminine plural	English
bueno	buena	buenos	buenas	Good
sucio	sucia	sucios	sucias	Dirty
tranquilo	tranquila	tranquils	tranquilas	Peaceful
bonito	bonita	bonitos	bonitas	Pretty
feo	fea	feos	feas	Ugly
antiguo	antigua	antiguos	antiguas	Old
moderno	moderna	modernos	modernas	modern

Year 9 – Term 5 and 6

ART TERMINOLOGY YOU SHOULD KNOW LEARN AND USE

Shape, form, space

Closed
Open
Distorted
Flat
Organic
Deep
Positive
Negative
Foreground
Background
Composition
Curvaceous
Elongated
Large
Small
2D 3D

Tone

Bright
Dark
Faded
Smooth
Harsh
Contrasting
Intense
Sombre
Grey
Strong
Powerful
Feint
Light
Medium
Dark
Dramatic
Large
Small

Pattern and Texture

Repeated
Uniform
Geometric
Random
Symmetrical
Soft
Irregular
Coarse Bold
Uneven
Bumpy
Rough
Smooth
Uneven
Spiky
Broken
Furry
Fine Flat
Grid

Line

Fluent
Free Rough
Controlled
Powerful
Strong
Geometric
Angular
Light
Delicate
Flowing
Simple
Thick Thin
Horizontal
Broken
Interrupted
Rounded
Overlapping
Feint

Colour

Bright Bold
Primary
Secondary
Tertiary
Radiant
Dull Vivid
Contrasting
Deep
Monochrome
Harmonious
Complementary
Natural
Earthy
Subtle
Pale
Cool Warm
Saturated
Luminous
Strong

Mehndi

1.The application of henna paste in intricate designs to decorate the body, often for wedding celebrations and other festive occasions in South Asia, the Middle East, and North Africa.
2.Decoration on the body made by mehndi.

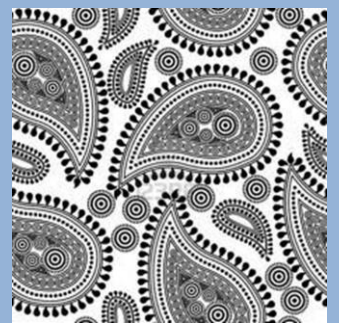
Mexican Day of the Dead

It is believed that the gates of heaven are opened at midnight on October 31, and the spirits of all deceased children (angelitos) are allowed to reunite with their families for 24 hours. On November 2, the spirits of the adults come back to enjoy the festivities that are prepared for them.

Basic, simple, solid, loud, quiet, bright, realistic, stylised, observed, busy, vibrant, strange, interesting, balanced, lively, negative, recognisable, abstract, tactile, meaningful, symbolic, depressing, unique, emotive, hidden, textural, dynamic, powerful, intentional, concealed, subtle.

Paisley

The Paisley teardrop 'buta' / comma shape



Year 9 – Term 5 and 6

Mexican Day of the Dead

Carnival Processions

James Bond 'Spectre' scene set at a Day of the Dead celebration

The festival is known as:
'El Día de los Muertos',
'Días de Muertos'
or just 'Muertos' for short.
Mexicans view it not as a day of sadness but as a day of celebration because their loved ones awake and celebrate with them.
View these clips showing the festival in Mexico:
https://www.youtube.com/watch?v=_sSawpU81cI&safe=active

https://www.youtube.com/watch?v=8FHrhH9k-PY&safe=active

https://www.youtube.com/watch?v=7FXYeSlu9QQ&safe=active

Sugar skulls are made and purchased.

The 'ofrenda' - offering

It is a veritable family 'feast', laid on every year especially for the dead, and it aims to appeal to all the senses: attracted by the sounds (from music to fireworks), lights (of candles), aromas (of foods, flowers and incense) and general festivity, the souls can come back to Earth to enjoy, however briefly, some of the pleasures they remember when they were alive.

They believe that the gates of heaven are opened at midnight on October 31, and the spirits of all deceased children (angelitos) are allowed to reunite with their families for 24 hours. On November 2, the spirits of the adults come back to enjoy the festivities that are prepared for them.

Day of the Dead outdoor market in Patzcuaro, Michoacan where locals buy their sugar skulls, special foods and altar decorations.

Year 9 – Term 5 and 6

PAISLEY PATTERN DESIGN

Paisley Pattern

A Paisley design is basically a teardrop/comma shape. Its shape and design is Persian in origin and can be traced back over 2000 years. Its name comes from the town of Paisley in Scotland.
The first appearance of the tear-shaped 'buta' motif was in Persia, then spread into India. Resembling a comma, it is one of the most recognised patterns in the world. It was used in 18th century Europe as a design motif, particularly being used on shawls. These were mass produced in Paisley, Scotland in the 19th century (hence the name Paisley). Paisley was a major site for the manufacture of printed and woven cotton and wool, particularly for shawls at this time.
It was widely used again in the 1960s when it became synonymous with 'psychedelia' and 'flower power'.
It is still a popular motif – you will find it all around you if you look for the design in contemporary printed textile fabric.

View this clip showing paisley:

http://www.bbc.co.uk/culture/story/20151021-paisley-behind-rocks-favourite-fashion

Paisley print patterns are often hand printed by using a hand cut wooden or metal paisley stamper like this one.

Use these tutorials to develop your own paisley patterns:
https://www.youtube.com/watch?v=WsgJIV5WhsE&safe=active

https://www.youtube.com/watch?v=2vtKELmA-v8&safe=active

https://www.youtube.com/watch?v=ZOyZsCECRsA&safe=active

Paisley design for Crabtree and Evelyn by Abigail Borg

Vera Bradley design

Alexander McQueen

A famous textile designer whose T-shirts cost nearly £150 each. His logo for this season is based around skulls which incorporate paisley patterns.

Contemporary fabric print by artist Lisa Busby

Year 9 – Term 5 and 6

Mehndi Design

Mehndi

Mehndi is a form of body art originating in ancient India, in which decorative designs are created on a person's body, using a paste, created from the powdered dry leaves of the henna plant (Lawsonia inermis). Dating back to ancient India, mehndi is still a popular form of body art among the women of the Indian subcontinent, Africa and the Middle East.

Mehndi is derived from the Sanskrit word mendhikā.

Traditional Indian designs are representations of the sun on the palm, which, in this context, is intended to represent the hands and feet.

Mehendi has a great significance in performing classical dance like Bharatnatyam.

Henna paste when applied to the skin creates a temporary but quite long lasting tattoo.

View this clip showing Mehndi henna paste being applied:

https://www.youtube.com/watch?v=MIkHNehkHKc&safe=active

The technique of Mehndi is detailed and intricate. It requires care and accuracy as any henna paste applied to the skin will stain it.

There is a design activity loaded onto the TFG Art page which links to this sheet. Be equally detailed and intricate in your designs.

SAMBA

Module Learning Objectives

This unit introduces the polyrhythmic style of Latin-American Samba and revises and revisits may key concepts concerning rhythm, beat and pulse from pupil's learning including features such as polyrhythms, cyclic rhythms, syncopation, ostinato and call and response.

Understand how instruments, structures and textures are used in Samba

Perform as part of a larger ensemble understanding key roles of performers and different instruments and the relationship between these and the effect this has on the music

Use rhythmic features such as ostinato, cyclic rhythms, polyrhythms, call and response and syncopation when performing and improvising

AAINJAA is a Samba collective from Bogota, Colombia band. They organise drumming sessions for anyone so that they can; "create spaces in which everyone is accepted, regardless of the differences that make us unique." Here they are performing with 150 drummers!

A Surdo,
The Bass drum

Language for Learning/Music Theory

CALL AND RESPONSE – one person plays or sings a musical phrase, then another others respond.
CYCLIC RHYTHM – a rhythm that is repeated over and over again.
IMPROVISATION – making up music as you go along, without preparation.
OSTINATO – a repeated pattern. Can be rhythmic or melodic.
PERCUSSION – Instruments that are mostly hit, scraped or shaken to produce sound.
POLYRHYTHM – the use of several rhythms performed simultaneously, often overlapping each other to create a thick texture.
PULSE – a regular beat that is felt throughout music
RHYTHM – a series of notes of different lengths that create a pattern.
SYNCOPATION – accenting or emphasising the weaker beats of the bar (often a half beat (quaver) followed by a full beat (crotchet)) giving the rhythm an OFFBEAT feel.
SAMBISTA – the leader of a Samba band. STRUCTURE – the way in which a piece of music is put together.
CODA – section that brings a piece of music to an end (Italian for "tail".)
INTRODUCTION – the opening section of a piece of Music

Here is a street Samba group from Rio De Janiero. They are so full of life!!

SAMBA

A. Key Words and Terms in Samba Music

CALL AND RESPONSE – one person plays or sings a musical phrase, then another person/group responds with a different phrase or copies the first one.
CYCLIC RHYTHM – a rhythm that is repeated over and over again.
IMPROVISATION – making up music as you go along, without preparation.
OSTINATO – a repeated pattern. Can be rhythmic or melodic; usually short.
PERCUSSION – Instruments that are mostly hit, scraped or shaken to produce sound. Samba uses many percussion instruments which together are called a **BATERIA**.
POLYRHYTHM – the use of several rhythms performed simultaneously, often overlapping each other to create a thick texture.
PULSE – a regular beat that is felt throughout music
RHYTHM – a series of notes of different lengths that create a pattern. Usually fits with a regular beat or pulse.
SYNCOPATION – accenting or emphasising the weaker beats of the bar (often a half beat (quaver) followed by a full beat (crotchet)) giving the rhythm an **OFFBEAT** feel.
SAMBISTA – the leader of a Samba band or ensemble, often signalling cues to the rest of the band of when to change sections within the music with an **APITO** (Samba whistle)

B. Form and Structure of Samba

Samba music often starts with an **INTRODUCTION** often featuring **CALL AND RESPONSE RHYTHMS** between the Samba Leader and ensemble. The main Ostinato rhythm of Samba is called the **GROOVE** when all the instruments of the Samba Band play their respective rhythms over and over again **(CYCLIC RHYTHMS)** forming the main body of the piece. The **GROOVE** is broken up by **BREAKS** - 4 or 8 beat rhythms providing contrast and **MID SECTIONS** – one or two instruments change the rhythm of their ostinato and the others stay the same or stop. Sometimes **BREAKS** and **MID SECTIONS** feature a **SOLOIST** who "shows off" their rhythms. The **SAMBISTA** must signal to the group when to change to a different section which is normally done with an **APITO** (Samba Whistle – loud!). A piece of Samba can end (this section is called the **CODA**) with either a **CALL AND RESPONSE** pattern or a pre-rehearsed ending phrase of rhythm. The **FORM AND STRUCTURE** of a piece of Samba may look like the following:

Intro	**Groove**	**Break**	**Groove**	**Mid-Section**	**Groove**	**Mid-Section**	**Groove**	**Break**	**Groove**	**Coda**

C. Texture of Samba Music

Texture varies in Samba music, often **MONOPHONIC** where a single rhythm is heard as in **CALL AND RESPONSE** sections, sometimes **POLYPHONIC** where sections of the Samba band play different rhythms **(OSTINATOS)** creating **CROSS-RHYTHMS** (when two rhythmic patterns that "conflict" with each other occur simultaneously) creating a thick texture of interweaving and interlocking rhythms – a **POLYRHYHM** or a **POLYRHYTHMIC TEXTURE**.

D. Dynamics of Samba Music

The dynamics of Samba music are normally **VERY LOUD** – it is music designed to be performed outdoors at carnivals and is played by large numbers of instrumentalists and to accompany dancers and processions with large audiences watching and listening. Sometimes, a **CRESCENDO** is used at the end of a piece of Samba music for dramatic effect.

E. Tempo of Samba Music

Samba music is generally **FAST** at around 104 bpm and keeps a constant tempo to assist the dancers or processional nature of the music. Sometimes the **SAMBISTA** (Samba leader) uses **(TEMPO) RUBATO** – tiny fluctuations in tempo for expressive effect.

F. Instruments, Timbres and Sonorities of Samba

SURDO

REPINIQUE

TAMBORIM

CHOCOLO

RECO-RECO

APITO

AGOGO BELLS

CAIXA DE GUERRO

What Makes a Good Song?

Module Learning Objectives

Understand the different textural and structural elements of a song/popular song.

Understand and use the different musical information given on a lead sheet in creating a Musical Arrangement of a Popular Song.

This is Emonik! We will be using Bandlab for this project. Here he takes you through a simple tutorial.

Here is Sink aka Rachel Lindsey who shows you in this video how to formulate a song. She uses loops here and concentrates on melody and from/structure!

Language for Learning/Music Theory

HOOK – A 'musical hook' is usually the 'catchy bit' of the song that you will remember.
RIFF – A repeated musical pattern often used in the introduction and instrumental breaks in a song or piece of music.
BASS LINE – The lowest pitched part of the music often played on bass instruments such as the bass guitar.
MELODY – The main "tune" of a song or piece of music.
CHORD – A group of two or more notes played at the same time.
ACCOMPANIMENT – Music that accompanied either a lead singer or melody line.
FORM AND STRUCTURE – the different sections of a piece of music or song and how they are ordered.
INTRO – The introduction sets the mood of a song.
VERSES – Verses introduce the song theme.
PRE-CHORUS - A section of music that occurs before the Chorus which helps the music move forward.
CHORUS – All the choruses have the same lyrics. This section relays the main message of the song .
MIDDLE 8/BRIDGE – This section adds some contrast to the verses and choruses by using a different melody and chord progression.
INSTRUMENTAL SOLO – Solos are designed to show off an instrumentalists' skills.
CODA/OUTRO – The final section of a popular song which brings it to an end (Coda is Italian for "tail"!).
CONJUNCT MELODIC MOTION – Melodies which move mainly by step or use notes which are next to or close to one another.
DISJUNCT MELODIC MOTION – Melodies which move mainly by leap or use notes which are not next to or close to one another.

What Makes a Good Song?

A. Popular Song Structure

SONG STRUCTURE – How a song is made up of or divided into different sections (see below) and the order in which these sections occur. To work out the structure of a song, it's helpful to analyse the **LYRICS <u>and</u>** listen to a recording for the song (for instrumental sections).

INTRO – often shortened to 'intro', the first section of a song which sets the mood of the song and is sometimes, but not always, an instrumental section using the song's chord pattern.

VERSES – songs normally have several verses. Verses introduce the song's theme and have the same melody but different lyrics for each verse which helps develop the song's narrative and story. Songs made up entirely of verses are called **STROPHIC**.

LINK – a optional short section often used to join different parts of a song together, often instrumental, and sometimes joins verses together or appears at other points within a song.

PRE-CHORUS – an optional section of music that occurs before the **CHORUS** which helps the music move forward and "prepare" for what is to come.

CHORUS – occurs several times within a song and contains the most memorable **HOOK/RIFF**. The chorus relays the message of the song and is repeated with the same melody and lyrics each time it is heard. In popular songs, the chorus is often repeated several times towards the end of the song.

MIDDLE 8/BRIDGE – a section (often 8 bars in length) that provides contrasting musical material often featuring an instrumental or vocal solo using new musical material allowing the performer to display their technical skill on their instrument or voice.

CODA/OUTRO – The final section of a popular song which brings it to an end (Coda is Italian for "tail"!)

B. Key Words

LYRICS – The words of a song, usually consisting of **VERSES** and a **CHORUS**.

HOOK – A 'musical hook' is usually the 'catchy bit' of the song that you will remember. It is often short and used and repeated in different places throughout the piece. Hooks can be either **MELODIC, RHYTHMIC** or **VERBAL/LYRICAL**.

RIFF – A repeated musical pattern often used in the introduction and instrumental breaks in a song or piece of music. Riffs can be rhythmic, melodic or lyrical, short and repeated.

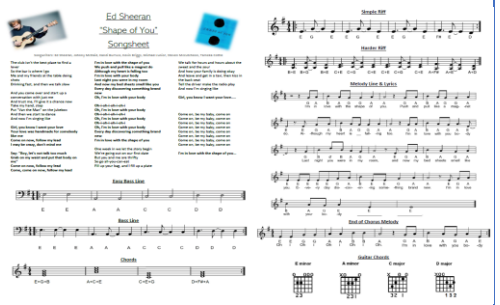
MELODY – The main tune of the song often sung by the **LEAD SINGER**.

COUNTER-MELODY – An 'extra' melody often performed 'on top of' the main melody that 'fits' with it a **DESCANT** or **INSTRUMENTAL SOLO**.

TEXTURE – The layers that make up a song *e.g., Melody, Counter-Melody, Hooks/Riffs, Chords, Accompaniment, Bass Line*.

C. Lead Sheet Notation and Arrangements

A **LEAD SHEET** is a form of musical **NOTATION** that contains only the essential elements of a popular song such as the **MELODY, LYRICS, RIFFS, CHORDS** (often as guitar chord symbols) and **BASS LINE**; it is not as developed as a ***FULL SCORE ARRANGEMENT*** and is open to interpretation by performers who need to use and adapt the given elements to create their own musical **ARRANGEMENT:** their "version" of an existing song.



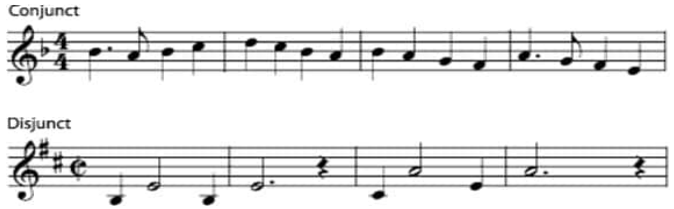
COVER (VERSION) – A new performance, remake or recording by someone other than the original artist or composer of the song.

D. Conjunct and Disjunct Melodic Motion

CONJUNCT MELODIC MOTION – Melodies which move mainly by step or use notes which are next to or close to one another.

DISJUNCT MELODIC MOTION – Melodies which move mainly by leap or use notes which are not next to or close to one another.

MELODIC RANGE – The distance between the lowest and highest pitched notes in a melody.



E. Song Timbre and Sonority (Instruments that are used to Accompany Songs)

Pop Bands often feature a **DRUM KIT** and **PERCUSSION** to provide the rhythm along with **ELECTRIC GUITARS** (**LEAD GUITAR, RHYTHM GUITAR** and **BASS GUITAR)** and **KEYBOARDS**. Sometimes **ACOUSTIC INSTRUMENTS** are used such as the **PIANO** or **ACOUSTIC GUITAR**. **ORCHESTRAL INSTRUMENTS** are often found in pop songs such as the **STRINGS**, **SAXOPHONE, TROMBONE** and **TRUMPET.** Singers are essential to a pop song - **LEAD SINGER** – Often the "frontline" member of the band (most famous) who sings most of the melody line to the song. **BACKING SINGERS** support the lead singer providing **HARMONY** or a **COUNTER-MELODY** (a melody that is often higher in pitch and different, but still 'fits with' the main melody) and do not sing all the time but just at certain points within a pop song e.g. in the chorus.

Drama: Terms 5 and 6 Our Day Out and Blood Brothers

The social context: Liverpool and Britain in 1982

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

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

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

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

Blood Brothers- A summary of the plot

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

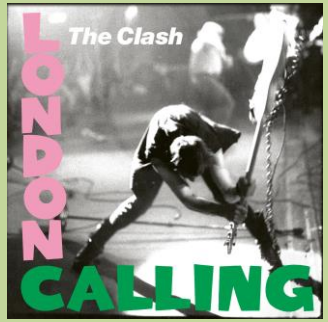
The two boys grow up without knowing each other. One, Edward, who was given away, grows up in Mrs Lyon's rich, comfortable middle class household. Mickey grows up with the hardships of a single parent family with several siblings (brothers and sisters).

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

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

The cultural and artistic context

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



Key Past Knowledge to draw on

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

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

Study Focus

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

Key Ideas

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

Signing – on –Going to the **Dole Office** once every 2 weeks to **sign a declaration** that you have had no work or money paid in the last **fortnight.**

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

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

Conservative Party- One of the major British political parties. Others include the **Labour Party, Liberal & Social Democratic Party, and The Green Party.**

Acting Techniques

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

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

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

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

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

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

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

Themes

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

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

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

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

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

Athletics

Middle distance: 800m, 1500m

Maintaining a good position:

Running technique:

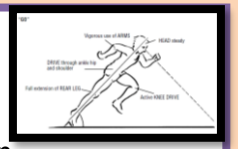
- Upright body position
- Head still and looking straight ahead
- Relaxed head, neck, arms and shoulders
- Gently swinging arms forwards and backwards and slightly across the body
- Easy stride length
- Landing foot placed just ahead of the body
- Pushing off the ground to straighten the leg fully on each stride
- Fairly low know lift to conserve energy on each stride

Race tactics:

Should you consider to sprint at these points at the race:

- Sprint start
- Start of the 2nd Lap
- Back straight
- Final Bend

Sprints: 300m, 400m



Sprinting technique

1. Posture should be upright with a slight forward lean
2. Keep head still and in alignment with your body
3. Relax your jaw, neck, shoulders and hands
4. Keep your shoulder and trunk steady – no twisting
5. Arms bent at the elbow and swing forward and backwards to aid momentum
6. Drive each leg powerfully to full extension
7. Lift your leading leg high with each stride

Finish Line Dip:

As you approach the finish line, with a stride left, lean forwards to push chest to cross the line first.

Unit Outcome:

To specialise in 3 events, one from each discipline

Success Criteria:

To be able to self-assess your performance in order to constantly improve and set new Personal Bests frequently.

Athletic Events:

Track Events:

- 100m
- 200m
- 300m
- 400m
- 800m
- 1500m
- Hurdles
- Relay

Throwing Events:

- Discus
- Javelin
- Shot Putt

Jumping Events

- Long Jump
- Triple Jump
- High Jump

Key Vocabulary:

Track Events:

Take you marks
Set
Go
Pace
Sprint start

Throwing Events:

Grip
Stance
Preparation
Release
Follow through

Jumping Events:

Approach
Take off
Flight
Landing

High Jump

Approach:

- Fast, curved approach, body leans inwards

Take Off:

- Take off foot placed slightly ahead of the body
- Take off foot landing with the heel leading and the foot virtually parallel to the bar
- Take off leg slightly bent at the knee before take off
- Upward drive directly off the jumping foot
- Take off about an arms distance away from the bar and about a quarter of the crossbar's length in from the nearest upright

Scissor Kick Technique:

- Swing the leg nearest to the bar upwards and back towards where you have run from
- Turn your body in the air so you are jumping backwards over the bar
- Push your hips upwards to clear the bar
- Straighten legs quickly as soon as hips have cleared the bar

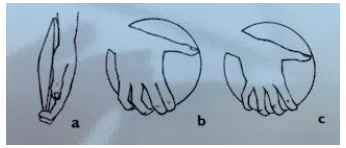
Landing:

- Land on your back and shoulders

Discus

Grip:

- Hold the discus by the pads of your finger tips, your thumb resting against the side of the discus
- The index finger can be placed (b) close together or apart (c)
- As you rotate to create momentum the discus will stay in your hand

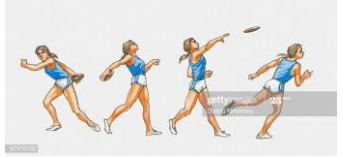


Wind-up Phase:

- Rotate backwards and forwards
- Arm travels from your side, across your body, to your hand being on top, non-throwing hand meets the discus to stop it dropping

Release:

- Spin the side of the discus



Cricket

Key skills: Wicket keeping

Good glove work: Use two hand

Watch the ball with a still head

Catching with relaxed elbows moving the gloves in the same direction as the path of the ball. Have 'soft hands'

Key Vocabulary:

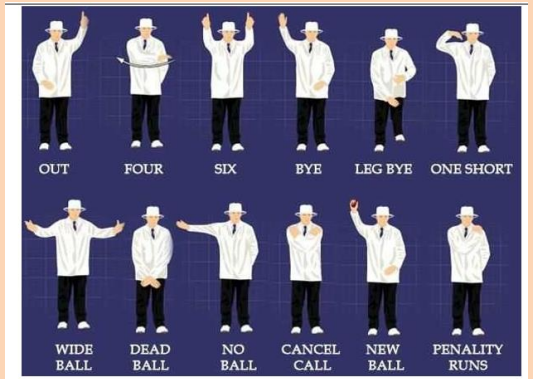
- Wicket
- Boundary
- Batting
- Bowling
- Fielding
- Over
- Catch
- Crease
- Stumps
- Delivery
- Innings
- LBW (leg before wicket)
- Pace
- Line
- Length

Unit Outcome:
To understand, apply and evaluate different front and back foot batting shots.

Success Criteria:
To be able to choose which shot to play when attacking and defending the wicket.

Watch the following clip on the 11 different types of dismissal (ways of getting out) in cricket:
https://www.youtube.com/watch?v=K3qVwuPXHX4

Write out the 11 different ways of getting out



Bowling Technique Checklist:

The Bound

- Ball held at chin
- Arms thrown up
- Body leans backwards

The Coil

- Front arm pulled back
- Make a figure of six with bowling arm
- Back foot lands parallel to the crease

The Release

- Release ball at 1 o'clock
- Arm brushes ear
- Look over your shoulder

Follow Through

Forward Defence

The principle of a forward defensive stroke is to block the ball rather than to score runs.

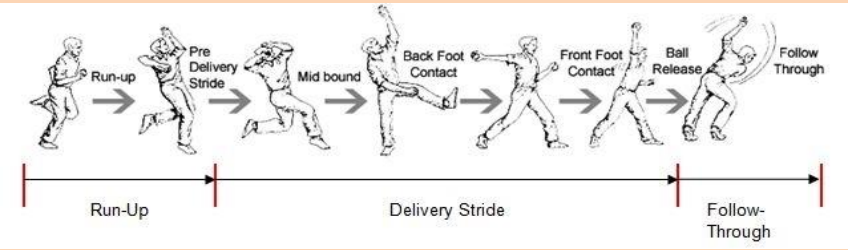
1. Played to a straight full delivery.
2. Get your head in line with the ball.
3. Get your weight right into the ball.
4. Don't push at the ball, let the ball hit the bat not the bat hit the ball.
5. Angle the bat towards the ground

Key Skills: Forward defensive

Key Skills: The Cut shot

The Cut Shot

1. Played to a ball that is short and wide
2. The back foot goes back and across to get closer to the ball. Extend your arms through the shot.
3. Try to come from a high back lift down onto the ball. This will allow you to keep the ball on the floor so you don't get caught out.



Rounders

Batting technique

- Hold the bat high (in one hand).
- Have a strong grip on the handle.
- Make sure your wrist is strong.
- Keep your eye on the ball.
- Stand side on to the bowler.
- Swing through the ball.
- Stamp forwards into the move to gain power (transfer your weight from the back foot to the front foot as you move).

Placing the ball

There are different types of batting technique where you spin your body, so you bat to certain areas of the field. A good batter can select gaps and areas where there is no fielder or can bat towards weaker fielders, so they have more chance of scoring the rounder.

Backhand shot

- Start with original batting stance and change your stance as late as possible to disguise the shot.
- Like in tennis, begin your backswing by turning your hips and shoulders.
- Step out towards the line of the ball, shifting your weight to the outside foot.
- Hit through the ball as you bring most of your weight onto your front foot.
- Do not make your arm do all of the work, use your whole body to add extra power to your shot.

Unit Outcome:
To be able to bat effectively taking into account the fielding teams positioning.

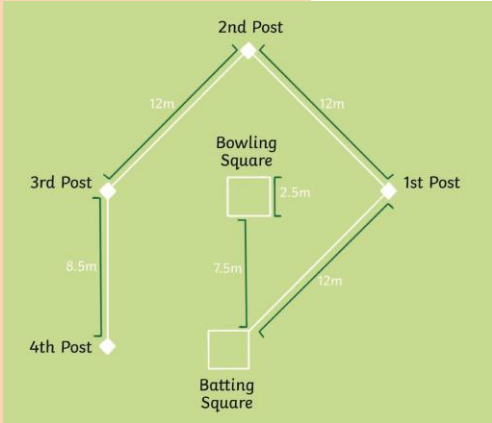
Success Criteria:
To be able to control the direction of the ball when batting to increase scoring chances.

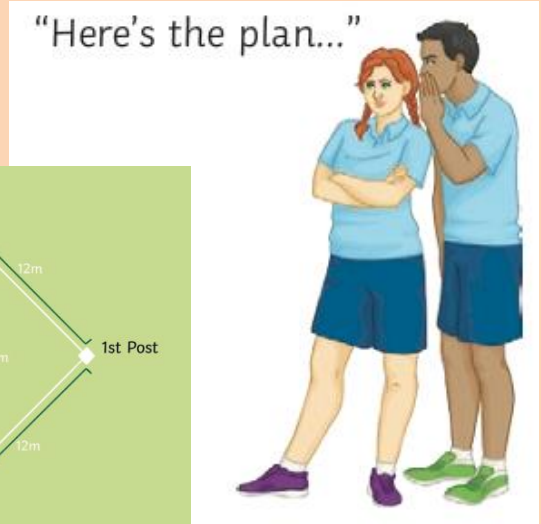
Key Vocabulary:

Rules Vocabulary
- Obstruction
- No ball
- Backward hit
- Batting square
- Bowling square

Technique Vocabulary
- Stance
- Body position
- Follow through
- Mechanics of movement
- Balance
- Co-ordination
- Cushion

Tactics Vocabulary
- Batting order
- Bowling techniques
- Field placements





Tactic instructions

1. Ask the bowler to change bowling technique for each batter (try a donkey drop, fast bowl, a slow bowl, a spin).
2. Move the fielders around, depending on the batters' strengths and weaknesses.
3. ask the batters to strike the ball into space (using a backhand hit if possible).
4. Give fielders space when the ball is thrown to them.
5. Ask batters to disguise their hits if they can, keeping their batting intentions a secret for as long as possible.
6. Ask the batters to 'chance' a run to 2nd or 4th, even if they think they may be stumped out.
7. Tell batters standing on bases to set off running to the next base as soon as the ball leaves the bowlers hands.
8. Ask your bowler to cover 3rd base when fielding.
9. If there is a backwards hit, ask your backstop to walk up to the back line with the ball, before deciding where to throw it.

Tennis

Unit Outcome:
To be understand the tactics of doubles and score accurately.
Success Criteria:
To understand where to be positioned in specific situations.

Volley
- It is the most technically difficult, requires players to be exceptionally athletic and calls for lightning reactions.
- By coming forwards in the court you are putting huge pressure on your opponent and also opening up all the angles - making winners much easier.
- It can be a gamble though.
- You have less time to cover the width of the court.
- So if your opponent gets in a good shot only exceptional movement and reactions will get you out of trouble.

Step One
- Ready position.
- Alter the ready position slightly from the way you would prepare for groundstrokes by bringing the racquet head slightly higher.
- Move the elbows forward so they're just in front of the body.

Step Two
- Bring the racquet head out into position in front of you.
- Your upper body goes to the ball and your feet following.

Step Three
- Do not swing the racquet at the ball.
- Shot should be short and punchy.
- Use your wrist and forearm to bring the racquet head down on the ball in a short, sharp action.

Step Four
- Follow through in the direction you want to send the ball.
- Then get back into the centre of the court as quick as you can ready for the next shot.




Key Vocabulary:

Technique:
Ready position
- Stance
- Back swing
- Top Spin
- Racket
- Slice
- Pace
- Forehand
- Backhand

Shot Vocabulary
- Serve
- Groundstroke
- Slice
- Drop Shot
- Volley
- Smash

Smash
- The smash is the shot that the professional players hardly ever miss and that club players rarely get right.
- The main reason for that is practice!

Step One
- The moment you see the lob go up in the air you need to turn sideways - as if you were getting ready to serve.
- Your hands and racquet head up to around chest level with the same grip that you serve with.

Step Two
- Keep your eye firmly on the ball and start to adjust position so that the flight of the ball is in line with your body.
- You want the ball to come down just in front of you.
- As you start to move you must stay sideways on, so use side steps and cross over steps to adjust your position.

Step Three
- Try to feel both hands going up together - your non racquet hand should stretch up towards the ball, use your hand as an aid to track the incoming ball.
- Your racquet hand should bring your racquet back behind you - into the same throwing position that you use half way through your service action.

Step Four
- Keep your head still and your eyes firmly focussed on the ball.
- As the ball arrives throw the racquet head up to meet the ball as you would in a serve.
- Don't try to hit too hard though - timing is the key.

How an electronic system can make a product function
The role of control devices and components

Key terms

Input device: something that can give an input signal to the system.

Output device: something that responds to an instruction of change in control elements.

Input signal: information given to the system by an input device.

Output signal: an instruction the system gives to an output device.

Program: a set of instructions the system controller has been given to make the electronic system do what it is supposed to do. If a transistor (see page 34) is used, there is no program, just a simple switching action due to the rise in voltage on the base of the transistor above 0.6 volts.

Resistance: an electrical quantity that is a measure of how the device or wire reduces the electric current flow through it.

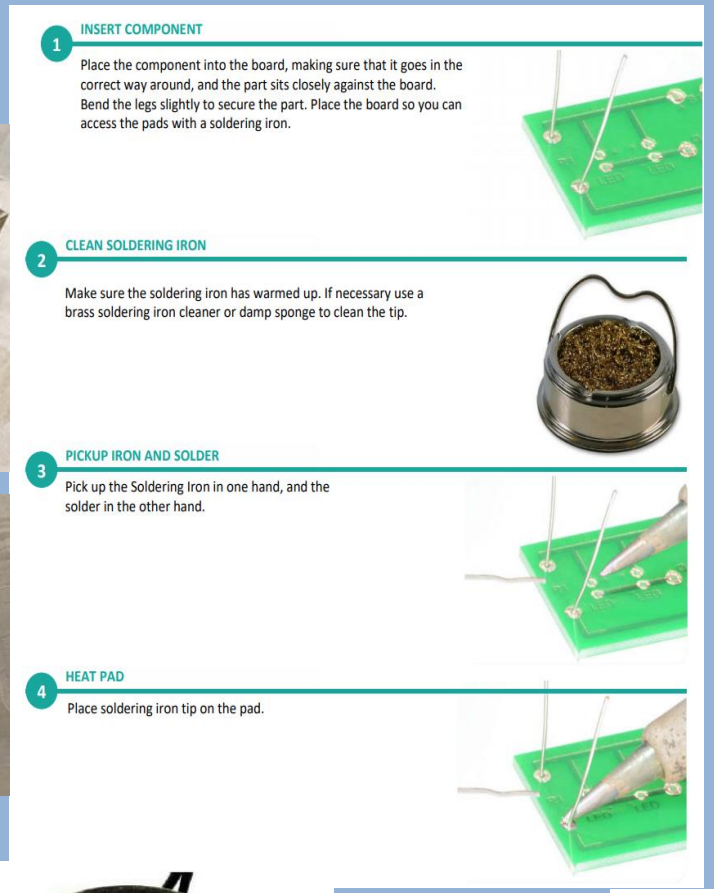
Component: an individual piece of a circuit.

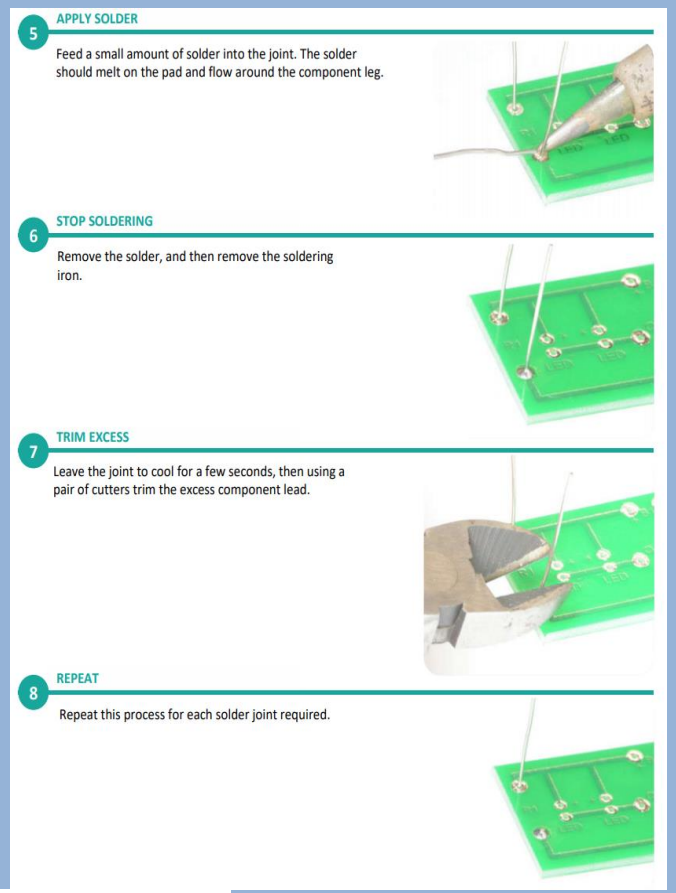
Circuit: individual components are joined up with a conductive material so electricity can flow through them and perform a task.

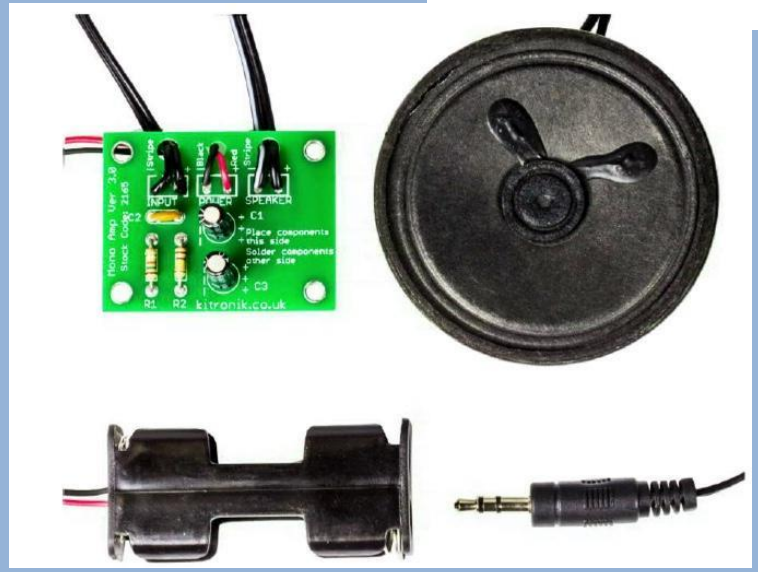
Voltage: the amount of potential electrical force available that could make electricity flow.

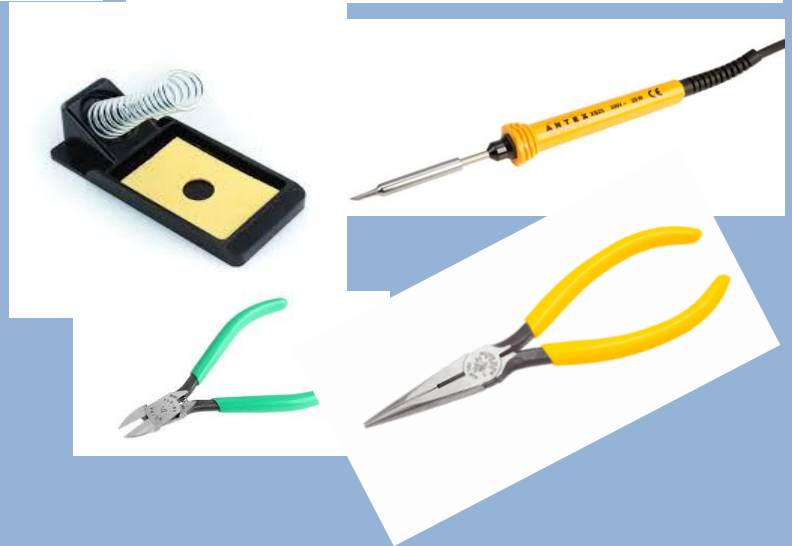
Current: the amount of electricity that is flowing through a circuit.

Semi-conductor: a material that allows electricity to flow under certain conditions. It can behave as an insulator or conductor.

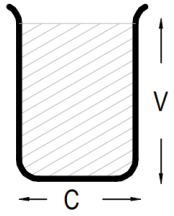








What is a capacitor?

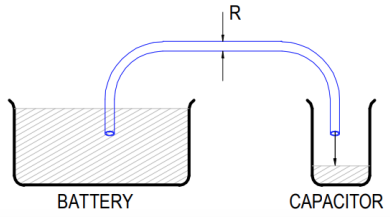


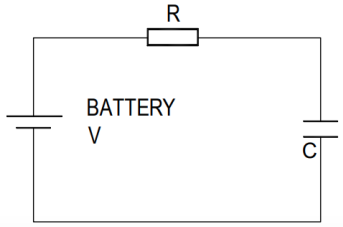
A capacitor is a component that can store electrical charge (electricity). In many ways, it is like a rechargeable battery.

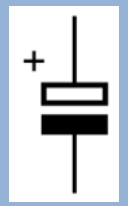
A good way to imagine a capacitor is as a bucket, where the size of the base of the bucket is equivalent to the capacitance (C) of the capacitor and the height of the bucket is equal to its voltage rating (V).

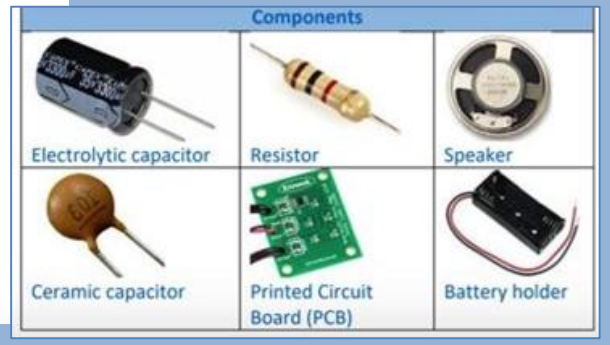
The amount that the bucket can hold is equal to the size of its base multiplied by its height, as shown by the shaded area.

Filling a capacitor with charge



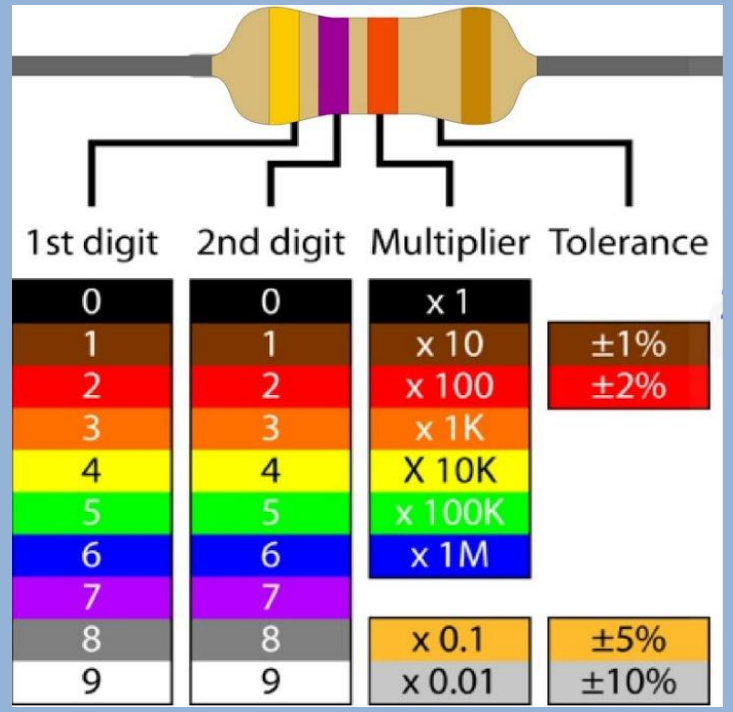


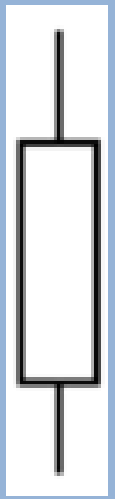


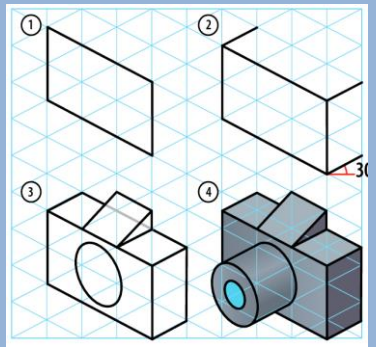


Resistor Values

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'.







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.

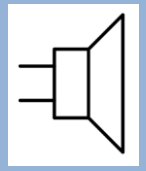
Picture	Description	Voltage	Capacity	Estimated life	Max power
	Polymer Lithium Ion Cell	3.7 V	400 mAh	2 days	0.7 W
	Polymer Lithium Ion Cell	3.7 V	1000 mAh	5 days	0.7 W
	2x AAA	3V	1000 mAh	7 days	0.45W
	3x AAA	4.5 V	1000 mAh	4.5 days	1 W
	2X AA	3V	1500mAH	10 days	0.45W
	3x AA	4.5 V	1500 mAh	6 days	1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

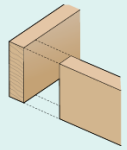
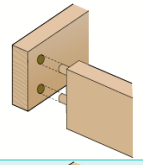
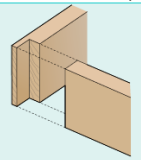
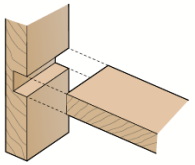
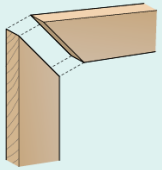
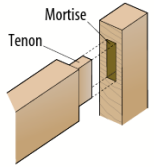
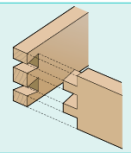
Please note that the estimated battery life has been calculated running the amplifier on standard alkaline batteries at full power, hence the higher power choices have a shorter battery life. Obviously if you don't run your MP3 player at the maximum volume, the batteries will last longer.

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



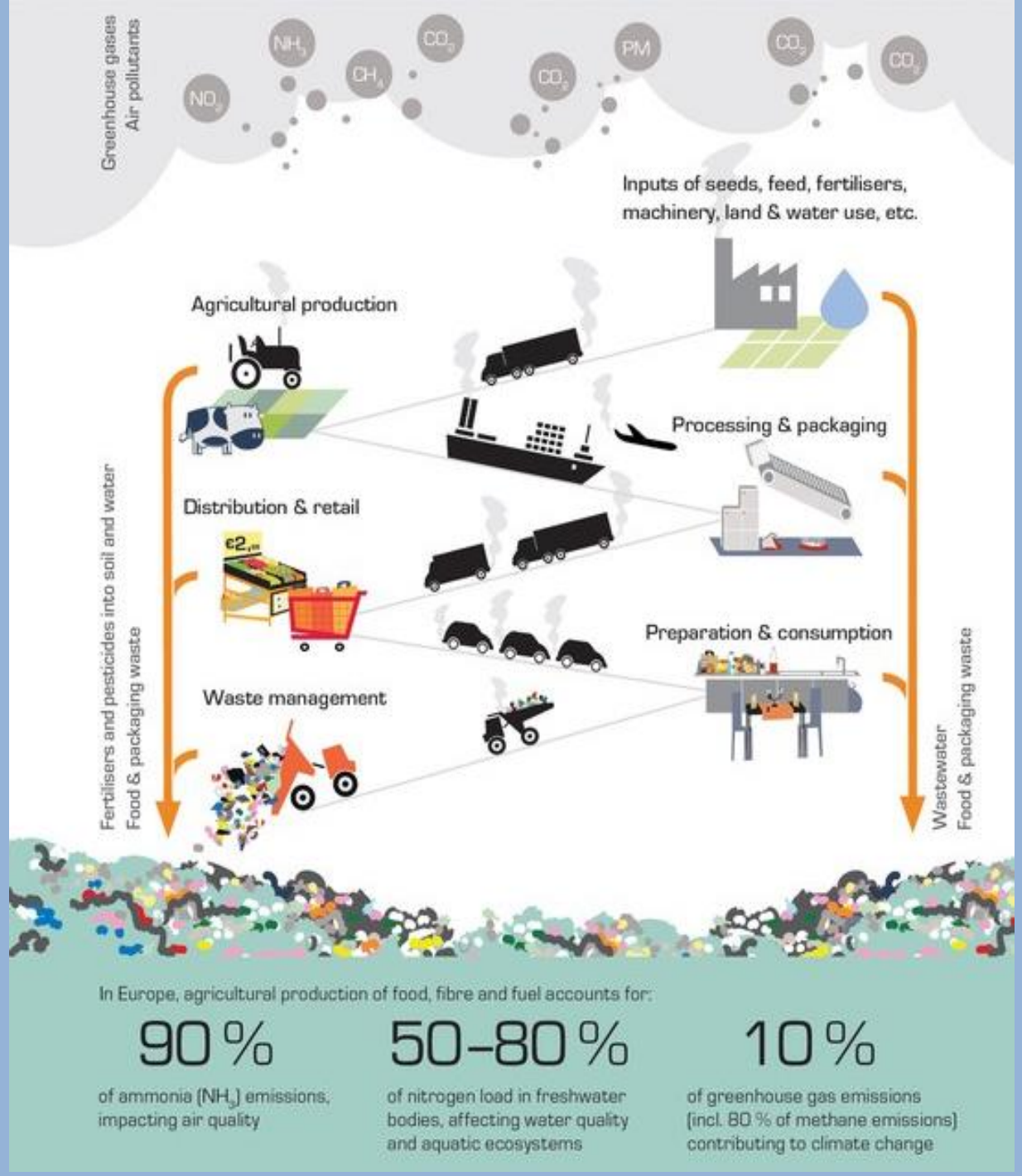
1. a current in the coil creates a magnetic field
2. the magnetic field interacts with the permanent magnet generating a force, which pushes the cone outwards
3. the current is made to flow in the opposite direction
4. the direction of the magnetic field reverses
5. the force on the cone now pulls it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

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

Name	Appearance	Advantages	Disadvantages
Butt		Easy to make, it is just square ends glued together	• Weak: there is no mechanical strength, just the glue • Not aesthetically pleasing
Dowel		Automated machines can drill the dowel holes quickly and accurately	Hard to line up the dowels accurately by hand
Lap		Quite easy to cut	Not very strong
Housing		• Holds a shelf or divider securely in the middle of a carcass (frame) • Pairs well with corner lap joints	• Can be tricky to cut neatly on a wide board • Very accurate marking out and cutting required to ensure a shelf is exactly level
Mitre		• Looks good because no end grain shows • Good for picture frames	Weak, it is only a butt joint at 45°
Mortise and tenon		• A strong joint • Good for joining a table or chair frame to legs	Time consuming to cut by hand
Dovetail		• A very strong joint – the dovetails lock together securely • Good for a drawer front that will get pulled hard	Very tricky to cut accurately by hand

Type	Description	Advantages	Disadvantages
Paint	A coloured pigment in liquid that dries out	Available in a range of colours	Covers up the natural woodgrain
Stain	A coloured liquid that soaks into the wood surface	Makes a pale coloured wood like pine a darker colour to mimic more expensive woods like oak or mahogany	Does not look quite like another wood as the pine grain still shows
Varnish	A clear coating that dries to shine	Gives a hard wearing finish that shows the grain of the wood Can be a high gloss or a matte finish	Can scratch or chip and expose the wood
Wax	A soft solid that is rubbed into the surface with a cloth	Easy to apply Gives a plain natural look	Rubs away and needs reapplying Not a glossy finish
Oil	Is rubbed onto the surface and soaks in	Good waterproofing for timber Vegetable oil on kitchen ware is non toxic	Surface feels oily
Shellac	A cloudy liquid made from a resin secreted by a beetle Lots of layers are rubbed on and polished to a finish called French polish	Traditionally used on expensive furniture for its glossy lustre	Easily damaged by water and heat
Veneer	A thin layer of wood glued onto the surface	An expensive decorative wood like mahogany can be put onto a cheaper wood like pine or chipboard	The veneer is natural wood so it still needs a finish applied

Organic & Food Carbon Footprint



ORGANIC ALWAYS MEANS

- ✔ Fewer Pesticides
- ✔ No artificial colours & preservatives
- ✔ Always free range
- ✔ No routine use of antibiotics
- ✔ No GM ingredients

Soil Association Organic Principles

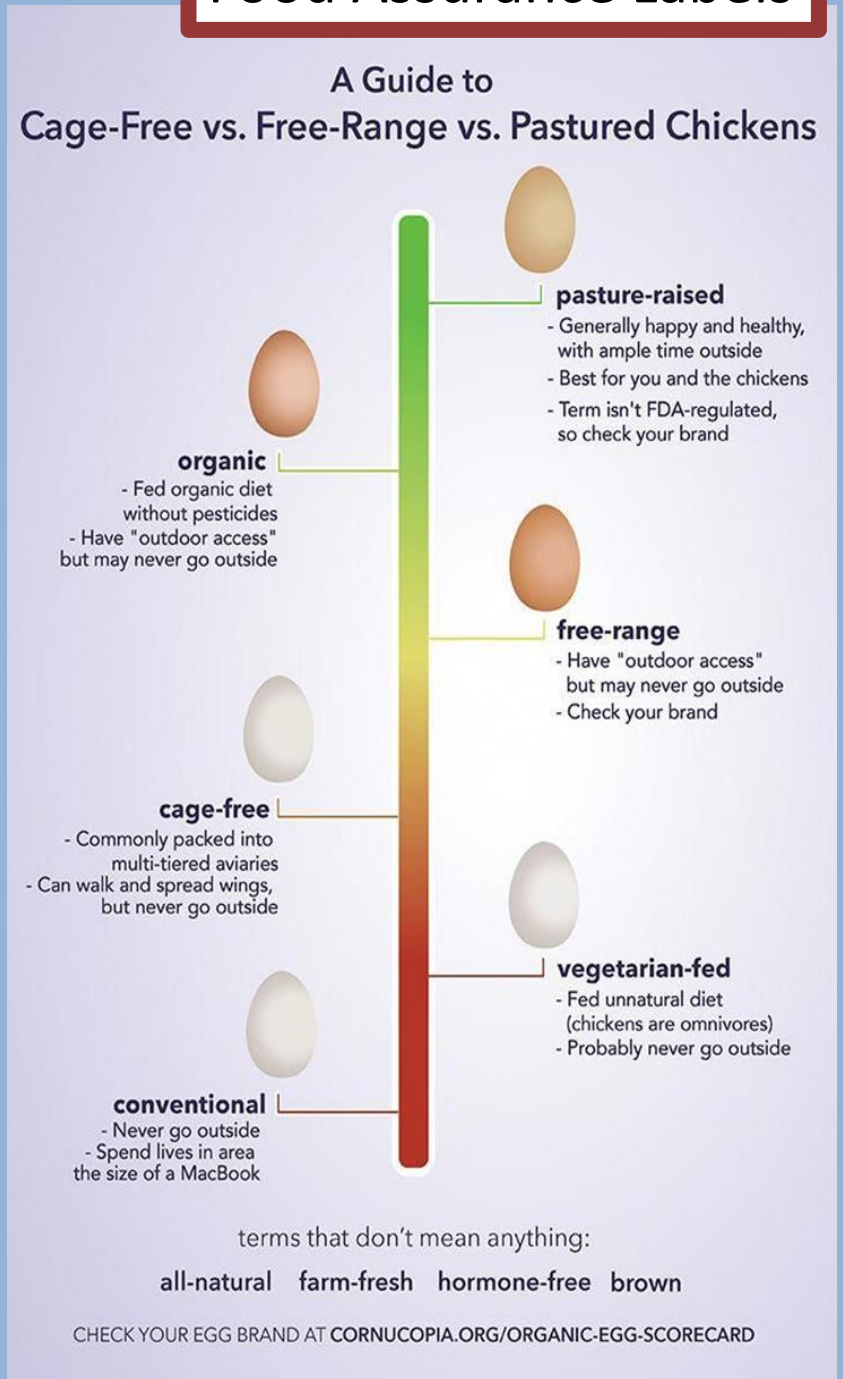
The Principle of Health - Organic agriculture should sustain and enhance the health of soil, plant, animal and human as one and indivisible.

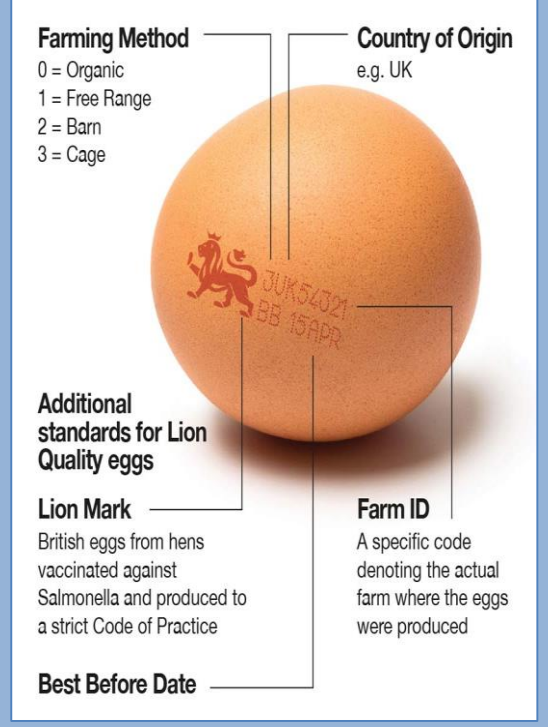
The Principle of Ecology - Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.

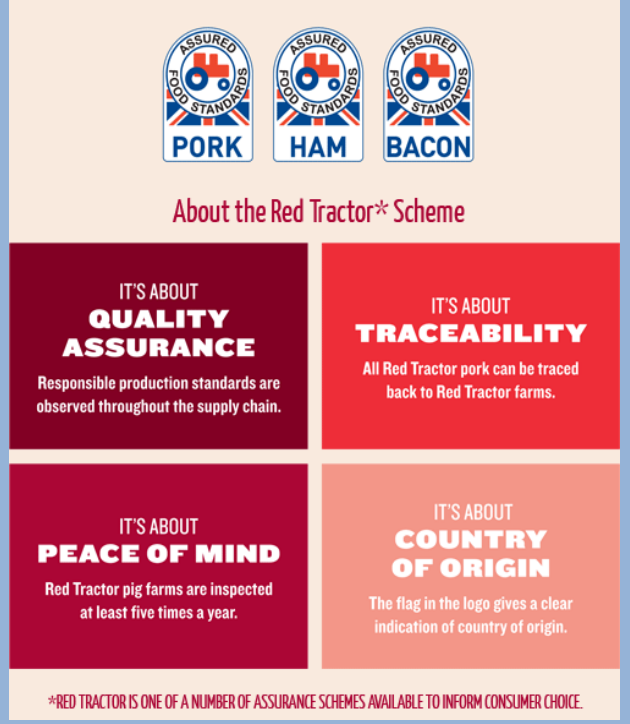
The Principle of Fairness - Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities

The Principle of Care - Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.

Food Assurance Labels







Seasonal & Sustainable Food

WHY EAT THE SEASONS?

There are a number of good reasons to eat more **local & seasonal** food:

- to reduce the energy (and associated CO_2 emissions) needed to grow and transport the food we eat
- to support the local economy
- to reconnect with nature's cycles and the passing of time
- It is often cheaper
- But most importantly, seasonal food is fresher and so tends to be tastier and more nutritious

Vitamin & Mineral Deficiency

Nutritional Deficiencies Disorders

Vitamins	Deficiency Disease	Symptoms
Vitamin - A	Loss of Vision	Poor vision, loss of vision in darkness
Vitamin - B_1	Beriberi	Weak muscles and very little energy to work
Vitamin - C	Scurvy	Bleeding gums
Vitamin - D	Rickets	Bones are bent
Calcium	Weak bone & tooth decay	Weak bone and tooth decay
Iodine	Goitre	Gland in neck
Iron	Anaemia	Weakness

Recommended Daily Intake
RDI

Protein	Fat	Saturated Fat	Carbohydrate	Sugars	Sodium	Dietary Fibre
50g	70g	24g	310g	90g	2300mg	30g

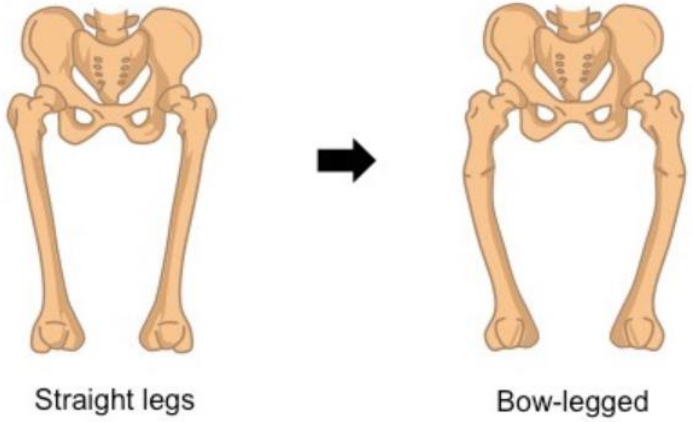
Vitamin D Deficiency

Deficiency disease: **Rickets**

Deficiency symptoms:

- **B**one fragility & fracturing
- **A**trophy / muscle weakening
- **D**ental problems
- **G**rowth retardation
- **E**nlargement of liver / spleen
- **S**keletal deformities

Mnemonic: **BADGES**



Beriberi

There are two types of this condition

Wet beriberi affects the cardivascular system and causes symptoms such as shortness of breath, increased heart rate, and swelling of legs

Dry beriberi affects the nervous system and causes symptoms such as difficultly walking, numbness in hands and feet, confusion, pain, and vomiting.

Nutrient Excess

HOW EATING TOO MUCH SALT HARMS YOUR BODY

Brain

The brain controls the body's central nervous system.

For some people, too much salt can:

- **Strain or damage arteries** that lead to the brain
- Which can cause **dementia** due to reduced oxygen and nutrients to the brain
- If an artery bursts or gets clogged then it could lead to a **stroke**

Heart

The heart pumps oxygen-rich blood through the body for organ function.

For some people, too much salt can:

- **Strain or damage arteries** that lead to the heart
- Which cause **sharp chest pains** because the heart is starved of oxygen and nutrients
- If an artery gets completely clogged or bursts it will lead to a **heart attack**

Kidneys

Kidneys remove excess fluid from your body by sending it to your bladder.

For some people, too much salt can:

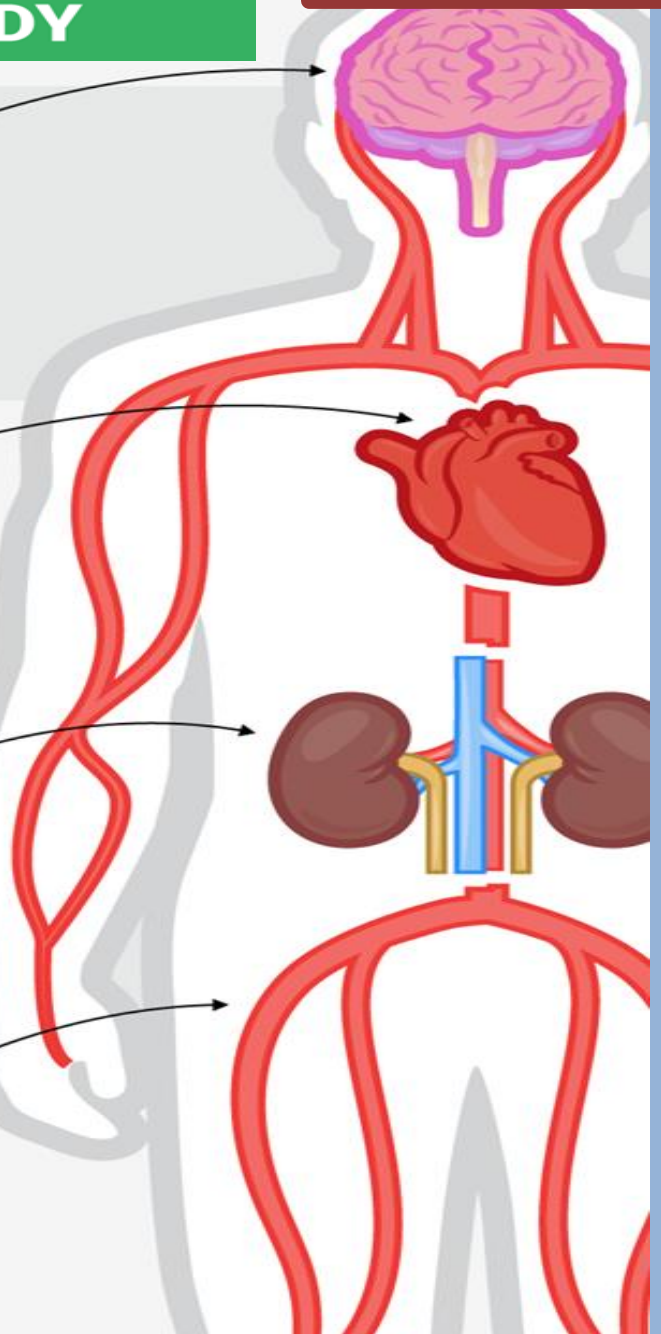
- Keep kidneys from removing excess liquid so you **retain more water**
- This can strain the kidneys and cause **kidney disease** or eventually kidney failure

Arteries

Arteries are the vessels that transport oxygen-rich blood from the heart to the rest of the body.

For some people, too much salt can:

- **Raise blood pressure** which strains the arteries
- To alleviate the strain, **arteries grow thicker**, but that can increases blood pressure more
- The end result can be **clogged or burst arteries** that prevent critical blood flow to organs



- Eating too much saturated fat is one of the major risk factors for heart disease.
- A diet high in saturated fat causes a soft, waxy substance called cholesterol to build up in the arteries.
- Too much fat also increases the risk of heart disease because of its high calorie content, which increases the chance of becoming obese (another risk factor for heart disease and some types of cancer).

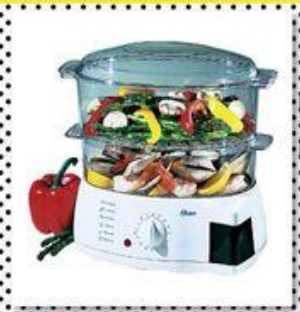
Maintaining Nutrients During Cooking

How cooking methods impact on nutritional value	
Nutrient	What is the effect?
Protein	Not destroyed by heat but coagulated and denatured. Can easily be overcooked by high heat cooking such as BBQ or grilling. Charred protein foods have been found to contain carcinogenic compounds.
Fat	Not destroyed by heat. Repeated use of cooking oil breaks it down in to substances harmful to the body. In stir-frying, fat helps to increase the absorption of vitamin A in some vegetables.
Carbohydrate	Starch is gelatinised when boiled in liquid. When heated starch can be degraded and the chemical reaction (dextrinization) creates sweetness & colour in food. Pectin & cellulose (found in fruit & vegetables) are degraded (softened) by boiling, frying, grilling, roasting and baking. Sucrose in carbohydrates melts when heated and causes caramelisation.
Fat soluble vitamins A D E K	Loss of pigmentation & vitamins through boiling, frying, grilling, steaming and roasting. Longer cooking times increase the loss. Loss is more acute in fat/oil based cooking methods such as deep/shallow frying.
Water soluble vitamins B C	Loss of pigmentation & vitamins through boiling, frying, grilling, steaming and roasting. Longer cooking times increase the loss. Loss is more acute in water based cooking methods, particularly boiling.
Minerals	Minerals tolerate higher heat cooking and longer cooking times and marginal loss is seen when boiling.
Antioxidants	Increased formation of antioxidants in cooking by frying, baking, grilling and roasting.

BOILING VEGETABLES

When cooking vegetables in water, some of the nutrient content, especially water-soluble vitamins including vitamins B and C, may leach into the surrounding water.

ALTERNATIVE COOKING METHODS



STEAMING VEGETABLES

Steaming softens vegetables while maintaining most of their nutrients, especially water-soluble compounds that are easily damaged by heat. Whether you use an electric steamer, a bamboo steamer or a microwaveable plastic bag or dish, your vegetables will retain more texture, flavor and nutritional value when you prepare them with this indirect form of heat and moisture.

ROASTING VEGETABLES

Roasting is of the healthiest cooking methods you can employ, since it uses dry heat to soften vegetables and doesn't require any added butter or oil, which can contribute significant amounts of calories and fat to cooked foods

YR9 Textiles Knowledge Organiser

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

CAD – Computer Aided Design

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

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

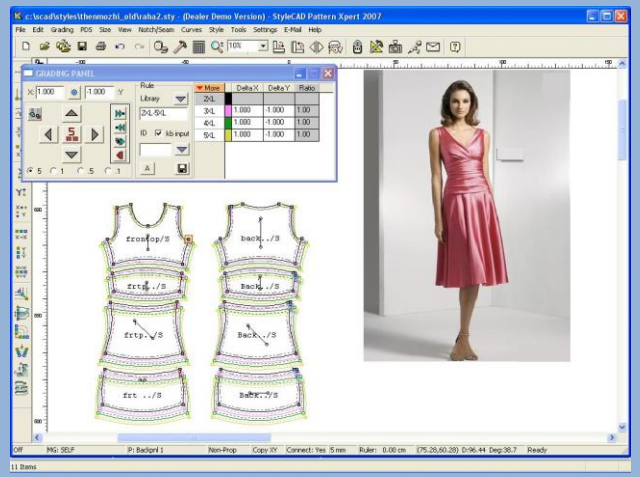
Computer Aided Manufacture is the manufacturing of products designed using CAD. CAM can create a faster production process.

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.	

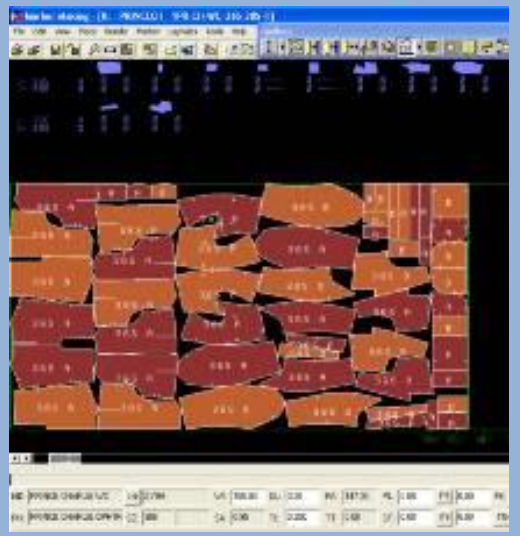
If you are designing products and they are made in another country you need to talk to the factory ALL the time.
E-mail used to be THE THING but now that's moved on to virtual 'cloud based' sites where product information can be uploaded to and which can be accessed from anywhere on the globe. So it's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



Drawing patterns and layplans



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

Cutting out of materials

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

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

Digital jet printer

Digital Knitting machine

Laser Cutter

Multi-head embroidery machine

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

Scales of Production

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

Production Line

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

Planned Obsolescence

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

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

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

Technical Textiles

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

Name and stimulus	Characteristics	Uses
Thermochromic pigments Heat	Pigments embedded into the thermochromic material respond to temperature changes by changing colour. They normally change as they heat up and cool down, but some versions are irreversible.	Flexible thermometers, temperature indicators, clothing, novelty goods, over-heating or over cooling indicators. 
Photochromic pigments UV light	The pigments that are embedded into photochromic material respond to changes in the UV light levels by changing colour or darkening. Once the UV light is taken away they change back or lighten.	Novelty goods, 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. 
Photo luminescent (Glow-in-the-dark) Light	Glow in the dark materials carry inorganic phosphors that absorb light in the visible and ultra violet wavelengths and then re-emit visible light, or a "glow".	Toys, stickers, paints, clock face/dials, emergency signs. 

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

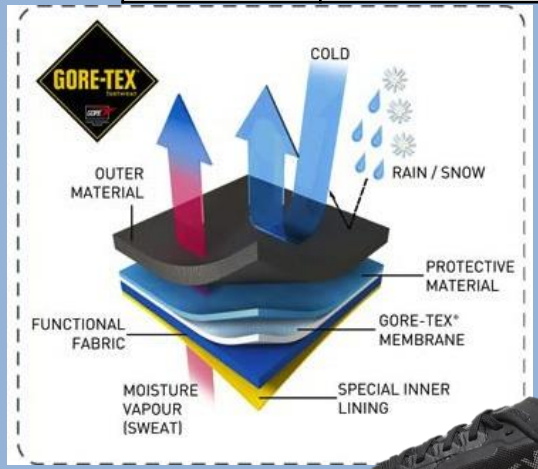
Name	Characteristics	Uses
Polylactic acid PLA	Widely used in 3D printers as reels of filament, it is non-toxic, easily moulded and fully biodegradable.	Bottles, pots, disposable food and drink containers, pens, phone cases and 3D printed items
Polyhydrox y-butyrate PHB Biopol	Stable, stiff, quite brittle,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

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

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

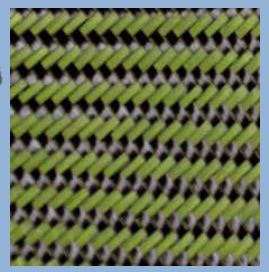
Composite Materials are formed when two to more distinctly different materials are combined together to create a new material with improved properties and functionality.

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



Gore-Tex

Kevlar



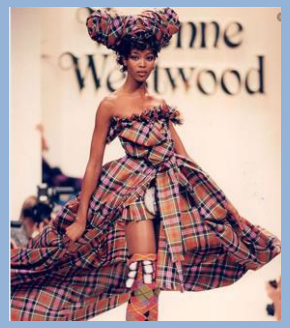
Design Culture

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.

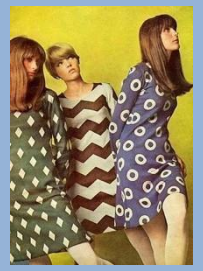
Vivienne Westwood
LONDON



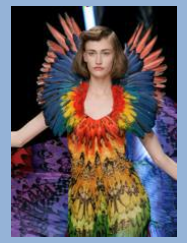
Coco Chanel (1883-1971)
A fashion designer known for introducing practical casual-chic clothing for women who had traditionally worn corsets and long skirts.

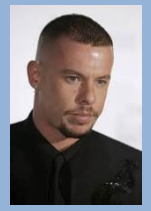
Mary Quant (1934-Present)
A fashion designer who popularised the mini skirt, hot pants and OVC in the sixties. Her clothing often featured white collars, simple shapes and bold colours.

MARY QUANT

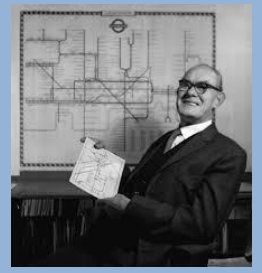


Alexander McQueen (1969-2010)
An influential fashion designer known for his theatrical, well tailored clothing and dramatic catwalk presentation displaying his collections.

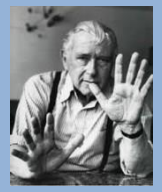




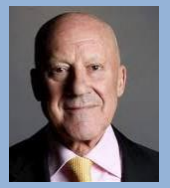
Harry Beck (1902-1974)
He redesigned the London Underground map in the 1930's. It's simplified layout made it a huge success and maps of many other transport networks now use Beck's style.



Marcel Breuer (1902-1981)
A modernist architect and furniture designer. Some of his best works include- tubular steel furniture and concrete sculpted buildings.

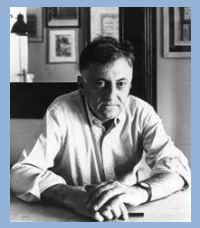


Norman Foster (1935-Present)
Architect famous for creating the Millennium Bridge, Gherkin London and Wembley Stadium.



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.



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. Other ways to avoid are-

- Collaboration
- Honest feedback
- Focusing on new solutions
- Using fresh approaches

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

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

- 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.